

Farmer-Led Participatory Maize Breeding in Middle Hills of Nepal

*Final Report of Second Phase of the Project
(August 2001 – September 2002)*

By

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ACRONYMS

CIMMYT	The International Maize and Wheat Improvement Center
DADO	District Agriculture Development Office
FGD	Focus Group Discussion
FRC	Farmers' Research Committee
FW	Farm Walk
GARDP	Gulmi Arghakhanchi Rural Development Project
HMRP	Hill Maize Research Project
IPR	Intellectual Property Right
LI-BIRD	Local Initiative for Biodiversity, Research and Development
NARC	Nepal Agricultural Research Council
NGO	Non Government Organization
NMRP	National Maize Research Program
PPB	Participatory Plant Breeding
PRGA	Participatory Research and Gender Analysis
PVS	Participatory Variety Selection
SMMC	Seed Management and Marketing Committee
SPG	Seed Producer Group

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1 INTRODUCTION

Maize (*Zea mays* L.) is the main livelihood crop and is largely grown in intercropping system in the middle hills of Nepal. Maize production system in the western hills of Nepal, particularly in the districts of Palpa, Gulmi, Arghakhanchi and Pyuthan, is in unique geo-physical environments, which are different than other maize growing environments of Nepal. These areas are in remote parts of the country and district head quarters are accessible by road in winter season only. Farmers of these areas have poor access to improved genetic materials and information (Subedi *et al.*, 1998). During the decade of 1990s, only 16 tons seed of modern maize varieties were distributed for 58,000 ha maize area (Kadayat *et al.*, 1997). Location- specific problems are also not addressed by the existing formal research system. Major proportion of the maize area in these VDCs is dominated by landraces. The purpose of the project is to strengthen role of farmers in landrace improvement processes using farmers' local knowledge and resources. From previous experiences of Participatory Variety Selection (PVS) programme conducted in this region with the support from EU-funded rural development project, LI-BIRD recognised that there was a scope for improving maize productivity through strengthening farmer breeding (Sunwar *et al.*, 2001).

LI-BIRD conducted farmer-led participatory maize breeding programme in collaboration with national research system and farmers through Farmer Research Committee (FRC) as major stakeholders in two locations, viz. Darbar Devasthan (800-1500 masl) and Simichaur (800-1500 masl) VDCs of Gulmi district. Small grant support was obtained from System

Wide Programme (SWP) for Participatory Research and Gender Analysis (PRGA) initially from 1999 to 2000. The objective of the project was to develop farmers-preferred new varieties, building farmers skill on breeding and informal seed selection and maintenance process. As this was the process-led approach, a number of considerations had been made in the design and process of the research programme such as modification in initial breeding objective by focussing to improve the production performance of widely grown local landrace *Thulo pinyalo* as well as incorporation of users' and gender's perspective of maize production and utilization (Shrestha *at al.*, 2000).

The initial impact of the project was found very encouraging in terms of technical (breeding skill transfer, seed selection and maintenance) and social (capacity building and empowerment) dimensions. However, project duration of two years was of very short to achieve desired outputs from such type of programme specially focused on crop breeding and improvement. So, LI-BIRD requested to SWP/PRGA for the extension of project for few more years to accomplish the breeding activities already initiated under second phase.

As a result, PRGA funded the project for one more year under second phase from August 2001. Under second phase, strengthening and advancement of first phase activities has been made to increase the effectiveness and impact at large. Major outputs of the project have been that farmers have become able to select and develop a variety which they have named *Resunga composite*. Hill Maize Research Project (HMRP/CIMMYT, Nepal) has supported for seed production and marketing activity of the varieties identified through Participatory variety Selection (PVS) and *Resunga composite* at community level. This has resulted in scaling-up of the varieties in a larger area in the year 2002. During the project period, a number of other supporting organizations of farmers such as Seed Producers Groups (SPG), Seed Management and Marketing Committee (SMMC), women' sub-committee have also evolved. Farmer Research Committees (FRCs) have become able to take lead in all the project activities independently and established a linkage and co-ordination with other local organizations, district level I/NGOs and government line agencies. This technical report presents the summary of activities for the period of second phase (August 2001 to September 2002) of the project.

2 ACHIEVEMENTS AND CONSTRAINTS

2.1 Variety Improvement Programme

The farmer-led *Thulo Pinyalo* and *Resunga Composite* improvement programme has unique features that differ from what conventional breeder (researchers) follow (Table 1). The farmer-led maize breeding program is a process-led approach where both farmer breeder and researchers learnt variety improvement strategies by working together.

The strategy followed was to maintaining high population size from low number of crosses. In 2002, only five populations were maintained and *Thulo Pinyalo/Khumal Yellow* was dropped (Table 2). The low cross number allowed farmer breeders to concentrate on particular cross and select within crosses for the desired traits. We encouraged farmer breeders to work on single cross however Mrs Lal Kumari Basnet worked on both the reciprocal crosses *Thulo Pinyalo/Ganesh-1* and *Ganesh-1/Thulo Pinyalo*. She has been improving the same population for the last three years. The size of the population was maintained at 6000-10000 plants depending upon the seed available for the segregating population. In case of *Resunga Composite*, farmer breeder maintained 10000 plants and selected 900 best plants from the population at standing condition. He further selected cobs

for the post harvest traits and maintained 800 cobs. The approach of high population size was followed to get the rare sergeants in the population, which was difficult in small population size.

Table 1. The contrast between conventional research and learning process approaches adopted by FRC in farmer-led maize improvement programme in Gulmi.

Characters	Conventional breeding	Learning process of FRC
Point of departure	Nature's diversity and its commercial value	The diversity of both people, system and nature's value
Strategy	Strategic planning for centralized breeding; Breeder-led	Participatory Plant Breeding; Farmer-led
Approach	High cross Number Small population size On-station selection lack of post harvest evaluation	Low cross Number Large population size On-farm selection Post harvest evaluation
First step	Centralized, ideas originate in researchers mind	Decentralized, idea generate in village among farmers
Design	Static, by expert/scientist	Process led, Awareness, action, adoption, scaling up
Main recourses	Central funds and technicians	Local people, local sets and indigenous knowledge
Methods, rules	Standardized, universal, fixed package	Diverse, local, varied basket of choice
Analytical assumptions	Natural science bias	System, holistic and livelihood
Management focus	Spending budget, completing projects in time	Sustained improvement and performance
Communication	Vertical: orders down, reports up	Lateral: mutual learning and sharing experiences
Evaluation	External intermittent	Internal, continuous
Error	Buried	Recognized and incorporated into the learning process
Relationship with people	Controlling, policing, inducing, motivating, dependency creating, people seen as beneficiaries	Enabling, supporting, empowering, FRC and farmers seen as main actors
Outputs	a. Diversity in conservation, and uniformity in production b. Empowerment of professional	a. Diversity as a principle of production and conservation b. The empowerment of FRC and farmers

2.1.1 Farmer-led Thulo Pinyalo Improvement

The farmer-led *Thulo Pinyalo* improvement programme includes population developed from six crosses (Table 2) in two sites. However, breeder farmers from Darbar Devasthan dropped the population of *Thulo Pinyalo/Khumal Yellow* because the population was very tall and lodging prone. They observed that there will be less genetic gain for the lodging tolerance as compared to other population and dropped the population during farm walk organised by FRC. The key points of departure of farmer-led maize breeding programme from conventional breeding programme is summarised in Table 2.

Table 2. Maize population advanced by farmer breeders of Darbar Devisthan and Simichaur, Gulmi in 2002.

Crosses	2002		Seed selected
	Darbar	Simichaur	
<i>Thulo Pinyalo</i> /Ganesh –1	-	F ₃	30 kg
Ganesh-1/ <i>Thulo Pinyalo</i>	-	F ₃	30 kg
<i>Rampur Composite</i> /Ganesh-1	-	F ₃	20 kg
<i>Thulo Pinyalo</i> /Khumal yellow	F ₃		Dropped*
Pop 22/ <i>Thulo Pinyalo</i>	F ₃		50 kg
<i>Rampur Composite</i> / <i>Thulo Pinyalo</i>	F ₂		50 kg

*very tall plant height and lodging problem led to drop this population

2.1.2 Researcher-led *Thulo Pinyalo* Improvement in NMRP

The National Maize Research Programme of NARC started an alternative approach of Self Progeny Selection to improve the lodging tolerance in the *Thulo Pinyalo*. The selfed S₂ progenies are evaluated in project sites in 2001 during the maize growing season while the remnant seed are kept at NMRP. The best progenies are identified for lodging tolerance and farmers preferred traits. The identified best progenies will be recombined once again in NMRP during winter season in 2002 using remnant seed. The evaluation and recombination will be repeated until population is developed as a variety.

