



Photo: MSSRF

Farmers taking oath to cultivate pulses

Pulse Panchayat

Achieving self sufficiency in pulse production

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Pulse panchayat is an integrated approach in establishing a sustainable production, value addition and marketing system. The initiative implemented by a Farmer Producer Company in Tamil Nadu, is moving towards achieving self sufficiency in pulse production.

Pulses with their inherent capacity to fix biological nitrogen and the ability to withstand weather variability, are the solutions in reclaiming fallow lands and improving soil fertility of degraded lands. Packed with nutrition and their ability to grow under harsh conditions, pulses are ideal for poor farmers with marginal lands.

The area and production of pulses has been witnessing a steady decline. Grown under rainfed conditions on marginal lands, pulse production faces a number of constraints. Some of them include area stagnation, low productivity, lack of timely availability of inputs, susceptibility to pests and diseases, inefficient storage and market linkages, price

volatility, lack of crop insurance etc. The per capita availability of pulses in India is low at 33g/capita/day (2009-10), while the WHO recommends about 80g/capita/day. To meet the domestic demand the government is forced to resort to imports.

To enhance production and make pulses affordable to the common man, the government has been promoting improved technologies and farm management practices through its initiatives like NFSM – Pulses in 171 districts belonging to 14 states. Recently, in order to provide incentive to farmers, Government of India has announced a bonus of Rs 200 per quintal of Pulses.

M.S. Swaminathan Research Foundation (MSSRF) through the India Morocco Food legume Initiative (IMFLI), has promoted *Pulse Panchayats* in Tamil Nadu and Odisha states of India in fostering self sufficiency in pulse production. OCP Foundation, Morocco has initiated a programme through South – South Collaboration - an India Morocco Food legume Initiative (IMFLI) involving partners in India



Photo: MSSRF

Women's group meeting in progress

and Morocco. This paper explains the initiative taken up by MSSRF in Tamil Nadu.

Pulse Panchayat

Edaiyapatti panchayat is located in Annavasal block of Pudukkottai district, which is one of the driest regions in Tamil Nadu. 95% of the farmers are small holders. The panchayat has 79 open wells to provide partially assured irrigation. The major crops grown are paddy, millets, black gram and groundnut. Only few farmers cultivated pulses on an area of about 30 acres. Majority of the rainfed lands were left fallow and now brought under cultivation through bio-industrial watershed activities.

Illuppur Agriculture Producer Company Limited (IAPCL) was initiated in 2012 and registered in January 2015 to address the market issues for the farmers in a collective manner. IAPCL was established with 1000 shareholders belonging to 5 panchayats inclusive of Edaiyapatti panchayat farmers. One hundred and eighty two farmers from Edaiyapatti are now with IAPCL as institutionalised farmers. IAPCL focus is on four different value chain based enterprises (pulses, organic vegetable, integrated dairy and poultry) to enhance the income of farmers by promoting sustainable production, value addition and marketing.

In 2013, the entire panchayat passed the resolution to take up pulse cultivation in a massive way, agreeing to put the maximum available land i.e. 474 acres (Gross Cropped Area) into pulse production for one season. The members had successfully demonstrated certified pulse seed production in Rabi season.

The entire panchayat consisting of 10 villages has been digitized using remote sensing tools and strategic plans developed for pulse production. The Panchayat and the IAPCL are involved in the planning and monitoring of the pulse production. The Panchayat has provided infrastructure

facilities for the village knowledge center and the custom hire of farm equipments. The technical backstopping support is provided by the National Pulse Research Station, Vamban, Government Agriculture department, and MSSRF.

The IAPCL is promoted based on value chain analysis of various crops and as a business model. All the activities are funnelled through the IAPCL. The role of IAPCL is as follows:

- Input supply of quality seeds, bio-fertilisers, custom hire of farm equipments etc.
- Procurement of produce, storage and marketing
- Access to credit through linkages with banks
- Access to knowledge empowerment through Village Knowledge center
- Facilitate processing of produce for value addition
- Linkages with various stakeholders and MSSRF

Several initiatives like Intensive awareness programmes, knowledge building on pulse cultivation through Participatory Varietal Selection (PVS) processes, Farmer Field Schools (FFS), Farmer Field days, discussion platforms through Agriculture Producer Groups, assured market option through establishing their own producer company, possibility of getting premium price by Producer company etc., motivated farmers in taking up the pulse cultivation. Some of them are described in detail here.

Farmer-Participatory Varietal Selection Trials (FPVST)

Totally 41 participatory varietal selection trials were conducted in this area to identify the best performing pulse varieties in the locality. The varieties were sourced from various institutions – agriculture universities, research

Table 1: Varietal selection trials 2015 -2016

| Pulse Crop | Pulse Varieties Tested | Best Performing Variety |
|------------|---------------------------------------------------------------------------------|--------------------------------------|
| Black gram | Kharif - VBN 4, ADT-5, MDU -1 Rabi - VBN 4, VBN-6 | Kharif & Rabi – VBN 4 |
| Green gram | Kharif – Co 8, VBN 3, VRM-1 Rabi VBN3 ,Co 8,VRM1, BGS9,ML618 | Kharif – Co8 & VBN 3 Rabi – VBN 3 |
| Red gram | Kharif – 37 acres intercrop with Gnut Rabi –VBN2, ICPL1124,161, 20335, 88039 | Rabi – ICPL 88039 |
| Groundnut | Kharif – Co 7, Pollachi 1, VRI 2 Rabi – VRI 2, K6, Co4, TMV7, GG2 | Kharif – Co7 & VRI 2 Rabi – VRI 2 |



Photo: Author

Farmers participating in Varietal Selection Trials

institutes and farmers. Every PVST process involved 20 progressive farmers in five decisive stages of the crop. Vamban 4 & 6 and MDU 1 performed well in black gram, Vamban 3 and Co 8 performed well in green gram and CO 6 and LRG 41 performed well in red gram. Farmer field days were held after each trial to provide an opportunity to select the best variety based on 10 critical parameters during five decisive crop growth stages.

