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NARC Progress Review Workshop

Nepal Agricultural Research Council (NARC) organized a review workshop to evaluate the progress of F.Y. 2065/66 (2008/09) on 26-27 Aswin, 2066 in Kathmandu under the chairmanship of NARC Executive Director Dr. Bharatendu Mishra. Honorable Minister of Agriculture and Cooperatives Mr. Mrigendra Kumar Singh Yadav was the Chief Guest of the workshop. Mr. Bhava Krishna Bhattarai, Joint Secretary, NPC,



Hon. Minister for Agriculture & Cooperatives Mr. Mrigendra K. Yadav inaugurating the Review Meeting

Mr. Uttam Bhattarai, Joint Secretary, MOAC, Director General, DOA and NARC Directors were also present.

While addressing the inauguration session of the workshop Minister Yadav expressed his realization that government expenditure on agriculture research has been low in Nepal mainly due to economic

crisis. He also urged the scientists to show honesty and make all possible efforts in technology generation with best utilization of available resources. Joint Secretary of MOAC, Mr. Uttam Bhattarai mentioned that present level government expenditure on agricultural research is only 0.2% of AGDP and it should

cont. in page 2

NARC Scientist Received Science and Technology Award

Dr. Chet Raj Upreti, Senior Scientist of Nepal Agricultural Research Council (NARC) has been honored with Science and Technology Award 2065/66 from Nepal Academy of Science and Technology (NAST). Rt. Hon. Prime Minister and the Chancellor of the Academy Mr. Madhav Kumar Nepal gave away the certificate. Dr. Upreti was honored with the award for his contribution in "Initiation of Animal Science Research and Extension to Promote the Livestock Development in the Farmer's Field "



Dr. Chet Raj Upreti receiving Science & Technology award from Rt. Hon. Prime Minister Madhav K. Nepal

Dr. Upreti, Ph.D in Animal Science from Central Luzon State University of the Philippines (CLSU) has published more than 21 scientific papers, 10 books, 11

other publication related to livestock and livestock product industries in English and Nepali language. He is editors of NAST Journal, SAS/N Journal, Krishi Gyanmala, and "Livestock". His contribution in the field of Animal Nutrition, Goat and Sheep Production, Wool and Pashmina Technology, Livestock related environment, are well recognized in the country. He has also been involved in developing environment management policy of livestock sector.

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Nepal Agricultural Research Council (NARC) is an apex body for Agricultural Research in the country with the goal of poverty alleviation and sustainable growth of agriculture production through technology development in different aspects of agriculture.

be raised at least to 1% for rapid commercialization of agricultural commodities. He also suggested giving more attention for generating technologies on post-harvest loss management as well. Joint Secretary of NPC, Mr. Bhava Krishna Bhattarai assured for every possible support in agriculture research in the years to come. From the Chair Dr. Bharatendu Mishra, Executive Director of NARC pointed out that despite financial and human resource constraints that have been faced since many years NARC is making every possible efforts to generate agricultural technologies for the country. He further stated that extension system should be proactive and efficient to disseminate such technologies to farmers' fields to improve agriculture productivity and food security. Mr. Subasha Nanda Baidha, Chief of Monitoring and Evaluation Division of NARC presented the overall progress of NARC achieved during F.Y. 2008/2009. Commodity Programs, Research Stations and central level Divisions also presented their progress reports separately.

The financial information presented in progress review



Chief of Monitoring & Evaluation Division presenting NARC's progress report

workshop shows that budget allocated to NARC for agricultural research has been decreasing since F.Y. 2058/59. NARC's annual

budget in F.Y. 2058/059 was Rs 578.8 million which was equivalent to 0.58% of National budget and 14.7% of the budget allocated for Ministry of Agriculture and Cooperatives. In F.Y. 2065/66 NARC received a total of Rs 510 million as a grant from government which was 0.22% of national budget and 8.85% of total budget allocated for MOAC (Table 1). In this year, major proportion (74%) of allocated NARC budget was spent for staff salary, administrative purposes and infrastructures maintenance and remaining 26% of the budget was set aside for research activities (Fig. 1). Number of research projects and activities implemented during the reporting period on crops, horticulture, livestock, fisheries, outreach research and production program are presented in Table 2, Fig. 2 and Fig. 3.