2.1.3 *Resunga Composite* Improvement

Farmers have selected *Resunga Composite* from randomly crossed population (namely *Rampur Composite*, *Rampur-1*, *Rampur-2 Across-9331* and *Narayani* which were obtained from National Maize Research Programme, Rampur). Although we distributed only about one kg of seed to each of the sites in 1999, farmers selected superior plant and did their recombination in isolated condition. After two generations of selection and recombination, farmers have been able to develop the population of *Resunga Composite*. Farmers have detasseled the undesirable plants (such as lodged, tall, thin, weak, malformed, diseased and late maturing) at standing crops stage and thus recombined the best plants only in the population through simple recurrent selection. In 2002, they selected 318 kg of this population for seed multiplication and other trials for 2003. Two farmer breeders grew *Resunga Composite* in a large population size for further improvement through simple recurrent selection where as 11 farmers evaluated this population as a PVS variety. Also the FRCs have organised multilocational testing of this population through District Agriculture Development Office (DADOs) in Gulmi and Palpa districts. They found the population very promising in terms of preferred traits like lodging resistance, yield potential, grain type and grain colour. DADOs of Gulmi and Palpa have reported that farmers from their districts have liked the population and there is a high demand for the seed of farmers bred *Resunga Composite*.

2.2 Participatory Variety Selection (PVS)

Farmers of Darbar Devisthan and Simichaur have evaluated seven varieties; *Rampur Composite*, *Hill Pool Yellow*, *Hill Pool White*, *Pool-21*, *Manakaman-3 (POP-22)*, *Resunga Composite* and *ZM 621* through PVS. Two hundred and fifty nine farmers evaluated the PVS varieties in 2002. They have preferred, *Rampur Composite*, *Manakamana-3*, *Resunga*

Composite, Hill Pool Yellow and Hill Pool White. Still farmers want to assess the yield and quality traits of *Hill Pool Yellow, Manakaman-3, Hill Pool White and ZM 621*. They have preferred these PVS varieties in terms of lodging resistance, yield potential, grain type and plant height. A preference ranking for six varieties including *Thulo Pinyalo* was done. Both male and female farmers of Darbar Devasthan have ranked *Rampur Composite* as first and, *Resunga Composite* and *Manakaman-3* both as second respectively. There is a high correlation between preferences of male and female farmers ($r = 0.93$) (Table 4). Based on the results of PVS, seed multiplication and scaling up of farmers preferred varieties has been done. Seed producer groups have produced the seed of *Rampur Composite, Resunga Composite* and *Manakaman-3* for the next year.

Table 3. Maize varieties, farmers and seed quantity used for PVS programme in 2002.

Variety	Farmers	Seed (Kg)	Status of PVS variety
<i>Rampur Composite</i>	35	333	Farmers preferred variety
<i>ZM 621</i>	6	6	Test variety
<i>Hill Pool Yellow</i>	6	6	Test variety
<i>Hill Pool White</i>	6	6	Test variety
<i>Manakamana-3</i>	5	25	Farmers preferred variety
<i>Resunga Composite</i>	11	89	Farmers developed variety
Total	69	465	

Table 4. Correlation coefficient of preference ranking of six maize populations by male and female farmers of Darbar Devasthan, Gulmi, in 2002.

Maize Varieties	Preference ranking		
	Male	Female	Overall ranking
<i>Rampur Composite</i>	1	1	I
<i>Thulo Pinyalo</i>	4	3	III
Pop-22	3	2	II
<i>ZM 621</i>	7	7	VI
<i>Hill Pool Yellow</i>	5	4	IV
<i>Hill Pool White</i>	6	5	V
<i>Resunga Composite</i>	2	3	II
	Correlation coefficient (r) = 0.93		

2.3 Seed Production and Marketing

Farmer-led maize PPB is one of the process-led projects where new activities were identified in due course of time. FRC decided and started seed production of improved varieties and PPB lines identified through PVS activities in limited scale in 2001. They have formed Seed Producer Group (SPG) and Seed Management and Marketing Committee (SMMC) for sustainable seed production activity. With the encouraging results from seed production activities, committee decided to scale up the area in 2002. The area under seed production has increased from less than 3 ha. in 2001 to 6 ha. in the year 2002 with a 9.9 tons production of high quality seed of four improved varieties; *Rampur composite, Resunga Composite, Manakamana-3* and *ZM-621* (Table 5). A total of 45 farmers have been involved in seed production activity from both the sites in the year 2002.

However, in 2002, the region received the lowest rainfall and affected the crop growth including seed production of maize. Also the draught had synergistic effect on disease

development resulting low seed production. Brown Spot disease appeared in the region at early stage (after 40 days of seeding) where draught had severed effect on Maize. LI-BIRD staffs, senior scientist (pathologist) from NMRP, plant protection officer from DADO/Gulmi, FRC and SPG members visited the draught and disease affected plots.

Table 5. Area and production of maize seed from both the sites during 2001 and 2002, Gulmi.

Variety	2001		2002		Total	
	Area (ha)	Production (t)	Area (ha)	Production (t)	Area (ha)	Production (t)
Rampur Composite	1.7	2.76	4.5	4.95	6.2	7.71
Resunga Composite	0.25	0.36	1.1	0.96	1.35	1.32
Manakaman a-3	-	-	0.3	0.81	0.3	0.3
ZM 621	-	-	0.05	0.09	0.05	0.05
Total					7.9	9.93*

* This does not include grain used for consumption purpose.

Seed production has profitable activity to the farmers and seed producer groups involved in the maize seed production programme. SMMC sold the seed produced in the 2001 other farmers, DADOs of Gulmi and Palpa and local private agro vets (Table 6). For this year, seed is being collected and stored for marketing in the next season. The joint meeting of SPG and SMMC collected the maize seed @ 17.00 NRs per kg. Their local landrace generally exchanged and sold @10NRs per kg thereby the seed produce farmers got net 7 NRs per kg cash benefit from improved variety. Furthermore, there is yield advantage from Rampur Composite and other improved varieties due to less lodging. They have utilised their own revolving fund for seed collection. They have started to collect demand from DADOs of Gulmi, Palpa, GARDP-II, and LI-BIRD, DADO Arghakhanchi and other local private agro vets for seed sell.

Table 6. Quantity of seed sold by SMMC in 2002 from the production of 2001.

S. N	Buyers	Variety		Quantity (kg)	Remarks
		Rampur Composite	Resunga Composite		
1.	DADO, Gulmi	368	30	398	Seed quantity disseminated through farmers to farmers exchange is not included
2.	Local Agro vet	150	-	150	
3.	Farmers of the area	70	-	70	
4.	Total	588	30	611	

3 MONITORING AND EVALUATION

3.1 Participatory Crop Monitoring

FRC annually organised joint field monitoring programme during crop maturity stages. The representatives from HMRP/CIMMYT-Nepal, NMRP/Rampur, DADO/Gulmi and Palpa, Western Regional Seed Laboratory, Bhairahawa, GARDP II/Gulmi, Businessman,

researchers from LI-BIRD, members of FRCs, SPGs, SMMC and farmers participated in the monitoring programme. The farmers, extensionists and researchers jointly observed, discussed and evaluated the field activities. Comments and suggestions obtained from field visit and discussions were taken as feedback for further improvement of the programme. During discussions, farmers showed their strong desire to continue *Thulo Pinyalo* and *Resunga Composite* improvement programme. The team in the forthcoming season recommended that the breeder farmers should focus on the selection for tolerance to water stress because there was severe drought the region in 2002 maize season. The scientists of NMRP and Regional Seed Lab recommended that seed production farmers should be trained to produce foundation seeds preferred varieties so that access to quality seed can be improved in the future.

