National Database: SLEM Practitioners for the Development of Institutional and Individual Networks

Indian Council of Forestry Research and Education
(Autonomous body of Ministry of Environment, Forest and Climate Change, Government of India)
P.O. New Forest, Dehradun – 248006

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ICFRE, 2021

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Contents

1. Introduction

Land provides many services to humankind and is under different land uses. Land has cultural as well as productive value. In the form of provisioning services, land provides food, medicines, clothes, building material, fruits, forage, natural fibers and so on. Whereas, as a supporting service, it provides fresh and clean air and water, maintains nutrients cycling, helps in waste decomposition, regenerates soil, thus supports life on earth. Its resilience to natural calamities and other environmental disturbances helps in stabilizing the climatic conditions; minimizing the ill impacts of disturbances caused by nature and human both; and rejuvenates as well as maintains the ecosystem balance. Its role as a carbon sink is also remarkable, if covered by vegetation. Spiritual and cultural values associated with land have their own significance. Among all the benefits associated with land, role of land as a feeding mother become more significant as sustenance of life on earth entirely depends on it. With the rising population, demand for food, water and land have increased enormously, which has led struggle for natural resources and human wildlife conflicts. All this has encouraged the over exploitation of natural resources in unsustainable manner and resulted the alarming situation of land degradation, desertification and drought, which have become major environmental challenges, the world is facing presently. These issues have directly raised the concern about human survival and survival of other living beings on the mother earth. Over exploitation of natural resources has not only depleted the natural resources but has also affected the rural livelihood and food security. If this situation prevails, it would be difficult to achieve the 'Sustainable Development Goal 2: ZERO hunger by 2030'. As per the United Nations the number of people facing hunger has begun to increase slowly. Estimates has also reflected that in 2019 nearly 690 million people at global level were facing hunger[1]. If this trend continues, the mentioned figure may cross 890 million by 2030. Figures of World Food Programme also sensitize the nerves by reflecting that about 135 million population faces acute hunger. COVID 19 pandemic like situations could double this figure shortly and made the situation more alarming. As it was projected that by the year 2050, world population will rise to nearly 10 billion, which will raise the global food demand by 56 percent. To full fill this demand, world needs 593 million hectares of more agriculture land, which is next to impossible task. Thus, need of the hour is to deeply analyse the current scenario and come up with the stringent solutions to outface this issue. Moving towards scaling up of sustainable land management practices, innovative ways to produce food, focus on cultivation of improved and resilient crop varieties, sustainable water harvesting methods, soil conservation approaches and focus on reducing greenhouse gas emission could be the way out in this alarming situation (Ranganathan *et al*., 2018).

If we look into the scenario of developing country like India, it is reflected that with only 2.3 percent of the world's land and less than 4 percent of the global fresh water, India has to to fulfill the food and water requirement of its population (which contributes about 17 percent of the world's population). Depleting land resources and growing population pressure have

1 *https://www.un.org/sustainabledevelopment/hunger*

made the situation worst by affecting the productivity of agriculture lands. Urbanization and other developmental activities have made agricultural land to shrink at faster rate (ICFRE, 2014). All this has decreased the per capita availability of land from 0.91 ha in 1951 to 0.27 ha in 2011, which is likely to slide further to 0.20 ha by 2035 (MoA&FW, 2016). To achieve high agriculture production from less land on rain fed areas, country needs adequate fund flow, planning and institutional arrangements and sustainable land management practices.

Another issue which has been raised due to over exploitation of natural resources and land degradation, desertification and drought, is scarcity of water. Low availability of groundwater has affected not only the dry states of the country but also affected the food producing states like Punjab and Haryana. Groundwater in India fulfills about 85 percent rural domestic water requirement, 50 percent of urban water requirements and more than 50 percent of irrigation requirements. In many irrigated lands, the selection on cropping pattern and cropping intensity are being largely dependent on the availability of groundwater (ICFRE, 2014).

However, the over explotation of natural resources, unsustainable land use practices have made the life less resilient and more vulnerable to the climate change. Among all the resources, land is the key entity, which is facing highest pressure of anthropogenic activities related to agriculture production or developmental activities.

Major Causes and Impact of Land Degradation

Land degradation has taken place across the country by both natural and human induced factors. As far as the human induced factors are concerned, population growth is found as prime factor leading land towards degradation followed by overgrazing. By following unsustainable agricultural practices, population not only losing fertile soil, but also facing the challenges of water scarcity and land degradation. Scarcity of resources is compelling population to migrate to urban areas in search of livelihood and good quality life. Globally, the International Committee of the Red Cross estimates that 25 million of the world's refugees (58%) are fleeing from degraded lands. After high population pressure and uncontrolled grazing were found as major drivers of land degradation, which has shown negative impact on soil compaction leading to soil erosion. Grazing lands face two major issues such as damage to soil and damage to vegetation through uncontrolled grazing. Grazing activities lead to uprooting of plants and expose the fertile soil to erosion. After removal of top layer, soil losses its productivity over the period of time and become degraded.

Fuelwood collection is also one of the drivers responsible for land degradation. Over extraction of fuelwood by the large quantum of population specifically in Asia and Africa is making the dry woodlands vulnerable to desertification. In these areas principle source of fuel is wood, which is used directly or in the form of charcoal. FAO (1997) has also projected that fuelwood and charcoal are the primary forest fuel products which comprise approximately 60 percent of worldwide wood removals.

In India, major cause of land degradation and desertification is water erosion, followed by vegetation degradation and wind erosion. Wind erosion was found as major cause of desertification in arid region whereas vegetation degradation and water erosion were considered as major drivers of desertification in semi-arid and dry sub-humid regions. Land degradation in India has highly affected the agriculture sector which has highest contribution

in country's GDP. Thus, clear impact of land degradation on GDP of the country can be easily figure out. In the year 2014-15, the economic loss faced due to land degradation and change in land use pattern was 2.54 percent of the India's GDP, which was about 3,177.39 billion (TERI, 2019). Impact of climate change on natural resources was also noticed at global level due to the anthrpogenic emission of carbon dioxide and other greenhouse gases by fossil fuel combustion. It was also found that drought, floods and other extreme events including avalanches and landslides in hilly regions of the India leading to land degradation and desertification (ICFRE, 2014). Adverse impacts of climate change on land productivity have also been observed, as dry and hot areas are found to be more prone to naturally occurring wildfire which in turn leads to soil erosion (Safriel and Adeel, 2005 and Barrow, 1991).

Land degradation and desertification have adversely affected the life of millions of people and biodiversity. Loss of soil productivity not only affected the lives but also led the mass migration and socio-economic conflicts. Unsustainable use of land resource, loss of vegetation through deforestation, unsustainable fuelwood and fodder extraction, shifting cultivation, forest fires and overgrazing etc. are found as prime factors that subject land to excessive degradation. Besides, other unsustainable land use practices such as improper crop rotation, inadequate adoption of soil conservation measure, excessive use of agro-chemicals such as fertilizers and pesticides, improper planning and management of irrigation system and excess extraction of ground water, are also identified as drivers of land degradation. Land degradation and desertification issues can be addressed through up scaling of Sustainable Land and Ecosystem Management (SLEM) best practices.

2. SLEM Approches in India

In India, an emphasis on poverty alleviation through enhanced productivity of dry as well irrigated ecosystems requires apt conservation measures for sustainable production. The genesis of SLEM was rooted in the rationale that food security through enhanced agricultural productivity cannot be achieved by further increasing the cultivated area. Sustainable and integrated management of the natural resources is vital to meet the challenges of land degradation and desertification, and to sustain the flow of ecosystem goods and services.

Keeping above approach in mind, SLEM-Country Partnership Programme (SLEM-CPP) was initiated in 2008 through the World Bank/GEF funded project on "*Policy and Institutional Reform for Mainstreaming and Up-scaling Sustainable Land and Ecosystem Management in India*", with the objective '*to enhance the institutional and policy framework for harmonization, coordination and monitoring of land based interventions and develop natural resource management strategies that promote sustainable land management and enhance agricultural productivity while minimizing environmental impacts*'. The coordination of SLEM-CPP was entrusted to the Indian council of Forestry Research and Education (ICFRE) as a Technical Facilitation Organization (TFO) under the overall supervision of the Ministry of Environment, Forest and Climate Change, Government of India.

The SLEM CPP's overall development objective was to contribute to poverty alleviation in India by promoting enhanced efficiency of natural resource use, improved land and ecosystem productivity, and reduced vulnerability to extreme weather events (droughts, floods). The SLEM-CPP supported by GEF was in itself an innovative programmatic operation specifically developed to become more inclusive in addressing the sustainable land and ecosystem management agenda by drawing upon GEF resources from three focal areas, and setting objectives that include combating land degradation, conserving biodiversity and adaptation to climate change. In the Indian context, SLEM was innovative as it takes a multi-sectoral approach to land management relating to poverty reduction, watershed management and afforestation initiatives based on ecosystem approach that pays particular attention to safeguarding biodiversity and climate change.

Identification, collection, documentation and dissemination of SLEM best practices in the areas of land management, water resource conservation, ecosystem services enhancement, biodiversity conservation, climate change adaptation under the SLEM-CPP was one of the of the major objectives of the TFO. The SLEM best practice documents were developed to disseminate, upscale and mainstream the best practices developed by the SLEM project partners and other such projects outside SLEM-CPP. These best practices address the issues related to increase in land productivity, sustainable utilization of biological resources, water resource management, long terms sustenance of ecological goods and services, opportunities for off-farm livelihoods and sustainable livelihood generation. It has targeted the stakeholders such as farmers groups, community-based organizations, policy makers, agriculture and natural resource institutions/departments. The best practices documented by ICFRE under

the SLEM-CPP (ICFRE, 2014) are categorized as under:

1. ***Enhancing land productivity of non-agriculture land and rainfed agriculture system***: Adoption of SLEM best practices such as wise use of water, rainwater harvesting and soil moisture conservation may enhance the productivity by 5-15% on an average across the rain-fed regions. Whereas diversified agriculture system and integrated farming system are very fruitful for rain-fed areas as these encourage faster agriculture growth. *In-situ* water harvesting practices using simple technologies (vegetative barriers, gravel and stone mulching, compartmental bunding, cover cropping, inter-plot rainwater harvesting, dug-out pond, percolation tanks etc.) enables greater water infiltration and retains soil moisture for longer period.

2. ***Sustainable utilization of water resources:*** This category includes rainwater harvesting structure, improvement of water use efficiency by incorporating activities such as laser leveling of land for uniform distribution of water in field, use of micro irrigation systems like drips and sprinklers, water application in consonance with water requirement of crops, adaptation of low water requiring crops and varieties, adopting water economic practices like sustainable rice intensification (SRI) for paddy and integrated water management for higher productivity per unit of water use.

3. ***Sustainable utilization and conservation of biodiversity***: This category includes traditional practices like intercropping, agro-forestry, seed bank, flood and salt tolerant varieties of rice, agriculture innovation and value addition to eroding genetic resources in the form of landraces.

4. ***Climate change adaptation and mitigation:*** Wetland management, afforestation, introduction of varieties of crop which are climate resilient (salt tolerant and flood tolerant), crop diversification to address the climate change and variability especially in cereals and horticulture crops.

5. ***Sustainable livelihood generation and socio-economic improvement:*** This category includes on-farm and off-farm intervention. Under on-farm intervention it includes horticulture, forestry, sericulture, medicinal plant cultivation, animal husbandry, fishery, making agro-service centers, production of agriculture inputs like biofertilizers, biopesticides, vermicompost, mushroom spawn production etc. whereas off-farm interventions include incense stick making, weaving etc.

6. ***Dissemination and outreach:*** It highlights the experiences shared by stakeholders on sustainable land management practices. It includes short documentaries, case studies, success stories and intervention models and other knowledge products from which other stakeholders can become motivated and adopt sustainable land and ecosystem management practices in the country.

7. ***Institutional innovation for sustainable resources use:*** Village level community-based institutions formally recognized and empowered for sustainable management of the forests of their villages. This category includes mobilization of community and groups in sustainable land management, participatory management of natural forest resources through van panchayats and joint forest management committees.

3. Database of SLEM Practitioners

The objective for preparation of database of SLEM practitioners is to help land practitioners/ stakeholders to adopt SLEM practices, locate the organization working in the respective areas of sustainale land management and scale up the tested and proven best practices. The SLEM database prepared comprises of agroforestry, agro-biodiversity, aqua-culture, bee-keeping, climate resilient agriculture, crop nutrient management, cross-slope measure (bench terracing, terrace cultivation, sloping agriculture land technology etc.), cold desert afforestation, disaster management, drinking water management, ecological restoration, energy efficiency, farm machinery bank, fish farming, food security, forest management and conservation, gene bank, groundwater management, home gardens, herbal garden, improved agriculture practices (system of rice intensification, system of wheat intensification, azolla cultivation with system of rice intensification, responsible crop initiative agriculture, system of pigeon-pea intensification, ridge and furrow system of planting, crop intensification, low external input sustainable agriculture etc.), improved plant/animal breeds, improved vegetation cover, information, education and technology, integrated farm development, integrated pest/ disease management, integrated soil fertility management (soil reclamation and management and mulching), irrigation management (micro irrigation, drip irrigation), lac cultivation, land shaping, low cost farming equipments/tools, low cost technology, land management, medicinal plantation, micro-finance and livelihood, minimal soil disturbance, mushroom cultivation, non-timber forest products, participatory land use plan, pastoralism and grazing land management (fodder management, pasture management), post-harvest measures, reseach and training on rotational system (inter-cropping/ mixed cropping, shifting cultivation, vertical farming), rural tourism, seri-culture, shelterbelt/ windbreak, surface water management (spring, river, lakes), traditional water conservation and land management, waste management/ waste water management/ agro waste management, water conservation, water diversion and drainage, water harvesting, wetland protection/management and women empowerment.

National database on SLEM practitioners for the development of institutional and individual networks has been prepared. Database consist of 362 SLEM practitioners comprising of 117 organisations/ institutions, 159 individuals and community groups of SLEM practitioners, 21 awards winning practitioners and 65 other organizations. The database having detailed information on the SLEM best practices developed/ adopted in the country by institutions/ organizations and individuals. This data base will also provide information on community-specific traditional/ indigenous practices for water conservation, land management, natural resource management including agriculture in the region.

Table 1: National Database of SLEM Practitioners (Government Departments, Research Institutions, Academic Institutions and Non-Government Organisations)

S. N.	Name of Institutions/ Organizations	SLEM Practices Developed/ Adopted	Website link of the SLEM developed/adopted	Area of operations	Categories
1	***'Action for Food Production'*** 25/1-A, Institutional Area, Pankha Road, D-Block, Janakpuri, New Delhi-110058 Ph:011-28525452, 28522575 Email: ed@afpro.org, pd@afpro.org, adm@afpro.org, fin@afpro.org Website: www.afpro.org	• **Deenbandhu 2000 model biogas plants:** The Deenbandhu design claimed to cut the cost of installations and most efficient biogas model within the National Programme for Biogas development (NPBD). The cost reduction was due to the use of some standardized pipes and a different construction technique. • **Artificial reefs:** Artificial reefs provide fish with a conducive environment to breed and grow. Artificial reefs are constructed from cement set in mould. After putting them together, they are sunk off the coast in clusters of 4 to 5. This has created better result in catching fish for traditional fishers due to the reefs. • **WADI programme:** Crop management practices (seeds, farm mechanization, fertilizers, pesticides, credit, market linkages etc.) and allied activities (livestock poultry, rearing of small ruminants (goat and sheep), cattle, fisheries) for small and marginal farmers. Introduction of **Rice-Fish-Horticulture**: It generates additional income for flood prone areas. • **Sloping agricultural land technologies (SALT):** The organization in rainfed regions promotes sloping agricultural land technologies (SALT). It optimizes land use to grow not just food crops but horticultural produce and forests as well. It enhances income levels as well as food and fodder availability within the community. • **Rooftop rainwater harvesting:** Restoring Groundwater potentials through Roof-top Rainwater harvesting for water stressed area. • **Low-cost protective irrigation**: In rainfed agricultural, low cost protective irrigation systems were installed through diversion-based irrigation system developed on the gravity flow concept in the village. • **Integrated pest management:** Promoting better management practices in cotton through Integrated Pest Management. cotton was inter cropped with cowpea in order to divert the aphids and leaf miner pests to this crop. T-shaped bird perches and various bio-agents like Chrysopa, Trichogramma etc. were also used for the management of pests. • **Watershed programme:** Devpimpalgoan, a village in a drought prone region of Maharashtra has been declared as "Watershed Model" by the Government of Maharashtra.	http://www.afpro.org/wp-content/uploads/2014/OurFocus/IntegratedPestManagment.pdf http://www.afpro.org/success/food-security-livelihoods http://www.afpro.org/blog/2014/07/07/watermelon-cultivation-poha-village-karanja-lad-block-washim-district-maharashtra/	Maharashtra, Karnataka, Rajasthan, Jharkhand, Madhya Pradesh, Chhattisgarh, North East and Odisha	Energy efficiency, Integrated farm development, Cross-slope measure, Irrigation management and Integrated pest management

2	***'Aakar Charitable trust'*** The Phoenix Mills Ltd.Premises,462, Senapati Bapat Marg, Lower Parel, Mumbai -400013, Maharashtra Ph: 09833298801 Email: ruiaamla@hotmail.com Website:www.aakarcharitabletrust.org/whatwedo.html www.aakarcharitabletrust.org	• **Construction of water harvesting structure:** Water conservation through construction of medium to small size check dam and ponds. First step involves connecting with people and spread awareness on the benefits of water harvesting. Secondly, experts with experience of at least 2000 water harvesting structures are employed to take care of the design of the structures in consultation with the villagers. Third, a meeting is held informing that the help will be provided by the organization only when the people agree to help themselves. They have to contribute all the stone, water and 1/3rd in the digging and compacting of the soil. The dam consists of part masonry and part earthen bunding. The Trust provides JCB, cement, mason, all the labour-expenses for the masonry work and 2/3rd labour for the earthen work. Fourth, the organization also make agreed condition with the local people to stop child marriage, dowry system, alcohol and tobacco.	https://aakarcharitabletrust.org/success.html https://www.facebook.com/Aakar-Charitable-Trust-101836144615466/videos https://www.facebook.com/101836144615466/videos/2763096247110282/?__so__=channel_tab&__rv__=all_videos_card https://www.facebook.com/Aakar-Charitable-Trust-101836144615466/videos/aakar-charitable-trust-latest-video-from-bansur/268968164186092/?__so__=channel_tab&__rv__=related_videos	Rajasthan	Surface water management
3	***'Action for social advancement (ASA)'*** "The Farmers House" Plan-C, Tulip Greens, Village Mahabadia, Kolar Road, Bhopal-462042, Madhya Pradesh Ph: 09109988784, 9109988785 Email: info@asabhopal.org Website: www.asaindia.org	• **Agriculture productivity**: Enhancement in agriculture productivity based on 'Responsible Crop Initiative (RCI)' or popularly known as "*Jimmedar Kheti*". They are grown with special safeguard by maintaining environment responsibility (no crop residue burning, no use of pesticides, preservation of traditional practices etc.), sustainable agronomy practices (seed treatment, integrated nutrient management, integrated pest management, use of organic manure etc.), and social responsibility (no child labour, equal pay for equal work, no land encroachment, respect to labour law etc.). • **WADI promotion:** Trees on farm by promoting Agri-Horti-Forestry activities • **Agri-business:** Formation of Barwani Farmer Producer Company which helped in providing effective linkage with the value chain, products and services for enhancement of the income of the shareholders. The company has helped them address issues such as low incomes due to the absence of post-harvest infrastructure, low value addition and absence of organized marketing processes	https://www.youtube.com/watch?v=7o0SzHt8HwM https://www.youtube.com/watch?v=ICmmLmQKC9o&feature=youtu.be https://www.youtube.com/embed/EqJMudhJ9UY https://www.youtube.com/watch?v=HHEWww4bD14&feature=youtu.be https://www.youtube.com/watch?time_continue=5&v=QxfpEbiqYTU&feature=emb_logo http://asaindia.org/BTG/others/LISTenglish.html http://www.asaindia.org/NewsLetters2/nl2/nl2.htm http://www.asaindia.org/stories%20July%20upd/Helping%20farmers%20through%20forming%20a%20Producer%20Company.pdf http://www.asaindia.org/stories%20July%20upd/Marginal%20to%20a%20Lakhpati%20Farmer%20-An%20emerging%20leader.pdf http://www.asaindia.org/stories%20July%20upd/Yield%20Enhancing%20Shift.pdf https://www.youtube.com/watch?v=eliziIf2Qdg	Madhya Pradesh	Improved agriculture practices, Agri business and Integrated farm development

4	***'Action for Agricultural Renewal in Maharashtra (AFARM)'*** 2/23 A-B Raisoni Park, Market Yard, Pune 411 037, Ph: (020) 24264641, 24268302 Email: admin@afarm.org Website: www.afarm.org	• **Sustainable agriculture:** Promotion of environment friendly low external input sustainable agriculture (LEISA) to build resilience in agricultural productions system. The package of practices (POP) of sustainable agriculture are being promoted to small & marginal farmers. The initiatives involved in LEISA are as follows: ➢ Biological Seed Treatment as preventive measure to increase tolerance for potential pest and diseases, increase in germination percentage. ➢ Sowing through broad bed furrow planter to retain soil moisture for longer period. ➢ On-farm water management – efficient irrigation practices such as improved field layout, sprinkler and drip systems. ➢ Biological pest management preventive as well as curative measure for pest and diseases. ➢ Integrated plant nutrient management appropriate and safe utilisation of manure, fertilisers. ➢ Diversification of farming systems by introducing new varieties and new crops, improved crop husbandry techniques including multiple cropping, improved inter cropping. ➢ Dry land farming practices including strip cropping, contour cultivation, mulching, raised bed cultivation, weeding and use of weed as mulch in the field. ➢ Weather based crop planning.	https://www.afarm.org/img/sucessstory/WSD_SS_2.pdf https://www.afarm.org/img/sucessstory/WSD_SS_4.pdf https://www.youtube.com/watch?v=qBUAEoiSA4Q&feature=emb_imp_rv_oc https://www.afarm.org/img/sucessstory/SA_SS_1.pdf https://www.afarm.org/img/sucessstory/WSD_SS_3.pdf https://www.afarm.org/img/sucessstory/SA_SS_6.pdf https://www.afarm.org/img/sucessstory/WSD_SS_1.pdf	Maharashtra	Improved agriculture practices
5	***'Anandana'*** Coca-Cola India Foundation 16th Floor, One Horizon Centre, Golf Course Rd, DLF - Phase V, Sector 43, Gurgaon-122003, Haryana Ph: 0124-4785000/5001 Email: anandana@apac.ko.com Website: www.anandana.org	• **Watershed rejuvenation:** The watershed rejuvenation was taken under project 'Bhujal'. It created a storage capacity of 100 million liters of water. the cropping intensity increased up to 30% after the intervention and there was a significant increase in the ground water recorded up to 2 to 5 meters. Around 100 acres of land was made cultivable resulting in extra source of income up to Rs.20,000/- per acre for the farmers of the area. The framework included development of essential infrastructure, the labor was mostly generated from within the community thus gave a huge scope of employment. The community was also encouraged for effective utilization of resources. Regular public interaction platform was developed in which there was equal representation of women, men and all the stakeholder groups which provided a platform for discussion and suggestions and gave a fare and transparent evaluation of the intervention.	https://www.anandana.org/videos.html https://www.youtube.com/watch?v=zJfP9YChvQo&feature=emb_err_woyt	Haryana	Water harvesting

6	***'Arghyam'*** #599, 12th Main, HAL 2nd Stage, Indiranagar, Bangalore – 560008 Ph: 080-41698941/ 42 Email: info@ arghyam.org Website: www. arghyam.org	• **Water security:** Prevention of over-extraction of groundwater, encourage water strategy management methods through conjunctive use of water sources and preserve traditional water conservation systems. • **Water conflict:** The organization fought against water conflict and has funded the forum for policy dialogue on water conflicts in India, which is a network of over 250 individuals and organisations and has extensively documented conflicts since 2008. • **Participatory water quality analysis:** Strengthened the community/village-level institutions for analyzing water quality, planning, management, and monitoring practices, as well as awareness generation on water quality issues and mitigation. • **Participatory ground water management**: Demonstration of participatory groundwater management in Bhuj. The interventions involved both social processes and technical processes. On the social front a cadre of para professionals and community representatives having knowledge on urban watershed and groundwater management was created and citizens' action group was created to enable their participation. On the technical front a number of interventions were carried out such as demonstrating groundwater management at a decentralised level in residential areas and institutions, revival and strengthening of traditional water resources in Bhuj, and assessment and monitoring of groundwater resources in the city to manage the water resources better.	http://arghyam.org/evolving-water-self-reliance-through-surface-and-groundwater-sharing-and-management/ https://www.youtube.com/watch?feature=player_embedded&v=yFM6My5tAqM https://www.indiawaterportal.org/articles/rooftop-rainwater-harvesting-chhattisgarh-school-reduces-absenteeism https://www.indiawaterportal.org/articles/understanding-groundwater-film-acwadam-groundwater-study-pune	Karnataka, Uttarakhand, Haryana, Rajasthan, Chhattisgarh, Gujarat, Maharastra, Jharkhand, West Bengal, Uttar Pradesh, Odisha, Assam, Manipur, Sikkim, Bihar, Madhya Pradesh, Andhra Pradesh, Karnataka, Tamil Nadu and Kerala	Ground water management
7	***Aga Khan Rural Support Programme (India)*** Sarojini House, 2nd floor 6, Bhagwan Dass Road New Delhi 110001 Ph: 011-4739 9700 Website: www.akdn.org/ind	• **Water conservation:** Treatment of gullies through boulder checks, gabion structures and other structures, farm ponds for water recharge, small water harvesting structure for recharge and irrigation purpose and on farm water management by drip irrigation, moisture conservation. • **Sustainable agriculture:** System of root intensification for small and marginal farmers, non-pesticide management, integration of agriculture with livestock, fruits and vegetable cultivation and promoting crop diversity including legumes, millets etc. • **Innovation adopted:** -"*Amrit Krishi*" is an efficient conservation farming approach. Amrit Krishi loosely translated as Nectar farming involves the production and use of organic compost and bio pesticide which go by the name of "*Amrit Khaad" and "Amrit Pani"* respectively. Both of these are low-cost but highly effective organic products that strengthened graded farm soils as well as build immunity of standing crops and protect them from pest attacks. These can easily be prepared by farmers themselves with locally available materials and within a short period of time. *Amrit Pani* for instance, is an eco-friendly product, acts as an effective insect and pest repellent and a liquid growth promoter for all types of plants (field crops, horticultural crops such as fruits and vegetable crops, ornamental plants etc.). From numerous field experiences across locations, it has been proved to reduce input cost towards chemical fertilizer and pesticides significantly.	https://www.youtube.com/watch?v=GCsTPIcNfjM (Water for Livelihoods - Stories of Pipalpada village of The Dangs, Gujarat) https://www.youtube.com/watch?v=uHsQB9FTeaE (Mahalpada - On the path of Development) https://www.youtube.com/watch?v=9zTH9rKfW1o (Enhancing Livelihood through Integrated Approach) https://www.youtube.com/watch?v=VBjVKukLg18 (Participatory Irrigation Management) https://www.youtube.com/watch?v=9zTH9rKfW1o (Enhancing Livelihood through Integrated Approach) https://www.youtube.com/watch?v=QMoHB2BcZGw (Solar irrigation in India) https://www.youtube.com/watch?v=Z16I16OYzAw&feature=emb_logo (Dariya Kantha Gram Vikas Karyakram - KVY IV)	Bihar, Gujarat and Madhya Pradesh	Integrated disease and pest management

8	***Appropriate Technology India (ATI)*** Mandir Marg Guptkashi District- Rudraprayag (Uttrakhand)-246439 Ph: 08006407501 Email: ed@atindia.org Website: www.atindia.org	• **Sustainable livelihood promotion:** Adopted the natives of the state for livelihood which includes bee keeping, sericulture, dairy and spices. Oak tasar silk cultivation is one of the livelihood generation adopted. In oak tasar silk cultivation special thrust has been to plant *Quercus serrata* species of Oak, at the valley level. In collaboration with local community organization, Van Panchayats and other stakeholders, *Quercus serrata* plantations has been able to take up in 860-hectare land. Raising of the nursery of *Quercus serrata* are also done by the local communities themselves. • **Value chain-based approach:** It is followed under the organic spices cultivation sectors with major thrust on building the capacity of the producers in pre and post-harvest management. For the value-based approach careful selection of seed varieties, seed treatment, improved cultivation practices, minor-irrigation technology, composting and biological inputs to reduce the risk in organic spices value chains knowledge were followed.	http://www.atindia.org/video-gallery.html	Uttarakhand	Seri-culture
9	***Appropriate Rural Technology Institute*** 2nd Floor, Maninee Apartments, Survey No.13, Narhe Road, Dhayari, Pune 411041, Maharastra Ph: 020-24390348, 24392284 E-mail: arti_pune@vsnl.net; articontact@gmail.com Website: www.arti-india.org	• **Improved cook stoves**: The stoves designed has not only high efficiency of about 25% but also reduce the indoor air pollution. Some of the cook stoves models developed are cement concrete, with the help of mould, insulative bricks, and metallic. • **Sarai cooker**: It is a mobile cooker for which briquetting coal is used as fuel in cooking. 100 grams of coal is sufficient to cook food in 45 minutes. • **Compact biogas plant**: It is a model which works on agro-waste material as feed stock. This model is smaller in size compare to other biogas plant. Adding nutritive substance (flour) in slurry for bio-gas generation is introduce in the model. • **Briquette plants**: These are specialized plants which help in making coal from the Agro-waste materials, such as sugarcane, sawdust and remains of crops. • **Solar drier**: This bamboo structure is used to dry vegetable and fruits in sunlight. • **Bamboo treatment**: It increases the efficiency of the bamboo by treating it with chemical mixture of sodium, dichromate, copper sulphate and boric acid, it hampers termite infection. • **Low cost shed net:** it is also known as open poly house it is open from the top and is covered from the four sides. This helps in capturing CO_2 which increases the photosynthesis and helps in increasing the yield of the crop.	https://www.youtube.com/watch?v=YMb9FhHBtvc https://www.youtube.com/watch?v=7hZ0hpLe1a4 https://www.youtube.com/watch?v=r8NcSyHjvyA https://www.youtube.com/watch?v=BGSl72xZHNk	Maharashtra	Energy efficiency, Integrated disease and pest management and Agro-waste management
10	***AME Foundation***-Helping people help themselves	• **Sustainable agriculture:** Promoting sustainable agriculture in drylands through systematic combination of in-situ rain water management, soil fertility improvement, mixed cropping in dry land maize, crop and cropping practices, together with support activities like generating and recycling manurial biomass through low external input sustainable agriculture approaches. Promoting	http://amefound.org/wp-content/uploads/Case-Study/Case-Study-6.pdf http://amefound.org/wp-content/uploads/Case-Study/Case-Study-4.pdf	Karnataka	Improved agriculture practices, Rotation system, Fodder

	No. 204, 100 Feet Ring Road,3rd Phase, Banashankari 2nd Block, 3rd Stage, Bangalore – 560 085 Ph: 080- 2669 9512, 2669 9522 Email: amefbang@yahoo.co.in amefbang@amefound.org Website: www.amefound.org	resource conserving methods like system of rice intensification (SRI) in irrigated paddy, rainfed paddy, ragi and red gram. Guiding farmers through season-long farmer field schools are some of the practices adopted in promoting sustainable agriculture. Some of the other sustainable agriculture practices are dead furrows, bund plantation, biomass nursery and azolla. • **Soil fertility enhancement practices**: Use of bio fertilizers, legumes as inter/mixed crops, FYM and enriched FYM application were adopted by most of the farmers and vermicomposting. In-situ green manuring and incorporation of crop residues. Generating plant biomass on and off the field as a support activity to improve soil productivity and for use as fodder. • **Green fodder for livestock**: Promotion of azolla cultivation as a low-cost fodder for milch animals.	http://amefound.org/wp-content/uploads/Case-Study/Case-Study-3.pdf http://amefound.org/wp-content/uploads/Case-Study/Case-Study-1.pdf https://www.youtube.com/watch?v=NdBWX8-e6lY http://amefound.org/project/producing-less-resource-use-2/		management and Integrated soil fertility mangament
11	***Arid Forest Research Institute*** P.O. Krishi upaz Mandi, New Pali Road, Jodhpur-342005, Rajasthan Ph: 0291-2722549, 2729101 Email: dir_afri@icfre.org Website: www.afri.icfre.org	• Rehabilitation of degraded land through seed sowing to increase land productivity and combat desertification. • Use of surface vegetation in sand drifts control and sand dune stabilization hot arid region. • Rehabilitation of degraded hills through afforestation and rainwater harvestings. • Silvipastoral approach for augmenting the fodder availability during lean seasons in arid regions. • Prosopis cineraria-based agroforestry for hot arid region of Gujarat and Rajasthan • Mulching and weeding for conservation of soil moisture and enhancing plant growth.	https://afri.icfre.org/UserFiles/File/technology/t_16_load.pdf https://afri.icfre.org/UserFiles/File/technology/t_16_load.pdf https://afri.icfre.org/UserFiles/File/technology/t_15_load.pdf https://afri.icfre.org/UserFiles/File/technology/t_14_load.pdf https://afri.icfre.org/UserFiles/File/technology/t_3_load.pdf https://afri.icfre.org/UserFiles/File/technology/t_11_load.pdf	Rajasthan, Gujarat and Dadra & Nagar Haveli and Daman & Diu	Afforestation, Integrated soil fertility management
12	***'Avani'*** PO Tripuradevi, via Berinag Dist. Pithoragarh, Kumaon- 262531, Uttarakhand Ph: 9411767118 Email: info@avani-kumaon.org Website: www.avani-kumaon.org	• **Natural Dye from locally available resources:** Dyeing the fiber with colour extracted from leaf of Indigo plant and making natural cryon colour for kids. Besides, kilmora (*Berberis spp.*), harad (*Terminalia chebula*), akhrot (*Juglans regia*), dadim (*Punica granatum*), Basanti grass (eupatorium - an invasive species.) are also used for extracting natural colours. Villagers sell powder of fruit bark of akhrot's, which has therapeutic value to organisation. Organization is also promoting the use of peal of reetha fruit (Sapindus mukorossi) to wash the fabric and utensils, which is a very good replacement of chemical dish washers and fabric cleaners. • **Use of pine needle for power generation and briquette making:** Avani has set up two power plants of 9KW and 120 KW in Berinag village of Uttarakhand. After 50 hrs of running the power plant, ash filter is cleaned and the 10 kg of charcoal is collected as a waste. This waste charcoal is used for making briquettes. They	Dr. Deepti Verma (2016). Opportunity for the growth of NTFP based cottage enterprises for the upliftment of hill economies in India: A case study of Uttarakhand and Himachal Pradesh, India. International Tropical Timber Organisation, Japan.	Uttarakhand	Non-timber Forest Products

		are using fruit of wild arbi (*Colocasia esculenta*) as binder in briquette making procedure. These briquettes are sold at a minimum price of Rs. 10/kg to the villagers who are involved in collection of pine needles, whereas estimated cost of pine needle briquettes is Rs.13/Kg.			
13	***'BAIF Development Research Foundation'*** BAIF Bhavan, Dr. Manibhai Desai Nagar, Warje, Pune 411058 Ph: 020-25231661-9 Mob.: +91-9075002912-5 E-mail: baif@baif.org.in Website: www.baif.org.in	• **Wadi model:** Introduced tree-based farming systems (Wadi) model which has converted the degraded land owned by tribal families into a productive asset through plantation of fruit trees, inter-crops, multipurpose forestry tree species along the border and soil and water conservation measures. Besides, activities such as cultivation of food crops, vegetables, plant nurseries, mushroom cultivation, inland fishery and other forestry-based activities such as lac cultivation and tasar rearing were also added subsequently. • **Livestock development:** Cryogenic system for artificial insemination at the farmer's doorstep, goat development programme, • **Community institution for water management:** Water user groups and watershed committees were developed to imbibe a sense of ownership and to regulate the usage of water to ensure the long-term sustainability. • **Silvi-pasture:** Silvi-pasture system has been promoted for poor and marginalized families. The farm bunds have been strengthened by grasses such as Dhaman (*Stylosanthus haemata*) and Dinanath (*Pennisetum pedicellatum*) which are cut for fodder apart from generating additional employment for the community, particularly the landless, by way of seed collection. • **Habitats and ecosystems restoration:** Community involvement in habitat and ecosystem restoration have revived ecological processes in identified landscape/ habitat and rejuvenated forests and naturally occurring springs; increasing vegetation cover thereby improving the micro-climate of the site; increased fodder, fuelwood and other minor forest production from the landscape. • **Ecological restoration of rivulets:** Treatment of the Shindawane Nala at Urulikanchan in Maharastra through watershed management techniques and ecological restoration on pilot basis.	https://www.youtube.com/watch?time_continue=8&v=D0abhKXOGZc&feature=emb_logo https://www.youtube.com/watch?time_continue=1&v=ekRS5sD9zC8&feature=emb_logo https://www.youtube.com/watch?v=5TIiElZX9-c https://www.youtube.com/watch?v=3iTnyZe_0VE https://www.youtube.com/watch?v=rnTV8JyKSio https://www.youtube.com/watch?v=qkZp1_zjDGw https://www.youtube.com/watch?v=-DP1VHYK9RQ https://www.youtube.com/watch?v=pJL-TiQC5cg (Bottle Irrigation)	Maharashtra, Gujarat, Karnataka, Madhya Pradesh, Rajasthan, Andhra Pradesh, Telangana, Uttar Pradesh Bihar, Uttarakhand, Haryana, Odisha and Jharkhand	Improved animal breed, Ground water management and Integrated farm development
14	***Barefoot College*** Old Campus, Tilonia-305816, Via Madanganj District Ajmer, Rajasthan Ph: 9413 204413, 01463 288351	• **Neer jaal (www.neerjaal.org)** is a water mapping website controlled and managed by rural communities. By collating information related to groundwater, Barefoot's Neer Jaal software generates, stores and distributes information related to village's water supply, which helps in managing scarce water resources. • **Solar Powered desalination (Reverse Osmosis):** Plant filters water from Sambhar Lake and stores it in a 5,000 litre tank, constructed from a booster pump, sand filter, carbon filter, and other readily available materials. The desalination plant prevents waste and impurities from mixing with the purified water, providing drinkable water to thousands of individuals. The plant reduces	https://www.youtube.com/watch?v=5xyueW3pk0Q&feature=emb_logo https://vimeo.com/169682725	Rajasthan, Jammu & Kashmir, Gujarat and Madhya Pradesh	Drinking water management

	Email:devashish.taknet@barefootcollege.org Website: www.barefootcollege.org	the salinity of locally available water, making it safe to drink and free of any salty taste. It is powered by a 2.5-kilowatt solar generator that creates an uninterrupted supply of water without relying on the standard electric grid. There are 6 solar powered desalination plants in all, which supply water to nearby villages in Ajmer district of Rajasthan.The system provides potable water through reverse osmosis.			
15	***Bharathi Integrated Rural Development Society*** 26/130 B-2, EVA Nest, Gnanapuram, Nandyal (R.S) Kurnool District, Andhra Pradesh-518 502 Ph: 08514-222266 Email:birdsorgndl@gmail.com Website: www.birdsorg.net	• **Ground water governance**: Communities were provided with the technical capacity to understand and assess groundwater potential, crop water requirements, water accounting and budgeting and to apply this information in village planning. Water-saving devices such as sprinkler and drip methods have been introduced for groundnut, sunflower, bengal gram, chilies and horticultural crops. Techniques for improving the moisture retention have been adopted, including border strips, ridge and furrow check basins, alternate furrows, vermicompost, mulching, double ring method, and paddy husk mulching. These methods helped farmers stabilize and increase yields and incomes. **Crop water budgeting (CWB)**: Farmers collectively make crop plans based on water availability. The aim of CWB is sustainable groundwater management by the farmers themselves. The CWB involves estimation of the groundwater based on the total annual recharge and withdrawal. This estimation helps farmers to make decision on crops to be sown. • **Mixed cropping:** Farmers with one or two hectares of land grew as many as nine crops, including cereals, pulses, and oilseeds. These crops provide the subsistence needs of the family. Some crops fix nitrogen in the soil, and others draw various nutrients and soil moisture from different layers. Mixed cropping creates a good balance in soil nutrient and moisture management because each crop matures at a different time and has varying moisture requirements at different stages. Even if one or two crops fail due to moisture stress or untimely rainfall, the remaining crops could survive and provide at least some returns to the farmers.	https://www.birdsorg.net/Activities.php	Andhra Pradesh, orisha, Telangana, Karnataka, Tamil Nadu and Kerala	Irrigation management, Ground water managemnet and Rotational system
16	**CARE India Solution for Sustainable Development** A-12, Bhilwara Towers, Third Floor, Tower II, Sector-1, Noida, Uttar Pradesh - 201 301 Ph: 0120 4048 250	**Disaster resilient construction:** Shelter repair work undertaken ensure that specic resilient features were incorporated in terms of quality, technical specication of construction. **Materials, and its usage.** • Solid concrete bricks instead of hollow bricks for walls • Quarry stone for foundation work • M. Sand used for concreting work • P. Sand used for plastering works	https://www.careindia.org/downloads/Financials/CARE%20Learning%20Brief%20DRR%20Shelter.pdf https://www.youtube.com/watch?v=vYfnCN9gG-Q https://www.youtube.com/watch?v=zCbECnhRdro&feature=emb_logo https://www.youtube.com/watch?v=gyrem17_qls&feature=emb_logo	Tamil Nadu, Delhi, Odisha, Gujarat, Rajasthan, Madhya Pradesh, Uttar Pradesh, Bihar, Haryana, Maharastra,	Disaster management

	Email: contactus@careindia.org Website: www.careindia.org	• Increased thickness of TMT bars for Reinforced cement concrete work • Higher grade cement for masonry works • Increased size of metal used for Plain Cement concrete (PCC) and reinforced cement concrete (RCC) works • Aluminium Roong Sheet used for roong instead of asbestos	https://www.youtube.com/watch?v=mYxWimTBeWA&feature=emb_logo https://www.youtube.com/watch?v=d6SpkDMS9wM&feature=emb_logo https://www.youtube.com/watch?v=g-kHxaedTWE&feature=emb_logo https://www.youtube.com/watch?v=1fJ0udnZIB4	Telangana and Kerala	
17	**Church's Auxiliary for Social Action (CASA)** Rachna Building,4th floor, 2 Rajendra Place, Pusa Road, New Delhi - 110 008 Ph:011-25730611 Email: info@casa-india.org Website: www.casa-india.org	• **Weather Station to fight climate change:** Villagers are using traditional knowledge of making mud boundary all along the forest boundary around their villages so that forest fire cannot enter into their area. "Forest Fire Line" is used to prevent fire breaking into the forest from one compartment to another. The collected litter was burnt in isolation. To avoid fire incidence, they are also using scientific knowledge like keeping the source of fire or source of ignition separated from combustible and inflammable material, and keeping the source of fire under watch and control. Weather recoding station was established. and training on operating instruments were given. Farmers were also trained in collecting agro-weather information like air temperature, RH, rain gauge, soil temperature, wind flow, direction, soil testing and weather recording. This information is used by the farmers in selection of crops.	https://www.youtube.com/watch?v=Jt8UQCauGm0 https://www.youtube.com/watch?v=s7dNAGFdV9o	Bihar, Jharkhand, West Bengal, Odisha, Assam, Nagaland, Utarakhand, Manipur, Meghalaya, Mizoram, Tamil Nadu, Telangana, Karnataka, Madhya Pradesh, Andhra Pradesh, Chhattisgarh, Rajasthan, Uttarpradesh, Gujarat, Maharastra and Himachal Pradesh	
18	**Centre for Advanced Research and Development** H-2/195, Arvind Vihar, Baghmugalia, Bhopal, Madhya Pradesh - 462043 Ph: 0755–2481234	• **Ecofriendly honey harvesting for tribal communities:** The traditional honey hunters who were the collector of rock bee from Mandla district of Madhya Pradesh were formed into self help groups. This rock bee yield between 5 and 15kg of honey/ honey comb. The skills of the members of the groups were upgrade, arranged modern hygienic procurement and provided processing facilities. To provide value addition, introduced quality control, packaging, branding, certification and establishing marketing linkages. The tribal youth were trained in non-destructive harvesting techniques and were provided kits and protective dresses.	https://www.youtube.com/watch?v=H3fKv4GLPEY&feature=emb_logo https://www.youtube.com/watch?time_continue=447&v=pknjy2MQ9_4&feature=emb_logo (Agriculture water management) https://www.cardindia.org/sucess-stories/sucess-samruddhi-17-18(1).pdf	Madhya Pradesh, Punjab, Maharastra, Chhattisgarh	Home gardens, Integrated farm development and Bee keeping

	Email:card.zonaloffice@gmail.com Website: www.cardindia.org	• **Sustainable agriculture and responsible farming practices in soya cultivation:** CARD is promoting responsible soy cultivation as per the principles of round table on responsible soya (RTRS) in over hundred villages in Ujjain, Agar, Dhar, Dewas and Jhabua districts. Round Table on Responsible Soya is based on five principles: 1) Legal Compliance and Good Business Practice; 2) Responsible Labour Conditions; 3) Responsible Community Relations; 4) Environmental Responsibility; and 5) Good Agricultural Practices. For the purpose following strategies are adopted: i) improvement of productivity, ii) adoption of new technology, iii) diversification and intensification iv) meeting the processing, storage and marketing gaps. • **WADI project of NABARD:** Under the project, each WADI was proposed in one-acre land out of which 10 percent area is reserved for Mandva system (spice and vegetable cultivation) and in the remaining land 44 horticulture plants (grafted Mango; *Dashehary* and *Langada* and Guava) are planted. There are 20 teak saplings for border plantation. Ginger, turmeric, onion and garlic seeds have also been distributed to promote inter-cropping.	https://www.cardindia.org/sucess-stories/waste-water-pond-Amampura.pdf https://www.cardindia.org/sucess-stories/stopdam-bazarkurrideeh.pdf https://www.cardindia.org/sucess-stories/pani-ki-vani-khet-ki-kahani.pdf https://www.cardindia.org/sucess-stories/potato-kamalsingh.pdf https://www.cardindia.org/sucess-stories/amritpani-hakamsingh.pdf https://www.cardindia.org/sucess-stories/nabard-ws-ss-dhamtari.pdf		
19	**Central Arid Zone Research Institute (CAZRI)** CAZRI Road, Jodhpur - 342 003, Rajasthan Ph: 0291 2786584 Email: director.cazri@icar.gov.in Website: www.cazri.res.in	• Shelterbelt plantation in arid region • Contour vegetation barriers in arid region • Gum production from *Accaia senegal* trees • Rodent control • Improved *tanka* (cistern) and *nadi* (pond) for rain water harvesting in arid region • Improved agri-horticulture agri-silviculture, horti-pasture and silvi-pasture system for arid region	http://www.cazri.res.in/publications/SEWAN%20GRASS.pdf http://www.cazri.res.in/publications/ss-bh231018.pdf http://www.cazri.res.in/publications/SuccessStoryKisanMitraDedaRam.pdf http://www.cazri.res.in/publications/PraveenKumar_01.pdf http://www.cazri.res.in/publications/PraveenKumar_02.pdf http://www.cazri.res.in/publications/ss-khejri.pdf http://www.cazri.res.in/publications/ss-ber.pdf http://www.cazri.res.in/publications/VegetableProd.pdf http://www.cazri.res.in/publications/BhagwanSingh.pdf http://www.cazri.res.in/publications/KrishiKosh/134.pdf https://www.youtube.com/watch?v=8hWg5dFAxhU	Gujarat, Rajasthan, Tamil Nadu, Maharastra and Jammu and Kashmir	Ground water management, Pastoralism and grazing land management and Shelterbelt

			http://www.cazri.res.in/VideoGallery/SafaltaKiKahani.mp4 http://www.cazri.res.in/VideoGallery/CAZRI-Movie.mp4		
20	**Centre for Indian Knowledge Systems** B-3, Rajalakshmi Complex, 2nd Floor, No. 18, Chamiers Road, Nandanam, Chennai – 600 035 Ph: 044-4218 8011 Email: ciksorg@gmail.com, info@ciks.org Website: www.ciks.org	• **Setting up of community vermicompost Unit**: Vermicompost production cost per kg is Rs. 4.00. Sale cost per kg is Rs. 6.00. Each woman involved in vermicompost production are able to obtain Rs. 700/- to Rs. 900/- income per month and use the vermicompost in paddy crop for 2 seasons. • **Organic seed production:** Technology includes cultivation of crops without chemicals, hence it can be quantified in terms of economics, i.e., cost of cultivation/acre. Average paddy seed production and processing cost is Rs.26 per kg. Average seed sales cost: Rs.30 per kg. • **System of rice intensification (SRI) method of paddy cultivation:** The main components of the technology are - Low seed rate -5 to 10 kg/acre, minimum area of nursery-1 to 2 cents, young seedlings (15-18 days old), number of seedlings per hill – single, Spacing - 15 cm between rows, use of conoweeder thrice during vegetative stage and alternate wetting and drying. Total cost of paddy cultivation (following SRI cultivation technology is Rs. 14,000/- per acre. Farmers are getting 500 to 600kg of higher yield (27-35% higher) than conventional farmers and also saving Rs. 3500 – 4000/- per acre (upto 30-35%) towards cost of cultivation. • **Development of storage forms of bio-pesticides:** Trained women groups have setup biopesticides units in their villages and involved in the production of bio-pesticides like neem kernel extract, five leaves extract, sweet flag extract, modified *Panchagavyam, Andrographis Kashayam* and neem oil-based soap for readily available to the farmers.	https://www.youtube.com/watch?v=m9GWG89kRfg&feature=emb_logo https://www.youtube.com/watch?v=oqUMgqs8MsE&feature=emb_logo https://www.youtube.com/watch?v=zE88d8V0cRs&feature=emb_logo https://www.nammanellu.com/adopt-rice?page=2 https://www.youtube.com/watch?v=m9GWG89kRfg&feature=emb_logo http://ciks.org/wp-content/uploads/2020/05/Traditional-Rice-Varieties-of-Tamilnadu_compressed.pdf	Tamil Nadu	Integrated pest management and Improved agriculture practices
21	**Central Agroforestry Research Institute** Gwalior Road, Jhansi-284 003, Uttar Pradesh Ph: 0510-2730214 Email: director.cafri@gmail.com Website: www.cafri.res.in	• **Agroforestry based integrated farming system:** The systems envisage important multi-purpose tree species (MPTS) such as Poplar (*Populus deltoides*), Eucalyptus (*Eucalyptus treticornis*), Neem (*Azadirecta indica*), Shisham (*Dalbergia sisoo*), Teak (*Tectona grandis*), Bamboos (*Bambusa spp.*), Karanj (*Pongamia pinnata*), Jatropha (*Jatropha curcas*), Siris (*Albizia procera*), Anjan (*Hardwickia binata*) and *Ailanthus*. A number of crops (cereals, grasses, legumes, oil seeds) and medicinal & aromatic plants have been evaluated as intercrops under different agroforestry systems. Number of fruit trees and their varieties have been introduced in different agroforestry models for different agroclimatic zones. The different agroforestry model includes: ✓ Agrihorticulture System (Aonla with Blackgram) ✓ Agrisilviculture System (Poplar with Wheat)	http://cafri.res.in/newwebsite/index.php/rejuvenating-permanent-rabi-fallow-through-renovation-of-traditional-rainwater-harvesting-system/ http://www.cafri.res.in/Technical_Bulletins/Folder_1_Agroforestry.pdf http://www.cafri.res.in/Technical_Bulletins/Technical%20Bulletin_4-2018.pdf http://cafri.res.in/newwebsite/index.php/bamboo-based-agroforestry-system-has-transformed-the-life-of-a-farmer-in-bundelkhand/	Uttar Pradesh	Agro-forestry