Promoting *Climate Smart* agriculture practices

Promotion of pulses in rice fallow cropping system has brought an additional area (40%) under pulses production. Demonstrations were done by including short duration varieties of pulses as main/catch crop. This has enhanced productivity by more than 30% compared to the traditional variety, with additional incomes. The varietal replacement rate of new improved cultivars has increased by 70%. The inputs and credit support is through the IAPCL. Farmers were capacitated in Integrated Crop Management practices with adoption of new improved varieties and packages of practices based on climate variability. By leveraging CSR funds from Hindustan Petroleum Corporation (HPCL),

The “Pulse Biopark” based on the value chain analysis managed by the IAPCL has significantly enhanced the pulse cultivating farmers share in the consumer rupee.

Mumbai, Asia Initiatives, USA, more than 30 open wells were rejuvenated to ensure equitable sharing of water resources for pulse cultivation, especially in Rabi season, for quality seed production. This has reclaimed more than 50 acres of fallow lands.

The farmers field school has trained them to cultivate pulses with new climate smart agriculture technologies like accessing quality seeds, cultivating pest and disease resistance varieties, nutrient management through soil health cards based recommendations, seed treatment, Foliar spray of DAP (Di Ammonium Phosphate), use of pulse wonder (a booster with nutrients and growth regulators), line planting, intercropping, water management, processing etc.

The farmer’s field days has enabled farmers, scientists, project staff and government department staff to share and spread the experiences of pulse production. The yield levels from various pulses were 50% more than the State and the National average yields.

Promotion of seed system and governance

A fully functional and sustainable Pulse seed supply system for quality seed supply is very important. To meet the demand of Certified/Truthful seed at farmers’ level, a Pulse Seed Value Chain System was established through IAPCL. The Seed Replacement Rate (SRR) has increased to more than 40%. About 10 tons of quality seeds were procured by the IAPCL and stored. This will be further certified by the

government agencies. Thus, low cost innovative seed systems and select farmers' preferred varieties through farmers' participatory varietal selection (FPVS) which replaced old varieties, has yielded encouraging results.

Storing seeds in innovative triple layered Purdue Improved Crop Storage (PICS) bags (originally designed by Purdue University), was demonstrated. The loss of seed quality owing to storage pest incidence was considerably less. Besides preserving seed quality, this method of seed storage enhanced seed viability.

The Pulse Biopark

The Pulse Biopark, based on the value chain analysis, is a pilot project, implemented by the IAPCL with the technical support of MSSRF and other stakeholders. A dhal mill has been installed and the initial processing results are encouraging and benefiting small and marginal farmers to process their produce. The processed pulse is cleaned, packed, branded and sold in the open market. Documenting existing and innovative value chains for different pulses, will enable Scaling up, Sales and Sustaining (3 S) the Pulse production.

Knowledge Management

Knowledge management through Farmer Field Schools and Farmers Field Days using ICT tools were integrated through Village Knowledge Centres, managed by the IAPCL. Support services of custom hire of farm equipments at the right time with affordable rental charges, has enabled small farm holders to benefit economically. The village knowledge centre provided timely and location specific information on climate smart agriculture technologies, crop insurance, soil health care, market prices, plant and animal health care clinics, monsoon behaviour and government schemes. Phone-in programmes, voice and text messages were also used with more than 2000 farmers, to enhance pulse productivity.

Conclusion

The *Pulse Panchayat* movement has demonstrated that innovative approaches with Knowledge management enhancement, through multi-stakeholder platforms and policy making networks, are key to achieving self sufficiency in pulse production. The *Pulse Biopark* based on the value chain analysis managed by the IAPCL has significantly enhanced the pulse cultivating farmers share in the consumer rupee. This has also reduced the post harvest losses significantly. These approaches will bridge the supply - demand gap and have significant importance in Grain Legume research and development especially in countries with low and middle income with high rates of

Table 2: Economics of Black gram 2015-16

| Variety | Improved variety with New Techniques - VBN 4 (Rs.) | Local Variety with Traditional Practices - T9 (Rs.) |
|-------------------------------------|----------------------------------------------------|-----------------------------------------------------|
| Summer Ploughing | 550 | Nil |
| FYM application (2 tractor load) | 3600 | Nil |
| Ploughing before sowing (2times) | 900 | 1100 |
| Seed quantity (kg / acre) | 900 (6kg) | 1200 (8kg) |
| Seed treatment | 50 | Nil |
| Seed sowing | 500 (Machine sowing) | 200 |
| Cost of weed management | 600 | 2000 |
| Foliar and Pesticide spray | 1000 | 500 |
| Harvesting and threshing | 2000 | 2000 |
| Total Yield (Kgs /acre) | 350 | 140 |
| Gross income (Rs.) / acre | 31500 | 12600 |
| Total cost (Rs.) / acre | 10100 | 7000 |
| Net Income (Rs.) / Acre | 21400 | 5600 |
| Net profit- Rs. 21400 / acre | | |

undernourishment. Breaking the yield barrier, tolerance to biotic and abiotic stress factors and enlarging the genetic base of pulses are challenges for discussion in the International Year of Pulses - 2016.

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