



Newsletter

Local Initiatives for Biodiversity, Research and Development

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EDITORIAL

Indigenous *Chepang* communities in Nepal still practice shifting cultivation as it is often the only viable option in farming the steep slopes they inhabit. The current practice in Nepal is almost permanent farming as there is swift decline in the fallow period. The decreasing fallow period and increased pressure on land has contributed to increased soil erosion and land slides thus threatening the survival of the ethnic groups involved in the practice. This practice is often blamed as unproductive and ecologically detrimental. There have been negligible attempts made to counter this problem. Several studies show that adoption of these Sloping Agriculture Land Technologies (SALTs) by hill farmers have been very poor and limited due to the sole control of researchers for the development of technology.

LI-BIRD with the financial support from Hill Agriculture Research Project (HARP)/ DFID has designed and implemented a research project in the shifting cultivation areas of Gorkha and Tanahun districts. The integrated hedgerow technology involves management of farmers preferred cultivation practices for the shifting cultivation and sloping land areas which stabilizes soil, enhances food production and contributes to on-farm cash income. The project was successful in demonstrating integrated hedgerow technology which is effective in maintaining the ecological condition of the shifting and sloping land areas as well as providing livelihood options and opportunities for poor and marginalized farmers practicing shifting cultivation in Nepal.

LI-BIRD'S ANNUAL REVIEW AND PLANNING MEETING

Annual Review and Planning Meeting was organized by LI-BIRD from 1st to 3rd July, 2007 in Pokhara. The main objective of the meeting was to review the progress and achievement of projects in the last fiscal



year (2006 - 2007) and prepare detailed plan for the coming fiscal year (2007 - 2008). The meeting was also organized to develop an understanding and knowledge among staffs about LI-BIRD's current projects and focus areas.

All the officer level staffs including field based staffs participated in the meeting. The meeting was also used as an opportunity to share project related information, activities, outputs and key issues. The overall facilitation of the meeting was done by Mr. Tara Lama, Programme Director under the chairmanship of Dr. Pratap Kumar Shrestha, Executive Director, of LI-BIRD.

LI-BIRD'S STRATEGY MEETING

The third strategic meeting was organized from April 15 - 20th, 2007 at Kurintaar. The meeting was organized to redirect LI-BIRD's strategies in the areas of newer perspectives considering the changing context of local, national and international scenarios and comparative advantages of LI-BIRD. All the members of executive board, LI-BIRD officer level staffs and professionals participated in the meeting. The meeting has identified key emerging social and ecological issues that need to be focused in coming years with efficient Institutional set up and skilled human resources. This output of the strategic meeting is a bigger leap for LI-BIRD to take in revisiting its role and contribution in conservation and management of genetic resources for the livelihood of poor and marginal communities in Nepal.

We focus more on social justice, empowerment and poverty reduction through sustainable management of biodiversity and ecosystem, health and services combined with promotion of agricultural innovations,



Group Discussion at Strategy Meeting

policy research and dissemination of knowledge and information through technology transfer and capacity building. All these focus programmes will add value to the Institutional goal and thus contribute towards poverty reduction and maintain ecological stability in Nepal. The meeting was facilitated by Dr. Balaram Thapa.

INTERNATIONAL BIOLOGICAL DIVERSITY DAY

To mark the International day for Biological Diversity a workshop entitled "Community Biodiversity Register for Acquisition and Utilization of Biodiversity" was organized on 24th May, 2007 in Dragon Hotel,



Pokhara. The workshop was hosted jointly by *Jaibik Shrot Samrakshyan Abiyan*, District Biodiversity Coordination Committee/ District Forest Office-Kaski, Local Initiatives for Biodiversity, Research, and Development (LI-BIRD) and GEP, Small Grant Programme, UNDP. The purpose of the workshop was to share knowledge and experiences of Community Biodiversity Register (CBR) and enhance institutional collaboration and networking to mainstream good practices of CBR.

