International Maize and Wheat Improvement Center

The Hill Maize Research Project (HMRP) Phase IV

"Improved Seed for the Rural Poor in the Hills of Nepal:
Fostering Adoption of Improved Maize Technologies to Promote Food Security, Nutrition, and Economic Growth"

Annual Progress Report, 2012

Submitted to

The Swiss Agency for Development and Cooperation (SDC)

And

The United States Agency for International Development (USAID)
Kathmandu, Nepal

14-August-2013

Contact:
Dr. Maria Luz C. George
Head, Program Management Unit
Km. 45 Carretera Mexico-Veracruz, El Batán, Texcoco, Edo. de Mexico, C.P. 56130 Mexico
Telephone: +52 (595) 9521900; Fax: +52 (595) 9521983
Email: m.george@cgiar.org

CIMMYT

Schweizerische Eidgenossenschaft
Confédération suisse
Confederazione Svizzera
Confederaziun svizra

USAID FROM THE AMERICAN PEOPLE

1. Executive Summary

The Hill Maize Research Project (HMRP), funded by the Swiss Agency for Development and Cooperation (SDC), began in 1999 with the objective to increase food security of farming families by raising production, productivity and sustainability of maize-based cropping systems in the hills of Nepal. HMRP IV (August 2010–July 2014) is co-funded by the SDC and the United States Agency for International Development (USAID). The goal of HMRP IV is to improve food security and income of poor and DAGs[1] in the hills of Nepal by further up-scaling and consolidating project achievements from the past three phases (1999–2010), maximizing impacts by selective intensification of key project activities, focusing on dissemination, Community-based Seed Production (CBSP), seed marketing and continuing policy advocacy for decentralized source seed production and public–private partnership in seed quality control. Two targeted outcomes of the HMRP IV are: (A) hill maize farmers, especially poor and DAGs, adopt sustainable and profitable maize varieties and technologies to enhance productivity and marketing opportunities and, (B) the Nepal Agricultural Research Council (NARC) and National Seed Board (NSB) have enhanced institutional capacity to promote source seed production and facilitate certification procedures.

The 2012 Yearly Plan of Operation (YPO) set priorities for maize research and development in the country, outcome based resources allocation and implementation strategies using participatory and inclusive R&D approaches. The YPO 2012 provided strategic directions for maize varietal improvement, maintenance, decentralized source seed production, community based seed production, seed quality control, seed marketing and seed promotional activities and validation and dissemination of maize based technologies. The YPO also outlined policy priorities for a sustainable seed system in the hills of Nepal.

Results obtained in 2012 showed that all the milestones set for each outcome of the project were met or even surpassed for some indicators. HMRP reached 50,740 households (72% DAGs and 54% women) and covered 601 Village Development Committees (VDCs) in the 20 project hill districts of Nepal. Regarding varietal development, in close collaboration with NMRP/NARC and other HMRP partners, new maize genotypes– S99TLYQ-B (yellow QPM); Across 9942/Across 9944 (white normal); Arun-4 (early yellow normal) and Pool 17 (extra early yellow) – were validated in the Participatory Variety Selection (PVS) trials and these varieties are expected to be released by the end of 2013 or early 2014. Several drought-tolerant, Gray Leaf Spot (GLS) resistant and quality protein maize (QPM) genotypes were introduced from the International Maize and Wheat Improvement Center (CIMMYT) breeding locations and are being tested on-station and on-farm for their adaptability, suitability and superior agronomic traits. More than 19 released and pre-released maize varieties are being maintained in NARC stations through varietal maintenance and maintenance breeding. Decentralized source seed production has been fully implemented through NARC stations, local private seed companies and strategic CBSP groups. Three NARC-Agricultural Research Stations (ARS) situated in strategic locations of the mid and far western hills were taken onboard in this phase (Surkhet, Salyan and Doti). Other NARC partners have significantly expanded their source seed production area. Nine NARC stations and strategic CBSP groups produced 101.8 tons of breeder and foundation seed in 2012. These source seeds were sufficient to meet the source seed demand for the entire hills of Nepal (estimated demand: 101.7 tons for 5,086 ha) for the 2013 maize season. Similarly, during 2012 a total of 207 CBSP groups and cooperatives produced 1,036 tons of marketable surplus improved maize seed. Out of this seed, 83% was sold by the end of the season. Gender Equity and Social Inclusiveness (GESI) in the CBSP groups was significantly increased. Final results showed that, out of 5,019 CBSP members, involvement of women and DAG farmers was 56% and 61%, respectively. The 1,036 tons of improved seed produced in 2012 was sufficient to meet the targeted 30% demand for maize seed in the hills of Nepal (estimated maize seed demand in the hills– 4,000 tons per year). In addition to improved maize varieties and quality seeds, HMRP continued participatory validation and dissemination of crop management technologies such as maize-vegetable

[1] Disadvantaged groups (DAGs) are groups of economically poor people (living on less than one dollar a day or having less than 6 months food security) that also suffer from social discrimination based on gender, caste/ethnicity and regional identity.

intercropping, promotion of balanced use of fertilizer and compost, plant population management, weed control, profitable crop rotations, residues management, reduced tillage and other low cost technologies. In seed policy ambits, significant achievements were made in 2012. HMRP contributed in the formulation of Nepal's National Seed Vision (2013-2025) which has been recently approved by the Government of Nepal (GoN). Similarly, the project supported the National Seed Board (NSB) to amend the Seed Regulation (2012/13). The process to harmonize the District Seed Self-sufficiency Program (DISSPRO) and CBSP has been initiated with the aim to institutionalize HMRP experiences of CBSP especially public-private partnerships, seed value chain, Gender Equity and Social Inclusion (GESI) and participatory technology development approaches in the GoN system. A total of 37 agricultural scientists and development workers of NARC, District Agriculture Development Office (DADO), private sector and CBSP were trained for initiating licensing systems for seed field inspection, seed analysis and seed sampling. These trained people will participate in the licensing test examination of NSB. HMRP has a plan to support NSB to conduct this kind of examination during 2013 and 2014.

For the first time in the history of HMRP, five Interns successfully completed their internship program during 2012. These Interns (including three women), worked closely with the four HMRP Cluster Agronomists who are strategically located in the hill districts of Dadeldhura, Surkhet, Kaski and Okhaldhunga. The five Interns contributed significantly in helping HMRP achieve the milestones set during the year. The internship program provided them the opportunity to learn about the research and development constraints affecting maize production in the hills of the country, HMRP's farmers participatory methodologies, and the work the project and its partners conduct to help alleviate the issues of food security and livelihoods in the hills. The internship program also provided them the opportunity to grow professionally. At least two of the Interns are pursuing their MSc and two others have started work with other research and development organizations in Nepal. The experience gained from this first generation of Interns will help HMRP to further improve the internship program of 2013 and beyond.

The total operational budget allocated to partners in 2012 was NRs. 56,670,000 (NARC – 24,977,000; Department of Agriculture (DoA)/Crop Development Directorate (CDD) – 14,300,000; and Non-government organizations (NGOs)/Community-based Organizations (CBOs) – 17,393,000). Similarly, NRs. 21,810,000 (US$ 290,800) was mobilized centrally to support partners and CBSP groups for training, workshops, equipment, small infrastructure, seed revolving fund, support for seed marketing and field monitoring.

Several important issues and lessons were learnt during the implementation of the HMRP IV in 2012. These lessons significantly helped to develop the Yearly Plan of Operation (YPO) – 2013. Those lessons were as follows:

(i) Contract maize seed production in CBSP facilitated by HMRP in 2012 has been very successful. Project aims to continue increased efforts to implement contract system through CBSP, seed companies and Agro-vets in 2013 and onwards.

(ii) GoN has introduced a provision as a compulsion to all the financial entities, to invest at least 12% of their budget in the agricultural sector. In this context, among other efforts in the project to increase the sustainability of CBSP groups, HMRP will launch a new initiative for linking CBSP groups with the financial institutions and to strengthen working relations between them.

(iii) Well-built partnerships of the project with GoN institutions has helped significantly in institutionalization of project's achievements in the NARC and DoA systems, and project considers this is one of the key strategies for long-term sustainability of program interventions.

(iv) Ensuring participation of women and food-insecure farmers in maize R&D activities is key to improving food security at the household level.

(v) HMRP has increased efforts to develop new partnerships with the local states (Agriculture, Forest and Environment Committee (AFEC)/VDC and District Development Committee (DDC). Several VDCs and DDCs, in partnerships with HMRP collaborators, were able to

train and provide maize seed and support for development of small seed related infrastructure at the community level (Sindupalchowk, Jajarkot, Syangja, Dhading, Kavre, Palpa, Dailekh, Surkhet, Okhaldhunga, Khotang, Dadeldhura, Baitadi, etc). Initial results have been very encouraging and the project will continue its efforts towards building stronger partnerships with local states in the future.

(vi) Collective and coordinated actions of government, non-government and private sector actors are essential for increasing program impacts.

(vii) Implementation of a decentralized source seed production through public-private-CBSP groups/cooperatives can ensure that breeder and foundation seed is available on time in the country.

(viii) The NARC should focus on variety development, maintenance and breeder seed (BS) production (currently the private sector is too weak to take these responsibilities), whereas foundation seed (FS) production can easily be transferred to the private sector.

(ix) Seed storage, post-harvest management, processing, packaging, branding and marketing are the areas that the project has to focus in 2013 and beyond.

(x) Promotion of high yielding varieties (HYVs) and improved crop management is essential to achieve maximum yield and sustainability of the production systems.

(xi) Marketing of improved seed remains a key challenge. Considering the current seed replacement rate (SRR) of 9.5% in maize in Nepal, we deduce that there are enormous demands for improved maize seed. But on the other hand, out of 1,036 tons maize seed produced in 2012, only 83% could be sold and used as seed. This shows the importance of intensifying project works towards maize seed marketing.

(xii) The fund flow analysis (FFA) for the period from 16 July 2011 to 15 July 2012 showed that out of US$ 994,335 analyzed budget, 59%, 22% and 18% were utilized at the district, central, and international level, respectively. Similarly, 39% of the funds reached the discriminated groups, and 61% reached non-DAGs. Final results elucidated that 47% of the funds reached to disadvantage groups and 36% to non-disadvantaged groups. Gender analysis of the budget reached 47% and 37% female and male beneficiaries, respectively (Annex-7).

2. Outcomes Monitoring Summary Report – 2012

Indicators	Baseline[2]	Phase target	Situation	Comment
A. Hill maize farmers, especially from poor and disadvantaged groups, adopt new and profitable maize varieties and improved technologies to enhance productivity and marketing opportunities				
1. National Maize Research Program (NMRP) and Community-based Seed Production (CBSP) meet 30% of the national open pollinated variety (OPV) maize seed demand of 5,086 t	830 t	4,000 t	1,036 t of marketable surplus maize seed produced by 207 CBSP groups (improved 978 t and foundation seed 58 t).	Seed productivity and seed retention in 2012 were 1 t/ ha and 83% respectively. This shows that the project has enough scope to increase seed productivity up to 2 t/ha and improve retention significantly
2. 35,000 disadvantaged group (DAG) households (HHs) used new maize varieties and improved technologies	21,252 HHs	35,000 HHs (60% women and 70% DAGs) used new maize varieties and improved technologies	50,740 HHs (overall 57% women and 72% DAGs) used new maize varieties, improved technologies or both	Partners' ability to increase the project outreach was much higher than expected. Project target can be reviewed

[2] Base line data indicates situation until 2010 (extracted from HMRP Annual Progress Report 2010)

Indicators	Baseline[2]	Phase target	Situation	Comment
3. CBSP groups/Cooperatives involved in commercial seed production and marketing (Seed Value Chain)	174	200 CBSP groups engaged in seed multiplication and at least 40 of them developed commercial seed businesses	5,019 farmers in 207 CBSP groups/cooperatives were engaged in seed multiplication and 42 of them developed commercial seed business	Improvement in governance, transparency, sustainability and business orientation will be focused
4. Beneficiaries use quality protein maize (QPM)	1,500 HHs	11,000 HHs use QPM	10,000 HHs produced QPM in the project period	QPM needs specialized agronomy (regular testing and isolation) to retain the QPM properties. Need to create awareness about QPM and production technologies among the QPM users
5. Women and DAGs represented in CBSPs and in participatory research and extension activities	50% women and 70% DAGs in total	50% women and 50% DAGs represented in CBSPs and 60% women and 70% DAGs participated in other research and development activities	58% women and 65% DAGs represented in CBSPs and 54% women and 72% DAGs participated in other research and development activities	Importance of Gender, Equity and Social Inclusion (GESI) will continue to ensure increased participation of women and DAG farmers in CBSP and maize R&D activities
B. National Seed Board (NSB), Nepal Agricultural Research Council (NARC) and Department of Agriculture (DoA) enforce quality control through both public and private institutions				
1. NARC/NSB issued directives and procedures for decentralized, truthfully labeled, source seed production	0	Directives and procedures for decentralized, truthfully labeled, source seed production issued	Directives and procedures for decentralized, truthfully labeled source seed production is being jointly prepared by SQCC, HMRP and other SDC funded projects. HMRP believes that the directive will be issued by GoN authority by the end of 2013	Practically, decentralization of source seed production has been met in 2012. Nine NARC stations produced breeder and foundation seed in the hills and 27 CBSP groups also initiated foundation seed production.
2. Public and private sector experts obtain seed quality control mandate	0	200 NARC breeders, District Agriculture Development Office (DADOs), subject matter specialists (SMS), and private sector experts (at least 50 women and 10 from the private sector) authorized for field inspection, sampling and seed testing	71 NARC breeders, DADOs SMS and private sector experts, trained in two batches (2011 and 2012), were trained on seed quality control in collaboration with Seed Quality Control Centre (SQCC). Among them 12 were female candidates. NSB will conduct a licensing test to authorize those trained personnel once seed regulation is approved by the GoN	Despite significant efforts, only 12 out of 71 participants were female. This was mainly due to the fact that most of the women scientists were not working in remote areas. The phase target to train 200 scientists (100 female) should be revised.