		✓ Agrisilviculture System (*Hardwickia binata* with Mustard) ✓ Silvipastoral System for Livestock Production ✓ Agrisilviculture System (Poplar with Sugarcane) ✓ Hortisilviculture System (Poplar with Garlic) ✓ Agrisilviculture System (Neem with Mustard) ✓ Agrisilviculture System (Poplar with Maize and Toria) ✓ Agrisilviculture System (Eucalyptus with Wheat) • **Water conservation**: Cost-effective Rainwater Harvesting Structures (RHS) which can potentially reduce 15- 20% cost of construction without affecting efficacy and life of checkdams. Construction cost of water harvesting structures (masonry check dam) was reduced through decreased width of foundation after 50 to 70 cm below ground level till depth of foundation. About 10 to 33 cum stone masonry could be saved. These check dams are serving the community efficiently since 2006 without any repair and maintenance. • **Developed Farm Tree Mobile App**: The FarmTree mobile app provides a user-friendly, bi-lingual, e-platform to have all basic information on 20 commonly grown promising agroforestry tree species by farmers at their farm. It covers various aspects like common name, botanical name, family, potential area, silvi-cultural requirements, nursery techniques, planting techniques, tending operations, suitable agroforestry systems, tree protection, yield, utilization and material availability. Farm tree also provides its users a platform of having a discussion on its public forum, sending a query directly to the developers, attaching a photograph for easy communication, contacting experts and knowing how to avail the materials.	http://cafri.res.in/newwebsite/index.php/journey-of-small-farmer-from-rag-to-rich-through-agroforestry-interventions/ http://cafri.res.in/newwebsite/index.php/agroforestry-brings-back-smile-to-dhani-ram/ https://www.youtube.com/watch?v=Ex03CvPEtLU http://www.cafri.res.in/photogallery.html https://play.google.com/store/apps/details?id=com.cafri.farmtree&hl=en		
22	**Centre for Action Research and Management in Developing Attitude Knowledge and Skills in Human Resources (CARMDAKSH)** House No 19, Gitanjali Park Near Maharishi School Post: Mangla, Nehru Nagar, Bilaspur-495001, Chhattisgarh Ph: 9893114529	• **WADI (Horticulture crops).** A wadi of 1 acre of land per family with 2-3 horticultural crops is being promoted. This is to increase the income of the family through fallow or uncultivated land. • **"Climate Proofing of Watershed Development Projects:** Intervention include conservation of soil and water, create awareness about natural farming, conservation and promotion of traditional varieties to build resilience towards climate change."	http://www.carmdaksh.org/pdf/How%20make%20Vermi%20compost.pdf http://www.carmdaksh.org/pdf/SRI%20%20in%20paddy-%20A%20book%20for%20farmers.pdf http://www.cafri.res.in/Technical_Bulletins/Anusandhan_Uplabdhiyan_Bulletin_2015.pdf	Chhattisgarh	Integrated farm development

	Email:carmdaksh@gmail.com Website: www.carmdaksh.org				
23	**Central Institute Fisheries Education (CIFE)** Panch Marg, Off. Yari Road, Versova, Andheri (west), Mumbai-400 061 Ph:022 -26363404, 26374306 Email: director@cife.edu.in Website: www.cife.edu.in	• **Training:** CIFE has setup Centre of Excellence for imparting training in molecular biology & bio-technology for fisheries professionals. Regional centers also conduct demand-driven training and educational programs for different stake holders in fisheries sector and also provide technical support, inputs for policy development and consultancy services. • **Monitoring:** Monitoring and management of marine fishery resources. • **Research:** Laboratory for conducting practical on aquaculture.	https://www.cife.edu.in/pdf/Jalchari(22)(08-05-2017).pdf http://cifa.nic.in/sites/default/files/CIFABROOD-Success%20story-ICAR-CIFA_2.pdf	West Bengal, Andhra Pradesh, Bihar, Madhya Pradesh and Haryana	Fish farming
24	**Center for Environmental Education (CEE)** Thaltej Tekra, Ahmedabad- 380 054 Ph: 079-2685 8002, 2685 8010 Email: paryavaranmitra@ceeindia.org Website: www.ceeindia.org	• **Awareness and training:** Biodiversity awareness integration through documentation of indigenous knowledge; climate change literacy, knowledge exchange and public awareness and trainings to stakeholders. • **Waste management:** Implementing healthcare establishment, waste management and education programme (HEWMEP)' wherein a common bio-medical waste treatment facility called CHAMP has been set up in Kalaburagi city. • **Sustainable agriculture:** Sustainable irrigation practices and alternative horticulture cropping were demonstrated on eight acres of land in the drought prone villages of Aljapur, Kamone and Khadki in Karmala taluka of Solapur District, Maharashtra.	-	Andhra Pradesh, Karnataka, Kerala, Tamil Nadu, Andaman and Nicobar Islands, Lakshadweep, Gujarat, Rajasthan UTs of Daman & Diu, Dadra & Nagar Haveli, Jammu & Kashmir, Haryana Himachal Pradesh	Waste management

				Uttar Pradesh, Uttarakhand, Bihar, Arunachal Pradesh Assam, Manipur Meghalaya, Mizoram Nagaland, Sikkim Tripura, Chhattisgarh Maharashtra Goa, Madhya Pradesh, Orissa West Bengal, Jharkhand, Haryana, Punjab and UT of Chandigarh	
25	**Central Himalayan Rural Action Group (CHIRAG)** Village Simayal, P.O. Nathuwakhan Nainital- 263 158 Uttarakhand Ph: 05942-285738 Mobile:094120 85732 Email: info@chirag.org Website:www.chirag.org	• **Water conservation:** Treated and monitored springs. In order to understand spring behaviour two watersheds were instrumented with automated water level recorder and automated rain gauges. The instrumentation was done on two springs and a stream at the mouth of the watershed. The springs chosen are of different typologies with differences in the characteristics of the recharge areas and are expected to provide a detailed understanding of the spring behaviour with respect to time as well as with land use. Developed spring atlas of Uttarakhand. • **Forestry and fodder:** Introduce new variety of fodder grasses that would remain green for longer periods, regenerate faster, etc. Planting of fodder grasses and shrubs along the contour trenches and on terraces, encourage the growth of rootstock, enabling the soil moisture levels to go up and ensuring the survival of sapling broad-leaf trees.	https://www.youtube.com/watch?v=BHuFCAndPMU&feature=youtu.be http://chirag.org/wp-content/uploads/2019/07/SPRING-ATLAS-CHIRAG.pdf https://www.youtube.com/watch?v=BHuFCAndPMU&feature=emb_logo	Uttarakhand	Surface water management (spring) and Fodder management

26	**Central Soil Salinity Research Institute** Zarifa Farm, Kachawa Road, Karnal – 132001 Ph: 0184-2290501, 2291156 Email: director.cssri@icar.gov.in Website: www.cssri.res.i	• **Gypsum for reclamation of sodic soil:** Application of 10-15 tons gypsum per ha is applied followed by mixing of surface (10 cm) soil. Before gypsum is applied, field leveled, bunded, irrigation water is applied to leach down the salts. About 2.07 Mha sodic soils have been reclaimed using gypsum application technology. The reclaimed area contributes around 16.60 million tonnes of food grains to the National pool. Farmers obtained 4 tonnes/hectare rice and 2 tonnes/hectare wheat yield from reclaimed alkali land right from the first year of the reclamation, which increased to 5 and 3 tonnes/hectare during 3rd year onwards, respectively with an increment cost of Rs. 76, 500 per ha.The agricultural income generated from the reclaimed soil is Rs. 25320 crores. This also provides an employment opportunity to about 28 crore man days annually. Its Net Present Worth estimated to be Rs. 2, 80,000/ha, Benefit Cost Ratio (BCR) of 2.47 and Internal Rate of Return of 67% of the technology. The technology improved soil health, increased resource use efficiency, raised farm income, reduced poverty, minimized inequity, reduced flood hazards and water logging, recharge groundwater and improve quality of overall environment. • **Gypsum bed technology for poor quality water management:** Developed new techniques for sustainable use of poor-quality waters for agriculture. Number of amendments and by-products such as gypsum, pyrites, distillery spent wash and press mud identified. Gypsum bed technology for location specific situations has been developed. • **Auger hole technology for alternate land use system:** Pit cum auger hole technology is developed to raise fruit trees like aonla (*Emblica officinalis*), karaunda (*Carissa Carandus*) and guava (*Psydium guajava*) in soils having pH 10 and above, where nothing is possible to grow. Different agro-forestry models have also been developed, which have shown B: C ratio of 1.6. • **Silvi-pastoral model for bio-reclamation of sodic soil (pH2>10)** has been developed for production of fuel wood, fodder, pods and honey besides reducing runoff volume, increasing infiltration, reducing soil alkalinity and improving soil fertility. • **Bio-drainage technology:** Bio-drainage removes excess soil-water through transpiration by trees. It is an option to prevent the development of water-logged and saline soils especially in areas having no possibility of disposing saline drainage effluent. • **Farmer based recharge structure:** The structures involve passing of excess rain and canal water under gravity through a bore well to subsurface sandy zones coupled to a recharge filter consisting of layers of coarse sand, small gravel and boulders in a small brick masonry chamber. The recharge structures can be installed at any low-lying location prone to surface water flooding. Being individual farmer oriented and of small size, these structures have relatively	https://www.youtube.com/watch?time_continue=1&v=Q4TEHGW4S9A https://www.facebook.com/icar.cssri/videos/985111364935704/?__so__=permalink&__rv__=related_videos https://www.facebook.com/icar.cssri/videos/1126181257495380/?__so__=permalink&__rv__=related_videos https://cssri.res.in/technology/ https://play.google.com/store/apps/details?id=gypcal.shyamsanginfosys.com&hl=en Anyone can download on their Andriod Mobiles/ Tabs/Smart Phones and use the application	Haryana, Uttar Pradesh, Gujarat and West Bengal	Integrated soil fertility management and Land shapping

		better chances of success due to ease of cleaning the clogged recharge filters by farmers themselves. • **Bio growth enhancer (CSR-BIO):** It is a low-cost multiplication technology of salt tolerant bio-growth enhancers (CSR-BIO) for increasing productivity of agri-horti crops in normal and sodic soils. The technology is developed to produce microbial consortia of beneficial microbes which have universal applicability, higher shelf-life and lower cost of production. The consortium of microbes enhances the growth, productivity, nutrient mobilization and support the establishment of plantlets. • **Technology with reduced gypsum and salt tolerant varieties:** The field experiments were initiated to develop low cost technologies for the resource poor farmers by integration of gypsum and salt tolerant varieties of rice and wheat cropping system. The cost of technology is likely to be Rs.40, 000/- per ha. • **High ridge and deep furrow technology:** About 50% of the farmland is shaped into alternate ridges (1.5m top width ×1.0m height × 3m bottom width) and furrows (3m top width×1.5m bottom width × 1.0m depth). These ridges remain free of waterlogging during Kharif with less soil salinity build up in dry seasons (due to higher elevation and presence of fresh rain water in furrows). Remaining portion of the farmland including the furrows is used for growing more profitable paddy-cum-fish cultivation in Kharif. The rainwater harvested in furrows is used for irrigation. The remaining portion of farmland (non-furrow and non-ridge area) is used for low water requiring crops during dry (rabi/ summer) seasons. • **Paddy-cum-fish cultivation technology:** Trenches (3mtop width × 1.5m bottom width × 1.0m depth) are dug around the periphery of the farmland leaving about 3.5m wide outer from boundary and the dugout soil is used for making dikes (about 1.5 m top width × 1.0m height × 3.0m bottom width) to protect free flow of water from the field and harvesting more rain water in the field and trench. The dikes are used for vegetable cultivation round the year. Remaining portion of the farmland including the trenches is used for more profitable paddy-cum-fish cultivation in kharif. The likely cost of intervention is about Rs. 32,000/- per ha for soil excavation. • **Shallow furrow & medium ridge technology:** About 75 % of the farm land is shaped into medium ridges (1.0m top width × 0.75m height × 2.0m bottom width) and furrows (2.0 m top width × 1.0 m bottom width × 0.75 m depth) with a gap of 3.5 m between two consecutive ridges and furrows. As in high ridge and deep furrow above the furrows are used for rainwater harvesting and paddy-fish-cultivation during Kharif. The likely cost of intervention is about Rs. 39,000/- per ha for soil excavation.			

		• **GypCal Mobile App-A decision support system for soil sodicity assessment and gypsum requirement:** This App is useful for field functionaries, researchers, line department officials as well as farmers for chemical reclamation of sodic soil for optimizing crop production in Indo-Gangetic plains. It helps in calculating the gypsum requirement in bags (of 50 Kg), total depth of water required for leaching, expected yield of salt tolerant as well as traditional varieties of rice-wheat after chemical reclamation.			
27	**Central Research Institute for Dry land Agriculture** Santoshnagar, Hyderabad - 500 059 Ph: 040 -24532243, 24530161 Email: director.crida@icar.gov.in Website: www.crida.in	• **Agriculture:** Zero till cultivation of wheat, identification of heat tolerant rice genotypes for north eastern region (ICAR RC-NEH, Umiam) • **Access to information:** Dedicated website to access information on weather so that farmers can plan and manage their crops as well as linkewith other associated web sites where information of agrometeorological relevance is located for viewer to access all related information of his/her needs. Developed watershed development monitoring & evaluation tool (WDMET) • **Jal-DSS - Tool to Measure Impact of Watershed Development Program** • **Water harvesting:** The institute has standardized water harvesting technologies in the form of Farm Ponds to address the problem of run off. The pond is dug (17m x 17 m x 4.5 m). • **Low cost portable kiln for Biochar production.** Biochar kiln was used to produce biochar from maize, cotton, castor and pigeon pea stalks on a small scale and the operational (process) parameters viz. loading rate, holding time and maximum conversion efficiencies were standardized for four bio-residues. It is used as recycling of bio-residues. A low-cost portable kiln unit was developed to match the needs of the small and marginal farmers. The cost of one unit of the kiln is Rs. 1200/- (approx.) including cost of metal drum, vent making charges and side fittings.	https://www.youtube.com/watch?v=6GNz7GYoPJU http://www.crida.in/NAIP/ss/Success%20Stories-2010.pdf http://www.crida.in/Success/NN%20Reddy.pdf http://www.crida.in/Pubs/Success_Stories_KSReddy.pdf http://www.crida.in/Pubs/NICRA%20-%20CRIDA%20Low-cost%20Bro%20VENKATESH%20G%202013.pdf http://www.crida.in/Pubs/NICRA%20-%20CRIDA%20Low-cost%20Bro%20VENKATESH%20G%202013.pdf	Hyderabad	Climate resilient agriculture

28	**Central Institute of Brackish water Aquaculture (CIBA)** #75, Santhome High Road, MRC Nagar, Chennai-600028, Tamil Nadu Ph:044-24618817, 24616948, 24610565 Email: director.ciba@icar.gov.in, director@ciba.res.in Website: www.ciba.res.in	• **Livelihood:** Brackish water aquaculture based integrated farming system through Pearl spot seed rearing. It consists of (1) stocking of pearl spot fry size seed in the modular tanks (2) feed preparation and feeding (3) tank cleaning and maintenance (4) monitoring the fish growth (5) harvesting and packing the fingerlings and (6) marketing to local ornamental fish farmers and traders. A total of 1,865 pearl spot fingerlings were harvested, indicating a successful nursery phase with the survival rate of 93.3%. The cost of production was worked out to be Rs. 2500/-(seed cost @ Re. 1.0/-seed and feed cost Rs.500/-). The fingerlings were sold @ Rs.6 per fingerling to ornamental fish farmers. The group earned an income of Rs. 9000 per batch from pearl spot seed rearing technology. The drain from the larval rearing tanks was used for growing vegetables in the kitchen garden. • **Research and development** on nutrition and feed technology for brackish water aquaculture, development of cost-effective ecofriendly feed for white shrimp • **Mobile App for shrimp farmers-** This mobile app provides technical support to the shrimp farmers, entrepreneurs and extension personnel and connects them with the scientific community. CIBA Shrimpapp works offline. The app has been updated with several modules like better management practices of shrimp farming, input calculators, disease diagnosis, shrimp farm risk assessment etc.	https://www.youtube.com/watch?v=Lf0VJK4VyKg	West Bengal, Gujarat and Tamil Nadu	Aqua-culture
29	**Central Institute of Freshwater Aquaculture** Kausalyaganga, Bhubaneswar, Odisha-751002 Ph: 91-674-2465421,2465446 Email: Director.Cifa@icar.gov.in Website: www.cifa.nic.in	• **Aquaculture production and environment:** Technology development for breeding, seed production and grow-out culture of important cultivable freshwater fin fishes and shellfishes. Develop new culture systems for freshwater aquaculture. • **Fish nutrition and physiology:** Feed formulation, feed preparation and feeding demonstrations to farmers • **Fish health management:** Monitoring national fish disease outbreaks and serological screening of diseases and develop vaccine using molecular techniques • **Fish Genetics and Biotechnology**: Implementation of genomic tools and genomic selection. Gene edited carps to improve growth. Integration of brood stock diet and improve variety to produce quality seed.	http://www.cifa.nic.in/sites/default/files/Early_Breeding_Major_Carps.pdf http://cifa.nic.in//video-gallery http://www.cifa.nic.in/sites/default/files/Brochure_FFP.pdf	West Bengal, Andhra Pradesh, Karnataka, Gujarat, Punjab and Odisha	Aqua-culture
30	**Centre for People`s Forestry** 12-13-483/39, First Floor, Street No. 14, Lane 6, Nagarjunanagar Colony, Tarnaka,	• **Sustainable forest management** CPF have special thrust on developing livelihood security of the marginalized sections among the forest-dependent, dwelling communities' women, tribal and dalits. Under Agro-ecological practices 4253 acres agriculture land has been treated. An amount of Rs.5000/- average additional income received per acre per farmer by shifting from broadcasting to line sowing in Visakhapatnam district (588 farmers). Safe and sustainable Rock been honey harvesting has helped the forest dependent community to harvest the combs twice in a season. Honey price increased from Rs. 80/- to Rs. 158/-.	-	Andhra Pradesh	Sustainable forest management; Women empowerment

	Secunderabad – 500 017 Ph:040 2715 4484 Email: info@cpf.in Website: www.cpf.in				
31	**Centre for Technology and Development** D-158 Lower Ground Floor, Saket New Delhi 110017 Ph: 011-26524323-24 Email: ctd.delhi@gmail.com; ctddsf@vsnl.com Website: www.ctdsess.in	• Low-cost processing and preservation of horticulture produce • Leather tanning • Carcass utilization • Improved red clay pottery • Low cost processing of horticultural produce • Extraction and processing of non-edible oils.	https://www.scienceandsociety-dst.org/redclay.htm	Delhi, Uttarakhand, Himachal Pradesh, Manipur and Andhra Pradesh	Low cost rural technology
32	**Chhattisgarh Agricon Samiti** 404, 4th Floor, Progressive Point, Lalpur, Raipur, Chhattisgarh Ph: 0771-2410840 Email:info@cgagricon.org Website: www.cgagricon.org	**Water conservation**: This samiti has developed micro irrigation system using portable sprinkler system which cost @8000/ acre and utilize 40% less water for cultivation. **Establishment of farm Machinery Bank:** Farm machinery bank are provided for the small and marginal farmers who are unable to access modern machinery due to high cost and unaffordable which could otherwise help complete their cultivation activity in time. Establishment of farm machinery bank is formed by following steps: • Forming of 3 groups of 100 each in villages and establish Farm Bank. • Farm Bank will have Agri/Farm implements uphill value of 10 Lacs comprising of tractor, trolley, implements, thresher etc. • Farmer group to be the owner of all implements. Group will hire these implements with themselves on a nominal hire charge. • These collected charges will be used for maintenance of all equipment and machine.	-	Chhattisgarh	Farm machinery bank
33	**C.P.R. Environmental Education Centre**	**Nenmeli Eco village:** This village turned into a barren wasteland due to extensive deforestation. There is a small hillock in the middle of agricultural lands overlooking two artificial tanks. During the rains, the soil got washed off into the two artificial reservoirs, which silted up. Soon there was no water in the village and the people	http://cpreec.org/pubbook-biomedical.htm http://cpreec.org/pubbook-harvest.htm http://cpreec.org/pubbook-traditional.htm	Andaman and Nicobar Islands, Puducherry,	Ecological restoration

	No.1, Eldams Road, Alwarpet, Chennai - 600 018, Tamilnadu Ph: 044 – 48529990, 42081758 Email: cpreec@gmail.com, cpreec@envis.nic.in Website: www.cpreec.org	migrated to Chennai in search of work. With the help of community participation first contoured the hillock and bunded it with locally available rocks and stones. The site was fenced with trees and the pits were mulched to retain moisture. The two water tanks were desilted. The lands attached to the village temple, were converted into sacred groves. Another 5.5 acres of land, adjoining the temple land was also afforested. Local women were involved in herbal garden in these lands. They were also trained to plant and manage their own kitchen gardens, vermicompost their biodegradable waste and construct smokeless chulhas. They were also taught to prepare simple herbal kits with the medicinal plants available. **Conservation and restoration of sacred groves in South India:** Restoring degraded sacred groves in the states of Andhra Pradesh, Karnataka and Tamilnadu as part of the 'Awareness through Action' programme was initiated in 1994. Sacred groves that are endangered or near extinction were identified. Appropriate species suitable to the area were selected and planted with the cooperation of the temple authorities and local villagers. The nakshatra-rasi thottam at the Meenakshi temple lands at the Koodal Senkulam near the Madurai airport is one of the first of its kind by an educational centre. The 27 species of plants corresponding to the twenty-seven stars of the Hindu zodiac calendar have been identified and public can plant a sapling of tree of their birth star and pay for its maintenance. This novel effort in encouraging community participation in preservation of plants as well as nurturing a religious element has found adaptation in many other temples, private institutions and even public parks. The organisation has also documented booklet on bio-medical waste management, harvesting rainwater, traditional water harvesting systems of India etc.		Odisha, Tamilnadu, Karnataka, Andhra Pradesh and Telangana	
34	**Deccan Development Society** 101, Kishan Residency, 1-11-242/1, Street No. 5, Shyamlal Buildings Area, Begumpet, Hyderabad, Telangana- 500 016 Ph: 040-27764577, 27764744	• **Land management for food security:** This programme has addressed household food security of dalits by encouraging them to work collectively on their marginalised lands towards its incremental upgradation. Through this programme about 4000 members of women's sanghams have improved their own patches of degraded lands (about 10000 acres) gifted to them by the government as a part of its land reforms programmes through efforts like bunding, trenching, top-soil addition etc. This has made them improve their crop production by over 300 per cent. Lands which hardly grew 20-30 kg of sorghum per acre today grow about 100-120 kgs. This has ensured an amount of food-grain security for their households. • **The community grain fund programme** was intended by DDS to rejuvenate the marginalised lands in the villages for cultivation of new coarse grain for public distribution services and are managed by the community itself. After the programme, over 60 varieties have been under active cultivation as against 25-30 varieties during the beginning of the programme in 1996. Diverse cropping	http://www.ddsindia.com/www/pdf/SDHS%20Ecological%20Heroism.pdf http://www.ddsindia.com/www/pdf/NC%20Dharwad.pdf http://www.ddsindia.com/www/pdf/BHS%20of%20ZHB%20A%20Profile.pdf http://www.ddsindia.com/www/pdf/Milletsfutureoffoodandfarming_Hindi.pdf http://www.ddsindia.com/www/default.asp	Telangana	Land management, Agro-biodiversity and Food security

	Email: ddshyderabad@gmail.com Website: www.ddsindia.com	which was becoming an exception, has started becoming a rule. Extremely marginal lands have become productive. Lands which used to produce crops worth Rs.250-300 per acre have started producing crops worth over Rs.4000/ acre. Seeds that can crop about 1000 ha have been stored in villages within a span of two years and three cropping seasons. Safe food and a variety of options are on the women's menu. Forgotten foods from the past like Korra, Aargulu, Bailodlu are in the kitchen. More pulses add protein, more vegetables add vitamins have become available. A rethinking on the harmful effects of the new agricultural practices has started. Tractor ploughing is no more the dream in many minds. Bullocks have come back to occupy the centre stage (deep plough through tractor upturns the fine and fertile top soil and brings up the hard subsoil while our own shallow ploughing through bullocks keeps the fine soil on the upper layers itself). Many people have started approaching the sangham women for seeds. This process helps make people move away from the organised, externally controlled market and helps a self-reliant seed economy.			
35	**Development of Humane Action (DHAN) Foundation** 1A, Vaidyanathapuram East Kennet Cross Road, Madurai, Tamil Nadu- 625016 Ph: +91-452-2302500, 2302598 Email: dhanfoundation@dhan.org Website: www.dhan.org	• **Community resource centre:** The centres are benefiting community through e-services catering to the needs of school going children, youth, women and farmers. Digital literacy including internet knowledge among rural poor women, online consultations for health, education, agriculture, animal husbandry, fisheries, and multimedia content in local language for educational, promoting user groups to provide ICT-based livelihoods are some of the activities undertaken in the centres. • **Revalorising small millets in rainfed regions:** Developed improved dehuller prototype. After the field tested for the single chamber centrifugal dehuller prototype developed for little and foxtail millet it was found that the improved dehuller prototype has reduced the time spent by women for dehulling by 50% to 70%. This model was further modified into a double chamber dehuller, to extend its capacity for dehulling of kodo and barnyard millets.	https://www.youtube.com/watch?v=g8R8LJsZojw https://www.youtube.com/watch?v=ktQljXOhGjU https://www.youtube.com/watch?v=o0z6cNBC8nw&feature=emb_logo https://www.youtube.com/watch?time_continue=3&v=eH062Z4C7bw&feature=emb_logo http://www.dhan.org/ict-for-poor/file/practice-of-the-Farmer-to-apply-organic-manure.pdf http://www.dhan.org/smallmillets/posters.php http://www.dhan.org/smallmillets2/file/Scaling%20up%20small%20millet%20post-harvest%20and%20nutritious%20food%20products%20project%20brochure.pdf http://www.dhan.org/smallmillets2/sm-puthaiyal.html http://dhan.org/cpp/pdf/policybrief6.pdf https://www.youtube.com/watch?time_continue=1&v=FlDsuBrRT14&feature=emb_logo https://www.youtube.com/watch?v=pYyyGwCoskM&feature=emb_logo	Rajasthan, Uttar Pradesh, Bihar, Assam, Madhya Pradesh, Jharkhand, Maharashtra, Odisha, Telangana, Andhra Pradesh, Tamil Nadu, Kerala, Karnataka and Puducherry	Information education and technology (IET) and Low-cost farming equipment and tools

36	**Development Support Centre** Near Government Tube well Bopal, Ahmedabad, Gujarat- 380058 Ph: (02717) 235994/5 Email: dsc@dscindia.org, dscbopal@gmail.com Website: www.dscindia.org	• **Drinking Water security:** Paani Samitis have been formed in these villages, which in turn have drawn up a plan for the various activities needed to develop their local water source as well as the distribution system. • **Preparation of Groundnut and Wheat Seeds by Dhari Krushak Vikas Producers Co Ltd (DKVPCL):** Due to unavailability of quality and reliable seeds in the market at the time of sowing, the Dhari Krushak Vikas Producers Company Ltd. took up an initiative to prepare quality groundnut (GG20) and Wheat (GW-366) seeds for its farmer-members. Using these seeds, farmers were able to prepare 38 quintals of Groundnut and 32 quintals of Wheat seeds for the first time. The most significant outcome of this initiative was that the farmers were able to get good prices for their produce at their doorstep. • **Vermi compost production through entrepreneurship model:** In order to minimized gap between the demand and supply of vermi compost in the market, the Dharoi and Guhai field units formed women groups to start large scale production of vermi compost. Till now, two women groups of Kesimpa and Dedasan villages have been facilitated for the preparation and sale of vermi compost. The initiative produces about 312 tons compost from 52 beds @ 6 tons production from per bed. The estimated gross income per year by selling ready compost is Rs. 9.36 lakhs @ Rs. 3,000 per ton, which enable the business to carry out longer period of time.	https://www.dscindia.org/upload/01__Success-Stories_Report_DSC_A4_Size.pdf https://www.dscindia.org/upload/CORVE_Chilly.pdf https://www.dscindia.org/upload/CORVE_Cotton.pdf https://www.dscindia.org/upload/CORVE_Maize.pdf https://www.dscindia.org/upload/CORVE_Soyabin.pdf https://www.dscindia.org/upload/CORVE_Wheet.pdf https://www.dscindia.org/upload/02__Success-Stories_Report_DSC_A4%20Size.pdf https://www.dscindia.org/upload/03__Success-Stories_Report_DSC_A4_Size.pdf https://www.dscindia.org/upload/04__Success_Stories_Report_DSC_A4_Size.pdf https://www.dscindia.org/upload/05__Success%20Stories_Report_DSC_A4_Size.pdf https://www.youtube.com/watch?v=9ATFM9fWlyU https://www.youtube.com/watch?v=3MosBSVqWn0	Gujarat	Rotational system, Improved plant breed and Integrated pest management
37	**Department of Soil Conservation**, Nagaland, Government of Nagaland, Kohima-797001 Ph: 0370-221445 Website: www.snwc.nagaland.gov.in	Department of soil conservation under the project Sustainable **Land and Ecosystem Management in Shifting cultivation areas of Nagaland for Ecological and livelihood security** has made following physical progress: -**Participatory land use plan (PLUP):** Designed land use action plans by the village institution. Land use committees have been formed to ensure the implementation and monitoring of the land use plans and to create an enabling environment for improved local ecosystem and livelihood. -**Jhum agroforestry systems:** Improved the vegetatitive cover by over 2000ha through soil and water conservation measures, azolla cultivation, water provisioning and plantations of forest horticulture and agronomical crops. The jhum cropping phase has increased from 2 years to 3 years in pilot jhum farms as a result of timely intervention of soil and water conservation measures. -**Livelihood:** Over 800 jhum practicing households have benefited from introduction of integrated farm development practices.	https://www.youtube.com/watch?v=8t2d_LbgWYw&feature=emb_logo	Nagaland	Rotational system, Integrated farm development and Participatory land use plan

38	**Department of Land Resources** 6th Floor, Block -11, CGO Complex, Lodhi Road, New Delhi -110003 Ph: 011-23062722 Email: usadmn-dolr@gov.in Website: www.dolr.gov.in	• Neeranchal - World Bank Assisted National Watershed Management Project • Implementing Digital India Land Records Modernization Programme (DILRMP) • Implementing Pradhan Mantri Krishi Sinchayee Yojana • Implementing pilot project on Land Use Planning and Management	https://dolr.gov.in/programme-schemes/pmksy/best-practices-pmksy https://dolr.gov.in/sites/default/files/Success%20stories.pdf https://dolr.gov.in/sites/default/files/Anagonda%2C%20Andhra%20Pradesh_compressed.pdf https://dolr.gov.in/sites/default/files/Success%20story%20-%2023012020.pdf	All states and UTs	Water diversion and drainage, Integrated soil fertility management and IET
39	**Development Alternatives-Eco solution for people and the planet** B-32, Tara Crescent, Qutub Institutional Area New Delhi -110016 Ph: 011-2654-4100, 2654-4200 Email: mail@devalt.org Website: www.devalt.org	• **Prepared micro concrete roofing tiles** • **Integrated water management:** The organsation has developed low cost, innovative household filter unit 'Jal-TARA Arsenic Purification System'which removes arsenic and iron. It also reduces the bacteria in drinking water. The filter prototypes have features like efficacy in arsenic removal, no requirement for electricity, filter-cum-storage unit, and tamper proof with aesthetic appeal. Moreover, the filter was designed as such that it's amenable to local assembly and can be recycled in the area where it is to be used. The Jal-TARA water filter employs sand filtration technique to provide safe and clean drinking water to the community. It is a modular unit that doesn't require electricity or chemicals for operation. • **EcoKiln technology:** This technology has the potential to cut 30% carbon emissions and save up to 50% natural resources by utilising mining wastes • **Streamlining decentralized bio-mass and bio-gas** to generate electricity and promote solar technologies for enhancing the energy security of villages, promoting electricity generation through scalable pilots of Decentralised Renewable Energy (DRE) micro-grids. It mimics a grid and has proved to be an innovative solution. It utilises the potential of solar off-grids, biomass gassifiers and device-based renewable energy options • **Roof Water Harvesting:** The RWH system installed on all the different types of roofs- tiled roof, stone slabs roof, and roof made from reinforced concrete. Fifty rainwater harvesting structures covering 18 kachha roofs with sloppy chappar and storing water in 42 storage tanks (rest recharging into the aquifers) is covering approximate 29,000 sq ft roof area. It turns into the average roof size of approximate 600 sq ft. the total storage capacity of the installed tanks are 300 m^3 which has the potential to harvest about 3500,000 liters of water.	https://www.youtube.com/watch?v=EJE-Y_K_j9E https://www.devalt.org/Pdf/L2_SixThemePdfs/loco-soc.pdf https://www.devalt.org/Pdf/L2_SixThemePdfs/CaseStudy_WADI_PranSingh.pdf?Tid=910 https://www.scienceandsociety-dst.org/microcon.htm https://www.youtube.com/embed/ZzLF9lQ4ocw?list=UULB1HE8DyK-pbaA6XoqDLDw https://www.youtube.com/watch?v=A5lnl9_cjFE https://www.youtube.com/embed/C34k9-vhit0?list=UULB1HE8DyK-pbaA6XoqDLDw https://www.devalt.org/Pdf/L2_SixThemePdfs/CaseStudy_PremNarayan.pdf?Tid=955 https://www.youtube.com/embed/B6kdSDFnwbU?list=UULB1HE8DyK-pbaA6XoqDLDw https://www.devalt.org/Pdf/L2_SixThemePdfs/WADI.pdf?Tid=54 https://www.youtube.com/embed/7tmxgbCGgBs https://www.youtube.com/embed/nCZRi2wBH6A https://www.devalt.org/images/L3_ProjectPdfs/Technology_DESI_Power.pdf	Madhya Pradesh, Uttar Pradesh and New Delhi	Energy efficienty, drinking water management and Water harvesting

			https://www.devalt.org/images/L3_ProjectPdfs/GreenEnergyforDrinkingWater.pdf https://www.devalt.org/images/L2_ProjectPdfs/WadiPhotobook.pdf		
40	Environment Planning and Coordination Organization (EPCO) Paryavaran Parisar, E-5, Arera Colony, Bhopal, Madhya Pradesh -462016 Ph.0755 2460038 Email: epcobpl@sancharnet.in Website: www.epco.in	• Conservation & management of water bodies in urban areas. • National Environment Awareness Campaign (NEAC). • Technical training programmes on environmental policy, regulation of pollution control and environmental protection and management have been organized. • Dissemination of environmental information through the media orienting policy makers and opinion leaders towards environmental issues. • Undertaking environment sensitive planning by providing comprehensive design services in architecture, urban and landscape design and environmental graphics.		Madhya Pradesh	Research and training
41	East Kolkata Wetlands Management Authority DD-24, 5th Floor, Sector-I Salt Lake City, Kolkata-700064 Ph:033-23343003 Website:www.ekwma.in	• **Biodiversity conservation:** The authority has been entrusted with the statutory responsibility for conservation and maintenance of the East Kolkata Wetland areas. The main task of the authority is to maintain the existing land use practices along with its unique recycling activities for which EKW has been included in the Ramsar list of wetlands of international importance.	http://ekwma.in/ek/wp-content/uploads/2020/08/Pictorial-guide-on-Amphibians-Reptiles-and-Mammals_compressed.pdf	West Bengal	Wetland protection and management
42	Foundation for Ecological Security Post Box No. 29 Jahangir Pura Hadgud, District - Anand PO - Gopalpura Vadod, Gujarat- 388 370	• **Ecological restoration:** Assisting natural regeneration by supporting appropriate measures of soil and moisture conservation and regeneration through community participation, there is marked improvement in recharge of groundwater levels, biomass productivity and biodiversity, resulting in increased crop productivity, double cropping, fodder and water availability.	https://www.youtube.com/watch?v=THwDP33a-EA https://www.youtube.com/watch?v=raEh6wVLlXk https://www.youtube.com/watch?v=y_h1wlJD2js https://www.youtube.com/watch?v=jWobkVH1UwU https://www.youtube.com/watch?v=ctIe3nmy1GA	Rajasthan, Andhra Pradesh, Orissa, Madhya Pradesh, Karnataka and Gujarat	Ecological restoration

	Ph:02692-261303 Email: ed@fes.org.in Website:www.fes.org.in		http://fes.org.in/studies/smtkesibai-wwsf-prize-2016-announcement.pdf		
43	Gandhigram Trust Gandhigram, Dindigal, Tamil Nadu–6243020 Ph:0451-2452326 Email: gandhigramtrust@gmail.com Website: www.gandhigram.org	• **Establishment of Herbal Garden:** Seventeen varieties of medicinal plants have been collected and planted. Bio pesticides and Panchakavya have been prepared and used to protect the plants from pests and other diseases. Out of the sixteen herbal plants, the commercially viable plants like *Aloe vera, Indigo*, *Tulsi*, Vallarai and Vellaikarisalanganni have been planted on pilot scale in the campus as well as in the farmer's field for economic analysis. Organic manures such as FYM, vermicompost and bio pest repellents have been applied based on the soil test report. • **Extraction of Indigo Dyes:** Indigo plant was cultivated in half an acre and 600 Kg in the first ratoon and 400Kg. in second ratoon was harvested. It was soaked in water over night. The next day decomposed plant was removed. Oxidation was carried out by using mechanical agitator for one hour. The slurry was allowed to settle as insoluble at bottom and insoluble dyes slurry was drained out. The slurry was heated to boil and filtered. The thick mass was pressed and made into cake. The dye yield was 1.800Kg in the first ratoon and 1.200Kg in the second ratoon. The strength of Indigo dye was 73.55%. • **Technological improvement and mechanization of charkha:** 15V. Solar powered spinning Charkhas were developed and integrated to operate Two numbers of eight spindle charkha at a time by a spinner. Productivity and income level have been increased from 25hanks to 50 hanks and Rs.75/- to Rs.150/-per day respectively. This technology is transferable and it has reduced work drudgery and increased production. 10 spinners were trained for one month and Micro enterprises model is in operation. This technology is being providing the livelihoods for the spinners.	-	Tamil Nadu	Herbal garden and Energy efficiency
44	G.B. Pant Institute of Himalayan Environment and Development Kosi-Katarmal, Almora-263 643, Uttarakhand Ph: (05962) 241015,241041, 241154	• **Spring revival:** Sustainable community forest management combined with spring shed protection significantly improved the spring flows, maintaining forest resources and preventing further land degradation. In the rural village of Nakina in the Gorang valley, the community Forest Council (Van Panchayat) is reviving their local springs through a protective forest-spring shed approach that includes: 1) regulated forest resource extraction, 2) natural assisted regeneration with planting of broadleaved species, 3) maintaining an oak and fodder nursery, 4) protecting the forest perimeter with stone wall and firebreak, and (5) recharge ponds, trenches, and check dams.	http://gbpihed.gov.in/PDF/Policy%20Briefs/Science_Policy_Brief_SLM.pdf	Uttarakhand	Surface water management (spring)

	Email: psdir@gbpihed.nic.in Website: www.gbpihed.gov.in				
45	Gramin Vikas Trust KRIBHCO Bhawan, 5th Floor, 'A' Wing, Plot No. A-10, Sector-1, Noida-201301 Ph: 0120-2535623 Email: honoida@gvtindia.org, ceo@gvtindia.org Website: www.gvtindia.org	• **WADI Organic and Non-Organic:** Orchard development on uncultivable land and providing the beneficiaries the basic knowledge and advantages of orchard farming, providing organic manures, organic fertilizers, organic certification, identifying viable & sustainable micro enterprises. It also includes small fruit orchard and restoration of denuded land through ecological intervention and soil conservation measures. The fallow area between the two rows of fruit plants is promoted by vegetable cultivation, which ensure employment and income generation for the target group. • **Watershed:** Promoted integrated watershed development through land water conservation and water resource development along with other components viz. livestock development, crop improvement, women and social development, community health and capacity building.	https://gvtindia.org/templates/theme1/files/publications/wierfp/WIRFP%20Farmer-Managed%20Participatory%20Research%20For%20Varietal%20Selection.pdf https://gvtindia.org/templates/theme1/files/publications/wierfp/WIRFP%20Empowering%20Communities-20Jankar%20System.pdf	Madhya Pradesh Jharkhand Rajasthan Bihar Gujarat West Bengal Chhattisgarh Odisha Uttar Pradesh Haryana Maharashtra Andhra Pradesh and Telangana	Rotation system and Integrated farm development
46	Gram Vikas Nayyuvak Mandal (GVNM), Laporia Gram Vikas Navyuvak Mandal Villages Laporiya, Post – Gagardu, Jaipur, Rajasthan-300201 Ph: 094144 09228 Email: jagveer@gvnml.org	• **Chouka system or Laporiya Square:** Building choukas (squares), a system of low berms and shallow pits, to recharge the local groundwater and to regenerate the communal pasture land. The chouka system divides the open, grassy plains into several cells of chouka. Within each cell, the run-off was carefully managed with the system of berms to ensure that the monsoon rainwater, which comes in intense bursts, is spread over the entire area. The slight slope pattern of the land allows rainwater to enter the square and fill it up as per the available depth. Excess rainwater then flows into the next square and soon all the square gets filled with water. At the downhill end of the cell, the excess water gets collected in a tank, this is used for watering livestock.	https://www.youtube.com/watch?v=hOvz6VSDZHo&feature=emb_logo https://www.youtube.com/watch?time_continue=102&v=I1Vt8oPCZiE&feature=emb_logo https://www.youtube.com/watch?v=j3AzZLU36tc	Rajasthan	Minimal soil disturbance, Pastoralism and grazing land management
47	Gramin Vikas Vigyan Samiti (GRAVIS) 3/437, 3/458, M. M. Colony	• ***Tanka* (drinking water storage tanks):** GRAVIS has upgraded the traditional tanka (cylindrical tank) system for drinking water collection. Cylindrical tank with capacity to store between 18,000 and 20,200 litre of water has attached a silt catchers and secure lids to keep out animals, insects and mud.	-	Rajasthan	Traditional water and land management

	Pal Road, Jodhpur, Rajasthan -342008 Ph: 0291 2785116, 2785317 Email: email@gravis.org.in Website: www.gravis.org.in	• Orans: An Oran is a community pastureland which has traditionally been private land donated to a deity for the benefit of the public. While the practice is fading, its usefulness is still apparent as the growth of trees and shrubs helps to avoid soil erosion, adds nutrients to the soil, and provides fodder for livestock. While the Thar continues to be degraded by over-grazing and unsustainable farming methods, orans are a useful tool in regenerating the environment. GRAVIS has set up 69 orans. • ***Khadins***: A *khadin* is traditional build that serves as a method of collecting water by building an earthen embankment at the end of an upland plot of land to prevent water run-off. This method was developed by Paliwal Brahmins in Jaisalmer hundreds of years ago, but still serves as an effective and sustainable method for improving soil moisture. GRAVIS promotes the use of this traditional technology and construction of 5,095 khadins. • Seed bank: In this activity GRAVIS' involved in twofold. First, research was conducted to identify the most productive seeds based on water consumption and yield. This process does not involve genetic modification or hybridization. Then, once the healthiest seeds are harvested, they are stored in earthen pitchers in a mix of ash and neem leaves for preservation. The seeds are then distributed among farmers to be sown. GRAVIS' other focus was to established seed banks within villages so farmers can store their own seeds nearby. This allows farmers to save time and money as they will not need to travel to the market to buy commercial seeds.			
48	Green Foundation #25, ACES Layout,1st Main Road, Ashwath Nagar, RMV 2nd stage, Bangalore-560094 Ph: Email:contact@greenfoundation.in Website: www.greenfoundation.in	• **Agro-biodiversity conservation:** Promoted the concept of community seed banks in conjunction with other organizations working at the grassroots level with farming communities include small and marginal farmers, where they could conserve, borrow, lend and multiply their seeds. Seeds are given free of cost to members of a seed bank. Any one from the community can become a member by paying a nominal annual fee. The member then sows the seed, harvests the crop, and later returns the seed to the seed bank twice the quantity he/she received to replenish the store. The seed bank also works on seed treatment, seed selection, maintaining a record of needs, and planning for the next season. It is managed by women's groups. Their work involves the process of seed mapping which is to gather information about the varieties of seeds that had become extinct or fallen into disuse and then collecting small quantities of them. After that multiplies these seeds by growing them on small plots of lands and setting up seed banks. • Formed ***Janadhanya*****,** which is an association of farming community members who are empowered to work collectively to conserve agro biodiversity, provide market linkage for farmer produce and promote organic farming.	https://www.youtube.com/watch?v=C9G5sa-A1hw&feature=emb_logo https://www.youtube.com/watch?v=s9xAseAlcBw&feature=emb_logo https://www.youtube.com/watch?v=-hNGyu-kLNU&feature=emb_logo https://www.youtube.com/watch?v=0IvqqLSW-ZI&feature=emb_logo https://www.youtube.com/watch?v=oPjcXoy1OdY&feature=emb_logo https://www.youtube.com/watch?time_continue=1&v=1uxNojq9lMg&feature=emb_logo https://www.youtube.com/watch?v=t9fjOQHvsUk&feature=emb_logo https://www.youtube.com/watch?v=evwiOTvbAl0&feature=emb_logo	Karnataka, Tamil Nadu and Madhya Pradesh	Agro Biodiversity

	Janadhanya Near to New Indian School, Pipe line road, Kanakapura, Ramanagar, Karnataka-562117 Ph: 080 27522188 Email: janadhanyaokkuta@gmail.com Website: www.janadhanya.org		https://www.youtube.com/watch?v=cdiPumvYjng&feature=emb_logo https://www.youtube.com/watch?v=cdiPumvYjng&feature=emb_logo http://www.greenfoundation.in/pdfs/pub/Day_and_Night_Cannot_Dwell_Together_Community_initiatives_as_good_practice.pdf http://www.greenfoundation.in/pdfs/pub/women-reclaim-our-seeds.pdf http://www.greenfoundation.in/pdfs/pub/banking_on_seeds.pdf http://www.greenfoundation.in/pdfs/pub/living_on_the_edge.pdf https://www.youtube.com/watch?v=Qs2ICBoei_s		
49	Gorakhpur Environmental Action Group (GEAG) HIG First Phase 1/4, Siddharthpuram, Tara Mandal, Gorakhpur, Uttar Pradesh-273017 Ph: 0551-2230004 Email: geagindia@gmail.com Website: www.geagindia.org	• **Short term weather forecasting and agro advisory**: Automatic Weather stations have been installed in Gorakhpur and Bihar and mobile SMS-based climate information advisory services are being provided to the farmers with weather information and agro advisory at the interval of 5 days. Information on temperature, rainfall, wind and humidity are also being sent to farmers through SMS, which acts as an early-warning system and helps the famers in scheduling their irrigation, sowing, harvesting, use of bio-pesticide or other crop activities. • **Vertical farming**: Farmers have adopted an innovative technique of growing creeping vegetables vertically by using thermocol boxes and jute bags to raise climber crops such as bottle gourd and sponge gourd. The boxes or bags are filled with soil and manure and the vegetable seeds are sown in them. The climbers are supported by wooden sticks as they grow. • **Developing raised bed low tunnel poly-houses**: Raising crops in nurseries during summer for transplanting in winter used to be extremely difficult due to extensive waterlogging. Farmers have provided training to prepare and use poly-houses for growing seedlings. In this practice, first, the farmers prepared a raised seed bed (1 to 1.5 feet above the ground) in the field which was free from waterlogging. A 30 to 45cm high mound with a sloppy drain is made around the seed bed to prevent rainwater from entering the seed bed and to allow excess water to drain away easily. This high raised bed is covered by a low tunnel poly-house supported with bamboo sticks. Vegetable seedlings of tomato, cauliflower, brinjal (eggplant), and chilli are prepared in these seed beds until they have become ready for early transplantation.	https://geagindia.org/blog-post/sustainable-agriculture-and-livelihoods/wheel-weed-women-friendly-farm-tool	Uttar Pradesh, Bihar, West Bengal, Madhya Pradesh, Uttarakhand and Assam	Vertical farming and Integrated farm development