The workshop was chaired and inaugurated by Mr. Narahari Baral, Chief Local Development Officer. About sixty participants from DADOs, DFOs, representation from different organizations of Kaski, farmers and farmers group, journalist from local and national media, senior scientist BR Sthapit of Bioversity International and Gopal Sherchan, Programme Coordinator, SGP participated in the workshop. Mr. Ananta Bijaya Parajuli, Chief, Environment Division, Ministry of Forest and Soil Conservation was the chief guest at the workshop. Two books on CBR were also unveiled during the inauguration. About ten papers related to experiences on CBR, its good practices and issues were presented. The workshop was focused on raising awareness among concerned stakeholders about the recent outcome and progress in biodiversity registration in Nepal.

“MELTING ICE - A HOT TOPIC?” WORLD ENVIRONMENT DAY, 2007

The Government of Nepal, Practical Action Nepal and Local Initiatives for Biodiversity, Research and Development (LI-BIRD) organized a one-day Seminar in Pokhara on June 2nd 2007 as one of the functions to mark the World Environment Day 2007 with the slogan “Melting Ice a Hot Topic”.

The main objective of the seminar was to raise awareness among different communities, local government line agencies, NGOs and civil societies on climate change and start taking actions to address the issues arising from climate change. Moreover 60 participants representing district line agencies, academic institutions, I/NGOs, CBOs and farmers in the Western Development Region of Nepal participated in the seminar in Hotel Fewa Prince, Pokhara. Participants highlighted the need of field based

(awareness campaign) and plantation at green foot trail periphery of Rupa Lake. A Large Number of school children, women groups and civil society representatives participated in the campaign.

INCEPTION PLANNING WORKSHOP ON COMMUNITY-BASED BIODIVERSITY MANAGEMENT (CBM) PROJECT



collaborative actions as well as national and sectoral plans and policies to cope with the adverse impacts of climate change.

On the same occasion LI-BIRD in collaboration with Rupa lake restoration and fisheries cooperative, Wold Vision Kaski, UNDP/GEF/SGP, SGP The Netherlands Committee IUCN also organized PRABHAT FERI

The inception planning workshop was organized by LI-BIRD at Dhulikhel Lodge Resort, Dhulikhel, on 29th May 2007. The workshop was organized with the objectives to consult, inform and share the concept, initial activities, plan and progress of CBM project with the project stakeholders, and to gather ideas, views, experiences and knowledge to prepare basis for selection of districts and farming communities. The workshop was organized under the chairmanship of Dr. Nanda Prasad Shrestha, Executive Director of NARC. Altogether, 36 participants including representatives from Department of Agriculture, Regional Agricultural Directorate, District Agriculture Development Office, Nepal Agricultural Research Council, Bioversity International, Institute of Agriculture and Animal Science and staffs from LI-BIRD participated in the workshop and shared their experiences. In addition, agriculture journalists from different media attended the workshop.

FEATURE ARTICLE

INTEGRATED HEDGEROW TECHNOLOGY: AN OPTION FOR THE MANAGEMENT OF SLOPING AND SHIFTING CULTIVATION AREAS

Background

Shifting cultivation is a traditional agricultural system in which plots of land are cultivated temporarily and then abandoned. Shifting cultivation is still a major



Demonstration of Hedgerow Technology, Tanahun

land use system of some of the ethnic group in Nepal. It is prevalent in 17 districts of Nepal and this practice is common within the indigenous tribes of Nepal where almost all household belonging to *Chepang* community are involved in it.

Shifting cultivation areas are characterized by high population growth, declining productivity and high ecological risk. The decreasing fallow period and increased pressure on land has somehow contributed to increased soil erosion and land slides thus threatening the survival of the ethnic groups associated to this practice. There have been negligible attempts made to address this problem. Technology aimed at these places is grossly limited and those available are offered in pieces. Several studies show that adoption of these Sloping Agriculture Land Technologies (SALTs) by hill farmers have been very poor and limited due to the sole control of researchers for technology development.

LI-BIRD with the financial support from Hill Agriculture Research Project (HARP)/ DFID designed and implemented a research project in the shifting cultivation areas i.e. Bhumlichowk VDC, Thumka village of Gorkha and Chimkeswori VDC, Kholagaun and Rasauli village of Tanahun districts. The project was successful in demonstrating package of technologies among which **Integrated Hedgerow Technology** is suitable for shifting and sloping land areas of Nepal.