Table 1. Comparative budget of National, MOAC and NARC (Ten Million NRs)

Particulars	Fiscal Year							
	058/59	059/60	060/61	061/62	062/63	063/64	064/65	065/66
National Budget	9979	9612	10240	11168	12689	14391	16900	23602
Budget of MOAC	392.76	242.35	247.3	269.23	336.5	351.63	417.69	575.95
NARC budget	57.78	29.78	30.06	31.12	29.51	35.50	41.50	51.00
Percent of National budget	0.58	0.31	0.29	0.28	0.23	0.25	0.25	0.22
Percent of MOAC budget	14.71	12.29	12.15	11.56	8.77	10.10	9.94	8.85

Table 2. Number of targeted projects, activities and achievements in FY 2065/66 under different subsector

Subsector	Target (number)		Budget (Rs 000)	Achievement (Number of activities)
	Project	Activities		
Crop Research	133	698	19063	693
Horticulture Research	79	295	9851	281
Livestock Research	41	207	8924	192
Fisheries Research	17	73	2893	73
Outreach Research	115	605	19612	595
Multi-sector Research	15	50	1687	50
Research Support & Management	65	314	38716	312
Production Program	40	219	30463	215
Total	505	2461	131209	2411

Table 3. Production program of NARC in F.Y. 2065/66

Program	Unit	Annual Target	Progress
Source Seed	mt	683	781.24
Seedling/sapling	Number	305,700	315,252
Goat/Animal breeds	Number	819	1,179
Chicken	Number	22,480	22,673
Fish fingerlings	Number	446,000	4,414,226
Table fish	mt.	15	15.88
Mushroom seed	Bottle	2,000	1,800

Fig.1 Budget breakdown by budget headings (2065/66)
Total budget: 510,000,000

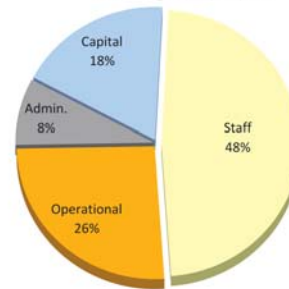


Fig. 2 Sectorwise project distribution
Total projects: 505

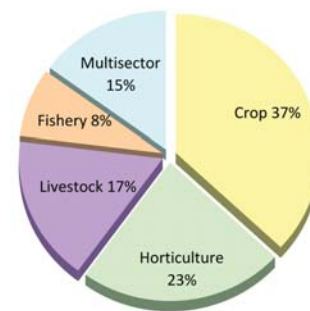
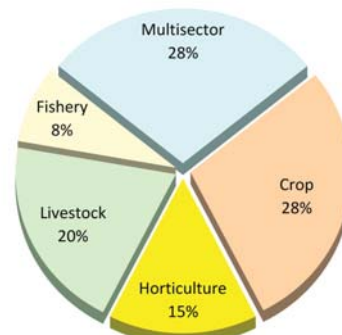


Fig. 3 Sectorwise breakdown of operational budget (Rs 131,209,000)



Highlight of technologies developed by NARC in 2065/66 through on-station and on-farm research were also presented at review workshop. They are as follows:

Field crops

- 1 Two maize varieties; Manakamana-4 and Posilo Makai-1 released
- 1 Technology of white grub management with *Metarhizium anisopliae* developed
- 1 Maize varieties- Ganesh-1, Manakamana-1, Manakamana-2 and Deuti found tolerant to gray leaf spot disease
- 1 Maize & zinger intercropping was found most beneficial maize based cropping system in the hills
- 1 Some promising hybrid maize varieties are at advanced stage of releasing
- 1 Rice varieties: Radha-32 (Hardinath-3) for upland and Rato Basmati are proposed for release.
- 1 Wheat varieties-Aditya (BL 3264) and NL 971 are ready for release
- 1 Wheat varieties – BL 3063, BL 2800 have been found very promising
- 1 Wheat genotypes: NL 1050, NL 1052, NL 1053, NL 1054, NL 1055, NL 1064, NL 1067, NL 1073 and BL 4176 were found Ug99 resistant
- 1 Resource Conservation Technology (Zero-till or reduced till) are found very promising in wheat with several benefits such as 24% less in seed requirements, 72% less in cost of cultivation, 43% less water requirements, 22% less in investment and 177% more in net income
- 1 Malt barley cultivar – Bonus has been found suitable for brewery industry with 60% malt available
- 1 Recipe for making breads/noodle from finger millet and buckwheat developed
- 1 Two lentil varieties namely Maheshwor Bharati and Sagun were released