Indicators	Baseline[2]	Phase target	Situation	Comment
3. Sufficient quantity of breeder and foundation seed produced by NARC	17.5 t	80 t breeder and foundation seed produced	Significant results achieved on this indicator. 101.8 t of breeder and foundation seed produced on-station and on-farm (45.2 t on-station and 56.6 t on-farm by 27 CBSP groups)	Regional level sufficiency for source seed was achieved HMRP will put further efforts towards increasing seed quality of the produced seed
4. Four maize varieties, including one QPM, developed and released	7	Four varieties, including one QPM released	Three pipeline OPVs, including one yellow QPM are in the process of release in 2013	Pipeline OPVs under extensive seed multiplication

3. Basic Information

3.1 Project evolution

The HMRP has gone through an initial period of four years (Phase I, 1999–2002), with the aim to develop, identify and validate maize varieties and technologies for the benefit of poor farmers in the hills of Nepal. Its primary focus was on basic research. Phase II of the project went from 2003 to 2007 and the project balanced applied and adaptive research, multiplied seed of varieties selected by farmers in PVS, through CBSP, and coordinated diverse small-grant projects that contributed to the HMRP goals. In Phase III (January 2008–July 2010), the project placed emphasis on the dissemination and up-scaling of the improved maize varieties and agronomic/soil interventions, consolidated the participatory approaches for technology adoption, strengthened the partnership with different local stakeholders, emphasized GESI, and expanded to other geographical areas in the hills. HMRP IV (August 2010–July 2014) is co-funded by the SDC and USAID. The goal of HMRP IV is to improve the food security and income of poor and DAGs in the hills of Nepal by further up-scaling and consolidating project achievements from the past three phases (1999–2010), maximizing impacts by selective intensification of key project activities following a geographical clustering approach, focusing on dissemination, CBSP and marketing, and continuing policy advocacy for truthful labeling, decentralized source seed production and public–private partnership in seed quality control.

3.2 Analysis of socio-political contexts

Despite the political instabilities and low economic growth rate, Nepal has made a fair level of progress in some social indicators. Nepal recorded a 5.7% decline in absolute poverty between 2003/04 (30.86%) and 2009/10 (25.16%) (NLSS-III, 2011). Furthermore, Nepal's hunger status has been improved from 'alarming' to 'serious' according to the recent Global Hunger Report 2012 published by the International Food Policy Research Institute (IFPRI). Nevertheless, these reports indicated that poverty and hunger have increased in the mid and far west of Nepal and among the vulnerable social groups. These findings indicate the relevance of HMRP in working with the poor and disadvantaged farmers living in remote food deficit areas to alleviate poverty and hunger. Wider adoption of innovations of QPM varieties (Poshilo Makai- 1) and maize-vegetable intercropping technologies has good potential to overcome nutrition insecurity in the hill farming communities.

The GoN's development framework for three years (FY2010/11– FY2012/13) is going to be completed in 2013. To replace this plan, the GoN has brought a Three Years Plan (TYP) for the period of 2013/14-2015/16. This plan foresees a sustainable economic growth with an average growth rate of gross domestic product (GDP) at 6%. The role of the HMRP will also be important to help achieve this target by increasing maize production and productivity in the country.

The GoN has been prepared the Agriculture Development Strategy (ADS) to replace the country's current Agriculture Perspective Plan (1995–2015). Likewise, the Seed Vision (2013 to 2025)

document has been approved. These developments are opportunities for the HMRP to work with the relevant institutions to support in the effective implementation of those policies. The provision of investment of at least 15% budget from VDC grants in the agricultural sector has created new opportunities for the HMRP to expand collaboration with local states in the area of maize food security.

Out-migration of rural youth has created many-fold impacts in agriculture. Such impacts have been either positive (remittances, farming knowledge/skill, empowerment, etc.) or negative (increased labor crisis, increased amount of abandoned land, decreased investment in farming, feminization of agriculture, etc.). In this situation, there is a need to open new space within the project to adapt agriculture under migration pressures by utilizing the positive environments created and finding out appropriate ways to tackle the potential negative impacts. There are opportunities to develop agricultural knowledge and technologies that demand less labor with higher returns and reduce soil degradation due to erosion. Climate change and climate variability is emerging as a main threat for a sustainable food secure situation in the country. This shows the importance of the HMRP and its partners in working on the development of climate resilient maize varieties and technologies.

3.3 Partners and budget utilization in 2012

Ten NARC research stations and divisions; 20 DADOs; 5 Regional Seed Testing Laboratories (RSTLs) and 5 Regional Agricultural Directorates (RADs) under DoA/CDD, 18 NGOs, and 5 private companies implemented 60 small grant projects in 2012 (see details of partners, project and budget in **Annex 2**). These partners received financial support to implement the SGPs. A total operational budget provided to HMRP partners in 2012 was NRs. 56,670,000 (**Table 1**). In addition to this, partners were provided NRs 4,577,000 to prepare and distribute about 49,000 IRD sets and 300 PVS sets through central purchase. HMRP continued to provide small equipment and infrastructure support to NARC and DoA partners and CBSP groups and cooperatives. Likewise, CBSP groups and cooperatives were provided Seed Revolving Funds (SRFs). The central budget to support these kinds of activities was NRs 21,810,000.

Table 1: Budget allocated for Outcome A and Outcome B 1 US$= NRs. 75.0

SN	Activities	No. of SGPs	Total 2012	
			US$	NRs. ('000)
1	Budget for 60 SGPs	60	755,600	56,670
a	Nepal Agricultural Research Council (NARC) –10 hill stations and Divisions	32	333,027	24,977
b	Crop Development Directorate (CDD) – Department of Agriculture (DoA) (20 District Agriculture Development Offices and 5 RSTLs)	1	190,667	14,300
c	Non-government Organizations (NGOs)/ Community-Based Organizations (CBOs)/Private Seed Companies	27	231,907	17,393
2	Budget to purchase seed for preparation of 49,000 IRD and 300 PVS sets		61,000	4,575
3	Central budget to support Outcome A and Outcome B		290,800	21,810
Total for Outcome A and B			**1,107,400**	**83,055**

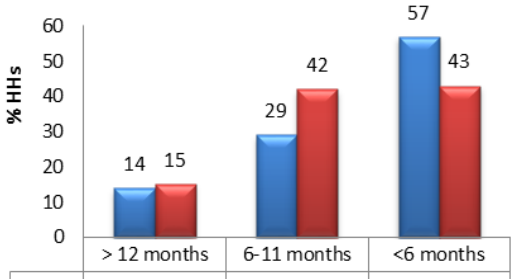
4. Outcomes Achieved

Description of intended and unintended effects: The achievements against the planned goals and outcomes are briefly presented in the following section. Further details are provided in **Annex 4**.

Outcome 1: *Hill maize farmers, especially poor and DAGs, adopt sustainable and profitable maize varieties and technologies to enhance productivity and marketing opportunities*

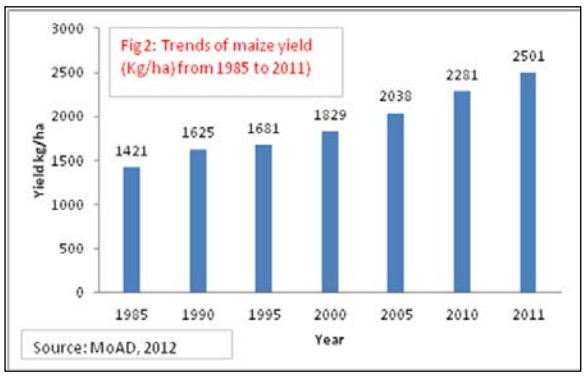
A.1 Enhanced food security situation: The Outcome Monitoring Summary (OMS) information of 2010 and the HMRP external phase review showed that the food security situation of poor and DAGs had improved significantly **(Figure 1).** Of the 21,252 participating households, the percentage in the category who have food sufficiency of >12 months from own production increased from 14% (2,975 households) to 15% (3,188 households). For the category of 6–11 months, the percentage increased from 29% (6,163 households) to 42% (8,926 households). Likewise, the number of households with less than 6 months food sufficiency decreased from 57% (12,113 households) to 43% (9,138 households). This significant contribution was possibly due to the adoption of quality maize seed and improved agronomic practices by the maize growers. Similar, or even higher impacts on food security of participating households, are expected in the current HMRP IV phase. Data collection is being carried out in the project and results will be reported once information is collected (2010 and 2013).

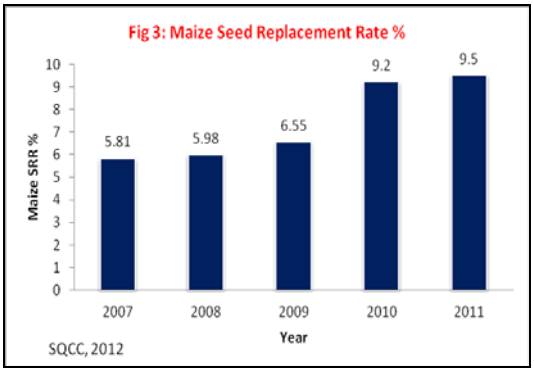
Fig. 1 Major shift in food security due to the Hill Maize Research Project interventions



	> 12 months	6-11 months	<6 months
2007	14	29	57
2010	15	42	43

A.2 Improved maize productivity and profitability: Published GoN data (MoAD, 2012) verifies that the national maize productivity has increased by 36% over the last 20 years, and 17% over the last 5 years **(Figure 2)**. These increments are mainly due to the increased area under high yielding maize varieties and the adoption of improved technologies**.** Seed Replacement Rate (SRR %) in maize also increased significantly. According to SQCC (2012) data, the maize SRR increased from 5.81% in 2007 to 11.3% in 2011 (**Figure 3)**.

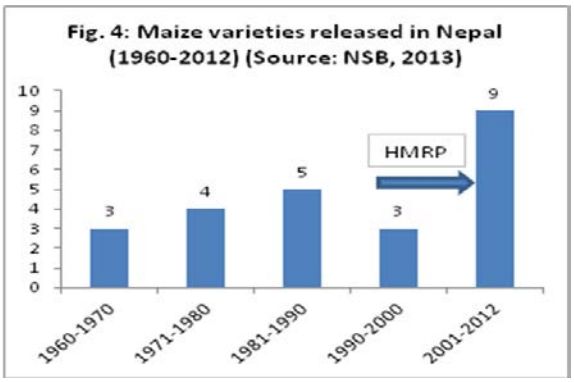




Analysis of gross margins from maize production showed that by adopting improved maize varieties and technologies farmers were able to generate employment equivalent to 197 human days/ha/year and had a gross margin of NRs 9,695 per ha. Similar analysis for local varieties and local management practices showed an employment generation of 180 human days/ha/year and had a gross margin of NRs 697 per ha. This analysis demonstrates that by promoting improved maize cultivation in the hills of Nepal, there is a high potential for contributing to food security and poverty reduction on a sustainable basis.

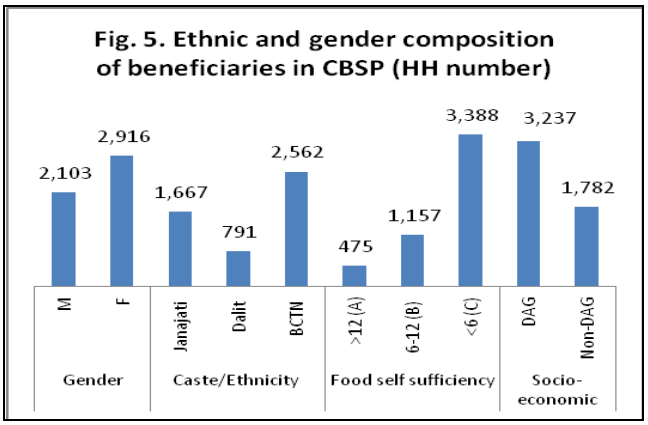
A.3 Expanded markets and value increment: The market for improved maize seed and grains (in the accessible areas) has been improved**.** In 2012, a total of 5,019 seed producing farmers produced 1,036 tons of marketable surpluses of improved maize seed. Final analysis (as of June 2013) shows that 83.24% (862 t) seed was marketed in 2012. The average farm-gate price of maize seed in 2012 was NRs. 42 per kg, totaling approximately NRs. 36 million. Through decentralized source seed production, 101 tons of breeder and foundation seeds were produced with a worth of NRs 6.0 million (at NRs. 60 per kg). Considering 25% yield increase due to improved maize varieties and technologies from current national maize productivity of 2,501 kg/ha, farmers, from the use of seeds produced in 2012, will be able to secure a maize value increment of NRs 366.7 million from 43,125 ha in 2013.

A.4 Enhanced technological innovations and dissemination: HMRP IV re-directed its maize R&D efforts in a value chain fashion which included involvement of the project in maize varietal development and improvement, source and improved seed multiplication, processing and storage, institutional strengthening of public, private and CBSP groups/cooperatives, establishing/improving small infrastructures in NARC and CBOs, and marketing of produced seed. Besides intervention in the seed sub-sector, the project has also increased efforts for the development and validation of crop management technologies that help farmers to augment their productivity in a sustainable way. HMRP-generated maize based technologies and varieties are summarized in **Annexes 5 and 6**. HMRP, in collaboration with NARC, NSB, DoA and CIMMYT's Global Maize Program (GMP), facilitated the development and release of seven farmer-preferred maize OPVs, including a QPM variety, through farmer participatory approaches. Trends in maize varietal development in Nepal shows that, majority of the varieties were developed and released during 1999 to 2012, the working period of HMRP **(Figure 4).** Through the project, the decentralization of maize seed through public, private and community partnerships was successfully implemented. At least 10 farmer-preferred maize varieties identified through PVS were multiplied by 207 CBSP groups and cooperatives producing the marketable surplus of 1,036 tons. The project continued participatory validation and testing of new maize based technologies focusing on maize–vegetable intercropping and composting technologies, weed management, insect pest control, post-harvest management, and validation of conservation agriculture (CA) technologies. Preliminary results have shown that these technologies, in combination with quality seed of improved maize varieties, have tremendous potential to enhance maize productivity on a sustainable basis by 20 to 70% in the hills of Nepal. Information on the profitability of new maize varieties, quality seeds and improved management practices was disseminated through local level training, FM radio, leaflets and booklets, newspapers and TV. It is estimated that during 2013, a total area of 43,125ha was occupied by improved maize varieties and technologies.



A.5 Inclusive farmers' groups and cooperatives: GESI continued being strongly emphasized during 2012. As a result, CBSP groups/cooperatives were more inclusive, transparent and had improved record-keeping systems. In more than 207 CBSP groups, participation of women and DAGs was very encouraging. Among 4,137 surveyed farmers, the involvement of Janajati, Dalit and women farmers was 33%, 16% and 58%, respectively (**Figure 5**). This data confirms that a seed production program

can be effectively implemented, even with poor farmers, if it is planned and implemented in a strategic manner.