The project adopted participatory approaches in planning, designing and implementation of project to generate technology with strong integration of farmers' knowledge and experiences in the process. Farmers' local knowledge about and management practices of shifting and sloping land cultivation was documented and used in combination with scientists' research findings for designing SALTs options suitable for the area.

Technological Intervention

Integrated Hedgerow Technology is the technology that involves management of farmers preferred cultivation practices for the shifting cultivation and sloping land areas that stabilizes soil and enhances food production and on-farm cash income.

Various nitrogen fixing plants along the contour lines were planted densely. Nitrogen fixing species like *Flemengia*, *Desmodium*, *Ipil-IPil*, *Sunhemp* and *Tephrosia* were planted in one contour line and in the line below, various fodder and fruit species like *Kimbu*, *Napier*, *NB 21*, *Seteria*, *Banana*, *Citrus*, *Pineapple* and *Coffee* were planted. Seedlings of some of the species were raised in the nursery by the community themselves and managed by the farmers group. The hedgerow species were periodically pruned to extract fodder and to reduce the effect of shading on companion crops. The alleys in between the hedgerows were used for cultivation of food and cash crops. Various cash oriented leguminous crops like *cowpea*, *soybean*, *horse gram*, *black gram* etc were promoted. Strip cropping

of yam, colocasia, and ginger was introduced in the area. Legume vegetables were tested as trial by farmers in Gorkha. Besides this, seeds and seedlings of other types of improved and fast growing crop, vegetables and other species were also provided to the farmers. Improved livestock breed was introduced in the area along with the promotion of bee keeping. Various training on vegetable farming, bee keeping, integrated nutrient management, fund mobilization, group mobilization etc was provided to the community.

Effectiveness of the Technology

a. Ecologically Viable Technology

The study carried out by LI-BIRD showed that Integrated Hedgerow Technology is one of the promising technologies in the shifting and sloping land areas. There are some biophysical indicators that justify that hedgerow technology could be one of the options for sloping land. Results highlighted that due to intervention of nitrogen fixing plants like Desmodium, Flamengia, Ipil-Ipil, and Tephrosia, the nitrogen content in the soil has increased by 0.3% in both the research sites. It was observed that there was substantial increase in nitrogen, phosphorus and

potassium level. There was also a slight change in soil pH level and an increase in organic matter content of the soil in the research sites. Observations mentioned above clearly indicate that Integrated Hedgerow Technology is contributing towards improving the biophysical condition of the soil. Based on the measurement of soil deposition, it was also found that soil deposition is high in the area. Soil deposition was recorded from 6-12 inches in the research plots. With this trend many of the hedgerow plots are now being transformed into terraces.

b. Socially and Economically Sustainable Technology

After the intervention, many new and locally adopted and preferred varieties were introduced in the area. Due to introduction of diversified cash crops and legumes, farmers expressed that their income has increased. The diversification of agricultural system even made farmers busy with their farm works. The technological intervention has also contributed in substantial increase in the income of farming households. Farmers in Gorkha and Tanahun sites are earning a reasonable cash income from the sell of vegetables to the nearby market (see the box for success stories).

SUCCESS STORIES

- Chatur Singh Praja is a research farmer of the project in Gorkha district. Due to the project support, he sold banana and pineapple worth NRs 10,000 last year. With the earned money now he is repairing his house and started sending his children to school.
- Ganga Bahadur Praja, a farmer from Gorkha site, earned annual income of NRs 80,000 from the sale of seasonal and off seasonal vegetable production. He is also a local resource person and helps other farmer in growing vegetables. Ganga Bahadur is also involved in preparing the cutting of Mulberry (Kimbu).
- Suk Maya Praja, a resident of Rasoli- Tanahun, is extending the hedgerows and producing sufficient amount of fodder and forage for her livestock. She has also earned a lot of money from the sale of livestock and its product (Ghee). Besides this, she is actively involved in demonstrating as well as disseminating about the hedgerow technology.

One of the most successful contributions of the intervention is on the improvement of livelihood among the communities. Due to technology transfer, farmers have learned to become small entrepreneurs. There are over dozen of farmers in the research sites

who are established as commercial vegetable grower.

c. Wider Adaptable technology

Initially the technology was introduced to 24 research farmers from 2 research sites in Gorkha and Tanahun.