		• **Establishing resilient farming techniques in flood prone areas for small land holding farmers**: This type of farming techniques is based on the principle of integrating household, livestock and agriculture, and seeks to enhance diversity and recycling in the farming systems. Low cost external bio-inputs, appropriate crop varieties, space and time management, seed banking, land shaping and portable nursery systems are being experimenting and taken up by the farmers.			
50	Himalayan Environmental Studies and Conservation Organization (HESCO) Shuklapur, P.O. Ambiwala, via Premnagar, Dehradun, Uttrakhand-248001 Mob: 09411112402 Email: kirannegi.wise@gmail.com Website: www.hesco.in	• **Renovation of traditional water mill-Gharat** • **Pyrolysis and briquetting of biomass** • **Products (Mosquito Repellent cake, furniture etc.)** made from weed like lantana grass. • **Location specific crop Line sowing markers** were developed to minimize the drudgery in weeding process. This marker helps in weeding, irrigation and harvesting and processing of crops. • **Low cost bakery**, and product made from the locally available pseudo-cereals of the hilly areas.	https://www.youtube.com/watch?v=o6jnHWywlWk http://hesco.in/wp-content/uploads/2019/07/Time_Eng_2019.pdf http://hesco.in/wp-content/uploads/2019/04/DST_TIME-Magzine_2017-18_vol-17.pdf https://www.scienceandsociety-dst.org/pyrolysis.htm https://www.scienceandsociety-dst.org/watermill.htm	Uttarakhand, Jammu and Kashmir and Himachal Pradesh	Surface water management; Low cost Farming eqipments and tools and Agri business
51	Himalayan Research Group Umesh Bhawan, Chotta Shimla-171002, Himachal Pradesh Ph:0177 262 6820, 981 602 6820, Email: hrgshimla@hrg.org.in Website: www.hrg.org.in	• **Button mushroom cultivation:** Taking minimum 2 crops of button mushroom (*Agaricus bisporus*) under natural conditions for additional income generation for rural folks especially women. Quality mushroom compost and casing soil is prepared through short method of pasteurization. Button mushroom cultivation technology provides 100-120% net profit in three months cropping cycle. Therefore, two cropping cycle of 1000Kg per annum compost under suitable conditions of temperature 18-22°C can yield net profit of Rs. 15000-18000 in three months time. • **Agro-technology of selected Himalayan Medicinal Plants:** Commercial cultivation technology standardization of one native species of *Chirayita* from seed sowing was initiated after ascertaining the profile of secondary metabolites and acceptability in the market. Highest harvest of 1352Kg *Chirayita* by 143 women was achieved in 2010-11. M/s Dabur India Limited, Sahibabad, Ghaziabad (U.P.) purchased cultivated *Chirayita* @ 288/- Kg provided a gross return of Rs. 3,89,376/- per annum to the farmers. • **Vermi-composting:** Conversion of biomass and animal excreta with earthworm (*Eisenia foetida*) into black granular crumbly powdered vermicompost. Animal excreta and biomass are mixed and digested with earthworms in a bed. 1Kg	http://www.hrg.org.in/skytero/publication/Button-Mushroom-Cultivation-for-Women-Livelihood.pdf	Himachal Pradesh	Mushroom cultivation, Medicinal Plantation, Fodder cultivation and Rural Tourism

		earthworm/10Kg biomass and animal excreta ratio was standardized to initiate vermicomposting in the beginning. After multiplication of earth worms, large quantities of dung and biomass can be converted in heaps depending on the availability of space and composting material. Temporary shade and protection from rain was provided with bamboo or wooden poles and plastic cover to reduce the cost. • **Fodder development programme for women drudgery reduction:** Cultivation of improved fodder grasses, planting of fodder trees and processing of green fodder through silage making fodder available for lean period during winters. Different grasses like Orchard Grass, Ginni Grass, Maize (African Tall), plants of Oak, *Rubinia* and *Celtis* were planted and used for fodder. • **Rural tourism:** Community based tourism has been adopted for giving due significance to folk lifestyles, traditional crops, food, livelihood systems, custom and cultures. More than, 50 households have been registered under 'Home Stay Scheme'. Traditional food and craft have made a comeback with this tourism model. The populaces were successful in doing brisk sale of handicraft, handloom, dry fruits, pulses, buckwheat, apricot oil, honey etc. which helps in providing an additional source of income for the rural folk.			
52	Himachal Pradesh Krishi Vishwa Vidyalaya CSK HPKV, Palampur - 176 062, Himachal Pradesh Ph: 01894-230383 Website: www.hillagric.ac.in	• **Biodiversity conservation:** On-farm conservation of genetically important crop landraces of Rajmash. Can we give some brief	ICFRE. (2014). Sustainable Land and & Ecosystem Management, Some Best Practices from India. ICFRE, Dehradun, 96-100.	Himachal Pradesh	Agro biodiversity
53	Himalyan Forest Research Institute Conifer campus, Panthaghati, Shimla-171013, Himachal Pradesh Ph: 0177-2626778 Email: samantss2@rediffmail.com Website: www.hfri.icfre.gov.in	**Insect Pests disease management** • **Management of Polygraphus longifolia Beetle in Chir- Pine forest:** Tree-trap with 95 - 110 cm L X90 - 100 cm GBH and 25 to 35 % moisture content is found to be effective to attract the beetles. • **Control of Thysanoplusia orichalcea (Lepidoptera: Noctuidae):** A serious defoliator of Saussurea costus (Kuth): Neem cake @ 500 gm / m2, Grownim @ 5.0 % and summer oil @ 5.0 % is proved to be effective to keep the population of T. orichalcea below Economic Threshold Level in *Saussurea costus*. • **Intercropping models for high hill temperate regions:** Developed suitable intercropping model for commercially important medicinal plants viz. *Aconitum heterophyllum* (Atish), *Valeriana jatamansi* (Muskbala), *Picrorhiza kurrooa*	-	Himachal Pradesh and Jammu and Kashmir	Cold Desert Afforestation and Pasture Management

		(Kutki), *Polygonetum verticillatum* (Salam misri) and *Angelica glauca* (Chora) with horticultural plantations in high hill temperate region of Himachal Pradesh to help farmers in augmenting their income besides helping in productivity enhancement per unit area of land. • **Afforestation of cold deserts/ management of alpine pastures:** HFRI has standardized the nursery techniques or some indigenous species suitable for cold desert areas including *Elaeagnus angustifolia, Rosa webbiana* and *Colutea nepalensis*. In case of *Eleagnus angustifolia* the new growing shoots of 20 to 30 cm length collected from the healthy mature plants and treated with 5000 ppm to 6000 ppm concentrations of IBA using quick dip method in soil and sand medium gave more than 90% rooting in Poly- house. Whereas 6000 ppm to 7000 ppm concentrations in open nursery conditions in soil medium gave more than 70% rooting. After rooting, all the plants kept in beds in open nursery during next growing season for hardening.			
54	Indian Grameen Services (IGS) CE 103, Sector 1, Salt Lake, Kolkata, West Bengal-700 064 Ph: 91-033-23596264 Email: admin@igsindia.org.in Website: www.igsindia.org.in	• **Farm based livelihood:** IGS has introduced green gram with System of Rice Intensification (SRI). It is promoting indigenous and innovative models to ensure cropping intensity, productivity of fragmented holdings through systems of root intensification, *machan* cultivation, kitchen gardens, lac cultivation for local communities. Communities prepared and use bio-fertilizers and bio-pesticides as steps towards responsible agricultural practices (RAP). Modern agricultural technologies like drip/sprinkler irrigation to enhance productivity have also been promoted. Concepts like seed village, seed bank have also been promoted to increase the seed replacement rate as well as germination percentage.	https://www.youtube.com/watch?v=ljMWuF3kok4 http://www.igsindia.org.in/stroris_of_change.php	Jharkhand, West Bengal, Bihar, Madhya Pradesh, Maharashtra, Andhra Pradesh, Telangana, Odisha, Karnataka, Mizoram, Manipur, Meghalaya, Sikkim and Rajasthan	Improved agriculture cultivation and Lac practices
55	Indian Council for Agriculture Research 1st Floor, Krishi Anusandhan Bhawan I, Pusa, New Delhi 110 012 Ph: 91-11-25843295 Email: chairman@asrb.org.in Website: www.icar.org.in	• Conservation and sustainable use of genetic resources of plants, insects and other invertebrates, and agriculturally important micro-organisms. • Developed and released nearly 3,300 high-yielding varieties of field crops for different agro-ecologies; facilitated verification and identification of technologies under the country-wide, synergistic network of All India coordinated projects. • Documented selection of session wise crop for cultivation, integrated farm development, organic farming practices etc. • Documented inventory of indigenous technical knowledge in agriculture and geographical indications of plant species in ITKs in Agriculture.	https://icar.org.in/sites/default/files/KHETI-MAY-2020-FINAL-PDF-min.pdf https://icar.org.in/sites/default/files/KHETI-FEB-2020-min.pdf https://icar.org.in/sites/default/files/Kheti-Jan-2020-min-min.pdf https://icar.org.in/sites/default/files/Kheti-December%2023-11-19-min_compressed.pdf https://icar.org.in/sites/default/files/Kheti-October-2019-FINAL-min.pdf https://icar.org.in/sites/default/files/Kheti-September-2019-min.pdf	All states and UTs	Improved plant and animal breed

			https://icar.org.in/sites/default/files/KHETI-AUGUST-2019-min.pdf https://icar.org.in/sites/default/files/KHETI%20JUNE%202019%20FINAL.pdf https://icar.org.in/sites/default/files/KHETI-MAY-2019.pdf https://icar.org.in/sites/default/files/KHETI-APRIL-2019s.pdf https://icar.org.in/sites/default/files/KHETI%20JAN%202019-min.pdf https://icar.org.in/sites/default/files/Kheti-December2018-min.pdf https://www.youtube.com/watch?v=ZTdH3YzOEp4&feature=emb_logo https://www.youtube.com/watch?v=IlyMXViB8QA&feature=emb_logo https://www.youtube.com/watch?v=fqnJrCsJmVA&feature=emb_logo https://kvk.icar.gov.in/download/IFSmodelsIndia.pdf https://www.youtube.com/watch?v=aFp_xhhYWuM&feature=emb_logo https://www.youtube.com/watch?v=7iKhHKDOya8 pradhttps://www.youtube.com/watch?v=woH2e7wzN7g&feature=emb_logo https://www.youtube.com/watch?v=bamCbmn1s-c&feature=emb_logo http://zpd7icar.nic.in/download/IITKA_DATA/Document_2%20_%20Supplement%202%20_IITKA.pdf http://zpd7icar.nic.in/download/IITKA_DATA/Document%20_5%20_Geographical_Indications_of_Plant_Species_in_ITKs_in_Agriculture.pdf https://www.youtube.com/watch?v=yF5F1a1msIs https://www.youtube.com/watch?v=BDz_wMVoTXI		

56	Indian Institute of soil and water conservation 218, Kaulagarh Road, Dehradun (UK)-248195 Ph: 0135 2758564; Email: directorsoilcons@gmail.comdirector.iiswc@icar.gov.in Website:www.cswcrtiweb.org	• **Integrated farming system: IISW** has developed an Integrated Farming System (IFS) comprising of water mill, fish farming, poultry, piggery and agriculture. Water from existing water mill was channelized into two cemented water harvesting ponds (100+160 m^3) constructed in vertical series. Strategic pond construction to let-out subsurface water flow through a covered channel has significantly reduced the water loss. to a minimum level. Grownup fish seedlings of Indian and exotic major carps weighing between 20-50 gm were stocked in the ponds @ 1-2 fishes/m^2 for composite carp culture. A poultry hut (11.6 m^2) and pigsty (6.7 m^2) were constructed above the ponds. Leftover from water mills, poultry and pigsty and poultry or pig excreta were used as feeds for fishes or pigs to reduce cost of feeding. • **Participatory Water Resource Development:** A HDPE pipe line of 6.0 km length was laid in a very difficult hilly terrain to harvest the water from a perennial source where sufficient discharge was available (15lps). This pipe line was connected to the above said non-functional water tank for water storage. On monitoring huge seepage loss of stored water from tank was found, which was arrested by lining the tank with silpaulin sheet of 250gsm. In these interventions, villagers had contributed in terms of labour required for digging of trench and burying of pipe for entire length of 6.0 km. This intervention is taken up in a participatory mode with a total cost of Rs 7,20,000/- in which about 21 percent (Rs 1,50,000/-) is contributed by the farmers towards cost of digging trench, manual labour required for transportation of pipes, laying the pipe line, cleaning of tank and fixing of silpaulin sheet in the tank. **Puertorican Terraces:** In Puertorican method of terrace formation, the expenditure incurred is only one sixth of the cost as compared to mechanical terracing. Here, terraces are formed naturally without disturbance of the topsoil by using grasses or other suitable vegetation as vegetative barrier. On a sloping land selected for terrace formation, suitable species are planted in single or double row on contour at pre-determined spacing. The inter space between the two hedge lines of barrier is cultivated to take up crops. As a natural process, the tilled soil slowly moves towards the vegetative barrier and gets deposited against it, leading to the formation of terraces in 3 to 4 years time. Conservation of bench terracing (CBT): The CBT system can be successfully used in the semi-arid climate with mild slopes (2-5%) with sufficient soil depth for erosion control, moisture conservation and improvement of soil and crop productivity. In the CBT system, land is divided along the slope into 2:1 ratio. The lower 1/3rd area is levelled or collecting runoff from the upstream 2/3rd area, which is left in its natural slope. Upper 2/3rd area is cultivated during kharif either with sorghum + pigeonpea intercropping or soybean. The lower 1/3rd levelled terraces are left fallow during monsoon and cultivated with mustard or gram during rabi. The cost of construction of CBT on 2% slope was about Rs 3,022/ha.	http://www.cswcrtiweb.org/Technology/English/l.pdf http://www.cswcrtiweb.org/Technology/English/g.pdf http://www.cswcrtiweb.org/Technology/Hindi/Katta_crate.pdf http://www.cswcrtiweb.org/Technology/Hindi/mine.pdf http://www.cswcrtiweb.org/Technology/English/inm%20in%20groundnut%20brouchure.pdf http://www.cswcrtiweb.org/Technology/Hindi/Veg_Barriers.pdf http://www.cswcrtiweb.org/Technology/Hindi/IFS.pdf http://www.cswcrtiweb.org/Technology/English/com-bunding-20-june-2015.pdf http://www.cswcrtiweb.org/Technology/Hindi/CBT_FODDER.pdf http://www.cswcrtiweb.org/Technology/Hindi/GEOTEXTILES.pdf http://www.cswcrtiweb.org/Technology/English/c.pdf http://www.cswcrtiweb.org/Technology/Hindi/p.pdf http://www.cswcrtiweb.org/Technology/English/Melia%20dubea%20brouchure.pdf http://www.cswcrtiweb.org/Technology/English/i.pdf file:///F:/best%20practices/5.%20Bamboo.pdf file:///F:/best%20practices/Success%20model%20of%20Integrated%20Farming%20System.pdf https://www.iitr.ac.in/wfw/pdf/CSWCRTI_at_a_glance.pdf	Uttarakhand, Karnataka, Uttar Pradesh, Madhya Pradesh, Rajasthan, Gujarat, Tamil Nadu and odisha	Water diversion and drainage, integrated soil fertility fertility managemnet, minimal soil disturbace, water harvesting, cross slope management

		It was observed that through CBT: ✓ 21-29% of cropping season lost rainfall through surface runoff could be reduced to 13.4-15.8%. ✓ Reduced water erosion from 3.8-11 tonnes/ha/yr to about 2.2-3.2 tonnes/ha/yr ✓ 78.1% increase in grain and straw yields in terms of sorghum grain equivalent (SGE). ✓ Benefit: cost ratio of the system was 1.4:1. ✓ Benefits of soil and nutrients conservation			
57	Indian Institute of Natural Resins & Gums (IINRG) Ranchi - 834 010 Email: iinrg.ranchi@gmail.com director.iinrg@gmail.com Website: www. iinrg.icar.gov.in	• **Lac production in Semialata-early kusmi breed**: Due to its fast growth, tender shoots and suitability for intensive, lac cultivation in Flemingia semialat has shown a boon to the farmers. It is also helpful for particularly those farmers who do not have lac host trees but are interested in lac cultivation. Lac production in Flemingia semialat has increased to 44% in yield of per meter broodlac and 30.89 % increase in sticklac and no detachment of broodlac from the stem. Early harvest also provided better growth and plants are ready on time for inoculation of the next crop. • The recommended practices developed by IINRG are as follows: (i) Early maturing variety of kusmi strain (maturing in June and January - about one month before the normal time i.e. July and February) should invariably be used for lac cultivation on semialata, (ii) Lac insects should not be allowed to settle on more than 35 % inoculable space of the available shoots, (iii) Paired row system of planting should be followed and (iv) Irrigation at fortnightly interval after cessation of the monsoon (December – January) should be provided to lac cultures on semialata. • **Ber-late *kusmi* breed combination**: In this combination, ber is pruned in the month of March / April and late maturing variety of kusmi strain of lac insect is inoculated in the month of July-August. The crop is harvested in the coming March / April which serves as pruning also. Two main interventions viz., use of late maturing breed and four-six-month-old shoots for inoculation has resulted in sustainability of kusmi lac production on ber. Inoculation with late maturing variety of kusmi strain (maturing in July / August – about one month after the normal time i.e. June / July) delays the lac crop harvesting time to March / April which not only tends to coincide with the pruning time of the tree but also more lac yield (3-26%) was obtained in comparison to early maturing varieties.Yellow kusmi breed of Kerria lacca: Yellow kusmi lac insect has been developed through cross breeding, selection and multiplication. The insect has good productivity on semialata and kusum in that order. The breed has better productivity in comparison to existing lac insect breeds and it yields yellow lac dye. Being early maturing breed, most suitable for broodlac production on semialata. Broodlac output:input ratio is 8-10 on semialata and 4-6 on Kusum which is 10-20% more than conventional	https://www.youtube.com/watch?v=gd4f6wEP_QE&feature=emb_logo https://www.youtube.com/watch?v=7iKhHKDOya8&feature=emb_logo https://www.youtube.com/watch?v=akXErRQlC7Q&feature=emb_logo https://www.youtube.com/watch?v=akXErRQlC7Q https://www.youtube.com/watch?v=7HAYFBikzfo https://iinrg.icar.gov.in/Technologies%20-IINRG,%20Ranchi.pdf	Jharkhand, Ranchi	Lac Cultivation and mulching

		• Lac cultivation on arhar (*Cajanus cajan*): Out of three varieties of arhar tested forintensive lac cultivation on plantation basis, late maturing variety (Bahar) was found to be the most suitable. Under paired row system with a spacing of 50 cm between plants and paired rows, and one meter between rows, about 26,400 plants can be accommodated in one ha. Seeds sown in June become ready for inoculation in October / November for rangeeni summer crop. By inoculating 50g broodlac per plant, approx. five times broodlac can be obtained along with the pulse grains. Although 32% reduction in grain yield occurs due to lac cultivation on arhar but profit obtained from lac is much higher than the crop loss. In terms of raw lac, about 1750 kg scraped lac and 900 kg pulse can be obtained from one ha land. • Management of soil fertility for winter season kusmi lac production on ber • Development of high-density plantation of ber for lac cultivation • Kusmi lac cultivation on Siris tree • Kusmi lac production technology on *Prosopis juliflora* during winter crop season • Summer season (*jethwi*) sticklac production on ber trees with the help of pitcher irrigation • Moisture conservation through organic mulching for establishment of ber (*Ziziphus mauritiana*) plantation under rainfed condition • Eco-friendly pest control for lac crop through bio pesticide and egg parasitoid			
58	Indian Grassland and Fodder Research Institute Near Pahuj Dam, Gwalior Road, Jhansi - 284 003, Uttar Pradesh Ph:0510-2730666, 2730158 2730385 Email: Director.igfri@icar.gov.in igfri.director@gmail.com Website: www.igfri.res.in	Fodder production system in irrigated situation: The system comprises of raising seasonal legume fodder crops, inter-planted with perennial grasses (hybrid napier/guinea grass). Hybrid Napier based cropping system (Hybrid Napier + Cowpea - Berseem + Mustard) has green fodder production potential of 273t/ha and dry fodder potential of 44.3t/ha per year under assured water supply (water requirement 1090 mm). Technology can supply round the year good quality fodder (Cereal: legume, 67:33) which can sustain 8-10 ACU per ha (1 ACU= 350 kg bodyweight). Fodder Production system in Rainfed situation: The system comprises of Subabul + Trispecific hybrid - Fodder sorghum + Pigeonpea based fodder production system for rainfed conditions. In this system, the Pennisetum Trispecific Hybrid (TSH) is planted in paired rows at 0.75 m x 0.5 m spacing. Subabul is planted at 50 cm plant to plant spacing in between pairs of TSH. The 3 m space between such two alleys is utilized for fodder sorghum + pigeonpea cropping system in 2:1 ratio at 30 cm.	http://www.igfri.res.in/pdf/Chara_Patrika/Chara-Patrika-Sep-Dec-2011.pdf http://www.igfri.res.in/pdf/Chara_Patrika/chara-sep-dec-2010.pdf http://www.igfri.res.in/pdf/Chara_Patrika/chara-patrika-Jan-April-09.pdf http://www.igfri.res.in/cms/Publication/Miscellaneous/Bulletin_Chara_Guide-compressed.pdf http://www.igfri.res.in/cms/Publication/Miscellaneous/8%20type%20leaflet.pdf http://www.igfri.res.in/cms/Publication/Miscellaneous/IMPROVED%20FORAGE.pdf http://www.igfri.res.in/cms/Publication/Miscellaneous/8%20type%20leaflet.pdf http://www.igfri.res.in/cms/Publication/Miscellaneous/Leaflet%20Silage%20(1).pdf	Uttar Pradesh	Fodder management

		Fodder on field boundary Bunds/Channels: Among different perennial cultivated grasses, Napier - bajra hybrid is found most suitable for bunds of irrigated areas and Tri-specific hybrid (TSH), guinea grass, anjan grass and nandi grass are found suitable under rainfed conditions. 400 rooted slips per 100-meter length of field boundary with a spacing of 50 x 50 cm are planted and being perennial in nature no further plantation needed up to 4-5 years, other than gap filling and tussock dressing. Azolla as supplement feed for livestock: IGFRI has developed an economical Azolla cultivation technology for the livestock farmers. A water body of 2 x 1.5 x 0.4m is dug and leveled to maintain uniform water. Lined with a silpauline sheet or any other polythene sheet. Silpauline is a polythene tarpaulin which is resistant to the ultra violet radiation in sunlight. Width of the bed is maintained at 1.5m to enable the cultural operation from both the sides. About 10-15kg of sieved fertile soil is uniformly spread (depth of soil layer should be about 10cm) over the silpauline sheet which will provide nutrient to the azolla plant. Slurry made of 5 kg of pre-decomposed (2 days) cow dung and 30 g of super phosphate mixed in 10 litres of water, is poured on the sheet. More water is poured on to raise the water level to about 20-25 cm. About 0.5-1kg of fresh and pure culture of azolla is inoculated in the water of the pit. This will grow rapidly and fill the pit within 10-15 days and then onwards 500 -600g of azolla can be harvested daily. Biomass should be removed at regular interval to avoid overcrowding or restricted growth. A mixture of 20 g of super phosphate and about 1 kg of cow dung should be added once in every 5 days in order to maintain rapid multiplication of the azolla and to maintain the daily yield of 500g. A micronutrient mix (about 40g of nutrient mix made by mixing 10kg rock phosphate, 1.5 kg magnesium salt and 500 g of murate of potash) containing magnesium, iron, copper, sulphur can also be added at monthly intervals to enhance the mineral content of azolla. This not only takes care of the micronutrient requirement of azolla but also the cattle when it is fed with the azolla. The cost involved in setting up Azolla plot varies between Rs.1500 to Rs.2000 for a structure of 5x2sqm. The primary cost is in the form of manual labour, which can be contributed by the family labour. While estimating the cost of Azolla plot, two units of Azolla beds have been considered to maintain regular yield of azolla fodder. Silvo-pasture model for highly degraded/ waste lands: It consist of combination of Ficus based Hardwickia based, Morus based and Acacia based silvipasture. Interspaces intercropped with pasture combinations at 50 cm row- to- row and legume between 2 rows of grasses. One weeding beneficial for establishment of pasture. Silvi-pasture systems can serve the purposes of forage and firewood production and ecosystem conservation. This system support 2-4 ACU per year depending upon species of tree, pasture combinations and agro-climatic conditions. It also conserves soil moisture and reduces soil erosion as well as builds up soil in long rotation			

		Horti-pastoral model for higher income in rainfed ecosystem: Hortipasture system integrates pasture (grass and /or legumes) and fruit trees to fulfill the gap between demand and supply of fruit, fodder and fuel wood through utilizing moderately degraded land. It consists of Aonla and Guava based hortipasture systems for higher productivity. The range grasses used in the system are Cenchrus ciliaris, Stylosanthes seabrana and Stylosanthes hamata. Fodder production in mango orchards: The common mango planting distance followed is 10 m by 10 m giving minimum 7-8 m inter space for introducing fodder crops.			
59	International Crops Research Institute for the Semi-Arid Tropics (ICRISAT) Patancheru 502324 Telangana Ph:040-30713071 Email: ICRISAT@CGIAR.ORG Website: www.exploreit.icrisat.org	Growing drought-tolerant and climate-resilient crops: Developed and released several varieties of sorghum, pearl millet, chickpea, pigeon pea and groundnut, all of which are more drought tolerant than currently grown varieties. ICRISAT has been instrumental in developing pest-resistant varieties in sorghum (ICSV 745), chickpea (9ICSV 10), and pigeon pea (ICPL 332WR). Action to replace affected crops with more drought tolerant: Farmers should grow crops that mature earlier to escape drought. Short-duration crops thrive and yield well even with scarce water as they mature before soil moisture gets depleted. Farmers plant pearl millet instead of sorghum. Likewise, an action plan to produce seeds of drylands and other alternate crops for emergencies and natural calamities should be put in place. The Plantix App: An innovative multilingual diagnostic mobile app called Plantix, helps farmers identify pests and diseases on their crops and suggests remedies. Farmers take pictures of the affected crop and upload them on the app. The photographs are analyzed using artificial intelligence algorithms and diagnostic results are returned to the farmer. Critical information on symptoms, triggers, as well as chemical and biological treatments are provided immediately. All pictures sent using the app are geo-tagged, thereby enabling real-time monitoring of pest and diseases. The resulting metadata provides valuable insights into the spatial distribution of cultivated crops and most significant plant diseases e.g., in the form of high-resolution maps. The Sowing App:The Sowing App helps farmers achieve optimal harvests by advising (via SMS in local languages) on the best time to sow crops depending on weather conditions, soil and other indicators.	http://www.icrisat.org/wp-content/uploads/2017/10/Web_Smart-food-flyer_Global.pdf https://www.youtube.com/watch?v=7kY9s5C1Qa8 http://www.icrisat.org/who-we-are/investors-partners/donor-flyers/INDIA_and_ICRISAT.pdf http://www.icrisat.org/PDF/A-journey-of-innovation.pdf https://www.youtube.com/watch?v=xkfRx-JiqiQ https://www.youtube.com/watch?v=EtWffqK79gw https://www.youtube.com/watch?v=4LGWWmroyCA www.facebook.com/watch/?v=2313526698872655&extid=eJPy28fTIKKkvHNp https://www.facebook.com/Plantix/videos/778569066230247/?__so__=permalink&__rv__=related_videos https://www.youtube.com/watch?v=DhQORYwWm7E https://www.youtube.com/watch?v=kpG29PUUs5U https://www.youtube.com/watch?v=4dB41x1SLlc&feature=emb_logo	Telangana	Crop and nutrient management; irrigation management, IET, Integrated pest and disease management, improved plant breed

60	Indian Cardamom Research Institute (Ministry of Commerce & Industry, Govt. of India) 'Sugandha Bhavan" N.H. By Pass, Palarivattom P.O Cochin - 682025 Kerala Ph: 0484-2333610 - 616 Email: mail.sboard@gov.in Website: www.indianspices.com	• **Mulching in Cardamom:** A mulch may be made of materials such as straw, sawdust, grass clippings, peat moss, leaves, or paper etc. For large areas under cultivation a tilled layer of soil serves the purpose of a mulch but intensive cultivation of cardamom, ignoring the traditional cultural practices, has resulted in repeated losses. The soil fertility on a farm and found that the organic carbon/humus content is higher in the farms where this technique is practiced compared to neighbouring plantation. The soil bulk density is also very low. Mulching reduced the acidity of the soil and increased the soil moisture.	https://www.indianspices.com/spices-development/harvest-calendar.html	Andhra Pradesh, Tamil Nadu, Karnataka, Maharastra, Gujarat, Rajasthan, Uttar Pradesh, Madhya Pradesh, Assam, Sikkim and Jammu and Kashmir	Integrated soil fertility management
61	Indian Council of Forestry Research & Education, P.O. New Forest, Dehra Dun - 248 006 Ph:0135-2224855 Email: dg@icfre.org Website: www.icfre.org	**Bio-pesticide** • **Tree PALH** is a biopesticide product which has been developed as an alternative to chemical pesticides for the management of insect pests of forestry importance. Use of Hydnocarpic acid as biopesticide is first of its kind and combination with neem oil and essential oil of Lantana is a new approach. It is found to be very effective against insect pests of teak, *Hyblea purea* and *Ailanthus*, *Eligma narcissus* and *Atteva fabricella*. • **Crawl clean** is an ecofriendly plant-based insecticide comprising of leaf powder of Melia dubia (Malai vembu), Pongamia pinnata (Pungam), Aristolochia bracteata (worm killer), Adhatoda vasica (Adhatoda) and Vitex negundo (Vitex). It has been developed exclusively for the management of Papaya mealybug, Paracoccus marginatus on papaya. • **Tree Rich Biobooster-An alternate potting mixture for plant production:** It is made from coconut fiber waste duly decomposed and enriched with all nutrients through various beneficial microbes. It is made from organic wastes, has less weight, needs less irrigation, and offer growth enhancement of 25-30 percent. It is a suitable medium for raising nursery, terrace garden to grow vegetables/ plants and similar applications. • **Production and distribution of bio-fertilizers of microbial origin:** Bio-fertilizers or microbial inoculants are preparations containing live or latent cells of efficient strains of nitrogen fixing, mineral solubilizing, or cellulolytic microbes used for application to seed, soil or composting areas to augment the extent of availability of nutrients to plants. Its application in forest nurseries helps in improving soil fertility, nutrient uptake, controlling soil borne disease and early growth of seedling.	https://icfre.gov.in/technology_update_file/tech_update13.pdf https://icfre.gov.in/technology_update_file/tech_update12.pdf https://icfre.gov.in/technology_update_file/tech_update6.pdf https://icfre.gov.in/technology_update_file/tech_update1.pdf	Uttarakhand, Madhya Pradesh, Rajasthan, Himachal Pradesh, Tamil Nadu, Jharkhand, Andhra Pradesh, Assam, Tripura, Mizoram, Karnataka, Uttar Pradesh,	Agro forestry, lac cultivation, Forest conservation and management

		• Intercropping of temperate medicinal plants with horticultural plantation (*Angelica glauca* (*Chora*) with Apple, Intercropping of *Picrorhiza kurrooa* (*Kutki*) with Apple and Intercropping of *Valeriana jatamansi* (*Muskbala*) with Apple). • Developed a bio-polymer based binding material (*Jigat*) for incense sticks from the locally available bio-resources. • Developed Samridhi – Multiplying Benefits from Silkworm Rearing causes reduction of the cocoon spinning period to just 15-18 hours. • Standardizing lac cultivation techniques on *Flemingia semialata*, an evergreen native shrub, resulting in much higher yield per acre and average annual returns of about Rs. 80,000/-. • Developed a simple equipment to treat bamboo culms and also developed an environmentally safe treating agent. • Agroforestry models adopted by farmers is Agri-silvi-pastoral and agrisilvicultural systems. Poplar plantation in the block and on the boundaries. Some of the model adopted by farmers are as follows: ➢ Model -1: poplar sugarcane-turmeric block plantation medel: In the first year, one-year old poplar and cutting of sugarcane are planted in the first week of February. Sugarcane is harvested in December. From the left-over clump, new clump of sugarcane come up which are harvested in the second year in November. After this potato is sown in Novemberand harvested in April. And harvested in April. Then turmeric is sown in April and harvested in March. In the sixth year after harvesting turmeric, chari fodder crop is sown in May and harvested during August-September. Poplar is harvested in the sixth year. ➢ Model-2: Poplar-sugarcae-whea-chart block plantation model ➢ Model-3: Poplar-sugarcane-wheat-chari-potato-maize-bajra block plantation model ➢ Model-4: Poplar-sugarcane-potato-barseem ➢ Model-5: Sandal based agroforestry at 6x3m spacing with amla.			
62	International Competence Centre for Organic Agriculture (ICCOA) #294/22, 7th Cross Road, 1st Block, Jayanagar, Bangalore-560011	• **Organic farming:** Developed organic crops guides for farmers in paddy, maize, tomatoes, potatoes, turmeric etc. The centre trained farmers and stakeholders in organic agriculture and sustainable farming methods and educate people including children about healthy food, conserving environment and biodiversity. • **Agri business:** The organization has tied up with Ms. SUS AGRI Private Ltd, Delhi and Big basket to procure the Farmers produce from the implementing projects	file:///C:/Users/Admin/Downloads/parstavna.pdf https://www.iccoa.org/download-2/tomato.pdf https://www.iccoa.org/download-2/tomato-2.pdf https://www.iccoa.org/download-2/potato.pdf https://www.iccoa.org/download-2/turmeric.pdf https://www.iccoa.org/download-2/peas.pdf	Delhi, Karnataka, Himachal Pradesh, Sikkim, Kerala and Assam	Agri business and integrated pest and disease management

	Ph: 080-26561151, 080-26561152 Email: admin@iccoa.org Website: www.iccoa.org		https://www.iccoa.org/download-2/paddy.pdf https://www.iccoa.org/download-2/maize.pdf https://www.youtube.com/watch?v=rq5VrXQ1BVM&feature=emb_logo https://www.youtube.com/watch?v=y0KJg70w-Bs&feature=emb_logo		
63	ICAR-Indian Institute of Horticulture Research IIHR Main Road, Hessaraghatta lake post, Ivar Kandapura, Bengaluru, Karnataka 560089 Ph: 080-28466353, 28466471 Email: director.iihr@icar.gov.in Website: www.iihr.res.in	• **Biopesticides for nematode management in horticultural crops:** IIHR has developed eco-friendly technologies for sustainable management of nematode problems in horticultural crops viz., tomato, capsicum, cabbage, cauliflower, gerbera, carnation, tuberose, chillies, banana and papaya. It has also developed six biopesticide technologies viz., Paecilomyces lilacinus 1% W.P., Trichoderma harzianum - 1% W.P, Pseudomonas fluorescens - 1% W.P., Trichoderma viride - 1.5% W.P, Verticillium chlamydosporium (Pochonia chlamydosporia) - 1% W.P, Arka plant growth enhancer, yield promoter, bio-pesticide technologies (Bacillus subtilis and Bacillus pumilis are being generated). Use of bio-agents can boost crop yield of tomato and chilli (Anaheim type) by reducing the infestation of nematodes and associated diseases	https://www.youtube.com/watch?v=bXP1moQ1upo https://www.youtube.com/watch?v=YmcGtB95mCw https://www.youtube.com/watch?v=FmAF_wJrz1w&feature=youtu.be https://www.iihr.res.in/success-stories	Odisha, Andhra Pradesh, Tamil Nadu and Karnataka	Horticulture and integrated pest and disease management
64	Jal Bhagirathi Foundation D-66 (B), Sawai Madho Singh Road, Bani Park Jaipur 302016, Rajasthan Ph: 0141-4025119 Email: jalbhagirathi@jalbhagirathi.org Website: www.jalbhagirathi.org	• **Traditional water efficient method of pitcher plantation.** • **Created community ownership and promoting rights-based approach for water management:** A multi-tiered system of community institutions from village level called the Jal Sabha (village water user association) to the regional level called the Jal Sansad (Stakeholders Forum), ensures active participation of the actual beneficiary community, including women and marginalized sections of the society. Inclusive Jal Sabhas (water user associations) with participation of marginalized sections & women facilitated & capacitated for community management of village's resources • Communities contribute 30% to 50% of the cost of the water harvesting systems • Developing improved & sustainable sources of drinking water through rain water harvesting – little bit info can be added	https://www.youtube.com/watch?v=5IhjyOBAy2s https://www.youtube.com/watch?v=rlki3oyqrjQ https://www.youtube.com/watch?v=nX2vDE1qOD0 file:///C:/Users/Admin/Downloads/321704.pdf file:///C:/Users/Admin/Downloads/876458%20(2).pdf	Rajasthan	Ground water management
65	Jan Vikas Society Ashram Campus,	• Promoting Utilization of Solar Energy • Providing training in compost making and organic farming • Creating awareness on decentralized waste Management and disposal	-	Madhya Pradesh	Energy efficiency and waste management

	Palda P.B. No. 103, Indore, Madhya Pradesh - 452 0011 janvikaspalda@hotmail.com Mobile: 9009948987 Website: www.janvikassociety.com	• Formed Self Help Groups of women belonging to unorganized sector in different slums.			
66	Jan Mitram Kalyan Samiti Administrative centre, Jan Mitram House Past Kelo Vihar Near Indian School, Raigarh Chhattisgarh–496001 Mob: 098261-44243 Email: janmitram@gmail.com Website: www.janmitram.org	• Created water harvesting structures to increase the ground water recharge and surface water availability for agriculture and other usage. • Enhancing livelihood through WADI	https://www.youtube.com/watch?v=tutjOq9iXRE&feature=emb_logo	Chhattisgarh	Water harvesting and integrated farm development
67	Jawaharlal Nehru Krishi Vishwa Vidyalaya Jabalpur 482 004, Madhya Pradesh Ph. 0761-2681074 Email: drsjnkvv@gmail.com Website: www.jnkvv.org	• **Genetic Improvement of Non-toxic Jatropha varieties for biofuels and animal feed:** The plant G2-3 and G3-3 have been identified for promotion and plantation in 3x3m planting density in matching ecologies. It is a short rotation crop for a smart biofuels agroforestry system which will significantly reduce the time of fruiting as compared to 3-4 years for a normal Jatropha. • System of Pigeon pea Intensification: The production of pigeon pea is quite low due to traditional method of sowing on flat beds. The crop sown on flat bed suffers from water logging due to excess rain water and results in low yields. System of pigeonpea intensification (SPI) increased crop growth and yield. The Pigenpea plant of 30 days are transplanted on the raised beds and nipping of growing tip is done after 30 DAT. Transplanting of 30 days old nursery of pigeon pea varieties Asha, ICPL 88039 and ICPH 2671 at 90 cm plant to plant spacing & 150 cm row to row spacing, nipping at 30 DAT + Application of NPK@ 20:50:20 kg/ha + 20 kg S + 5 kg Zn/ha.It is found suitable for both heavy soils having low infiltration and poor drainage as well under light textured soils of rainfed areas where crop suffers due to terminal water stress condition.	-	Madhya Pradesh	Improved plant breeds and improved agriculture practices

		• **Ridge and furrow system of planting:** Soybean, maize and pigeon-pea occasionally suffer due to water stress during monsoon period. Water logging and terminal water stress conditions leads to lowering the production of these crops. A large-scale ridge and furrow system of planting has increased the productivity by 28 to 36 percent in soybean, maize and pigeonpea. This technology is found suitable for both heavy soils with low infiltration and poor drainage as well under light textured soils of rainfed areas where crop suffers due to terminal water stress condition.			
68	Kalpavriksh Environmental Action Group Flat no 5, 2nd Floor, Shri Dutta Krupa, 908, Deccan Gymkhana, Pune 411004, Maharashtra Ph:020-25654239; 25675450 Email:kalpavriksh.info@gmail.com Website: www.kalpavriksh.org	**Bhimashankar wildlife sanctuary conservation and livelihood programme:** This programme facilitate inclusive conservation governance and management in and around the villages of Bhimashankar by supporting local people's rights over and responsibilities towards surrounding forests and biodiversity. Some of the major activities taken are as follows: ➢ **Celebrating and reviving bio-cultural diversity**: Through uncultivated and wild food festivals to reconnect the link between community and biodiversity health; van bhojan to celebrate the spirit of the forest; reviving local biodiversity based cultural activities and festivals and facilitating informal and formal village discussions on these subjects. ➢ **Local seeds conservation and natural farming systems:** Emphasising the need for conservation of local seed diversity and farming systems, looking into their gradual decline, reasons for the decline and need for revival; facilitating community seed exchange processes. ➢ **Community based eco-tourism**: Community run and managed eco-tourism programme in Yelavali village	https://kalpavriksh.org/wp-content/uploads/2018/07/CCAbro-_HINDI.pdf	Maharashtra	Forest Conservation
69	Key Foundation Keystone Centre PB 35, Groves Hill Road Kotagiri 643 217 Nilgiris District, Tamil Nadu Ph: 04266-272277, 272977 Email: Keystone – kf@keystone-foundation.org Website: www.keystone-foundation.org	• **Apiculture practices and pollination services amongst Indigenous mountain communities through bee colony production in the Nilgiri Biosphere Reserve (NBR):** 50 starter stock colonies were gathered from beekeepers to accommodate in apiaries in four sites for training farmers in beekeeping. conducted six one day training for 50 farmers for hands on practical beekeeping, observation, dividing techniques to multiply 3 colonies from the stock and take away home 3 bee colonies by every farmer accounting for 150 colonies. To establish starter colonies 50 bee hives are fabricated and supplied to all apiaries. To enhance the brood size, top bar is introduced in the brood chamber and regular frames are used in super chambers. The top bars in brood provide opportunity for easy inspection and split at queen appearing period without disturbing the brood. The swarming hives are equipped with top bars only. very trained farmer was additionally supplied with three bee hives to transfer the divided colonies and installed in their homestead farm. These trained farmers are continuing supports to assist in beekeeping to neighbouring farmers.	https://keystone-foundation.org/wp-content/uploads/bsk-pdf-manager/Revival_of_Apis_Cerana_in_South_India010-ilovepdf-compressed_26.pdf https://keystone-foundation.org/wp-content/uploads/bsk-pdf-manager/Reducing_the_Water_Content_of_Tropical_Honey037-min_27.pdf https://keystone-foundation.org/wp-content/uploads/bsk-pdf-manager/Pollinators-Key_for_agro_biodiversity_conservation-min_34.pdf https://keystone-foundation.org/wp-content/uploads/bsk-pdf-manager/Eco_threat_from_Euro_Bees-min_28.pdf	Tamil Nadu	Bee-Keeping

70	Ladakh Ecology Development Group (LEDG) Karzoo, Leh, Ladakh – 194101, Jammu and Kashmir Website: www.ledeg.org	LEDG has developed following technologies • Solar water heating systems • Trombe wall technology, • Solar ovens • Solar parabolic reflector cookers (both, for individual families and communities) • Hydraulic rampumps • Improved water mills	https://www.youtube.com/watch?v=EowHUVgFGj4&feature=emb_logo https://www.youtube.com/watch?v=3boO_8qfw8o&feature=emb_logo https://www.youtube.com/watch?v=vihgVxbrb8k&feature=emb_logo	Jammu and Kashmir	Energy efficiency
71	Mitraniketan Post Vellanad Thiruvananthapuram - 695 543, Kerala Ph: 08281114470, 8281114479 Email: trivandrumkvk@yahoo.co.in, kvk.Trivandrum@icar.gov.in Website: www.mitraniketan.org	• **Automatic low-cost drip irrigation system to grow bag vegetable cultivation:** Mitraniketan has developed automatic low-cost drip irrigation system includes, the drip kit, booster pump and timer. Total cost for the entire system cost around Rs.3650/-. 0.2hp submersible pump is used to pump water from the tank to the laterals. Pump is needed when the tank is kept on the level of the terrace itself. Minimum pressure of 1 kg per cm^2 is required to obtain the desired discharge. If the tank is above the ground level, at a height of more than 2m, water directly flows by gravity. 16mm lateral are connected to pump to obtain the sufficient pressure. • **Drip kit developed:** It consists of 16mm LLDPE lateral, dripper / emitter (4 LPH), stake four-way assembly with micro tube, screen filter, fittings and accessories. Sixty numbers of poly bag can be irrigated by using this drip kit having a discharge rate of 1LPH / Poly bag. Screen filter, filter the water efficiently @ 700 litre per hour. Drip kit will last for more than two years without any damage. It has reduced the water use by 30-70 percent, increased the yield by 25 percent and reduced in additional costs like fertilizers, labour, tilling and weeding.	-	Kerala	Low cost farming equipment/ tools and irrigation management
72	Madhya Pradesh Vigyan Sabha Gyan Vigyan Parisar, Sangoni Kalan, Raisen Road, Bhopal (MP) Ph: 0755 - 2900068, 2923554 Email: mpvs.bpl@gmail.com srazad61@gmail.com Website: www.mpvigyansabha.org	• **Design and development of dehusking machine for minor millets (Kodo and Kutki):** It has reduced the drudgery of tribal women engaged in dehusking of *Kodo* and *Kutki.* The newly improved threshing cum dehusking machine is for minor millets having the capacity of dehusking continuously without any break. This machine has the capacity to dehusk 100 Kg millets per hour and 2 HP single phase electric motor and 150 Kg weight. • **Developed honey processor:** Developed honey processors having various processing capacity 20 kg to 100 kg per batch	-	Madhya Pradesh and Chhattisgarh	Post harvest machinery, bee keeping

73	MP forest department O/o the Principal Chief Conservator of Forests Satpura Bhavan, Bhopal-482003 Madhya Pradesh Website: www.mpforest.gov.in	**Implemented Integrated land and ecosystem management to combat land degradation and deforestation in Madhya Pradesh supported by the Global Environment Facility and UNDP.** MP Forest Department has allotted 20 hectares of bamboo forest land to each household and trained them on how to maintain degraded bamboo forests and conserve soil and water in the project areas of Sidhi and Chindwara. This proved to be a recipe for success. Between 2010 and 2016, the Government of Madhya Pradesh and UNDP helped in restoring over 14,000 hectares of degraded bamboo forests reducing soil erosion. It has raised the incomes of local communities by 40 percent. Greater community involvement under this program has improved the protection and management of forests Local communities involved under the programme have themselves decided who amongst them were the most vulnerable, and required this support. Each family was paid a sum of Rs.3500/- every month to care for the plot allotted to them. Many used the by-products from the harvested bamboo to craft products for sale. Besides, plots were also demarcated in each forest division for families to cultivate fast-growing fuel wood trees, and fodder plants.	https://www.youtube.com/watch?v=OSCzkMQSMRs	Madhya Pradesh	Forest plantation management, minimal soil disturbance and Rehabilitation of Forest
74	Ministry of Rural Development - Govt. of India (Deendayal Antyodaya Yojana - National Rural Livelihoods Mission (DAY-NRLM) 7th Floor, NDCC Building -II, Jai Singh Road New Delhi - 110001 Ph: 011 – 23461708 Website: www.rural.nic.in	MoRD has started the campaign, under the name of "Sabka Sath, Sabka Gaon, Sabka Vikas" to promote social harmony, spread awareness about pro-poor initiatives of government and reach out to poor households to enroll them as also to obtain their feedback on various welfare programmes. • Information dissemination to the citizen on rural government schemes • Developed Mobile Apps ***'Gram Samvaad'***: A citizen centric mobile app to serve and empower the rural citizens of India, by facilitating single window access by citizens to information at Gram Panchayat level on various Rural Development programs, covering inter-alia programme objectives, scope and performance. • ***'AwaasApp'*****:** A citizen centric mobile app to inspect and report the houses constructed under PMAYG or other rural housing schemes. • ***'Meri Sadak'*****:** A citizen centric mobile app to enable users to give their feedback regarding pace of works, quality of works etc. of PMGSY roads to the Nodal Departments in the State Governments/National Rural Roads Development Agency (NRRDA). • ***'Janmanrega'*****:** A citizen centric mobile app provides an interface to improve quality of public services under MGNREGA.	https://www.youtube.com/watch?v=BdtO3kqYDBA&feature=emb_logo https://www.youtube.com/watch?v=9xPalqLvnyA&feature=emb_logo https://www.youtube.com/watch?v=UQ_KaOHleJk&feature=emb_logo https://www.youtube.com/watch?v=Eu5p6SJ77sA&feature=emb_logo https://play.google.com/store/apps/details?id=com.nic.gramsamvaad https://play.google.com/store/apps/details?id=nic.hp.ccmgnrega https://play.google.com/store/apps/details?id=rural.housing&hl=en https://play.google.com/store/apps/details?id=com.cdac.pmgsy.citizen https://www.youtube.com/watch?v=9j4Hs1zYeec	All States and Union Territories	Rural livelihood

75	Department of Agriculture & Cooperation Ministry of Agriculture and Farmers Welfare, Krishi Bhawan Rajendra Prasad Road, New Delhi-110001 Ph: 23382629 Extn.475 Email: dg.icar@nic.in Mohinder.k@nic.in Website: www.agricoop.nic.in	• Doubling of farmers income: Strategies are developed by the states of Manipur, Chhattisgarh, Arunachal Pradesh, Manipur, Rajasthan, Madhya Pradesh etc. • Released guidelines on Jaivik Kheti and its certification (For details visit: https://pgsindia-ncof.gov.in/home.aspx) • Operational guidelines of Pradhan Mantri Krishi Sinchayee Yojana (PMKSY) • Released guidelines on Pradhan Mantri Fasal Bima Yojana (PMFBY) • **Launched National Bamboo Mission to** promote holistic growth of bamboo sector by adopting area-based, regionally differentiated strategy and to increase the area under bamboo cultivation and marketing. **Launched National Mission for Sustainable Agriculture (NMSA) to** enhance the agricultural productivity especially in rainfed areas focusing on integrated farming, water use efficiency, soil health management and synergizing resource conservation.	http://agricoop.nic.in/sites/default/files/Kishan%20Book.pdf http://agricoop.nic.in/sites/default/files/Manipur%20strategy%20for%20DFI.pdf http://agricoop.nic.in/sites/default/files/Doubling_Farmer_Chattisgarh_New.pdf https://pgsindia-ncof.gov.in/pdf_file/Booklet-Hindi.pdf http://agricoop.nic.in/sites/default/files/Guidelines_PMKSY.pdf http://agricoop.nic.in/sites/default/files/PMFBY_Guidelines.pdf https://nbm.nic.in/Documents/pdf/NBM_Revised_Guidelines.pdf https://nbm.nic.in/VideoGallery.aspx https://nmsa.dac.gov.in/pdfdoc/NMSA_Guidelines_Hindi.pdf	All states and UT	Sustainable agriculture
76	M.S. Swaminathan Research Foundation 3rd Cross Street, Institutional Area, Taramani, Chennai-600 113 Ph: 044-22541229, 22541698 Email: swami@mssrf.res.in, founder@mssrf.res.in executivedirector@mssrf.res.in Website: www.mssrf.org	• **Opened Community Agro-biodiversity Centre:** Centre maintains 25 lines in Banana, 26 lines in different pulses species, 45 lines in vegetables and 52 different green leafy vegetable species and act as a resource centre to address malnutrition by strengthening agriculture nutrition linkages. • **Developed Mobile app to save lives and livelihood of small-scale fishers** • **"Shetkari Mitra" (farmers' friend)**, a whatsapp group in Yavatmal, Maharashtra, formed for sharing information on agriculture. Village Resource Centre has created this group of farmers from different villages, who use Whatsapp. Through this group, information is shared on agriculture, marketing, animal husbandry and government schemes. • **Developed a low-cost cage fish farming technology for livelihood enhancement:** Under this cage- farming method, juvenile fish from a hatchery or those caught from the normal fishing operation (which is usually discarded) are reared in confinement to market size in estuaries. • **Developed Rice seed villages:** With a group of farmers, production of traditional paddy seeds has started. This group caters the seed needs of themselves as well as provide seeds to fellow farmers of the village and farmers of neighboring villages at affordable cost and well in time. • **Botanical pesticides and plant tonics:** In an effort to promote sustainable agricultural practices, the technical know-how of a series of plant-based products are being popularized among the rural farming community of Wayanad district, Kerala. Product ingredients used as garlic mixture garlic, ginger, bird eye chilli for stem borer. Turmeric for thrips. Cow - urine pesticide for root grubs. Neem seed mixture for fruit borer.	https://www.youtube.com/watch?v=oFldjzHFjF8 https://www.youtube.com/watch?v=7lcOMhzyOAc https://www.youtube.com/watch?v=yTjP3Q72KPA https://www.youtube.com/watch?v=nJjYkNQP5fc https://www.youtube.com/watch?v=NN2waQI7p54 https://www.youtube.com/watch?v=5owd1yhSmgk http://mksp.gov.in/images/Reflection_of_mahila_kisan_MKSP_MSSRF.pdf https://www.mssrf.org/mssrfthirtyyearsnew/success-stories-of-MSSRF/ https://www.youtube.com/watch?v=HSgAPlDimok&feature=emb_logo	Chennai	Agro biodibersity, IET, Fish farming, Integrated pest and disease management