3.2 Participatory Farm walk (FW) and Focus Group Discussion (FGD)

A series of participatory farm walk and focus group discussion were conducted by FRC as a part of implementation process for planning, effective monitoring and evaluation of the activities. FRCs organised participatory farm walk during vegetative stage (tasseling) and after harvesting followed by focus group discussions. Collaborating farmers and researchers from LI-BIRD participated in the programme along with committee members. Refresher mass selection training was provided during early tasseling stage whereas training related to selection for post-harvest quality traits were given before harvesting. At the time of farm walk and focus group discussions, farmers evaluated the performance of PPB and PVS varieties in field condition as well as assessed for pre and post harvest traits (Table 4 and 7).

3.3 Evaluation of Post Harvest Trait

Focus Group Discussion (FGD) revealed that almost 25% of maize is eaten as roasted cobs. That is why, a pre-harvest evaluation on roasting quality of maize through preference ranking was important for the farmers. Therefore, an evaluation was carried out to explore the roasting quality of PVS and PPB varieties by 34 farmers in 2002. The post harvest traits of *Thulo Pinyalo* were, thus, considered superior over other PVS and PPB varieties. The roasting quality was found to be the best in *Manakaman-3* followed by *Thulo Pinyalo* and *Resunga Composite* (Table 7).

Table 7. Evaluation of PVS and PPB varieties for roasting quality in Darbar Devasthan, Gulmi in 2002.

Characters	Resunga Composite	Thulo Pinyalo	ZM 621	Manakamana-3	Rampur Composite
Softness	3	1	2	1	3
Sweetness	1	3	3	1	1
Ease of roasting	2	2	3	1	2
Grain type	2	1	1	2	2
Ease of shelling	2	1	1	2	3
Total	10	8	10	7	11
Ranking	III	II	III	I	IV

The lowest score is the best quality.

4 CAPACITY BUILDING

4.1 Farmers Training

Different *in-situ* and *ex-situ* trainings on seed production, marketing, post harvest quality control, group mobilization and strengthening and mass selection were organized to the members of FRCs, SPG, SMMC and farmers. One hundred and seventy one farmers participated in the training programme conducted during the project period of two years. Among them, 58% were female participants.

4.1.1 Mass selection (refresher)

Refresher training on mass selection was organized for the members of FRCs, Seed Producer Groups (SPGs) and other selected farmers of the project sites separately. The objective of the training was to strengthen skills and capacity of the farmer breeders to select superior population, produce and maintain quality maize seed. One hundred and seventy one farmers involved in the training programme during two years project period.

The training covered maize plant morphology, floral morphology, pollination, and concept of inheritance parent selection, detasseling and its importance, stages of plant and seed selection. Separate sessions (theory and practical) of training were organized for selections. Plant Breeder and Assistant Plant Breeder from LI-BIRD led the theory of training. Committee members were requested to lead the practical session and they successfully demonstrated their capability to train other farmers. Mrs Lal K Basnet and Mr. Chinta Mani Panthi were the two innovative farmers who led the practical sessions in the field.

4.1.2 Seed production, marketing and group mobilization

FRC and SPG members received training on seed production and distribution, quality maintenance and marketing of seed, group mobilisation and strengthening in 2001. The objectives were, create awareness among seed growers about the need for decentralised seed production and distribution and associated legal framework, impart skills for quality seed production and marketing system, introduce the concept of group mobilisation and group strengthening. After this training FRCs and SPG members decided and formed SMMC at district level, as a reflection of this training. The SMMC is responsible for seed marketing, price fixation, management and co-ordination between seed producers and line agencies that demand for seed. Expert from Seed Sector Support Programme (SSSP) was invited to provide the training.

4.1.3 Post harvest quality control

Separate training on Post harvest quality control was organized at both the project sites in 2001. The objective of this training was to create awareness on post harvest quality control and its importance to quality seed. The topics covered were definition and importance of quality seed factors affecting quality seed, post harvest handling etc. One hundred and four farmers were participated on the training programme.

4.2 Exposure Visit

Ten members of FRCs from both project sites visited the Pithuwa seed producers group and Majhuhi Cooperative Khairahani of Chitwan district. The objective of this visit was to give

an exposure on working mechanism, the strength as well as the problem faced for group mobilization by the Pithuwa groups. The exposure visit to FRC and SPG was an orientation to the seed-marketing network and helped in developing marketing skills and knowledge.

One day's farmers exchange visit was organized across two project sites on July 21, 2002 in which 30 farmers observed seed production, PPB and PVS activities across and within the project sites. Also experts from NMRP and LI-BIRD participated in exposure visit. The team visited drought affected plots in Darbar Devasthan and Simichaur VDCs. The area experienced severe drought in post anthesis stage of maize. Therefore, there was a high loss in grain yield due to water stress. Farmer developed *Resunga Composite* and *Manakamana-3* were observed drought tolerant and performed superior over *Rampur Composite* and *Thulo Pinyalo*.

5 EMPOWERMENT

5.1 Effect on Developing Leadership in the Programme

The FRC has clear roles and responsibilities, lateral communications and learning process. The FRCs are mainly concerned with the problems of farming communities on crop production. The main actors, members of FRCs are new local level professionals in the project who are concerned not only with the research but also with the actions at field level. FRC is one of the major stakeholders in the farmers-led participatory maize breeding in Gulmi. The concept of FRCs had emerged spontaneously in a village level workshop in 1999 to ensure farmers leadership in the programme. Since then, FRC has developed leadership in the programme. Participatory programme planning of maize breeding is carried out annually by FRC. The committee has institutionalized the process of programme planning through a series of discussions with SPG, SMMG, Women's Groups, LI-BIRD and NMRP/NARC. In the initial years, LI-BIRD representatives used to organise the annual programme planning but in the subsequent years, planning has been led by FRCs. Researchers agreed to provide the technical backstopping and suggestions on the programme prepared by the FRCs. The programme activities are based on the results of last cropping season and suggestions made by different stakeholders. The planning process is summarized in Figure 3.

Also FRC successfully organizes the participatory monitoring and evaluation of breeding activities including members of FRC, SPG, SMMC, farmers, LI-BIRD staffs, researchers and extensionists. Thus, The FRC facilitates local people in analysis, planning, action, monitoring and evaluation of different activities (Fig. 1). That is why, the whole process of farmer-led participatory maize improvement programme focused to empower strengthen local institutions through capacity building. But, still FRC has an important challenge concerning the creation of effective long term partnership between local organizations, government agencies, research institutions and other stakeholders (Fig. 2).

5.2 Effect on Institutionalisation of the PVS Programme

Participatory variety selection is one of the activities that FRC has institutionalised in recent years to the other crops as well. In 1999, LI-BIRD started PVS on maize and farmers identified *Rampur Composite* and *Manakamana-3* suitable for the region. There is spill over of the PVS process into winter crops such as wheat, mustard, peas, chickpea and lentil. In subsequent years, FRC led the process by themselves and identified suitable varieties for

winter crops. The FRC has started seed production for varieties identified through PVS (Table8). In 2002, FRC organised PVS programme in different winter and summer crops providing service to 1132 farmers. Also they have included wheat and mustard in seed multiplication programme through seed producer groups in 2002.

Table 8. Participatory variety selection in winter crops led by FRC in 2001 and seed production during the winter of 2002.

SN.	Crops	No. of varieties	PVS (2001)		Seed multiplication (2002)		Remarks
			No. of farmers	Seed (kg)	No. of farmers	Seed (Kg)	
1.	Wheat	3	255	493	2	17	Varieties; Achut, Kanti and NL-781 Farmers have selected variety Achut
2.	Mustard	2	84	31.5	10	17.5	Varieties; Bikash and Pragati Farmers have selected variety Bikash
3.	Pea	2	211	50			Both Arkel and Sikkim local varieties have been selected
4.	Lentil	2	25	44			Simal, Sindhur both performed equally seed saved by farmers themselves
5.	Chick pea	1	20	20			Variety Dhanush
	Buck Wheat	1	20	20			Variety Chitwane Local; farmers saved seed
5.	Cow pea	1	30	8			Variety Prakash farmers preferred the variety and saved seed
6.	Broad leaf Mustard	1	100	1.25			Marpha broad leaf
7.	Radish	1	100	1.3			Minu Early
9.	Cucumber	1	161	1			Bhaktapur Local
11.	Butter bean	1	32	0.7			Kentuki wonder

6 STRENGTHENING LOCAL AND FARMING COMMUNITY'S RIGHT

The legitimacy of farming community's rights on agriculture related aspects are more apparent in recent years. They also have major implications for national policies on sharing of benefits derived from the agriculture and its end products. Guaranteeing the right of farmers' to save and re-use of seed is crucial in these connections.