Altogether 124 farmers in Gorkha, Dhading and Tanahun have adopted this technology (see table 1). This technology is institutionalized within LI-BIRD as well as scaled up by Leasehold Forestry and Livestock Programme and other partner institutions. With the species, the demand of Mulberry and Napier is very high in the area. Mulberry is very popular in the area

and almost all the farming households demanded the mulberry cuttings from the research farmers due to its multiple use i.e. good fodder, useful in controlling soil erosion, used as a fruit, used for apiculture, easily propagated etc. Integration of the cash crops like ginger, banana and colocasia is preferred by the farmers.

Table 1. Number of households adopting the hedgerow technology

Site	Total Household	Research Household	Total Adopted Household
Thumka, Gorkha	35	12	23
Hiklung, Gorkha	19	0	12
Luprang, Gorkha	7	0	4
Ghalchowk, Gorkha	36	4	15
Laitak, Dhading	50	0	18
Kholagaun/Rasoli, Tanahun	20	12	19
Khasrang, Tanahun	25	0	23
Amdanda, Tanahun	33	0	10

Currently the research sites have become resource villages from where the knowledge and materials are disseminated to nearby areas. Farmers in Tanahun research sites are selling the seedlings of Napier to their neighboring villages in Khasrang and Amdanda. These sites are also becoming the learning sites for farmers, researchers and other organizations.

Conclusion

Integrated Hedgerow Technology was found to be effective in maintaining the ecological condition of the shifting and sloping land areas as well as providing livelihood options and opportunities for poor and marginalized farmers practicing shifting cultivation. The hedgerow technology is viable technology that contributes in increasing the nitrogen content of soil, improving soil condition through adding organic matter, increasing phosphorus and potash, increasing the soil depth and deposition while maintaining the soil pH. It was observed that the technology is promising in biomass production and is a potential option for species diversification. The technology is also capable of providing direct benefit to farming households. The adoption rate is very encouraging and farmers initiated

in scaling the technology within their own farm and to the nearby villages.

RESEARCH HIGHLIGHT

SUNAULO SUGANDHA: AN AROMATIC, HIGH YIELDING RICE VARIETY FOR TERAJ REGION OF NEPAL (figure9)

Sunaulo Sugandha is a rice variety developed through Participatory Plant Breeding (PPB) in High Potential Production System (HPPS) project implemented by LI-BIRD in Chitwan and Nawalparasi districts. This project was technically supported by CAZS Natural Resources (CAZS-NR), University of Wales, UK in collaboration with National Rice Research Program (NRRP) of Nepal, National Agriculture Research Centre (NARC), District Agricultural Development Offices (DADOs) and the farming communities of Chitwan, Nawalparasi and other districts of Nepal.

This variety is developed through irradiation (mutation) of Pusa Basmati-1. It was selected, tested, developed and promoted in participation with farmers, scientists and extension workers (Table 1).

Table 2. Procedures in the selection, testing and dissemination of Sunaulo Sugandha, 1998-2006

Year	Season	Procedure
1998		Parents treated by Y-rays (at IRRI).
1998	Main	Transplanted in 700 m ² area and bulk harvesting of M1 family.
1999	Chaite	Single plant selection (LIRI-BAS-20)
1999	Main	Modified bulk harvesting from selected lines.
2000	Main	Single plant selection from bulk population.
2001	Main	Again single plant selection from selected families.
2002	Main	Selected families were grown at 10 m ² area in a bulk.
2003	Main	Disease screening nurseries (NRRP).
2004	Main	Disease screening nurseries (NRRP), Mother Baby trials (NGOs and DADOs), seed production and distribution by LI-BIRD.
2005	Main	IET and disease screening nurseries (NRRP), Mother Baby trials (NGOs and DADOs), seed production (CBOs and LI-BIRD).
2006	Main	CVT and Disease screening nurseries (NRRP), Mother Baby trials (NGOs and DADOs), seed production (CBSP groups and LI-BIRD), mini-kit distribution by DADOs, Fertilizer trial (LI-BIRD).
2007	Main	Mother Baby trials (NGOs and DADOs), seed production (CBSP groups, DADOs and LI-BIRD), mini-kit distribution by DADOs. Proposing for release.

