Punjab Agricultural Management & Extension Training Institute (PAMETI), situated in Punjab Agricultural University (PAU) campus, Ludhiana is a state level institute under National Mission on Agricultural Extension & Technology (NMAET) meant for capacity building of extension workers from agriculture and allied sectors. It was established in 2000 and formally inaugurated by His Excellency, Former President of India, Dr APJ Abdul Kalam.

Core activities of PAMETI:

To function as State level institute to provide Extension and Mngt. input for extension functionaries.

» To provide consultancy in areas like project planning, appraisal, implementation, monitoring and evaluation etc.

» To organize need based training programme for middle level and grass root level agriculture and allied sector extension functionaries.

» To develop and promote the application of management tools for improving the effectiveness of agricultural extension services through better management of human and material resources.

» To conduct studies on agriculture management, communication, participatory methodologies, etc. as sequel to the feedback from training programmes.

About the Project & Interventions

A demonstration project aimed at creating no-burn model villages by informing, educating, training & convincing the farmers to adopt Conservation Agriculture (CA) practices and subsequently shun the open burning of crop residue.

Punjab Agricultural Management & Extension Training Institute (PAMETI) handled a demonstration project titled “Climate & Clean Air Coalition to Reduce Short-Lived Climate Pollutants,” from 2017 to 2019, in Punjab.

The objective of this project was to inform, educate, motivate, and convince the farmers and stakeholders alike to manage the crop residue by making use of all the available technologies for crop residue management (CRM).

The project was implemented in six villages viz Bhoewali, Qiampur, and Rajjian villages of Amritsar district and Tungaan, Uppli, and Kanoi villages of Sangrur district.

In all, two project fellows and four demonstrators were engaged in the selected villages. Implements such as Happy Seeder, PAU Straw-Cutter-Cum-Spreader, and Mould-Board Plough have been provided in these villages, to help the farmers to manage the crop residue.

Interventions

All the possible interventions such as distribution of farm literature, formulation of farmers-WhatsApp groups, identifying & training of ambassador farmers/opinion leaders, farmer awareness camps, farmers-scientists meetings, field days, school awareness camps, door to door contact, farmer training camps, village-level workshops, handouts/brochures, wall paintings, on & off campus farmers’ trainings, roping in institutions like village panchayats, religious places and schools to create awareness, broadcast & telecast of Radio/TV talks, using IT for flash messages through SMS, felicitating the farmers practicing no-burning, exposure visit to demonstration plots in PAU, BISA, and of progressive farmers and demonstrations of the machinery & equipment by the project staff to convince the farmers about the ways, means, and relevance of managing the crop residue.

Also, PAMETI helped the farmers of the project and nearby villages in filling up the forms (individual and group subsidy cases) of subsidy scheme on farm machinery and implements announced by Government of India. This ensured greater presence of CRM machinery/implements in the villages and led to higher stubble management.

Outcome

Over time, PAMETI has trained around 1515 stakeholders (including farmers and extension functionaries of the state) on the subject of Rice Residue Management and managed about 1908 acres of rice residue in the adopted villages, with its own demonstration machinery and has consistently tried to motivate the farmers by quoting religious scriptures in which, Air has been called Guru, Water as the great Father and Earth as the great Mother.
Crop Residue Burning & Alternatives

The burning of crop residue is a phenomenon, which is as old as the practice of agriculture itself. However, the burning of crop residue is becoming increasingly untenable, considering residue quantum burnt its ill-effects on soil, animal, plant, and human health, biodiversity, traffic (air & vehicular) movement, and environment.

The farmers, in Punjab & Haryana, burn the rice residue as there is a narrow window (around 20 days) between the sowing of the wheat crop after the harvesting of rice crop.

There is also lack of awareness about the benefits accruing from the practices of Conservation Agriculture (CA), and at places and times, the requisite machinery to manage the stubble is found lacking. Even wherever the machinery is available, the lack of skill in using such machinery/implements also becomes an impediment in the rice residue management.

The alternatives to open agricultural burning of crop residue in the state can be broadly categorized in to in-situ and ex-situ management. In-situ management would be to plough the residue back in to the soil, there by using the straw as a fertilizer and soil enricher as the residue contains both micro and macro nutrients.