77	Myrada No. 2 Service Road, Domlur Layout, Bangalore-560071 Ph: 080 25352028/3166/ Email: myrada@myrada.org Website: www.myrada.org	• **Cost effective farm level fertilizer factory:** A simple barrel unit with a capacity of 200 litres is used for manufacturing liquid manures. Two outlets were fitted in the barrel at the height of 1½ feet and 2 feet from the bottom end and one more at the lower part of the barrel. Fresh cow dung and urine are mixed in the unit at 1:1 ratio. Then 10 parts of water are added and thoroughly mixed and allowed to ferment. This takes 12 hours, after which 1 kg of jiggery is added for every 100 litre fermented solution. Again, it is kept for fermentation and sedimentation processes to take place. (It is location specific, other farm level waste like Palmyra fruit also can be used for the fermentation process) The clear and enriched liquid organic manure is ready for field application in another 12 hours. Mirada use this manure mainly for *Moringa*, Coconut and Amla crops. The input cost of this technology is around Rs. 1500/- only.	https://www.youtube.com/watch?v=IeKyRS6wm_k&feature=emb_logo https://www.youtube.com/watch?v=pWFL6RpcoE4&feature=emb_logo https://www.youtube.com/watch?v=Jslh-YncZVY&feature=emb_logo https://myrada.org/film/ https://www.youtube.com/watch?v=lBoN2JRUbnM&feature=emb_logo	Karnataka	Integrated pest and disease management
78	National Bank for Agriculture and Rural Development (NABARD) Plot C-24, G Block, Bandra Kurla complex, BKC Road, Bandra East, Mumbai, Maharashtra-400051 Ph: 022-26539895/96/99 Website: www.nabard.org	• Apart from refinance support to building rural infrastructure, supervising Cooperative Banks and Regional Rural Banks (RRBs), NABARD also promotes watershed development, WADI model, promoting climate smart/hi-tech agriculture, crop diversification and enhancing of farmers' income, promoting and nurturing farmers' collectives, etc.	https://www.youtube.com/watch?v=P3Z7g6G8tEY https://www.youtube.com/watch?v=B1-95Pp8ndY https://www.youtube.com/watch?v=mN6pmywSdC8&feature=emb_logo https://www.youtube.com/watch?v=tM521jt5Ifw	All states	Micro finance and livelihood
79	North Eastern Regional Institute of Water and Land Management O/o- NERIWALM, P/O- Kaliabhomora, Dolabari, Tezpur - 784 027 Ph: 03712-268107/268077 Email: director.neriwalm@gmail.com Website: www.neriwalm.gov.in	• Water management for irigation • Integrated water resource management • Participatory irrigation management • Soil and water conservation and watershed management • Command area development and water management • Multiple cropping and crop diversification • Women participation in irrigation management	-	Assam	Irrigation management

80	National Bureau of Animal Genetic Resources Makrampur Campus, G.T. Road Bye Pass, Near Basant Vihar, P.O. Box No. 129, Karnal-132001, Haryana Ph. 91-184-2267918 Website: www.nbagr.res.in	• Other than management and conservation of animal genetic resources, NBAGR has developed following database on animal genetic resources- ***-AGRI-IS*:** It covers all the indigenous breeds of domestic livestock and poultry species from India.This database contains descriptors of various breeds of livestock and poultry, information on farms, semen production, vaccine production; and district-wise information on population, animal breeding, animal health infrastructure, animal products like milk, meat, egg, wool, etc. It also stores photographs of male and female animals of breeds. ***DAGRIS*:** DAGRIS is designed to facilitate the compilation, organization and dissemination of information on the origin, distribution, diversity, present use and status of indigenous farm animal genetic resources from past and present research results in an efficient way.		All states especially Haryana, Punjab, Kerala, Tamil Nadu, Gujarat, Rajasthan and Telangana	Improved animal breed
81	National Bureau of Plant Genetic Resources Pusa Campus, New Delhi-110012 Ph: 011 -25843697 Email: director.nbpgr@icar.gov.in; kuldeep.singh4@icar.gov.in Website: www.nbpgr.ernet.in	• Managing indigenous and exotic plant genetic resources for food and agriculture as per region specific. • **Application of DNA-based markers to differentiate citrus root stocks:** Grafting and microbudding in citrus requires excellent quality root stock material. It has been shown that Jambhiri and Rangpur lime provide the quality root stock seedlings. • **Developed PCR based detection assays and protocols for ten Genetically Modified (GM) crops**: PCR-based developed diagnostic kits are reliable, sensitive and efficient, as more than one target sequences can be detected in a single assay, the sensitivity of the kits is up to 0.1%. • **Hexaplex GMO Screening PCR targeting six marker genes:** The developed technology of hexaplex PCR targeting six marker genes facilitate testing the GM status of a sample irrespective of GM crop and trait. The technology involves use of multiplex PCR targeting six marker genes, which could be amplified in the template DNA by use of HotStart Taq DNA polymerase to minimize the chances of mispriming and primer-dimer formation. In multiplex PCR, specific amplicons, i.e., 82 bp for uidA, 177 bp for bar, 262 bp for pat, 406 bp for aadA, 508 bp for nptII and 839 bp for hpt would be detected in the respective positive samples. • **TaqMan® Real time PCR based multitarget system targeting 47 targets**: The developed technology of TaqMan® Real time PCR based multitarget system comprises a pre-spotted system in which primers and probes for each target are lyophilized. It simultaneously amplifies 47targets, including 21 GM events, 5 construct regions, 15 transgenic elements (including promoters, terminators, marker genes and transgenes) and 6 taxon-specific sequences of cotton, maize, rice, brinjal, potato and soybean, which would facilitate preliminary screening for testing the GM status of a sample. Two samples can be simultaneously screed for 47 targets in a run using the robust TaqMan® Real time PCR technology. The limit of detection of assays is upto 0.1-0.01%.	http://www.nbpgr.ernet.in/Divisions_and_Units/Conservation.aspx	Maharashtra Uttarakhand Odisha Telangana, Andhra Pradesh Rajasthan Meghalaya Jharkhand Himachal Pradesh Kerala and Jammu & Kashmir	Improved plant breed

82	National Bureau of Fish Genetic Resources Canal Ring Road, P.O. Dilkusha, Lucknow - 226 002 Ph: (0522) 2442440, 2442441 Email: director.nbfgr@icar.gov.in Website: www.nbfgr.res.in	• **Promotion of Fish diversity and fish farming practices for rural communities.** • **Developed Animal Genetic Resources of India (AGRI-IS) mobile app:** Animal Genetic Resources (AnGR) comprise of a large number of described breeds and populations of farm animal and poultry species. The mobile app on animal genetic resources of India (Farm-AnGR-India) provides information on breeding tract and breed characteristics.	-	Lucknow	Fish farming and fish diversity
83	Nature Environment & Wildlife Society 10, Chowringhee Terrace Kolkata-700020 Ph: 033 -2223 4148, 09830093283 Website: www.naturewildlife.org	• Alternative livelihood through integrated farming development • Restoration of mangroves through afforestation • Integrated mangrove-shrimp farming	-	West Bengal	Biodiversity
84	National Institute of Agricultural Extension Management (MANAGE) Rajendranagar, Hyderabad - 500 030, Telangana, Ph: 040-24016993 Mob: 9640977738 Email: sr_khiste@manage.gov.in Website: www.manage.gov.in	• Training and capacity building of farmers on good agriculture practices.	https://www.manage.gov.in/publications/SuccessStories/SuccessStories-H.pdf https://www.manage.gov.in/publications/goodpractices/CaseStudy3_Feb2018.pdf https://www.manage.gov.in/publications/goodpractices/CaseStudy2_Feb2018.pdf	All 29 states and 2 UTs (Puducherry and Chandigarh)	Skill development

85	National Institute of Plant Health Management (NIPHM), Rajendranagar, Hyderabad - 500 030 (Telangana) Ph: 040-24013346 Email: infoniphm@nic.in niphm@nic.in Website: www.niphm.gov.in	• **Developed Low Cost Bio-Control Agents:** Biological agents and low-cost insect-pest lures to promote bio intensive strategies for plant health management and sustainable agriculture. Some of the bio-control agent promoted are *Bracon hebetor Say and B. brevicornis (Wesmael*) (They parasitize a variety of important Lepidopteran pests of stored product and field crops. Among the common insect pests that are hosts of *Bracon* are rice moth (*Corcyra cephalonica*), angoumois grain moth (*Sitotroga cerealella*), wax moth (*Galleria mellonella*), Indian meal moth (*Plodia interpunctella*), castor shoot and capsule borer (*Conogethes punctiferalis*), castor semilooper (*Achaea janata*), cabbage head borer (*Hellula undalis*), gram pod borer (*Helicoverpa armigera)*, spotted pod borer (*Maruca testulalis*), spotted bollworm (*Earias vittella*), tobacco caterpillar (*Spodoptera litura*), cabbage leaf webber (*Crocidolomia binotalis*), sorghum/maize stem borer (*Chilo partellus*), pink bollworm (*Pectinophora gossypiella*) and coconut black headed caterpillar (*Opisina arenosella*). • reduviids, also known as assassin bugs, *Rhynocoris marginatus/R. fuscipes*, are important and effective predators of insect pests in many agro-ecosystems (soybean, groundnut, pigeonpea, cotton, castor, rice, cabbage, tobacco, pumpkin, okra, citrus, sugarcane, sesbania, apple etc.). Predaceous reduviids are of considerable economic importance because they reduce the pest population by killing the host quickly with their highly proteolytic saliva • *Corcyra cephalonica*: It is one of the most efficient surrogate host for rearing a wide range of biological control agents. The important among them are egg parasitoids - Trichogramma spp., egg larval parasitoids - Chelonus blackburni, larval parasitoids - Bracon spp., Goniozus nephantidis, Apaneteles angaleti, insect predators - Chrysoperla carnea, Mallanda boniensis. Cyrtorhynus feltiae (Neoaplectana carpocapsea) is reared on the larvae of C. cephalonica. Besides, some entomopathogenic nematodes such as Steinernema feltiae is also reared on the larvae of Corcyra cephalonica • Trichogramma: It is important for plant protection because of its wide spread natural occurrence and its success as biological control agent by mass releasing. Since this parasitoid kills the pest in the egg stage itself before the pest could cause any damage to the crop. • **Designed Plant Protection Equipment:** Most of the high moisture grains harvested during the monsoon seasons get damaged due to high moisture content and non-availability of suitable drying facility with the farmers. They eventually end up with the moisture damaged paddy to be disposed off and incur huge monetary loss due to distress sales. The high moisture grains undergo qualitative damage also apart from fungal damage and development of micotoxins. A 2 MT capacity Paddy Dryer has been designed by NIPHM to	https://niphm.gov.in/Videos/Pseudomonas_H.mp4 https://niphm.gov.in/Videos/Trichoderma_H.mp4 https://niphm.gov.in/Videos/Reduviid-Bugs_H.mp4 http://niphm.gov.in/Videos/Bracon_H.mp4 https://niphm.gov.in/FruitFlies/Trap_Lures_Hindi.pdf https://niphm.gov.in/Education/FruitFlies_booklet.pdf https://niphm.gov.in/Education/igdir_weeds_inner.pdf https://niphm.gov.in/Education/Field_Guide_Sprayers.pdf	Telangana	Plant health management

		enable on-farm drying (and interim storage, if necessary) of food grains even with high moisture content of 24-26%. The design of the bin ensures adequate aeration in storage while promoting the natural draft technique to keep the grains cooler while enabling slow removal of moisture. Thus, the grains can be stored safely for a period of 3-4 months before further processing. The bin is equipped with an electric blower to use it into a dryer. This will enable the farmers to ensure quicker turnover of drying the grains and to market better quality grains at a better price. Cost of the 2 MT Paddy Dryer is Rs. 1,00,000/-. • **Developed Natural Enemy Friendly Light Trap:** Natural Enemy Friendly Light Trap was developed to trap the insect in the field thereby reduce application of chemical pesticides. The trap is provided with a plastic funnel catcher through which the insects fall into a perforated plactic holding jar. Perforations are so made in the holding jar to enable the escape of the smaller size insects (mostly defenders) back into the field. A CFL lamp serves to provide the blue colour light to attract the insects in the field. This light trap enables segregation of beneficial insects which returns to the field to augment the ecosystem as part of AESA & Ecological Engineering approach to pest management. The cost of each would be about Rs 1,100/- per piece. • **Developed Low Volume Spinning Disk Backpack Sprayer:** Backpack sprayer has been developed with a boom attachment to enable the operator to spray behind and safely away from his body, while covering larger area with two spinning disk nozzle system (unlike the existing one hydraulic nozzle sprayed from front).This is provided with a 10 L spray tank and hence lighter in weight. The appliance has a higher productivity as it would cover larger area safely with lesser fatigue to the operator. The sprayer runs of a 12 V chargeable battery and produces uniform mist size droplets (200-400 microns size) resulting in better efficacy and distribution over a swath of 2m in each sweep. The field capacity of this backpack sprayer is 0.6 hectare in an hour. The sprayer is light in weight and is farmer friendly. Cost of the sprayer is Rs 18,500/- per piece. • **Swing sack granular applicator:** This is a simple device for basal application of pesticide/fertilizers in dust form. This equipment is well suited for pesticide application for control of brown plant hopper (BPH) in paddy ecosystem. The dust hopper can contain about 3 kg dust. The dust is emitted by shaking the duster by hand, in twirling or up- down vertical motion. Especially the brown plant hoppers generally harbour at the lower portion of the paddy crop and hand rotary duster usually fails to apply the dust at the bottom of the crop. Hence, this device is very useful for the farmers. A farmer can cover one acre of paddy in a day with the help of this duster. This could be utilised for other crops as well. Cost of the device is Rs 500/- per piece.			

86	Navdhanya A-60, Hauz Khas New Delhi - 110 016 Ph: 011- 26968077, 26532561, 26532124 Email: navdanya@gmail.com Website: www.navdanya.org	• Organic farming practices; preservation of seed/seed bank; conserving the traditional agro-biodiversity; organic management of pest.	https://www.youtube.com/watch?v=K5b-cbE0_KI&feature=emb_logo https://www.youtube.com/watch?v=xfnIMkzho5c&feature=emb_logo https://www.youtube.com/watch?v=KKanFBrlhrs	Uttarakhand	Agroecology and food security
87	National Biodiversity Authority, 5th Floor, TICEL Bio Park, CSIR, Road, Taramani, Chennai - 600 113 Ph: 044-2254 1805 Email: chairman@nba.nic.in Website: www.nbaindia.org	• Listed Species of Plants and animals which are on the verge of extinction in the state of Bihar, Goa, Himachal Pradesh, Karnataka, Kerala, Madhya Pradesh, Meghalaya, Mizoram, Orissa, Punjab, Tamil Nadu, Tripura, Uttar Pradesh, Uttarakhand and West Bengal. • The state Biodiversity Board (SBBs) focus on advice the State GovernmentS, subject to any guidelines issued by the Central Government, on matters relating to the conservation of biodiversity, sustainable use of its components and equitable sharing of the benefits arising out of the utilization of biological resources. The Local Level Biodiversity Management committees (BMCs) are responsible for promoting conservation, sustainable use and documentation of biological diversity including preservation of habitats, conservation of land races, folk varieties and cultivators, domesticated stocks and breeds of animals and microorganisms besides chronicling of knowledge relating to biological diversity. • Developed taxonomy expert's data base(http://nbaindia.org/expert_db/search.php). • Releases guidelines for operationalization of Biodiversity Management Committees.	http://nbaindia.org/uploaded/pdf/Aichi%20target%20design%20low%2014-11-2018.pdf http://nbaindia.org/uploaded/pdf/Guidelines%20for%20BMC.pdf	All 28 States and UT's	Biodiversity
88	Nirman-An Initiative for Sustainable Development P.O.-Biruda, Via-Itamati, Dist-Nayagarh Odisha-752068 Email: nirman96@gmail.com prasant@nirmanodisha.org	• The organization intervening in millet-based bio-diverse farming values and proposes re-designing agriculture, there has been increase in number of millets and legume varieties to 25 from 13 and has increased the surplus grain at household level; this has enabled the community to barter/exchange/make cash during lean periods; and has the yield has increased the food basket of the community for another 75 days. Millet based bio-diverse farming system, unlike other farming system offers ability to transform small farms towards greater productivity by increasing soil fertility and stability, optimizing water use, diversifying crops and incomes, building resilience to climate change, achieving high yields under difficult conditions and creating new local markets. Given the necessary information provision and extension services, this is an affordable low-risk strategy for smallholders.	-	Odisha	Water havesting, home gardens, agro biodiversity, improved agrciculture practices (SRI)

	Ph: (+91) 674-2720417 (+91) 9438294417 Website: www.nirmanodisha.org	• Implementation of SRI intervention has resulted in increase in production of rice by 30% per acre and decrease in production cost by 35% due to reduction in use of fertilizers. • Conservation of indigenous seed of 39 indigenous varieties of rice, 25 varieties of Millets and pulses along with indigenous varieties of chilly, ridge gourd and several other vegetables. • Promoted rain water harvesting in two villages in Rayagada district of Odisha. • Promoted home gardens and mushroom cultivation by involving women work force.			
89	N. M. Sadguru Water & Development Foundation Post Box – 71, Dahod (Gujarat) 389151 Ph no: +91 2673 238603 Email: nmsadguru@yahoo.com Website: www.nmsadguru.org	• **Promoting vegetables trellis system** which has significantly improved the quantity and quality of creeper vegetables, thus making it a profitable endeavour. In addition to the creeper vegetables growing on trellis, farmers have used the land underneath the hanging trellis to grow spices such as ginger, turmeric, garlic and onion. • **Promotion of seed village concept:** one seed institution between one-two clusters (10-15 villages) is formed, which identify its producers and channelize quality and timely inputs and other facilitation, as and when required. It also procures, process and later sell the seeds to the farmers, ensure easy availability at affordable costs, in the villages itself. An agreement is made between the individual producers and the seed institutions to pro assurance to producers and to devise a mechanism for collection of the produce and its further processing and marketing in an institutionalized way. • **Formation of Pani Samiti:** An institution at hamlet level manages the drinking water supply scheme. It consists of 20-35 women members representing all households • **Formation of lift irrigation federation:** Lift irrigation (LI) federations provide the crucial support to primary lift irrigation cooperatives in managing, operating and maintaining their individual lift irrigation.	https://www.youtube.com/watch?v=1JNHi6Sqt-Q&feature=emb_logo https://www.youtube.com/watch?v=KFl5589kc24	Gujarat	Vegetables trellis system, Institution building, irrigation managemnet
90	People Science Institute G.M.S. Road Near Hotel Sun Park Inn ITBP Road, P.O. Kanwali Dehradun - 248 001	• **System of wheat intensification (SWI):** A single wheat seed sown by SWI method yielded an average of 19 tillers as compared to 6 tillers by broadcasting method. The average plant height in case of SWI crop was 90 cms as compared to 70 cms in case of broadcasting method. The average productivity of irrigated wheat went up from 22Q/ha to 43 Q/ha, showing about 95 percent increase in grain yields. Similarly, under unirrigated conditions, the average yield increased by about 63 per cent from 16 Q/ha to 26 Q/ha. The straw yields from SWI crop under irrigated and unirrigated conditions increased by about 87 and 48 per cent respectively. The average yield increases 97 percent and 81 percent grain in irrigated and un-irrigated land respectively.		Uttarakhand and Himachal Pradesh	Agriculture

	Ph: 0135 - 2971954, 55, 56, 57 Email: psiddoon@gmail.com www.peoplescienceinstitute.org	• **System of Rice Intensification to System of crop intensification:** The SCI paddy produced more effective tillers per plant, each plant had more and heavier grains yielding 4.8 T/ha whereas conventional paddy produced only 2.5 T/ha, showing an average increase of about 92% in grain yield of SCI paddy over the conventional paddy crop. SCI performances with kidney beans, soyabean, finger millet and maize have increased grain yields upto 69%, 29 % 50% and 34 % in kidney bean, soyabean, finger millet and maize, respectively. In the case of *mandwa*, farmers were recommended (a) to transplant one to three 15-25 days old seedling per hill keeping the plant-to-plant and row-to-row spacing of 15-25 cm and 15-20 cm, respectively, in the case of irrigated fields, and (b) to undertake direct seed sowing, placing 1-2 seeds about 30 cms in a line under rainfed conditions. Direct seed sowing was also adopted for kidney beans and maize. Healthy seeds were selected and treated with organic formulations and one to two seeds per hill were sown maintaining a spacing of about 25 cm to 30 cm. In all the crops weeding was done once or twice using a hand rake. Application of cowdung, matka khad, panchgavya and amritghol was applied as desired by the farmers. • Documented Himalayan region of Uttarakhand and Himachal Pradesh rich heritage of water harvesting structures and systems and the role of sanskriti (culture) in ensuring sustainable management of these resources.			
91	Professional Assistance for Development Action (Pradan) #3, Community Shopping Centre, Niti Bagh, New Delhi – 110049 Email: headoffice@pradan.net Website: www.pradan.net	• **Sericulture:** Promoting mulberry sericulture, which provides an opportunity to poor farmers to earn Rs.60,000 to Rs.80,000 per annum. Promotion of Tasar sericulture has focused on strengthening the seed vertical to ensure the supply of over 1.8 million high-quality seeds (disease free layings). It has also supported large-scale cocoon production and spurred growth in Tasar yarn production, weaving and product development. 1,400 ha. of host tree plantations was raised in wastelands owned by poorer households. This helped silkworm rearers to produce more than 71 million cocoons and earn an average income of Rs. 21,500 from around 65 days of engagement in Tasar rearing.	https://www.pradan.net/wp-content/uploads/2017/02/pradan-brochure-english-1.pdf https://www.pradan.net/wp-content/uploads/2017/01/AR-2017-PDF-02.pdf https://www.youtube.com/watch?v=Zet-tMXYmZg https://www.youtube.com/watch?v=IrMpR5Pm53U	Rajasthan, Chhattisgarh, Madhya Pradesh, Odisha, Jharkhand, Bihar, West Bengal, Uttar Pradesh	Agriculture
92	Peermade Development Society (PDS)	**Herbal mosquito repellent coil:** It is made from agricultural waste and plants which are abundantly available locally. This has multiple benefits of waste management, income generation, drudgery reduction and mosquito control through bio methods.	https://www.pdspeermade.com/images/success%20stories.pdf	Kerala	Low cost rural technology

	PB No. 11, Peermade P.O., Idukki District, Kerala- 685 531 Phone: +91-4869-232197, 232725, 232496, 232497, 9447032197 E-mail: pds@pdspeermade.com, pdsngo1980@gmail.com director@pdspeermade.com Website: www.pdspeermade.com	• **Bio manure:** The unit produces vermicompost, different bio -pesticides and related products. *Eisenia foetida* and *Eudrilus eugeniae* are the two types of earth worms used for the production of vermicompost. During the reporting period, 45 tonnes of vermicompost, 2.5 tonnes of vermifert, and 625 litres of vermi-wash were sold to the farmers. • **Technologies to improve bio-efficiency in mushroom cultivation:** Low nitrogen content of paddy straw (substrate), insufficient air circulation in mushroom growth chamber and clump drying are the major problems leading to bio-efficiency. Thus, developed a growth promoter to supplement nitrogen content of the substrate. • Developed a new method using fewer holes in mushroom growth bed to initiate bigger clumps; and enhanced the air circulation in mushroom growth bed by fixing an exhaust fan in reverse manner. • **Quality planting material production in black pepper through seed germination** Collection of ripe pepper berries from mother plant. ➢ Remove the fleshy skin. ➢ Mix with wood ash and dried in shade for a day. ➢ Sow the seeds in raised earthen beds of 15 cm thickness, 1m width and desired length. ➢ Cover the seeds with soil with a thickness of 0.5 cm. ➢ Again, cover the beds with dry grass. ➢ Water the beds twice a day. ➢ The seeds germinate by 32nd day. ➢ Transfer the seedlings to polybags in a potting mixture combination of soil, vermicompost, sand and coco peat at 2:1:1:1 ratio. • **Devloped low cost method for decapitation in Banana - a modified nursery technique for high density planting:** High Density Planting in banana (HDP) is gaining popularity in Kerala in the last few years, but the cost of cultivation is high because farmers need three suckers instead of one sucker. So, for solving this problem core team has developed a low-cost method by producing multiple sprouts from a single sucker by hindering the growth of apical meristem. • **New rejuvenation technology in old senile pepper plants:** Due to no viable technology for rejuvenation of old plants in pepper cultivation, farmers are adopting replanting of the old plantation but this is not affordable for small and marginal farmers. In order to resolve the problem, steps like covering the			

		basal nodes with topsoil and vermicompost are followed. The height of the covering is minimum one foot, so that it can easily cover three to four nodes with soil. These nodes trigger the production of new roots and simultaneously resulted in the production of healthy vegetative sprouts. Ideal season is May-June and September-October. • **Multi-layer farming technology in rubber plantations:** In order to addressethe problems of mono-cropping and price fluctuations faced by the rubber farmer, a package was developed for multilayer farming using black pepper and cocoa. For the successful demonstration of the technology, standardized spacing in rubber plantations from 15x15 to 20x10 was done for getting better inter row spaces Shade loving pepper varieties such as *Narayakodi, Kumbukkal, Panniyoor* -5 and *Karimunda* are taken to obtain better yield. By this model farmer is getting steady income.			
93	Rashtirya Seva Samithi (RASS) Annamayya Marg, AIR-Bye-Pass Road, Tirupati – 517 501 District Chittoor Andhra Pradesh Ph: 0877-2242404, 2244210 E-mail: rassorg@gmail.com / rass_org@rediffmail.com Website: www.rassngo.org	• **Rejuvenating river Swarnamukhi**: Construction of sub-surface dams and restoration and renovation of the existing water harvesting structures are the main activities in addressing 40,000 hectares of forest land and 59,500 hectares of non-forest area that need treatment under the current drive.10 sub-surface dams have been constructed at various locations along the course of the river after conducting hydro-geological investigations. This dam was constructed with 98% of clay and 250% of micro film was used which is most cost effective. To sustain the motivation levels, special programmes have been planned for the farming communities, especially the user groups and self-help groups. • **Land Development:** Developed 2500 acres of waste land into cultivable land. In addition, surface bore wells have been dug to a depth of 100-200 meters. All the wells have been energized. Out of the 2500 acres, 1500 acres have been brought under irrigation. Some of the SC and ST colonies have been completely transformed into self-sufficient communities as a result of land development activities. • Low cost housing was built under Neeruvoy integrated housing project 1993, each measuring 225sq. ft with RCC roof and cement flooring. The uniqueness is that no contractor or middle man was employed for the entire construction. A committee of the beneficiaries was constituted to plan, implement and monitor the construction. • **Pest management:** Adopted spraying of neem cake solution (neem kernel extract) during early stages of the crop growth as a repellent. Installation of pheromone traps to monitor the incidence of pest population. Control of root grub with chlorophyriphos seed treatment.	-	Andhra Pradesh	Surface water management (river), land development, integrated pest management and low-cost housing

94	Ramakrishna Ashram, KVK P.O. Nimpith Ashram -743338 Dist. South 24-Parganas (Sundarbans) West Bengal Ph: 03218-226002 Website: www. rakvknimpith.org.in	• **Innovation on Puffed paddy cleaning machine:** It takes 80 minutes to clean 200 Kgs of unclean puffed paddy for production of 135Kgs of cleaned puffed rice whereas one manday is required in traditional method. The present invention involves only Rs. 42/- for electricity and depreciation cost. A machine has been prepared to clean puffed paddy with a quick and cost-effective manner. 1 HP electric motor is used to run the machine. Unclean puffed paddy is poured into the funnel of the machine which is larger than the traditional paddy husking machine. The unclean puffed paddy is then allowed from the funnel to one end of a rotating wooden shaft which is 195 cm. long and 8 cm indiameter. A spiral rubber band (car window glass holder) has been fixed upon the wooden shaft. The spiral is so fitted that for one circle of rotation it becomes 10 cm wide. A drum of galvanized iron wire net having 2 mm. mesh sizeis fitted over the rotating shaft. The diameter of this drum is17.5 cm. This drum acts as sieve. More output is obtainedwithin a short period, thus improving productivity of thepuffed paddy industry. It reduces huge strain on biceps and triceps, minor and even major wounds on hands and dust allergy which occur during traditional operation. • **Mobile SMS alert for Agriculture and allied Agri- information.** • **Developed Parasitological mapping:** This map will forecast the probable incidence and occurrence of specific worms in animals with specific season, thus the farmers may well ahead take the preventive measures for prevention of such. • **High ridge and deep furrow technology:** About 50% of the farmland is shaped into alternate ridges (1.5 m top width ×1.0 m height × 3m bottom width) and furrows (3m top width × 1.5 m bottom width × 1.0 m depth). These ridges remain free of waterlogging during Kharif with less soil salinity build up in dry seasons (due to higher elevation and presence of fresh rain water in furrows). Remaining portion of the farmland including the furrows is used for growing more profitable paddy-cum-fish cultivation in Kharif. The rainwater harvested in furrows is used for irrigation. The remaining portion of farmland (non-furrow and non-ridge area) is used for low water requiring crops during dry (rabi/ summer) seasons. • **Paddy-cum-fish cultivation technology:** Trenches (3 m top width × 1.5 m bottom width × 1.0 m depth) are dug around the periphery of the farmland leaving about 3.5 m wide outer from boundary and the dugout soil is used for making dikes (about 1.5 m top width ×1.0 m height × 3.0 m bottom width) to protect free flow of water from the field and harvesting more rain water in the field and trench. The dikes are used for vegetable cultivation round the year. Remaining portion of the farmland including the trenches is used for more profitable paddy-cum-fish cultivation in kharif. The likely cost of intervention is about Rs. 32,000/- per ha for soil excavation.	https://www.youtube.com/watch?v=ad-mPJpdfE8&list=PL_cl9BYlXntodrHH3CTAKC7ybObuN3QRA https://www.youtube.com/watch?v=89sLAwXV1rY&list=PL_cl9BYlXntp3wE0I-28w7Vy8J4COiO7V http://www.rakvknimpith.org.in/rakvkfilm3.htm http://www.rakvknimpith.org.in/rakvkfilm5.htm http://www.rakvknimpith.org.in/rakvkfilm4.htm https://www.youtube.com/watch?v=l_sSaVtmoFk	West Bengal	Land shaping, IET

95	Regional Head, NBSS&LUP Salt Lake City, D.K. Block, Sector-II, Bidhan Nagar, Calcutta - 700 091 Ph: 91-33-23586926, 23590727 Email: nbsscal@wb.nic.in Website: www.nbsslup.in	• Responsible for conducting soil survey and resource mapping of West Bengal, Bihar, Jharkhand, Orissa, Sikkim and Andaman & Nicobar Islands • Soil survey and mapping related projects at various levels together with soil correlation and classification, pedological research, remote sensing and GIS application for land management practices, assessment of soil degradation	Soil conservation, assessment of soil degradation and land management practices	West Bengal, Bihar, Jharkhand, Orissa, Sikkim and Andaman & Nicobar Islands	Soil conservation and assessment
96	Rural Communes 2nd Floor, LIC Building, Anandilal Podar Marg, Marine Lines, Mumbai-400002, Maharashtra Ph: 022-2208 5601 Email: ruralcommunes@gmail.com Website: www.ruralcommunes.org	• **Nutrient Rich Raised Bed Nurseries i.e. Mat nursery:** Producing young healthy saplings, a healthy nutrition rich soil bed Mat nursery is prepared. Due to mat nursery farmers can produce healthy, young saplings which are uniform in size and easy to use in machinery. Mat nursery needs 4 cubic meters of soil mix for every 100 m^2 of nursery area. Mixing 7 parts soil with 2 parts rotten and well-decomposed chicken manure, and 1 part fresh or charred rice hull. For Preparing the nursery area ✓ Prepare a 100 m^2 nursery area to plant one hectare. Select a levelled area in backyard or in the main field. ✓ Level seedbed and spread banana leaves or plastic sheeting on top to prevent the roots of the seedlings from penetrating into the soil. ✓ Lay the soil mixture. It can be done this with or without using a wooden frame. For those using a wooden frame, place the frame on top of the banana leaves. ✓ The frame should be half a meter long, 0.3-meter-wide and 4 centimeters deep, divided into equal segments. Then, fill the frame to the top with the soil mixture prepared. • **Vertical Bag Agriculture:** Vertical vegetable sack garden is cultivation of the vegetables and even medicinal plants for daily use grown in the sack in vertical arrangement. Adopting Direct Seed Sowing commonly known as *'Per Bhat'* i.e. without mud ploughing. In this case direct seeded crops require less labor and tend to mature faster than transplanted crops. In this method, plants are not subjected to stresses such as being pulled from the soil and re-establishing fine rootlets.	-	Maharastra	Nursery raising and traditional sowing measures

97	Samaj Pragati Sahayog (Baba Amte Centre for People's Empowerment) Samaj Pragati Sahayog Bagli, District Dewas, Madhya Pradesh 455227 Ph: 07271-275757, 275550, 275500 Email: core@samprag.org; samprag@gmail.com Website: www.samajpragatisahayog.org	• **Watershed Development:** In the watershed development, package of agricultural practices finely tuned to the resource endowments of the watershed, which is accessible to the poor (low-cost) and sustainable (low-risk). Construction of water harvesting structure in the form of check dam. Community Shram Daan and whenever water harvesting structures are built, written agreements are forged about water sharing, hours of pumping, sequence of irrigation, cropping patterns and watering intensities. In many cases, all households irrespective of their size of land holding are entitled to an equal share of the water. • **Agriculture:** Introducing 120 improved varieties based on indigenous seeds of 15 crops like sorghum, maize, pigeon pea, soybean, cotton, groundnut, black gram, green gram, chick pea, pearl millet, sesame, foxtail millet and wheat, which give good yields even with low external inputs. Use of farm yard manure, green manuring crops and bio-pesticides was also practiced by the farmers.	https://www.youtube.com/watch?v=QRUxxi6ZeJA https://www.youtube.com/watch?v=LzqVs0p7GXI https://www.youtube.com/watch?v=vk4X0PYQlwU https://www.youtube.com/watch?v=7Hyd143KA7E https://www.youtube.com/watch?v=mwm1mMy36xk https://www.youtube.com/watch?v=MS_pIBJQLoo https://www.youtube.com/watch?v=0f1wj5XGsjE https://www.youtube.com/watch?v=_UQlPQjbuSU https://www.youtube.com/watch?v=w0ALj5mw-qM https://www.youtube.com/watch?v=ccU0nAa7vHo https://www.youtube.com/watch?v=i26vU3IaM1o https://www.youtube.com/watch?v=Strh8DFs0HM https://www.youtube.com/watch?v=umyYIZfEVpw https://www.youtube.com/watch?v=-i_bzxqBgbQ https://www.youtube.com/watch?v=bXhk5qi-TbI https://www.youtube.com/watch?v=nyx2fnE_toI https://www.youtube.com/watch?v=rAENF-qxN20 https://www.youtube.com/watch?v=LOEWM6XzWGo	Madhya Pradesh	Water harvesting, improved plant varieties,
98	Seva Mandir Old Fatehpura Udaipur - 313004, Rajasthan Ph: +91 294 2451041	• **Common property resource management**: Developing more than 16,000 hectares of common land (pastures, forests etc) by cultivating fodder, fuelwood and non-timber forest products and are being managed by the communities themselves according to management rules decided by them.	https://www.youtube.com/watch?v=DDqm5RB9XuE&feature=emb_logo	Rajasthan	Pastoralism and grazing land management

	Email: info@sevamandir.org Website: www.sevamandir.org	• **Village development fund** was created by formation of *Gram Samuhs* with a one-time membership fee. The fund grows as the community makes subsequent contributions to support developmental activities in their villages. Members consist of both male and female, which help in managing common property resources by planting fodder and fuel plants, monitoring and in supply of fodder and fuel wood to the households. They also assisted in building check dams, water-harvesting structures and irrigation systems. This leads to greater availability and better access to water for agriculture and livestock.			
99	Social Action for Rural Development (SARDA) Chhotki Murram Ramgarh Cantt., District -Ramgarh (JH) Pin-829122 Ph-09431146129, 08404822904 Email-sardagroups@rediffmail.comsardagroup01@gmail.com Website: www.sardaindia.org	• **Promotion of Thala** (a ring-shaped earthen structure around plants to conserve soil) around the plants during WADI. In addition, Mandap System (trellis structure) for vegetable cultivation is also promoted.	https://www.youtube.com/watch?v=NznG9KMn60Y&feature=emb_logo https://www.youtube.com/watch?v=8ZzVhJnSweg&feature=emb_logo	Jharkhand, Bihar, Maharashtra, Madhya Pradesh and Chhattisgarh	Integrated crop-horticulture management
100	Society for Technology & Development (STD) Malori, P.O. Behna, Teh. Sadar, Distt. Mandi, Himachal Pradesh 175006 Ph: 01905 - 246154-55 Mobile: 94180 23354 Email: stdmandi@gmail.com, stdpn@yahoo.in Website: www.stdruraltech.org	• **Up-Scaling of Pine needles and other bio-mass pine needle briquetting technology** through women-based community organization in hilly area of Mandi, Himachal Pradesh. • **Organic spray mixture** has been formulated & standardized from locally available materials such as Derek leaves, cow urine & Chach (Old lassi), which is used in aphids & Caterpillars of Cabbage butterfly in cole crops. • **Raised nurseries** by using mini green house, high humidity chamber, use of compost, shade net, hormones and supplementary light. • **Construction of Vermi-compost tanks** of size 2.5m x 1m x 0.75m either in the farm or near to the cow shed depending upon the feasibility. Inoculation of earthworms for wider replication and further use for organic farming are being introduced.	-	Uttarakhand, Himachal Pradesh, Manipur and Andhra Pradesh	Energy efficiency, Nursery raising, integrated pest management (organic farming)

101	Shri AMM Murugappa Chettiar Research Centre (MCRC) Taramani, Chennai - 600113 Ph: 044-22430937 Email: BalasubramanianM@mcrc.murugappa.org Website: www.amm-mcrc.org	Development of rapid cost-effective testing methods to identify whether the crop has been grown organically. Fortified Panchagavya: It is made by using five cow-based products (cow dung, cow urine, ghee, curd and milk), rotten bananas and Jaggery and fermented them for 21 days. This liquid manure is well known and used in crop for healthy growth of plants. A simple method has been developed to produce an enhanced quality of panchagavya by adding bacterium (Bacillus methylotrophicus) This has resulted in speeding up the maturation process and also the quality of resultant Panchagavya in terms of increased microbial population and growth of hormones. The fortified Panchagavya was tested on different crops such as Banana, Guava, Ragi, Pearl Millet, Paddy and Sesame crops resulting in 9-11% higher yield in different crops. Produced Vitamate (Humic acid) through locally available resources: Vitamate is an organic liquid fertilizer, rich in humic acid and used as a foliar spray. This is produced through recycling of locally available resources (cow dung and leafy biomass). The leafy biomass, cow dung, biodynamic herbal preparations and water were mixed in a plastic drum and fermented for 45 days. The manure is rich in bio active organic compounds and minerals which are required for plant growth.	http://www.amm-mcrc.org/mcrcdst/pdf/DST_CSP_Brochure.pdf	Chennai	Integrated pest and disease management
102	Shramik Abhivrudhi Sangh 20. Milkman Street, Camp, Belgaum - 590 001 Karnataka, India. Ph: 0831-2431978, 2425609 email: shramikindia@gmail.com Website: www.shramik.in	Grassland development: Undulating and sloppy hilly areas of Kattanbhavi and Bambarg villages of Karnataka were converted into lush green grassland. Traditional agriculture on hill slopes was totally stopped. Grassland helped in soil and water conservation. When there was heavy rainfall grass acted as a shock absorber and checked velocity of raindrops. This ultimately reduced chances of soil erosion and allowed infiltration of water into the soil. Thus, grassland development has helped in soil and water conservation. Adoption of this technique is very simple, cost effective and does not require any hi-tech knowledge. Grassland can be developed with the help of villagers themselves. Protection of the area with social fencing helps in natural regeneration of the local grasses. For social fencing villagers came forward, and adopted method of stall feeding for their cattle. If due to certain reasons natural grass regeneration is not good then seeds of some grasses were spread. Contour bunding & plowing: Soil and water conservation was done in the field with medium slope. In between two contours agriculture can be practiced. Along bunds trees which fix nitrogen into the soil are planted with grass along the bunds. It helps in soil and water conservation. When there is rainfall, contour bund acts as a barrier to the water flow and checks the velocity. This reduces the chance of soil erosion. When water starts flowing along the field, the bund becomes an obstruction due to which velocity reduces. This allows infiltration of water into the soil. The height of the bund is 0.3 Mt and top width 0.3 Mt.	http://www.shramik.in/micro-watershed-management.html	Karnataka	Fodder management, ground water management and land management

		Spacing of bunds will depend upon slope of land. As slope increases distance between two rows will be less and vice versa. Biomass generated along the bunds can be used as fodder and for compost. As the flow water is obstructed, rate of infiltration is increased. This helps the recharge of groundwater. Intercropped agriculture in this way increases the yield. These interventions also help in generating additional income from the trees in the form of fodder, nitrogen for the soil, fruits, fuel and green manure. Land levelling: Another method adopted by the organisation is on soil conservation is leveling of the agricultural land. It prevents sheet erosion, where a thin layer of topsoil is washed away during rain. To avoid this phenomenon, sloppy area is converted into terraces at different contours. Terracing or land leveling helps in soil and water conservation. When there is heavy rainfall in the leveled fields, the velocity of the flow of water is reduced and ultimately chances of soil erosion also reduced. Water starts flowing slowly along the field and slow infiltration augments the ground water table. The people, who have undulating land, can adopt this technique. Unless the land is leveled, efficient water application to the crops is not possible and soil moisture can not be maintained. Terracing the land with required height of soil and stone bunds at suitable contours is also necessary. The land between two bunds is leveled with the help of bullocks or by some machine. Upper part of the field is excavated and filled in the depressions. It is important to provide a waterway to drain out accumulated water. These drains can be provided on the excavated side.			
103	Tata Trust Bombay House, 24, Homi Mody Street, Mumbai 400 001, Maharastra Ph: 022 - 6665 8282, 6665 8013 Email: talktous@tatatrusts.org Website: www.tatatrusts.org	• **Agriculture:** Developed vegetable model including half-acre remunerative model, crop cultivation through systems of rice intensification (SRI) and promotion of kitchen gardens to demonstrate the potential of vegetable gardens for economic gain and nutritious diets. Azolla pits were established for meeting year-long requirements of green fodder for livestock. Supported value chain development of apricot by providing training to farmers on harvesting, sorting, drying, grading, packaging and marketing of the crop. Undertook demonstrations of high value crops such as kidney beans, watermelons and green peas. Potato, ground-nut and vegetables are being promoted to enhance farmer income as an initiative for adding additional crops to enhance production. • **m-KRISHI programme:** The flagship m-KRISHI programme resulted in 2,00,000 farmers receiving year-round timely information on best agricultural practices to be followed in six crops-cotton, basmati, wheat, onion, gram and maize.	https://www.youtube.com/watch?v=VHUbZShWSV0 https://www.tatatrusts.org/our-stories/article/feeding-hope https://www.youtube.com/watch?v=HQRrXzkSKT4 https://www.youtube.com/watch?v=3LHe9I6QPu8	Ladakh; Punjab; Uttarakhand; Uttar Pradesh; Rajasthan; Gujarat; Madhya Pradesh, Chhattisgarh; Maharashtra; Odisha; Jharkhand; Meghalaya; Tripura; Mizoram; Manipur; Nagaland; Arunachal Pradesh; Andhra Pradesh and Tamil Nadu	Improved agrciculture practices (SRI), post harvest measures

104	The Indian Agricultural Research Institute (IARI) Pusa, New Delhi, Delhi 110012 Ph: +91-11-25842367 E-mail: director@iari.res.in	• **New wheat varieties** developed with higher yield potential and better resistance to rusts, becoming popular with farmers in the northern, eastern and central plains of the country. • **Aromatic fine quality high-yielding rice variety, 'Puss Basmati I'** developed by the Institute yields an advantage of 2 tons per ha at farm level and gives a net income of about Rs. 20,000 per ha. • **Improved varieties of chickpea, pigeon pea and mung bean** developed by IARI have contributed significantly to rainfed crop production. These varieties are of short duration and most suitable for crop rotation, leading to increase in foodgrains production and improvement in the protein status in Indian diet.	www.iari.res.in	Madhya Pradesh, West Bengal, Himachal Pradesh. Bihar, Tamil Nadu, Karnataka and Maharashtra	Improved plant varieties
105	Tarun Bharat Sangh Village: Bheekampura – Kishori, Block-Thanagazi, District: Alwar-301022, Rajasthan Ph.09636775645, 9414019456, 07597914465, 09414066765 Email: office@tarunbharatsangh.in maulik@tarunbharatsangh.in /tarunbharatsangh.in/ Website: www.tarunbharatsangh.in	• Formation of Arvari Sansad by the local communities to develop policies and enforce rules to govern the integrated management of interlinked natural resources like water, soils and the forest for the wellbeing of the villagers as well as other forms of life-flora and fauna. The primary objective of the Arvari Sansad is to follow Gandhian ethos of participatory, equitable and decentralised paradigm for water management (Jal Swaraj), where decisions are made at the grassroots not by centralized institutions. The Sansad has framed 11 rules for the river basin conservation and management on following issues: ➢ Arvari basin shall not have sugarcane, paddy & chilli. People growing these to be penalised. ➢ No one shall draw water from the river after Holi (Mar Apr) up to monsoon (July). ➢ Borewells not be allowed in Arvari catchment. ➢ Recommended crops – barley, makka, bajra in upper and vegetables in lower reaches. ➢ No axe can be carried to Bhairodev people's sanctuary, catchment of the source of Arvari. ➢ Fishing can be done only for food. ➢ Large-scale trade of foodgrains and vegetables was banned. Local production and consumption to be emphasised. ➢ Village people to help people from other areas for implementing water harvesting structures. ➢ Cattle outside the region are not permitted for grazing. ➢ Rotational grazing to be followed by farmers in their own pasturelands. ➢ Industrial units prohibited in 405 sq km of Arvari basin. • Mobilizing community for shram daan for the construction of water harvesting structure. • Mobilising communities around the issue of water, and supporting them in reviving and revitalising the traditional systems of water management through construction of '*Johads*' for rainwater harvesting. Over 10,000 rain-water harvesting (RWH) structures have been restored in this way.	https://www.youtube.com/watch?list=PLWJpFlbPDqHCGZQtpHK5UCVSK5BHAKiu6&v=ty9aVD98c54&feature=emb_logo https://www.youtube.com/watch?v=1N0HRPuke-4&list=PLWJpFlbPDqHCGZQtpHK5UCVSK5BHAKiu6&index=4 https://www.youtube.com/watch?v=RtACse1py0U&list=PLWJpFlbPDqHCGZQtpHK5UCVSK5BHAKiu6&index=10 https://www.youtube.com/watch?v=L9G74G-B-JI&list=PLWJpFlbPDqHCGZQtpHK5UCVSK5BHAKiu6&index=18	Rajasthan	Water harvestingand Ground water management

106	Technology and Action for Rural Advancement 29, Ghitorni, Mehrauli–Gurgaon Road New Delhi – 110030 Ph: - 011- 26801521, 26804482, 26805826 Email: tara@devalt.org	• **Eco Kiln**: It produce fired clay bricks results in coal savings from 30% - 50%. It is based on vertical shaft firing process and is most suitable for small to medium scale entrepreneurs. More savings can be had from use of carbonaceous waste materials or waste biomass. The TARA EcoKiln provides flexibility in production from 2,000 bricks per day for a single shaft to 30,000 bricks per day in a six-shaft kiln. • **Recycled paper & products:** These products are made of recycled and waste materials and crafted by the careful hands of highly skilled villagers, mostly impoverished women. It creates jobs and incomes while saving the environment. It is environment friendly process, which insist sustainable techniques of production, for example, organic dye, use of non-hazardous chemicals for bleaching etc. Generally, 100 GSM (gram square meter) to 1500 GSM especially of black and white color are made from pure white and black waste cotton. It ranges from different sizes and in numerous colors as per the requirements of clients.	www.tara.in	New Delhi and Madhya Pradesh	Waste management
107	The Centre for Community Economics and Development Consultants Society (CECOEDECON) Swaraj, F-159-160, Sitapura Industrial Area, Jaipur-302022 Rajasthan Ph. 0141-2771488 Email: cecoedecon@gmail.com	• Focus on agriculture-based livelihood. • Takes Agro Action initiatives for local farmers by promoting local crops, • Promote ground water management, waste water management and sustainable use of natural resources. • Organize events related to water such as Malwa Jal Utsav, Pani Utsav at regional and State level. • The organization has promoted the construction of water harvesting structures like ponds and anicuts at the village level which helped the farmers to continue growing crops for two seasons all through the past decade even though there were many years with sub-normal rainfall.	www.cecoedecon.org.in	Rajasthan and Madhya Pradesh	Water harvesting, waste water managemnet and ground water management
108	Udyogini D-17, Basement, Saket, New Delhi - 110017 Ph: 011-45781125, 9319620533 Email: mail@udyogini.org Website: www.udyogini.org	• **NTFP value chain-Lac**: Cultivation of Lac from *Kusumi* lac to ber trees (5 ber trees). Total yield is 39,000 and income generated is Rs. 48,500/- per annum out of the total input cost of Rs. 8,158/-. • **Triple crop value chain:** Practicing multiple crop namely cereals, pulses and vegetables with lac along with livestock.	https://www.youtube.com/watch?v=d-z3UNx-tpI https://www.youtube.com/watch?v=30BzGwoaHMQ&feature=emb_logo https://www.youtube.com/watch?v=d-z3UNx-tpI&feature=emb_logo https://www.youtube.com/watch?v=5GcZKKWM1sw	Uttarakhand, Jharkhand, Chhattisgarh, Uttar Pradesh, Madhya Pradesh and Rajasthan	NTFP value chain

109	Vivekananda Parvatiya Krishi Anusandhan Sansthan (VPKAS) ICAR- Vivekananda Parvatiya Krishi Anusandhan Sansthan Mall Road, Almora -263601 Uttarakhand Ph: 05962 230 208 Website: www.vpkas.icar.gov.in	• **Crop management in hills:** Intercropping of finger millet (transplanted) + pigeon pea in the row ratio of 4:1 under rain-fed condition. Pigeon pea-lentil cropping system was also introduced among pigeon pea–wheat, pigeon pea–barley, pigeon pea–field pea and pigeon pea-toria, pigeon pea–lentil cropping systems. ➢ Colocasia-onion-french bean produced the highest energy productivity among different colocasia-based cropping systems (viz., Colocasia-onion-french bean, colocasia-gardenpea-french bean, colocasia-wheat-okra, colocasia-radish-potato, colocasia-cabbage-french bean, colocasia-coriander-cauliflower-french bean, colocasia-corinder-tomato and rice-wheat). ➢ In traditional spring rice-wheat-finger millet -fallow and barnyard millet-wheat-finger millet-fallow, the fallow period can be replaced by cultivation toria/radish/cabbage under irrigated condition. • **Water Management:** A Poly-cement tank technology of low cost was developed using locally available material. It is better than cement tank (Rs 10 to 15 per litre), which is mostly damaged in earth quake and landslides. The tanks made of trapezoidal shape having slope: 1:1 with 1 to 1.5-meter depth. The blocks is made of soil having more than 80 percent sand with 1:7:2 ratios of cement, sand and gravels/stones for pitching covering. • **The run-off farming model** was developed by constructing sunken bed raised bed system which requires around Rs. 35000/- to Rs.39000/- to construct in one-hectare land with the help of labour. In one-year, sunken bed +Raised bed system returns around Rs. 25000/-from one-hectare land. Its expected life is 20 years. This technology generate employment of about 350-man days per year for crop growing and additional 370 to390 man days for construction of sunken + raised bed system in initial year for one-hectare land. • The drip system was designed for small terraces of hills and for kitchen garden to save time and labour using plastic tank (with storage capacity of 500/1000liter), which is kept on terrace risers/roof top (used for gravity energy to give appropriate head). The sprinkler as well as drip system can be run with the 2-meter terrace risers which give pressure 2.90 m head. The drip system can also be run with tank placed on soil surface with 0.9 m head without any extra terrace riser head. The cost of drip irrigation installation in 200 m^2 area is Rs.8625/-. The gravity fed irrigation system also designed for tanks made of polyfilm to irrigate terraces per field below the pond.	http://vpkas.icar.gov.in/upload/uploadfiles/files/108.pdf http://vpkas.icar.gov.in/upload/uploadfiles/files/103.pdf http://vpkas.icar.gov.in/upload/uploadfiles/files/4%20bemausamee%20phoolagobhee%20kee%20unnat%20khetee.pdf http://vpkas.icar.gov.in/upload/uploadfiles/files/7%20Dhan%20ki%20madai%20hatu%20Paddy%20thresher%201.pdf http://vpkas.icar.gov.in/upload/uploadfiles/files/13%20parvatiya%20kshetron%20mein%20sabjee%20matar%20kee%20jaivik%20khetee.pdf http://vpkas.icar.gov.in/upload/uploadfiles/files/20%20parvatiya%20kshetron%20mein%20mane%20tamaatar%20ka%20beej%20utpaadan.pdf http://vpkas.icar.gov.in/upload/uploadfiles/files/25%20parvatiya%20kshetron%20mein%20phrasabina%20ka%20bijotpadana.pdf http://vpkas.icar.gov.in/upload/uploadfiles/files/26%20parvatiya%20kshetron%20mein%20uparaoon%20ke%20lie%20unnat%20phasalachakr.pdf	Uttarakhand	Rotational System (mixed cropping), water harvesting, minimal soil distrubance, irrigation management