Horticultural Crops

- 1 Two varieties of potato namely Khumal Laxmi and IYP-8 were released
- 1 Technology for club root disease management of cruciferous vegetables developed
- 1 Technology for root knot nematode management developed
- 1 Off-season vegetable production technology for Karnali zone developed
- 1 Valencia Late variety of sweet orange has been found suitable for late season production
- 1 Integrated citrus decline management technology standardized
- 1 Organic apple, coffee and tea production technology standardized
- 1 Disease-free planting materials production of large cardamom using tissue culture technique standardized
- 1 Pusa Dwarf and Farm Selection papaya varieties are recommended for Tarai and river basin area
- 1 Low cost solar dryer developed for Karnali zone

Livestock

- 1 Giriraja chicken has been found to adopt well under scavenging condition
- 1 Broiler type rabbits have been found to perform well in mid-hills
- 1 Brewery residue can be included up to 50% in pig diet
- 1 Rare breed Achhami cattle characterized at chromosomal level and work initiated for its conservation and utilization
- 1 Peta sulfate @ 30-45 gm/day for 30-45 days (antidotes for selenium toxicity) has been recommended for curing Khari disease of cattle
- 1 Number of promising varieties of oat, berseem, and napier identified and are in the process of release
- 1 Technology for year round green fodder production developed

Fisheries

- 1 Technology of producing Trout fingerlings handed over to private sector and their capacities in being enhanced
- 1 Feed formulation for different ages of trout developed and has been handed over to private sector
- 1 Prawn production technology developed and dissemination to farmers is started
- 1 Technology to grow catfish (African Magur) in small ponds developed for marginalized communities

Major problems faced by NARC during reporting period (2065/66) were as follows:

- 1 Insufficient research budget
- 1 Delayed budget release mechanism
- 1 Insufficient scientific and technical manpower
- 1 Inadequate and poor laboratory and infrastructure facilities
- 1 Poor farm machines and equipment facilities
- 1 Irregular electricity supply

Review and Planning Meeting of HMRP

Hill Maize Research Program (HMRP) organized its Review and Planning Meeting from 14-16 December, 2009 at NARI Hall Khumaltar. The objectives of the meeting were to (i) review various activities undertaken in 2009 (ii) develop plan for the year 2010 and (iii) exchange experiences among partners working in maize R & D with the support of HMRP. More than 80 participants representing NARC, DOA, NGOs and CBOs who have been involved in HMRP supported maize based technology generation, dissemination and seed production programs in the country had taken part in the meeting. Two maize scientists from Bhutan participated the meeting for experiences sharing. The inaugural session of the meeting was chaired

by Executive Director of NARC Dr. Bharatendu Mishra. In the session, various papers related to strategy and policy for maize R & D were presented. Director General of Department of Agriculture highlighted DoA's programs on maize production for food security. G. O. Ferrara, Team Leader of HMRP presented the outcomes and achievements so far made by HMRP supported projects to improve maize and maize based cropping system of Nepal. Dr. N. P. Adhikari, Director for Crops and Horticulture Research spoke on NARC's focuses and priorities on maize research and Dr D. B. Gurung, Coordinator of National Maize Research Program (NMRP) presented comprehensive information on maize R & D in Nepal. Ms Yamuna Ghale of SDC presented outcome based planning and monitoring system in line with Swiss Strategy 2009-2012. In five technical sessions 41 papers related to variety improvement, seed production, agronomical and crop management technology development, validation and dissemination areas were presented. Projects outputs and activities of 2009 were reviewed and outline of programs for 2010 funding were prepared.

HMRP Phase III (2008-2010), a Swiss aided project, has given special focus on participatory research to increase the productivity and sustainability of maize farming systems in the hills of Nepal. The project has adopted the implementing strategies of (i) concerted efforts on coordination with national research and development partners, and (ii) participatory approach in its mode of implementation. NARC and DOA are leading partners of the project. Five hill research stations under NARC (Pakhribas, Kabre, Lumle, Dailekh, Kapurkot, Agri. Bot. Division, and NMRP) and 25 District Agriculture Development Offices of hills under DOA are the government agencies involved in project implementation. Likewise several NGOs like LI-BIRD, FORWARD, Support Foundation, ABTRACO, TTRI, CECRED, CBOs (TUKI, others), private entrepreneurs (seed traders, agrovets etc) and more than 20,000 farmers per year from 40 districts are involved in project activities.