In this context, the FRCs have been made aware of of the intellectual propret rights issues in general and crop varieties in particular. So, farmers' right to use and control over *Resunga*

Composite, the population developed by the farmer-breeders is a distinct case in hand. The committees are aware of contribution of different stakeholders in this maize breeding programme. The innovative farmers are involved in population development from six crosses made by the project and one cross obtained from National Maize Research Programme (NMRP). The farmer-breeders (member of FRCs) have developed the best populations out of these crosses. The FRCs shared the seed of *Resunga Composite* with District Agriculture Development Office (DADO) of Gulmi and Palpa (the government agency at district level) with formal written communication of sharing of seed between two parties. The FRCs agreed to share the farmer-bred population with DADOs where as DADOs agreed to share the performance of PPB bred varieties. The FRC decided to invite DADOs officials in monitoring programmes to share their experience of PPB in maize regularly very beginning of the programme. FRCs have included *Resunga Composite* in seed production programme and is willing to scale it up through their own seed production groups. There is clear indication that FRCs are aware of the farmers' property right. The FRCs have planned to include more populations generated through their breeding initiatives into formal research system in near future. However, *Resunga Composite* is near to varietal release stage; and therefore the mechanism of sharing benefits from this variety and the intellectual property right (IPR) issues have to be discussed and developed soon.

7 PROVISION OF REVOLVING FUND

To help the farmers' initiative as a self-sustaining activity for longrun, LI-BIRD provided, Rs30,000 seed money to them. FRC of each site received Rs 15,000 as a revolving fund in their account at branch office Rastriya Baninjaya Bank, Tamghas Gulmi. FRCs and SPGs have decided to use the seed money for buying source seed, seed collection from farmers, storage and seed selling activities.

8 CONCLUSION

- Farmers committee has build-up of their capacity for problem identification, programme planning, monitoring and evaluation of activities independently.
- The farmers-bred varieties have performed better under stress condition as compared to the advanced breeding population and released varieties. Breeder farmers have been concentrating on selecting better plants from larger population size to achieve uniformity of the population and better adaptability to stressed conditions.
- The breeding populations are selected for farmers preferred traits and evaluated for the post harvest traits by FRC. Breeder farmers got feedback of different evaluation for further improvement of the population.
- Farmers group perceived seed production as income generating activity have planned to develop Darbar Devisthan and Simichaur as maize seed production pocket areas for the region.
- SMMC started seed business through different networks such as DADOs, local agro vets, I/NGOs and farmers of the region. Their own revolving fund has been utilized for seed collection. SMMC has established formal communication system with DADOs, local private agro vets and other institutions like I/NGOs for demand collection and sell of seed.
- There is spill over of the variety selection approach to new crops like wheat, mustard and pea in winter season.
- FRCs now have their own revolving fund for research as well as seed production and marketing activities.

9 ADDITIONAL COMMENTS

The FRCs are now capable to mobilize community for research activities. However, there is a need to develop farmers' skills on maintaining their own seed and for seed production. The FRCs have now started the seed production activities to sustain the research activities in the project area. There is need to support farmers' initiative of maize breeding programme. By next year (2003), *Resunga Composite* will be a candidature for the varietal release procedure and there are more other populations coming from breeding programme. The seed production activities need to be strengthened to make the FRCs and SPG active in maize improvement in the long run. The farmers in the project area have developed the skills of selection and maintenance of varietal purity through mass selection. There is a potential of developing skilled farmer trainers for mass selection and seed production.

10 REFERENCE

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- Shrestha, P. K., M. Subedi, D. Poudel and S. Sunwar, 2000. Users' and Gender Perspective of Maize Production at Darbar Devasthan and Simichaur Research sites in Gulmi district of western hills of Nepal. Baseline report on Farmer-led Participatory Plant Breeding in middle hills of Nepal.
- Subedi, M. and P. K. Shrestha. 1998. Site selection report of Farmer-led Participatory Maize Breeding Programme for the Middle hills of Nepal. LI-BIRD, Pokhara, Nepal.
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Fig.1. FRCs and other organizations with their networking emerged after project interventions with distinct roles.

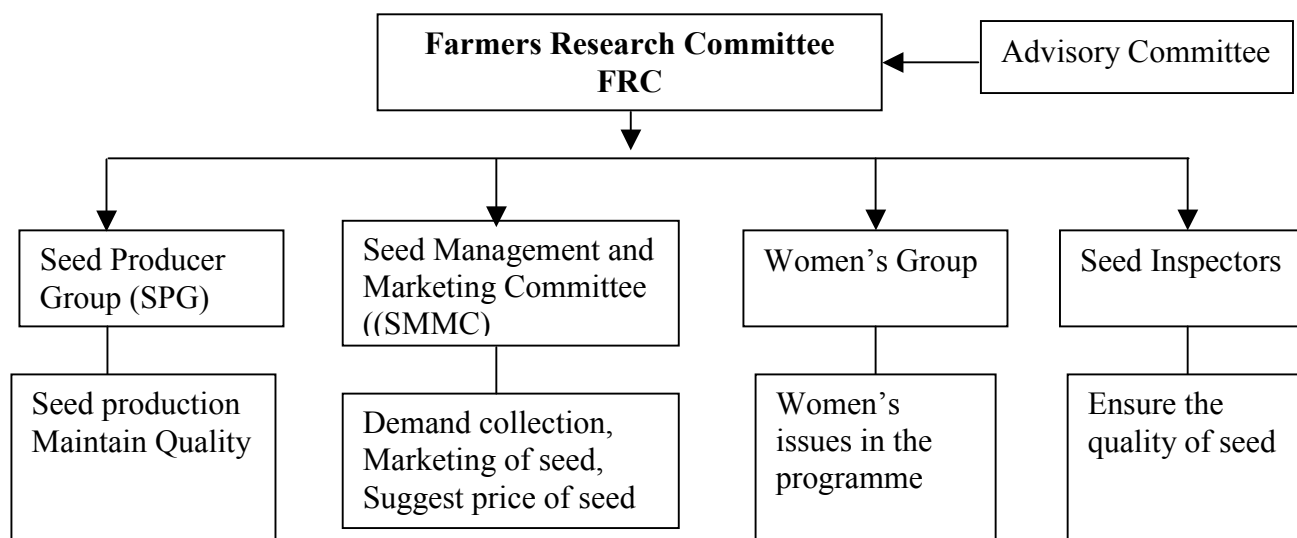
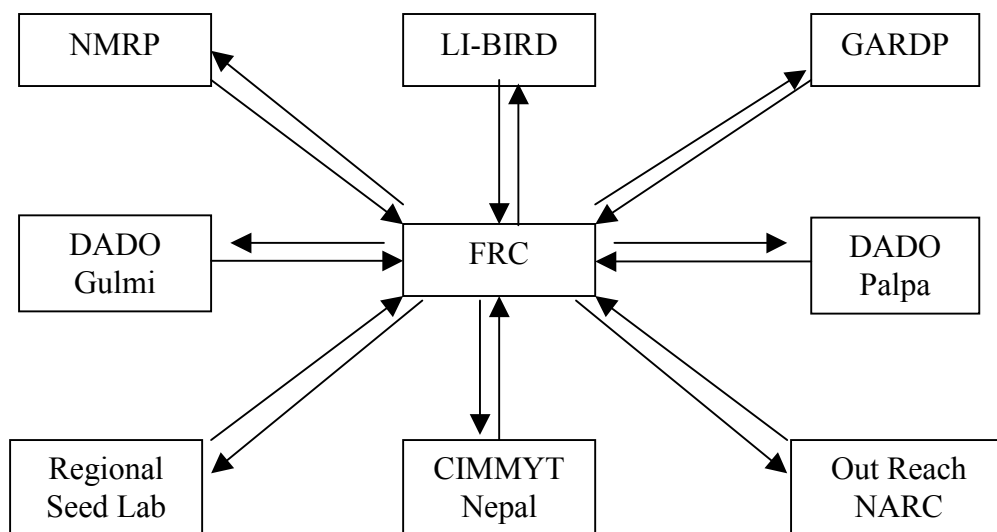


Table 9. Composition and functions of different local organizations evolved in the project area, Gulmi.