110	Vivekananda Institute of Biotechnology Sri Ramkrishna Ashram, Nimpith, Dist. South 24-Parganas-743 338 Jaynagar West Bengal Ph:03218-226003 Email: vibsran@gmail.com Website: www.vibsran.webs.com	• **Use of Neem Seed Kernel Extract in Pest Management:** Estimated that 20 to 30kg of neem seed (an average yield from 2 trees), prepared as kernel extract can treat one hectare of crop. This is very effective against cutworms affected plants like many vegetables, maize, tobacco and coffee. The methodology involves collection of ripe neem fruits, de-pulping of the seeds and drying in shade, decortications of dried seeds, grinding and sieving of kernel, preparation of aquatic extract, and spraying on the cop plants. • **Liquid bio-fertilizer (Azoto-bacter) for foliar spray:** This innovative approach involves production of Azotobacter in fermenter using specific growth medium, harvesting in 1:1 dilution with ½ strength of the same medium and packaging. The culture is mixed with tap water @ 10 ml/litre and sprayed on the leaves of the targeted crop at an interval of 10-20 days. • **A model for integrated biogas production with vermi-composting:** In this technology package kitchen waste and municipal waste (replacing cow dung) materials are utilized for the production of biogas in two levels. The slurry, produced in primary biogas plant is taken through a pipe/channel to secondary bio gas plants and then taken to the vermicompost unit where it is used for primary decomposition. After primary decomposition, the waste is fed to earthworms for the production of vermicompost. In addition to this earthworm are also used for production of vermiwash rich in plant growth promoting substances. Spraying of vermiwash on plants enhances its growth promoting substances and productivity. Three species, namely, Eisenia foetida, Eudrilus eugeniae, Perionyx excavates of earth worms were used. • **Apiary with promotion of Honey-bee flora:** Apiary and cultivation of honey bee flora are complementary to each other as the honey bee from apiary helps in pollination and consequent increase in productivity and honey bee flora acts as a source of nectar for the honey-bee. Apiary also helps in income generation among the rural women. • **Use of low-cost flat bottles for the production of bio- pesticide, Trichoderma:** As per standard method, it is produced in conical flask or round bottom flask which is of high cost. Instead of that, flat glass bottles, in vogue for commercial purpose, are used for the preparation of *Trichoderma viride*. Using this technique, production cost of *Trichoderma viride* can be reduced upto 16%. This is also easy adaptable by the rural entrepreneurs. • **Azolla-Fish-Rice Culture**: Application of Azolla in rice field, use of Azolla as feed of fishes and release of plant nutrient as excreta of fishes • **System of rice intensification (SRI):** Using this technique a farmer can transplant a 10-12 days old single rice seedling on field having thin film of water (not submerged condition).	Product are available for Microbial Inoculants, Vermicompost, Neem Seed Kernel Powder, etc.	West Bengal	Pest management, energy efficiency; Improved agrciculture practices (SRI), Bee keeping, Azolla cultivation

111	Vigyan Ashram Pabal, Dist. Pune - 412403 Maharashtra Email: vapabal@gmail.com, vapabal@gmail.com Website: www.vigyanashram.com	• **Aquaponics** is, simply integration of hydroponics (cultivation of plants without soil) and aquaculture (fish farming). In aquaponics system water from aquaculture is used for crop irrigation and extra water returns back to fish tank. When this water circulated near root zone, nitrogen fixing bacteria (manly nitrosomonas and nitrobactor) convert ammonia (NH_4) in to nitrite (NO_2) and then to nitrate (NO_3) form, which is very good source of nitrogen for plants and less toxic to fish in aquaculture system as compare to ammonia. Aquaponics made up of three main parts first ➢ Fish tank, reservoir and water pump. ➢ It produces fish, animal food (azolla), and vegetables/ tomatoes. ➢ Construction is made in such a way that the fish tank is kept at lower highs in which edible fish grows and azolla reservoir is kept on some height (more than the fish tank) in which vegetables are grown. ➢ Water get atomically recycle just we have to pump the water once in day to reservoir. • **Rice de-husking:** A simple machine developed helped setting up a rural enterprise to earn a sustainable income while providing value addition of raw rice. While dehusking rice, it retains volatile content and bran in the rice. Difference in colour of rice is visible and need no convincing. It rreduces breakage of rice<2%, removes over 86 % husk and tries to address stocking problem. Created a system to stock raw rice and supply brown rice as per the demand. This innovation will make it feasible to process rice in small quantity. If purchased by women SHGs, they can can sell brown rice and can earn good. Price of machine is Rs.60,000/- only. • **Kitchen waste composter:** Vigyan Ashram has developed very useful low-cost kitchen waste composter. Electrical consumption of this composter is 2.8 KWH per month. Bio-degradable waste per day is 100 kg per day. It is suitable for 200-250 households.	https://www.youtube.com/watch?time_continue=1&v=xLsEddEO3bs&feature=emb_logo https://www.youtube.com/watch?v=3ikhwJ-dgqI&feature=emb_logo https://www.youtube.com/watch?v=v7wJUq1u-eo https://www.youtube.com/watch?v=7FMvg_0gyuE https://www.youtube.com/watch?v=1RrbXpS4R-w&feature=emb_logo http://vigyanashram.com/InnerPages/Technology_Details.aspx?TechnologyId=1031&Title=Composter%20-%20Magic%20bin&Category=Engineering http://vigyanashram.com/InnerPages/Technology_Details.aspx?TechnologyId=1030&Title=Composter%20for%20society&Category=Engineering	Maharastra	Aquaponics and waste management
112	Watershed management Directorate Indira Nagar, Forest Colony, Vasant Vihar Dehradun – 248006 Uttarakhand Ph: 0135-2768712, 2760312,2761002	• **Protecting land and lives through comprehensive drainage line treatment activities in Nainital Division:** A village pond (259.20 cum) with 200 contour trenches (150 cum) was build and afforestation in an area of 5.0 Ha was carried out. The village has a model of 11 vegetative check dams, 8 dry stone check dams (80 cu m) and 33 crate wire check dams (533.33cum). The vegetative check dam coversa distance of 60m; dry stone check dams cover 80 m length and gabion structures 17 nos. (sized 5 x 1.05m) covers 205m distance, followed by 7 (6 x 1.05m size) covering 100m and 9 (7 x 1.05m) covering another 140m distance. The diversion drains protected a catchment area of 10.0 ha above the drain and a command area of about 4.0 ha, which has nearly 206 terraces in its command (each terrace approximately 65 x 3m,	https://www.youtube.com/watch?v=BYM0GzV4hsE https://www.youtube.com/watch?v=yRRVL1166rU https://www.youtube.com/watch?v=0ZdFSAKhDCQ	Uttarakhand	Water harvesting, water diversion and drainage and integrated soil fertility management

	Email: wmd-ua@nic.in Website: www.wmduk.gov.in	• about 1 Nali). Drainage line treatment works were found effective in arresting 269.5 tons of silt, and protecting 5 to 6 ha of valuable agricultural land. The efforts of water recharge were also quite fruitful in the area. The two main water sources viz. Khar naula and Dubra naula were used to cater to only 2 households in the beginning and lasted for only 10 months in a year, with discharges of 0.75 and 1.70 Lpm. After the water recharge efforts in the area, 9 households are now able to make use of these water sources as 1.2 and 3.3 Lpm water is now available throughout the year. • **Protecting valuable agriculture land and assets through stream bank protection works- Bageshwar Division:** The villagers have constructed 45 protection walls, 5 check dams and one cross barrier along *Pausari nala* and *Gagni-gad* after they were taken for exposure visit in the project areas. Similarly, in Sumati village, 27 Structures (400 Cum.) along sumati stream and 14 structure (300 cum) along Jagthana stream a stretch of 2.5 Km were constructed. At Pausari nala, a wire crated cross barrier of 11.0 m length was also constructed to divert the water to the irrigation channel for irrigation purpose of 40 nali agriculture land. About 2.30 ha. agriculture land belonging to 86 farmers and 6.75 ha barren land has been saved from erosion. The work has successfully reduced the amount of soil erosion and protected the kharif crop cultivated along the Gagnigad bank side. After the construction of wire crated cross barrier in Pausari nala as a permanent head work, farmers are getting assured irrigation in 1.0 Ha land, even during lean season. Now 0.8 Ha additional area is under irrigation. The productivity has also been increased by 20% (by sowing improved varieties) due to assured irrigation. • **Water source rejuvenation in Gram panchayat Selalekh-Nainital Division:** Villagers contributed Shram Dan (voluntary labour) for digging of Kachha ponds (earthen dugoutponds) in the Van Panchayat area of Ratora Hamlet. 4 ponds (182.81 cu m) with a total number of 1166 of staggered contour trenches (3.0 x 0.5 x 0.5m each) and 5.0 hectares of land was covered under afforestation with recommended species like banj, Kharsu, Bhimal, Utees, Majnu, Tejpat. Lemon Grass was planted on the bunds of the trenches for its binding qualities. DLT in village which was located down the slopes was done with construction of 8 vegetative or brush wood checkdams, 63 loose boulder or dry-stone check dams (700.77 cum) and 9 gabion or crate wire check dams (183.30 cum). • **Pine Charcoal Briquettes making in Bageshwar division:** The pine charcoal briquetting technology includes the steps: 1) carbonizing pine needles into char in the absence of oxygen in a closed drum to get the carbonized char, 2) moulding the carbonized char with binder mix (animal dung or starch powder or clay) in electric pine briquette moulding machine to get small and cylindrical pieces of pine briquettes, and 3) drying briquettes. The carbonization drum accommodates 30 kg of dry pine needles at a time and yielded 10 kg of char, which takes a time of 30 minutes in charring and 45 minutes in cooling of drums. Therefore, in a day, a SHG burns 150 Kg of needles to get 50 kg of Char. The cow dung as binder is used at the rate of 3-5%.			

113	Watershed Organisation Trust (WOTR) The Forum, 2nd Floor, Pune-Satara Road, Padmavati Corner, above RankaJwellers, Pune, Maharashtra-411009 Ph: 020 2422 6211 Email: info@wotr.org.in Website: www.wotr.org	• **System of crop intensification:** SCI techniques involve a four-pronged approach which comprises field preparation and management, crop spacing, systematic application of locally prepared organic and biological inputs and micronutrient foliar spray. • **Agro-met advisories**: combines local specific Met-advisories and Agro-advisories that provide timely information to farmers so that they can plan their agricultural activities accordingly. • **Farm precise:** 5 advisory modules are provided to the farmer, daily or as applicable based on weather forecasts for 5 days, integrated nutrient management, irrigation management, integrated pest and disease management and general advisories that promotes good agricultural practices such as crop-specific land management, in-situ soil and water conservation measures, seed treatment, crop geometry, trap crops, identification of pest-disease infestation etc. • **Water conservation:** Water budgeting, water harvesting and groundwater mapping & aquifer management	https://www.youtube.com/watch?v=AIBzEccaRrI&feature=emb_logo https://www.youtube.com/watch?v=Eu9soP-u-6Q https://www.youtube.com/watch?v=V8CkRmyZu38&feature=emb_logo https://www.youtube.com/watch?v=7TtzUFMAejA&feature=emb_logo https://www.youtube.com/watch?v=s3ob_DwP7TI https://www.youtube.com/watch?time_continue=14&v=tTwsvK9yT_o&feature=emb_logo https://www.youtube.com/watch?v=kuipyZ6SefE https://www.youtube.com/watch?time_continue=14&v=tTwsvK9yT_o&feature=emb_logo https://www.youtube.com/watch?v=wkZX5TVwkTA https://www.youtube.com/watch?v=WxeKocQgjRs https://play.google.com/store/apps/details?id=wotr.farmprecise&hl=en https://www.youtube.com/watch?v=rlq5XNfNvus (Participatory natural resource management) https://www.youtube.com/watch?v=YnBGommXHXg (ridge to valley) https://www.youtube.com/watch?v=AIBzEccaRrI&feature=emb_logo https://www.youtube.com/watch?v=wMFndXHlYu8 (Rain water harvesting) https://www.youtube.com/watch?v=8dnj0YYMCpE (Dainage line treatment) https://www.youtube.com/watch?v=CF_SOryfu1I (low cost chulla) https://www.youtube.com/watch?v=9HfP20wucnE https://www.youtube.com/watch?v=AIBzEccaRrI https://www.youtube.com/watch?v=Eu9soP-u-6Q	Madhya Pradesh, Telangana, Odisha, Maharastra, Rajasthan, Chhattisgarh and Jharkhand	Improved agriculture practice (crop intensification), ground water management, IET

114	Water and Sanitation Management Organization (WASMO) 3rd Floor, Jalsewa Bhavan, Sector 10-A, Gandhinagar - 382 010, Gujarat Ph: +91 079 23247170, 23247171, 23237075 Email: wasmo@wasmo.org Website: www.wasmo.gujarat.gov.in	• **Community managed drinking water supply program:** A community managed, demand-driven, decentralized approach for rural water supply program. The villages covered by this drive have been connected to the piped water supply network, overhead storage tanks that have been built in villages and drinking water supply is being administered with community participation. Pani Samitis have been formed to plan, implement, manage, own, operate and maintain village water supply system. Engagement of communities in the implementation process reduces the need of government support, makes the program self-reliant and ensures social sustainability. Collaboration with communities and maximum use of existing infrastructure ensures adequate, regular, safe, sustainable and convenient water supply at household level.	http://wasmo.gujarat.gov.in/downloads/story_dhedhuki_surendranagar.pdf http://wasmo.gujarat.gov.in/downloads/story_shirva_kutch.pdf http://wasmo.gujarat.gov.in/downloads/story_shinay_kutch.pdf http://wasmo.gujarat.gov.in/downloads/story_godhra_kutch.pdf http://wasmo.gujarat.gov.in/downloads/story_jepar_surendranagar.pdf	Gujarat	Drinking water
115	Watershed management, Department of Agriculture, Govt. of Rajasthan Mob. 9928177888 Email: dmies.wdsc@rajasthan.gov.in. Website: www.water.rajasthan.gov.in	• **Non-Arable land conservation**: Department is following various land conservation methods such as V-ditch, staggered trenches, pasture development, live fencing, and stone wall fencing and vegetative filter strip for Non-arable land. • **Arable land conservation**: For conservation of arable land, department is following conservation methods like contour cultivation, contour bund/ contour vegetative hedge/field bund, khadin (indigenous water harvesting structure), tanka, sand dune stabilization and shelter belts. • **Drainage line treatment**: It includes bank stabilization, vegetative check dam, brush wood check dam, loose stone check dam, gabion structure, earthen dam, dug out pond (*Nadi*).	http://water.rajasthan.gov.in/content/dam/water/watershed-development-and-soil-conservation-department/Publication/success_stories/Jhumki_Jhalawar.pdf http://water.rajasthan.gov.in/content/dam/water/watershed-development-and-soil-conservation-department/Publication/success_stories/Tonkra_Ajmer.pdf http://water.rajasthan.gov.in/content/water/en/wdandscdepartment/watershedconcept/Actvities/Non_Arable_Land_Conservation.html http://water.rajasthan.gov.in/content/water/en/wdandscdepartment/watershedconcept/Actvities/Arable_Land_Conservation.html http://water.rajasthan.gov.in/content/water/en/wdandscdepartment/watershedconcept/Actvities/Drainage_Line_Treatment.html	Rajasthan	Agroforestry
116	Watershed Support Service and Activities Network, registered as a Charitable Trust (WASSAN)	• Azolla cultivation with system rice intensification. • Practicing *taibandi* in SRI which is a traditional system of restricting the cultivating area keeping in mind the available water resources. This process addresses the water shortages at the end of the season and benefitting from low input costs and yield increase.	https://www.wassan.org/resource_material/poster#nanogallery/nanoGallery1/72157654583840470/19108106955	Andhra Pradesh, Telangana, Madhya Pradesh,	Improved agriculture practices (Azolla with SRI, *Taibandi* in SRI)

	H.No. 12-13-452, Street No. 1, Tarnaka, Secunderabad - 500 017 ph: 040-27015295 / 96 Email: wassanmail@gmail.com Website: www.wassan.org		https://www.wassan.org/resource_material/poster#nanogallery/nanoGallery1/72157654583840470/19102413952 https://www.youtube.com/watch?v=qmF_IRi9vi8&feature=emb_logo https://www.youtube.com/watch?v=YlloILRnDNw&feature=emb_rel_pause https://www.youtube.com/watch?v=Nk58syLzMF8&feature=emb_rel_pause https://www.wassan.org/assets/uploaded/publications/pdf/SRI_manual.pdf_05_56_05am_bkhp2x67y138g5wfwm1m.pdf	Odisha, Gujarat, West Bengal, Jharkhand	
117	Water and Land Management Institute (WALMI) Kanchanwadi, Post Box 504, Paithan road, Aurangabad - 431005 Maharashtra Ph. 0240-2379159 to 61 E-Mail admn@walmi.org Website: www.walmi.org	Providing training to women workers/NGO workers on water harvesting, water saving techniques, paddy based cropping system & its water management and participatory irrigation management.	-	Telangana, Karnataka, Tamil Nadu, Uttar Pradesh, Bihar, Gujarat, Maharashtra, Madhya Pradesh, Odisha, Rajasthan and Assam	Water harvesting, water diversion and drainage and Irrigation management

Table 2: List of Individual and community groups SLEM Practitioners

S.N.	Name of the farmers	SLEM Practice Adopted	Organisation associated
1	Shri Salam Shyamkumar Singh Village-Uchiwa Wangma, District-Thoubal, Manipur	**SRI with fish cultivation** Involved in SRI with fish cultivation. After a good harvest of fish. He kept his farm pond of 2 ha with one complete hectare of cultivable area submersed with 2-3 inches of water to check the weed growth. At this time, he raised nursery of rice hybrid using 5 kg seeds for transplanting under SRI methodology. As soon as the nursery was about a week old, the whole water from the fish pond was pumped out completely. This left the bed/ floor of the fish pond completely levelled, weed free and ready for rice transplanting. *(Source: http://kvkthoubal.org/site/success-story-2/)*	KVK, Thoubal, Manipur
2	Smt. Ibechaobi Leima Village-Umathel, District-Thoubal, Manipur	**Integrated Farming System (IFS)** She has been doing organic farming since 2015 under Integrated Farming System mode with the components; cattle, piggery, E.M. Composting, fishery, bamboo plantation around her farm boundary, Black rice during Kharif season, pumpkin, watermelon, Ground potato, Cucumber, King Chilli & Tomato in her 1.50 ha land. The farm produces were sold to the market as organic produce fetching good price earning as an annual income of more than Rs. 2,00,000/- though the production is bit low in comparison to chemical agriculture. The crops and livestock residues were utilized to produce organic manures and compost along with effective microorganism to enhance production period and quality. These organic manures were used for manuring the crops instead of using chemical fertilizers and other chemical pesticides. The produced blackrice grains were used to produced several by-products through food processing and value addition, such as black rice puri, ladoo, noodles, rasgulas, poha, suji etc. The knowledge of organic farming and food processing was brought about by the line departments such as horticulture, agriculture, animal husbandry. *(Source: http://kvkthoubal.org/site/success-story-of-smt-ibechaobi/)*	-do-
3	Smt. Wairokpam Ongbi Bimola Devi, Village- Laiphrakpam, District- Thoubal Manipur	**Integrated farming system (SRI cum Vegetables with fishery, piggery, poultry, vermicomposting and mushroom)** She is doing rice farming using SRI method for increasing production and seed production. The rice fallow areas were utilized for the cultivation of rabi field crops such as lentil, field pea and mustard in a cropping system mode. Apart from rice cultivation, she took up fishery, piggery, poultry, vermicomposting, mushroom cultivation and polyhouse cultivation of high value crops like king chilli, tomato and cucumber in an integrated farming system. *(Source:http://kvkthoubal.org/site/success-story-of-w-bimola-devi/)*	-do-
4	Smt. Huidrom Anita Devi Village-Tekcham Mayai Leikai District-Thoubal, Manipur	**Integrated farming system- Fish cum broiler farming** Anita Devi owned 1.5ha of land where she takes up fish farming. She conducted a trial on Fish cum Broiler farming in 0.5ha of Fish pond. She along with her husband made the shed above the pond and started rearing 150 birds per 0.5 ha pond. She also rears 5000 fingerlings in the ratio of 30% surface feeder, 30% middle finger and 40% bottom feeder. Broiler faces and left-over feed were dropped in the fish pond which were used as feed for the fish. Liming with quick lime was done in the fish pond at 300kg/ ha in four splits to increase Ph/ correction of acidity. She sold the birds at 49 days. *(Source: http://kvkthoubal.org/site/integrated-farming-system/)*	-do-

5	Smt Hema Vijayakumar and Shri Vijayakumar Pazhoor, Piravom, District-Ernakulam, Kerala	**Organic agriculture and aquaculture with azolla cultivation** In an area of around 2347.26 sq. m with laterite soil they started integrated organic farming of vegetables along with ornamental plants, variety of trees, medicinal plants, cash crops, poultry, cattle rearing and aquaculture. The challenge was to convert the hilly area with laterite soil, which is more apt for rubber plantation, to a fertile productive land suitable for integrated farming with horticultural plants by adopting fully organic cultivation. The couple was advised to rear genetically improved farmed tilapia. The 5-month feeding schedule was: 1st month 0.6mm 3 times/day, 2nd month 0.8mm 3 times per day, 3rd month 1.2 mm 2 times/day, 4th month 2.5mm 2 times per day and 5th month 4.0mm 2 times per day upto satiation. They constructed a natural pond with red stone at the bottom. The water quality in fish tank, inlet and outlet was regularly monitored, which is also fitted with automatic timer control system round the clock. Fish grew faster immediately after the stocking, and increased to three-fold from November to December 2017. Within 5 months it has reached to the size of 500g. The couple faced regular fish mortality due to increase in ammonia level in the pond. Necessary advisories were given to maintain ammonia under safe level by using recirculation of water through azolla plant and calcium carbonate and to improve the plankton bloom by slow leaching of dried cow dung manure. It was also suggested to the farmer for providing in situ recirculation. For maintaining pond Ph, 6kg common salt and 2 banana plants cut into pieces, were added into the water and average 7.5 pH was maintained. There were no instances of diseases. Having less fertility of the soil, the farmer included a 'Vechur' breed cow and poultry along with fisheries and horticulture. Urine and dung from the cow were used in the plants to improve productivity. They were also used for vermicomposting along with the dried leaves and the vegetable waste from the house. *(Source: https://www.icar.org.in/content/organic-agriculture-and-aquaculture-hilly-area-success-story-0)*	ICAR-Central Marine Fisheries Research Institute, Kochi
6	Shri Sardar Sahab Singh, Village- Ramba, District-Karnal, Haryana	**Zero tillage in wheat saved resources and enhanced income** By adopting zero tillage in wheat, which was sown directly into soil without plowing. In this process he has saved at least Rs 4000-5000 on account of ploughing and labour cost as well as 2-3q/ha more yield as compared to conventional tillage. He has become a role model for other farmers in nearby villages. He has also observed that due to continuous adoption of zero tillage technology, soil health is also enriched in terms of increased organic carbon, increased water holding capacity, avoidance of terminal heat, less water requirement and less lodging. *(Source: https://www.iiwbr.org/success-stories/)*	ICAR-Indian Institute of Wheat & Barley Research, Haryana
7	Shri Chaitram Hirauram Village-Salam Block-Kulgaon, District Kanker, Chhattisgarh	**Integrated farming system model** Major intervention taken are vegetable cultivation on drip system and use of vermi compost, back yard poultry rearing and pig and cattle rearing for additional income. *(Source: http://www.kvkkanker.org/)*	KVK, Kanker
8	Smt lalita mukati Village- Borlai District- Barwani, Madhya Pradesh	**Organic farming practices** She started making her own organic fertilisers and pesticides at home using ingredients like cow urine and cow dung. To start, she planted custard apple, sapota and cotton. She also used vermicompost and kitchen waste to help enhance soil fertility and is practising hydroponic farming -a method of growing plants without soil. In 2014, the Lalita and her husband were selected under the Mukhyamantri Kisan Videsh Adhyan Yojana and travelled to Germany and Italy to learn high-tech farming techniques. *(Source: https://yourstory.com/2018/11/lalita-mukati-organic-farming-madhya-pradesh)*	-

9	Shri Manish Dubey Village- Khadra Block- Bahoriband, District- Katni, Madhya Pradesh	**Cultivation of medicinal plant by organic manure** He has cultivated medicinal crops and planted citronella in 10 acres of farmland taken on his own and Sikami, Lemon Grass in 4 acres, Pamaroja in 2 acres, Metha in 2 acres and Stevia (sweet basil) crops in 1-acre land. Apart from this, organic farming of Urad with paddy was also done in some land for domestic use. Organic manure and fertilizers were also used in place of chemical fertilizer. He mentioned that due to very low requirement of chemical fertilizers, pesticides in medicinal plants, the input cost is also reduced. Once planted, crop can be obtained for the next three years. *(Source: https://katni.nic.in/en/success-story/manish-doubled-agricultural-income-by-cultivating-organic-and-medicinal-plants/)*	Department of Horticulture and Food Processing and the Agricultural Training cum Tour Program
10	Shri. Mankuram Village-Kulgaon, Block-Kanker, District: Kanker, Chhattisgarh	**Integrated farming system model** He is growing rice, vegetable, goatry and piggery in IFS model. He also planted fruit crops in small area for his family consumption. By adopting this IFS model and rabi cropping he is now one of the successful farmers of the locality and is very well established and known farmer of the village. He is now a source of inspiration for all the other farmers of the locality who are learning things for livelihood upliftment. *(Source: http://www.kvkkanker.org/)*	KVK, Kanker
11	Shri Suklal Ratauram Village-Mandavi Kulgaon, Block-Kanker, District-Kanker, Chhattisgarh	**Integrated farming system model** He grows rice, fishery, goatry and poultry with the help of IFS model. In rabi he started chickpea crop which was previously left fallow by him. He also planted fruit crops in small area for his family consumption. By adopting this IFS model and rabi cropping he doubled his annual income. *(Source: http://www.kvkkanker.org/)*	-do-
12	Shri Nirmal Borah Village-Silapathar, District- Dhemaji, Assam	**Lac cultivation** In addition to cultivation of vegetable crops viz., potato, brinjal, cucumber, okra, with horticulture crop like papaya, banana along with poultry farming in his own plot, he is also doing lac farming in 5 ha bare land with 1000 ber trees. He collects 75 kg of scrapped lac from two farmers of Dhemaji who has been doing lac in small scale. He sold scrapped lac @Rs.375 per kg. He earned Rs. 28,125/- for 75 kg of scrapped lac. *(Source:file:///C:/Users/Admin/Downloads/164-Article%20Text-264-1-10-20200525%20(3).pdf)*	Krishi Vigyan Kendra, Dhemaji& IINRG, Ranchi
13	Vinod Kumar Maurya Village- Allipur, Block-Maholi, District- Sitapur, Uttara Pradesh	**Substantial blue bull management technique for vegetable crop protection** He while cultivating tomato (Lycopersicon esculentum) covered the whole 0.4 ha crop by 50 cotton dhoti costing Rs. 500 (Rs 10 per dhoti) with the help of bamboos used for staking touching the ground level and feel relaxed about bull attacks. The crop was safe throughout cropping season. Next year while growing tomato during 2015, Vinod Kumar used this barricading for bitter gourd (Momordica charantia) and received additional income from bitter gourd to the tune of Rs 12,500/-. The theory behind this is the blue bull never jumps the fencing and does not eat bitter gourd. The time and labor saving techniques have become very popular among vegetable grower. The technology is very well accepted by farmers and very well adopted in more than 400 ha tomato growing areas covering 20 villages of Maholi block of Sitapur district, Uttar Pradesh. *(Source: https://sitapur2.kvk4.in/success-story.html)*	KVK, Sitapur, Uttar Pradesh
14	Shri Gadhav Majhi Village-Parajabarikanta Block- Dasmantpur District- Koraput, Odisha	**Intercropping in 'WADI'** Majhi has been cultivating turmeric in his Wadi and getting diverse benefits from this. Turmeric plantation as inter-crop in orchard has been found not only to assist in suppressing the population of trunk borers, termites and gummosis causing pathogens in the soil	Agragamee NGO and NABARD

		through secretions from its roots, but also provides income from the harvest of the rhizomes, nine months after planting. The mango orchards remain free from termite attack when turmeric is grown as an inter-crop. Turmeric planted as an inter-crop in fruit orchards is beneficial in organic farming systems, to control various soil-borne pests and diseases. Majhi also cultivates indigenous maize with mustard as inter-cropping. He said, 'I cultivate upland paddy with green grams along with the orchards crops. First, we harvest paddy and after a month thereafter we harvest green gram. In this way, harvested two different crops from same. Last year, the yields of both the crops were good". It is noticed that, mixed-cropping of legumes with cereals helps in conserving moisture, by reducing run-off, improving physical properties of soil and building-up of soil fertility owing to the nitrogen fixing ability of the legumes. Legumes like green gram/black gram being short duration crops may constitute potential crops in upland paddy under rainfed condition. Due to different rooting system of maize, mustard or cereals and legumes, there is optimum utilization of moisture and nutrients from the soil. The nitrogen fixation by legume nodules and transfer to the cereal crops owing to their proper growth in the shades provided by maize canopy result in significant biomass production from maize crop. Tomatoes are also inter-cropped with maize. But, after adopting mixed- cropping, inter cropping and growing vegetables along with orchard crops round the year, the farmers are now storing enough food stuffs as a buffer stock to meet the need of food scarcity periods. All these factors have reduced the rate of mal-nutrition especially amongst pregnant women and children. (*Source:http://neo-agri.org/en/wadi-a-holistic-model-for-reinforcing-livelihood-in-hilly-rainfed-region-in-india/)*	
15	Udai Singh Village-Murma Block- Satbarwa District- Palamu, Jharkhand	**Community fish farming practice** He has formed a committee and 71 family are involved in this committee. He purchased spawn of fish such as Katla, Rehu, Mrigal and grass carp from Ramsager, West Bangal and got production of fish as about 15-20 quintal per season as a community approach. *(Source: https://palamau.kvk4.in/success-stories.php)*	KVK, Palamau
16	Shri Ganesh Pal Village- Rajhara Block- Medininager District- Palamu, Jharkhand	**Development tandi for sowing of seeds in tand land** Developed tandi (Local name) for sowing of seeds to cultivate crop in tand land. This implement is mostly used for growing pulse crops. By using this implement he conceptually saved labour cost, able to place the seeds evenly at proper depth and conserved available moisture. This implement can easily be mounted on Desi plough and adjust easily up to required depth and easy to operate by the traditional farming communities. At present 148 farmers of that village along with more than 280 farmers of four adjoining villages, adopted this practice. *(Source: https://palamau.kvk4.in/success-stories.php)*	
17	Mr. Dhanjay Village- Gopalpura Hesaraghatta, Bangalore Rural District, Bengaluru Karnataka	**Organic production of Okra F1 hybrid "Arka Nikita"** He used to grow all kind of vegetables (brinjal, chilli, okra, palak, coriander, sweetcorn, baby corn, dolichos and beans) in his two acres field throughout the year depending upon the season and demand in the market under organic way. After knowing the benefits (early flowering, high yielding, dark green, medium, smooth and tender fruits, nutritionally rich in antioxidant activity and minerals and resistant to yellow vein mosaic virus) of okra F1 hybrid "Arka Nikita", he wanted to grow this hybrid in his field. Sowing was taken during kharif and late kharif seasons. The farmer wanted to grow okra organically without using any inorganic chemical fertilizers and pesticides. Earlier at the time of field preparation, he applied organic manures like well decomposed farm yard manure, neem cake, vermicompost and farm waste manures for basal application. Later on, he applied cow-dung slurry, cow urine, wood ash and	Indian Institute of Horticulture Research, Bengaluru

		herbal extracts for top dressing. The farmer realized very good fruit yield in okra i.e. 5.59 tones/acre during kharif season and 5.86 tones/acre during late kharif season. He now sells his produce @ Rs 35 per kg in market constantly till last harvest. *(Source: https://www.iihr.res.in/success-story-organic-production-okra-f1-hybrid-%E2%80%9Carka-nikita%E2%80%9D-during-kharif-and-late-kharif-2019)*	
18	Smt. Saroja Village- Deverayanapatna Tumkur, Bengaluru Karnataka	**Poly mulching in tomato cultivation** In one acres of land she cultivated summer tomato Arka Samrat with poly mulching. She transplanted the tomato seedlings on raised beds with ploy mulch film laid with drip irrigation. She has followed package of practices with fertigation and plant protection recommendations as per the suggestions given by the KVK Scientists.The practice of mulching helped in moisture conservation, weed suppression and maintenance of soil structure. Mulches also improved the use efficiency of applied fertilizer and use of reflective mulches minimized the incidences of pests and viral diseases. She started harvesting tomato after 65 days after planting and got 32.50 tonnes of tomato per acre and sold them @ Rs.10 per kg. This resulted in a total income of Rs. 3.25 lakhs per acre. The total cost of cultivation for tomato was Rs.60,000 per acre. Thus, she earned a net profit of Rs. 2.65 lakh per acre (BC ratio 5.41). Farmers of surrounding villages were very impressed by the result of this technological intervention of plastic mulching with drip irrigation. Farmers from the village are of the opinion that by following these technologies, they can reduce the wastage of water and fertilizers and also increase the water use efficiency. The incidence of pests and diseases has come down. The number of seedlings required for planting one acre is also less because of the decreased seedling mortality. The fruits obtained are of better quality and colour, which fetched her more prices in the market. *(Source:https://www.iihr.res.in/poly-mulching-tomato-cultivation-%E2%80%93-successful-venture-farm-woman)*	KVK, Hirehalli and Indian Institute of Horticulture Research, Bengaluru
19	Sri. Purnachandra Das Village-Baladuan Cluster- Anandpur, District- Keonjhar, Odisha	Integrated Farm Development Implement the aqua-horticulture system in less-utilised dike area of his couple of ponds. Being the part of the Self-Help Group created for fruit and vegetable nursery, he could raise papaya seedlings of red lady variety in nursery from the seeds provided by the NAIP and planted 25 numbers of seedlings in his dike area with a plant to plant distance of 3mt. After one year he got approximately 1.0 to 1.2 quintal papaya fruits per plant on an average. He harvested papaya fruits twice in a year and grossly he got 60 quintal papaya. He sold papaya in local haat and nearby markets @ Rs. 8.5/- in rainy season and in summer @ Rs.6.5/- per Kg. He got Rs.38,000/- from papaya cultivation in his unutilised dike area of ponds excluding home consumption. He also cultivated poi, bitter gourd, cucumber as intercrop in papaya and earned Rs.8000.00, Rs.5000/- and Rs.2000/- respectively. The candid utilisation of the dike area for economic gains through horticulture besides pisciculture has become a role model for farmers in the region. *(Source: https://www.iihr.res.in/success-story-integrated-farming-enhancing-livelihood)*	Consortium partner Central Horticultural Experiment Station, Bhubaneswar,Indian Institute of Horticulture Research, Bengaluru
20	Mr. Yunus Khan, Village Devgaon, Block- Pali, District- Umariya, Madhya Pradesh	**Tree shaded cultivation** Introduction of technology of turmeric cultivation (variety: Suroma) under the shed of mango and mahua trees. The soil had optimum content of rich organic matter beneath the trees. It was an added advantage. In the first year with the investment of Rs. 11,000/-, he got a profit of Rs. 78,000/- with the benefit cost ratio of 1: 7.09. *(Source: http://jnkvv.org/PDF/KVK_Success_Stories.pdf)*	KVK, Umariya

21	Mr. Manoj Dwivedi Village- Khaur District-Rewa, Madhya Pradesh	**Turmeric cultivation in waste land** Introduced turmeric of high yielding variety "Roma" in waste land. *(Source: http://jnkvv.org/PDF/KVK_Success_Stories.pdf)*	KVK, Rewa
22	Shri Mithilesh Dangi Village & P.O. Dariyatu, Block-Chatra, District-Chatra, Jharkhand Ph: 09470956077	**Modified method of turmeric cultivation** Mother rhizome is soaked in a solution prepared with cow dung and water (1 kg cow dung dissolved in 5 litre water) for six hours before placing in the furrows. The land is thoroughly pulverized and vermicompost is added in the top soil furrows to place mother rhizome on the vermicompost-mixed soil. Vermicompost helps in retention of soil moisture for better germination of turmeric plants. *(Source: Farmers Innovation, ICAR, Kolkata)*	-
23	Mr. Gangaram Village-Narayanpur Panchayat-Bandhdih, Block- Gamharia, District-Saraikela, Jharkhand	**Innovative technique to irrigate the farm land** He has made vegetable cultivation round the year possible through assured supply of water with a low-cost mechanism to lift water from river 'Sanjay' flows nearly 500 meters away from his residence. He has dug a shallow water body of 6' diameter as feeder tank on the bank of the river above 110' to collect water. With the help of a pump (1 hp), water is lifted from river and collected in the feeder tank. Feeder tank is connected with main water collecting 'Kund' (3' diameter) in the field through plastic pipe. For effective distribution of water 9 more such 'Kund' are dug which are connected with main Kund through small pipes. Once the 'Kunds' are filled up, water is taken out with the help of bucket to irrigate vegetables. Through his device, water lifting is economized followed by need-based application of irrigation water in the vegetables. Fallow land of the village has been brought under vegetable cultivation and nearly 30 farmers are earning more than Rs.1.0 lakh from vegetable cultivation. *(Source: Farmers Innovation, ICAR, Kolkata)*	-
24	Smt. Purnima Devi Village-Heth Adar, Block-Ghaghra, District-Guma, Jharkhand	**Re-use of mushroom bed for vermicomposting** She instead of destroying the mushroom bundles and drying it for fuel, she decided to use the abandoned mushroom beds for vermicompost production. The idea helped her reducing the dependence on other waste materials to prepare vermicompost pit substantially. Addition of mushroom beds also increased quality production of vermicompost for higher market return. Alongside reducing the labour and cost of vermicompost production, abandoned mushroom beds also helped in improving the quality of vermicompost. As mushroom beds are easily available in the village, less effort is needed in collecting and putting into vermicompost unit. The beds also decomposed easily with mushroom leftover and encourage the growth and activities of worms. *(Source: Farmers Innovation, ICAR, Kolkata)*	-
25	Shri Pashupati Mahato Village- Bhadsa, Block-Purulia, P.O-Chitora, District-Purulia, West Bengal Ph: 09832244157	**Alternative use of aloe vera in goat farming** Use of Aloevera as de-wormer in livestock is not very common practice. Pashupati Mahato, thought differently to apply aloevera in goat rearing over conventional medication. In this process edible mucilage is collected from tender as well as fresh aloevera leaf and mixed with jaggery. Mixture composed of 40 gm of edible mucilage combined with 50ml Jaggery. It is *administered* once orally empty stomach for 3 consecutive days followed by 21 days interval. Irrespective of age and stage of pregnancy. Oral administration of edible mucilage of aloevera reduces fecal worm load and increases body weight by checking malnutrition of goat. It has also reduced the mortality rate in new-born. Skin quality and texture has also improved. This practice reduces cost of medicine (de-wormer) and increase demand of meat in the market due to visible quality of goat. Farmers of surrounding villages are also adopting this unique practice to earn substantial profit from goat rearing. *(Source: Farmers Innovation, ICAR, Kolkata)*	-

26	Shri Chandra Narayan Village- Bairagya Block- Memari District-Burdwan, West Bengal Ph:09474643067	**Modification of hatchery** A modification made by Shri Chandra Narayan has not only reduced the mortality to 2-3%, but also enhanced the production of fish fingerlings to the tune of three times compared to existing hatchery. In this modification a chamber of 10' diameter and 4' height cemented construction is prepared with a central platform (6' dia x 6" peripheral height and 1.5" central height) to enable female fish to reach the shallower portion of it to lay eggs. To ensure fresh water flow with adequate oxygen across the hatchery, four horizontal and four vertical water inlets (perforated) are fitted outside the central platform. Nylon nets are used as separator between eggs and spawn before it is reared in the main hatchery pond. The tendency of female fish to lay eggs in the shallow water from deep water is exploited in this structure. In place of three chambers found in Chinese hatchery, in the modified hatchery two chambers are sufficient to produce a greater number of fingerlings at a much lower cost. This modified hatchery needs only Rs.40,000 - 45,000 to construct as against the market price of Rs.2-5 lakh of existing hatchery. *(Source: Farmers Innovation, ICAR, Kolkata)*	-
27	Shri Vijay Bahadur Singh Village- Sabeyan, Block- Rajandih District- Rohtas, Bihar Ph:08002119937	**Fencing net to protect crop from Neelgai menace** He has developed fencing net made of para twist thread with a total cost of nearly Rs.18,000/- including labour component. Altogether 132 pieces of bamboo are required to cover 1 ha of crop land through this para twist net. The net is tied with erected bamboo placed at a fixed interval as tight as possible so that in the process, the animals are trapped. Moreover, knots in the net are made (in square shape) in such a way that leg of Neelgai can very well entrap to prevent Neelgai from running away. An economic analysis of the fencing adopted by different methods indicates that this Para twist net works well up to 8-10 years against bamboo fencing for 3 years and barbed wire for 12 years. As installation of this device needs only bamboo, labour and thread, it is much cheaper than that of barbed wire and bamboo fencing. *(Source: Farmers Innovation, ICAR, Kolkata)*	-
28	Shri Pursotam Mandavi District-Kanker, Chhattisgarh	**Lac Cultivation in Flemingia semialata** He learnt the technique of lac cultivation on Flemingia semialata while undergoing training on "Scientific method of lac cultivation, processing and uses" at Indian Lac Research Institute. He purchased the seeds of semialata and raised the plants in the backyard of his house. He transplanted 180 saplings in about 2 decimil land. After two years of planting, he collected one kg of seed (worth Rs. 4000/-) from 80 plants, harvested 25 kg of scraped lac (worth Rs.3750) and sold 1570 plants (worth Rs. 4710/-) raised through vegetative propagation. The plants were raised at a distance of l x l meter adopting pest management technology. The average production of seed (12 g per plant) and sticklac 250 g per plant is quite satisfactory. He also utilizes kusum tree (Schleichera oleosa) and ber tree (Ziziphus mauritiana) for lac cultivation. He has earned Rs. 85,000 from lac production in 2005 and now he is a resource person for imparting lac knowledge.. Encouraged from the results of 2005, he has raised a plantation of 4,500 F. semialata plants on 2.5 acre land in July 2006. *(Source: Farmers Innovation, ICAR, Kolkata)*	IINRG, Ranchi
29	Shri Baladeo Marandi and Shri Nirmal Marandi Village- Baramajhladih, Block- Narayanpur, Jharkhand Shri Subodh Hembrom and Shri Bodi Nath Village- Charedih Saurimundu, Block- Jamtara, Jharkhand	**Lac cultivation** They have successfully produced and marketed broodlac from their palas tree within one year of its introduction. They have also produced their own broodlac for further propagating this venture by utilizing their own trees and set example for other farmers to follow it and utilize other unexploited trees. The farmers of this village have stopped cut down the naturally available palas, rather preserving them for better environment and utilizing it rationally for income enhancement without putting any adverse effect on trees for lac production. *(Source: https://icar.org.in/node/8067)*	NAIP, ICAR, Jharkhand

30	Shri Prakash Sanga Village-Mangobandh, Block-Namkum, District-Ranchi, Jharkhand	**Lac cultivation** He was involved in lac cultivation since long but his harvested yield was very low. IINRG had provided him the required technical guidance and broodlac of productive breeds (20kg each of Kulajanga, Nawadih and late maturing variety) in 2008. He was trained on kusmilac cultivation on ber. A very good crop giving 191kg broodlac of Kulajanga, 207kg of Nawadih and 174.5kg of late variety, respectively was harvested in February 2009. Similarly, a very good crop giving 156kg broodlac of Kulajanga, 221 kg of Nawadih and 182.5 kg of late variety, respectively was harvested in February, 2010. Encouraged by the very good returns, he became whole-time lac farmer and is a leading good-quality broodlac supplier of the region. *(Source: http://14.139.215.35/~lpd/library/annrpt/Year%202011-12%20(2).PDF)*	IINRG, Ranchi
31	Shri Soni Ram Puro Village- Bayanar, Block-Bhanupratappur, District-Kanker, Chhattisgarh	**Lac cultivation** Doing lac cultivation since last many years by traditional method (only inoculation and harvesting of lac, no intermediate crop operation/pest management) and gets very less income. Generally, he gets Rs. 2,000 annually from lac. In 2005, he started scientific lac cultivation with adopting all improved techniques of lac cultivation. He has 30 Palas, 2 Ber and 40 Kusum trees available for lac cultivation. Besides his own lac host trees, he has taken 20 Ber trees on lease basis (half output basis) for lac cultivation. Agriculture, lac and Minor Forest Produces is the major source on income of his farm family. He has 4 acres of irrigated agricultural land in which paddy, coarse cereals, vegetables are grown in majority. During the year 2005-06 he has produced 250 Kg Kusmi broodlac and 35 Kg Kusmi sticklac (total worth Rs. 33,000) from 6 Kusum trees. During the year 2006-07 he has produced 350 Kg broodlac and 170Kg sticklac (total worth Rs. 52,000) from 13 Kusum and 15 Palas trees. During the year 2007-08 produced 700 Kg broodlac and 200 Kg sticklac (total worth Rs. 76,000) from 23 Kusum and 25 Palas trees. During the year 2008-09 produced 540 Kg broodlac and 65 Kg. sticklac (total worth Rs. 55,300) from 14 Kusum and 20 Palas trees. (*Source: https://iinrg.icar.gov.in/successtories.html)*	IINRG, Ranchi
32	Shri Ashok Kumar Patel Village- Rishewada, Block- Narharpur, District-Kanker, Chhattisgarh	**Scientic method in lac cultivation** Since last 25 years, he was getting very low average annual income from lac cultivation. He has 10 Palas land 14 Kusum tree available for lac cultivation and 5 acres of irrigated agricultural land for paddy and vegetable. Earlier, he was doing lac cultivation with traditional methods i.e. only inoculation and harvesting of lac, no intermediate crop operational/pest management etc. but now he has started scientific lac cultivation by adopting couple system, pruning of host, selection of quality broodlac, phunki removal, spray of fungicide and insecticide etc. He is also using improved lac cultivation implements in lac production process. Besides his own lac host trees, he has taken 40 ber land 2 kusum trees on lease basis and made scientific lac cultivation. During the year 2007-08, he has produced broodlac and sticklac worth Rs. 86,000 from 30 ber and 8 kusum trees. On an average he earns profit of Rs. 1000 per ber tree and Rs. 7000 per kusum tree. During the year 2008-09 he has taken lac production from 30 ber and 5 kusum trees and produced around 4.5 quintal of broodlac (worth Rs. 40,000) and around 1.6 quintal of sticklac (worth Rs. 10,000). *(Source: https://iinrg.icar.gov.in/narharpur.html)*	IINRG, Ranchi
33	Mr.Narendra Kumar Netam Village-Nathia, Block-Nawagaon, District-Kanker, Chhattisgarh	**Lac cultivation** He has only 4 acres of agricultural land. Earlier, he had no knowledge about lac cultivation other than high selling price of lac. He got primary information from forest Department Chhattisgarh and trained at IINRG, Ranchi on Scientific Method of lac Cultivation in	IINRG, Ranchi Forest Department, Kanker

		the year 2006. He had no lac host. After training and motivation, he had taken 700 palas and 18 kusum trees on lease basis (half out put basis) and followed scientific lac cultivation method. During the year 2007-08 he has produced 7.5 quintal of rangeeni broodlac and 5 quintal sticklac (total worth Rs. 80,000/-) from 700 palas tree at the same period he has produced 11 quintals of kusmi broodlac (worth Rs.1,20,000/-) from 18 kusum trees. During the year 2008-09 he has taken lac production from 450 palas and 19 kusum (leased tree). The total production of rangeeni broodlac and sticklac was 5 quintal and 60 kg, respectively (worth Rs.30,000/-) at the same time he has produced 9 quintals of kusmi broodlac and 2.5 quintal of kusmi sticklac (worth Rs.1,05,000/-). After earning from lac cultivation, he has taken 2 acres of land on lease basis for 10 years (@ Rs. 3,000/year) in the year 2007-08 and planted around 2000 Flemingia semialata in 0.5 acres of land and extended the plantation in around 1.5 acres (8,000 plant). During 2008-09 he has sold 16 kg of semialata seed (worth Rs.56,000). He also sold the 25kg. of scraped lac from 1000 semialata plants. He sells broodlac with the help of Forest Department, Kanker and sell sticklac directly to lac processing unit situated at Kanker. With the earning from lac he has procured land on lease basis, made boring in the field, established semialata plantation etc. He employed around 10 un-employed youth in lac cultivation and provided information on scientific methods of lac cultivation. Sh. Netam is now a source of inspiration to other farmers in that area. *(Source: https://iinrg.icar.gov.in/nathia.html)*	
34	Mr. Dominic Basumatary Bengtol, District- Chirang, Bodoland Territorial Council (BTC), Assam	**Lac cultivation** Since he had no lac host trees, he discussed about the raising of multitier mixed lac host plantation with experts and learnt the technique of raising plantation. He raised the multitier mixed lac host plantation in seven acres of land which was uncultivated wasteland and prepared the layout plan of plantation by marking for preparing pits for planting and transplanted the saplings of 270 kusum, 1378 ber and 3700 semialata in July, 2014. With his hard efforts, Basumatary could achieve success in his mission and he is extending the lac cultivation to different parts of the region by involving the unemployed youths for their economic sustaibility. *(Source:https://www.sentinelassam.com/news/lac-grower-from-assam-receives-excellent-lac-farmer-award)*	IINRG, Ranchi
35	Mr. Joydeb Mahato Village- Jhalda District-Purulia, West Bengal Ph: 09932138348 Email :joydeb.lac@gmail.com	**Commercial lac cultivation** The knowledge, skill and confidence motivated him to increase number of trees from 250 palas to 2500 and 9 kusum to 19 followed by 32 ber trees. Lac on Semialata is also produced by him. Training on nutrient management, brood lac management, insect pest management as well as processing and marketing further strengthened his zeal to go for commercial lac cultivation. Sensing the possibility of earning substantial profit, he decided to involve resource poor jungle dwellers in this enterprise. He arranged training for the tribal and provided technical and material help towards entrepreneurship development among them. In the course of entrepreneurship development, he has made all the inputs like brood lac, 60 mesh nylon bags, insecticide, fungicide and other technical know-how available. Once the resource poor tribal farmers produced lac, brood lac and stick lac were repaid back to Mr. Mahto in the same rate of received input. For landless rural youths, Mr. Mahto has appointed more than 1500 youths, trained them and put them into the service of making brood lac available to other tribals, looking after lac production and providing technical support. He has also formed ten SHGs to make them engaged in producing decorative items like bangles, lac coated pen stand, candle stand etc. *(Source: Farmer Innovation, ICAR, Kolkata)*	IINRG, Ranchi

