

A CASE STUDY ON COMMUNITY SEED BANK IN DOULTABAD MANDAL, MAHABUBNAGAR OF TELANGANA STATE

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ABSTRACT

Since independence several government sponsored schemes have been implemented for the reduction of rural poverty. However, the net result of all these programmes have not made desired impact in the removal of rural poverty. Rural poverty in our country has direct and strong relationship with the agriculture scenario. India's agriculture sector however faces sever crisis for the future. Despite sizeable national food stocks, widespread poverty and hunger remain because agricultural and country's national economic growth has not adequately benefited disadvantaged areas and the poor. Most of the agricultural output increased over the years has taken place under irrigated conditions. The crisis of agricultural biodiversity in India has been attributed to change in cropping pattern with the use of HYV and hybrid seeds. The risk of losing climate resilience crop is very high with the dependence on exotic variety of seeds available. Increased dependence of farmers on the outside sources than their own seed system led to the decrease in productivity, rising cost, decreasing resilience, reduced diversity in crop as a result of non-availability of seed in time without any contingency, lower quality, lack of diversified seeds.

Conservation of agricultural biodiversity is impossible without the participation of communities who have evolved and protected the plants and animals that form the basis of sustainable agriculture. In some rainfed areas of the country, the efforts have been made to establish community managed seed systems, where the community owns the entire process of seed production, storage, quality check and distribution. In this regards, some efforts have been made in Doultabad mandal of Mahabub nagar district in Telangana state under Comprehensive pilot of Revitalisation of Rainfed Agriculture (RRA) network. Showing the interest and commitment of the RRA Network, it was therefore thought to study such initiatives and to determine the scope for replication of this program in similar rainfed areas in the country.

KEYWORDS: Nagu System, Farmers Groups and Farmers Cooperatives, Mandala Mahila Samakhya, Seed Procurement, Management

INTRODUCTION

Mahabub nagar has 64 mandals comprising of 1550 revenue villages and 1348 Gram Panchayats. The district has a total population of 35.14 lakhs (accounting for 4.61% of the total state population) comprising of 17.82 and 17.32 lakh males and females respectively. Of the total population, rural and urban areas have registered 31.42 and 3.71 lakhs, respectively.

Climate and Rainfall

The regions are characterized by hot summers with low rainfall and relatively moderate winters. The average rainfall of Mahabub nagar district is 604 mm, most of it received during south west monsoon period (June – September).

Seasonal rainfall distribution indicates that Mahabubnagar with low precipitation from the northeast monsoon is more drought-prone in the later part of crop-growing season.

SOIL

Andhra Pradesh has eight sub agro ecological regions (National Bureau of Soil Survey and Land Use Policy (NBSS&LUP 1996–97). Deep loamy and clayey mixed red and black soils dominate Mahabub nagar district. The major portion of the land is covered by sandy and sandy loam soils (70%) which have got characteristic feature of less water retentive capacity, there by most of rain water goes as run off. In Doulthabad mandal, it is further high i.e., 76%

Irrigation

Net area irrigated under different sources of irrigation in the district is 1,66,606 hectares accounting for as low as 3.8% of the state net area irrigated (43,92,303 hectares). Gross area irrigated is 2,11,454 hectares. Area irrigated more than once has registered as 26.9% of the net area irrigated in the district. Tube wells has emerged as dominant source of irrigation which has occupied a lion's share of net area irrigated to the extent of 66.4% followed by canals (12.5%), other well (11%), tanks (6.7%) and other sources (3.4%)

Agriculture and Cropping Pattern

Agriculture is the most important occupation of the people of the district. The prominent crops cultivated are rice, sorghum, bajra, maize, pigeonpea, horsegram, groundnut, castor, sunflower, cotton and chillies. The district stands first in the production of pigeonpea and castor, second in maize, greengram; third in terms of production of sorghum, bajra, ragi, horsegram, total oilseeds; fourth in the contribution of groundnut, onions and fifth in terms of total pulses, sunflower and chillies. Pigeonpea, pearl millet and sorghum are commonly grown as intercrops in the groundnut cropping system. In Mahabub naga rpigeonpea is widely intercropped with sorghum. Crops grown in these traditional cropping systems are primarily for subsistence. The cropping system survey undertaken as part of this study between 2002-06 indicated that sorghum, pearl millet, foxtail millet, groundnut and pigeonpea were raised using own-saved seed of traditional varieties sown year after year. (Seed System Innovations in the semi-arid tropics of Andhra Pradesh)

Productivity of Crops: The productivity of maize has occupied first position (3384 kg/ha) among major crops grown in the district while rice attained second (2501 kg/ha) and groundnut (1178 kg/ha), sorghum, greengram, pigeonpea, castor and cotton being third, fourth, fifth, sixth, seventh and eight positions (figure 1).