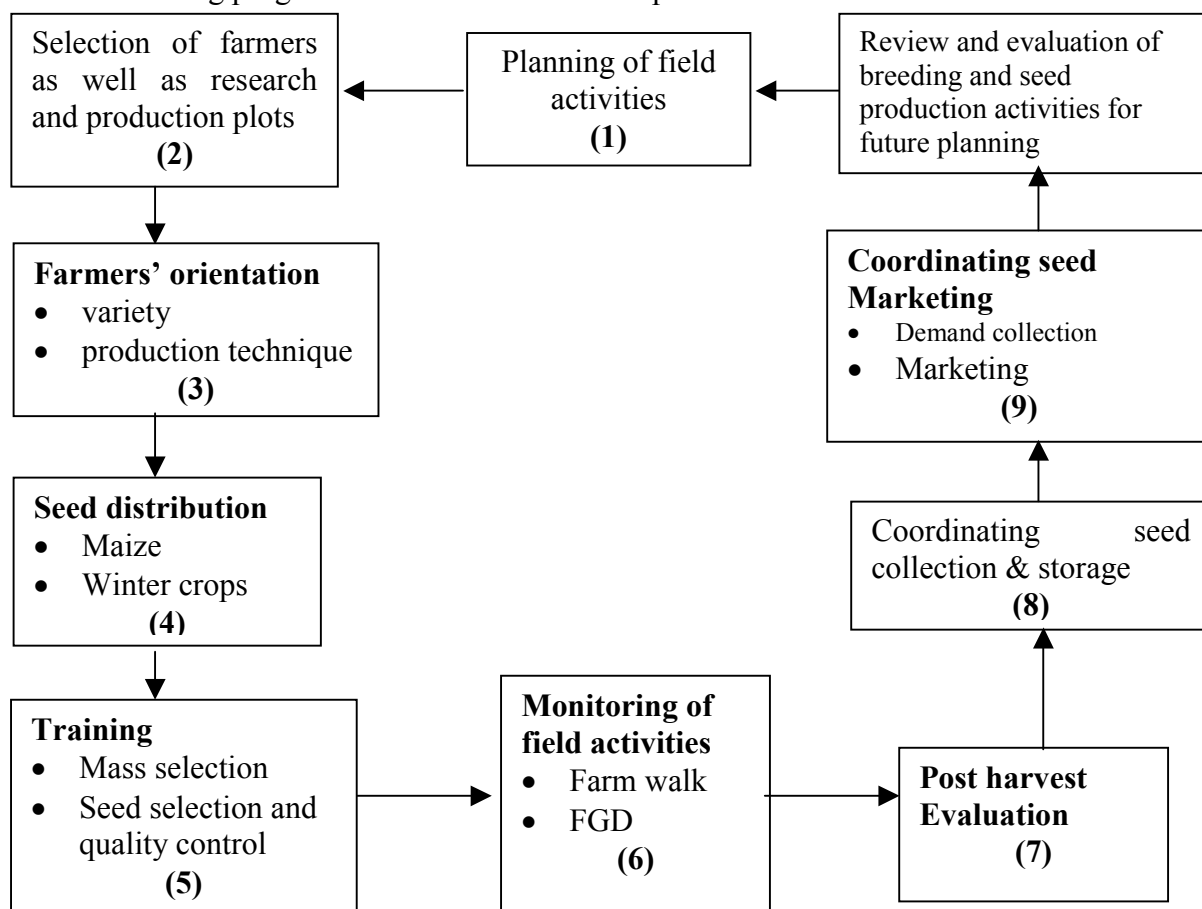
S.N	Organisation	Composition	Functions
1	Farmers Research Committee (FRC)	11 members, selected by the farmers of the area, 41% female	<ul style="list-style-type: none"> plan, implement and evaluate the project activities organise meeting, training etc. in consultation with other organisations establish linkage and co-ordination with other agencies
2.	Advisory Committee	7 members, headed by VDC chairperson	<ul style="list-style-type: none"> give advice to the FRC and other supporting committees
3.	Seed Management and Marketing Committee (SMMC)	7 representative members from FRC, SPG and advisory committee of both sites	<ul style="list-style-type: none"> field inspection and monitoring to maintain purity and quality pricing, collection, management and marketing of maize seed
4	Seed Producers Group (SPG)	9 members, formed by the farmers involved in seed production activities	<ul style="list-style-type: none"> identify farmers involved in seed production activity produce quality seed at community level
5	Women's Sub-Committee	12 selected female members	<ul style="list-style-type: none"> consolidate women farmers' issues in the programme

Fig. 2. Sphere of FRC's collaboration with different organizations in farmer-led maize Breeding programme in middle hills of Nepal.



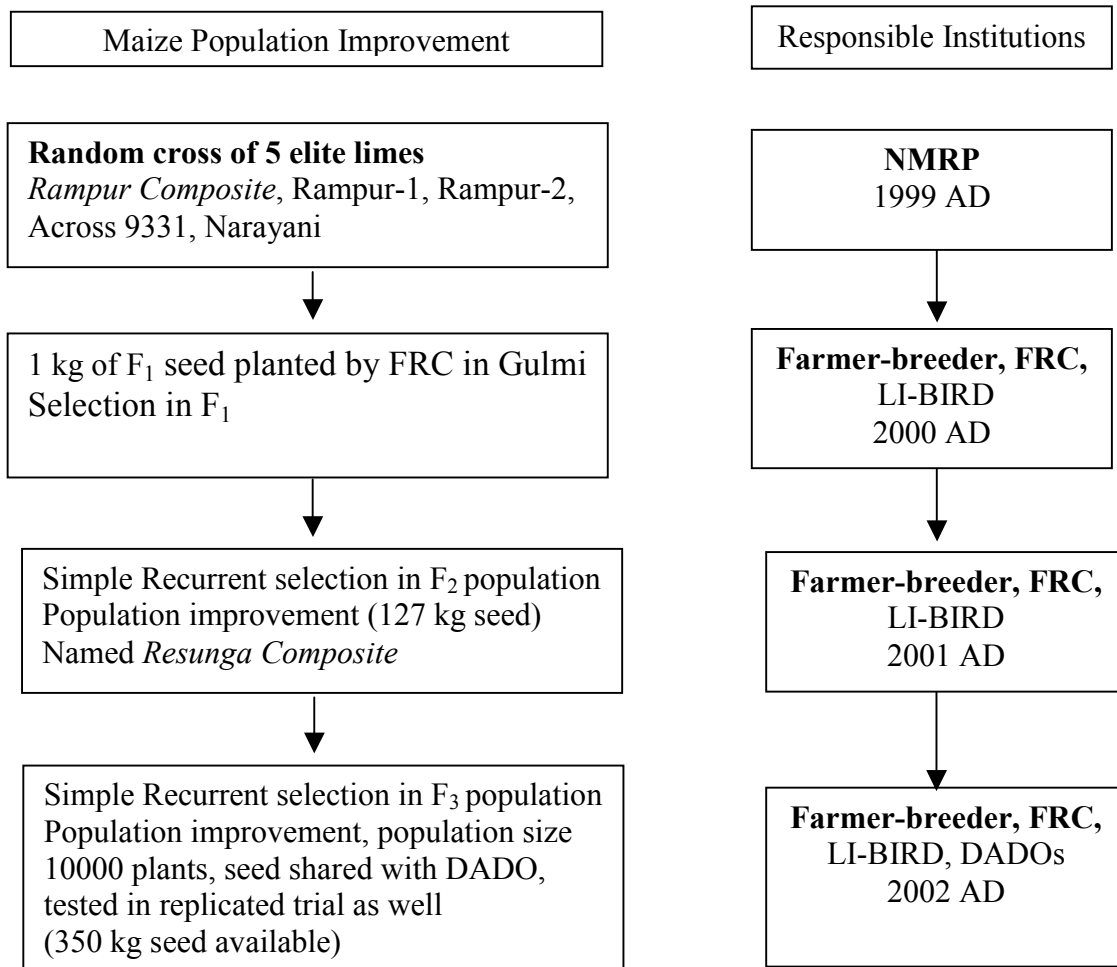
DADO = District Agriculture Development Office, NMRP = National Maize Research Program, NARC = Nepal Agricultural Research Council, Gulmi Arghakhanchi Rural Development Project.