Outcome 2: *The NARC and NSB have enhanced institutional capacity to promote source seed production and facilitate certification procedure*

B.1 Favorable policy provisions ensured through amendments: Major seed policy hurdles in the seed sector of the country identified to date include: participation of public and private sector actors in seed quality control system, provision of truthful labeling (TL) in source seed production, implementation of decentralized source seed production (DSSP), and institutionalization of HMRP learning in the NARC and DoA systems. HMRP has made significant progress in these areas. Seed quality control through public-private partnerships (PPPs) and provision of TL in source seed are ensured in the revised Seed Act 2012. Nepal's first Seed Vision 2025 document has been approved. In the formulation and finalization process of the Seed Vision (2013-2025), HMRP provided technical and financial support and served as a secretariat member of the Seed Vision Drafting Committee. DSSP was implemented in full fledge through 9 NARC stations and 27 CBSP groups and cooperatives. Directives for DSSP are being prepared in the leadership of SQCC and NSB where HMRP is playing a major role. The Agriculture Extension Guidelines of CDD were reviewed and new guidelines have been drafted with the aim to institutionalize HMRP's experiences and lessons on CBSP, PVS and participatory approaches.

B.2 Enhanced human and institutional capacities: In 2012, the HMRP worked with 207 CBSP groups (80 new), 10 NARC stations (3 new), 18 NGOs (12 new) and 20 DADOs (coordinated by CDD – 4 new) including 7 private seed companies and cooperatives (3 new). These institutions received short term institutional and technical training from the HMRP. Training courses provided to HMRP partners covered mainly maize seed production, crop management, policy and project management issues and new agricultural technologies and market information. In 2011, a total of 404 (387 males and 17 females) people were trained. Likewise, at the farm level, in 2012 HMRP partners trained 6,788 farmers (55% females and 38% youth) in improved crop management technologies, seed production and marketing, and CBSP governance. About 61% of the total trained farmers (4,141) were from disadvantaged communities **(Annex 10).** Training data for 2012 are being received and analyzed. This will be included in the HMRP Half Yearly Progress Report 2013 (OMS 2013). A total of 50,740 farmers (direct beneficiaries of HMRP) used improved maize varieties with adoption of one or more new maize technologies (intercropping, compost, and appropriate plant population, judicial use of chemical fertilizers, weed control, pest management and post-harvest practices). Most of the CBSP groups, cooperatives and private seed companies have been adopting and promoting HMRP-generated technologies.

B.3 Decentralized source seed production: Decentralized source seed production through public, private and community partnerships was successfully implemented in 2012. Three NARC-ARS

situated in strategic locations of the hills were taken onboard in 2011 (Surkhet, Salyan and Doti). Previous NARC stations also significantly expanded their area under source seed production. NARC stations and CBSP groups significantly increased source seed production in 2012. Team building and the capacity enhancement of partners received a high priority to ensure that the source seed produced was of good quality. A total of 101.9 tons (NARC – 45.3 tons and CBSP –56.6 tons) breeder and foundation seed produced in 2012 fulfilled the source seed demand of the hills of Nepal. Small infrastructure (improvement of seed storage, irrigation tube wells, threshing floors, vehicle repair, etc.) and small equipment (germinators, seed graders, moisture meters, weighing balances, samplers, sack sewing machines, etc.) was provided to NARC and CBSP groups. Likewise, HMRP played a crucial role in accrediting the Central Seed Testing Laboratory (CSTL) to International Seed Testing Association (ISTA) standards by providing laboratory equipment and technical support as per the recommendation of ISTA auditors.

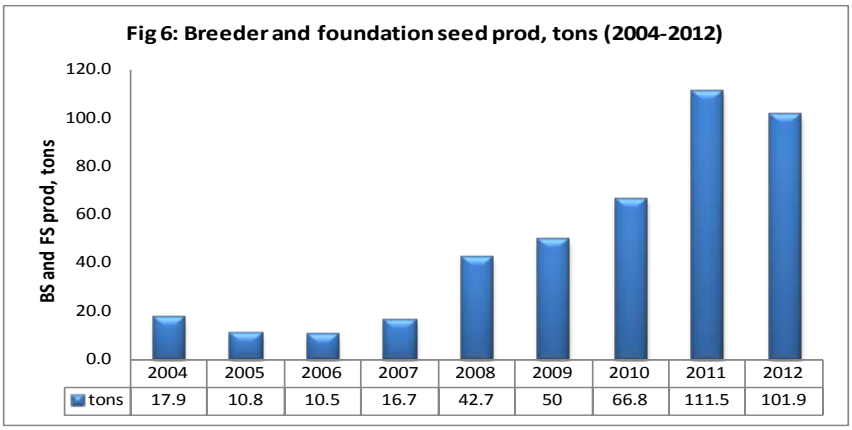
B.4 Simplified process of variety release system established: HMRP increased collaboration with the NSB to strengthen institutional capacity and simplify the variety release system. Farmers' feedback on the performance of varieties is being taken into account to release new varieties. The NSB has released seven improved varieties of maize developed by the NMRP in the last 10 years which has taken into account the PVS data and farmers' perceptions whilst also assessing varietal performance and preferences.

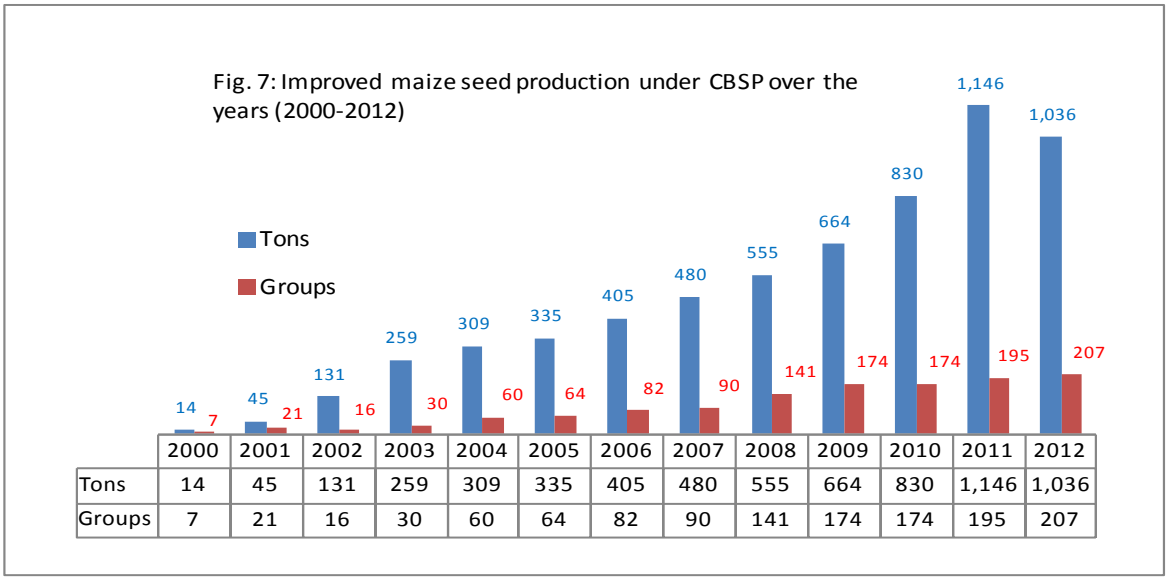
5. Outputs Achieved, Performance, and Partners

5.1 Varietal improvement, release and maintenance: In the last three phases of the HMRP, seven improved maize varieties developed by the NMRP (Manakamana-3, Deuti, Shitala, Manakamana-4, Manakamana-5, Manakamana-6, and Poshilo Makai-1) were approved for release by the NSB for commercial production in the hills of Nepal (see **Annex 5** for specific traits of the released varieties). These varieties are very popular among the farmers throughout the hills of Nepal, including districts that are not covered by the HMRP. Other promising lines identified through on-station evaluations, PVS, Coordinated Variety Trials (CVTs) and Coordinated Farmers' Field Trial (CFFT) include S99TLYQ-B (yellow QPM); Across 9942/Across 9944 (white normal); Arun-4 (early yellow normal) and Pool 17 (extra early yellow). These varieties have been submitted for release. Several CIMMYT GLS resistant, drought tolerant and QPM genotypes are being researched on-station and on-farm for their adaptability, suitability, superior agronomic traits, and farmers' acceptance. These lines will undergo further testing in 2013 and thereafter. Maize improvement for GLS resistance, earliness, and open husk cover, has been continued at the NMRP and other research stations of NARC.

5.2 Increased availability of maize source seed and improved seed: Significant progress was made in source and improved seed production in 2012. Production trends of source seed by NARC and improved seed by CBSP groups and cooperatives are presented in **Figures 6 and 7,** respectively. A total of 111.5 tons of the farmers' preferred varieties was produced by NARC/NMRP stations. Similarly, about 5,019 seed producing farmers, organized in 207 CBSP groups, produced 1,036 tons of marketable surplus improved maize seed (**Figure 7**). This production was lower than the one obtained in 2011 (1,146 t) mainly due to lower and erratic rainfall in that year. The CBSP approach followed by the project not only helped farmers to have timely access to new seeds at the local level at a cheaper rate, but has also helped to enhance farmers' skills (particularly women) in quality seed production and entrepreneurship development. One of the remarkable achievements of CBSP is that the project hill districts have become self-sufficient for maize seed, and a significant quantity of maize seed is sold outside the district. Foundation seed production was successful among 27 CBSP groups and cooperatives in different parts of the country, supporting the availability of source seed at the local level. Truthful labelling was initiated in 2010 among successful CBSP groups in various districts, and this has been institutionalized in at least 40 CBSP groups and cooperatives. The HMRP, together with other key partners, has continuously promoted seed plot inspections by the GoN-authorized agency, as well as the truthful labelling of quality seed produced by different farmer groups. The SQCCs and the RSTLs, under the Ministry of Agriculture and Cooperatives (MoAC),

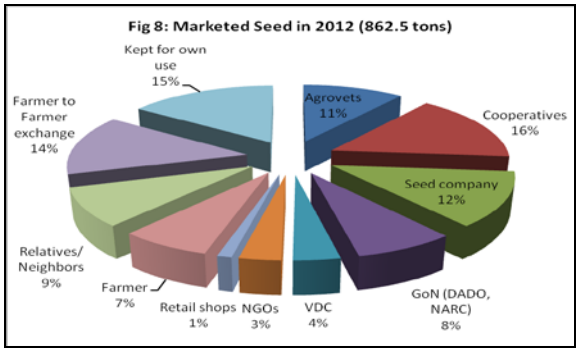
have played a vital role in training CBSP groups in quality seed production, truthful labeling, and facilitating inspection of seed plots.





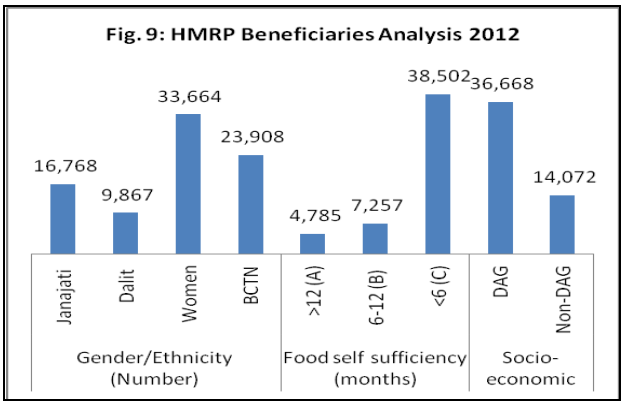
5.3 Community seed producers established commercial relationships with seed traders: Seed sale records of CBSP groups and cooperatives shows that from the total marketable surplus of 1,036 tons, as of June 2013, 862.6 ton was sold/ distributed locally and outside of district. Farmers sold/ distributed their seeds through 11 different kinds of market outlets such as private seed companies, agro-vets, DADOs and VDCs, directly to the farmers, farmers' cooperative, farmer to farmer exchange, etc. Quantities of seed sold through these channels are presented in Figure 8 below.

During 2012, the project placed special emphasis on institutional strengthening and capacity building of CBSP groups and cooperatives for seed marketing and development of community managed seed related small infrastructure. Out of 2007 CBSP groups/cooperatives, 42 of them (strategic CBSP groups) now have received small infrastructure and equipment support from the project. These strategic CBSP groups are now involved in commercial seed production business.



5.4 Improved agronomic practices and plant protection: Several eco-friendly maize-based crop management technologies were tested and validated through 'diamond' and intercropping trials in 2012. Some of the intercropping combinations such as maize+tomato, maize+ginger, maize+soybean, maize+groundnut and maize+other vegetables are becoming popular and widely adopted by farmers. Profitability from these intercrops ranged from NRs. 8,500/ha for maize+soybean to NRs. 670,000/ha for maize+ginger. Likewise, improved composting was found effective in improving soil quality and the indigenous fungal pathogen *Metarhizium anisopliae* showed promising results as a biological control agent for white grubs. Farmers increasingly prefer to sow two maize plants per hill in maize–vegetable intercropping. Irrespective of variety, maize fields applied with 15 t of compost and 60:30:30 NPK kg/ha had the highest yields (5,985 kg/ha). This technology has reduced the recommended dose of fertilizer –120:60:40 NPK kg/ ha– by almost 50% without reducing the yield. The application of improved compost (compost covered with black plastic; vermi-compost – prepared using earthworms), cattle urine (decomposed for 15 days after collection and diluted five times with water before application), conservation practices (planting pigeon pea and other leguminous grasses on the terrace risers produced 17.3% higher maize yields) were among other crop management practices demonstrated during 2012. The list of crop management technologies that continued being validated in HMRP is provided in **Annex- 6.**

5.5 Resource poor farmer adopted improved maize varieties and technologies: HMRP worked with 50,740 farmer households in 2012 through participatory on-farm maize R&D activities such as PVS, CBSP, Informal Research and Development (IRD), FAT, CFFT, improved composting trials and demonstrations, CA technologies and intercropping and diamond trials. Dissemination of improved maize varieties, use of quality seeds, composting technologies, maize–vegetable intercropping, insect pest management using resistant varieties and biological control methods, seed storage using botanical pesticides, and safe storage by use of super grain bag technologies were important activities emphasized in 2012. HMRP reached 50,740 farmers where 76% of the beneficiaries had food self-sufficiency of less than six months and 72% were DAG HHs (**Figure 9**). With the adoption of new maize varieties and technologies, resource poor farmers in the hills are now able to produce more, increase income and employment, and minimize the impact of biotic and abiotic stresses such as lodging, drought and diseases (including maize leaf blights such as GLS).



5.6 Seed policies revised: NSB has entered into major policy reforms in the seed sector of the country. The National Seed Act (2045 BS) has been amended, for the first time providing seed quality control systems based on public–private partnerships and introducing TL in source seed. Seed Regulation (2054 BS), has been revised and approved by the GoN. Nepal has endorsed National Seed Vision (2013-2025). The Agriculture Extension Guidelines of CDD have been reviewed and the guidelines have been drafted with the aim of institutionalizing HMRP's experiences and lessons on CBSP, PVS and participatory approaches. HMRP provided financial and technical support towards this and served as a secretariat member of the Seed Vision Drafting Committee. Directives for DSSP are being prepared with the leadership of SQCC and NSB, where HMRP is playing a major role.