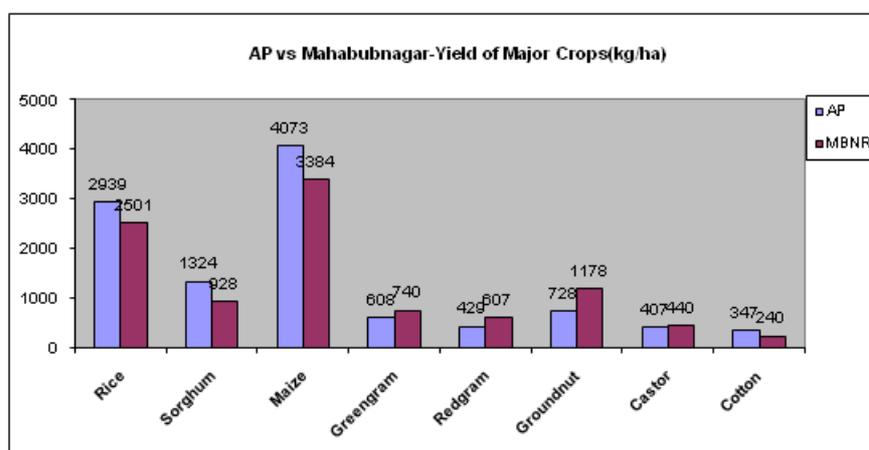


Figure 1: Yields of Major Crops in AP Vs Mahabub Nagar District during 2005-06

The area under total food crops is 57.4% in the district compared to the 65.9% under the state while non-food crops contribute about 42.6% and 34.1% respectively.

In this regards, some efforts have been made in Doultabad mandal of Mahabub nagar district in Telangana state under Comprehensive pilot of Revitalisation of Rainfed Agriculture (RRA) network. Showing the interest and commitment of the RRA Network, it was therefore thought to study such initiatives and to determine the scope for replication of this program in similar rainfed areas in the country.

REVIEW OF LITERATURE

New institutions of organized seed collection, storage and exchange operate formally, and are made up of individually and collectively stored, locally multiplied, modern and farmer varieties of seed (Reddy, C. R. et al. 2007), ensuring that village seed committee members undertake the responsibility of producing quality seed. Seed costs can be kept low if locally produced seed stays non-processed and non-certified. The statutory standards of commercial seed are too expensive for the informal sector. Evolving a policy to certify village/community-based seed production without taxing smallholder farmers would offer greater scope for production of quality seed. (Reddy, C. R. et al. 2007)

Community- or village-based seed production and distribution schemes have gained popularity in recent times. The concept of village seed banks involves improved seed and technical assistance focused on 'pilot' villages in order to train farmers in seed production, storage and distribution. (Reddy, C. R. et al. 2007)

The reality is that there is some commercial seed supply, but without hybrid technology the incentives for the private sector remain limited. Use of hybrid seed by small- and medium-scale farmers remains a dream due to lack of access, availability, timely supply and affordability. The most important aspect of hybrid technology is that the farmer has to buy seed every year. He cannot save his own seed and use it in the next season. Nongovernmental and other local organizations have begun to experiment with a wide range of seed provision innovations, but these are limited in scope. The most effective strategy will involve a combination of public, commercial and local participation, but much work remains to be done to identify the most effective and equitable formulation. In the meantime, farmers have inadequate access to improved seed and are unable to take advantage of new varieties developed by national and international agricultural research. Uncertain production environments, particularly the threat of drought, add to the instability of the current seed provision. Policies that seek to diversify local agriculture systems are difficult to implement because of this inadequacy. Therefore, there is an urgent need to identify appropriate policies and strategies to expand and diversify national seed systems. (Reddy, C. R. et al. 2007). Seed is retained on-farm by millions of separate farming households throughout the world. This is by far the most prevalent method of storing seed. (Lewis, V. and Mulvany, P. S., 1997).