Ex-situ management is to collect the crop residue from the field and use it for purposes such as fuel in biomass based power generation plants, biogas plants and brick kilns, as mulch in crops, as fodder & bedding for animals, composting for mushroom and in other industrial purposes such as briquetting/pelleting etc.
Development of study material

The study material was developed for the rice & wheat residue management highlighting the major key points such as:

- The ill-effects of rice residue burning
- The ways to manage the rice residue
- Important guidelines to follow before using Happy Seeder
- How to avoid the incidences of fire in the standing wheat crop
- Ways to manage the wheat crop residue

The pamphlets were distributed to the farmers and the wall paintings were done at common places in the villages such as common sitting place, walls of cooperative societies, religious places, educational institutes and private walls (with owner’s permission) etc., which could be easily seen by one and all.
**Field visits, Field days, Farmer-Scientist interaction, Village visits**

**Farmer field days**

These are organized to inform the farmers about the PAMETI-UNEP project being run in their respective villages.

The farmers are informed, educated, motivated and convinced about the need and importance of crop residue management.

Experts interact with the farmers and apprise them about the latest technologies to manage the crop residue.

**Farmer Interaction** (Field days were organized after conducting field level demonstrations to share & show the results of the interventions carried out)

Learning about farmers’ issues & suggesting solutions thereof during village visit(s)
Visit to farmers’ field & meetings

At farmers’ field, examining the wheat crop sown with Happy Seeder

Addressing farmer gathering at a field day

Rice residue machinery being displayed at a Farmers’ meeting
SSG team visiting a farmer’s field in Amritsar

SSG team visiting a farmer’s field in Sangrur
Visiting a farmer field along with other officials in Amritsar

Informing the farmers about the conservation agriculture practices and comparative economics of various CRM technologies on the eve of field day
Trainings & Demonstrations at PAMETI and PAU

Rice Residue Management Trainings

» Conducted under PAMETI-UNEP project in collaboration with Department of Agriculture and Farmers’ Welfare Punjab

» Training for Farmers and Officials from the State’s Agricultural Department, Soil Conservation Department and Department of Cooperation, Punjab.

Training method

» Lectures by experts

» Exposure visits to the fields/ Farm machinery and implements center.

Demonstrations

» Conducted at the farmers field by the project staff

» The working of CRM machinery & implements was explained to the farmers through the PAMETI staff stationed at the respective villages.

» Besides conducting a demonstration, where the practical working of the implement was explained the project staff also took up the queries of the farmers with respect to the working of the implement.

» The study material developed by PAMETI regarding rice residue management was distributed to the farmers and they were persuaded to not to burn the paddy straw.

Total in-house RRM trainings conducted at PAMETI: 11
Total persons trained in above trainings (Farmers & Extension functionaries): 395
Total off-site (on farmers’ fields) persons trained via farmer field days, demonstrations, farmer-scientist meetings, village visit etc.: 1120
Total persons trained (395+1120) = 1515
The purpose of these demonstrations was to familiarize, educate and train the farmers on different aspects of rice residue management machinery & implements and allay their fears so that they adopt the machinery & implements to manage the rice residue and also educate their fellow farmers to do the same.

The staff of the project was adequately trained in the different aspect of management of machinery/equipment & constantly interacts with the farmers to know about their time of requirement of machinery and to clear their doubts, if any.

Method and Result demonstrations were used to impart the technology to the farmers and then convincing them with the results obtained from the farmers’ fields.
School Awareness Camp

A school awareness program was held under the project at Government Senior Secondary School, Qiampur, Amritsar to create awareness against the open burning of rice residue.

Dr Dhaliwal quizzed & educated the students on their awareness about the ill-effects of open burning of crop residue and their knowledge about different existing CA technologies.

Various competitions such as poem recitation, poster making, lecture and debate in relation to rice residue management were held amongst the school students and the prizes and certificates were given to the 1st, 2nd and 3rd position holders.

A procession was carried out in the village with the students carrying the placards exhibiting slogans related to RRM.
Farmers’ Felicitation

Felicitating the farmers helps a great deal in motivating the farmers about the rice residue management.

Those farmers who didn’t burn crop residue during the recent year were felicitated under the project and were given appreciation certificates.

Farmers took an oath for not to burn stubble and use various available technologies to manage the rice residue.

The farmers of the project villages in Amritsar and Sangrur pledged to motivate fellow farmers against open burning of crop residue.
Book Publishing

The book aims to inform and create awareness about the problems of management of rice residue and the subsequent ways to tackle them.

This book is published under the PAMETI-UNEP project titled “Climate and Clean Air Coalition to Reduce Short Lived Climate Pollutants” and is funded by Climate and Clean Air Coalition (CCAC).

The book contains 13 chapters on different aspects of Rice residue management.
Efforts by Project staff

There is always a risk of a field fire spilling on to the farmers’ field from the field of the adjoining neighboring village.