Major outcomes of this phase of the project are:

- 1 Hill maize farmers, especially poor and disadvantaged groups, adopt sustainable and profitable maize varieties and technologies to enhance productivity and marketing opportunities
- 1 NARC and NSB have enhanced institutional capacity to promote source seed production and seed marketing

Major outputs of the project are:

- 1 Seed production of released maize varieties was one of the major focus area of HMRP-III. In 2009, the project targets to produce maize seed in 566 hectares of land which includes 163 hectares in NARC stations, 237 hectares in farmers' fields through the management

of DADOs and 166 hectares by NGOs/CBOs.

- 1 Vehicles, equipment and small infrastructure support (Threshers, Drills, weighing balances, moisture meters, seed stores, threshing floors, Metal bins, Computers, internet, etc.) is another output of the project.
- 1 With the support of the project several maize varieties have been developed. These include normal season varieties (Manakamana-3, Deuti, Shitala, Manakamana-4, Manakamana-5, Manakamana-6) and QPM (Poshilo Makai-1, Corralejo S99SIWQ, S99TLYQ-B, Celaya S91SIWQ and S99TLYQ-HGAB)

NTCC meeting of RWC held

Nepal Agricultural Research Council organized one day meeting of National Technical Coordination Committee (NTCC) of Rice Wheat Consortium (RWC) on December 29, 2009 at NARC seminar hall under the chairmanship of NARC Executive Director, Dr. Bharatendu Mishra. Technical papers on various activities and achievements on Rice-Wheat System researches were presented by National Rice Research Program, Hardinath, National Wheat Research Program, Bhairahawa, Regional Agriculture Research Station, Parwanipur, Tarahara and Nepalganj, Agriculture Research Station, Pakhribas and Cereal System Initiatives in South Asia (CSISA) project. Dr. J. K. Ladha, IRRI Scientist spoke about the history and importance of RWC for Indo Gangetic plain of south Asia. Dr. J. K. Bajracharya, DDG of Department of Agriculture, stressed the need of further coordination between research and extension. Most of the scientists present in the meeting expressed their dissatisfaction over low budget allocation for research and very slow pace of Resource Conservation Technology (RCT) dissemination. Use of resource conservation technologies (RCT) in wheat (Table 4) and rice (Table 5) has shown very promising economic viability. However, unlike in India and Pakistan these technological outputs are not transformed into large scale adoption in Nepal. Nepalese scientists have identified the following reasons for slow dissemination of RCTs in Nepal:

- 1 Poor policy support from the government
 - 1 Poor mechanization in the country
 - 1 Lack of aggressive extension program focused on RCTs
 - 1 Poor coordination between research, extension and private sector
 - 1 Inadequate fertilizer supply
- Lack of awareness to climate change: mitigation and adaptation strategies

International News

Green tea could modify the effect of cigarette smoking on lung cancer risk: Drinking green tea could modulate the effect of smoking on lung cancer. Results of this hospital-based, randomised study conducted in Taiwan

Table 4 Resource Conservation Technologies in Wheat: Economic Viability

RCTs	Total cost (Rs/ha)	Cost Saving (Rs/ha)	Gross income (Rs/ha)	Net benefit (Rs/ha)	% benefit	Benefit /cost ratio
CT	25290	-	36123	10833	-	0.43
ZT	20340	4950 (19.6%)	48006	27666	155.4	1.36
PTSD	20865	4425 (17.5%)	55829	34964	222.8	1.68
PTR	24750	540 (2.1%)	47954	23204	114.2	0.93
SS	17990	7300 (28%)	45319	27329	152.3	1.53

CT= Conventional till; ZT= Zero till; PTSD = Power till drill; SS = surface seeding

Table 5 Resource Conservation Technologies in rice: Economic Viability

Seeding or Planting method	Total variable cost Rs/ha	Gross return Rs/ha	Return above variable cost	Net benefit over CTRP
PTD-DSR	6400 (31%)	42371	35971	6773 (23%)
ZTD-DSR	6100(43%)	40875	34775	5577 (19%)
CTR	9225	38423	29198	-