6. Project Management and Financial Resources

The procedures for managing the project followed those established in Phase III. The project was guided by a Steering Committee (SC) chaired by the Secretary of the MoAD. This Committee comprised high level representatives of NARC, NMRP, DoA, SDC, USAID, Ministry of Finance (MoF), NGOs, the private sector, National Planning Commission (NPC), NSC Ltd. and CIMMYT. This Committee approved the YPO and other policy issues. A Technical Committee (TC) co-chaired by the Director General (DG) of DoA and the Executive Director (ED) of NARC provided technical guidance in the implementation of the project. The role of this Committee included recommending for approval the annual programs and budgets, as well as other project-related initiatives (i.e. project consultancies, etc.). Resources to support project activities were allocated annually through a competitive Small Grant Project (SGP) scheme.

A SGP Selection Committee was established with representatives from the DoA, SQCC/NSB, NARC, CIMMYT and other partners with relevant experience (GESI, poverty, etc.). The SGP Committee developed guidelines for project proposals that were focused on meeting project objectives and outputs. These procedures allowed for flexibility, low overheads, transparency and effectiveness. The SGP Committee selected and recommended 60 SGP proposals which were discussed and approved by the TC and SC. The Annual Review Planning and Scientific meeting was held during 7-10 Jan 2013. The approved budget for 2012 is summarized in **Table 2.**

Table 2: HMRP budget for 2012

Outcomes	2011 actual budget (US$)			Total budget for 2012/13 (US$)			% change from 2011
	SDC	USAID	Total	SDC	USAID	Total	
Outcome A	512,615	276,024	788,639	515,512	277,584	793,096	0.6
Outcome B	199,350	107,343	306,693	204,298	110,007	314,304	2.5
Sub- Total A and B	**711,966**	**383,366**	**1,095,332**	**719,810**	**387,590**	**1,107,400**	**1.1**
NRSs Expert Assistance	62,997	33,181	96,178	71,500	38,500	110,000	14.4
CIMMYT-Nepal Office Cost	117,754	62,023	179,777	126,750	68,250	194,999	8.5
Total	**892,717**	**478,570**	**1,371,287**	**918,060**	**494,340**	**1,412,400**	**3.0**

The Fund Flow Analysis (FFA) for the period from 16 July 2011 to 15 July 2012 showed that of the total analyzed budget (US$), 66% were utilized at the district level followed by international (18%) and central levels (16%). Likewise, from the social equity point of view, 53% of the funds reached the discriminated groups and 47% non-discriminated. In regard to clusters, the central and western clusters received 30% and 26% funds, respectively **(Annex 7).**

Lessons learnt

Main Difficulties

⇨ Lack of information, awareness and subsistence nature especially of maize farmers in the hills, seed quality management and seed marketing continued being as tough challenge for the project.

A recent survey conducted by HMRP showed that until June 2013, about 83% of the marketable surplus maize seed (1,036 tons) was sold/ distributed and the remaining seed were either consumed or sold as grain. The project will continue its efforts towards raising public awareness about the importance of improved maize seed by mobilizing mass media such as TV, FM radio, newspaper, hording board, cell phone services, etc.; enhancing production of high quality seeds through training and implementation of more organized seed quality control system and expanding contract seed production system. Poor seed germination, low purity and infestation by grain weevil in some of the foundation seed lots produced by ARS, Surkhet was reported. The project took up this issue seriously and important discussions and filed visits were conducted. The team comprising agronomists from HMRP and scientists and field technicians from ARS, Surkhet conducted fact finding and has recommended technical and managerial solutions to avoid such problems in future. Project will continue monitoring the implementation of those recommendations to ensure such weaknesses will not be repeated in the future.

- ⇨ Release of S99TLYQ-B (Yellow QPM), Pool 17 E , Arun 4 and Arun 1 EV could not be made in 2012. According to NSB sources, the meeting of the Varietal Release Sub-committee of NSB could not be organized on regular basis due to approval of only partial budget during the fiscal year. It is expected that these four varieties will be released during 2013 or early 2014.
- ⇨ Drought during and after maize planting resulted in reduced seed harvest in 2012 (9.6% less compared to 2011, **Figure-7**). In some areas, CBSP farmers were compelled to re-plant their fields for 2-3 times causing poor and uneven crops and crop contaminations.
- ⇨ Despite significant efforts to collect information on the 'real market demand for maize seed' in advance of planning seed production, this initiative could not fully implemented due to uncertainty in the maize seed market. However, HMRP will continue working on market assessment and business plan development in 2013 and onwards. Encouraging improvements have been seen in the governance, transparency, efficiency, and inclusivity of the CBSP groups and cooperatives, but these issues remained challenges due to the lack of timely communication, training and commitments of the partners. Realizing these weaknesses, the project will continue placing emphasis on these areas during 2013 and onwards.
- ⇨ Despite the modest progress achieved in creating linkages among the natural resource management (NRM) projects in the HMRP working areas, full realization of this spirit still needs significant efforts and increased interactions among the NRM projects and strategic resource allocations need to be made by each project to address and tackle the multiple dimensions of food security and livelihood issues. Another difficulty that the project faced during 2012 was maintaining proper coordination with local state bodies (VDC and DDC) and working through the AFEC. This was mainly due to the working modality of HMRP i.e., lack of project staff at the local level. However, for 2013 and onwards, HMRP will increase efforts through its Cluster Offices to align project interventions according to the priorities set by AFEC at the VDC level.
- ⇨ HMRP has conducted two training courses on seed certification during 2011 and 2012. In-spite of the project's efforts to reach its phase target of training 200 scientists and development workers, only about 80 of them have been trained. The Seed Act has now been approved by the Cabinet of the GoN and these trainees will take their certification license test very soon. However, the phase target of 200 needs to be revised.

Exit strategy

Since there is still a large gap between the national demand and supply of maize seeds in Nepal, which shows there is significant scope for HMRP to continue its support to the seed sector. Through the last three phases, HMRP focused on varietal development, release, certification and dissemination. The current fourth phase emphasizes decentralization of source seed production and enhanced institutional capacity of NARC stations and CBSP groups/cooperatives for the establishment of internal seed quality control systems for the produced seed. Therefore, the HMRP will work together

with NARC, DoA, NGOs and the private traders to develop a sustainable maize seed sub sector in Nepal. To achieve this, the following exit strategies will be adopted:

- ⇨ The integration of DISSPROs of the MoAD and HMRP- promoting CBSP into the government's regular program.
- ⇨ Federation of cooperatives into the national entity and lobby for policy advocacy on maize seed sub sector development with specific focus on quality control and marketing.
- ⇨ Provision of TL and introduction of brands either in collaboration with private seed traders or within the framework of the future seed grower's federation.
- ⇨ Provide small community-managed seed related infrastructure and a SRF for advance payment to poor and DAGs.
- ⇨ Establishment of a CBSP SRF for the timely purchase of seed from small seed producers.
- ⇨ Linking CBSP groups and cooperatives with the local state bodies, private seed companies and institutional graduation of CBSP groups into cooperatives and then to community seed companies.
- ⇨ Establishing private sector led source seed production and quality control mechanisms in a sustainable way.
- ⇨ Linking CBSP groups/cooperatives with the rural financial institutions for long-term sustainability.

Reliability and scaling up

- ⇨ The CBSP approach for improved seed production needs to be up-scaled as an efficient approach (business model, inclusiveness and participation), expanding geographical coverage and ensuring product quality (branding, labeling, packaging, etc.). It has immense potential to meet the local seed demand, improved production/productivity and contribution to food security.
- ⇨ Institutionalizing the formal contractual arrangements (pre-sowing seed contract) with the cooperatives, private seed traders for assured seed market, better prices and enhancing competence of cooperatives to deal with the market.
- ⇨ The combined effort on both varietal development and dissemination is crucial to improving farmers' access to improved seed and better technologies. To do this the involvement of research and development institutions, extension authorities, NGOs, the private sector and local resource persons from the community will be promoted. Additional efforts on climate responsive trait development in maize varieties is crucial. For example, the strategy of breeding for adaptation of maize to drought in the hill regions of Nepal will focus on the use of several morphological and physiological traits including earliness, anthesis-silking interval, leaf senescence, leaf rolling, tassel size, early vigor, grain filling duration, water use efficiency, leaf water potential, relative water content, root architecture/conductance, leaf chlorophyll content, and others, including grain yield. The breeding strategy will also focus on having a better understanding of the complex processes involved in drought tolerance and the application of marker-assisted selection techniques. The capacity of the NARC on such variety development is to be up-scaled.
- ⇨ Since HMRP has been working only in 20 hill districts of Nepal, there is a clear development space for HMRP to initiate discussion with MoAD and line agencies for the possibility of starting maize R&D initiative in non-HMRP districts to improve household food security.

References

IFPRI (International Food Policy Research Institute)/Welthungerhilfe/Concern. 2007. Global Hunger Index The Challenge of Hunger: ENSURING SUSTAINABLE FOOD SECURITY UNDER LAND, WATER, AND ENERGY STRESSES. Washington, DC

MoAD, 2012. Statistical Information on Nepalese Agriculture 2011/12. Ministry of Agriculture Development, Singhadurbar, Kathmandu, Nepal

NPC (National Planning Commission/ GoN). National Population and Housing Census, 2011 Volume 01, NPHC 2011. Central Bureau of Statistics. Kathmandu, Nepal

NPC (National Planning Commission/ GoN). 13th Three Year Plan (2070/71-2072/73) Base Paper. Singha Darwar, Kathmandu, Nepal

NLSS III, 2011. Nepal Living Standard Survey Statistical Report Vol. 3. Central Bureau of Statistics, National Planning Commission Secretariat, Government of Nepal.

WFP/ MoAC , 2012. Nepal Food Security Bulletin- Issue 32. Food Security Phase Map. World Food Program/ Ministry of Agricultural Development/ Government of Nepal. Singhadurbar, Kathmandu, Nepal

List of Tables

List of Figures

List of Annexes

Annex 1: Abbreviations

ABTRACO	Agro-Business Trade Promotion Multipurpose Cooperative Ltd
AFEC	Agriculture, Forest and Environment Committee
Agro-vet	Agriculture and Veterinary Inputs Shop
ARS	Agriculture Research Station
BS	Breeder Seed
CA	Conservation Agriculture
CBO	Community-based Organization
CBSP	Community-based Seed Production
CDD	Crop Development Directorate
CeCRED	Center for Community Resource and Environmental Development-Nepal
CFFT	Coordinated Farmers' Field Trial
CIMMYT	International Maize and Wheat Improvement Center
CPDD	Communication Publication and Documentation Division
CSTL	Central Seed Testing Laboratory
CVT	Coordinated Variety Trial
DADO	District Agriculture Development Office
DAGs	Disadvantaged Groups
DDC	District Development Committee
DFID	Department for International Development
DG	Director General
DISSPRO	District Seed Self-sufficiency Program
DIWO	Development Initiative Welfare Organization
DoA	Department of Agriculture
DSSP	Decentralized Source Seed Production
EC	Executive Committee
ED	Executive Director
EMC	Everest Media Consults
EUFF	European Union Food Facility
FAO	Food and Agriculture Organization
FAT	Farmer's Assessment Test
FFA	Fund Flow Analysis
FORWARD	Forum for Rural Welfare and Agricultural Reform for Development
FS	Foundation Seed
FYM	Farm Yard Manure
GDP	Gross Domestic Product
GESI	Gender, Equity and Social Inclusion
GLS	Gray Leaf Spot
GoN	Government of Nepal
HCRP	Hill Crop Research Program
HHs	Households
HMRP	Hill Maize Research Project
HYV	High Yielding Variety
IRD	Informal Research and Development
IPNS	Integrated Plant Nutrient System
ISTA	International Seed Testing Association
LI-BIRD	Local Initiatives for Biodiversity, Research and Development
MADE	Multi-Dimensional Agriculture for Development
MoAD	Ministry of Agriculture Development
MoF	Ministry of Finance
NARC	Nepal Agricultural Research Council
NMRP	National Maize Research Program
NPC	National Planning Commission
NGO	Non-government Organization
NRS	Nationally Recruited Staff
NRM	Natural Resource Management
NSB	National Seed Board
OMS	Outcome Monitoring Summary
OPV	Open Pollinated Variety
PPP	Public Private Partnerships

PVS	Participatory Varietal Selection
QPM	Quality Protein Maize
RARS	Regional Agriculture Research Station
R&D	Research and Development
RSTL	Regional Seed Testing Laboratory
SAHAS	Group of Helping Hands
SC	Steering Committee
SDC	Swiss Agency for Development and Cooperation
SGP	Small Grants Project
SMS	Subject Matter Specialist
SQCC	Seed Quality Control Centre
SRF	Seed Revolving Fund
SRR	Seed replacement rate
SUPPORT	Social Upliftment through Participatory Programmes, Research and Training
TC	Technical Committee
TL	Truthful Labeling
TUKI	Farmer organization, literally “light from an oil lamp” (NGO)
USAID	United States Agency for International Development
VDC	Village Development Committee
WFP	World Food Program
YMMC	Youth Manpower Mobilization Centre
YPO	Yearly Plan of Operation

Annex 2: List of partners, projects and budget in 2012

Ref No.	Organization Name	Project Title	Project location (District)	Budget ('000 Rs) 2012		
				1st Installment	2nd Installment	Total
1.01	Agriculture Botany Division, NARC, Khumaltar, Lalitpur	On farm Source Seed (BS & FS.) Production and Varietal Maintenance	Lalitpur	510.0	340	850.0
1.02	Agriculture Research Station, Pakhribas, Dhankuta	Source seed production cum location specific varietal trial on maize	Dhankuta	600.0	400	1,000.0
1.03	Agriculture Research Station, Pakhribas, Dhankuta	Variety improvement of maize through Informal Research and Development (IRD) and Participatory Variety Selection (PVS) in eastern hills of Nepal	Khotang, Okhaldunga	336.0	224	560.0
1.04	Agriculture Research Station, Pakhribas, Dhankuta	Up-scaling of QPM vegetable intercropping and composting technologies in Khotang and Okhaldhunga districts of Nepal	Khotang, Okhaldunga	600.0	400	1,000.0
1.05	Agriculture Research Station, Pakhribas, Dhankuta	Community based seed production in Khotang and Okhaldhung districts of Nepal	Khotang, Okhaldunga	591.0	394	985.0
1.06	Agriculture Research Station, Dasharathpur, Surkhet	Increasing Food and Nutritional Security in hilly region of Surkhet district by Developing Quality Protein Maize (QPM) Village through Community Based Production	Surkhet	540.0	360	900.0
1.07	Agriculture Research Station, Dasharathpur, Surkhet	On-Station Source Seed Production of Different Maize Varieties	Surkhet	540.0	360	900.0
1.09	National Ginger Research Program, Kapurkot, Salyan	Increasing the maize production through selection of high yielding varieties and seed production in mid -western hills of Nepal	Salyan	300.0	200	500.0
1.11	Hill Crops Research Program (HCRP), Kabre, Dolakha	Increased production and productivity of maize for improved livelihood and food security of hill farmers focusing to DAGs and women through varietal and agronomic manipulations in the context to climate change in the research command areas of HCRP, Kabre	Dolakha, Ramechhap, S'palchowk, K'palanchowk,	408.0	272	680.0
1.12	Hill Crops Research Program (HCRP), Kabre, Dolakha	Increased Income and Food Security of Socially Disadvantaged Remote Hill Farmers Through validation, dissemination, Quality Protein Maize based Intercropping and Soil Fertility Management of promising and released maize varieties in the command area of HCRP Kabre	Dolakha, Ramechhap, S'palchowk, K'palanchowk,	450.0	300	750.0
1.13	Hill Crops Research Program (HCRP), Kabre, Dolakha	On-Station and On-Farm source seed production for availability of quality seed	Dolkha	420.0	280	700.0