The concept of 'individual farmer as seed bank' has the potential to be a successful innovation in local seed systems. By giving the support of scientific tools to a traditional system of seed exchange, this innovation can be sustainable in disseminating improved varieties and improved production technologies at the village level. (Reddy, C. R. et al. 2007).

Collective seed storage occurs when farmers, either self-organised, or assisted by outside organisations coordinate the storage of the seed they need for planting. Although, this type of seed storage does have roots in indigenous cultures or yeoman traditions, there has been an increase of NGO-led, farmer-participatory collective seed storage projects in the last decade or so (Berg, 1996a)

METHODOLOGY

Looking at the time and resource availability, it was decided to make a successful case study from the Doulthabadmandal on Seed Bank. Since presently 14 villages with 48 farmers' groups is under the Cooperative as part of the WASSAN as a Comprehensive Pilot partner under Revitalisation of Rainfed Agriculture network in India. It was decided that 6 villages will be taken for the study that are getting benefits of Seed Bank Program. From each village 6 farmers selected randomly and interviewed individually with the pretested interview schedule and 2 Focus group discussion with two farmers' groups were conducted. Since, there was one group present in one of the villages of study area i.e., Chellapur village, total 11 farmers participated in focussed group discussions.

Secondary data regarding district and mandal profile including climate and agricultural data was collected from agriculture department and mandal office, departmental website and NGOs/CBOs.

Primary data regarding seed bank development and management process and impact was collected from the farmers in Seed Bank, Seed bank managers, staff of WASSAN, concerned government officials such as Asst. Director of Agriculture, Kodangal Division, Agriculture Extension Officer, Doulthabad mandal, etc.

DISCUSSIONS

Past Trends of the Area

Mahabub nagar district is affected with severe droughts many a times affecting the agriculture sector very badly. The farmers are affected with various issues in their livelihood. Cropping pattern found in Doultabad mandal has gradually changed over time. Around 10 years back, there were not much irrigation facilities. Most of the crops grown were rainfed such as paddy, jowar, bajra, finger millets, foxtail millets, green gram, red gram, ground nut. Farmers were using their own farm saved seeds. There was traditional method of conservation practices of seeds for different crops. Farmers had to extract best variety of crops from the total yield and after processing and cleaning manually and with the use of bullocks, it was mixed with the neem leaves and ashes from the wood used for cooking. Then the seed was stored in the burned clay pots for longer period without any damage. Ragi, foxtail. Jowar, green gram, red gram, bajra, horse gram were cultivated in rotational basis. Earlier, there was mixed cropping of red gram, green gram and cow pea. There was also mixed cropping of red gram, jowar and inter cropping of red gram and ground nut.

Change in Agriculture Scenario

Gradually there was change in cropping pattern. Now major crops found are paddy, red gram and ground nut with the increased use of ground water. There was change in the food habit of the people. Earlier Jowar roti which was taken as main course in dinner has been changed to paddy. The support price for jowar has not increased so much as compared to paddy. The demand has also been shifted with government supply of paddy in PDS. Due to wild boar problem, in millets, and less market price there was a shift in cropping pattern with less millets. Genesis of HYV seed in paddy, ground nut and jowar, people are demanding more HYV varieties. Inter and mixed cropping has been changed into mono crop. Farmers go for double and triple crops in irrigated areas and one crop in rainfed areas. Mainly, paddy and ground nut are taken in the irrigated fields with red gram and jowar in rainfed land. Gradually, the process has been changed to mono cropping like only red gram or only ground nut. However, there is mixed cropping of ground nut and cow pea in some areas.

Now the incidence of high pest and insect attack is prominent in crops like red gram, paddy, and green gram due to change in cropping pattern and followed by more use of insecticides and pesticides.

The seed availability of different crops has been limited to some of the preferred varieties due to its taste and

productivity. In paddy, the seed has been limited to Hamsa and 1010 variety. Farmers have to get paddy seed mainly from the market and produce twice with own saved seeds from their field. Then once again they have to purchase the seed from the market or procure from the government department. Red gram with red variety seed is still from own sources. The farmers are taking seed from the neighbours with the traditional system of nagu. Green gram storage is difficult due to more pest attack. Mostly, the farmers have to purchase green gram seed from market or procure from the government department. The farmers are still using own farm saved seed of jowar, but they are preferring HYV of jowar available in the market and from the government department. Ground nut seed is generally conserved by the farmers and taken in nagu for the use from the neighbours if seed is available in the village and in some cases HYV of seed is purchased from the market and government departments.