ZTD = Zero till drill; DSR = Direct seeded rice; PTD = Power till drill; CTRP = Conventional transplanted rice

were presented at the AACR-IASLC Joint Conference on Molecular Origins of Lung Cancer, held from Jan. 11-14, 2010. According to this report tea, particularly green tea, has received a great deal of attention because tea polyphenols are strong antioxidants, and tea preparations have shown inhibitory activity against tumourigenesis. The researchers enrolled 170 patients with lung cancer and 340 healthy patients as control. The researchers administered questionnaires to obtain demographic characteristics, cigarette smoking habits, green tea consumption, dietary intake of fruits and vegetables, cooking practices and family history of lung cancer. They also performed genotyping on insulin-like growth factors as polymorphisms on the following insulin-like growth factors: IGF1, IGF2 and IGFBP3, which have all been reported to be associated with cancer risk. Among smokers and non-smokers, those who did not drink green tea had a 5.16-fold increased risk of lung cancer compared with those who drank at least one cup of green tea per day. Among smokers, those who did not drink green tea at all had a 12.71-fold increased risk of lung cancer compared with those who drank at least one cup of green tea per day. Researchers suspect genetics may play a role in this risk differential. Green tea drinkers with non-susceptible IGF1 (CA)19/(CA)19 and (CA)19/X genotypes reported a 66 percent reduction in lung cancer risk as compared with green tea drinkers carrying the IGF1 X/X genotype.

Source: www.aacr.org/home/public-media/aacr-press-release

Tilapia feed on Fiji's native fish: The tilapia has been a problematic invasive species for the native fish of the islands of Fiji, according to a new study by the Wildlife Conservation Society and other groups. Scientists suspect that tilapia introduced to the waterways of the Fiji Islands may be gobbling up the larvae and juvenile fish of several native species of goby, fish that live in both fresh and salt water and begin their lives in island streams. The most surprising finding of the study centres on the tilapia, a member of the cichlid family of fishes from Africa that has become one of the most important kinds of fish for aquaculture, due in large part to its

rapid rate of growth and palatability. Aside from its value as a source of protein, the tilapia is sometimes problematic to native fish species in tropical locations.

To gauge the impacts of tilapia and other human activities on native fish species in the Fiji Archipelago, researchers surveyed the fish species of 20 river basins. In addition to catching and identifying fishes with gill and seine nets, the scientists also rated other environmental factors such as: the potential of erosion due to loss of forest cover and riparian vegetation; road density near rivers and streams; the distances and complexity of nearby mangroves and reefs; and the presence or absence of invasive species (tilapia mainly). The team found that streams with tilapia contained 11 fewer species of native fishes than those without; species most sensitive to introduced tilapia included the throat-spine gudgeon, the olive flathead-gudgeon, and other gobies. In general, sites where tilapia were absent had more species of native fish. Since tilapia are known to consume the larvae and juvenile fish, the researchers assume that the introduced species may be consuming the native ones as they make their way upstream and down. Absence of forest cover adjacent to streams was also correlated to fewer fish species. Based on the spatial information compiled in the study, the researchers found that remote and undeveloped regions - with waterways containing a full complement of native species and no tilapia - on the three islands should be considered priority locations for management. The main management activities, the authors recommend, should include conserving forests around waterways and keeping the tilapia out.

Source: www.scienceblog.com/cms/tilapia-feed-fiis-native-fish

Warmer climate could stifle carbon uptake by trees:

Contrary to conventional belief, as the climate warms and growing seasons lengthen sub-alpine forests are likely to soak up less carbon dioxide. As a result, more of the greenhouse gas will be left to concentrate in the atmosphere, according to a new study conducted at University of Colorado at Boulder. The researchers found that while smaller spring snowpack tended to advance the onset of spring and extend the growing season, it also reduced the amount of water available to forests later in the summer and fall. The water-stressed trees were then less effective in converting CO₂ into biomass and summer rains were unable to make up the difference. Snow is much more effective than rain in delivering water to these forests. If a warmer climate brings more rain, this won't offset the carbon uptake potential being lost due to declining snowpacks. The results suggest subalpine trees like lodgepole pine, subalpine fir and Englemann spruce depend largely on snow melt, not just at the beginning of the summer, but

throughout the growing season, according to the researchers. As snowmelt in these high-elevation forests is predicted to decline, the rate of carbon uptake will likely follow suit. Subalpine forests currently make up an estimated 70 percent of the western United States' carbon sink, or storage area.