Ref No.	Organization Name	Project Title	Project location (District)	Budget ('000 Rs) 2012		
				1st Installment	2nd Installment	Total
1.15	Hill Crops Research Program (HCRP), Kabre, Dolakha	Improved livelihood and food security of remote hill farmers through availability of quality maize seed produced through community based seed production program in the research command areas of HCRP, Kabre	Dolakha, Ramechhap, Sindhupalchowk, Kavre	438.0	292	730.0
1.16	National Maize Research Program, Rampur, Chitwan	Development of high yielding OPVs suitable for mid hills of Nepal	Chitwan	600.0	400	1,000.0
1.17	National Maize Research Program, Rampur, Chitwan	Maintanence of released maize varieties through Improvement of husk cover and agronomic traits	Chitwan	192.0	128	320.0
1.19	National Maize Research Program, Rampur, Chitwan	Quality source seed production of released maize varieties	Chitwan	600.0	400	1,000.0
1.20	National Maize Research Program, Rampur, Chitwan	Maintenance, improvement and Quality Breeder Seed Production of released and pre released Open Pollinated Maize Varieties for hills of Nepal	Rampur, Pakhribas, Kabre, Lumle, Dailekh	360.0	240	600.0
1.21	National Maize Research Program, Rampur, Chitwan	Development of high yielding and drought tolerant OPVs suitable for mid hills of Nepal	Chitwan	600.0	400	1,000.0
1.22 a	National Maize Research Program, Rampur, Chitwan	(a) P. Thakur: Up-scaling of proven maize based management technologies and validation of resource conservation technologies for maize in western mid-hills of Nepal	Palpa and Syangja	330.0	220	550.0
1.22 b	National Maize Research Program, Rampur, Chitwan	(b) IP Upashaya: Verification of conservation agri under maize Tori system (Palpa and Syangja)	Palpa and Syangja	330.0	220	550.0
1.24	National Maize Research Program, Rampur, Chitwan	Improvement of pre-released and pipeline maize varieties for mid hills of Nepal	Chitwan	279.0	186	465.0
1.28	Regional Agricultural Research Station, Lumle	Improved Livelihoods through Community Based Seed Production Program (CBSP) on Maize in Western Hills (CBSP)	Gulmi, Syangja, Palpa, Baglung	600.0	400	1,000.0
1.30	Regional Agricultural Research Station, Lumle	Promotion and dissemination of superior maize varieties in western hills of Nepal through FAT and IRD (FAT and IRD set preparation and transportation)	Gulmi, Syangja, Palpa, Baglung	390.0	260	650.0
1.31	Regional Agricultural Research Station, Lumle	Promotion of profitable and environmentally sound technologies on maize based cropping system (ICT and Demonstrations)	Gulmi, Syangja, Palpa, Baglung	420.0	280	700.0
1.33	Regional Agricultural Research Station, Lumle	On-farm and on-station source seed production of released and pipe-line varieties of maize in the western hills of Nepal (BS+FS production)	Gulmi, Syangja, Palpa, Baglung	600.0	400	1,000.0
1.35	Regional Agricultural Research Station, Lumle	Livelihood enhancement of the marginal farmers through the promotion and dissemination of superior maize varieties in the western hills of Nepal (FFT+PVS)	Gulmi, Syangja, Palpa, Baglung	408.0	272	680.0

Ref No.	Organization Name	Project Title	Project location (District)	Budget ('000 Rs) 2012		
				1st Installment	2nd Installment	Total
1.36	Agriculture Research Station, Dasharathpur, Surkhet	Enhancing Maize productivity through improved agronomic management in the western hills of Nepal	Surkhet	300.0	200	500.0
1.38 a	Agriculture Research Station, Pakhribas, Dhankuta	(a) Up scaling of proven maize pest management technologies and validation of resource conservation technologies	Khotang, Okhaldunga	240.0	160	400.0
1.38 b	Agriculture Research Station, Pakhribas, Dhankuta	(b) Verification of conservation agriculture under maize based system	Khotang, Okhaldunga	330.0	220	550.0
1.40	Agriculture Research Station, Dailekh	Promotion and dissemination of high yielding maize varieties in mid and far western hills of Nepal through IRD, FAT and PVS	Dailekh, Kalikot, Achham, Bhajang	240.0	160	400.0
1.41	Agriculture Research Station, Dailekh	Increasing availability of maize source seed through on-station and community based seed production program in mid hills of Nepal	Dailekh	480.0	320	800.0
1.42	Agriculture Research Station, Dailekh	Adding to the living Standard of Maize Growers in the Mid-hills by Adopting Sustainable Maize Based Cropping System	Dailekh	330.0	220	550.0
1.46	Agriculture Botany Division, NARC, Khumaltar, Lalitpur	Development of GLS Tolerant Maize syanthetic populations for GLS epidemic environments of Nepal	Lalitpur	180.0	120	300.0
1.47	Agriculture Research Station, Doti	Improving Livelihoods of far western hill people through increasing production of maize by assuring their access to improved technologies of maize and on-sattion source seed production	Doti/Achham	574.2	383	957.0
1.48	CPDD, Khumaltar	Production and communication of imvroved maize and maize based technology through print and eleectronic media (Radio, FM, TV)		480.0	320	800.0
1.49.2	Agriculture Research Station, Doti	Up scaling of proven maize pest management technologies and validation of resource conservation technologies for maize in far western mid hills of Nepa	Doti	390.0	260	650.0
2.01	Department of Agriculture/Crop Development Directorate, Hariharbhawan, Lalitpur	Enhancing food security at local level Through Maize Technology Verification/ Dissemination and Community Based Seed Production (CBS) in the Middle-hills of Nepal	20 districts	8,400.0	5,600	14,000.0
4.17	Youth Manpower Mobilization Centre (YMMC), Jajarkot	Strengthening Community Based Seed Production and dissemination of improved maize technologies and Varieties in the food deficit and GLS prone VDCs of Jajorkot District	Jajarkot	450.0	300	750.0
4.18	Asaahaya Upakar Kendra/Garden, (AUK) Kathmandu	Maize Seed Production and Dissemination Project	Kavrepalanchowk	360.0	240	600.0

Ref No.	Organization Name	Project Title	Project location (District)	Budget ('000 Rs) 2012		
				1st Installment	2nd Installment	Total
4.19	Youth Manpower Mobilization Centre (YMMC), Jajarkot	Dissemination of Improved Maize technologies and varieties to improve food and nutrition security of poor and disadvantaged farmers in the remote VDCs of Surkhet district	Surkhet	390.0	260	650.0
4.20	Agri-Business and Trade Promotion Multipurpose Cooperative Ltd. (ABTRACO), Anamnagar, Kathamandu	Development of maize seed village in Dhading incombination with CBSP, PVS, IRD, ICT	Dhading	540.0	360	900.0
4.22	Center for Community Resource and Environmental Development (CeCRED)-Nepal	Livelihoods improvements of resource poor and backward communities through promotion of profitable maize farming	Baglung	360.0	240	600.0
4.26	Development Initiative Welfare Organization (DIWO)	Maize Technology Promotion and Dissemination among the Mid-hill Farmers Community of Western Region of Nepal	Syangja, Palpa	450.0	300	750.0
4.27	Forum for Rural Welfare and Agricultural Reform for Development (FORWARD Nepal)	Improving Food Security through Community Based Seed Production Initiatives in Surkhet District	Surkhet	420.0	280	700.0
4.28	Local Initiatives for Biodiversity, Research and Development (LI-BIRD)	Enterprising Community Based Seed Producer Groups in the Western Mid Hill Districts of Nepal	Gulmi, Palpa , Syangja	450.0	300	750.0
4.29	Local Initiatives for Biodiversity, Research and Development (LI-BIRD)	Demonstration and promotion of Maize Based Technologies in Western Mid-hill Districts of Nepal	Gulmi, Palpa , syangja	390.0	260	650.0
4.31	MADE-Nepal	Promoting improved maize varieties through participatory research and community based seed production in Maize-based farming systems in Dailekh district of Nepal	Dailekh	420.0	280	700.0
4.32	MADE-Nepal	Promoting improved maize varieties through participatory research and community based seed production in Maize-based farming systems in Kalikot district of Nepal	Kalikot	420.0	280	700.0
4.39	Group of Helping Hands-(SAHAS) Nepal	Improvement of farm household income by enhancing production, productivity and sustainability of maize and maize based cropping system	Okhaldhunga	420.0	280	700.0
4.40	Technical Training & Research Initiative Khumaltar, Lalitpur (TTRI)	Selection of location specific high yielding maize varieties with farmers' preferred traits and their seed multiplication	Kavrepalanchowk	420.0	280	700.0
4.41	SUPPORT (Social Upliftment through Participatory Programmes, Research and Training) Foundation	Scaling up and dissemination of best Bets technologies in Achham, Bajhang, Baitadi, Dadeldhura and Doti districts	Aacham, Bajhang, Baitadi, Dadeldhura, Doti	510.0	340	850.0

Ref No.	Organization Name	Project Title	Project location (District)	Budget ('000 Rs) 2012		
				1st Installment	2nd Installment	Total
4.42	SUPPORT (Social Upliftment through Participatory Programmes, Research and Training) Foundation	Strengthening Community Based Seed Producer (CBSP) groups and maize seed production and marketing in and Achham, Baitadi and Dadeldhura districts	Achham, Baitadi, Dadeldhura	480.0	320	800.0
4.44	Hill Development Council, Kathmandu (HDC)	Enhancing food security through sustainable seed security program to improve the livelihoods of marginalized rural poor in Dhading District	Dhading	330.0	220	550.0
4.46	Forest and Environment Protection Society (FEPS)	Promotion of improved maize varieties and technologies in Dhading	Dhading	330.0	220	550.0
4.47	Downtrodden and Oppressed Society, Gorkha (DOS)	Production of Quality Maize seed and enhancing the production of maize through the applications of maize production technologies	Ramechhap	330.0	220	550.0
4.52	EcoHimal Nepal, Kathmandu (EcoHimal)	Improving the Food Security and Livelihoods in Northern Khotang District	Khotang	420.0	280	700.0
4.53	Lumbini Social Development Center, Arghakanchi (LSDC)	Maize varietal dissemination and validation and CBSP and Markeitng in Gulmi District	Gulmi	330.0	220	550.0
4.66	Khotang Development Forum (KDF)	Improved maize promotion in Khotang	Khotang	373.8	249	623.0
5.01	Hariyali Community Seed Company Ltd and Sindhu Tuki Seed Cooperative, Thumpakhar Sindhupalchowk (Hariyali)	Community Based Seed Production and Marketing through technology dissemination and business services to poor and DAG farmers in Sindhupalchowk district	Sindhupalchowk	450.0	300	750.0
5.02	Anamolbiu Company Pvt. Ltd., Chitwan	Linking Maize Seed Production of Released and Pipeline Varieties for Securing Livelihood of Resource Poor Farmers in Baglung and Ramechap districts of Nepal	Baglung	330.0	220	550.0
5.03	Sindhu Seed producer cooperative Association, Sindhupalchok	Validation and dissemination of new and profitable maize varieties and technologies for improved food security and income of poor and DAGs in Dolakha, and Sindhupalchowk districts	Dolakha, S'Palchowk	450.0	300	750.0
5.07	Global Agri-tech Nepal Pvt. Ltd, Banke (GATE)	CBSP and PVS of Maize for enhanced food security and farm income in selected VDCs of Jajarkot	Jajarkot	374.4	250	624.0
5.09	Everest Media Consults (EMC)	Media Promotion of Hill Maize Research Project (MMRP) Phase IV		417.6	278	696.0
Grand Total (NRs '000)				34,002	22,668	56,670

Annex 3a: List of CBSP Groups and cooperatives provided with equipment support (2011 and 2012)

Name of CBSP groups and cooperatives	Balance Plat Form Type	Balance Top Pan (100 kg)	Corn Sheller Electrical	Corn Sheller Manual	Cotton Tarpaulin	Desktop Computer	Mini Tiller	Moisture Meter	Multimedia Projector with Screen	Plastic Sealer	Printed Plastic Bag (1 Kg)	Printed Plastic Bag (3 kg)	Seed Cleaning cum Grading Machine	Seed Treater cum Dressing Machine	Super grain Bag (1 t)	Super grain Bag (60 kg)
2011																
Community Seed Bank (Salla gaun CBSP Group), D/dhura							1									
Hariyali Community Seed Company, S/palchowk							1									
Laxmi Shraswati Multipurpose Cooperative Ltd, Dotee							1									
Maize Community Seed Production Group, Khotang							1									
Maize Community Seed Production Group, Okhaldhunga							1									
Maize Seed Producer's Women , Syangja							1									
Namuna Mahila Cooperatives, Kavre							1									
Pourakhi Women Maize Seed Producers Group, Syangja							1									
Randevi Cooperative Ltd., Dhading							1									
Shivashakti Maize Seed Production Group, Palpa							1									
Sikhar Biu Parbardhan Cooperative/ Basudev Krishak Samuha, Baitadi							1									
Singhadevi Seed Producer Farmers Group, Dolakha							1									
2012																
Aatma Nirvar Cooperatives, Kavre	1			4				1		1	3000	2000				40
Arjunchaupari Women Farmers Group, Syangja	1			4				1		1	5000	2000				40
Basantamala Maize Seed Production Group, Dailekh		1		4						1	3000	2000				40
Bhairab Samudayik Kutani Pisani Cooperative Ltd, Baglung		1		4						1	3000					40
Bhumisthan Bandrebesi Bij Bridhi Krisak Sauha, Ramechhap		1		4						1	3000	1000				40
Community Seed Bank	1			4				1		1	5000				2	40
Community Seed Bank (Salla gaun CBSP Group), D/dhura			1		1											
Randevi Cooperative Ltd., Dhading		1		4						1	5000					40
Devistan Farmers Group, Achham		1								1	3000					40
Devisthan Cooperative, Dolakha		1		8						1	3000	2000				40
Ganesh Himal Krishi Byabasaya Tatha Biubijan Byapar Company Pvt. Ltd., Dhading		1	1	4	1			1		1	5000	4000			2	40
Halesi Makai Bij Bridhi Samuha, Khotang		1		4						1	3000					40