36	Mr. Veer Shetty Biradar Village-Gangapur, Mandal-Jharasangam, District-Sangareddy, Telangana Ph: 7702860613	**Millets production in rainfed condition** He takes up millets in June-July with the onset of the south-west monsoon and manages to get a good yield from millets (foxtail millet 3-3.5 quintals/acre, bajra 4-5 quintals/acre, sorghum 4-5 quintals/ acre and finger millet 4-5 quintals/acre) with proper management practices at the right time even though his village receives meagre rainfall. He also made millet-based value-added products for marketing. *(Source: Inspiring stories from innovative Framers, MANAGE, Hyderabad, Telangana)*	Institute of Millets Research (IIMR), Hyderabad, Telangana.
37	Mr. Gadde Satish Village-Seethampeta, Mandal- Denduluru, Eluru, District-West Godavari, Andhra Pradesh Ph: 9912511244	**Trendsetter of cattle based organic farming** He follows open grazing in the daytime, and during night-time, animals are tied in rows across the farm using a long rope; on alternate days, the rope is shifted a few meters ahead in order to change the resting place/position of the animals. This way, dung and urine of the animals is allowed for absorption by the land insitu. The farmyard manure, enriches soil fertility and reduces weeds. Mr. Satish says the availability of labour is a major problem, and to minimize this problem, he uses the basin method of irrigation for coconut orchards. One of advantages of cattle-based organic farming is that there is no dependence on expensive chemical fertilizers. *(Source: Inspiring stories from innovative Framers, MANAGE, Hyderabad, Telangana)*	-
38	Mr. D.M. Ramesh Village Daradahalli, Taluk Mudigere, District Chikkamagaluru, Karnataka Ph: 9242144019/ 9480738978	**Farm yard manure (FYM), cultivation of spice and inter-cropping** He purchased 15 acres of land through bank loan. He grows plantation crops such as coffee, banana, pepper and areca nut. He has used Farm Yard Manure (FYM) for the effective growth and development of plantation crops. Bordeaux paste 2.5 feet above the ground level and neem cake and Trichoderma were applied by him to protect the crops from pathogens. He gets 8 1/2 tonnes of pepper, 450 bags of coffee and areca nut per year. *(Source: Inspiring stories from innovative Framers, MANAGE, Hyderabad, Telangana)*	-
39	Mr. S. Sukhdev Singh Village- Bhullar Bet, P.O. Nurpur Lubana, District-Kapurthala, Punjab Ph: 9814565706	**Inter-cropping** The land he inherited was barren, saline with no irrigation facilities and yielded very little. Under the land reclamation programme, he witnessed a tremendous improvement in soil fertility with gypsum application. Earlier, he followed the traditional paddy-wheat cropping system. With improvement in soil fertility, he switched to other crops, such as sugarcane, potato, mustard, berseem and maize etc. His production of wheat, maize, rice and sugarcane increased manifold with the cultivation of improved varieties. He irrigates crops through the underground pipeline system to cut down on losses through evaporation. As a tech-savvy farmer, he utilises his smart phone and the Internet for getting latest rates from agri-markets, weather information and advanced agri-tech on different websites and shares the information with his fellow farmers for mutual benefit. Mr. Singh experiments at his farm and shares the results with scientists. He has observed the effect of alternate wetting and drying of wheat and concluded that it enhances germination, tillering and productivity. He sows wheat on 15 acres and oats fodder on 5 acres with Happy Seeder every year. Therefore, he does not burn the paddy straw, rather ploughs it back into the soil to improve the environment and soil fertility and attain sustainable productivity. He has an uncanny flair for growing diverse crops such as wheat, rice, basmati, oats, turmeric and marigold. This cropping pattern fetches him a gross annual income per acre of Rs. 30,000/- from wheat, Rs. 40,000/- from rice, Rs. 27,000/- from basmati, Rs. 40,000/- from maize, Rs. 20, 000/- from oats, Rs. 2,40,000/- from turmeric and Rs. 30,000/- from marigold	Punjab Agricultural University, Ludhiana, and Farm Advisory Service Centre (FASC), Kapurthala

		cultivation. He also maintains a dairy enterprise comprising 9 milch animals. Four buffaloes and five H.F. Cows produce about 126 quintals of milk per annum. After sparing milk for domestic consumption, the surplus milk is sold to dairy units, which fetches him an annual income Rs. 3,78,000/-. Mr. Singh has been bestowed with Dalip Singh Dhaliwal Memorial Award for crop diversification by PAU Ludhiana in 2017. He is a successful amalgamation of modern farming using agrotechnologies, economic prosperity and human values combined with simplicity, thriftiness and knowledge. *(Source: Inspiring stories from innovative Framers, MANAGE, Hyderabad, Telangana)*	
40	Mr. Amar Singh Village- Penghore, Panchayat- Kumher, District-Bharatpur, Rajasthan Ph: 9982566104, 8003114663	**Rural entrepreneurship through amla farming** Mr. Singh once came across a leaflet about Amla farming at an agriculture exhibition in the state. After reading about the health benefits of amla, he was so inspired that he decided to plant amla trees in the year 1997. Prior to that, he had plum trees in his field. He bought 60 plants at a cost of Rs. 1,200 from the Horticulture department in the Bharatpur district and planted them in his 2.2 acres of fertile land. After one year, he purchased another 70 plants and included them in his nursery. He maintained the fertile land with good irrigation facilities, and within a span of 4-5 years, the trees were ready and started bearing fruits. Some trees bore 5 kg fruits, while some bore up to 10 kg. He has employed village women in his Murabba preparation unit and sold the murabba under the brand name "Amruta" in Rajasthan in Kumher, Bharatpur, Tonk, Dig, Mandawar and Mahua. *(Source: Inspiring stories from innovative Framers, MANAGE, Hyderabad, Telangana)*	Lupin Human Welfare Research & Foundation, Rajasthan
41	Mr. Muttappa Pujar Village-Hasanapur, Taluk-Kalaburagi, District-Gulbarga, Karnataka Ph: 9731680384	**Integrated farming practice** He owns 8 acres of land, and four livestocks i.e. two oxen and two goats. He grows red gram, cotton, ginger, flowers and leafy vegetables in the Kharif season. Immediately after harvest of the Kharif crops, he takes up wheat, chilli, chickpea and sorghum for the Rabi. *(Source: Inspiring stories from innovative Framers, MANAGE, Hyderabad, Telangana)*	-
42	Mr. Roshan Lal Vishwakarma, Village-Mekh, Tehsil–Gotegaon, District– Narsinghpur, Madhya Pradesh	**Low cost technique in farming** He was awarded 'Mahindra Samriddhi Krishi Yantrikaran Samman' for his innovative Sugarcane bud Chipper. This machine operated manually as well as by power. *(Source: http://www.zpd7icar.nic.in/download/Farm%20Innovator%20news.pdf)*	-
43	Mr. Shivkant Bheemgarh road bypass, Chhapara, Seoni, Madhya Pradesh	**Organic manure from the remaining of maize crop** Instead of burning the remaining plant of maize after harvesting, he mixes it in the field with the help of rotavator and make organic manure from it. He doesn't burn the corn leftover as other farmers do. With the help of rotavator, he mixed the same in the farmland and make organic manure. it minimises the use of urea while sowing the wheat crop and make the crop weed free. *(Source: https://www.thehitavada.com/Encyc/2020/10/25/Collector-showers-praises-on-Seoni-farmer-for-being-innovative-.html)*	
44	Mr. Manjanna T.K. Village-Thimmalapura, Taluk-Tiptur, District-Tumkur, Karnataka Ph: 9741365466	**Integrated farming practice** He owns 0.8 ha of land and grows field crops such as ragi and red gram, horticultural crops such as banana, mango and coconut. He also maintains a nursery and does bee-keeping, along with owning one milch cow. To make use of the land in between trees, he started growing Jasmine and Chrysanthemum as an inter-crop in an area of 0.2 ha, which gave him additional income. Keeping in mind the advantages of the integrated farming system, he started growing red gram (BGR-1) and chilli in between rows of mango. He wanted	KVK, Konehalli, Tumkur

		to use every inch of his land in a proper way. So, he started growing banana (G-9) in 20 guntha as an inter-crop in a coconut orchard. Looking at the adequate availability of flora and fauna in his garden, he started keeping beehives, which helped in the pollination of plants as well. He used pheromone traps in the coconut orchard to control the damage from rhinoceros beetle. For better growth of the plants, he has used compost and Trichoderma. *(Source: Inspiring stories from innovative Framers, MANAGE, Hyderabad, Telangana)*	
45	Mr. Bhoopalaksha Village Kenchanahallipura Taluk-Alur, District-Hassan, Karnataka Ph: 9591256671	**'Bee keeping'** He followed a mixed farming system of cultivation (Agri+Horti+Pasture). In the monsoon season, he used to grow paddy, maize and horticulture crops such as chilli, ginger, coconut, mango, sapota, guava and banana and earmarked a considerable portion of farming area to cultivate vegetables for household consumption. He has successfully adopted the technique, and now he is capable of multiplying a single bee colony into 5-6 bee colonies during the season and supply them to bee-keepers. He also assists 100 bee-keepers. *(Source: Inspiring stories from innovative Framers, MANAGE, Hyderabad, Telangana)*	KVK, Hassan
46	Mr. Hari Babu Plot No. 372B, III Phase, Road No.81, Jubilee Hills Hyderabad - 500033 Ph: 9441280042	**Integrated farming practice** The success model adopted by Mr. Hari Babu is the integrated farming system. He has six cows, whose dung and urine are converted into Jeeevamrutham, which is used as a fertiliser for the plants. He never uses chemical fertilisers or pesticides and follows only natural methods of agriculture. He has more than 300 hens, which are great predator of insects and pests. He planted as many as 9,000 trees belonging to 90 different species in his 10 acres of land. *(Source: Inspiring stories from innovative Framers, MANAGE, Hyderabad, Telangana)*	-
47	Mr. Narinder Singh Village- Uchana, Near Karan Lake, District-Karnal, Haryana Ph: 9416112157	**Bee-keeping and apple production practices** He wanted to diversify his farm from the routine rice-wheat farming system, thus he started a horticulture nursery. In his nursery he took up horticulture crops such as apple, jamun, pear, peach, sapota, guava, mango, litchi and so on. He was the first person to introduce apple in Haryana, and named it "Rana Gold Apple" and started selling apple seedlings. He is also known as "Apple Man of Haryana". Along with the nursery, he took up other allied enterprises, such as bee-keeping, crop production, vermi-compost and so on. He maintains 15 cows that yield 180 litres of milk per day. He also maintains 350 beehive boxes that provide 27-30 kg of honey. He believes in complementary and supplementary relationship of enterprises generates higher income for farmers. *(Source: Inspiring stories from innovative Framers, MANAGE, Hyderabad, Telangana)*	-
48	Mr. Sigicherla Chenna Reddy Village-Lakkasamudram, Mandal- Talupula, District-Anantpur, Andhra Pradesh Ph: 9676468687	**Sprinkler and drip irrigation method saved crops in a drought situation** Ever since he has adopted the drip irrigation method, he is able to manage a whole year without any scarcity of water. Besides cultivating agricultural crops such as groundnut, Bengal gram and black gram, he also grows vegetables such as dolichos bean and fruit crops such as watermelon. He also maintains floriculture in one acre of land by cultivating Crossandra with the help of drip irrigation. Due to all this, he has been able to generate a regular income for his family. He also grows ground nuts in mango and black plum orchards for effective land utilisation. Due to unavailability of labour during lean season, he started using a tractor for inter-cultivation operations, and he also uses a seedcum-drill fertiliser. *(Source: Inspiring stories from innovative Framers, MANAGE, Hyderabad, Telangana)*	-

49	Mr. G. Srinivasulu Village- Narayanapuram, Mandal- Kalyandurg, District- Anantapur, Andhra Pradesh Ph: 9494542720	**Dairy farming flourishes with fodder crops** He grows a new and improved high yielding and drought-tolerant Hybrid Napier variety called Phule Jayawant (RBN-13). Initially, he took a few samples of Hybrid Napier and planted them in a 500 Sq.m area. Later, he multiplied and extended it in a 1ha area. Now, he can manage around 95-120 tonnes of green fodder per year, which is sufficient for maintaining 8 dairy milch animals with minimum expenditure. Appropriate fodder cultivation has enabled him to save up to 80% expenditure, besides getting a higher milk yield. He has supplied fodder to nearly 25 farmers free of cost, covering an area of 20 hectares, which has contributed to improve the milk yields and net returns to farmers. *(Source: Inspiring stories from innovative Framers, MANAGE, Hyderabad, Telangana)*	Krishi Vigyan Kendra (KVK), Kalyandurg
50	Mr. Malleshappa Gulappa Biserotti Village-Hiregunjala, Taluk-Kundgola, District-Dharwad, Karnataka Ph: 9945011754	**Used of solid Jeevamrutha in organic agriculture practices** He has been continuously practising organic farming since the last one decade. Over four years of usage, he noticed his crops getting better and developed an interest in vermi-compost development and its continuous application. He started using liquid Jeevamrutha organic technique, a zero-investment method in agriculture crop production, only sufficient water is neededto prepare liquid Jeevamrutha. With the water shortage situation in mind, he started experimenting with the use of solid Jeevamrutha and succeeded in raising crops over the last six years. Solid Jeevamrutha is prepared from 10 kg cow dung from a local cow or ox, 250gram pulse flour (any), 250gram jaggery, 500 gram soil and 1.5 to 2.0 litres cattle urine. These products are mixed well and a heap is made under the shade, covered with a gunny bag for 24 hours. The next day, the gunny bag is removed and the products are dried under the shade for 25-30 days, which results in the pebble form of solid Jeevamrutha. Then, pebbles are sieved to separate fine and coarse particles and used directly along with the seeds during sowing and also as top-dressing. With this method, he noticed the development of an enormous number of earthworms, which provided a new ray of hope to organic farming. For three days, 2.5 litres of water was dded to 20 kg solid Jeevamrutha. He found around 1,000 earthworms in the tray after 45 days under incubation. After 71 days of vermi-compost preparation, he found a high number of earthworm colonies, pupa and small worms and noticed 1,500 well grown and developed earthworms in the tray. He gets 20 kg of vermi-compost from each tray, which is mixed with compost and solid Jeevamrutha and used for crops. With the help of this new method of preparing solid Jeevamrutha and vermi-compost, he produces 10 MT of vermi-compost and 5 MT of solid Jeevamrutha every year. With these organic products, he has been able to produce sustainable crops that are naturally better than those produced through inorganic farming practices. Every day, he prepares a minimum of 15 kg of solid Jeevamrutha per tray, which amounts to more or less 5,475 kg of solid Jeevamrutha a year. He also prepares 200 kg of neem cake with the seeds collected from 17 neem trees and uses neem leaves for vermi-compost production. He explored sustainable agriculture using locally available natural resources with compost, vermi-compost and local seed material. By adopting this method of organic farming, he has been able to achieve better crop productivity per acre of land under scanty rainfall conditions. *(Source: Inspiring stories from innovative Framers, MANAGE, Hyderabad, Telangana)*	-
51	Mr. Praveen Village- Vagarahalli, Taluk-Channarayapatna, District-Hassan, Karnataka Ph: 9972117190/ 9113697264	**Horti-Silvi-Pasture cultivation** His only source of income was from crops such as ragi, maize, potato and coconut, which would fetch him an annual net income of Rs. 47,740/-. With the introduction of high value crop ginger and sericulture, his annual income increased to Rs. 2,37,558/-. He has started growing drumstick and papaya between coconuts, which fetches him an additional income. He has developed his farm with a combination of Horti-Silvi-Pasture cultivation. He has planted	Krishi Vigyan Kendra (KVK), Hassan

		silver oak all along the borders, utilising the land efficiently, and has started backyard poultry rearing with Swarnadhara (15), Giriraja (15) and local (20) poultry breeds. From these birds, he gets around 4,230 eggs and earns Rs. 49,780/-. Moreover, he has a sheep and piggery unit that helps him fetch an additional income of Rs. 23,950/- and Rs. 73,630/-, respectively. This has motivated many farmers in his village to start integrated farming with livestock. To feed his dairy (three Holstein Friesian cows, two nondescript cows and one Buffalo) and sheep unit, he has established Azolla with the help of KVK, Hassan. The utilization of Azolla has helped him to save feed cost by Rs. 150 per day. As a water conservation practice, he adopted a micro sprinkler irrigation system in the coconut garden, which increased water use efficiency compared to flood irrigation. He uses farm machinery such as coconut climber, coconut dehusker and cycle weeder to reduce farm drudgery. He has recycled farm waste into healthy manure through the vermi-compost unit and gets over 50% nutrients by recycling the bio-mass available within the farm itself. He has cultivated Sun Hemp in the coconut garden and incorporated the bio-mass (green manure). The average production from his farm per year is 5,400 coconuts, 10 tonnes of vermi-compost, 5 tonnes of cow dung, 40 tonnes of fodder grass and vegetables worth Rs. 1 lakh. *(Source: Inspiring stories from innovative Framers, MANAGE, Hyderabad, Telangana)*	
52	Mr. H. Muralidhara Village- Hosahudya, Venkatagirikote, Post- Vijayapura Hobli, Taluk- Devanahalli, District- Bangalore - 562 110 Ph: 9632832557	**Horticulture** Mr. Muralidhara replaced the new grape rootstock, Dogridge, with exotic varieties of grapes, such as Sharad Seedless (70 guntas), Red Globe (20 guntas) and Sonaka (10 guntas) on 2.5 acres land and Bangalore Blue grapes on 1 acre using the Pendal system. He has adopted scientific spacing for different varieties. From the second year onwards, he started producing good quality bunches of grapes, but he failed to realise their remunerative income as market prices were low due to adverse weather conditions. An addition to grapes, he also started cultivating a pomegranate variety called Bhagwa in an area of 2 acres with a plant population of more than 1,000 by adopting a high-density planting system during the year 2016. In 2017, with the same crop, he took home a gross income of Rs. 6 lakh from a total production of 12 tonnes. In the current season, he is expecting 25 tonnes from 2 acres with a bumper yield of 25 kg from each plant. *(Source: Inspiring stories from innovative Framers, MANAGE, Hyderabad, Telangana)*	Department of Agriculture, Marketing and Cooperation, GKVK, UAS, Bengaluru,
53	Mr. Angaraju Satyanarayanaraju Village- Kumudavalli, Mandal- Palakoderu, District- West Godavari, Andhra Pradesh	**Integrated farming practice** He used MTU 1010, PLA 1100 paddy seed and 300 grams neem oil sprays three times. As advised by KVK scientists, among the fish varieties, he used Sheelavathi (800), Botcha (200) and Mosa (100) fingerlings, each weighing 50-100 grams. These were left in the trenches for 20 days after the rice transplantation. He used five kg rice bran every alternate day (1,000 kg in a year), 200 kg cattle manure and small quantities of Azolla as fish feed. Apart from serving as feed for the fish, Azolla also helps in absorbing and supplying atmospheric nitrogen to the paddy field. It was observed that freely moving fish in the paddy fields aided pest control naturally by eating the larvae and eggs. He has harvested 820 kg fish in one year on 20 guntha, and they were sold in the Bheemavaram market. He also planted banana, papaya, chillies, tomatoes, gourds, coconut trees, drumstick, tree plants etc. on the bunds to supplement his income in the medium and long term. He introduced a vermi-culture unit to prepare manure at the farm level and a honey bee box to get supplemental income and help in pollination. He has also added a local variety of poultry birds to his farm by constructing a small nest for the birds above the fish trench using local material. *(Source: Inspiring stories from innovative Framers, MANAGE, Hyderabad, Telangana)*	Department of Agriculture, with technical support from Agricultural Technology Management Agency (ATMA), West Godavari and KVK, West Godavari

54	Mr. Yusuf Khan Mushroom Farm & Training Centre, VPO-Nangal Salangri, Tehsil & District- Una, Himachal Pradesh Ph: 9418178839	**Mushroom and vegetable cultivation** Mr. Yusuf Khan, a farmer from Nangal Salangri village, Una district, Himachal Pradesh used his professional expertise to start mushroom cultivation. Since his childhood, he was passionate about agriculture and allied sectors. After joining the Agriculture College, his interest deepened and he established his own mushroom cultivation unit in the year 2000 in Nangal Salangri, Una. With success in this venture, he started a training centre, which has been promoting and popularising mushroom cultivation in Himachal Pradesh as well as all across the country. Along with this, he initiated protected vegetable cultivation, strawberry cultivation, and aeroponics (tomato, cucumber) etc. The centre also provides support for mushroom projects. Till now, he has trained more than 1,000 farmers across the country, apart from training some farmers from Bahrain as well. The turnover of his units is about Rs. 70-80 lakh/year. Wheat straw, along with poultry manure and supplement (sunflower cake and cotton seed) as a source of nitrogen and gypsum, are used as raw materials. Making 1kg wheat straw requires 5 litres water, and it needs to be sprayed for minimum 12 days for the outer phase of wheat straw at a required temperature of 75-800C. After 12 days, it is transferred to the composting temperature and then taken to a pasteurisation chamber. Pasteurisation is done at 58-600C for 8 to 10 hours; in this period, all the nitrogen is converted into ammonia, which acts as a nutrient medium for mushroom. Once the compost is ready for spawning, the temperature requirement becomes 220C. For 10kg compost, the required quantity of spawn is 50-80 gram. After that, 220C temperature is maintained in a closed room. Within 15 days, spawn is taken to the compost bag. He also grows tomato, potato, capsicum, coriander, lettuce and strawberry on the farm under protected cultivation. There are two polyhouses on the farm, covering an area of 1,000 square metres in which vegetables such as cucumber and tomato are grown. He has developed a seedless cucumber nursery in media, and then it is shifted to a hydroponic system. *(Source: Inspiring stories from innovative Framers, MANAGE, Hyderabad, Telangana)*	-
55	Mr. Prasad Village- Sagipadu, Mandal K. Kota, Post- Rathnagirinagar, District- Nellore, Andhra Pradesh	**Inter cropping, micro irrigation practices and organic agriculture practices** He cultivates coconut along with banana (Karpuram variety) as an intercrop in 12.5 acres with 8x8 meters spacing, palm with coco as an inter-crop in four acres, banana separately in two acres and fodder and vegetable in two acres. He purchased a power tiller and small implements instead of big motors. He dug trenches of two feet width and 2-6 feet length along pathways and bunds against the slope in the farm and used them as water conservation structures, filling them with weeds and dung. He also dug shallow pits with about nine inches depth between plants on the entire farm and filled the pits with coconut shells as mulch to harvest rain water. He also made arrangements for in-situ decomposition of coco leaf fall in palm and coconut orchards to enrich soil. Through these measures, he was able to harvest surplus rainwater in his farm and improve soil fertility by incorporating decomposed farm waste. *(Source: Inspiring stories from innovative Framers, MANAGE, Hyderabad, Telangana)*	-
56	Mr. A. Alagesan Hulasiammal Farm, Mylady near Chennimalai, Tamil Nadu Ph: 09842135117	**A simple, low-cost unit for manure production** Farmer in organic farming practices, who developed an effective liquid manure manufacturing technology from cattle resources such as cow dung and cow urine. He is a member of the 'MYRADA KVK farmers' a forum which provides exposure and guidance over cost effective methods in fertilizer management in organic farming practices. In just Rs.800 as an investment for purchasing a plastic barrel, rest of the inputs can be easily sourced from the farm itself. The basic principles behind this technology are fermentation and sedimentation processes.	-

		Methods: A 200 litre plastic barrel and three plastic gate valves are the requirements. Two quarter inch plastic gate valves are fixed one about a quarter inch below the top of the barrel and the second a quarter inch above the bottom. The third one-inch valve is fixed behind the barrel at the bottom. Fresh desi cow dung and urine should be mixed well with 10 parts of water in the barrel and allowed to ferment for a day. Add one kg of jaggery for the next day along with decomposed fruits, vegetables or practically any vegetative matter available in the farm. Close to the mouth of the barrel, thin piece of cloth is used to prevent mosquitoes or other insects from laying their eggs. Leave the solution undisturbed for a week. After a week farmer can use this solution by opening the valve at the top and allow fermented liquid to flow freely along with irrigating water or through drip irrigation. Once in ten days water must be added to increase the solution level in the barrel and can be used. Every 20-25 days the barrel must be cleaned and the sediments allowed to wash out by opening the valve at the back. By adopting this technique, a farmer can save Rs.4,000-20,000 per hectare. Apart from reduction in cost of cultivation, this technology increases the water holding capacity of the soil and improves the beneficial micro organisms present in the soil. *(Source: Inspiring stories from innovative Framers, MANAGE, Hyderabad, Telangana, https://myrada.org/simple-organic-liquid-manure-production-technique/)*	
57	Mr. Birsa Oreya Village- Gutigara, Block- Murhu, District- Khunti, Jharkhand Ph: 8809376863	**Vegetable cultivation** Belongs to tribal dominant district Khunti, Mr. Oreya works hard in his field for survival of his family. But due to lack of resources and technical knowledge he is not getting the desirable output even with his sufficient land holding for his existence. Later on, after the start of Akhandanada Seva Prakalp project, he came in contact of Krishi Vigyan Kendra (KVK) Ranchi in the year 2011-12. A package of technologies and seeds of improved varieties were provided for demonstrations. He started growing improved and hybrid varieties of vegetable. Now he is able to identify important insect pest of vegetables especially tomato, including fruit borer and their management practices. For enrichment of soil he started using compost, organic liquid fertilizer, bio-fertilizer (Phosphate Solubilizing Bacteria (PSB), Azospirillum & Azotobacter) and bio-pesticides. He has actively guided other farmers in adopting new technologies. With his intervention farmers have started growing different vegetable crops seasonally and getting better prices in the market. He has also started growing other improved varieties of vegetables like Brinjal (BNR-218), Chilli (BNR-206). In large scale his produced was purchased by local vegetable vendors. By adopting different technologies, he is now one of the successful well-known farmers of his village and district. *(Source: https://ranchi.kvk4.in/success-stories.php)*	Akhandanada seva prakalp project, KVK, Divyayan Ranchi
58	Mr. Srawan Kumar Gupta C-92, Harmu Housing Colony, Behind Sahajanand Chowk, Thana-Argora, Ranchi-834012 Ph. 9431360542/ 9709254037	**Quality sapling production with good nursery management** After getting informal training on vegetative propagation techniques of horticultural and forest plants and learning about nursery business, he has started his business with grafting in 100 mango plants and raising 500 papaya seedlings in 1998. He has planted about 1600 mother plants in his family land as well as villagers land to get scion for grafting purpose. Presently, he is dealing in various crops like mango (13 varieties), litchi, guava (6 varieties), sapota, jamun, pomegranate, lime, lemon, jackfruit, banana, papaya etc., and his nurseryhas more than 2 lakhs fruit plants and 2.5 lakhs timber plants. He is now the largest private supplier of saplings in Jharkhand and he has expanded his business out of Jharkhand too such as Orissa, Chhattisgarh, Bihar. His nursery has been rated as 3 Star by the Directorate of Horticulture, GOI. He has increased the survival rate of mango, guava plants from 60% (mango) and 70% (guava) to 95% in mango and 90% in guava by increasing the tube size and used pond mud as base material. He kept the plant in the tube for 3 years and allowed the roots to grow substantially. He always sales a 3 years old plants to the customer. *(Source: https://ranchi.kvk4.in/success-stories.php)*	KVK, Ranchi

59	Mr. Gandura Oraon Village- Gurgurjari, Block Mandar, District–Ranchi Ph: 7250959075, 7870311851	**Integrated Farming system of farming** He has taken up Integrated system of farming focusing on limited resources for cultivation of Paddy and vegetables. With the profit earned from vegetable crops and information regarding convergence from different government schemes, he has purchased pump sets, tractor, rotavator, power tiller, conoweeder and other agricultural implements, which have increased his work efficiency. He also cultivated marigold as well as gladiolus. He also started animal husbandry for additional source of income. Today he is cultivating cereals, cash crops, ornamental plants, vegetables etc. and he is also engaged in seed production of paddy and green gram. After getting success he has started guiding his fellow villagers to get benefitted from various subsidy schemes of central and state government. *(Source: https://ranchi.kvk4.in/success-stories.php)*	KVK, Ranchi
60	Mr. Danua Jani and Ms. Puri Jani Village- Bonasil, Block- Dasmantpur, District- Koraput, Odisha	**Wadi** The initial task was to develop land through earth and stone bunding, priority was given to fencing for protection from cattle and once the land was developed and fenced, fruit saplings and intercropping was used extensively. During Kharif season dwarf varieties like finger millet, green gram, black gram, groundnut and various vegetables are cultivated as intercrops. In Rabi season chickpea, pea, masoor, sunflower and vegetables are cultivated. *(Source: http://www.indiatogether.org/sustainable-tribal-livelihood-via-wadi-agriculture)*	Agragamee NGO, Odisha and NABARD
61	Mr Fakir Kishan Village- Gujapal, Tehsil- Bonaigarh, District- Sundargarh, Odisha	**Horticulture with vegetable cultivation** He has planted 57 plants in his orchard of 0.81acre land and cultivated vegetables like bitter guard, chilly, cucumber, pumpkin, cow pea in the entire 0.81-acre land. *(Source: https://sgupngo.com/success-stories/)*	Sundargarh Gramya Unnayan Pratisthan (SGUP)
62	Mr. Bherusingh Village- Haldi, Block- Kukshi, District- Dhar, Madhya Pradesh	**'Wadi'** He has planted 44 fruit plants (24 Mangoes and 20 Guava) and established two-tier creeper house system to cultivate vegetables (Bottle guard, Bitter guard, Sponge guard), spices (Turmeric and Ginger) in 0.25 acre of land and chilly in 0.5 acre). With intercropping of chilly over 0.5 acre of land with fruit plants he gets good income. From September 2013 to till date, his income has increased from Rs.30,000/- per acre to Rs.44,600/- per acre per season (From Wadi field only). *(Source: https://www.gvtindia.org/templates/theme1/upload_files/1395903481GVT-JhabuapresentsSuccessStoryofWadiFarmer,Bherusingh.pdf)*	Gramin Vikas Trust (GVT) and NABARD
63	Village- Bheemawala, Block- Vikasnagar, District- Dehradun, Uttarakhand	**Rajma Cultivation** As the combined efforts of KVK and farmers, almost whole area is converted into Rajma cultivation, the trend of enhancement of Rajma in this belt has been experientially viewed from 3 ha to 100 ha cross the boundaries to neighboring state of Himachal Pradesh. The families of these belts are getting lucrative returns from production of this new crop as compared to their traditional cropping pattern. Due to its higher acceptability in the local market, the Chakrata Rajma (local) with radish brown color, plant height of 60 to 80 cm and maturity in 110 to 120 days, excellent cooking quality, more pods and higher grains/pods were used in the demonstration. The variety is also tolerant to pod shattering with easy threshability. As per the farmers' demand of village Bheemawala, the KVK planned to organize the frontline demonstration on Rajma in the spring seasons of 2015 and 2016. Around 5 farmers were identified and trained on production technology of Rajma for conducting the FLDs. The quantity of 80 kg/ha seed was used for sowing to maintain the spacing of 45 cm x 10 cm. Before the sowing, the seeds were treated with Phosphorus Solubilizing Bacteria (PSB) 5ml/kg of seed following Trichoderma harzianum and Pseudomonas fluorescens 5g each per kg of seed. A basal dose of 100 kg of N, 60 kg of P and 30 kg of S were applied as basal on the basis of soil test. The urea and single super phosphate were used as sources of N, P & S respectively. *(Source KVK, Dhakrani, Dehradun)*	KVK, Dhakrani, Dehradun

64	Smt Rita Kamila Village- Ramganga Block- Patharpratima District- South 24 Pargana, West Bengal	**Integrated farm development in 1.65-acre land** She has total 1.65 acre of land, including her house, pond, homestead garden & agricultural land. Agriculture is the main source of earning for her family. As her husband is a van puller she alone has to manage the farm. Earlier, she was a conventional farmer and use to apply chemicals, fertilizers & pesticides in her agriculture field as well as in her homestead garden. There was no diversity & integration in her farm. She was searching for an alternative way to get rid of this problem. She came to know about Indraprastha Srijan Welfare Society who was working in collaboration with DRCSC to attain food & livelihood security of poor & marginalized farmer through sustainable management of natural resources. She was oriented & trained on various topics of sustainable agriculture. She tried to implement all her knowledge in her own farm. For her homestead garden she started using techniques like mulch, raised bed, circle bed, mix cropping etc. Both for her homestead garden & agricultural land she started applying organic manure, vermi-compost, liquid manure, bio-pest repellant. She is now using the farm waste to prepare compost. She is rearing/raising local varieties of chick, ducks & small cattle, which is also fetching extra income to her family. The productivity and diversity of her farm get increased. She is now able to cultivate/grow paddy, seasonal vegetables, fish & duck at a time. She is utilizing the space available along the periphery of pond bank and agri-field by planting perennial, semi-perennial multipurpose trees and vegetables (climbers & creepers) using trellis, which in turn satisfying her need of food, fodder & fire wood. Nevertheless, her risk of farming got reduced. She has been able to enhance her family's food & livelihood security *(Source:http://www.drcsc.org/casestudies/Rita%20Kamila.pdf http://www.indraprasthasrijan.in/docs/Rita%20Kamila.pdf)*	Indraprastha Srijan Welfare Society (ISWS) & DRCSC
65	Smt Chandramma and other fellow women District- Medak, Telangana	**Womenfolk teaching rain-fed farming** Women farmers of the Medak District of Telangana are teaching sustainable rain-fed farming techniques to peasants in the neighbouring Vidarbha region of Maharashtra. Representing the poorest of the poor in their village communities, these women farmers were once landless laborers, but today, these women have not only tackled their farming problems effectively but are also generating an additional income through innovative and eco-friendly ways. Using traditional preservation techniques, these women preserve organic seeds that they barter with farmers in the region. Chandramma, who heads the Seed Bank at Pastapur, explains that they pick and keep the healthy grain in a mud container, layered with neem leaves, ash and dry grass. They then seal the whole box with mud, dry it and keep it at a secure space. On their month-long seed bartering journey to 30 villages in the region, Chandramma and her fellow women farmers teaches other villagers the technical know how such as how to follow organic farming methods and grow climate-resistant crops like traditional varieties of millets. Many of them have become filmmakers (they haven't been to school!) who have produced documentaries on organic farming, seed sovereignty, bio-fertilisers and good farming practices that have been screened worldwide. They have also launched the Sangham community radio, the first-of-its-kind in India, which is another great initiative that educates farmers in a staggering 200 villages in the region. *(Source:https://www.thebetterindia.com/71745/india-women-farmers-international-day-of-rural-women/)*	Deccan Development Society (DDS), Telangana
66	Smt Algi Poolamma Village- Metlkunta Mandal- Nyalkal Medak, District- Telangana	**Vermicomposting** In the beginning she used to take two months to get manure. But with experience, she has learnt to get it in a month's time. Then she cut down the duration even more. Now it is taking just 15 days for the manure to form. In a 3m X 1m bed, she is getting 2-3 quintals	Deccan Development society, Telangana

		of manure. For the beds, she uses all sorts of organic matter that is available: cow dung, neem leaves, kanuga (pongamia), tangadu (cassia auriculata) etc. Today, not only the 'kapus' and 'reddies' (upper caste people) of their village, but people from other villages from Bidar, Nagwar, and Kottur comes to buy manure. She sells it at Rs.2/kg, and make about Rs.800/ month. She does not go for day labour. In the past, her husband used to get a "jeetam" (pay) of Rs.4000/year, which was not sufficient. But for the past 2 years, she is able to earn Rs.6000-7000/year. *(Source: http://www.ddsindia.com/www/default.asp)*	
67	Smt Gangwar Manemma Village- Gangwar Mandal- Nyalkal District- Medak, Telangana	**Agro-Biodiversity** She had 3 acre of Erra Bhoomi (red soil)/land, which was almost like a waste land. She used to collect traditional seeds from all the places she went to work on, picked up quite an expertise in permaculture cultivation, drew strength from the Sangham, and changed the very face of her land. She says " By God's grace, and Sangham's help, we have brought fertility to our soil. We could raise 30 varieties of crops-Thogarlu (Redgram) - Eerra (Red), Nalla (Black), Aasha, Nadipi, Pundlu (Hibiscus) - Nalla (Black), Thella (White), Eerra (Red), Jawar (Sorghum) - Pacha (Yellow), Thella (White), Gareebu, Manchi Nuvvulu (Sesame) - 3 months crops, 4 months crops, Gaddi Nuvvulu (Sesame), Aargulu (Proso Millet), Kodi Sama (Little Millet), Thaida (Ragi) - rikka, mudda, Bebbari (Cowpea) - Pedda, Thella (White), Anumulu (Field bean), - Thella (White), Nalla (Black), Eerra (Red), Pesarlu (Greengram) - Chemki, Kitiki, Ganga, Minumulu (Blackgram), Korralu (Foxtail millet) - Eerra (Red), thella (White), Nalla (Nalla), Mansu, Poraka, Ulvalu (Horsegram) - Eerra (Red), Nalla (Black), Bymugulu(groundnut), Green leafs, Payeli koora, Doggali koora, Jonna chenchali koora, gangapayeli koora, tomatoes, Bendalu (Ladies finger), Sajjalu (Pearl Millet) - Gundu, Muthyala. Earlier, she had only four varieties of crops. She found mixed cropping as the best method as every crop does something to the soil, and helping other crops to grow, by way of providing safety against insects or enriching the soil with leaf fall. Further, it also gives security, in case one crop fails, there is always another one to sustain. It also provides varities of fodder to live stock, which keeps them them healthy and active. Through this method use of chemicals has been replaced by organic ones such as neem and chilli decoctions, and other natural agents to fight against pests and insects. Use of dung manure as well as vermicompost has enhanced the fertility and productivity of laddnd. *(Source: http://www.ddsindia.com/www/default.asp)*	Deccan Development Society, Telangana
68	Mr. Gudivada Nagaratnam Naidu Village- Balakrishnapuram District- Chittoor, Andhra Pradesh	**Cultivation in barren wasteland** Mixed cropping, organic farming and water saving technologies were adopted in three acres barren land. Mr. Naidu grows papaya– stacking up to 45 tonnes of this fruit seasonally besides flowers of 20 regular and exotic varieties which are transported to Bengaluru every day, and a range of vegetables including brinjal, okra, beans, tomato and green leafy veggies. Added to the list are guava, banana, five varieties of mango, coconut, almond, jamun and sapodilla. SRI is also practice for increasing the productivity of irrigated rice by managing plants, soil, water and nutrients. According to him, paddy requires water but is not a water plant as is generally believed; secondly, farmers plant too deep in the soil with their fingers. Whereas paddy seedling, grows better if placed on top of the soil as roots goes deep to the soil by its own in search of water. Precise distances between two plants and rows, and comparatively less water ensures that "the root will search for water and absorb micronutrients in the surrounding areas." Importantly, the number of seeds used per acre is far less in the SRI method of cultivation than traditional ways; while conventional farmers use 30 kg of seeds per acre, only 2 kg of seeds are required in the SRI method. He said	-

		"If one could collect the seeds wasted every year, we could feed the nation for 22 days," says Naidu. With the introduced of SRI, his yield of paddy is doubled. If 35 bags per acre is the maximum yield that a farmer gets, Naidu managed 92 bags. In 2008 for implementing organic farming practices in groundnut cultivation and generating a record yield of 95-110 kg pods from 2 kg seeds, and the best SRI farmer award from WWF Netherlands. *(Sources: http://www.indiagri.in/success-story.aspx?id=52* *http://www.indiagri.in/success-stories.aspx* *https://www.youtube.com/watch?v=7Ai98idgjiQ* *https://www.thenewsminute.com/article/meet-organic-farmer-who-converted-barren-wasteland-near-hyderabad-lush-farm-66992)*	
69	Smt. Chenamma Village-Antarahalli, Tubegere Hobli, Taluk-Doddaballapura, Bangalore	**Cultivation of improved variety Vegetables** She is having 7 acres (3.5 acres-Irrigated; 1.5 acre-Rainfed & 2 acre-agro-forestry-Eucalyptus)) of land holding, on which she started growing vegetables namely French Beans, Tomato, Peas, Radish, Brinjal, Chilli & Green Leafy vegetables since 2006. Presently she is growing improved French Beans varieties like Arka Suvidha, Arka Komal and Arka Anoop. All the three varieties were grown in her farm for past three years. The yield of French beans ranged from 16.5-17.4 tons per ha which is highest as compare to the production of nearby villages. Arka Suvidha variety fetched more price in market as it is a stringless variety. Based on the availability of labour, harvesting can be done after a gap of up to 5 days as the fruits of this variety does not lose its quality. In case of Peas and Tomato, she is using Panchagavya during the flowering stage, according to her it was found effective in control of flower drop. Panchagavya is made out of 5 Kg of Cow dung, 10 litre of Cow Urine, 1 litre Curds, 1 litre Milk, 1 Kg Ghee kept for 15 days while spraying mixed formulation at the rate of 1:10 ratio (Panchagavya: Water). Ms. Chennamma has taken up seed production in the current year. Generated seeds were supplied to the neighbouring farmers. She is also guiding other farmers in adoption of new technologies and under her guidance other farmers have also started growing different seasonal vegetable crops in the village and as a result they are getting better price in the market. For soil enrichment she has started using both bio-fertilizer (Phosphate Solubilizing Bacteria (PSB), Azospirillum &Azotobacter) and bio-pesticides (Pseudomonas fluoresces, Paecilomyceslilacinus & Pochoniachlamydospria) *(Source:https://www.iihr.res.in/success-story-smt-chenamma-innovative-vegetable-farmer-karnataka)*	IIHR, Bangalore
70	Shri Gomeshri Munda Village- Ulatu Block- Namkum District-Ranchi, Jharkhand	**Ajeevika Krishi Mitra providing information on sustainable agriculture practices** Gomeshri was trained to provide extension services and disseminating information on preparing NADEP compost, hanjeevamrit and other community-managed sustainable agricultural practices by the JSLPS team. Gomeshri received agricultural and non-agricultural trainings from JSLPS, such as system of rice intensification, system of crop intensification, non-pesticidal management and integrated nutrient management. He was also formally trained on book keeping. Gomeshri, like the other Ajeevika Krishi Mitra (AKM), was also trained on disseminating best practices through videos to SHGs. Some videos are also in the local language, Mundari. *(Source: http://www.indiagri.in/success-story.aspx?id=46* *https://www.youtube.com/watch?v=lA-QGC-qPps)*	Jharkhand State Livelihood Promotion Society (JSLPS)
71	Shri N.K.P. Muthu Village- Nagathasampatti, Taluk- Pennagaram, District- Dharmapuri, Tamil Nadu Ph: 09344469645	**Right crop for the right market** A small farmer, Mr. Muthu, grows jasmine and citrus in his 50 cents land and is able to earn more than Rs. 4 lakh per annum. All the crops are being grown using goat manure, farmyard manure, groundnut and neem cake. With five goats and five bulls the farmers face no difficulty in sourcing the inputs. The 25 citrus trees are pruned during summer and the fruits have a good demand in	-

	Mr. Madhu Balan Village-Nagathasampatti, Taluk- Pennagaram, District- Dharmapuri, Tamil Nadu Ph: 09751506521 Email: balmadhu@gmail.com	the market. All the crops are grown organically. Fish hormone is sprayed regularly over the crops. About 10 kg fish waste is mixed in 10 litres of sour buttermilk and allowed to ferment for 10 to 15 days in a plastic barrel and stirred periodically. It is then filtered and sprayed through a sprayer. Neem, pongam, nochi and eureka leaves are gathered, crushed and mixed with 10 litres of cow's urine and sour buttermilk and allowed to ferment for 10- 20 days and then sprayed over the crops as bio pesticide. The farmer says that the glossy appearance of citrus is due to this hormone, which makes the trees quite sturdy against pest attacks. Similarly, he grows off-season groundnut as intercrop in his citrus garden which is harvested during January. The organically grown three-seeded nuts are big in size and good in taste. Farmers come to his field to buy the nuts at Rs 3,000 per bag. He gets 10 bags of groundnut from 25 cents of land. This year he earned about Rs 27,000 as net profit for which he spent only Rs 3,000. The farmer has presently bought a piece of land near his village to take up citrus farming in a bigger way. *(Source: https://vikaspedia.in/agriculture/best-practices/sustainable-agriculture/marketing/right-crop-for-the-right-market-is-the-key-success-story-of-mr-muthu)*	
72	Village-Khoskadampur GramPanchayat-Kankalitala, Block-BolpurSriniketan, District-Birbhum, West Bengal	**Community managing the food forest in Khoskadampur village of West Bengal** The saplings were protected and nurtured by the group members over the years and they are reaping the fruits and other produces, which is equally shared among the members, especially during and after natural calamities when no other food is available. Vegetables, pulses, oilseeds, etc. are also cultivated as interim-crops which serves the day today food and fodder requirements. To sustain the efforts, food forest has been integrated with poultry and duckery also. *(Source: http://www.drcsc.org/resources/newsletter_6th_issue.pdf)*	Development Research Communication and Services Centre (DRCSC), West Bengal
73	Shri Avtar Singh District- Kapurthala Punjab	**Phagwara method of water in rice cultivation in Punjab** He has developed a farming technology called Phagwara method to deal with the rice cultivation related two major issues i.e. High-water intensity crop and GHG emissions. When tractor can move in fields then planking with suhaga (solid wooden plank) with extra weight on it should be done six times. Idea is to push air out of moist soil using pressure. Then with zero drill machine 8kg paddy seeds per acre should be sown and immediately after that planking should be done twice with extra load. First irrigation is required after 21 days and then second after 10 days. Usually, by this time rain starts and no sub soil water is needed. In Phagwara technique, anaerobic sowing of rice (ASR) is achieved by planking the soil repeatedly and heavily before and after using the drill machine for seeding. *(Source:https://www.iamrenew.com/environment/phagwara-method-saves-90-of-water-in-rice-cultivation-in-punjab/* *https://sandrp.in/2020/03/21/world-water-day-2020-top-positive-stories-from-farmers/)*	Guru Nanak Dev University, Punjab
74	Village- Farol Nagariya District- Firozabad, Uttar Pradesh	**Jal Budget Gaon** Farol Nagariya, a remote village in the Firozabad district of Uttar Pradesh, has declared itself a 'Jal Budget Gaon'. The title is prominently displayed outside the panchayat office. This village, which has just about a hundred households, has adopted a mix of budgeting and conservation techniques to tackle its water woes and improve the groundwater table. Each household has created soak pits for putting the waste water from the kitchen and the bathroom back into the ground. Besides, soak pits have also been created near hand-pumps. They have also planted trees around the hand-pumps. Earlier, a household that used 20 buckets of water a day, has cut down its usage by five buckets. This excludes the water they use for livestock. Residents of Farol Nagariya have also	

		constructed a check dam at a nullah in the village and dug up three ponds. Not only that they have placed an iron mesh in the nullah to prevent polythene and other waste items from entering river Yamuna.*Source: https://www.hindustantimes.com/lucknow/this-up-village-is-setting-an-example-with-its-water-budgeting-model/story-zEfHIE50AMT8fKC1hotQzK.html)*	-
75	Rati Ranjan Mondal Village- Nagrijuli District- Baksa, Assam	**Reviving traditional water harvesting structure** A *dong* is built by digging a canal in the earth, spanning from 3 feet to 10 feet deep depending on the topography and the distance from the point of origin at a river. A diversion-based dam is then created to divert some of the water into the *dong* that can stretch from anything between four kilometres to 15 kilometres and serve as many as four to five villages along its course. At various points along the dong, a form of sluice gate is built through which the water is channelled into a particular village as per the needs. Building dongs is a community effort and at least one person from each household joins in to dig the channels. Gravity makes water flow along the *dongs* that lead to agricultural fields and homesteads across villages. While the main *dongs*, which start at the rivers, are about 12-feet wide, smaller subsidiary *dongs* that branch off from the main ones are around three-feet wide. There are subsidiary *dongs* branching off from the main *dong*, which in turn have field channels or 'jamphai', diverting water from them. Sometimes it takes several days to dig one channel for the water from the river and it depends on the distance from the river to the particular area where the water flows. *Dongs* are opened for a specific period for a particular village so that the residents can use the water in their paddy fields and also store the water in the ponds in their backyard. They are opened for one week for one village and the following week it is the turn of another village. Every household in each village is supposed to send at least one member to work voluntarily on the dong to ensure 24×7 flow of water, failing which there are penalties imposed to the communities. *(Source:https://india.mongabay.com/2019/05/traditional-knowledge-to-the-rescue-in-water-scarcity-hit-assam/* *https://india.mongabay.com/2019/05/traditional-knowledge-to-the-rescue-in-water-scarcity-hit-assam/)*	Gramya Vikash Mancha (GVM)
76	Shri Mojhiram Village- Sapere Ka Pura Tehsil- Mashalpur District- Karauli, Rajasthan	**Water conservation** He has dug-up a large pond in front of his house with the help of other villagers to collect rainwater. Though the pond has dried up in this prolonged hot summer, the hand pump is still providing water to his family and other villagers. In Mardaikalan, a few kilometers from Mojhiram's village, more than 100 villagers erected a 60 feet-high mud wall in 2012 to harvest rainwater. This worked well and the pond slowly kept spreading. Today, even in this summer, the reservoir has water to serve the villagers and cattle. *(Source: https://www.news18.com/news/india/in-parched-rajasthan-digging-up-ponds-the-only-way-to-control-water-crisis-and-a-death-trap-2183021.html)*	-
77	Tiswadi, Bardez, Pernem and Bicholim villages, Goa	Goa's traditional water management To complement the water harvesting system, they also came up with simple but ingenious ideas to lift this water and use it it for irrigation, making use of rustic lever systems. One such tradition in Goa is called the 'laat' and it meets irrigation needs for chillies, coriander and onions. Today, this tradition of making judicious use of water continues, but only in rural pockets of Tiswadi, Bardez, Pernem and Bicholim where the system continues to be maintained in an intelligent and sustainable manner. During the monsoon, when the land is amply fed with moisture pits more than 3m in diameter are dug near fresh water bodies. These are locally referred to as 'honde'. Then to pull the water out, a lever system is fashioned out of the trunk of an arecanut tree where one end is	

		weighed down with a heavy stone. To the other end a bamboo stick with a bamboo basket is attached. When the stone weighs down the bamboo basket rises filled the water collected from the honde'. With time, the bamboo basket or 'kolame', as it is called, has come to be replaced with a tin box. *(Source:http://timesofindia.indiatimes.com/articleshow/68030349.cms?utm_source=contentofinterest&utm_medium=text&utm_campaign=cppst)*	-
78	Shri Vanrajsinh Gohil Village- Junavadar District- Bhavnagar, Gujarat	**Zero Budget Natural Farming (ZBNF)** He applied the dual methods of multi-layer cropping and SBNF to grow vegetables and fruits. Multi-layer cropping optimises the use of land as more than two crops of varying heights are grown in close proximity. He planted desi papaya seeds in the outer circle and Vegetables like brinjal, bitter gourd, turmeric, choli (beans), peanut, mung bean sprouts, cluster beans, sponge gourd and chillies in the inner circle. He used dry leaves as mulch instead of plastic sheets. Mulching is a gardening technique that suppresses weeds and conserves water in crop production. On the mulching sheet, he dug three feet deep holes at intervals where the seeds are sown. The deep holes prevent the crops from getting damaged during heavy rains. They absorb excess water and in turn recharge the groundwater. He also prepared jeevamrutham, a natural pesticide made from cow urine, dung and jaggery. He used 200 litres once every 15 days, for the plot of land. As per Palekar's observations, one gram of cow dung contains between 300 to 500 crore micro-organisms, which decompose biomass on soil and convert it into nutrients for the plants. In addition, he has opted drip irrigation method to water the crops, and that has reduced the usage of water by 70 per cent. *(Source:https://www.thebetterindia.com/196917/gujarat-farmer-zero-budget-natural-farming-double-income-organic-vegetables-india/)*	Palekar's organic farming, Ahmedabad
79	District Surguja, Chhattisgarh	**Women saving Agro Biodiversity** In 2005, a group of 20 tribal women farmers from six villages in the Surguja district in India's central-eastern state of Chhattisgarh, realized the threats to the survival of a traditional rice variety called Jeera Phool, and formed a self-help group to protect and promote it. Jeera Phool is an indigenous, superfine, aromatic variety of rice. The cumin-like grain is very soft in the mouth and remains flaky even after cooling. Its popularity gradually increased in local markets. The number of group members grew, and they eventually registered this variety with the Plant Varieties and Farmers' Rights Authority of India. The group then applied for a geographical indication tag (the JeeraPhool variety is primarily grown only in Surguja district), which was approved in March 2019 for a period of 10 years. *(Source: https://www.thegef.org/news/indian-farming-biodiversity-success-story)*	-
80	Mr. Samatbhai Aataji Dabhi Village- Bhuval Block- Daskroi District- Ahmedabad, Gujarat	**Cultivation of Local Variety of Small Gourd using Trellis System** Samatbhai used to cultivate Paddy, Sorghum, Bajra, pulses in kharif and crops like wheat, rapeseeds, bajra, fodder crops etc. during Rabi. In the first year, he cultivated seeds for local variety of small gourd and set up trellis by using wooden supports, cement poles, ropes and wires. He cultivated local variety of small gourd under trellis system using cow dung manure only. He used organic fertilizer and 20 Pheromene traps instead of chemical fertilizers to control fruit flies. He gave water four times a month through channel irrigation. Creepers rise after 40 days of sowing and the first lot of small gourds can be harvested after further 30 days. Thereafter, the crop can be reaped for six months at a stretch. From the second year, he planted a part of the creeper itself instead of seeds thus saving on cost of seeds. *(Source: Department of Agriculture and Co-operation, Gujarat state, Gandhinagar)*	Vegetable Research Centre, Anand Agriculture University, Gujarat