The variety has aromatic fine grain, high grain and straw yield, good eating quality, high milling percentage, long panicle and fertilizer responsiveness. In addition to that it has lodging tolerance and field tolerance to blast and bacterial leaf blight (BLB). Since 2004, this variety is being extensively tested in mother-baby trials and promoted and scaled up by DADOs, community based seed producers (CBSP) groups and other NGOs in a number of terai districts of Nepal.

This variety is suitable in irrigated medium to lowland having medium to high soil fertility condition. It has plant height of 105 to 110 cm, maturity of 150-155 days after seeding and yields of up to 5.5 t/ha. From crop cut data of 103 baby trials conducted in 8 districts (Chitwan, Makawanpur, Rupandehi, Mahottari, Morang, Lamjung, Tanahun and Udaypur) it was found that average yield of Sunaulo Sugandha is 4.09±0.12 t/ha while average yield of other farmers

local varieties grown together with Sunaulo Sugandha is 3.55±0.20 t/ha. Thus, Sunaulo Sugandha is distinctly yielding 15% higher than local varieties. Apart from higher yield, farmers are getting Rs. 4-6 per kg higher price than Masuli., the most popular rice variety grown so far.

Farmers of Makawanpur, Parsa, Saptari, Sunsari, Jhapa, Morang, Rupandehi, Nawalparasi, Tanahun, Chitwan, Lamjung and several other districts of Nepal have started to adopt this variety. The variety is performing better in river basin and fertile irrigated area of lower foothills (up to 900 masl) of Lamjung, Tanahun, Kaski and Udayapur districts. This year, community based seed producers groups from Rupandehi, Chitwan, Rautahat, Mahottari, Sunsari and Jhapa are producing significant quantity of seed of this variety. LI-BIRD is proposing this variety for formal release in current Fiscal Year 2007/08.

SUCCESS STORY

Making Revolving Fund Work for Farmers (figure6)

Ganga Maya Gurung (46 years old women) resident of Jamunkuna, Rupakot VDC Kaski was involved in Community Biodiversity Registration activities for last four years. Production from small rented land (1000m²) was not enough to maintain her large family. She did



not have any alternative source of income to support her family. She had trouble in her entire days when her neighbors did not trust her for providing loan. Due to this reason she could not send her children to school.

When the UNDP/ GEF/ SGP funded project was

implemented in her community, she was involved in biodiversity registration, diversity fair and maintaining conservation block. She attended several meetings, trainings and was also involved in farmer exchange visit organized by LI-BIRD. Due to the project support, community biodiversity registration Committee was formed and provided with NRs 50,000/each as revolving fund. She was also able to get a small loan of Nrs 10,000 for goat keeping from the fund. Every year she sold 4-5 goats earning NRs 20,000. From that money she became shareholder of Rupa Lake Fishery Co operative. Recently she has started a tea hut at her own house. Number of visitors in Rupa Lake is increasing day by day, so is becoming an opportunity of extra income to Ganga.

Ganga Maya Gurung is no more remaining a shy and suspicious women as before, she is not only running her small business confidently but also helping visitors by providing information about the project activities and community efforts on conserving biodiversity.

“It was the happiest time in my life when I was successful in admitting my children at local school.” Recalls Ms Gurung with joy.

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Mr. Gyan Bandhu Sharma, Project Officer (15 Jun 2007)

Ms Paltan Maya Rai, Community Organizer (1 Jun 2007)

Mr. Yadav Raj Thapa, Community Organizer (12 Aug 2007)

Outgoing Staff

Ms. Anu Adhikari, Programme Officer (17 Nov 2002- 16 July 2007)

Mr. Diwakar Poudel, Programme Officer (29 Jan 2005- 7 Aug 2007)

Mr. Padam Singh Thagunna, Project Officer (19 Aug 2001- 18 August 2007)

Ms. Sujata Manandhar, Project Officer (1 Jan 07- 1 Aug 2007)

Mr. Laxman Poudel, Community Organizer (29 May 2006- 15 Aug 2007)