Name of CBSP groups and cooperatives	Balance Plat Form Type	Balance Top Pan (100 kg)	Corn Sheller Electrical	Corn Sheller Manual	Cotton Tarpaulin	Desktop Computer	Mini Tiller	Moisture Meter	Multimedia Projector with Screen	Plastic Sealer	Printed Plastic Bag (1 Kg)	Printed Plastic Bag (3 kg)	Seed Cleaning cum Grading Machine	Seed Treater cum Dressing Machine	Super grain Bag (1 t)	Super grain Bag (60 kg)
Hariyali Community Seed Company, S/palchowk	1		1	4	1	1		1	1	1	5000	3000	1	1	3	40
Himchuli Krishak Samuha, Okhaldhunga		1		4						1	3000	1000				40
Indradevi CBSP, Kavre		1		4						1	3000					40
Jaidsi Danda Farmers Group, Syangja		1		4						1	3000					40
Jeevan Jyoti Maize Seed Production Group, Dailekh		1		4						1	5000	3000				40
Kalika Maize Seed Production Group, Kalikot										1	3000	2000				40
Khadhyana Bali Seed Producer Farmer Group, Achham		1		4						1						40
Khadhyanabali Krishak Group, Jajarkot										1	3000					40
Kunathari Multi Purpose Agriculture Cooperative Organization Ltd., Surkhet		1		4						1	3000					40
Laligurans Women Maize Seed Production Farmer Group, Baglung		1		4						1	5000	3000				40
Laligurans Women Maize Seed Production Farmer Group, Bajhang		1		4						1	3000					40
Laxmi Shraswati Multipurpose Cooperative Ltd.	1							1		1	5000					40
Laxmi Swaroti Multipurpose Cooperative Ltd, Dotee				4												
Malika Multipurpose Farmers' Group, Gulmi		1		4						1	5000	3000				40
Manakamana Maize Seed Producer Group, dotee		1		4						1						40
Naldhunga Seed Production, dolakha		1		4						1	3000					40
Namuna Mahila Cooperatives, Kavre				4						1	3000	2000				40
Panitanki Multipurpose Farmers Group, Gulmi		1		4						1	3000	2000				40
Randevi Cooperative Ltd., Dhading												3000				
Samridhi Farmer Cooperative Ltd., Surkhet	1		1	4	1			1		1	5000	3000	1	1	2	40
Sangam Saving and Credit Cooperative Ltd., Jajarkot		1								1	5000	2000				40
Saraswoti Agriculture Cooperative Ltd., Dailekh										1	3000					
Seti Bhumi Maize Seed Production Farmer Group, Khotang		1		4				1		1	3000					40
Shiva Shakti Krishi Tatha Pasu Cooperative Ltd., D/dhura		1		4						1	3000					40
Shivashakti Maize Seed Production Group, Palpa	1		1	4	1			1		1	5000	3000			2	40
Shree Kedar Gajurel Maize Production Farmer Group, Dotee		1		4						1	3000					40
Shrikot CBSP Group, Baitadi		1		4						1	3000					40
Sikhar Biu Parbardhan Cooperative/Basudev Krishak Samuha, Baitadi	1			4				1		1	5000					40
Singhadevi Seed Production, Dolakha		1		4						1	3000					40
Sramjibi Krishi Sahakari Sanstha Ltd., , Dhading		1		4						1	3000					40
Srijansil Women Group, Okhaldhunga		1		4						1	3000					40
Tilottama Agriculture Cooperative Organization Ltd., Palpa	1			4				1		1	5000	2000			1	40
Grand Total	**9**	**28**	**5**	**148**	**5**	**1**	**12**	**11**	**1**	**41**	**145000**	**45000**	**2**	**2**	**12**	**1600**

Annex 3b: List of equipments and materials provided to NARC and DoA (2010-20112)

Types of equipments and materials	RARS, Lumle	NGRP, Salyan	RSTL, Bhairahawa	DOA/CDD, Hariharbhawan	RSTL, Sunsari	RSTL, Kanchanpur	RSTL, Hetauda	SQCC, Harihar bhawan	HCRP, Kabre	ARS, Pakhribas	ARS, Dailekh	NMRP, Rampur	ARS, Surkhet	NARC, HQ (C&HD)	RARS, Doti	RSTL, Nepalgunj	ABTRACO, Dhading	DIWO, Syangja	Total
2010	**5**	**1**																	**6**
Bag Sewing Machine	5	1																	6
2011	**3**	**7**	**1**	**21**	**2**			**6**	**7**	**5**	**3**	**8**	**7**	**1**	**2**				**73**
Accelerated Aeging Chamber								1											1
Air contidioner			1																1
Bag Sewing Machine															1				1
Balance Digital/Electronic 3 decimal (2kg)				5															5
Balance Top Pan (100 kg)		1							2										3
Camera		1							1	1	1								4
Corn Sheller Manual		2																	2
Desktop Computer	2									1			1						4
Disc Harrow												1	1						2
Fertilizer cum Seed Drill													1						1
Generator				1															1
Laptop Computer								1	1										2
Magnetic Stirrer				1															1
Maize Planter													2						2
Mini Tiller	1	1							1	1	1				1				6
Moisture Meter		1		1								1	1						4
Motorcycle		1		4					1		1		1	1					9
Multimedia Projector								1	1			1							3
Oven				2				1											3
pH Meter				1															1

Types of equipments and materials	RARS, Lumle	NGRP, Salyan	RSTL, Bhairahawa	DOA/CDD, Hariharbhawan	RSTL, Sunsari	RSTL, Kanchanpur	RSTL, Hetauda	SQCC, Hariharbhawan	HCRP, Kabre	ARS, Pakhribas	ARS, Dailekh	NMRP, Rampur	ARS, Surkhet	NARC, HQ (C&HD)	RARS, Doti	RSTL, Nepalgunj	ABTRACO, Dhading	DIWO, Syangja	Total
Printer										1									1
Scanner				1				1											2
Scooter				1															1
Seed Counter				1	2			1											4
Seed Divider				2															2
Seed Grinder				1															1
UPS										1		5							6
2012	**2**	**6**	**1**	**4**	**1**	**2**	**1**	**1**	**2**	**2**		**7**	**1**		**7**	**1**	**3**	**1**	**42**
Air contidioner							1												1
Balance Digital (0.001g - 350g)						1													1
Camera												1							1
Desktop Computer																	1		1
Generator			1									1				1			3
Laptop Computer		1		1						2		2							6
Magnetic Stirrer					1														1
Maize Planter															5				5
Metal Bins									1										1
Moisture Meter															2				2
Multimedia Projector				1															1
Multimedia Projector with Screen																		1	1
Polinization Bags												1							1
Printer	2	1		1					1				1				1		7
Refrigerator						1													1
Tyres		4																	4
UPS																	1		1
Vehicle				1								1							2
Video Documentation												1							1
Water Distillation Unit								1											1
Grand Total	**10**	**14**	**2**	**25**	**3**	**2**	**1**	**7**	**9**	**7**	**3**	**15**	**8**	**1**	**9**	**1**	**3**	**1**	**121**

Annex 3c: Infrastructure development support to CBSP Groups (2011-2012)

SN	Name CBSP Group	District	Infrastructure Support 2011 (Rs)	Supplimentary Infrastructure Support for 2011 (Rs)	Infrastructure Support 2012 (Rs)	Total Infrastructure Support (Rs)
1	Randevi Agri Cooperatives Ltd	Dhading	400,000	100,000	-	500,000
2	Ganesh Himal Krishi Byabasaya Tatha Biubijan Byapar Company Private Ltd.	Dhading	-	-	550,000	550,000
3	Sramjibi Krishi Sahakari Sanstha ltd.	Dhading	-	-	400,000	400,000
4	Naldhunga Agriculture and Seed Production Cooperatives Ltd.	Dolkha	-	-	500,000	500,000
5	Devisthan Agriculture Cooperative Ltd.	Dolkha	-	-	500,000	500,000
6	Aatma Nirvar Cooperatives	Kavre	400,000	50,000	-	450,000
7	Namuna Mahila Cooperatives	Kavre	-	-	300,000	300,000
8	Indradevi CBSP, Bhumidanda	Kavre	-	-	400,000	400,000
9	Hariyali Community Seed Company	S. palchowk	500,000	200,000	-	700,000
10	Binjel Maize Seed Production Farmer Group	S. palchowk	-	-	400,000	400,000
11	Haleshi Makai Bij Briddi Krisak Samuha	Khotang	400,000	75,000	-	475,000
12	Seti Bhume Maize Seed Production Farmers Group	Khotang	-	-	500,000	500,000
13	Srijansil Women Group	Okhaldhunga	400,000	75,000	-	475,000
14	Himchuli Krishak Samuha	Okhaldhunga	-	-	500,000	500,000
15	Singhadevi Seed Producer Farmers Group	Ramechap	400,000	75,000	-	475,000
16	Bhumethan Bandre Bensi Seed Production Group	Ramechap	-	-	500,000	500,000
17	Devistan Farmers Group	Acham	-	-	500,000	500,000
18	Khadyanna Bali Biu Utpadan Krishak Samuha	Acham	-	-	500,000	500,000
19	Sikhar Biu Parbardhan Cooperative/ Basudev Krishak Samuha	Baitadi	400,000	100,000	-	500,000
20	Shrikot CBSP Group	Baitadi	-	-	400,000	400,000
21	Laligurans Women Maize Seed Production Farmer Group	Bhajang	-	-	500,000	500,000
22	Community Seed Bank (Salla gaun CBSP Group)	Dadeldhura	400,000	100,000	-	500,000
23	Shiva shakti Krishi Tatha Pasu Cooperative Ltd.	Dadeldhura	-	-	400,000	400,000
24	Laxmi Shraswati Multipurpose Cooperative Ltd	Doti	200,015	150,000	-	350,015
25	Shree Kedar Gajurel Maize Production Farmer Group	Doti	-	-	500,000	500,000
26	Manakamana Maize Seed Production Farmer Group	Doti	-	-	500,000	500,000
27	Jeevanjyoti Maize Seed Production Group	Dailekh	400,000	50,000	-	450,000
28	Saraswoti Agriculture Cooperative Ltd.	Dailekh	-	-	400,000	400,000
29	Basantamala Maize Seed Production Group	Dailekh	-	-	500,000	500,000
30	Sangam Saving and Credit Cooperative Ltd.	Jajarkot	-	-	500,000	500,000
31	Khadhyanabali Krishak Samuha	Jajarkot	-	-	400,000	400,000
32	Kalika Maize Seed Production Group	Kalikot	-	-	500,000	500,000
33	Samridhi Farmer Cooperative Limited	Surkhet	400,000	200,000	-	600,000
34	Kunathari Multi Purpose Agriculture Cooperative Organization Ltd.	Surkhet	-	-	500,000	500,000
35	Bhairab Samudayik Kutani Pisani Cooperative Ltd.	Baglung	400,000	-	-	400,000
36	Laligurans Women Farmers Group	Baglung	-	-	400,000	400,000
37	Malika Multipurpose Agri Cooperatives Lts	Gulmi	400,000	75,000	-	475,000
38	Panitanki Multipurpose Farmers Group	Gulmi	-	-	500,000	500,000
39	Shivashakti Seed Producer Cooperatives Ltd	Palpa	400,000	75,000	-	475,000
40	Tilottama Agriculture Cooperative Organization Limited	Palpa	-	-	500,000	500,000
41	Arjunchaupari Women Farmers Group	Syangja	-	-	500,000	500,000
42	Jaidsi Danda Farmers Group	Syangja	-	-	500,000	500,000
	Total		**5,500,015**	**1,325,000**	**13,050,000**	**19,875,015**

Annex 3d: Seed Revolving Fund (SRF) support to CBSP Groups

SN	Name CBSP Group	District	Seed Revolving Fund 2011	Seed Revolving Fund 2012	Total SRF (Rs)
1	Randevi Agri Cooperatives Ltd	Dhading	60,000	-	60,000
2	Ganesh Himal Krishi Byabasaya	Dhading	-	60,000	60,000
3	Sramjibi Krishi Sahakari Sanstha	Dhading	-	60,000	60,000
4	Naldhunga Agriculture and Seed	Dolkha	-	60,000	60,000
5	Devisthan Agriculture	Dolkha	-	60,000	60,000
6	Namuna Mahila Cooperatives	Kavrepalanchowk	60,000	-	60,000
7	Indradevi CBSP, Bhumidanda	Kavrepalanchowk	-	60,000	60,000
8	Hariyali Community Seed	Sindhupalchowk	60,000	-	60,000
9	Binjel Maize Seed Production	Sindhupalchowk	-	60,000	60,000
10	Haleshi Makai Bij Briddi Krisak	Khotang	60,000	-	60,000
11	Seti Bhume Maize Seed	Khotang	-	60,000	60,000
12	Srijansil Women Group	Okhaldhunga	60,000	-	60,000
13	Himchuli Krishak Samuha	Okhaldhunga	-	60,000	60,000
14	Singhadevi Seed Producer	Ramechap	60,000	-	60,000
15	Bhumethan Bandre Bensi Seed	Ramechap	-	60,000	60,000
16	Devistan Farmers Group	Acham	-	60,000	60,000
17	Khadyanna Bali Biu Utpadan	Acham	-	60,000	60,000
18	Sikhar Biu Parbardhan	Baitadi	60,000	-	60,000
19	Shrikot CBSP Group	Baitadi	-	60,000	60,000
20	Laligurans Women Maize Seed	Bhajang	-	60,000	60,000
21	Community Seed Bank (Salla gaun	Dadeldhura	60,000	-	60,000
22	Shiva shakti Krishi Tatha Pasu	Dadeldhura	-	60,000	60,000
23	Laxmi Shraswati Multipurpose	Doti	60,000	-	60,000
24	Shree Kedar Gajurel Maize	Doti	-	60,000	60,000
25	Manakamana Maize Seed	Doti	-	60,000	60,000
26	Jeevanjyoti Maize Seed	Dailekh	60,000	-	60,000
27	Saraswoti Agriculture	Dailekh	-	60,000	60,000
28	Basantamala Maize Seed	Dailekh	-	60,000	60,000
29	Sangam Saving and Credit	Jajarkot	-	60,000	60,000
30	Khadhyanabali Krishak Samuha	Jajarkot	-	60,000	60,000
31	Kalika Maize Seed Production	Kalikot	-	60,000	60,000
32	Samridhi Farmer Cooperative	Surkhet	60,000	-	60,000
33	Kunathari Multi Purpose	Surkhet	-	60,000	60,000
34	Bhairab Samudayik Kutani Pisani	Baglung	60,000	-	60,000
35	Laligurans Women Farmers Group	Baglung	-	60,000	60,000
36	Malika Multipurpose	Gulmi	60,000	-	60,000
37	Panitanki Multipurpose Farmers	Gulmi	-	60,000	60,000
38	Shivashakti Seed Producer	Palpa	60,000	-	60,000
39	Tilottama Agriculture Cooperative	Palpa	-	60,000	60,000
40	Arjunchaupari Women Farmers	Syangja	-	60,000	60,000
41	Jaidsi Danda Farmers Group	Syangja	-	60,000	60,000
			840,000	**1,620,000**	**2,460,000**

Annex 3e: Marketing promotion support to CBSP groups (FM, Printing etc.)