81	Shri Sanjay Kumar District- Palamu Jharkhand	**Locally made weeder with higher efficiency** He has developed a weeder which is very effective in removing field grass. This weeding tool is of 1-inch thickness and made up of hard iron. Both the edges of the weeder are sharpened for easy operation. The iron blade is fitted to a vertical wooden handle at an angle of 130^{O}. The length of the handle can be adjusted as per the height of farmer/farmwoman. This weeder is highly suitable for weeding in a standing position without putting pressure on waist. In addition, grasses like parthenium and nuthagrass (nut grass) can be cleaned from the field without body contact resulting into relief from irritation as well as skin diseases. Compared to traditional sickle, it is more effective as it can be operated like the pendulum of clock. Farmers of three villages are using this weeder. *(Source: Farmers innovations, ICAR, Kolkata)*	-
82	Shri Nilratan Kole Village-Deulpara, Bhanderhati, Block-Dhaniakhali, District – Hooghly, West Bengal Ph: 8900011191	Labour saving potato planting and harvesting methodology **with a handmade instrument** A handmade instrument with 32-inch hardy wooden beam and 4 iron shares. Instead of traditional single row planting he used to cultivate potato in paired row system with 27-inch bed where potatoes are placed in line made by the instrument with plant to plant spacing of 9 inch in the zigzag pattern. This instrument was used for making furrow for potato planting soon after land preparation, by adjusting the spacing it was again used for preparing irrigation cum drainage channel and at the time of harvesting it was driven by power tiller for exposing the soil. It was observed that by using this simple multipurpose instrument he got more profit in terms of higher yield and reduced cost of cultivation. This innovative farm equipment is made of 32-inch wooden beam with four adjustable holes for fitting of different sized iron share for different operations. During planting, two big size (9" x 5'') shares are fitted in two middle holes which function as making furrow for planting potato seed tuber and the other two small shares (7" x 3") are placed in two outer holes which are mainly used as a marker of irrigation channel. Two big size shares are again fitted in two outer holes 1 or 2 days after planting for making irrigation channel. Both these operations are managed manually. At the time of harvesting, again this instrument is used for exposing the soil. In that case the two big size shares are fitted in the two middle holes of the wooden beam and these will be operated by power tiller after fixing it behind with an iron clump. *(Source: Farmers innovations, ICAR, Kolkata)*	-
83	Mr. Krishna Kumar Tiwari Village & Post-Ukhara, Block- Bokhara, District-Sitamarhi, Bihar Ph: 09431499917	**Efficient enhancement of worms** Application of vermicompost in crop and vegetable cultivation has become a common practice among farmers of Sitamarhi, Bihar. However, gap between production and requirement often forces the farmers to apply much lower quantity of vermicompost than the recommended one. In view of enhancing the production of vermicompost without any additional expenditure, Mr. Krishna Kumar Tiwari of Sitamarhi district developed a method for its successful implementation. In this method, 10- 12 kg fresh leaves of Neem are added in the vermicompost pit and mixed thoroughly to allow the leaves to get decomposed. Water is added in the pit at a regular interval to avoid drying of leaves before decomposition. A decomposed green leaf of Neem enhances the working efficiency of worms. Addition of fresh Neem leaves in vermicompost pits enhances the population of worms to the extent of 25 per cent followed by increase in compost production of 15 per cent. Tolerance of worms towards low temperature is also increased to ensure round the year working efficiency of worms. Neem leaf decomposed vermicompost also helps in increasing yield of Toria as well as improving grain quality. Insect-pest infestation in brinjal is also reduced with application of vermicompost specially after pruning operation. *(Source: Farmers innovations, ICAR, Kolkata)*	

84	Smt Beraful Bibi District-Uttar Dinajpur, West Bengal	**Low cost duck house** A very low-cost duck/poultry house fabricated by Beraful Bibi of Uttar Dinajpur district, West Bengal has become a boon for the farmers. The house (2.5'x4.0') prepared with clay mud and straw can shelter 8 to 10 birds and protect them from heat and cold due to thermo regulatory capacity of the walls of the shed. Few small holes are kept in each wall which helps in better aeration inside the room. A small inbuilt food pocket is kept inside the wall just beneath the entrance. A thatched roof is prepared with locally available materials in the shape of a triangle to protect the birds from rain during night. In the case of attack by wild animals, a fencing of wire is prepared with a small wooden gate. As the construction of duck house involves very little cost, every household can afford to have it in the adjacent to their dwelling. The birds remain safe in all the season and egg laying birds/ducks can be hold back in the duck house to get the laid eggs. Feed can also be provided at a particular interval to maintain the body weight of the birds. Above all, more return can be obtained from rearing of birds/ ducks in such houses. *(Source: Farmer Innovation, ICAR, Kolkata)*	-
85	Shri Govindraj Village-Dandenahalli, Talluk-Magadi, District-Ramanagara, Karnataka	**Integrated Farming System enable farmer to earn Rs.60,000/ month from 2.4 ha land** Earlier, he use to cultivate finger millet and sunflower and used to earn around Rs.1.5 lakh per year. Under the guidance of KVK, Ramanagara he began cultivating integrated improved varieties of different crops. He has introduced new improved varieties of finger millet (MR-1 and MR6) red gram (BRG-1 and BRG-2) field bean (HA-4) and soybean (KBS-23). He also strengthened his livestock component by planting fodder cuttings such as Co-3, Co-4 and Chaya. Besides, he adopted labour and input saving practices like use of herbicides, seed drill for ragi sowing, IPM practices in vegetables and azolla production. Effective utilization of all these resources helped him to earn Rs.3.50 lakh/annum from poultry followed by banana (Rs.1.50 lakh/annum), dairy (Rs.0.82 lakh/ annum), tomato (Rs.0.60 lakh/annum), and finger millet (Rs.0.50 lakh/annum) during the year. With the diversification of crops and integration of livetock his earnings have now reached more than Rs. 7 lakh per year from the same piece of land. *(Source: Annual Report, 2017-18, ICAR, New Delhi)*	KVK, Ramanagara
86	Shri Subhash Divanchand Karir A/p-Hasnapur, Taluq- Rahata, District-Ahmednagar, Maharashtra Ph:02422-273511, 09271940320	**In-situ trash composting** He has developed a method of in-situ trash composting. The technology developed by him has been adopted by the sugarcane growers in the district as well as of the state. More than 250 farmers adopted trash mulching over 450 ha in the KVK operational area. The technology is economically viable, it reduces fertilizers cost by 35%. Further, it saves irrigation and increases yield of ratoon sugarcane from 80 tons to 95 tonnes per ha. Its benefit cost ratio is 3.92. *(Source: Farm Innovators-2010, ICAR, New Delhi)*	-
87	Shri Rajmohan Debnath P.O Sonatala, District-West Tripura, Tripura Ph: 09863626475	**Paired-row concept for cultivation of true potato seed** Paired-row concept for cultivation of True Potato Seed (TPS) is the innovation, in which TPS are sown in narrow inter space of 10 cm ×10 with 5 cm for plant-to-plant distance. A total of 100 plants per m2 were maintained in all cases. Two methods, transplantation and seedling tuber were used for producing of potato using TPS. This innovation is less laborious than a single row system, which need more time. Very high level of seedling maintenance is the major utility of this concept. Overall adoption is about 66% among potatogrowers of West District of Tripura. *(Source: Farm Innovators, ICAR, New Delhi)*	-

88	Shri Davinder Singh V. P. O. Nakodar, District- Jalandhar, Punjab Ph: 9872440130	**Intercropping onion with cabbage** Shri Davinder Singh invented technology of intercropping cabbage with onion. In this practice, cabbage was transplanted in December and onion was transplanted in the 2nd week of January. Seed rate for cabbage was 375 g/ha and for onion @ 2 kg/ha. The cabbage was transplanted on both sides of beds of size 2 feet. The difference between consecutive beds was also 2 feet. The onion was transplanted in lines 15 cm apart in between cabbage lines. He used only 30 kg/ha urea in two split doses of 15 kg each through the drip lines. He applied weedicides, and only two manual weedings were done in the field. He obtained about 300 tonnes/ha of cabbage (no yield reduction) and onion crop yield was the additional. *(Source: Farm Innovators-2010, ICAR, New Delhi)*	-
89	Shri Hrushikesh Giri Village- Gopalpur, Block- Bonth, District- Bhadrak, Odisha Ph: 09937780101	**Relay cropping in vegetables cultivation** In the relay cropping in vegetables, vegetables cultivation is followed from October to May (eight months). In the beginning two or more crops of different durations are cultivated in the same field. When vegetable of shorter duration is harvested second vegetable gets better space to grow. When second vegetable enters fruiting phase, a third vegetable is planted, and like wise with modified principles of mixed and relay cropping the farmers took 3 to 7 crops in same patch of land over a period of 8 months. The innovated model of relay cropping not only achieved scientific objective of crop management but also gave higher returns to farmers through relative advantages in space and time utilization, particularly when the proportion of up/medium land for vegetable cultivation is less. The utility of such model cropping also covers risk of uncertainty, enhances utilization of natural (land, water) and external (fertilizer, pesticide) resources as well as some times support eco-friendly crop management practice (e.g. the allopathic effects of garlic reduces disease chance in other crops in the same field). This practice reduces cost of cultivation and increases net returns from the same piece of land. The main utilities in this model are continuous flow of vegetables to market from the same piece of land. *(Source: Farm Innovators-2010, ICAR, New Delhi)*	-
90	Shri Jiblal Yadav Village- Chehal, P.O. Sarmatanr, Block- Jainagar, District- Koderma, Odisha	**Innovative sugarcane cultivation** In this innovative sugarcane cultivation, cane is cut into 2-3 pieces from the top and made in to bundle of 100 sets. Rest of the cane is used for jaggery purpose. A trench of 1-1.5 feet deep and sizable length and width is prepared in the field to place bundle of sets in the soil for sprouting. Ash and 10% Malathion or BHC or kerosene oil is applied in the surface of the trench in a single layer of bundle. The sets are covered with leaves and with trench soil. Irrigation is given after two days with cow-dung and mixture of Malathion dust and kerosene oil. After 2 weeks, sprouted sets are taken out and planted in a furrow by desi plough at about 1.5 feet (line-to-line) by end-to-end method. Sprouted sets are again treated either with Malathion or kerosene oil. While placing the sets, some soil is powered on the set by hand. After completion of planting procedure, planking is done. This method helps farmer save at least 2 weeks time, which can be utilized for making jaggery as well as for field preparation. Moreover, uniform set-setting is observed with higher yield and minimum insect-pest infestation. Farmers of entire Jainagar Block are practising this unique method in sugarcane. *(Source: Farm Innovators-2010, ICAR, New Delhi)*	-
91	Shri Jagnnath Gangaram Taluq & District- Aurangabada, Maharashtra Ph: 09421313616	**Cost effective shade net house** Shade net house was developed by Shri. Jagnnath Tayade from locally available iron material. Total height of the shade net house is 6m from center place, length is 36 m and width 24 m. The shade net house requires wire ropes. Obstacles within shade net are negligible which helps for smooth intercultural operations and	-

		easy movement of labour as compared to recommended one. This type of shade net house is suitable for growing heighted crops like capsicum, tomato, chili, etc. This shade net house sustains wind speed up to 80 km/hr and is economically viable as the total cost required to construct is Rs. 60000/- which become 30% less than the recommended technology and rain water is drained easily due to doom shape structure. At present 15 farmers had adopted this type of structure on 0.10 ha each and are taking seed production programme of capsicum and tomato. *(Source: Farm Innovators-2010, ICAR, New Delhi)*	
92	Shri Umesh Sood Village- Bashing, P.O- Babeli, Tehsil and District- Kullu, Himachal Pradesh Ph: 09816254302	**Panchagavya-A Bio-pesticide** For making 1 litres biopesticide, 500 ml Panchgavya (milk, curd, ghee, dung and urine of cow) + 150-200 ml extract of Ritha fruits and Neem leaves (50 ml Neem leaves extract + small quantity of gur + fermented wheat flour + 100 ml extract of Rith) + 300 ml cow urine (collected earlier) were taken. It is applied as 1 litre/100 litre of water 30-45 days after transplanting. The product exhibits action against insects as antifeedant, growth regulator, fecundity suppression and sterilization, oviposition repellency or attractancy, changes in biological fitness, and weaken the pests. All the ingredients of this bio-pesticides are natural and available on farm, eco-friendly, economically viable and leading to sustainable production system as a whole. It is a low cost and environment friendly bio-pesticide. *(Source: Farm Innovators-2010, ICAR, New Delhi)*	-
93	Shri Brijesh Vishwakarma Village- Jatwa, Block- Panagar, District- Jabalpur, Madhya Pradesh Ph: 0930038612	**Vermicompost Sieve** Vishwakarma established a vermi-compost unit in which he converts the farm and animal waste into quality vermicompost by using worms without constructing permanent structure and floor (used ground open surface by making of heaps). He also utilizes the space between shades for cultivation of cucurbits which helps to protect the worms from sunlight besides giving additional income and developed a hand operated device for sieving of vermicompost without damaging the worms. Minimize the input cost in making of floor and structures. It become easy and feasible for farmer, hence any farmer can adopt the same technology without much investment and efforts. Farmers can earn an additional income from cultivation of cucurbits. *(Source: Farm Innovators-2010, ICAR, New Delhi)*	-
94	Laxmidhar Mohanta Village- Basudevpur, Block- Sadar, District- Keonjhar, Odisha	**Yellow sticky pot trap** Developed yellow sticky pot trap by using locally available material i.e. earthen pot and mahua oil (Madhuca Indica). The outer part of the earthen pot was painted with enamel yellow paint and smeared with mahua oil. The pot was placed with wooden tag in the field @20 numbers per ha. The colour attracts insects and sticks to the pot due to stickyness of mahua oil. The performance of yellow sticky pot trap is at par with the trapping efficiency of white fly to commercial yellow sticky trap. It is cheaper, easy to prepare and eco-friendly; which controls significantly the viral diseases like little leaf in brinjal, leaf curl in tomato, YVMV in okra and mosaic in cucurbits, Further, it solves the problem of market unavailability of commercial trap. *(Source: Farm Innovators-2010, ICAR, New Delhi)*	-
95	Shri Anand Singh Thakur Village- Umariya Khurd, Post- Doodhia, Tehsil & District- Indore, Madhya Pradesh Ph: 09301301901	**Leaves decoction as bio-pesticide** Shri Anand Singh Thakur has developed a bio-pesticide. It is decoction of different type of leaves and other bio-materials. The components used were 5 kg leaves of Neem, Pongamiya, Custard apple, Ipomia, and Caiotropsis gigantia (Commonly known as Madar) (1 kg each) + 250 gm Garlic (mashed) +10 litre water + 10 litre Cow urine. He boiled it till it remains half of the total quantity	-

		(approx. 10 litre) and filtered. This decoction of 10 litres is dissolved in 600-700 litres of water and applied (sprayed) for 1 ha. Decoction is very simple to prepare and use. All the components are easily available at village level free of cost. Use of this biopesticide is very good to control the insect-pest (sucking pest, leaf feeders, etc.) of soybean and other crops. The use of this biopesticide does not harm beneficial insects and it helps the farmer to reduce the cost of cultivation also *(Source: Farm Innovators-2010, ICAR, New Delhi)*	
96	Shri Chakradhar Pradhan Village-Janhapada, Block-Attabira, District- Bargarh, Odisha Ph: 09861697336	**Stethoscope-now in agriculture** In medical science stethoscope is generally used to detect the heart beat of human beings and animals. Now it is used in agriculture sector by Shri C. Pradhan. The "Root borer" pest inside the plant could be detected through stethoscope. One can easily able to hear the cutting sound of the pest by keeping the stethoscope on the outer region of plant. It requires keen attention and a little patience. Accordingly, the needful curative measures like uprooting, soil drenching with pesticides are taken after detection of pests for protection of the affected plants. Stethoscope is used to detect the "Root borer" pest inside the plant. As a stethoscope is available in cheaper price (Rs 400/- only) and simple to operate, one farmer can easily use this. The farmers will definitely be benefited by practising this innovative method. They will easily find out the pests inside the affected plant by stethoscope. Then the pests can be controlled by taking the timely curative measures. Hence, now the use of stethoscope in plant sector is highly appreciated and widely accepted by the farmers. *(Source: Farm Innovators-2010, ICAR, New Delhi)*	-
97	Shri Surya Prakash Bahuguna Village & P.O Haripur, Near Harbertpur, District-Dehradun, Uttarakhand Ph: 09412147702	**'Amulya Amrit' for pest and disease management** A mixture of cow urine (5 litre), cow milk (0.5 litre), curd (0.5 litre), honey (200 g), green banana (5), coconut paste (1 coconut) and Ghee (50 g) are kept in sealed container. This mixture is kept in shade covered with wet gunny bag for three days. After three days, the gunny bags are removed and the container is opened to release the gas and stirred with stick. After stirring and releasing the gas for another 3-4 days, the fermented solution is filtered through muslin cloth. This solution is named as "Amulya Amrit" and used effectively against foliar fungal diseases and Lapidopterous borers in rice, mango, litchi, wheat, etc. The farmer is using one litre mixture in 5 litre of water in above crops for last 5 years. This mixture is used against foliar diseases in paddy, pulses, oilseeds and vegetables. It is very effective in these crops as compared to use of conventional insecticides. If this is used at lower level of incidence then further multiplication of diseases are checked. *(Source: Farm Innovators-2010, ICAR, New Delhi)*	-
98	Shri Narayan Singh Rawat Village & P.O-Gwaldam, Block -Tharali, District-Chamoli, Uttarakhand Ph: 09568505973	**Seed bio priming for early germination in cucurbits** In the mid to mid-high hills, it is very difficult to germinate the seeds in the Poly-tunnel up to February due to low temperature. The farmer places the cucurbit seeds tied in muslin cloth bag in raw cow dung heap for 5-6 days in last week of January. The heat and moisture of cow dung compels the seed to germinate early. Then these germinated seeds are sown in poly-bags and these poly-bags are also buried in raw cow dung up to 1/3 to 1/2 of the length. Polytunnel is also covered over the heap. This practice leads to early germination of cucurbit seeds in the month of February and is transplanted in the first to second week of March under open field condition when the chances of frost is over. Other farmers of nearby areas, are also using the technology for early season cucurbit production. It is highly feasible for early production of cucurbitaceous vegetables under mid to mid-high hill condition, where low temperature in late winters inhibits cucurbit seed germination. *(Source: Farm Innovators-2010, ICAR, New Delhi)*	-

99	Shri Didar Singh Dhillon VPO- Mahalon, District- S.B.S. Nagar, Nawanshahar, Punjab Ph: 09815118291	**Modified paddy transplanter** The float bed of transplanter was modified by removing float strips and fixing 1.5" angle-iron section of proportionate length for making passageway for mud underneath the float bed of transplanter. It was conceptualized that supporting plates attached beneath the float bed of machine were bigger/wider in size, thereby restricting mud flow beneath the float bed. So, narrower angle iron section can serve the purpose. Narrow plates attached beneath the float bed of machine offer less resistance to flow of mud. As a result, mud splashing and burying of planted seedlings while transplanting of seedlings in puddled field is restricted. *(Source: Farm Innovators-2010, ICAR, New Delhi)*	-
100	Shri Avtar Singh VPO -Kangrod, District- S.B.S. Nagar, Nawanshahar, Punjab Ph: 09463180285	**Modified pulverizing roller** While observing pulverizing roller attachment to cultivator attached to the tractor having cage wheel fixed to tyres, it was conceptualized that big size pulverising roller could be attached directly to tractor for better puddling and ease of operation. Accordingly, mild steel angle-iron were welded in four different sections on circular mild steel rectangular section with 50 mm mild steel axial shaft. Wooden bearings were used and mild steel frame was made for tractor hitching. The original pulvirizing roller takes more time for cultivation operation and planking. Modified machine with larger diameter roller is convenient to operate as its depth of penetration is less and there is more area for churning of puddle. Thus, it takes less time and consume less diesel in puddling operation. The innovator has sold more than 55 machines and is earning Rs. 15000/- per machine. *(Source: Farm Innovators-2010, ICAR, New Delhi)*	-
101	Shri Parma Ram Chaudhary Village-Chhatter, P.O- Jughahan, Taluq- Sundernagar District- Mandi, Himachal Pradesh Ph: 09805756261	**Multi purpose tiller cum puddler** Multi-purpose tiller cum puddler has been developed using the engine of an abandoned scooter (Lambretta) in the year 2009. The innovator has also fabricated puddler tines, tillers, ridge makers and a weed scraper for use in puddling, ploughing, ridge and channel making and weed scraping in wider spaced crops, respectively. The fabrication of this equipment along with different attachments was done at the cost of Rs. 21000/- only. The equipment resulted in higher efficiency of 0.064 ha per day in ploughing operation, 1.92 ha per day in puddling operation, 1.28 ha per day in ridge and channel making and 0.64ha of weed scraping operation in spaced crops. It can be efficiently operated using kerosene oil after initial ignition with petrol. This equipment uses 50ml petrol and 1litre Kerosene per hour covering 0.024 ha area for puddling, 0.08 ha for ploughing, 1 ha for ridging and channel making and 0.08 ha for weed scraping operations. The equipment is economically viable as it saves huge manual labour as well as draft power. *(Source: Farm Innovators-2010, ICAR, New Delhi)*	-
102	Shri Raj Kumar Village-Dalchera, P.O-Nain, Tehsil-Barsar, District- Hamirpur, Himachal Pradesh Ph: 09218723125	**Manually operated weeder-halodu** Farmers of the area use draft power for inter-cultural operations in maize. Due to diminishing practice of bullock rearing by the farmers, there was need of some low-cost technology as inter-cultural operations by tractors are costly and less effective in sloppy areas. Accordingly, the farmer developed the machine using second hand wheel and chimta of bicycle locally available in the area. Halodu is not only useful for weeding operation in maize crop but also for line sowing of maize as well as crops like spinach, sarson and coriander sown in kitchen gardens. Line sowing of maize with halodu takes only 3-4 hours per kanal area which is just one fourth compared to same operation with Kuddali or other manual implement. Halodu is also suitable for furrow opening in which fertilizer and seed can be put in lines manually. *(Source: Farm Innovators-2010, ICAR, New Delhi)*	-

103	Sh Amrik Singh Village-Chagran, Tehsil & District-Hoshiarpur, Punjab Ph: 01882-274313	**Vermi-compost and worm separator** Farmer has developed a small machine which can separate vermi-compost from worms very easily. This is having meshes of different sizes and there are two separate outlets for vermi-compost and worms. Machine is simple in design, low cost as well as labour and time saving. This machine is made of iron, pulleys, small motor and other locally available material. The machine is very useful for separating vermi-compost from worms very easily and effectively. As this saves time and labour, it can help in promoting vermi-culture in the farming community. It is new concept and with the popularization of vermi-culture, there is scope of its adoption by other farmers. *(Source: Farm Innovators-2010, ICAR, New Delhi)*	
104	Shri S. Amar Singh Village-Manuke, District-Moga, Punjab Ph: 09464217128	**Seed sowing drum in nursery bed** The developed nursery sowing drum consists of a heavy metallic drum attached to an iron stand. The metallic drum is deeply grooved all over. When a farmer pulls or pushes this drum on a well-prepared nursery bed, it makes definite grooves on the surface, in which seeds of any vegetable crop can be sown. The diameter of drum is 1.5' and length of drum is 2.5', handle is usually 3'. The apparent cost is Rs.2000/-. Drum sown seed were in straight lines, in controlled depth, improved germination of seeds and easily weeded in nursery beds. **Nursery transplanting machine** Machine resembles hand driven wheel hoe. Similarly, it has a wheel base fitted with solid cups. When this machine is moved on well prospered fields, it helps in making small pits to tram plant seedlings. This machine is especially helpful in transplanting seedlings raised in conical plastic trays. The approximate cost of the machine is Rs. 1000/-. It makes transplanting process fast. By adjusting at wheel base, the same machine can be used for adjusting plant to plant distance in different crops. It saves labour in transplanting of crops. *(Source: Farm Innovators-2010, ICAR, New Delhi)*	-
105	Shri Malayya Alambur Munti, Taluk Nanjangud, District-Mysore, Karnataka Ph: 09343871990	**Cocoon Deflosser** The Cocoon Deflosser developed by Shri.Mallaya has a mesh to glide the cocoons in front of the mesh. A rod of 6 mm is fixed and for easy operation of the device a universal joint is fixed. Operates with 0.25 hp motor. It removes outer layer of cocoon called floss is which hides the cocoons beauty that makes it accepted in the cocoon market for premium price. Removal of floss layer is an important process before farmers for taking cocoons to the market, which is laborious, time consuming and incurs high cost. This innovation by the farmers is simple to operate and portable. The cocoon deflosser could remove floss about 80 kgs per day which is double the capacity of normal machine introduced by research institute. It saves labour, time and is cost effective. Many sericulture farmers attracted to this device and there is huge demand for this device. Cost of the device is Rs. 5000/- and farmers could sell 400 such devices. *(Source: Farm Innovators, ICAR, New Delhi)*	-
106	Master Nisan Singh V. P. O. Kalyan, Tehsil-Malerkotla, District-Sangrur, Punjab Ph: 09814577999	**Marking roller** The roller is of five-inch diameter of MS pipe with width of three feet. On the circumference of the pipe, angle iron of size one inch and length three feet are fitted to break the small clods on the bed. On both sides of the roller, plain iron sheet of six-inch width is attached to make transplanting of nursery within the bed. This makes the manual as well as chemical weeding easy and safe. Two rings of six-inch diameter are fitted separately at distance of six inch from both ends of the roller. For marking equal distances on the bed, two pointers are welded on the circumference of rings	-

		in opposite direction. This equipment is helpful in sowing seeds and transplanting the vegetable seedlings in nursery at accurate spacing. It saves the labour thus reduce the cost of cultivation and also reduces the drudgery. *(Source: Farm Innovators-2010, ICAR, New Delhi)*	
107	Shri Chakreswar Bora Dachamua, Golaghat, Assam Ph: 9854585032	**Manually operated line/ row marker** Shri Chakreswar Bora has made an innovation in line/row marking. The farmers call it as computer technology because they are able to make lines at proper distance for sowing and planting of seeds and planting materials, respectively particularly in Rabi crops. The structure is made up of wood and bamboo. There is flexibility in adjusting the distance depending on the crops and varieties. It is manually operated and 4 to 6 lines may be made at a time. There are three models, two types of which are used by the farmers of Dachamua village and the other model is used by the farmers of Rajabari village of Golaghat district of Assam. In Rabi crops making lines is a time consuming and tedious job. High cost is involved due to more labour requirement and physical labour. With this innovation, 5-6 rows can be made easily and accurately in less time. Only two numbers of labourers are required to do the job, therefore, cost involvement is also less along with less physical labour. The farmers can also do the job without bending, thus work can be done comfortably without back pain. *(Source: Farm Innovators-2010, ICAR, New Delhi)*	-
108	Shri Tomo Riba Village- Regi, P.O Basar, District- West Siang, Arunachal Pradesh Ph: 09402249995	**Tool for rice cum fish cultivation** The system is used for controlling the passage or crossing over of the fingerlings from one plot to another plot with the help of small bamboo sticks fixed vertically nearby the outlet of water in semi circular manner. The outlet of water is also made through a piece of bamboo which may be of one node or two as per the bund thickness of the plot. This piece of bamboo is hollowed inside like a pipe and fixed beneath the bund by giving a slope as desired by the farmer for easy flow of water from the upper elevated plot. The 'Tape' is made with the net fixing as per the design upto the level of water in the field. The Tape is particularly used to control the crossing over of the fingerlings of middle finger or little finger size from one plot to another part so that the fish population can be maintained uniformly in the field. In normal rice cum fish culture, the farmer has to check the level of water at least once a day to keep the fingerlings intake inside the plot. As a number of hollowed bamboo nodes are fixed as per the size of the plot, checking the whole day is not required saving the day's labour. The total cost of the system is Rs. 180/- per plot. *(Source: Farm Innovators-2010, ICAR, New Delhi)*	
109	Smt Phalneikim Village Haipi, P.O. Kangpokpi, District Senapati, Manipur	**Water mill for pounding rice** Wooden log with incurved surface at one end and gradient of the flowing water is employed. In one of the adopted villages of KVK Sylvan, the community as a whole, use water mill for pounding of rice employing the gravity of flowing water of perennial stream as energy. In one day about 20 kg of paddy can be pounded. The technology is labour saving, cost effective and reduces drudgery of farm women. *(Source: Farm Innovators-2010, ICAR, New Delhi)*	-
110	Shri Chikkaboregowda Sathanur Taluk and District- Mandya, Karnataka Ph: 09341167703	**Roller and hooked hand weeders** Shri Chikkaboregowda developed two hand weeders – one is roller and another is hooked. The roller hand weeder is made of iron plate with a width of 10 inches and a pair of weeding rollers made of iron attached in the centre with 3ft handle is suited for weeding in SRI paddy. The hooked hand weeder is six inches wide with three hooks is suited for aerobic paddy/ragi cultivation. Many farmers	-

		are reluctant to adopt SRI method due to increased weed problem especially during the initial growth period because of wider spacing. The roller and hooked hand weeders developed by the farmer are effective, eco-friendly and practical in removing the weeds in SRI, aerobic rice and ragi cultivation. Further, reducing labour cost for weeding in every operation. These implements are being used by the farmers in the village as labour saving device. *(Source: Farm Innovators-2010, ICAR, New Delhi)*	
111	Shri Mipang Lego Village- Kangkong, P.O. Roing, District-Lower Dibang Valley, Arunachal Pradesh	**Manually operated adjustable row marker** A new manually operated winnowing fan was made by Shri Tokmin Perma for winnowing of harvested crops. It consists of 5 blades designed using scrap GI Sheets fixed on one end of an iron shaft. A gear is fixed on the other end of the shaft which gets it drive from the gear fixed on the end of the rotating handle, thereby rotating the blade. The whole set of the machine is mounted on a stand made of locally available wooden material. The cost of the operation per day is approximately Rs. 240/-. The winnowing fan can be used manually which saves time and labour by 80%. It helps in handling large quantity of farm produce within a short period of time in comparison to winnowing by traditional method. The net return per day is approximately Rs.360/- with a cost benefit ratio of 1:2.5. *(Source: Farm Innovators-2010, ICAR, New Delhi)*	-
112	Shri Mohan Lamb At Post- Chinchpur, Taluq Dharur, District- Beed, Maharashtra Ph: 09689984518	**Kranti spray pump** In the traditional knapsack sprayer efficient spraying was not achieved. Kranti spray pump consists a knapsack sprayer with three gears systems, low cost filtration unit, easily maintenance/ repair parts, (Foundation for tank) prolonged handle for getting more pressure, pressure chamber of greater size, lance with double nozzle with standard spacing. This Kranti spray pump was purchased by 300 farmers and used by around 1000 farmers. The repair and maintenance cost of this sprayer is less. This sprayer is gender friendly i.e. both male and female can easily operate this sprayer. With this sprayer pesticide requirement is less and spraying can be completed within time, reduces drudgery and economical. Income generated out of this innovation by the innovator was Rs. 120000/-. *(Source: Farm Innovators-2010, ICAR, New Delhi)*	-
113	Shri Kamal Kishor Kashyap Village-Bade Chakwa, District-Bastar, Chhattisgarh Ph: 09329747574	**Line sowing of minor millets through patta with tines** Bastar tribals having a liking for minor millets and are growing them for their own consumption. Traditionally they are sowing seed by broadcasting in upland situations in fertile soil and yield is affected due to poor management of the crop. Line sowing of minor millets manually is tedious and time taking operation and women are mainly involved in this work. Farmer has made patta with tines for easy operation and reducing the drudgery. The patta was fixed with tines making 8-10 rows with seeds sowing and is operated by bullock or manually. This patta made with tines from one side is used for sowing of seed and for leveling from another side after line sowing of the seeds. It has reduced the drudgery upto 40% and improved the work efficiency with reducing the labour cost. It is light weight and women's eco-friendly implement. This innovative technology is spreading horizontally in the farmers' fields who are cultivating minor millets in Bastar district. *(Source: Farm Innovators-2010, ICAR, New Delhi)*	-
114	Shri Kalloo Ghorse Village- Milanpur, Post- Betul Bazar, Disrict- Betul, Madhya Pradesh Ph: 08889705796	**Stacking of vegetables rolling and stretching type** An illiterate farmer of Betul developed the low cost, eco-friendly, handy stacking rods with stretching and rolling of iron wire for tomato and cucurbits cultivation. This device is made by welding and molding of iron rods at village level. They are using 6mm. thick	-

		rods stacking and 10 mm thickness rods for rolling wheel. The iron wheel for stretching and rolling of iron wire and stacking rod are very innovative, low cost, easy to handle, labour saving, eco-friendly and very useful for vegetable growers. The total cost of stacking device is just Rs 35000 per ha. It is a single time investment for 10-15 years with some write-off value. One day is sufficient for stacking of one-acre area with two labours. *(Source: Farm Innovators-2010, ICAR, New Delhi)*	
115	Shri Ramachandra Patrasaura, At-Pabliguda, P.O. Dasmantpur, District-Koraput, Odisha	**Marker for SRI method of rice cultivation** Developed marker is a low-cost marking device for SRI method of rice cultivation. This locally made marker is easily portable and very cheap in comparison to marker developed by agro industries. It is developed by using old bicycle rim, four pieces of bamboo stick and rope. It is operated manually. It marks points at a spacing of 25 cm in a line which is required for SRI paddy cultivation. Marker for SRI paddy is a low-cost implement. The device is very useful in hilly and terrain areas particularly when the paddy field is far away from the farmers house. This locally made marker is very cheap, easy to make, portable and good substitute for marker available in the Market. The cost of the device is Rs 150/-. *(Source: Farm Innovators-2010, ICAR, New Delhi)*	-
116	Shri Durai Siruvai, Post-Taluq Vannur, District- Villupuram, Tamil Nadu Ph: 09751582066	**Durai's modified Cono Weeder** Durai's modified Cono Weeder for SRI system is manually operated. It has one serrated round rotor with 30 cm x 1.4m dimensions and 2.5 kg weight. The serrated blades mounted with specified groove of central axis will help to increase or decrease the height of the rotors based on mud tightness. The removed weed is effectively incorporated in to the mud. Manual weeding even in SRI system gets extended beyond the defined period of weeding due to non-availability of labour. Cono weeder models available in the market are not helpful in limiting the weeds, better aeration to roots and enhance the tillering. However, Durai's modified Cono Weeder is capable of removing weeds and in-situ incorporation of the same, further facilitating continuous operation. It is easy to handle, cover 0.20 ha per day, reduces 13 labour cost per weeding, easy to operate due to its light weight and suitable for all types of soil. Moreover, it cost only Rs. 500/-. *(Source: Farm Innovators-2010, ICAR, New Delhi)*	-
117	Shri Shanmugasundaram Village-Kalleripatty, Taluq Attur, District-Salem, Tamil Nadu Ph: 09442782142	**Cage wheel type manual weeder for SRI** Cage wheel type manual SRI weeder for clay soil developed by Shri Shanmugasundaram consists short handle (3 ft), long wheel (5 ft diameter) and height (15 ft) weighing 10 kgs. It is adaptable, eco and gender friendly and efficient as compared to SRI weeder. Developed cage wheel type manual SRI weeder penetrates into high clay type of soils and removes the weeds very easily and efficiently. Weeding operation becomes easier when compared to the original SRI weeder and also reduces damage to the roots. Shri Shanmugasundaram is earning an amount of Rs. 15000/- per season by hiring cage wheel type manual SRI weeder for clay soil to other farmers. Further, this implement is being spread to other farmers in local village, nearby villages and other districts. *(Source: Farm Innovators-2010, ICAR, New Delhi)*	-
118	Shri S. Balaguru Vettaithidal, Post-Karunavoor, Taluq Mannargudi, District-Thiruvarur, Tamil Nadu Ph: 09442525236	**Marker for transplanting in SRI** Portable simple SRI marker is made up of 1" PVC pipe in triangle form and its length is 3.75 feet with marking of 22.5 cm uniform spacing. It is handy, weightless, portable and can be easily taken from one place to other. In the normal marker the marking is partially hidden and it is difficult to find the exact point of place at where planting has to be done, especially in heavy clay soil. One labour can simultaneously rotate the marker and plant the	-

		seedlings easily. Precision of space can be maintained uniformly throughout the entire field by using portable simple SRI marker. Further, it is easily rotated by a labour and hence the labours are not experiencing any drudgery. Normally under SRI system, for taking up planting of one acre 12 labours are needed for 8 hours. By using this marker only 6 labours are enough to complete the planting with perfection. Cost of this marker is only Rs. 350 per unit. In Vettaithidal cluster village 740 ha area cultivated under SRI and 230 ha area transplated using this marker. *(Source: Farm Innovators-2010, ICAR, New Delhi)*	
119	Shri M. Avaran Athavanad, District-Malappuram, Kerala Ph: 09446840750	**Micro sprinkler** A new micro sprinkler by Shri M. Avaran is from commonly available 3mm diameter micro tubes, a kerosene lamp and an old razor blade. Micro sprinkler is developed by fusing one end of the 3 cm long micro tube and making an incision just below the fused end. Discharge rate of the 3cm long micro sprinkler comes to 90 lph at the normal operating pressure of 1 kg/cm2 which produce half circle jets of 1m diameter. Received certificate from Department of Agriculture, Government of Kerala and appreciation from Kuttippuram Block Panchayath. Micro sprinkler is adaptable for all types of crops like plantation crops, fruits and vegetable. Water use efficiency increases with this micro sprinkler and thereby decreases the cost of irrigation. This sprinkler is economically viable because the input cost comes to only Rs. 2/-, while the drip emitters cost around Rs.18/- (for 3 Nos.). It is gender friendly. Clogging of drip emitters could be managed by this micro sprinkler. A total of 250 farmers adopted micro sprinklers and laid out in 200 acres. *(Source: Farm Innovators-2010, ICAR, New Delhi)*	-
120	Shri Annasaheb Udagavi Post-Sadalaga, Taluq Chikkodi, District-Belgaum, Karnataka Ph: 09342212732	**Chandraprabha's rain gun-sprinkler system with modified nozzel size** Developed raingun has a special LOPS nozzle which apply water over short as well as long distances. Also, there is a provision to choose nozzle size: 17, 19, 21 and 23 mm to achieve the required throw distance. For instance, a 17mm nozzle throws water up to 100 feet radius while a 23 mm nozzle can throw water up to 140 feet. Innovative Raingun saves 60 to 70 % water. Hence, it is possible to increase the irrigated area by more than two times using the same amount of water. Along with irrigation, the sprinkler can be used for application of fertilizers and plant protection chemicals simply by mixing them in the water tank. This can save a great deal of labour expenditure. More importantly, since the raingun has a three-inch pipe and a wide nozzle, even liquid composts such as biogas slurry can be applied to the crop. Since the water is applied with force, pests like aphids, white flies, scales etc., are effectively washed down. *(Source: Farm Innovators-2010, ICAR, New Delhi)*	-
121	Shri Vishwanath Tatyasaheb Patil At Post-Ambap, Taluq Hatkanangale, District-Kolhapur, Maharashtra Ph: 09823183833	**Refined drip irrigation system** Drip irrigation system is modified through refinement as per the need of different crops. Spacing between two rows of drip lines and the distance between two drippers and type of drippers is changed and the system is fully utilized for increasing yield of field crops and maintaining soil health. The diameter of drip line and also rate of discharge of water from dripper is modified in such a way that it is best fitted to each crop. This modification is made without disturbing assembly by maintaining optimum water pressure so that release of water at root level of each plant will be as per requirement. The technology is labour saving, easily adaptable, gender friendly with maximum water use efficiency which has enhanced productivity of different crops. The technology is best suited to different crops and intercrops like sugarcane, banana, soybean, groundnut, bengal gram and vegetables with easier fertigation applicability. The drip	-

		system is economically viable with cost of Rs 62,000 per ha having 10 years life so that per year price comes to Rs. 6,200 per ha. However, the increase in net profit went higher upto Rs. 55,000 per ha than initial. The method of changing spacing between drip lines and drippers along with their size and type and capacity of water discharge found to be highly useful in different crops with inter crops. The system resulted in saving of three nationally important wealth- water, fertilizer and electricity. *(Source: Farm Innovators-2010, ICAR, New Delhi)*	
122	Shri Tarapad Mahto Village-Palani, Block-Baliapur, District-Dhanbad, Jharkhand	**Modified lift irrigation system for enhancing water discharge** By lifting the out-let irrigation pipe up to 6-7 feet with support of bamboo, the flow of discharge was increased to a certain extent. Lifting the outlet pipe further (up to 30 feet) with support of bamboo and iron angle, the discharge of water was further increased and consumption of diesel has reduced to 25%. The modified approach drew the attention of district administration and the system was reinstalled with 8HP electric motor with an alternate 5HP diesel motor and 30 feet lifted pipe with the support of iron angles. Vegetable cultivation in the upper altitudinal areas of Baliapur block, Dhanbad district almost came to an end due to paucity of irrigation water. Though a sizeable land and production of vegetables were observed in the past, non-availability of water forced the farmers to stop vegetable cultivation. The alternate method of lift irrigation has not only assured water for vegetable cultivation but also helped the farmers earning adequate profit out of vegetable cultivation. *(Source: Farm Innovators-2010, ICAR, New Delhi)*	-
123	Mr. Sanjay Mahato Village-Baraghong, P.O Jamboni, Block-Jamboni Dist. Paschim Medinipur, West Bengal	**Alternate irrigation for cashew cultivation** In this innovative method, pitcher irrigation has been replaced with the plastic bottle of 1 litre water capacity tied to the plants. The bottles are filled with water in every week to ensure the water availability to the newly grown cashew plants. This simple modification brought down mortality rate to 4-5%. Moreover, earthen pitchers are costly, less durable and not easily available in the market. Replacement of pitchers with *used plastic bottle* reduced the cost of cultivation (Rs.11,000/- per ha) with assured availability and durability. In the newly planted cashew, generally FYM @ 5 kg per plant is used both as nutrient and mulching materials with pitcher irrigation during water stress condition. A large area has been brought under this new method and district Horticulture Department is in the process of large-scale dissemination of this technique. Area expansion through cashewnut cultivation in the wasteland of Midnapore district by National Horticultural Mission received setback due to prolonged drought like situation and ineffective mulching and irrigation systems. The innovative idea has helped in area expansion under cashew cultivation. *(Source: Farm Innovators-2010, ICAR, New Delhi)*	Horticulture Department, Medinipur
124	Shri Madhava Reddy Village-Karakampalli Gundlakattamanchi, Post- K.G. Satram, Mandal Bangarupalem, District- Chittoor, Andhra Pradesh Ph: 09866090081	**Village level fodder bank** In 2 acres of land, Mr. Reddy is raising 85 fodder varieties i.e Guinea, Napier and tree species. He has collected all the species from A.P, Karnataka, Tamil Nadu and Kerala states. For the past 12 years he is doing research on all these varieties and identified 40 Guinea (20 sps), Napier (15 sps) and Tree species (15) most suitable for cultivation considering the prevailing farming situations in Chittoor district. He not only works on cultivation of different species but also tested the palatability and yield improvement in milch animals. Shri Madhava Reddy's farm is a source of planting material to farmers, research farms, and other private Dairy farms. With the support of Animal Husbandry Department and Agricultural Technology Management Agency (ATMA), Chittoor, he supplied seeds and slips to about 10000 families in the district in addition to	Animal Husbandry Dept and ATMA, Chittoor

		neighboring districts like Kadapa, East Godavari, West Godavari and Nizamabad. He also motivates the Dairy farmers to take up fodder production through training programmes, radio talks, TV Shows and news items. He is identified as the resource person and farmer facilitator by the State Department of Animal Husbandry. His farm is regularly visited by the farmers, officials and Veterinary students of the University. *(Source: Farm Innovators-2010, ICAR, New Delhi)*	
125	Mrs Sephali Debnath Village-Samrucherra, P.O. Chebri, District West Tripura, Tripura Ph: 09863732251	**Storage of tomatoes through air hanging stalkes** She applied domestic storage technique of matured tomatoes at harvesting stage. The technique involved air hanging of stalked tomatoes on ceiling by tying with thread. Ropes with 1-2 cm diameter are tied on two side of bamboo pool. On the rope, tomatoes are tied with stalks is hanged keeping at least 6 feet height from the ground level and 2 feet below the roof with free air circulation. To protect direct light from the roof they kept ceiling of thick cotton cloth at a distance of 1.5 feet from the roof. This increases the shelf life of tomato upto 3- 4 months. This method involved less labour as well as time. Expenditure was only for thread and labour. Even though it is a new innovative approach, the adoption percentage is about 45%. The popularity is gaining very fast among the tomato growers of the West district of Tripura. *(Source: Farm Innovators-2010, ICAR, New Delhi)*	-
126	Shri Sirajuddin Village Biswastolly, P.O Chargoria, District-Uttar Dinajpur, West Bengal Ph: 9933504279	**Low cost vermicompost bed preparation** Generally, for preparation of vermicompost, concrete structure is advised which is costly and may not be feasible for the poor farmers to practice. Shri Sirajuddin made vermicompost pit of 4'x 2'x 2' which was erected using locally available materials like clay soil, cowdung, paddy straw, bamboo pegs and empty fertilizer bag (plastic made). Initially the specified structure was erected using clay soil. The outer and inner wall of the whole pit including the pit bed was coated with clay and cow dung and left for one or two days under the sun for drying and to make the structure hardened. The bed of the pit including the inner sidewalls covered with plastic bag (usually empty plastic fertilizer bag). An even layer of 4 inches paddy straw was used as base material. Bamboo pegs are used at four corners of the pit to keep the plastic erect to prevent the attack of red ants and mice. Use of locally available resources not only reduces the cost of bed preparation but also keeps inner temperature low, maintains optimum moisture level and make it is easy to maintain. As per the farmer the cost is reduced to one-tenth than the concrete structure. This method provided an appropriate solution for the aspiring farmers of the district to produce vermicompost in every household. *(Source: Farm Innovators-2010, ICAR, New Delhi)*	-
127	Shri Vinod Kumar Village- Gadi Majhila, Block- Kawakol, District-Nawada, Bihar	**Improving agricultural productivity through water harvesting** He excavated a pond measuring the dimension of 2m x 27m x 13m during the year 2013-14 with the help of NICRA project. After complete excavation, the rain water was harvested (stored) in the pond. During 2014-15, the stored water was utilized for transplanting kharif paddy in 1 ha and for supplementary irrigation in the dry spell. The fish culture was also started in the pond. The fruits and forest species were transplanted on the bank of pond. On bunds, pigeon pea was grown and harvested. On the side strips of the pond, vegetables were grown during kharif, rabi and zaid by utilizing stored water from pond as per need. The water was made available whole year in the pond due to automatic recharging capability of the pond. The farmer planned to establish dairy unit near the pond to start integrated farming for more income generation. Cost of cultivation of pigeon pea was Rs. 1350/- (0.2 ha) and gross income is Rs. 8700/- Cabbage and cauliflower cultivation contributed the total net income of Rs. 14850/- (0.2 ha). *(Source: Successful farmers, KVK, Endeavours, ICAR-ATARI, Kolkata)*	NICRA project