Fig. 3 Annual activities of Farmers Research Committees (FRCs) in farmer-led maize Breeding programme in middle hills of Nepal.



FGD = Focus Group Discussion, SPG= Seed Producer group, SMMC = Seed Management and Marketing Committee

Fig. 4. FRCs leadership in *Resunga Composite* development in farmer-led maize breeding programme in middle hills of Nepal.



Annex I. Summary four years of activities (1999 to 2002) at Darbar Devasthan and Simichaur VDCs of Gulmi district, Nepal

S. N	Activities	Variety/line	1999		2000		2001		2002	
			Darbar	Simichaur	Darbar	Simichaur	Darbar	Simichaur	Darbar	Simichaur
1.	Breeding	TP X Ganesh-1	Cross	Cross	F ₁	F ₁	X	F ₂ , 2 farmers	X	F ₃ , 7 farmers
2.		Ganesh-1 X TP	Cross	Cross	X	F ₁	X	F ₂ , 2 farmers	X	F ₃ , 5 farmers
3.		RC X Ganesh-1	Cross	Cross	X	F ₁	X	F ₂ , 2 farmers	X	F ₃ , 3 farmers
4.		TP X Khumal Yellow	Cross	Cross	F ₁	F ₁	F ₂ , 1 farmer	X	X	
5.		RC X TP			Cross		F ₁ , 1 farmer	X	F ₂ , 3 Farmers	
6.		POP22 X TP	Cross	Cross	F ₁	X	F ₂ , 1 farmer	X	F ₃ , 1 Farmer	
7.	PVS	Ganesh -1	4	4	X	X	X	X		
8.		BA-932126	3	3	X	X	X	X		
9.		Tlaltizapan 8644	2	2	X	3	X	X		
10.		Manakamna-1	4	4	X	X	X	X		
11.		POP-22	4	4	10, farmers	10, farmers			15 kg, 4 farmers	15 kg, 4 farmers
12.		Rampur compsite	4	4						
13.		Arun-2	3	3	X	X	X	X		
14.		Rampur-1	3	3	X	X	X	X		
15.		Khumal Yellow	3	3	X	19 kg	X	X		
16.		Ganesh-2	4	4	X	X	X	X		
17.		Narayani	4	4	X	X	X	X		
18.		Upahar	2	2		9 kg	X	X		
19.		Hill pool Yellow	X	X	8 farmers	7 kg			7 kg, 2 farmers	
20.		Hill pool White	X	X	10 farmers	9 kg			4 kg, 4 farmers	
21.		ZM 621	X	X	X	X	X			
22.		Pool-21	X	X	3 farmers	2 farmers				
23.	Display	Ganesh -1	2	2						
24.		BA-932126	2	2						
25.		Tlaltizapan 8644	2	2						
26.		Manakamna-1	2	2						

S. N	Activities	Variety/line	1999		2000		2001		2002	
			Darbar	Simichaur	Darbar	Simichaur	Darbar	Simichaur	Darbar	Simichaur
27.		POP-22	2	2						
28.		Rampur compsite	2	2						
29.		Arun-2	2	2						
30.		Rampur-1	2	2						
31.		Khumal Yellow	2	2						
32.		Ganesh-2	2	2						
33.		Narayani	2	2						
34.		Upahar	2	2						
35.		Arun-1	2	2						
36.		Kakani Yellow	2	2						
37.		Thulo Panhelo	2	2						
38.	OBN	2set/var/site	36 vars	36 vars	11 vars	11 vars				
39.	IRD Breeding	TP X R.Composite			100 farmers	100 farmers	50 kg, 44 farmers	55 kg, 53 farmers		
40.	S1 lines	Thulo panhelo			290 families		149 S ₁ families (1 farmer)	149 S ₁ families (1 farmer)	X	
41.	SMP	Rampur Composite					90 kg, 17 farmers	90 kg, 7 farmers	120 Kg, 17 Farmers	294 Kg, 17 Farmers
42.		ZM-621					1.5 kg, 1 farmer		3 kg, 1 Farmer	
43.		Hill pool Yellow					10 kg, 2 farmers	12 kg, 1 farmer	7 Kg, 2 Farmers	
44.		Hill pool White					15 kg, 2 farmers			
45.		Pop-22					5 kg, 1 farmer		15 Kg, 4 Farmers	
46.		Resunga					8 kg, 1 farmer	17 kg, 1 farmer	45 kg, 7 farmers	45 kg, 6 farmers
47.	Mustard	Bikash					10 Kg			
48.	Mass selection	Thulo pinyalo					45.5 kg, 7 farmers	50 kg, 4 farmers	3 Kg, 12 Farmers	30 kg, 3 farmers
49.	Pop corn	Lumle Yellow					3 farmers	1kg, 10		

S. N	Activities	Variety/line	1999		2000		2001		2002	
			Darbar	Simichaur	Darbar	Simichaur	Darbar	Simichaur	Darbar	Simichaur
								farmers		
50.		Lumle white					3 farmers	1kg, 10 farmers		
51.	CVT				6 varieties 1 farmer		8 varieties 2 farmer (1 set each)	8 varieties 2 farmer (1 set each)	6 varieties 2 Farmers (3 Rep. Each)	
52.	IRD maize	R composite							94 Kg 94 farmers	94 Kg, 92 farmers
53.	IRD Wheat	Achut	30 farmers	29 farmers	29 farmers	30 farmers	75Kg, 75 Farmers	215 kg, 80 Farmers	35 kg, 35 farmers	50 kg, 24 farmers
54.		A. Purna-4	10 farmers	5 farmers						
55.		NL-783	10 farmers	10 farmers						
56.		NI-781					5 Kg, 5 Farmers	10 Kg, 6 Farmers		
57.		Kanti	18 farmers	20 farmers	18 farmers	10 farmers	29 Kg, 29 Farmers	130 Kg, 60 Farmers		
58.	IRD Buck Wheat	Chitwan local						10 Kg, 10 Farmers		
59.	IRD Mustard	Bikash	17 farmers	20 farmers	56 farmers	63 farmers	8 Kg, 32 Farmers	10 Kg, 34 Farmers	9 kg, 36 farmers	22 kg, 26 farmers
60.		Lumle tori	26 farmers	15 farmers						
61.		Pragati					5 Kg, 10 Farmers	8.5 Kg, 9 Farmers		
62.		PT-30	25 farmers	38 farmers						
63.	IRD Sarson	Chitwan local						10 Kg 15 Farmers		
64.	IRD Pea	Sikim Local	35 farmers	31 farmers			11.5 Kg 65 Farmers	12 Kg, 68 Farmers	15 kg, 60 farmers	15 kg, 40 farmers
65.		Arkel	29 farmers	33 farmers	27 farmers	31 farmers	6.5 kg, 31 farmers	7 Kg, 47 Farmers	10 kg, 40 farmers	10 kg, 31 farmers
66.	Chick Pea	Dhanush						6 Kg, 6		7 kg, 12 farmers

S. N	Activities	Variety/line	1999		2000		2001		2002	
			Darbar	Simichaur	Darbar	Simichaur	Darbar	Simichaur	Darbar	Simichaur
								Farmers		
67.	IRD Lentil	Simal	29 farmers	29 farmers	14 farmers	23 farmers	5 Kg, 10 Farmers	7.5 Kg, 15 Farmers		
68.		Simrik						17 Kg, 10 Farmers		
69.		Shikhar	22 farmers	19 farmers	7 farmers	10 farmers				
70.		Sindur	14 farmers	17 farmers				10 kg, 10 farmers	15 kg, 30 farmers	20 kg, 33 farmers
71.	Cowpea	prakash							5 kg, 20 farmers	5 kg, 20 farmers
72.	Radish	Minu Early					.6 Kg, 60 Farmers	.6 Kg, 60 Faermers	75 farmers (1 packet each)	1.5 kg, 150 farmers
73.	Rayo	Marpha					225 gm, 45 Farmers	300 gm, 60 Farmers	75 farmers (1 packet each)	750 gm 150 farmers
74.	„ „	Manakamana-1					.075 kg 15 Farmers	.075 kg 15 Farmers		
75.	Cauli flower	Kathmandu local							25 farmers (1 packet each)	250 gm, 50 farmers
76.	Cabbage	Copenhegan							25 farmers (1 packet each)	250 gm 50 farmers
77.	Display Up-land Rice	Jire Chobo								
78.		Jhayle Bicharo			1 farmer	1 farmer				
79.		Linde Basaha			1 farmer	1 farmer	IRD 6 farmers	IRD 1 farmer		
80.		Panthe			1 farmer	1 farmer	IRD 8 farmers	IRD 1 farmer		
81.		Machhapuchhre-3			1 farmer	1 farmer				
82.		Machhapuchhre-9			1 farmer	1 farmer				
83.		Chhomrong			1 farmer	1 farmer	IRD 7 farmer	IRD 1 farmer		
84.		Phalamechobo			1farmer	1 farmer				
85.	IRD Finger millet	Kavre-1					1.75 kg, 3 farmers	1.75 kg, 7 farmers		
86.		Okhle-1					1.75 kg,	1.75 kg,		