Need for Seed Bank

Many attempts are on to revive the age-old concept of seed self-sufficiency. Community seed banks bring together seed-producing farmers, seed-using farmers and organize them to work in conditions of utmost transparency, mutual trust and social responsibility under peer supervision. An attempt was made at Timmar dipalli village in Mahabubnagr district of Andhra Pradesh, in the year 2013 to promote the concept of community seed bank with technical backstopping provided by WASSAN with support from Revitalising Rainfed Agriculture Network Consortium under Comprehensive Pilot program. Its objective was to ensure timely supply of quality seed of improved varieties to all groups of farmers as an approach towards increasing productivity and creating income generating opportunities for better livelihoods to villagers. This is an effort towards, self-reliance in the seed system by the farmers with the support from government addressing various problems in the system. Much prior to this intervention, a conscious effort to understand the sustainability of existing community seed systems was made to assess the needs of the stakeholders and to plan and develop appropriate seed bank model.

Evolution of the Farmers' Organisation and establishment of Community Seed Bank Formation of Farmers' Cooperative

Three years back, farmers have decided to address their problem in agriculture and motivated to form groups with the support of WASSAN. The groups were formed in the villages with the objective of addressing farming issues collectively. Diversified Farmers Groups were formed in 2007 with AP Drought Adaptation Initiative scheme (APDAI). Two villages in the mandal initially started farmers' cooperative and later 73 groups having 15 members in each of 14 villages are federated to form Mutually Aided Cooperative Farmers' Society. The Society is involved in the agricultural services, use of different government schemes like NPM, procurement, dal processing unit, soil fertility enhancement, thrift and credit, dry land horticulture, compost making, getting licence for fertiliser procurement and distribution, etc. Currently, 48 farmers groups are operational in the cooperative. Realising seed availability and viability problem in the past, farmers group started conceptualising seed bank. Initially the groups started contributing monthly saving within the group for internal lending. The membership criteria of the group are : The person should have be a land owner of 1 to 5 acre of land. He/she can save Rs 50/- per month in the group.

Since there was already having base from APDAI project and responsible group leaders came forward to have the collective action on agricultural issues. A resolution was made in cooperative for the formation of Seed bank after so many meetings and discussion regarding agricultural issue in the mandal. It was resolved in the meeting that there will not be any free provision of services. It took one year because of the condition of not availing any service freely, but later due to the initiatives of 3 to 4 resource persons from the villages who regularly talk with the farmers in groups and able to convince about the benefits of Seed bank programme. The selection of these group leaders was crucial for the mobilisation of people

for the Seed bank programme. Hence, 48 farmers' groups from 14 villages of the cooperative used to arrange meeting every month and discuss about the issues regarding seed. It was evolved from the discussion to set up a Seed bank by the cooperative for addressing the issues in seed. There was discussion of contribution from the groups in the form of share capital for the initial fund mobilisation. Three clusters are identified for Seed bank namely; Timaredipalli, Chellapur, Kowded. In order to qualify for seed bank, the group has to deposit Rs 3000/- share capital with the farmers' cooperative. The members have to pay towards service as per the provision.

The village Timaredypalli has taken lead in establishing Seed bank in spite of having various developmental issues such as water scarcity for agriculture, drainage system in the village, sanitation, electricity and road on a priority basis. The major crops grown in the village are red gram, green gram, jowar, paddy, ground nut in kharif season. However, the preference of ground nut cultivation in rabi season as it can be protected from wild boars by watch and ward mechanism by the villagers. Cotton crop is also growing in these area. The prominent problems faced in agriculture by the farmers are reduction in soil fertility, pest attack, increasing cost of cultivation by use of equipment's. Soil fertility has been intensive application of chemical fertilisers without knowing the need for soil minerals. Earlier the quality of harvested food was having good nutritive value as there was less use of chemical pesticides. The cost of cultivation has risen with more investment on use of equipments. There was problem of getting quality seed. Seven years back they were using their own farm saved seeds. They faced a problem of storage for their own seed and government provision of new seeds to the farmers for better productivity led to leaving own seed conservation and increased dependency on government supplied seeds. The farmers are facing many problems on seed i.e., timely supply of government seeds, insufficient supply of seeds, and lower quality of seeds, especially K-6 variety of seed in ground nut. There was problem of getting seed subsidy in time. The seed price is more for the farmers, than selling price of own seed.