128	Sk. Abdul Hanif Village-Konnamoni, P.O. Sarenga, District- Howrah, West Bengal	**Vermicompost: An additional source of income** After participating in many capacity building programmes on vermicomposting and learned about the benefits, uses, composition and preparation of processes. He planned to compost organic wastes i.e. cow dung, green leaves, skin of vegetables, trunks of banana trees, water hyacinths etc. available with him. Mr. Hanif started vermicomposting at one corner of his upland field using good quality tarpaulin in the pit. The pit was 10 ft long and 3.5 ft width. At a time one ton of vermicompost materials could be produced from his pit. At initial stage, he purchased 2000 number vermin worms at the cost of Rs. 500 and also constructed a shade over the pit to protect compost from rain and sun. In 2009, he produced 5 tons of compost and earned a net profit of Rs. 16000/- from that produce. In next year, from 9 tonnes the earning was Rs. 25000/-. Ultimately, his production reached at the level of 15 tonnes per annum. The vermicompost production has become very popular among other farmers in his region and they are routinely using in their field for paddy, banana and vegetable cultivations. They purchased vermi compost regularly from him. Sale value is Rs.50,000/- and the input cost is only Rs.7000/-. *(Source: Successful farmers, KVK, Endeavours, ICAR-ATARI, Kolkata)*	Ambuja Cement Foundation
129	Ms. L. Mariswari Village Vadamalai, Kurichi District Viruthunagar, Tamil Nadu	**Promotion of Enterpreneurship in Biological control** She has produces around 10,000 reduviid bugs and released these bugs on pulse and vegetable crops of the self-help group farmers. She also gave reduviid bug culture to other farmers. Central government has recognised her team work during the year 2018 and awarded Entrepreneurship Award-2018 on the occasion of International Rural Women day celebration for coordinating with Self Help Group for utilizing biocontrol agents to control the insect pest of pulses and vegetables. *(Source: Manage, Telangana)*	NIPHM, Telangana
130	Shri Dugyala Bhaskar Rao Village- Nallabelly, Mandal- Wardannapet, Warangal Rural District, Telangana Ph: 9849112794	**On farm production unit of bio agents** She has produced 130 litres of Pseudomonas and sold 96 litres in the village. She has also produced 70 litres of Trichoderma and sold 45 litres to other farmers of his village. She has also distributed about 90 litres bio agents to farmers. (*Source: National Institue of Plant Health Management (NIPHM), Hyderabad)*	NIPHM, Telangana
131	Smt Sudireddy Karuna Village Gunturpally Mandal-Kamalapur, Warangal Rural District, Telangana State. Ph.No. 9704745667	**Trichoderma and Pseudomonas** NIPHM provided mother culture to Ms. Karuna and she has produced 108 litres of Pseudomonas and 73 litres of Trichoderma out of it. Of total prepared bio-agent solution, she has sold 74 litres Pseudomonas and 53 litres of Trichoderma. earned Rs.1650/-. By applying these bio- agents, she has obtained yield of 28 quintals per one acre while other farmers have obtained 24 quintals yield. *(Source: National Institue of Plant Health Management (NIPHM), Hyderabad)*	NIPHM, Telangana
132	Mr. Shajimon K.D. Village- Mukkulam Panchayat- Kokkayar, District- Idukki, Kerala	**Low Promotion of Micro Hatchery** Low cost hatchability incubator is 80 to 95% and the capacity is 101 eggs. It is operated with electricity and can be managed without electricity for 6 hrs. *(Source: National Institue of Plant Health Management (NIPHM), Hyderabad)*	Peermade Development Society
133	Shri Keshab Jena Village- Darabal, Block- Derabis District- Kendrapara, Odisha	**Farming systems double the income of marginal household through low cost interventions** He was cultivating greengram, blackgram, jute and some vegetables like brinjal, bittergourd and tomato after the rice in 0.7 ha area. Besides these, he was also having a mango plant, one desi cow, two bullocks and four goats. The milk yield of cow was only <2	On-Farm Research (OFR) unit of Kendrapara district under AICRP on Integrated Farming Systems operating

		litres/day. One small pond of 320 m2 was present in his farm from which he was harvesting only 10 kg of local fish. In general, the productivity of all crops, animals and fish was very low compared to standards. He then addresses the constraints of low yield crop cultivars, imbalanced fertilizer application, high incidence of pest and higher incidence of weeds in jute by replacing the local variety of paddy with high yielding JKRH-401 and Hanseswari, bitter gourd with sathi and tomato with deepti, balanced fertilizer application to rice, application of rhizobium and paper mill sludge to pulses, IPM practices with low cost yellow trap and ash treatment to pulses & vegetables and quizalfop-ethyl. Similarly, in livestock module, through promotion of Artificial Insemination (AI), integration of azolla for feed, use of albendazole for deworming and vaccination as per schedule. In fisheries, the constraint was identified as seasonal derelict pond with short culture period which was addressed by stocking of quick growing species of paccu and silver carps. Apart from these, backyard poultry with improved breed of vanaraja, duckery and paddy straw oyster mushroom was integrated. In the on-farm processing and value addition module, the house women were trained for making quality pickle from mango and ghee from the excess milk for which low cost inputs like hand blender/milk frothier were provided. The total cost of interventions in all the modules was only Rs. 8700/year which contributed for additional income of Rs. 25000/year. Within one year, the net return per rupee invested on interventions stands at 1.87. The household earns net income of Rs. 33, 900/- per year which is 92 % higher than benchmark. *(Source: http://iifsr.res.in/publication/success_stories)*	in Orissa University of Agriculture and Technology, Bhubaneswar
134	Smt Ramkali Village- Bachalikhurd Tehsil- Korba District-Bilaspur, Chhattisgarh	**System of Rice Intensification** Smt Ramkali agreed to take demonstration of SRI with 5% model. There was lot of pressure from her family to drop the idea but she resists the pressure. She prepared 5% model on his plot of 0.75 decimil and took up SRI. The average increase in production is about 16-20Qt per acre as compare to 8-10 Qt per acre previously. *(Source: http://www.carmdaksh.org/program.html)*	Centre for Action Research and Management in Developing Attitudes, Knowledge and Skills in Human Resources, Chhattisgarh
135	Shri Yogesh Annojirao Village- Chikakanagalu Taluk- Alur District- Hassan, Karnataka	**Tree based agriculture practices** In addition to this, 400 silver oak planted in his 4 acres of land, banana, arecanut, pepper, coconut, ginger and many different forest plants are grown using the water from the same farm pond. The scheme has helped the farmer to grow multiple crops and following integrated farming system, is almost a boon for the farmer. *(Source: SLNA Karnataka Watershed Development Department, Bengaluru)*	Pradhan Mantri Krishi Sinchayee Yojana, Bengaluru
136	Mr. Bassappa Hanumanthappa Torgal and Mr. Fakirappa Hanumanthappa Torgal Village-Chunchnur Taluka-Ramdurg, Karnataka	**Free Range Grazing and Cultivated Fodder Grazing** Mr. Bassappa Hanumanthappa Torgal and Mr. Fakirappa Hanumanthappa Torgal of Chunchnur village in Ramdurg Taluka are two traditional sheperds and brothers as well. The brothers amongst themselves own 201 sheep, 197 ewes and 4 rams, 10 acres of irrigated land and 6 acres of semiirrigated land. Of the irrigated 10 acres, sugarcane is grown on 2 acres and the rest used for cultivating fodder. The 6 acres of semi-irrigated land is also utilized for sugarcane cultivation. The sheep graze on free grazing land in ex change for droppings. In the evenings from 5 to 7 p.m. the sheep graze directly on the 8 acres of standing fodder land - mixed crop of maize, jowar and cowpea, section by section. The land is very well managed to provide fodder for their 201 adult flock and the additional young ones around the year. Their flock is robust and the healthiest among all the flocks of the village as the additional food, tops up their food intake from free grazing. The ewes conceive regularly and deliver healthy lambs. The lambs fetch	

		around Rs.1250 - 1300 each as they rarely suffer from diseases. Besides the food, the village livestock workers (VLW) now play a big role in this. These VLWs are in constant touch with the shepherds to vaccinate and de-worm their sheep and goats regularly and provide mineral supplement during pregnancy. But the brothers feel that even though the economic returns were higher per acre through shepherding, opted for mixed farming, keeping in mind the bio diversity needed to balance both the professions. The brothers are convinced that sheep husbandry with agriculture is more rewarding than pure agriculture. According to them the sheep unit should not exceed 150-200 with one person to graze 50 sheep and their lambs. This daring experiment of these two brothers has given a new challenge to shepherds in this area and a boost to fodder cultivation. *(Source: Shramik Abhibrudhi Sangh (SAS) is a unit of Jana Jagaran working in the Belgaum district of North Karnataka. Retrieved from https://keystone-foundation.org/wp-content/uploads/bsk-pdf-manager/Adivasi__Livelihood_114.pdf)*	
137	Mr. Kalden Singh Bhutia Village-Thangu, North Sikkim	**Conservation of domesticated species** He is a herder of Tibetan sheep. He started herding at the age of 13. His first herd consisted of only 225 sheep. With deep traditional knowledge and an indomitable spirit, Mr. Bhutia took a number of steps to conserve and propagate the sheep. He conducted awareness and sensitization programmes, constructed a sheep farm to accommodate 550 sheep and documented its genetic characteristics in collaboration with National Bureau of Animal and Genetic Resources. Kalden Singhi Bhutia is the first Sikkimese to receive the Breed Conservation Award from the National Bureau of Plant Genetic Resources. *(Source: https://www.in.undp.org/content/india/en/home/climate-and-disaster-reslience/successstories/IBA2018.html)*	National Bureau of Animal and Genetic Resources
138	Smt Parvathi Nagarajan, Naickar House Kottakarai, Aurovillae, Tamil Nadu Ph: 0413- 262 2333	**Sustainable use of biological resources** She works for environment protection, wellness and women's empowerment. She has joined hands with the Sustainable Livelihood Institute (SLI) to take regular 'Herbs for Health' classes for women in her area. She has trained women in her community to set up herb gardens, test and prepare herbal remedies, cosmetics and organic foods for their livelihood. These women now create awareness about plants and their medicinal properties, as well as local health traditions. Select indigenous medicinal plant species are also planted to ensure long-term sustainability. She has inspired many women in her region to join the cause. *(Source: https://pitchandikulamblog.wordpress.com/2016/09/05/pitchandikulam-people-parvathy/)*	Sustainable Livelihood Institute, Tamil Nadu
Unique practices of North East India			
139	Village Nsunyu, Block Tseminyu, District Kohima, Nagaland	**Use of logs, bamboo and stones for control of soil and water erosion in the hilly jhum cultivation:** In this practice, use logs, bamboo and stones for controlling soil erosion in the hilly jhum fields. Jhum system of farming is very popular in this region, which is one of the main factors of losing soil fertility. To check this, logs, bamboos and stones are laid across the slopes of jhum fields in rows at a distance of 10–20 feet (row to row), depending on the degree of the slope. Proper support of the laid log/bamboo is ensured to last for fields in rows at a distance of 10–20 feet (row to row), depending on the degree of the slope. Proper support of the laid log/bamboo is ensured to last for at least three years, as the farmers go up to third year. Thus, the soil erosion and speed of the run-off water are checked and moisture is conserved in the soil. This practice results in increased crop yield. The entire farming community of this region has been following this practice since time immemorial with certain modifications like	-

		planting colocasia, ginger, chilies etc. on the bund to strengthen the bund and serve as additional barrier as also to get additional harvest. *(Source: http://kiran.nic.in/nagaland.html)*	
140	Village-Kikruma, District-Phek, Nagaland	**Technique of rain water harvesting** This village has adopted a method of harvesting rain-water mainly for irrigation of paddy fields and also for use as a source of drinking water. The system is to harvest water in water harvesting ponds constructed locally and tapping run-off rain water through contour trenches. The method is simple but it is very effective. The technique involves construction of a channel parallel to the slope. Stones are also carefully laid at the bed of the channel to prevent gully erosion. Several parallel gradual sloping contour trenches are made in series on both sides of the channel. These trenches collect run-off water from the catchment areas and drain it into the channel that leads the water to the target field. During planting season of rice, the water collected in the pond is gradually released by cutting open a small section of the bund. It has been recorded that a pond of 3×2×2m size can irrigate terrace to yield 600 kg rice. This practice has received wide publicity since many areas covered under the system are by the side of highways. The system has been followed by all the villagers for the past 150 years. *(Source: http://kiran.nic.in/nagaland.html)*	-
141	Porba village Phek district, Nagaland	**Use of ash in terraced fields** The farmers mainly go for terrace field system of cultivation as water in this region is sufficient enough and they have adopted the use of ash in their fields, which prevents paddy from dying of unknown etiology after transplanting. In some fields, paddy does not grow well after transplanting and becomes yellowish, dies after a few days. But the farmers manage this problem by application of ash in the paddy field after about 2 weeks of transplanting. The reason could be neutralization of acidic nature of the soil in the field by ash. This practice has a very good effect, up to the extent of 70%. Around 80% of the farmers have been practicing this method for the past 20–25 years. *(Source: http://kiran.nic.in/nagaland.html)*	-
142	Porba village Phek district, Nagaland	**Maize seed treatment with soot to control insect infestation** In this practice the farmers use soot, the black carbon deposit from kitchen, as seed treatment for maize. This soot is collected and crushed into powder form, which is then mixed with maize seed at sowing. This method prevents the seed from being eaten up by a particular ant. Thus, the germination rate of seeds is greatly enhanced. It has the efficacy up to the extent of about 70%. The practice is in use for the past 20–25 years by about 70% of the farmers. *(Source: http://kiran.nic.in/nagaland.html)*	-
143	Phek District, Nagaland	**Zabo system of rice cultivation** It is indigenous method of water harvesting used by the farmers in Nagaland (Phek District). Zabo means impounding of water. It is an excellent system of rain water harvesting. It is generally practiced in holdings of 2.0 to 2.5 ha. The catchment area is under permanent vegetation. Water body is 0.2 ha area pond of 1.5 to 2.5 m depth (shallow) located below the catchment area with a suitable silt trap. The bottom and sides of the pond are rammed and compacted to reduce seepage losses. The water so stored is let into the rice fields located in the lower elements of the slope. This area would be 0.2 to 0.8 ha (Nagaland). *(Source: http://kiran.nic.in/nagaland.html)*	-

144	Wokha Distrcit, Nagaland	**Multiple cropping in jhum field** The practice of multiple cropping in jhum field is followed by farmers of Wokha district in the state of Nagaland. Jhuming is still popular in this region and in order to get higher production and sustainable farming, multiple cropping system has been adopted, where 20 to 40 or more items of crops are grown on the same plot of land as intercropping with paddy as the main crop. To demarcate the boundary from the next farmer job's tears millet is sown around his own plot. Then, maize, sesamum and vegetable and other crops are sown in line as the filter strips whereas colocassia and ginger are also sown in line as contour vegetative hedges in order to conserve soil and water and also help form bunds at certain spacing in rows. The leguminous crops, specially the beans, are grown on every standing staking that are kept purposely at the time of jungle clearing. Harvesting of such crops start right from May and June. And for seed or marketing purposes it will be harvested in December. Some of the cucurbits and the tuber crops are grown as the cover crops wherever necessary and chilli is grown only on certain locations. These systems are practiced for higher production and economic return, and as soil-and-water conservation measures. With this practice, the economic return of a given area is increased by at least three times. Most of the farmers have adopted this practice and it is in use for about last 20 years. *(Source: http://kiran.nic.in/nagaland.html)*	-
145	Jhumia of Khonoma village Kohima district, Nagaland	**Alder tree-based farming system in Nagaland** The Jhumia of Khonoma village plant alder trees in the jhum cycle area and traditional agricultural crops basically with the idea that their root nodules improve soil fertility by fixing atmospheric nitrogen. It also increases crop yield and reduces soil erosion, besides providing sheds to plantation crops like coffee at lower altitude and cardamom at higher altitude. Normally, a Jhumia cultivates the field for 2 years within a 9 years span, but the alder-based system allows two harvests in every 4 to 5 years. The system involves pollarding of alder trees in two phases i.e. (i) Initial pollarding and (ii) cyclical/ subsequent pollarding. This practice has been in use since about 100 years by the whole community. *(Source: http://kiran.nic.in/nagaland.html)*	-
146	Medziphema, Socünoma, Kukidolong, Jharnapani Dimapur District Nagaland	**Chopping off the paddy at nursery stage to control infestation thrips** To protect the paddy from the damage caused by leaf-tips thrips as well as to control lodging problem, the farmers have adopted the method of chopping off the paddy at nursery stage. Thrips infestation has been observed to be a common problem in almost all the paddy-growing areas of Nagaland. This insect generally attacks the paddy from the tips, sucking its moisture/water content, which results in subsequent drying up of the paddy. The general practice developed is that the tip of the paddy is chopped off which discourages the insect to have its initial attack. Lodging problem is minimized, as initial tilting of the paddy stem is avoided by the practice. This technique has been developed by the farmers over the years which has been found to have a good effect up to the extent of 40%. Almost 100% of the farmers are practicing this for decades. *(Source: http://kiran.nic.in/nagaland.html)*	-
147	The farmers of Razuphema, Zubza Dimapur and Kohima districts, Nagaland	**Use of dhatura stems and leaves to control stem borer infestation in paddy** The farmers of this region have devised their own means to control stemborer infestation by using dhatura stem and leaves in the paddy field. Stemborer infestation in paddy is very common in Nagaland. The indigenous tribal people of the state are normally not very keen to apply chemical insecticides/ pesticides, mainly	-

		due to its cost factor as well as attitude of the people to grow paddy mostly under organic farming system. The practice is to spread dhatura leaves and stems (cut pieces) in the paddy field particularly on observing the stemborer attack. The water in the field is then blocked through bunds so that the dhatura stems and leaves spread and get decomposed. These decomposed leaves and stems get circulated throughout the field, which acts as a repellent to the stem borer, thereby saving paddy from severe damages. The practice has been in use since time immemorial, but about 40% of the total farmers only use it due to non-availability of dhatura plant. Alternatively, the farmers drain out water from the paddy field when the infestation occurs, and it is allowed to dry up after which fresh water is pumped in again. *(Source: http://kiran.nic.in/nagaland.html)*	
148	Village-Muktapur, District-Jaintia hills, Meghalaya	Bun system of cultivation: Under this system, the crops are grown on a series of raised beds locally referred to as "Bun" formed along the slope of the hills. The phytomass is collected on the raised beds along with the soil and burning follows after exposing and drying over a period in dry season. The entire shillong plateau has been denuded by this method of cultivation (Source: http://kiran.nic.in/indigenous_farming.html)	-
149	Village-Muktapur, District-Jaintia hills, Meghalaya	Bamboo drip irrigation system: Water application on hill slopes for irrigation of plantation crops poses a serious problem of soil erosion. The tribal farmers have developed the indigenous technique of bamboo drip irrigation. Betel vines planted with arecanut as the supporting tree are irrigated with this system, in which water trickles or drips drop at the base of crop. *(Source: http://kiran.nic.in/indigenous_farming.html)*	-
Ethnoforestry And Indigenous Fallow Management Practices			
150	Wancho Community of Arunachal Pradesh	Among Wanchos of Zadua mainly two agro-ecosystems i.e. terrace cultivation and jhum or shifting cultivation are prevalent. Out of which terrace cultivation is of recent origin and started just 30 years ago. Jhum is practiced for generations and developed through hundreds of years. **Shifting cultivation or Zhang of Wanchos** Zadua village is still maintaining 10 years jhum cycle and total village resource area used for jhum is divided into 9 resource areas. Each jhum area is cultivated for two years. The major crops of the first year are millet, kochu, tapioca, beans, leafy vegetables, mustard, potatoes and few varieties of rice. After harvesting of these items, rice is sown as the 2nd year crop without mixing. After harvesting this crop field is abandoned as fallow land. Every year two jhum areas are under cultivation. **Jhum fallows** Fallow is necessary for continuous and successful jhum cultivation. It allows natural regeneration and succession, allows the soil to replenish its natural fertility through litter decomposition, organic matter deposition and nutrient recycling. Mature Jhum fallows are important resource areas providing continuous supply of livelihood needs like fuelwood. Sufficient fallow period not only help to minimize the pressure on community reserved forests but also helps to get the NWFPs from the fallows. **Honeyem: Traditional agroforestry practice for fuelwood** Practices like Honeyem are traditional fallow management systems. Community forests are small forest patches spread over the village resource areas and generally non-exploitable. Only large timber with community's collective decision could be harvested. Therefore, for NTFP needs and daily requirement of fuelwood people rely on regenerating fallows of varying maturity. Practice of selection and maintaining seedlings; starts from second year of cultivation in	-

		jhum fields. Second year crop is pure rice; but field ready to sow rice is kept empty for a month or two after harvesting of Kochu, millet, vegetables and other first year jhum crops. In these empty field natural regeneration of Puak i.e. Macaranga denticulata and Puakmi i.e. Mallotus tetracoccus takes place profusely. These seedlings are kept and rice is sown in between these seedlings and allowed to grow. Automatically seedlings are nurtured properly during first year. This management system of allowing these species to grow with rice is called 'Honeyem'. Keeping and maintaining these two species is very important, as these two are mostly used fuelwood species of Wanchos, which are fast growing and giving yield within 4 to 5 years. Overcrowding of naturally regenerated seedlings of this primary colonizers is managed and only healthy seedlings are kept. During one full season of rice cultivation in the jhum fields; these seedlings are nurtured along with rice. The fallow management system Honeyem serves three purposes a. it increases soil quality b. it checks soil erosion c. gives fuelwood and timber very quickly i.e. within 4 to 5 years. **Loham** In the jhum fallows another system of maintaining palm groves is 'Loham' (Livistona jenkinsiana). Dried Livistona palm leaves is the very important house building material. Wancho know cultivation of this palm traditionally. Each family or clan maintains the 'Loham' ranging from 15 to 20 trees to 50-100 trees in each. In the community forest areas, after the timber extraction, certain areas are available, palm cultivation is done on such areas for the community. Zadua village has got a very large Loham consisting of more than 200 palm trees. In 'Duthongling' community forest area such palm groves are maintained permanently. But before cutting a palm grove for jhuming another fallow or opened up forest area, is planted with Livistona jenkinsiana plants. *(Source: http://www.fao.org/3/XII/0432-A1.htm)*	
151	Mr. Shyam Sunder Paliwal Village-Piplantri District-Rajsamand Rajasthan	**Eco-Feminist village** According to Mr. Shyam Sundar Paliwal, former panchayat (or village head) of Piplantri in Rajasthan, the birth of a girl child is celebrated with the planting of 111 trees. This initiative has transformed the ecology of the village. Once a completely barren village in the desert state of Rajasthan, Piplantri now has over 300,000 trees, which has not only ensured better air quality and attracted biodiversity, but has also brought water back to ground level when it had had fallen almost 800 feet below. Piplantri has become a model village which conveys a very strong social message to villages across India that the birth of girl children is a cause for joy and celebration. *(Source: https://www.youtube.com/watch?v=l_Hx0c7CVAg* *https://www.youtube.com/watch?v=guGxruFZ9_I)*	
152	Village Thausang, District-Gajapati, Odisha	**Thausang Village - Improving Skills through Participatory Development Technology (PTD)** Farmers are engaged in collective purchase of seeds, bio-fertilizers and other agricultural equipment as they have realized the benefits of collective bargaining. A lot of group activity was seen in the villages group nursery, shared transportation, collective irrigation, ploughing, harvesting, and threshing, etc. which is leading to improved labour productivity and effectiveness. According to the farmers they are able to observe more clearly, analyse the issues, draw lessons and take decisions in a group e.g. improved varieties, seed germination tests, healthy seedling characters, etc. Revolving funds are being utilized efficiently and this has facilitated reduction in financial vulnerability which is enabling them to take up agricultural activities and inputs on time. According to the	

		farmers who were involved in the PTD process, non - PTD farmers in the village who were earlier reluctant to join, are now eager to practice the proven technologies. Women have become more self confident and share their experiences and learnings with others. They are highly motivated to continue this process and learn more. According to the villagers, the process has strengthened community cooperation, self confidence, and social capital in the village. Besides, the process has improved the linkages with neighbouring villages and helped the cross-learning process. Green manure and local organic matter (green leaf/straw) mulching have been taken up to address the non-availability and high cost of Farm Yard Manure (FYM) and group nurseries have been set up to meet the entire village requirement. The uniqueness of the program is that the information on farming practices is being spread by the farmers themselves. Prior to PTD, the villagers were engaged in Jhum i.e. shifting cultivation. Presently, the entire forest area around the village is covered with cashew plantation. Through PTD, the villagers learnt seed treatment, composting and other agriculture related information like plant gap and green mulching. This information they now share with other farmers thus realizing the PTD objective of encouraging farmer to farmer training and information dissemination. The village also has a big nursery with close to 40,000-50,000 saplings of coconut, mango, drumstick, gooseberry, lemon, pomegranate, teak and cashew. *(Source: Centre for Community Development (CCD), Gajapati in Orissa. Retrived from https://keystone-foundation.org/wp-content/uploads/bsk-pdf-manager/Adivasi__Livelihood_114.pdf)*	
Biodiversity Conservation Champions			
153	Gram Panchayat-Kolayad, District-Kannur, Kerala	**Kolayad gram panchayat wins KSBB's best BMC award** Kolayad grama panchayat of Kannur district has bagged the award for the best biodiversity panchayat in the state for its projects to conserve biodiversity and safe disposal of plastic wastes. The panchayat, located in the eastern hill areas of the district and closer to the forest, took the biodiversity conservation drive in earnest, preparing a green protocol bylaw which allows the panchayat to impose fines on people violating it. The villagers impose fine to ensure compliance of measures under the green protocol. The green protocol by-law was prepared after detailed discussion at all levels in the panchayat. The panchayat's permission is required for holding any function including marriage reception if more than 100 people attend it. Plastic carrybags and other disposables have been banned and ballpoint pens and plastic bottles barred from schools. Ward-level member volunteers in the panchayat, monitor the protocol's compliance and the public is encouraged to send pictures of violations to the panchayat authorities' Whatsapp accounts. A major highlight of the conservation activities initiated by the panchayat is its strict intervention to stop direct pumping of water from two small rivers by local farmers for irrigation during summer. The panchayat dug 12,000 rain pits last year in an area that faced acute water scarcity. *(Source:https://www.thehindu.com/news/national/kerala/a-success-story-in-biodiversity-conservation/article19119532.ece)*	
154	Gram Panchayat-Pithaurabad Block/Tehsil-Unchahara District-Satna, Madhya Pradesh	**Biodiversity and Food: Pithorabad Gram Panchayat** A situation where 110 indigenous varieties of paddy are on the verge of extinction. Many strains had already been lost. Hybrid varieties were taking over the fields. Along with the disappearing traditional varieties, their intrinsic medicinal value, and even the knowledge of these values, was being lost. The Pithorabad Biodiversity Management Committee (BMC) was set up in 2013 to fight against the extinction of indigenous varieties. The BMC conserves around 115 traditional types of paddies, 32 varieties of vegetables, and medicinal plants. The committee has helped identify local flora	

		and fauna and associated traditional knowledge, which have been documented in the People's Biodiversity Register. It has established a community seed bank and facilitated value addition in the form of marketing for selected products like organic wheat. Varieties of traditional paddy collected by the BMC along the Narmada belt of Madhya Pradesh were distributed among the farmers for in-situ conservation. *(Source: http://www.indianaturally.in/stories-of-past-winners)*	
155	Village-Singchung Arunachal Pradesh	**Singchung Bugun Community Reserve Management Committee: Conservation of Wild Species** It is only 22 cm in size but the Bugun Liocichla, a critically endangered bird, is hard to miss. It is an olive-grey bird with a golden streak beside both eyes, as well as golden and vibrant red patches on wings and tail. It also has a distinctive fluty call. Just 14 to 20 of these birds are known to exist. They are found only in the Singchung village of Arunachal Pradesh, in the northeast of India. Over the years, activities like timber extraction, forest clearance and infrastructure development have threatened its habitat. The Singchung Bugun village community reserve management committee, formed in 2012, is using its traditional knowledge to protect the bird and its habitat. The committee makes sure that young people are involved in awareness generation, joint patrolling, rescue, rehabilitation and promoting ecotourism. *(Source: https://www.in.undp.org/content/india/en/home/climate-and-disaster-reslience/successstories/IBA2018.html)*	
156	Village-Yaongyimchen District-Longleng, Nagaland	**Lemsachenlok Organization: Conservation of Wild Species** The Lemsachenlok organization, set up in Nagaland in 2007, works towards the conservation and protection of wildlife, and for sustainable resource management. The organization has successfully created an 8-10 sq km community conserved area to encourage coexistence and reduce human-wildlife conflict. Local communities have stopped using guns and catapults and the organization has imposed a ban on logging, hunting, fishing and trapping. The village has now become a safe haven for 85 species of birds, including Amur Falcons. Though these little raptors are not endangered, hundreds of thousands of birds were found massacred earlier in the decade. 15 species of frogs, as well as the Indian Leopard, barking deer, sereow and otters are also protected by the community. *(Source: https://india.mongabay.com/2018/06/two-conservation-communities-from-northeast-india-win-biodiversity-awards/)*	
157	District Medak, Telangana	**Sangham Women Farmers Group: Sustainable Use of Biological Resources** The Sangham Women's Farmer Group in the Medak district of Telangana has been working towards the conservation of agro-biodiversity for the past 15 years. The women cultivate and conserve traditional crops and have set up community and individual seed banks. Using traditional knowledge in their farming practices has not only helped sustain them through harsh droughts, it has also helped to get food security. Since then, they have not faced a single instance of crop failure. These women have also started the Millet Sisters Network to conserve and preserve different varieties of millets, with the produce organically certified and packaged for marketing in the urban areas. A millet café has also been set up by the group to sell millet muffins, cakes, snacks and sweets. They've also started a community radio that plays the traditional songs of sowing, harvest, health, nutrition representing a farmer's life cycle. *(Source:https://www.in.undp.org/content/india/en/home/climate-and-disaster-reslience/successstories/IBA2018.html)*	

158	Village-Raipassa District-Dhalai Tripura	**Raipassa Biodiversity Management Committee, Tripura: Sustainable Use of Biological Resources** Villagers of Raipassa depends on the cultivation, collection and sale of broom grass for its livelihood. The villagers collect about 50 tonnes of broom grass per season, and sell it at Rs. 22/Kg. Realizing the economic and ecological significance of the bio-resource, the Raipassa Biodiversity Management Committee signed an agreement with commercial users. According to the agreement, 5 percent of the total proceeds from the sale to be transferred to the Joint Forest Management Committee, responsible for collecting the resource. The BMC and the Local Biodiversity Fund share 2 percent of the proceeds, while one percent is transferred to the state biodiversity fund. The BMC ensures that bio-resources of the area are traded in a manner that is both commercially and environmentally viable. *(Source: https://www.in.undp.org/content/india/en/home/climate-and-disaster-reslience/successstories/IBA2018.html)*	
159	Gram Panchayat-Eraviperoor, Block-Koipram, District-Pathanamthitta, Kerala	**Eraviperoor Gram Panchayat, Kerala: Biodiversity Management Committee** The Eraviperoor Biodiversity Management Committee (BMC), constituted in 2015, a model of a multi-stakeholder partnership in local biodiversity conservation, sustainable management of water resources, promotion of renewable energy and enhanced livelihoods. The BMC has rejuvenated a tributary of the river Pampa, successfully recovered 13.5 acres of river bank and shown exemplary work in plastic waste management with support from the Government of India, agencies, civil society organizations and academic institutions. It has also successfully revived the traditional cultural practice of boat racing. With innovative ideas and an optimistic vision, the BMC has also leveraged financial and technical resources, and plans to become carbon neutral by 2020. *(Source: https://www.in.undp.org/content/india/en/home/climate-and-disaster-reslience/successstories/IBA2018.html)*	

Table 3: List of award-winning SLEM practitioners

S.N.	Name	Area	Innovation/expertise	Detailed link
1	Mr. Uma Shankar Pandey Village- Jakhani, Block-Mahua, District- Banda, Uttar Pradesh	Water conservation	He is known as pioneer for jal gram. He has formed Sarvoday Adarsh Jalgram Swaraj Abhiyan Samiti'. The samiti started to make people aware of conserving water. Along with this, the water earlier being wasted flowing from the village-house-gutters had then been directed toward the farms through the newly made drainage-system. This water reached the farms, so began to be utilized. Even though the farmers of Jakhani have no formal degree, no proper education, their method of water-conservation— 'khet ke oopar med, med ke oopar ped' (ridge on the farm, tree on the ridge) in the draught stricken region of Bundelkhand is nevertheless evidencing them to be more educated even than the researcher of any university.	https://jalgram.org/true-story-of-the-jalgram-jakhani/
2	Mr. Jadav Payeng Village-Majuli, District-Jorhat Assam	Forest conservation	He is known as the '*Forest Man of India and recipient of Padma Shri*'. He went on to plant saplings and seeds along a dry sandbar by the Brahmaputra in Assam, creating a Molai forest that stands at 550 hectares.	https://www.youtube.com/watch?v=7vPFF03JC20&list=PLUNElt1CboQN-jVXJI0Y_YzKzYw9tP_71&index=4 https://www.youtube.com/watch?v=U1jtd3MrFQM&list=PLUNElt1CboQN-jVXJI0Y_YzKzYw9tP_71&index=3

3	Mr. Ranaram Bishnoi Village- Ekalkhori, District-Jodhpur, Rajasthan	Plantation and Management of land resources	He has planted more than lakh saplings of Khejri tree and also produced seedling which are used for plantation by others. His tremendous effort in enhancing the quality of land and improving the green cover in the drylands has helped the local community in enhancing the fodder availability and increasing the productivity. The other indigenous trees he has planted other than Khejri tree are Neem, Rohida, Kankeri, Fig, Bougainvillea and Babool. He was felicitated on the occasion of World day to combat desertification in 2014 by Honourable Minister of MoEF&CC for his commendable work in arresting land degradation	https://www.youtube.com/watch?v=w5_gVlR7T0M https://www.youtube.com/watch?v=Br9vPfliz_I
4	Mr. Jagdish Parikh Ajitgarh, District-Sikar, Rajasthan	Organic agriculture practices	He is the recipient of the 1st National Grassroots Innovation Awards (2001) for his innovation *"Ajitgarh Selection – a new Cauliflower variety of 15 kg"* and awarded Padma Shri 2019. He received several awards for his agro-innovations through traditional methods in the past. In 2017, he received an IPR (Intellectual Property Rights) for his high-yielding and pest-resistant innovative crops	https://www.youtube.com/watch?v=Qt4yE5VdPHE
5	Smt Rajkumari Devi Muzaffarpur District, Bihar	Agriculture practices and food Processing	She is popularly known as '*Kisan Chachi*'and awarded Padma Shri in 2019. Her expertise is in assessing the soil quality to ensure successful harvest. She has mobilized over 300 women and successfully set-up a Self-Help Group (SHG).	https://www.youtube.com/watch?v=Aaio5TGue8Y
6	Mr. Babulal Dahiyaa Pithaurabad village, District Satna, Madhya Pradesh	Conservation of Indigenous Traditional rice varieties	He has been growing 110 varieties of crops within two acres of land. He has been collecting indigenous rice varieties since 2005, when he learnt that a traditional rice variety had vanished from the region. The state biodiversity board has also recognized his work, and initiated a beej yatra (seed rally) to collect indigenous verities of vegetables and medicinal plants. They have collected over 1,600 varieties from 24 districts. For his commendable work, he was awarded with Padma Shri.	https://www.youtube.com/watch?v=GUUBILY-9Y8
7	Mr. Venkateswara Rao Yadlapalli, District-Guntur, Andhra Pradesh	Organic agriculture practices	Raithu Nestham is founder and champion of organic farming practices. He has developed an app called '*Rythunestham*' to help the farmers in organic farming practices. He was honoured with Padma Shri award in 2019.	https://www.youtube.com/watch?v=j3VHrkNMvAQ
8	Smt Tulsi Gowda Village- Honnali, Taluk- Ankola, District- Uttara Kannada, Karnataka	Afforestation	She has extensive knowledge about the diverse plant and herb species and their uses. As per reports, Gowda has planted over 1,00,000 trees so far and has been working to preserve mother nature for the past six decades. Known as the 'encyclopedia of forests', she at the age of 72 continues to nurture plants. She was honoured with Padma Shri on 26 January 2020.	https://www.youtube.com/watch?v=JAeCfBYM7Mc
9	Mr Radha Mohan & Smt Sabarmati Nayagarh, Odisha	Organic farming; Conservation of Forest; water and soil harvesting	More than three decades ago the father-daughter had sown the seed of organic farming in a patch of land in Nayagarh district, which has now become a huge tree spreading its roots deep as a state-wide movement. "Started Sambhav, a resource centre for farmers across the country where they visit to exchange seeds and learn organic farming". Phenomenal work in conservation of forests, water and soil harvesting and collection of more than 800 varieties of indigenous seeds. Their move towards the transformation of barren land into a green forest in Odisha's Nayagargh district has received recognition and thus, they are conferred for the Padma Shri award 2020.	https://www.ndtv.com/offbeat/padma-shri-for-father-daughter-radha-mohan-and-sabarmatee-who-transformed-wasteland-into-a-forest-2175441

10	Smt Rahibai Soma Popere Village- Komblne, Block-Akole, District-Ahmednagar, Maharashtra	Conservation of agro diversity; conservation of indigenous seed	Illiterate Tribal farmer honored with the title of 'Seed Mother' by CSIR for her inspirational work in the tribal-dominated region. At present about 122 landraces of 32 crops (Paddy, Millets, Beans, vegetables, Oil seeds etc.) are under conservation. She has expertise in the SRI method of Paddy cultivation, improved cultivation practices for Tomato and Hyacinth Bean, Participatory seed selection and Organic farming techniques. She is creating awareness among Women for participation in the Self-Help movement, Village sanitation, clean kitchen, Seed Conservation and wild food resources. He was also honoured with Padma Shri award in 2020.	https://www.youtube.com/watch?v=egrn_2RgOgE
11	Mr. Sundaram Verma Dantaramgarh District- Sikar, Rajasthan	Dryland Agroforestry' or 'one litre water per tree' method	He worked extensively towards water conversation and with his unique technique, irrigation requires only one liter of water per tree. Especially in Rajasthan, his technique has been very helpful to farmers. He successfully managed to grow 50,000 trees with his water-saving technique called 'dryland agroforestry'. For his exceptional work in the field of agriculture he was honoured with Padma Shri award in 2020.	https://www.youtube.com/watch?v=MvWOBb84rlI
12	Mr. Popatrao Pawar, Hiware Bazar, District-Ahmednagar, Maharastra	Water conservation	Transformed a drought-prone village of Maharashtra into a green model village. He started a rainwater harvesting and watershed conservation and management programme. Water problem with the help of contour trenches to recharge groundwater also revived farming as a source of income. He was honoured with Padma Shri award in 2020	https://www.youtube.com/watch?v=G8bQ8d1ePNw https://www.youtube.com/watch?v=IfdjubjdMtc
13	Mr. Hukumchand Patidar Manpura, Jhalawar, Rajasthan	Organic farming	Patidar got Padma Shri in 2018 for his contribution to organic farming. He is founder of Swami Vivekananda Agricultural Research Farm, which practices Organic farming in an area of 40 acres and provides organic products to six countries of the world including Australia, Japan, New Zealand, Germany, France and Korea. Over the last 16 years, he has motivated 120 farmers in the village to engage in organic farming and develop Manpura as a hub of chemical-free agriculture. They have set up a processing and grading unit in the village, and export coriander powder, garlic paste, fennel seeds and fenugreek to European countries and Japan, and supply oranges, pulses and onion to domestic markets.	https://www.youtube.com/watch?v=bBgh908j2vU
14	Mr. Vijay Jardhari Uttarakhand	Conservation of traditional seeds	'Beej Bachao Andolan' Uttarakhand in 1986 along with fellow farmers, has dedicated his life to conserving traditional seeds, which otherwise would have disappeared due to wide acceptability of hybrid seeds among farmers	https://www.youtube.com/watch?v=qd7aWOs65uQ
15	Mr. Bharat Bhusan Tyagi village Bihata Siana Tehsil, Bulandshahar district, Uttar Pradesh	Organic farming	He is the doyen of Indian Organic farming. He was awarded the Padma Shri, in 2019. He is also a recipient of Progressive Farmer Award by the Prime Minister, Narendra Modi.	https://www.youtube.com/watch?v=9kmkDr9FmTU https://www.youtube.com/watch?v=ECQRoQ5gMfM https://www.youtube.com/watch?v=CQBzubFYjck
16	Shri Trinity Saioo village Mulieh District.West Jaintia Hills, Meghalaya	Tumeric farming practices	Trinity Saioo is an award-winning turmeric farmer who has been leading 800 women in Meghalaya to encourage the farmers to cultivate the indigenous, high-curcumin content Lakadong variety of the turmeric. Saioo was awarded the Padmashree in 2020.	https://www.youtube.com/watch?v=uNXkduiY1Yg
17	Shri Batakrushna Sahoo	Animal Husbandry	Batakrushna Sahoo's contribution to the field of Animal Husbandry is extra-ordinary. His journey began in 1986 with pisciculture. He went on to contribute to the field without any financial assistance from the	file:///C:/Users/Admin/Downloads/1588559875_first-fish-farmer-awarded-padma-shri.pdf

	village Sarkana Khurda's Balianta block, Khordha district, Odisha		government by training hundreds of farmers in spawn production through traditional breeding methods. He was conferred with Padma Shri in 2020 for his contribution in animal husbandry.	
18	Shri Chintala Venkat Reddy Hyderabad	soil and nutrient management	Chintala Venkat Reddy is an innovative organic farmer also known for his soil and nutrient management techniques in farming. He has brought India the pride of being internationally acclaimed and holds a distinction of being the first independent farmer to receive an international patent for his technique in the soil swapping and soil fertility. He was also honoured with Padma Shri award in 2020	https://www.youtube.com/watch?v=4lUYY1YsLz8
19	Smt Thimmakkais referred as Saalumarada Thimmakka Karnataka	Environment	She started planting banyan trees along with her husband and found a purpose in it. They both have started with 10 banyan saplings on either side of the road along a stretch of 4 km in the first year and look after the plants just like their children. Every year, the count of these trees kept increasing. Till date, there have been more than 8000 other trees grown by her and her husband. Growing banyan trees was challenging in a place that was relatively dry. She not only planted those trees but also fenced, watered and guarded them. Though the trees grown by her are worth several crores of rupees today, her life has no respite from poverty. Unfortunately, she is dependent on a pension of Rs. 500/- given by the government, which is the sole source of her income. Himmakka and her husband used to carry four pails of water for a distance of 4 km to water the saplings. They used whatever little resources they had to plant trees. In order to get sufficient water for the trees, they started to plant the trees during monsoon. In this way, they could get sufficient rainwater for the saplings and the trees would have invariably taken root by the onset of the next monsoon. This became Thimmakka's daily routine for many years though it did not help in her financial condition. She has been recognized by the Government of India and was recently conferred with the Padma Shri award in 2019. There is also an environmental organization named after her in the U.S. called Thimmakka's Resources for Environmental Education.	https://www.youtube.com/watch?v=AHY45HSB-e8
20	Shri Genabhai Dargaji Patel Gujarat	Agriculture	Total 5500 trees of Pomegranate planted. Panchamrut (cow urine + cow dung + Jaggery + pulses flour) and vermicompost is given to each tree every month as organic fertilizer. This produces red, shiny, big and good quality fruits. Each tree is covered by bird net to protect fruits from birds. Inspired from his farming, approximately 2.50 lakh trees were planted in neighboring villages. He has been awarded the Padma Shri Award in the year of 2017 by the Government of India.	https://www.youtube.com/watch?v=hr2vZNBVnW0
21	Shri Simon Oraon's Khaksi Toli village, Bero Bazar block, Ranchi, Jharkhand	Forestry and water conservation	Padma Shri awardee and a renowned environmentalist from Ranchi, Mr. Oraon's is known as Jharkhand's waterman. He has taught 51 villages in his state the art of water harvesting and forest protection. He plants 1,000 saplings every year, digs up ponds and wells. He has managed to build canals and constructed three dams by drilling through mountains in Bero region of Jharkhand. With his contribution, the Bedo block has become one of the largest vegetable producers in Ranchi district. The block produces around 20,000 metric tonnes of vegetables and exports to neighbouring states of West Bengal and Bihar.	https://www.youtube.com/watch?v=ICxHQ-ayeiU

Table 4. Some other SLEM practiotiners

S.N.	Organisation/ Individual	Catogies of Best Practices on SLEM	Video link
1	Vasudha Organics	Pest control and cure	https://www.youtube.com/watch?v=IwdpDj0zBl0
2	ABCD farming	Low agriculture tools	https://www.youtube.com/watch?v=5_Xqfo3y-HU
3	Organic Farming & Gardening visit	Fish farming using rain water	https://www.youtube.com/watch?v=p72m2qXh7K8
4	Primitive Tools	Bamboo Fish Pond	https://www.youtube.com/watch?v=-qasxLkOEYQ
5	Mukesh Patil	Multiple cropping	https://www.youtube.com/watch?v=jUNniBIX3zc
6	CIALCAafrica	Intercropping banana with beans	https://www.youtube.com/watch?v=66rHparmsDQ
7	Dr. Priyanand Agale	Water Conservation Model at India's First Smart Village 'Dhanora', Rajasthan	https://www.youtube.com/watch?v=mx-hYYBWoII
8	Shramajeevi TV	Groundwater recharge methods	https://www.youtube.com/watch?v=utdyYvIznJE
9	IndiaWater Portal	Water Cup- A success story of Kakaddara village	https://www.youtube.com/watch?v=epV3jEvBWuY
10	UrbanSkyPictures	Traditional water harvesting structures for climate change adaptation	https://www.youtube.com/watch?v=sILOmuU3a-8
11	Shramajeevi	Dry land horticulture practices	https://www.youtube.com/watch?v=lMNm671h_w8
12	Isha Foundation	Agro forestry	https://www.youtube.com/watch?v=-1IVpmYqFfQ
13	dsc00786	Chicken and fish pond	https://www.youtube.com/watch?v=Z9NAGIfmzYc (Part 1) https://www.youtube.com/watch?v=5Oew3zZPgj4 (part 2)
14	Nai Phan	Chicken and Fish Pond-3	https://www.youtube.com/watch?v=ir-kAAlkoeM
15	digitalgreenorg	Low-cost vermicompost demonstration using dung and banana leaves in Bhanavasi, Karnataka	https://www.youtube.com/watch?v=Qs2ICBoei_s
16	My kisan dost	How to prepare vermi compost using vermi bed	https://www.youtube.com/watch?v=GtCB5u210-Q
17	Kanak News	Indian farmer used waste saline bottles to build drip irrigation system	https://www.youtube.com/watch?v=3aimvgyyjB8
18	Ishaq Tijjani	Sack with drip irrigation farming	https://www.youtube.com/watch?v=1C1yhGfdnAU
19	DW News	Clean Air in India through Biomass Briquettes	https://www.youtube.com/watch?v=UYNEya5Ptg8
20	United Nation	Zero Budget Natural Farming	https://www.youtube.com/watch?v=vF40gF-PUcs&list=PLE0100F1853987232&index=13
21	Grow trees	Trees for Elephant, Jharkhand	https://www.youtube.com/watch?v=tQN1EboWtYU&feature=emb_logo
22	Down to earth	Multilayer farming	https://www.youtube.com/watch?v=FyOzeO6fQwI
23	Krish-e	Crop Diversification and Allied Agri Businesses	https://www.youtube.com/watch?v=Fd2hD43rOgk
24	povertyactionorg	seed inoculation	https://www.youtube.com/watch?v=NF9x0n8Rci4
25	Vail Dixon - Simple Soil Solutions	seeds boost up with Inoculant	https://www.youtube.com/watch?v=_UXXB0uK-2U
26	HortLA Oklahoma State	Inoculation Demonstration	https://www.youtube.com/watch?v=GP8oS5EdPMQ

27	Down to earth	Aquaponics	https://www.youtube.com/watch?v=018rIAPkTH4
28	CG MFP FED Raipur	Lac cultivation	https://www.youtube.com/watch?v=KZ4f-abkRZo (part 1) https://www.youtube.com/watch?v=bTWtPYA6bW4 (part 2)
29	Jijeevisha Samitee, Korba, CG	Lac cultivation	https://www.youtube.com/watch?v=96Kgb_TDI1c
30	Nuteq Entertainment	Azolla with SRI	https://www.youtube.com/watch?v=JIBgESD-GQA
31	Green TV India	Azolla Cultivation	https://www.youtube.com/watch?v=bzbL2iZIAHM
32	Devalla Kalpana	Azolla as biofertilizer in paddy field	https://www.youtube.com/watch?v=EEkvsZ9MmUs
33	Digital Green	Azolla benefit	https://www.youtube.com/watch?v=9cfxN4sGr4s
34	Kisan Swaraj Samity	bio pesticide	https://www.youtube.com/watch?v=hBZqL78Mn0g&feature=emb_logo
35		Hapa - A vital rainwater harvesting structure in drylands	https://www.youtube.com/watch?v=OV82Qgh7n94&feature=emb_logo
36	DRCSC NGO	Climate change adaptation	https://www.youtube.com/watch?v=jxqML__h-0U
37	Durgesh Gupta	Khet talab yojana	https://www.youtube.com/watch?v=m3fA_OzlQRA&feature=youtu.be
38	Gaon Connection TV	Casestudy on water conservation	https://www.youtube.com/watch?v=xXcdFPglVUE&feature=emb_logo
39	Paani Foundation	From Drought to Prosperity	https://www.youtube.com/watch?v=09PGpYZlhrw
40		How to construct Continuous Contour Trenches (CCT)	https://www.youtube.com/watch?v=ir7HwZK_7Qg
41		How to Construct Deep Continuous Contour Trenches	https://www.youtube.com/watch?v=3u3iuxbNpCI
42	igidrhelpdesk	Pot drip irrigation	https://www.youtube.com/watch?v=w200mGBlreY
43		Fram Pond	https://www.youtube.com/watch?v=ulUZwOehg7o
44	TERI	When Every Drop Counts (Hindi version): A documentary on the legacy of rainwater harvesting	https://www.youtube.com/watch?v=WxdtmswwHAk
45	Down to earth	Man created a forest in a cold desert of Himachal Pradesh	https://www.youtube.com/watch?v=-foEwcAu_zw
46	festival21	From the Ground Up – Regenerative Agriculture	https://www.youtube.com/watch?v=6vQW8Tl_KLc
47	Paani Foundation	The Water Cup 2018 Journey (Hindi)	https://www.youtube.com/watch?v=OTSGF1KQ1UQ
48	Black Ticket films	The Miracle Water Village (Hindi Version)	https://www.youtube.com/watch?v=CwCX0JKgl7U
49	Discover agriculture	Zero Budget Natural Farming (ZBNF)	https://www.youtube.com/watch?v=m3d7X6UluNk
50	Green TV india	Zero Budget Farming | Subhash Palekar about Importance of Zero Budget Farming In Mission 2022	https://www.youtube.com/watch?v=yTTwYb1IvWI
51	Down to earth	How a cooperative conserved rainwater to grow a forest in a drought-prone Dharmapuri of Tamil Nadu	https://www.youtube.com/watch?v=Xy9qdrD3uK0
52	Muonde Trust	The Rainwater Harvester	https://www.youtube.com/watch?v=22V4vUtNC8Q
53	ECHO Inc.	Water harvesting principles & the story of an African rain farmer Design guidelines for regenerative	https://www.youtube.com/watch?v=D6_WZ789lpM
54	Samantha Braid	Check Dams (gully rehabilitation and reclamation)	https://www.youtube.com/watch?v=9nKc5wEjWrY

55	The natural Farmer	Recharging A Well part i - John Kaisner the Natural Farmer	https://www.youtube.com/watch?v=15GGV4sIMuM
56	Water matters	Heritage of Pahad: Naula - Dhara | India Water Portal	https://www.youtube.com/watch?v=yVXNEFRy_Uo
57	Water matters	Uffrainkhal - उफरैखाल : Dry Ravine to Gad-Ganga	https://www.youtube.com/watch?v=3C8-uyOgsbk
58	India water portal	Water Cup- A success story of Kakaddara village	https://www.youtube.com/watch?v=epV3jEvBWuY&feature=emb_logo
59	Gajanand Agarwal Founder Cowgrazing	innovative Farmer Lakhvinder ji	https://www.youtube.com/watch?v=_RhKjgqRxb0
60	Discovery Agriculture Channel	Gourd farming cultivation, vegetable	https://www.youtube.com/watch?v=7kiBR4E_qlk
61	Gaon connection TV	Multilayer Farming Techniques	https://www.youtube.com/watch?v=sf3-jU_d6b8
62	Hello Kisaan	Best Model 4 Youth in Agriculture	https://www.youtube.com/watch?v=eIUYJnhYdk4
63	NDTV special project	Seed banks: Enhancing sustainability of small-scale farmers in Odisha	https://www.youtube.com/watch?v=isSze2vcCXc
64	Organic Farmer	Five-layer organic farming model	https://www.youtube.com/watch?v=SHmtECagPxA
65	Brahma Kumaris Video Gallery	Preparing vermiicompost	https://www.youtube.com/watch?v=TCQfBMy-55E

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