SN	District	Name CBSP Group	Partner	Market promotion support (Rs)
1	Dhading	Ganesh Himal Krishi Byabasaya Tatha Biubijan Byapar Compa	ABTRACO, Kathmandu	25,000
2	Dhading	Randevi Agriculture Cooperatives Ltd.	ABTRACO, Kathmandu	15,000
3	Dhading	Sramjibi Krishi Sahakari Sanstha ltd.	DADO, Dhading	15,000
4	Dolkha	Devisthan Agriculture Cooperative Ltd.	DADO, Dolkha	15,000
5	Dolkha	Naldhunga Agriculture and Seed Production Cooperatives Ltd	HCRP, Kabre	15,000
6	Kavrepalanchowk	Aatma Nirvar Cooperatives Ltd	AUK, Kathmandu	15,000
7	Kavrepalanchowk	Indradevi CBSP, Bhumidanda	DADO, Kavrepalanchowk	15,000
8	Kavrepalanchowk	Namuna Nari Agri Cooperatives Ltd	AUK, Kathmandu	15,000
9	Sindhupalchowk	Binjel Maize Seed Production Farmer Group	DADO, Sindhupalchowk	15,000
10	Sindhupalchowk	Hariyali Community Seed Company	Hariyali Community Seed Company- S/palchowk	25,000
11	Khotang	Haleshi Makai Bij Briddi Krisak Samuha	DADO, Khotang	15,000
12	Khotang	Seti Bhume Maize Seed Production Farmers Group	EcoHimal, Kathmandu	15,000
13	Okhaldhunga	Himchuli Krishak Samuha	SAHAS, Nepal, Kathmandu	15,000
14	Okhaldhunga	Srijansil Women Group	SAHAS, Nepal, Kathmandu	15,000
15	Ramechap	Bhumethan Bandre Bensi Seed Production Group	DADO, Ramechap	15,000
16	Ramechap	Singhadevi Seed Producer Farmers Group	HCRP, Kabre	15,000
17	Acham	Devistan Farmers Group	DADO, Acham	15,000
18	Acham	Khadyanna Bali Biu Utpadan Krishak Samuha	RARS, Doti	15,000
19	Baitadi	Shrikot Seed Producer Group	Support Foundation, Kanchanpur	15,000
20	Baitadi	Sikhar Biu Parbardhan Cooperative/ Basudev Krishak Samuha	DADO, Baitadi	25,000
21	Bhajang	Laligurans Women Maize Seed Production Farmer Group	DADO, Bajhang	15,000
22	Dadeldhura	Community Seed Bank (Salla gaun CBSP Group)	DADO, Dadeldhura	25,000
23	Dadeldhura	Shiva shakti Krishi Tatha Pasu Cooperative Ltd.	Support Foundation, Kanchanpur	15,000
24	Doti	Laxmi Shraswati Multipurpose Cooperative Ltd	DADO, Doti	25,000
25	Doti	Manakamana Maize Seed Production Farmer Group	RARS, Doti	15,000
26	Doti	Shree Kedar Gajurel Maize Production Farmer Group	DADO, Doti	15,000
27	Dailekh	Basantamala Maize Seed Production Group	ARS, Dailekh	15,000
28	Dailekh	Jeevanjyoti Maize Seed Production Group	ARS, Dailekh	15,000
29	Dailekh	Saraswoti Agriculture Cooperative Ltd.	DADO, Dailekh	15,000
30	Jajarkot	Khadhyanabali Krishak Samuha	YMMC, Jajarkot	15,000
31	Jajarkot	Sangam Saving and Credit Cooperative Ltd.	Global Agri Tech Pvt. Ltd, Nepalgunj	15,000
32	Kalikot	Kalika Maize Seed Production Group	DADO, Kalikot	15,000
33	Surkhet	Kunathari Multi Purpose Agriculture Cooperative Organization	FORWARD Nepal, Chitwan	15,000
34	Surkhet	Samridhi Farmer Cooperative Limited	DADO, Surkhet	25,000
35	Baglung	Bhairab Samudayik Kutani Pisani Cooperative Ltd.	DADO, Baglung	15,000
36	Baglung	Laligurans Women Farmers Group	SEAN Seed	15,000
37	Gulmi	Malika Multipurpose Cooperatives Ltd	LIBIRD, Kaski	15,000
38	Gulmi	Panitanki Multipurpose Farmers Group	RARS, Lumle	15,000
39	Palpa	Shivashakti Seed Producer Cooperatives Ltd'	DIWO, Syangja	45,000
40	Palpa	Tilottama Agriculture Cooperative Organization Limited	DADO, Palpa	15,000
41	Syangja	Jaidsi Danda Farmers Group	DIWO, Syangja	15,000
42	Syangja	Manakamana Women Farmers Group	DADO, Syangja	15,000

Annex 4: Achievements against the log frame HMRP IV

Goal	**Objectively verifiable indicators**	**Achievements**	**Sources of verification**	**Framework conditions**
Farm households (HHs) in the hills of Nepal, especially of poor and disadvantaged groups (DAGs) have improved food security(3) and incomes	- 50% HHs increased food security through multiple agriculture-based livelihood options - Both the proportion of malnourished children and women reduced by 15% - 10,000 poor and small holders (60% DAG) increased their income due to adoption of new and profitable maize varieties and production technologies	- 1% increase in the category of >12 months; 13% increase in category of 6-11 months, 14% decrease in case of <6 month food self-sufficiency category - 10,000 HHs produced/consumed Quality Protein Maize (QPM) and 2,000 HHs produced/consumed vegetables - 5,019 4 seed producers (65% DAG and 58% women) produced 1,036 tons of improved seed and 2,000 HHs (70% DAG and 65% women) produced fresh vegetables in maize-vegetable intercropping	- HMRP internal reports - Reports of HMRP partner institutions (i.e., non-government organizations; NGOs, community based organizations; CBOs, etc) and field observations - Survey reports of project and on-farm observations - World Food Program WFP/, Ministry of Agriculture Development (MoAD) Food Security Monitoring Reports Newspaper reports/articles	- Socio-political circumstances in Nepal allow smooth implementation of activities in the rural hills - Improved coordination and linkages among agricultural projects
Outcomes	**Objectively verifiable indicators**		**Sources of verification**	**Framework conditions**
A. Hill maize farmers, especially from poor and DAGs, adopt new and profitable maize varieties and improved technologies(4) to enhance productivity and marketing opportunities	- National Maize Research Program (NMRP) and community based seed production (CBSP) meet 30 % of national open pollinated variety (OPV) maize seed demand of 5,086 tons(5) - 35,000 poor and disadvantaged HHs use new maize varieties and improved technologies by 2014 - 10,000 HHs adopt maize based intercropping practices by 2014 - At least 50% women and 50% DAGs represented in CBSPs and 60% women and 70% DAGs participated in participatory research and extension activities	- On track. 1,036 t of marketable surplus of maize seed produced by 207 CBSP groups. 50,740 HHs benefited from new maize varieties and improved technologies - 2,000 HHs (70% DAGs and 65% women) produced fresh vegetables in maize–vegetable intercropping - Achieved. 5,019 farmers in 207 CBSP groups/cooperatives (with 58% women and 65% DAG representation) and 57% women and 72% DAGs participating in other research and development activities	- National Seed Board (NSB) Report - MoAC statistics - NMRP annual report - Reports of HMRP partner institutions (i.e., NGOs, CBOs, etc) and field observation - Survey reports of project and on-farm observation. - Newspaper reports/articles	- Number of HHs willing to buy new seeds increased - Effective and functional partners exist in hill regions/districts - Personnel engaged in HMRP activities are trained and committed to work with multi-cultural groups of farmers in the remote hills
B. NSB, Nepal Agricultural Research Council (NARC) and Department of Agriculture (DoA) enforce quality control through both public and private institutions	- Revised seed policies and regulations on truthful labeling are available in 2011 - 200 NARC breeders, DoA agriculturists and private sector experts (at least 50 women) receive Seed Certification licenses by 2014 - 2,500 seed producers receive seed certification services from inspectors(6) annually - Four new maize varieties are released and ready for production through CBSPs - 1500 ha of CBSP maize seed field inspected by authorized license holders - CBSP/cooperatives receive better price with truthful labeling	- Achieved. Seed policies and regulations have been revised in the country allowing TL in improved and source seed - 71 NARC breeders, DoA agriculturists and private sector experts (12 women) received Seed Certification training and they will be competing for licenses once the seed regulations are approved by the Government of Nepal (GoN) - On track. Three OPV maize varieties and one yellow QPM are in the process of being released - On track. At least 700 ha seed field inspected by Regional Seed Testing Laboratories (RSTLs) and Central Seed Testing Laboratories (CSTL) and 2,800 seed producers received seed quality control services - Truthful labeling has been initiated by 42 CBSP groups and cooperatives	- Nepal Gazette and notices - Revised seed policies and regulations - HMRP internal reports - NSB/RSTL annual reports/notices - HMRP reports - Newspaper reports/articles	- Socio-political circumstances in Nepal allow smooth implementation of activities in the rural hills - NSB's Varietal Release Sub- Committee meeting held on time - Number of HHs willing to buy new seeds increased

[3] Food and Agriculture Organization (FAO) or DFID-UK definition of food security

[4] Technologies refer to improved resource conserving technologies mainly legume and vegetable intercropping, plant population management, plant protection, composting techniques, and use of energy and time saving equipment such as a hand-corn-Sheller, Jab planter, etc.

[5] Value indicates theoretical demand for approximately 203,437 ha (33% of total maize – 616,476 ha in the hills) land in the mid-hills to achieve ideal Seed Replacement Rate (SRR) of 33%

[6] Including non- traditional inspectors such as NARC breeders, DoA agriculturists and private sector experts including NGOs

Outputs	Objectively verifiable indicators	Achievement	Sources of verification
A.1 CBSP Groups know and use available varieties and technologies	- 1,000 tons of new and profitable maize variety seed produced and distributed by CBSP groups annually - At least 11,000 (33%) HHs produce QPM maize varieties by 2014 - At least five types of maize based profitable intercropping technologies are available for farmers - At least three crop management technologies developed and validated annually	- Achieved. 1,036 t of marketable surplus of maize seed produced by 207 CBSP groups (978 t and 58 t of improved and foundation seed respectively). Achieved. New crop management technologies are validated and disseminated - Achieved. At least three crop management technologies developed and validated	- NSB's SRR reports - NARC/ DoA annual Reports - MoAC statistical book - HMRP reports - On- farm monitoring and observation reports
A.2 Poor and disadvantaged HHs have increased access to quality maize seed and proven technologies	- New maize technologies sufficiently outperformed traditional technologies in on-farm verification trials and are liked by farmers - Enough seed of farmers' preferred varieties is available on time at the right place - Established seed groups/cooperatives and marketing network are sufficiently recognized by the government - Qualified CBSP/cooperative partners get sufficient amount of source seed from relevant sources	- Achieved. On- farm participatory trial results showed that the new maize varieties and improved technologies resulted in yield increases between 20-70% - Achieved. Seed produced in 2012 surpassed the demand for improved seed and source seed - CBSP approach has been institutionalized within NARC and DoA system and HMRP's CBSP groups and cooperatives are duely registered in Division Cooperative Office and DADOs - Source seed produced in 2012 (109 t) was sufficient to fulfill source seed demand in the hills	- NARC/NMRP Annual report - NSB report - HMRP reports - Newspaper reports/articles - Baseline data from respective District Agriculture Development Offices (DADOs) - NMRP/ CBSP seed sale record
A.3 CBSP groups/cooperatives supply quality seeds at a competitive market price	- 1,000 tons of quality maize seed produced by CBSP groups annually - At least 40 CBSP/cooperatives have contracts with local seed traders	- Achieved. 1030 t of marketable surplus of maize seed produced by 207 CBSP groups - Achieved. more than 41 CBSP groups maintained strong trade relationships and these groups have modest infrastructures such as seed store house, threshing floor, seed bins, weighing balance etc.	- NARC/NMRP Annual report - NSB report - HMRP reports - Newspaper reports/ articles - Baseline data from respective DADOs - NMRP/ CBSP seed sale record
A.4 Poor and disadvantaged maize producing HHs have access to multiple agricultural interventions for enhanced productivity	- At least 3,000 HHs increase cropping intensity in Swiss cluster districts - At least 1,000 farmers practice maize and vegetables seed production - At least 30,000 HHs of the Home Garden beneficiaries are harvesting QPM	- On track. In 2012 about 2,000 HHs received multiple livelihood options in the Swiss Agency for Development and Cooperation's (SDC's) cluster district - On track. - On Track.	- NARC/NMRP Annual report - NSB report - HMRP reports - Newspaper reports/ articles - Baseline data from respective DADOs - NMRP/CBSP seed sale record
B.1 NSB, NARC, DoA allow decentralized source seed production system	- NARC/NSB issued directives and procedures for decentralized truthfully labeled source seed production - NARC have a sufficient quantity of breeder seed (BS) and 20 tons of foundation seed (FS) through hill ARS stations and NMRP annually for CBSP - NARC RARS maintain at least 10 farmer preferred varieties - CBSP and District Seed Self-sufficiency Program (DISSPRO) operate under the same production guidelines by 2014	- On Track. Practically, decentralization of source seed production has been met in 2012. Nine NARC stations produced breeder and foundation seed in the hills and 27 CBSP groups also initiated foundation seed production. Directives and procedures for decentralized, truthfully labelled, source seed production is being prepared by SQCC and by the end of 2013, the directive will be issued by GoN - BS/FS produced by NARC stations (45 tons) surpassed the demand - On track. At least 15 released and 9 pre-released maize varieties and maintaince and improvement works are underway - On Track. CBSP/DISSPRO common guidelines are being prepared	- Nepal gazette, NSB and NARC reports of released and registered list - MoAC Agriculture Extension Guidelines - NARC seed production, sale and revenue collection records - Availability of CBSP/DISSPRO common operating guidelines
B.2 Public and private institutions obtain seed inspection mandate and license	- Trained 200 NARC breeders, SMS of DADOs and private sector experts (at least 50 women and 10 from the private sector) authorized for field inspection, sampling and seed testing - Five NARC research stations and 10 CBSP including private seed company initiated production of truthful labeled source seed by June 2012	- On Track. 71 NARC breeders, DoA agriculturists and private sector experts (12 women) received Seed Certification training and they will be competing for licenses once seed regulation is approved by the GoN - Achieved. Truthful labeling has been initiated by at least 42	- NARC/NMRP Annual report - NSB report - HMRP reports - Newspaper reports/ articles - Baseline data from respective DADOs