The office bearers were selected on the basis of following criteria. Two managers should be responsible person; they should be educated persons (read and write); they can motivate and negotiate with the farmers, able to motivate and resolve issues. They can collect the seed from the farmers through nagu system for the seed bank. Other three persons are representatives of cooperative.

The managers have to collect seed requirement data, submit proposal of seed requirement, purchasing seed with the 3 cooperative members, seed collection with quality check, maintain seed quality at the seed bank, manage seed storage, seed germination test, distribution of seed and do the book keeping activities as per the requirements of Seed bank. Other three office bearers are nominated by the cooperative to build linkage with the cooperative for getting fund and other support for the seed bank and also simultaneously deal with timely purchase of quality seed, negotiate for sourcing foundation and breeder seeds, collection of seeds from the farmers and make arrangement for trainings regarding seed bank operation. The seed committee has the role and responsibility of supervising, monitoring and advising seed bank office bearers in addition to the involvement in operational aspects directly.

Membership Criteria: The person should be small and marginal farmer. He should be land owner. There should not be any dual membership. The person should not be corrupted and convicted. The person is willing to obey the resolution and terms and condition of the cooperatives.

Bye-Law Formulation: Exposure visit was made to similar initiatives that have already taken place. Discussion about the initiatives along with roles and responsibility of different members and office bearers of the organisation. Later cooperatives was registered under Mutually cooperative societies act of 1995.

Rules and Norms: Regular meeting will be conducted every month, The seed agreement is made by the Seed bank with the condition that after seed germination test, the responsibility goes to farmers, so that they have to pay back the required amount of seed as per the agreement. There is quality check by the seed bank while getting back the seed from the farmers. There is a norm that the seed producer farmers given breeder and foundation seed and they return the produced seed based on Nagu system. Remaining seed farmer can use accordingly.

Seed Procurement

In the cooperative, there are different committees for different themes. The seed committee members in the cooperative deal with Seed issues. Seed requirement plan of the village will be prepared. Initially indents will be collected from the farmers within groups and placed in cooperative board meeting to procure seeds after taking stock of the situation. Accordingly, negotiations are made with different institutions for seed procurement. The seed committee members along with WASSAN staffs do the negotiation for the seed procurement. Seed bank manager along with a Seed bank cooperative representative and a cooperative service provider procure the seed. They check the seed about its purity, moisture content, and viability. Then they will distribute to the farmers and cultivate seed. Technical backstopping will be given by the department of Agriculture and WASSAN. Seed procurement from the member farmers was done as per the nagu system within 20 to 30 days of harvesting. In case, there is crop loss in one season, the farmers have to pay back seed through nagu system for the next season. Sometimes, different millets or pulses can be alternatively repaid.

Seed Production

Breeder and foundation seeds procured are given to the seed producer farmers for the cultivation. Seed producer farmers are given training on seed production methods, crop management practices, etc. 25 farmers in groundnut and 50 farmers on paddy received training from WASSAN on seed production management with the support of ATMA. Farmers do the rouging in the production management of crops from their field.

17 katha farmers were chosen for 22 demo plots of 22 acre land. The selected farmers should have irrigation facilities in summer for the seed cultivation. The farmers got training regarding seed production methods including rouging. After the seed was purchased by rabi farmers, 20% of the cost is paid to farmers in advance and rest 80% paid at the time of selling to other farmers. Office bearers of Seed bank go to the katha farmers for quality check. 30kg to 40kg packets are made sealed with label, with information about seed variety, quantity, name of the producer farmers and germination test findings. Seed bank managers collect seed from the farmer at the proportion of 1:1.5 with the existing nagu system. The rest of the seed are left with the producer farmer with the label and then cooperative will inform to the seed user farmers about the availability of seed from the producer farmers at the market rate.