Source: sciencedaily.com/releases/2010/10

Climate conditions in 2050 crucial to avoid harmful impacts in 2100: While governments around the world continue to explore strategies for reducing greenhouse gas emissions, a new study suggests policy-makers should focus on what needs to be achieved in the next 40 years in order to keep long-term options viable for avoiding dangerous levels of warming. The study is the first of its kind to use a detailed energy system model to analyse the relationship between mid-century targets and the likelihood of achieving long-term outcomes. The study, conducted at the International Institute for Applied Systems Analysis (IIASA) in Austria and the Energy Research Centre of the Netherlands, is published on 12th January in the Proceedings of the National Academy of Sciences. The team focused on how emissions levels in 2050 would affect the feasibility of meeting end-of-century temperature targets of either 2 or 3 degrees Celsius above the pre-industrial average. The study identifies critical mid-century thresholds that, if surpassed, would make particular long-term goals unachievable with current energy technologies. One 'business as usual' scenario showed that global emissions would need to be reduced by about 20 percent below 2000 levels by mid-century to preserve the option of hitting the target. In a second case, in which demand for energy and land grow more rapidly, the reductions by 2050 would need to be much steeper: 50 percent. The researchers concluded that achieving such reductions is barely feasible with known energy sources. The research team made a number of assumptions about the energy sector, such as how quickly the world could switch to low- or zero-carbon sources to achieve emission targets. Only current technologies that have proven themselves at least in the demonstration stage, such as nuclear fission, biomass, wind power, and carbon capture and storage, were considered. Research shows that average global temperatures have warmed by close to 1 degree C (almost 1.8 degrees F) since the pre-industrial era. Much of the warming is due to increased emissions of greenhouse gases, predominantly carbon dioxide, due to human activities. Many governments have advocated limiting global temperature to no more than 1 additional

degree Celsius in order to avoid more serious effects of climate change. During the recent international negotiations in Copenhagen, many nations recognised the case for limiting long-term warming to 2 degrees Celsius above pre-industrial levels, but they did not agree to a mid-century emissions target.

NARC Scientist conferred PhD

Mr. Yuga Nath Ghimire, Senior Scientist of Socio economics and Agricultural Policy Research Division of NARC has earned PhD degree at Asian Institute of Technology, Thailand in December, 2009. The topic of his dissertation was "Combating poverty in the hills of Nepal: Implications for agricultural research and development policy". His study has revolved around two important research questions regarding poverty reduction in the region. Firstly, how can adaptive capacity of farm households against vulnerability to drought be built-up and secondly, what are the ways to improve the access of marginal farmers to agricultural marketing?

The indicators identified and arranged from highest to lowest priority were access to land, access to irrigation, employment diversification, access to market, crop-livestock integration, access to social networks and access to agricultural training. Three clusters were derived from cluster analysis with the use of these seven

Stable climate and plant domestication linked:

Sustainable farming and the introduction of new crops relies on a relatively stable climate, not dramatic conditions attributable to climate change. Basing their argument on evolutionary, ecological, genetic and agronomic considerations, Dr Shahal Abbo, from the Levi Eshkol School of Agriculture at the Hebrew University of Jerusalem, Israel, and colleagues, demonstrate why climatae change is not the likely cause of plant domestication in the Near East. Rather, the variety of crops in the Near East was chosen to function within the normal east Mediterranean rainfall pattern, in which good rainy years create enough surplus to sustain farming communities during drought years. In the authors' view, climate change is unlikely to induce major cultural changes. Their detailed analysis demonstrates that climate change could not have been the reason for the emergence of grain farming in the Near East. They found that farming requires a relatively stable climate to function as a sustainable economy and therefore is not a sustainable option in times of climatic deterioration.