In one such instance, the fire from the field of a farmer in the village Terra, which adjoins the village Qiampur, the project staff along with the farmers from the adopted villages acted in time to control the spill of the fire on to the area of the project village.

These fires tend to spread quickly and if not controlled in time, these tend to do a lot of damage. The project staff displayed attentiveness in preventing the spread of such fires.

Use of paddy straw for mushroom cultivation. Under the PAMETI-UNEP project, the farmers from the adopted villages in Sangrur and Amritsar district were given a training on using the rice straw for making compost in the mushroom cultivation.

The project’s emphasis has been on informing and educating the farmers about all the different uses of paddy straw but a greater focus should be the in-situ management of paddy straw, where the paddy straw is managed at the farmers’ field level at a large scale.
SSG team meetings & reviews

SSG team member, Dr Mrs R K Dhaliwal putting forth her views on “Solution for Clean Air” at 2018 Asia Pacific Clean Air Partnership Joint Forum at Bangkok, Thailand. She also served as a panelist in Solution for Agriculture.

Strategic Support Group (SSG) meetings:

The meeting of the SSG members was regularly held after every six months to review the previous progress and discuss future course of action.

Dr HS Dhaliwal & Dr (Mrs) RK Dhaliwal were the representative of Punjab, India in this SSG.

Media & News (Electronic media)

Dr Jessica McCarty, Dr Amir Kassam & Dr HS Dhaliwal interacting with electronic media persons and apprising them about the interventions and activities of PAMETI-UNEP Project
Media & News (Print media)

UN experts visit three stubble burning-free villages in Amritsar

UN-PAU Project

Villages adopted for not burning crop residue

A team of the United Nations with farmers at Rajian village in Amritsar on Thursday.

Famers honoured for sowing wheat without burning residue

Three villages say no to stubble burning

RURAL REVOLUTION Farmers of Bhoewali, Kamour and Rajian villages in Amritsar district are leading the way by using the straw to fertilize the soil, an innovation that doesn’t cause pollution, helps save money and increases wheat yield

News about the project interventions being given in English, Punjabi and Hindi language in the leading dailies of the region.

It was ensured that the proceedings of the event/day are duly reported at the end of each event/day.
Success stories regarding RRM

Learnings from the project:
The project has been replete with learnings, such as:

1. **F**elicitating the farmers helps a great deal in motivating the farmers about the rice residue management. The results obtained from the method and result demonstrations coupled with honouring the farmers goes a long way in giving a boost to the CRM activities.

2. **A**s far as the use of machines & equipment is concerned, the project’s emphasis has been on “Learning by doing” & “Seeing is believing.” There is no bigger motivation for the farmers to see the results on a fellow farmer’s field and get convinced about rice residue management.

3. **R**emember, burning is also a behavioral problem, which can be addressed by regular social interaction and training of the farmers. The objective should be to shift the mindset of the farmers by providing them timely and required training.

4. **M**erely supplying them with the machinery and implements is not enough; for example, the agronomic practices to be followed during the use of Happy Seeder (a wheat sowing machine in standing rice stubble, without burning) are quite different from the conventional agronomic practices. The farmers should be trained enough in this regard.

5. **E**ngage with the farmers constantly, which can provide them with updated, timely, and concise knowledge about the advancements in the field of conservation agriculture and bring a change in the attitude of the farmers.

6. **R**ice residue management machinery & equipment is a slightly technical equipment as compared to other traditional machinery for managing the crop residue. Farmers need hand-holding & proper training as far as the use of rice residue management machinery & equipment is concerned.

7. **S**upporting the farmers by continuous hand holding by some trained person. Doing this done at the village level can lead to effective implementation & greater success of CRM activities.

Our Supporting partners

- **UNEP: United Nation Environment Program**
- **CCAC: Climate and Clean Air Coalition**
- **ICCI: International Cryosphere Climate Initiative**

Published by Dr. H.S. Dhaliwal and Dharvinder Singh, Director and Project Fellow, PAMETI

Project Staff:

- Dr H S Dhaliwal (Director, PAMETI & PI PAMETI-UNEP Project)
- Dharvinder Singh & Navjot Singh Samra (Project Fellows, Sangrur & Amritsar)
- Jagdip Singh & Gurinder Singh (Demonstrators, Amritsar)
- Gursewak Singh & Parwinder Singh (Demonstrators, Sangrur)

Average use of Happy Seeder (acre/season)

2017-18: 169
2018-19: 145