Seed Distribution

Initially, the foundation or breeder seed is distributed to the identified seed producer farmers. Seed bank distributes the seed procured from the seed producer farmers, and other sources as per the indent of seed requirement. While, in the distribution of seed, the previous record of the farmer in fulfilling the condition of regular saving in the groups and returning the seed in time as per the agreement is referred. The seed is distributed in time before the sowing season for both kharif and rabi crops. The Seed bank maintains the record on availability of seeds with the member farmers for selling. The Seed bank has the distribution register specifying details of seed distribution through the Seed bank. Group discussion about seed demand and expected seed demand as per the seasonal climatic condition of the area and accordingly seed distribution is made.

Seed distribution is made with the condition of repayment as per Nagu system for different crops listed below

Nagu System

Table 1

Sl. No.	Crops	Proportion of Repayment
1	Paddy	1:1.5 (one bag of paddy farmer has to give 1.5 bags)
2	Groundnut	1:1.5
3	Redgram	1:2
4	Green gram	1:2
5	Cowpea	1:2
6	Jowar	1:2
7	Millets	1:2

In every three year, there is seed replacement mechanism by the seed bank.

Seed Storage

A building has been hired for Seed bank at Rs 300 per month in Timmaredipalli village. The seed is stored in the Seed bank in the gunny bags. The managers have to look after the maintenance of the seed. In every 15 days, the bags are to be put in sun light to protect from pest attack. Excess seed will be stored with producer farmer.

Seed treatment is done by the farmers when they use seed. Last year, there was treatment of green gram and red gram seed with trichoderma.

Seed Quality Test: Seed bank has to do quality check at the time of seed procurement from outside sources where there is no labelling. The seed bank has to do germination test while distributing its own seed. There is group discussion among the farmers about seed maintenance.

Seed bank has following equipment's with support from RRA-CP project and want to have some more equipment's for its management:

Table 2

Sl. No.	Stocks of Equipment's	Requirement of Equipment's for Seed Bank
1	Weighing machine	Electronic weighing machine
2	Gunny bags	Gunny bags
3	Separator	Tarpoline
4	Plastic tray	Seed treatment drums
5	Jalleda (telugu) (sieve)	Stitching machine
6	Chata (telugu) (winnowing)	Display board for stock and distribution register
7	Thread	Small packing bags of 1 to 5 kg weight

The seed bank maintains following registers:

- Stock register
- Minute register
- Agreements
- Seed requirement formats for survey
- Monthly seed stock details report
- Distribution register

Capacity Building Programme

There was continuous capacity building on seed production was given. The seed growers were trained in basic seed production techniques, seed selection technique, seed health management and seed storage management. The seed bank managers underwent training on business skills, record keeping and group dynamics and leadership skills, etc..

Administration Costs of Seed Bank

Out of total profit of Seed bank in terms of seed, 25% is given to two managers of Seed bank; 25% is given to seed collectors. Rest 50% of the profit in terms of seed is kept in the Seed bank owned by the cooperative. The Seed bank managers can spend below Rs 500 for the operation of Seed bank and in case of requirement of more money the manager has to take approval from the cooperative.

After 3 years, the corpus of the cooperative is Rs 4.00 lakh and availed most of the benefits from government schemes. Now the cooperative is able to get timely seed in advance from the government which was delayed earlier. The cooperative got fertilizer license with 40 metric ton of fertilizer purchased and sold within the group members. As a plan of this year, 150 quintals seed to be given 22 farmers and 50 metric ton of fertilizer demand for the kharif crops. In its future plan, the Seed bank has to produce sufficient seed for meeting the seed demand with more seed stocks available in the bank. The Seed bank has to make arrangement for seed certification and start seed business in paddy and groundnuts to meet local seed requirements.

The Seed bank need at least 2 years hand holding support in seed certification process, continuous support of GO/NGOs for proposal making and building linkages with various agencies is required. The Seed bank needs regular government support with seed outlet and procuring extra from the Seed bank. The Seed bank managers need regular market information regarding prices of seeds, training on storage, pest management, seed maintenance, management, with future seed demand estimation, training on book keeping, facilitation and problem solving skills, etc.

CONCLUSIONS

Finally, farmers expressed that timely availability of seed, timely sowing, good quality seed and good liaisoning with government departments for the farmers through seed bank. There would be proper planning with the seasonality aspect of crops in mind. A good linkage between seed producers and seed users was established. Price reduction of seeds was made for the accessibility of all the farmers. Strengthening farmers' organisations is crucial for sustainable agriculture.

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