S. N	Activities	Variety/line	1999		2000		2001		2002	
			Darbar	Simichaur	Darbar	Simichaur	Darbar	Simichaur	Darbar	Simichaur
							5 farmers	3farmers		
87.	IRD Soyabean	PK-416					1 kg, 4 farmers	1 kg, 2 farmers		
88.		Ransom					1 kg, 2 farmers	1 kg, 2 farmers		
89.	IRD Cucumber	Bhaktapur Local							500 gm, 57 Farmers	500 gm, 105 Farmers
90.	IRD Spong Guard	Sented (Begnas Local)							500 gm, 56 Farmers	500 gm, 105 Farmers
91.	Butter Bean	Kantuki wonder							500 gm, 25 Farmers	500 gm, 18 Farmers
92.	Seed priming	R. Composite			10 farmers	10 farmers	5 farmers	9 farmers	20 Kg, 10 Farmers	20 Kg 10 Farmers
93.	Wheat	Achut					26 Kg, 13 Farmers	100 Kg, 25 Farmers		
94.		Kanti						28 Kg, 12 Farmers		
95.	Pea	Sikim Local					5 Kg, 10 Farmers	5 Kg, 10 Farmers		
96.		Arkel						20 Kg, 10 Farmers		
97.	Chick Pea	Dhanush					10 Kg, 10 Farmers	10Kg, 5 Farmers		
98.	Lentil	Sindur					20 Kg, 40 Farmers	20 Kg, 31 Farmers		
99.	Farmers Traning				110 farmers	435 farmers	78 Farmers	26 Farmers	35 Farmers	34 Farmers
100.	Farmers Visit				20 farmers	20 farmers	5 Farmers	5 Farmers	8 farmers	

Note: PVS= Participatory Variety Selection, OBN= Observation Nursery, IRD= Informal Research and Development, SMP= Seed multiplication, CVT=Co-ordinated Varietal Trial and S1 line= selfing line

Annex II. List of participants involved during field Monitoring in Darbar Devasthan and Simichaur VDCs, Gulmi (August 16-17, 2001)

SN	Name	Address
1.	Dr. Niranjan Raj Bhandari	CIMMYT/Nepal
2.	Mr. Ramji Khadka	Outreach Division, NARC Khumaltar
3.	Mr. Chitra Bahadur Kunwar	NMRP, Rampur
4.	Mr. Ash Lal Tamang	Regional Seed lab, Bhairahawa
5.	Mr. Jitendra Prasad Jaiswal	GARDP-II
6.	Mr. Bishnu Sharma	DADO, Gulmi
7.	Mr. Sanjaya Gyawali	LI-BIRD
8.	Ms Sharmila Sunwar	LI-BIRD
9.	Mrs Nagendra Kumari Khatri	LI-BIRD
10.	Mr. Bala Bhadra Paudel	LI-BIRD
11.	Mr. Hari Prasad Paudel	LI-BIRD
12.	Mr. Chetman Sing Khatri	FRC, Darbar
13.	Mr. Jit Bahadur Thapa	VDC Chairperson, Darbar
14.	Mr. Top Bahadur Thapa	Darbar
15.	Mr. Hira Bahadur Khatri	Darbar
16.	Mr. Chhabilal Aryal	Darbar
17.	Mr. Rikhi Ram Panthi	Darbar
18.	Mr. Chinta Mani Panthi	Darbar
19.	Mr. Hari Prasad Aryal	Darbar
20.	Mr. Yubaraj Chundali	Darbar
21.	Mrs Gita Aryal	Darbar
22.	Mrs Sita Aryal	Darbar
23.	Mrs Jhabindra Aryal	Darbar
24.	Mrs Jamuna Chundali	Darbar
25.	Mrs Hira Panthi	Darbar
26.	Mr. Jaya Prasad Aryal	VDC Chairperson, Simichaur
27.	Mr. Prem Raj Marasini	Simichaur
28.	Mr. Hiramani Bhattarai	Simichaur
29.	Mr. Hari Prasad Pandey	Simichaur
30.	Mr. Bhojendra Bdr Pandey	Simichaur
31.	Mr. Chhabilal Pandey	Simichaur
32.	Mr. Tek Raj Pandey	Simichaur
33.	Mr. Rishi Ram Aryal	Simichaur
34.	Mr. Balakrishna Basnet	Simichaur
35.	Mr. Krishna Prasad Aryal	Simichaur
36.	Mr. Thag Bdr Kunwar	Simichaur

SN	Name	Address
37.	Mr. Danshi Ram Pandey	Simichaur
38.	Mr. Ramchandra Aryal	Simichaur
39.	Mrs Nirmala Pandey	Simichaur
40.	Mrs Bimla Kunwar	Simichaur
41.	Mrs Sarada Khatri	Simichaur
42.	Mrs Asha Basnet	Simichaur

Annex III: Participants involved in Village Level Workshop (19th August 2001)

SN	Name	Address
1.	Mr. Sun Bahadur Rana	J.T, DADO - Gulmi
2.	Mr. Khubi Ram Pokhrel	J.T.A., Agriculture Sub Center, Darbar
3.	Mr. Hari Prasad Shrestha	J.T., Agriculture Service Sub Center, Tamghas
4.	Mr. Sanjaya Gyawali	Plant Breeder, LI-BIRD
5.	Ms Sarmila Sunwar	Asst. Plant Breeder, LI-BIRD
6.	Ms Nagendra Kumari Khatri	Community Organizer, LI-BIRD
7.	Mr. Bala Bhadra Paudel	Community Organizer, LI-BIRD
8.	Mr. Hari Prasad Paudel	Community Organizer, LI-BIRD
9.	Mr. Chinta Mani Panthi	Darbar-2
10.	Mr. Top Bahadur Thapa	Darbar-3
11.	Mr. Rishi Ram Panthi	Darbar-3
12.	Mr. Jit Bahadur Thapa	Darbar-3
13.	Mr. Yubaraj Chundali	Darbar-5
14.	Mr. Chetman Sing Khatri	Darbar-5
15.	Mr. Hira Bahadur Khatri	Darbar-3
16.	Mr. Hari Prasad Aryal	Darbar-5
17.	Mrs Jhabindra Aryal	Darbar-3
18.	Mrs Dhanmaya Karki	Darbar-3
19.	Mrs Sita Aryal	Darbar-3
20.	Mrs Gita Aryal	Darbar-3
21.	Mrs Jamuna Chundali	Darbar-5
22.	Mr. Thag Bahadur Kunwar	Simichaur-6
23.	Mr. Premraj Marasini	Simichaur-5
24.	Mr. Ramchandra Aryal	Simichaur-5
25.	Mr. Hari Prasad Pandey	Simichaur-4
26.	Mr. Jaya Prasad Aryal	Simichaur-5
27.	Mr. Bhupendra Thapa	Simichaur-5
28.	Mr. Ram Prasad Pandey	Simichaur-5
29.	Mr. Bala Krishna Basnet	Simichaur-6

SN	Name	Address
30.	Mr. Bhojendra Pandey	Simichaur-4
31.	Mr. Chhabilal Pandey	Simichaur-4
32.	Mr. Krishna Prasad Aryal	Simichaur-5
33.	Mrs Nirmala Pandey	Simichaur-4
34.	Mrs Sabita Shrestha	Simichaur-3
35.	Mrs Sarada Khatri	Simichaur-3
36.	Mrs Bimala Kunwar	Simichaur-6
37.	Mrs Asha Basnet	Simichaur-6
38.	Mr. Krishna Prasad Pandey	SMMC, Coordinator, Simichaur
39.	Mr. Hari Prasad Aryal Secretary	Darbar
40.	Mr. Rikhiram Panthi Member	Darbar
41.	Mr. Chetman Sing Khatri Member	Darbar
42.	Mr. Hari Prasad Pandey Member	Simichaur
43.	Mr. Ram Prasad Pandey Member	Simichaur
44.	Mrs Nirmala Pandey Member	Simichaur

Annex IV: List of FRC and SPG members attended training on seed marketing and Management in Chitwan (August 6-8, 2001).