Source: www.springer-sbm.com

Training, Workshop/Seminar, Study and Tours

S.N.	Name	Position	Office	Subject	Duration	Country
1	Mr. Ram C. Gauli	T-6	RARS, Lumle	M. Sc., Entomology	Oct. 1, 2009-Mar. 31, 2012	Japan
2	Mr. Mohan P. Yadav	T-5	ARS, Pakhribas	B.Sc. Agriculture	Oct.11, 2009-Oct.10, 2013	India
3	Mr. Gautam Manandhar	Chief	AED, Khumal	5th technical committee of UNAPCAEM	Oct. 14-16, 2009	Philippines
4	Dr. Niranjan Adhikari	Director	NARC	APAARI	Oct. 27-29, 2009	Taiwan
5	Mr. Buddhi P. Sharma	S-4	NPRP, Khumal	Training on late blight & 15th symp. international soc. for trop. root crops	Oct 18-Nov 06, 2009	Peru
6	Mr. Rameshwor Maharjan	T-6	Ento. Division	Training on late blight & 15th symp. international soc. for trop. root crops	Oct 18-Nov 06, 2009	Peru
7	Mr. Netra P. Wasti	S-4	AND, Khumal	6th Asian Buffalo congress	Oct 27-30, 2009	Pakistan
8	Mrs. Nirmala Pandey	T-8	BRP, Khumal	6th Asian Buffalo congress	Oct 27-30, 2009	Pakistan
9	Dr. Sri Ram Neupane	S-4	ABD, Khumal	6th Asian Buffalo congress	Oct 27-30, 2009	Pakistan
10	Dr. Baidya N. Mahato	S-4	PPD, Khumal	Full bright scholarship - USA	Oct 20, 2009-Apr. 19, 2010	USA
11	Mr. Kishor K. Shrestha	S-4	PFRD, Khumal	Exchange visit of RPP III Partners to Sichuan	Oct 27- Nov 3, 2009	China
12	Dr. Bhartendu Mishra	ED	NARC	13th CORA annual & APAARI-ADB meeting	Oct 29-31, 2009	Thailand
13	Mr. Pawan K. Jha	T-6	ARS, Pakhribas	M.Sc. Livestock	Oct 28, 2009-Oct 27, 2011	T.U. Nepal
14	Mr. Purna B. Chapagai	T-6	RARS, Lumle	M.Sc. Livestock	Oct 28, 2009-Oct 27, 2011	T.U. Nepal
15	Dr. Min Nath Paudel	S-4	ORD, Khumal	Hill agriculture in SAARC countries: constraints & opportunities in south Asia	Nov 3-5, 2009-	Bangladesh
16	Mr. Ashok Mudawari	Chief	ABD, Khumal	South Asia network on plant genetic resources	Nov 3-5, 2009-	India
17	Mr. Salik R. Gupta	T-8	ABD, Khumal	South Asia network on plant genetic resources	Nov 3-5, 2009-	India
18	Dr. Bhartendu Mishra	ED	NARC	Asian food and agriculture cooperation initiative (AFACI)	Nov 3-6, 2009-	Korea
19	Mr. Ram C. Adhikari	S-4	NPRP, Khumal	International conference on horticulture	Nov 9-12, 2009	India
20	Mr. Resham B. Amagai	T-6	ABD, Khumal	Int. rice genetics symposium	Nov 15-19, 2009	Philippines
21	Mr. Resham B. Amagai	T-6	ABD, Khumal	Int. symposium on wild rice, 2009	Nov 22-24, 2009	Thailand
22	Mr. Shrimat Shrestha	S-4	AED, Khumal	Research & development in agriculture engineering technologies	Nov 3-26, 2009	Israel
23	Mr. Rewati Raman Chaudhary	S-4	ARS, Surkhet	Innovative agricultural technology and management	Nov 9-Dec 4, 2009	Cyprus
24	Mr. Jay Dev Bista	S-4	ARS, Begnas	Training program on intensive aquaculture production	Nov 10-Dec 2, 2009	Israel
25	Mr. Bhim Nath Adhikari	T-6	NGLRP, Rampur	M.Sc. Ag. Plant Breeding	Nov 16, 2009-Nov 15, 2011	T.U. Nepal
26	Mr. Netra Hari Ghimire	T-6	RARS, Nepalgunj	M.Sc. Ag. Plant Breeding	Nov 17, 2009-Nov 16, 2011	T.U. Nepal
27	Mr. Ram Prd. Saha	T-6	NRRP, Hardinath	Agriculture mechanization for developing countries	Nov 27-Dec 17, 2009	China
28	Mr. Purushottam Jha	S-1	NRRP, Hardinath	Hybrid rice for developing countries	Nov 24-Dec 14, 2009	China
29	Mr. Keshav Shrestha	T-6	NARC	M.Sc. Ag. Agri-Economics	Nov 16-Nov 15, 2011	T.U. Nepal
30	Mr. Nabin Pradhan	T-6	HRD, Khumal	M.Sc. Ag. Horticulture	Nov 16-Nov 15, 2011	T.U. Nepal
31	Mr. Iswari P. Gautam	S-4	ARS, Dailkch	PhD – Horticulture	Nov 16-Nov 15, 2011	T.U. Nepal
32	Mr. Tufel Akhetter	S-4	RARS, Parwanipur	PhD – Agronomy	Nov 16-Nov 15, 2011	T.U. Nepal
33	Mrs. Bhawana Shrestha	T-7	NARC	IRRI leadership course for Asian women in agriculture research developing and extension	Dec 1-12, 2009	Philippines
34	Ram Nath Jha	S-1	RARS, Tarahara	Tackling water & food crises in south Asia	Dec 2-3, 2009	India
35	Dr. K.P. Paudyal	Chief	CPDD, Khumal	Workshop in ICM (ICM) in agriculture research for development	Dec 6-10, 2009	India
36	Dr. Renuka Shrestha	Coordinator	NGLRP, Rampur	First regional coordination meeting for south Asia & china	Dec 12-14, 2009	India
37	Dr. Bhartendu Mishra	ED	NARC	First regional coordination meeting for south Asia & China	Dec 12-14, 2009	India
38	Dr. Jwala Bajracharya	S-4	ABD, Khumal	Molecular analysis on the India rice bean	Dec 15, 2009-Jan 21, 2010	India