Name	Representative site
1. Mr. Rishi Ram Panthi	Darbar/Devasthan VDC
2. Mr. Hira Bahadur Khattri	“
3. Mr. Hari Prasad Aryal	“
4. Mr. Chetman Singh Khattri	“
5. Mr. Jit Bahadur Thapa	“
6. Mr. Giri Prasad Aryal	Simichaur VDC
7. Ms Sabita Shrestha	“
8. Mr. Hiramani Bhattra	“
9. Mr. Krishna Prasad Aryal	“
10. Mr. Dashiram Pandey	“

Annex V: List of outside personnels involved during participatory crop monitoring and evaluation programme (August 18-22,2002)

S.No.	Name of participant	Designation	Institution
1	Yug Nath Ghimire	Senior Scientist	NARC, Outreach Division
2	Baburam Regmi	Scientist	NARC, NMRP, Rampur, Chitwan
3	Sheshraman Upadhya	Scientist	NARC, NMRP, Rampur, Chitwan
4	Ashlal Tamang	Seed Inspector	Regional Seed Lab, Bhairahawa
5	Hari Sharma Neupane	Planning Officer	DADO, Palpa
6	Bishnu Raj Tandan	Extension Officer ,	DADO, Gulmi
7	Sanjaya Gyawali	Plant Breeder	LI-BIRD
8	Bharat Bhandari	Asst.Plant Breeder	LI-BIRD
9	Hari Poudel	Community Organizer	LI-BIRD

Annex VI: List of farmers involved in Farmers research committee (FRC) from each site, Gulmi.

A. Darbar site

S.No.	Name	Designation
1	Mr. Chetman Singh Khatri	Chairperson
2	Mr. Yuba Raj Chudali	Vice- Chairperson
3	Mr.Hari Prasad Aryal	Secretary
4	Mr. Chabilal Aryal	Member
5	Mr. Dil Bahadur Khanal	Member
6	Mr. Hira Bahadur Khatri	Member
7	Mrs. Gita Aryal	Member
8	Mrs. Jamuna Chudali	Member
9	Mrs. Jhabindra Aryal	Member
10	Mrs. Sita Gyawali	Member
11	Mrs. Manikala Gyawali	Member

B. Simichaur site

S.No.	Name	Designation
1	Mr. Hari Prasad Pandey	Chairperson
2	Mr. Prem Raj Marasini	Vice- Chairperson
3	Mr. Giri Prasad Aryal	Secretary
4	Mr. Jaya Prasad Aryal	Member
5	Mr. Thakur Prasad Aryal	Member
6	Mr. Chhabilal Pandey	Member
7	Mr. Rishi Ram Pandey	Member
8	Mrs. Lal Kumari Basnet	Member
9	Mrs. Namkala Balal	Member
10	Mrs. Bimala Kunwar	Member
11	Mrs. Asha Basnet	Member

Annex VII: Lists of farmers involved in Seed Management and Marketing Committee (SMMC) from both the sites, Gulmi.

S.No.	Name	Designation	Representative site
1	Hari Prasad Pandey	Co-ordinator	Simichaur,Gulmi
2	Hari Prasad Aryal	Secretary	Darbar, Gulmi
3	Rishi Ram Panthi	Member	Darbar, Gulmi
4	Chetman Singh Khatri	Member	Darbar, Gulmi
5	Krishna Prasad Pandey	Member	Simichaur,Gulmi
6	Ram Prasad Pandey	Member	Simichaur,Gulmi
7	Nirmala Pandey	Member	Simichaur,Gulmi

Annex VIII: List of participant involved in training programme during August 22-23, 2002 from both the sites, Gulmi.

S. No	Name	Address
1	Mr Chetman Singh Khatri	Darbar-3
2	Mr Hari Prasad Aryal	Darbar-5
3	Mr Chintamani Panthi	Darbar-2
4	Mr Rishi Ram Panthi	Darbar-2
5	Mr Chhatra Bahadur Khanal	Darbar-3
6	Mr Madhav Aryal	Darbar-3
7	Mr Bikram Khatri	Darbar-3
8	Mr Kamal Aryal	Darbar-3
9	Mr Yuba Raj Chudali	Darbar-3
10	Mr Top Bahadur Thapa	Darbar-3
11	Mrs Gita Aryal	Darbar-3
12	Mrs Jhabindra Aryal	Darbar-3
13	Mrs Sita Aryal	Darbar-3
14	Mrs Shivakala Khatri	Darbar-3
15	Mrs Kamala Khatri	Darbar-3
16	Mrs Sainli Khatri	Darbar-3
17	Mrs Manju Khatri	Darbar-3
18	Mrs Laxmi Aryal	Darbar-3
19	Mrs Dhana Kumari Aryal	Darbar-3
20	Mrs Yamakala Subedi	Darbar-3
21	Mrs Dhanamaya Karki	Darbar-3
22	Mrs Sabitri Aryal	Darbar-3
23	Mrs Sita Aryal	Darbar-3
24	Mrs Mangala Davi Khatri	Darbar-3
25	Mrs Biru Aryal	Darbar-3
26	Mrs Budhikala Aryal	Darbar-3
27	Mrs Gita Aryal	Darbar-3
28	Mrs Pabitra Aryal	Darbar-5
29	Mrs Dhan Maya Ghimire	Darbar-5
30	Mrs Manikala Gyawali	Darbar-5
31	Mrs Rundhata Ghimire	Darbar-5
32	Mrs Tulsi Khanal	Darbar-5
33	Mrs Belkumari Aryal	Darbar-5
34	Mrs Durga Devi Panthi	Darbar-5
36	Mr Ram Prasad Pandey	Simichaur-3
37	Mr Bir Bahadur Basnet	Simichaur-6
38	Mr Prem Raj Marasini	Simichaur-5
39	Mr Om Prakash Aryal	Simichaur-5
40	Mr Hiramani Bhattari	Simichaur-3
41	Mr Ramchandra Aryal	Simichaur-5
42	Mr Tek Raj Pandey	Simichaur-3
43	Mr Chom Bahadur Kunwar	Simichaur-5

S. No	Name	Address
44	Mr Amar Bahadur Kunwar	Simichaur-3
45	Mr Khageshwar Aryal	Simichaur-5
46	Mr Jaya Prasad Aryal	Simichaur-5
47	Mr Krishna Prasad Aryal	Simichaur-5
48	Mr Lal Bahadur Balal	Simichaur-5
49	Mr Nar Bahadur Balal	Simichaur-5
50	Mr Bal Krishna Basnet	Simichaur-2
51	Mrs Sabita Shrestha	Simichaur-3
52	Mrs Lal Kumari Basnet	Simichaur-2
53	Mrs Tika Kumari Thapa	Simichaur-7
54	Mrs Nandakala Balal	Simichaur-5
55	Mrs Kumari Balal	Simichaur-5
56	Mrs Ram Kala Balal	Simichaur-5
57	Mrs Jibakala Tandan	Simichaur-5
58	Mrs Maya Ghimire	Simichaur-5
59	Mrs Mankala Thapa	Simichaur-5
60	Mrs Sita Aryal	Simichaur-5
61	Mrs Mira Aryal	Simichaur-5
62	Mrs Kamala Aryal	Simichaur-5
63	Mrs Devaka Gyawali	Simichaur-5
64	Mrs Govinda Panthi	Simichaur-5
65	Mrs Parbati Hamal	Simichaur-6
66	Mrs Bel Kumari Thapa	Simichaur-7
67	Mrs Sharaswati Aryal	Simichaur-5

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