uncorrelated indicators as inputs. Based on the value of these indicators, clusters were named as highly vulnerable, moderately vulnerable and low vulnerable consisting of 63%, 18% and 19% of total households respectively. Similarly, access to market differed with the livelihood status of farmers- high livelihood status framers using organised marketing channels, whereas, low livelihood status farmers were forced to sell the produce at low price at less organised channels.

This study has made two contributions to the existing knowledge base. First, since the current literature on vulnerability has got inadequate attention with uncertainty in its measurement at household level, this research proposes a methodological framework using multivariate independence techniques for its objective measurement. Second, the study validated that neoliberal economic theory does not guarantee equity in production and marketing of agricultural crops in a society of individuals with diversity in gender and livelihood status. This study showed that demand of produces, and availability of infrastructure, technology and facilities were only the necessary conditions for poverty reduction in Nepalese hill context.

- 1 Upon request of NARC SAS will provide training and consultancy services, and organizes workshops, symposiums and conferences.
- 1 Periodical Research Journals and other informative materials will be published jointly.

Such cooperation shall be implemented by:

- 1 SAS shall conduct training, consultative meetings and workshops on various topics and areas upon request of NARC. NARC shall provide fund for conducting such activities on contract or cost basis.

NARC and SAS shall continue joint publication of the periodical: Nepal Agricultural Research Journal. One issue per Volume per year shall be published. NARC shall provide lump sum Rs. 100,000 annually to SAS for this purpose. NARC shall receive 150 copies of each issue of the Journal. Rest copies shall be the property of SAS. Other publications may come upon mutual agreement.



MoU Signed between NARC and SAS/N

Nepal Agricultural Research Council (NARC) has signed a Memorandum of Understanding (MoU) with Society of Agricultural Scientists (SAS), Nepal on 1st September 2009. The MoU was signed by Mr.

Dinesh Pariyar, Director of Planning and Coordination, NARC and Dr. Hira Kaji Manandhar, President, Society of Agricultural Scientists (SAS), Nepal. The MoU will be effective for two years period from the date of signature. Under the MoU, NARC and SAS/Nepal would promote co-operation in training, workshop, publication and consultancy services as given below:

<p>Patron : Bharatendu Mishra, Executive Director Nepal Agricultural Research Council (NARC) Singh Durbar Plaza, P.O. Box No. 5459, Kathmandu, Nepal Phone : (977-1) 5523041, Fax : 4262500, Email : ednarc@ntc.net.np</p> <p>Published by Communication, Publication and Documentation Division (CPDD) Khumaltar, Lalitpur, Phone : (977-1) 5523041, Fax : 5521197 Email : cpdd@narc.org.np Website : www.narc.org.np</p> <p>Editorial Dr. Krishna Prasad Paudyal : Technical Editor Dr. Bhim Khatri : Editor Manoj Kumar Thakur : Editor</p> <p>Layout and Design Srowan Maharjan, Ph : 9849102550</p>	<p>To :</p> <hr/> <hr/> <hr/>
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