		CBSP groups	- NMRP/CBSP seed sale record
B.3 CBSP/cooperatives manage supply of quality seed	- Training modules and trainers' manual on truthful labeling is available and followed by CBSP groups and cooperatives by 2012 - 5,000 kg of FS of farmers' preferred varieties produced by NARC and DoA in their respective regional farms annually - 50 CBSP groups have developed their internal seed quality control system for truthful labeling by 2014 - 40 CBSP groups have seed related minimum infrastructure by 2014	- On track. Training Manual will be finalized in 2013 - 4,500 kg of BS and FS of farmers' preferred varieties produced by NARC - On Track. 42 CBSP groups have developed internal seed quality control systems - On Track. 42 CBSP groups have seed related minimum infrastructure	- NARC/NMRP Annual report - NSB report - HMRP reports - Newspaper reports/articles - Baseline data from respective DADOs - NMRP/ CBSP seed sale record
B.4 NSB and NARC consider HMRP's experience in variety development, certification and release system	- Four varieties, including one QPM developed and released by NARC and other partners by 2014 - DoA and NARC consider gender marker while granting project for varietal trials - DoA and NARC include gender as an important criteria while doing Farmer's Assessment Test (FAT)	- Three Maize varieties and one yellow QPM are in the process of being released in 2012. - On Track. Increased involvement of DAG farmers in the NARC and DoA regular program are reported	- NARC/NMRP Annual report - NSB report - HMRP reports - Newspaper reports/ articles - Baseline data from respective DADOs - NMRP/ CBSP seed sale record

Annex 5: Varieties released (2002–2009) with specific traits improvement

MAIZE VARIETIES OF NEPAL

S.N.	Varieties	Reason for release	Yield (t/ha)	Maturity (days)	Grain (colour)	Released (year)	Recopmmendation domain	Parentage	Source
1	Manakamana-3	Tolerant to Gray Leaf Spot disease, husk cover, higher yield	5.0	160	White	2002	Mid hill	Population-22	CIMMYT
2	Deuti	Higher and stable yield, Tolerant to Gray Leaf Spot (GLS) disease and stem borrer, Tolerant to drought, lodging resistant	5.7	160	White	2006	Mid hill	ZM 621	CIMMYT
3	Shitala	Tolerant to stem borrer, and GLS, stay green character, Higher and stable yield,	6.0	160	White	2006	Mid hill	Population-44	CIMMYT
4	Manakamana-4	Tolerant to drought, Higher and stable yield, lodging resistant, moderately GLS	6.5	145	Yellow	2008	Mid hill	Population-45	CIMMYT
5	Poshilo Makai-1	Quality Protein Maize (Lysine % - 0.32 Tryptophane %-0.20, Tolerant to drought, partially tolerent to GLS, Higher and stable yield	5.5	145-155	White	2008	Mid hill	S99TLWQ-HG-AB	CIMMYT
6	Manakamana-5	Higher and stable yield, Tolerant to drought, partially tolerent to GLS	5.8	140	White	2009	Mid hill	Hill Pool White	CIMMYT
7	Manakamana-6	Higher and stable yield,, Tolerant to drought, partially tolerent to GLS	5.7	145	Yellow	2009	Mid hill	Hill Pool Yellow	CIMMYT

Annex 6: List of HMRP new technologies available for dissemination

A. Variety

SN	Mid-hills (1,000–1,700 m)	High hills (>1,700 m)	Low hills (<1,000 m)
1	Deuti – Released	Ganesh-1 – Released	Arun-2 – Released
2	Shitala – Released	Ganesh-2 – Released	Arun-1 – Released
3	Manakamana-3 – Released		Arun-4 – Pipeline
4	Manakamana-1 – Released		Arun-1EV – Pipeline
5	Manakamana-4 – Released		Pool-15 – Pipeline
6	Poshilo Makai-1 – Released		Pool-17 – Pipeline
7	Hill Pool Yellow – Pipeline		Z97EWBF2
8	Hill Pool White – Pipeline		
9	S99TLYQ-B QPM – Pipeline		
10	S01SIWQ-3 – Pipeline		
11	Resunga Composite – Pipeline		
12	Open ended WHP – Pipeline		
13	Across9942x44 – Pipeline		

B. Crop management (profitable intercrops)[7]

1. 1:2 rows of Maize + soybean (Ransom)
2. 1:2 rows of Maize + Groundnut (Janak)
3. Maize + ginger with double plants per hill of maize in the middle hills (900–1,300m)
4. Maize + tomato or beans with double plants per hill of maize in the mid/lower hills
5. Maize + radish (40 days) with double plants per hill of maize in the hills (900–2,100m)
6. Seed priming – soak seed overnight (about 16 h) and shade dry before sowing – it will be drought resistant with higher production as a result of proper plant stand per unit area. Primed crop matures 7–10 days earlier than un-primed. When sowing, soil moisture should neither be too excessive or too dry
7. Cover farm yard manure (FYM)/compost with black plastic – improve quality
8. Promote the balanced use of chemical fertilizers i.e., 60:30:30 NPK kg/ha with 15 t/ha compost. N should be applied in two split doses (30 kg each at basal and knee high stage)
9. District level training sessions organized by concerned institution should cover soil fertility management aspects as a major topic covering new learning and understanding (FYM management, Integrated Plant Nutrient System; IPNS, etc.)
10. Promote the use of Bojho (*Acorus calamous*) for stored grain pests in seed storage (5–10g/kg maize seed)
11. Maize + cabbage with double plants per hill of maize in the high/middle hills (900–2,100m) – mainly for the central hills
12. Manakamana-3, Deuti (for mid hills), Ganesh-1 (higher hills) found to be resistant to Gray Leaf Spot (*Cercospora zeae maydis*), which is a devastating foliar disease of maize (first reported in Nepal in 2006). We need to make special efforts to disseminate these varieties in more problematic areas. The major problem is that these varieties are not reaching the growers. These varieties are also tolerant to lodging and turcicum blight – also called northern leaf blight (*Exserohilum turcicum*). Local varieties are highly susceptible to this disease
13. Promote conservation technologies like planting pigeon pea (*Cajanus cajan*) on the terrace risers and incorporate plant debris and residues including weeds into soils

C. Some tips for maize seed production under CBSP and marketing networks

- Manage source seed of farmers' preferred variety (FS and C1) in advance
- Prepare balance sheets for each district (DADO, Farmer Groups, CBOs, Co-operatives, RARS, NGOs) and send it to the concerned agency as early as possible
- Identify production pocket and groups for seed production of each variety. Go for farmers' preferred new varieties either for CBSP or DISSPRO. Select site considering seed technology aspect (see CBSP guidelines). Do not change site every year for CBSP unless the group is self-sustainable (3–4 years). We need to go for new sites with the same objective and approach only when previous groups are capable of doing the job on their own. However, technical backstopping should be continued even for long-term participating groups

[7] Details on these technologies can be available at NARC (RARSs, Pakhribas, Kabre, Lumle, Dailekh) and HMRP/CIMMYT, if needed.

- Consider the sustainability of CBSP. Seed security and marketing is a must (seed produced under CBSP must not be used for consumption). If seed security is in question with poor and DAGs, then we should not encourage them for this activity. We need to go to somewhat better-off farmers, who can bear some sorts of risk for CBSP. There are other HMRP activities like IRD, PVS, FATs, Diamond trials, etc. to benefit the poor (food availability less than 11 months from their own produce) and DAGs (women, dalits, janajatis, etc. – groups of economically poor that suffer from caste, gender and ethnicity based discrimination). Involve women in CBSP activities (training, price fixing and use of money received from seed sell, future plans etc.)
- Promote the source seed production (FS) with technically capable private sector/farmer groups under close supervision
- Promote linkage between growers and seed traders, as well as interactions through meetings, training sessions, workshops and visits. Organize seed traders and growers linkage meeting - DADO should play a proactive and facilitating role
- Assess the seed demand for the district and outside well in advance. DADO should play a facilitating role
- Establish functional link with DISSPRO program of DADOs and try to get resources from DADOs' seed money as a revolving fund for CBSP. Other government and non-government organizations working towards food security should be contacted and brought into the loop
- Field inspection by concerned personnel and truthful labeling is a must to promote marketing
- TUKI (Literally meaning crude oil lamp to shed light nearby areas) Thumpakhar and Palpa Shiva Shakti women group Pokharathok Chhatiwan models are a few examples of success. These models should be replicated wherever possible. They are supported by HMRP partners. TUKI – collects seed from the group members (mixed group) after checking quality of seed, half of the payment is made immediately after receiving seed from growers and the other half is made once that seed (truthfully labeled) is sold. They follow all procedures required for truthful labeling. Chhatiwan group in Palpa has another model. They also follow all seed technologies with technical backstopping from HMRP partners and sell truthfully labeled seed to Agro-vets, DADOs and others. They negotiate the price themselves. This is a mixed women group. Priority is given to dalit women to sell the seed first. There is good harmony amongst farmers
- Negotiate prices before harvest, preferably by farmers' groups. Prices should not be influenced by outsiders
- Inform Agro-vets about the availability of seed of new maize varieties in a timely manner and create demand
- Initiate group saving and credit scheme from seed sale
- Disseminate information about new seed availability through Regional Directorate and DADOs under DoA, FM radios, television programs, posting information in public places such as local markets, tea and grocery shops, etc.
- Organize field level training as prescribed in CBSP guidelines, and invite Agro-vets and other seed traders in key meetings or training
- Distribute IRDs of the same variety, which are being multiplied under CBSP, to create demand

Annex 7: Fund Flow Analysis (Actual)

Project: Hill Maize Research Project –IV

Period of analysis July 2011 to June 2012 Actual

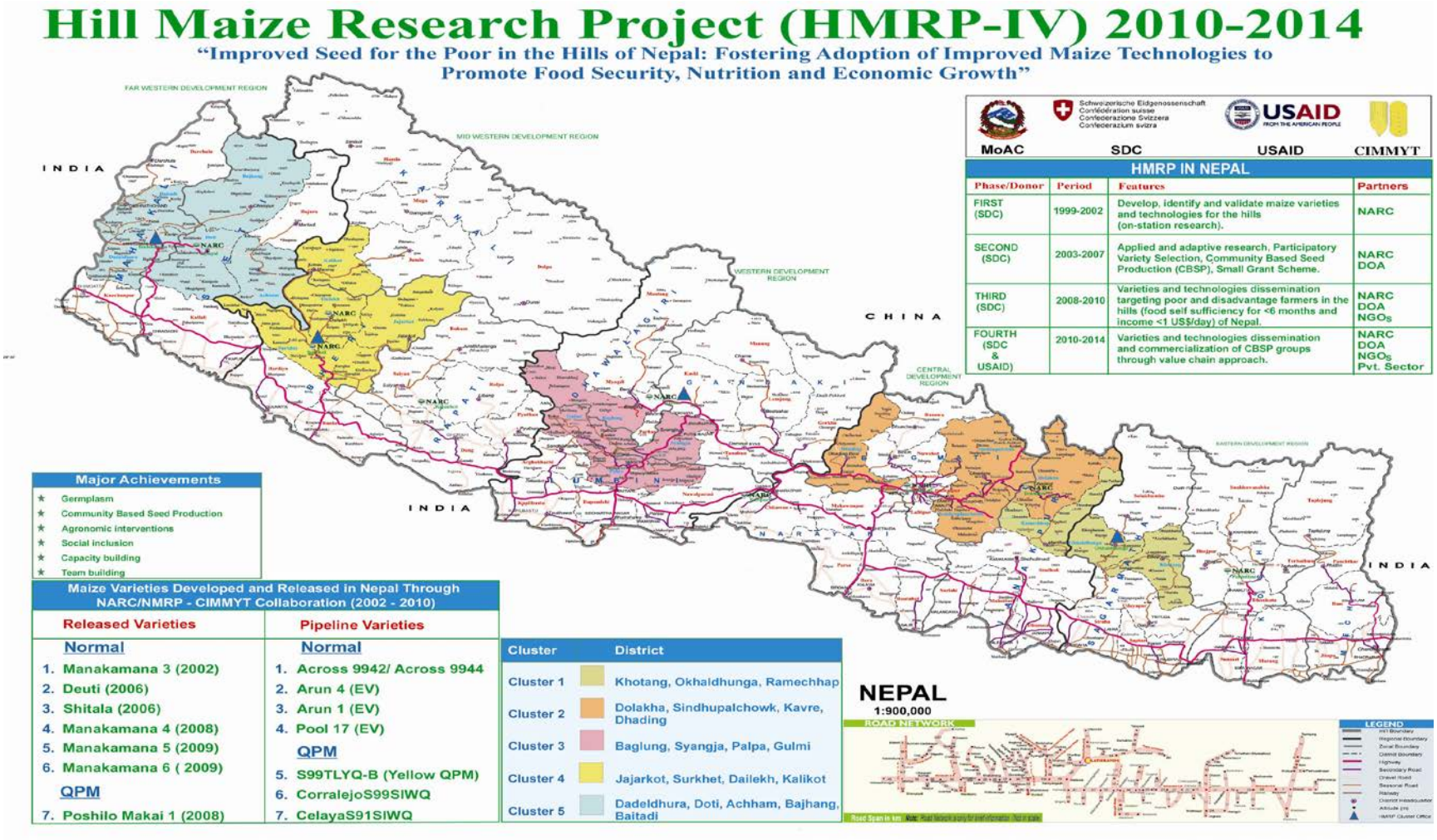
Budget 994,335

Currency USD

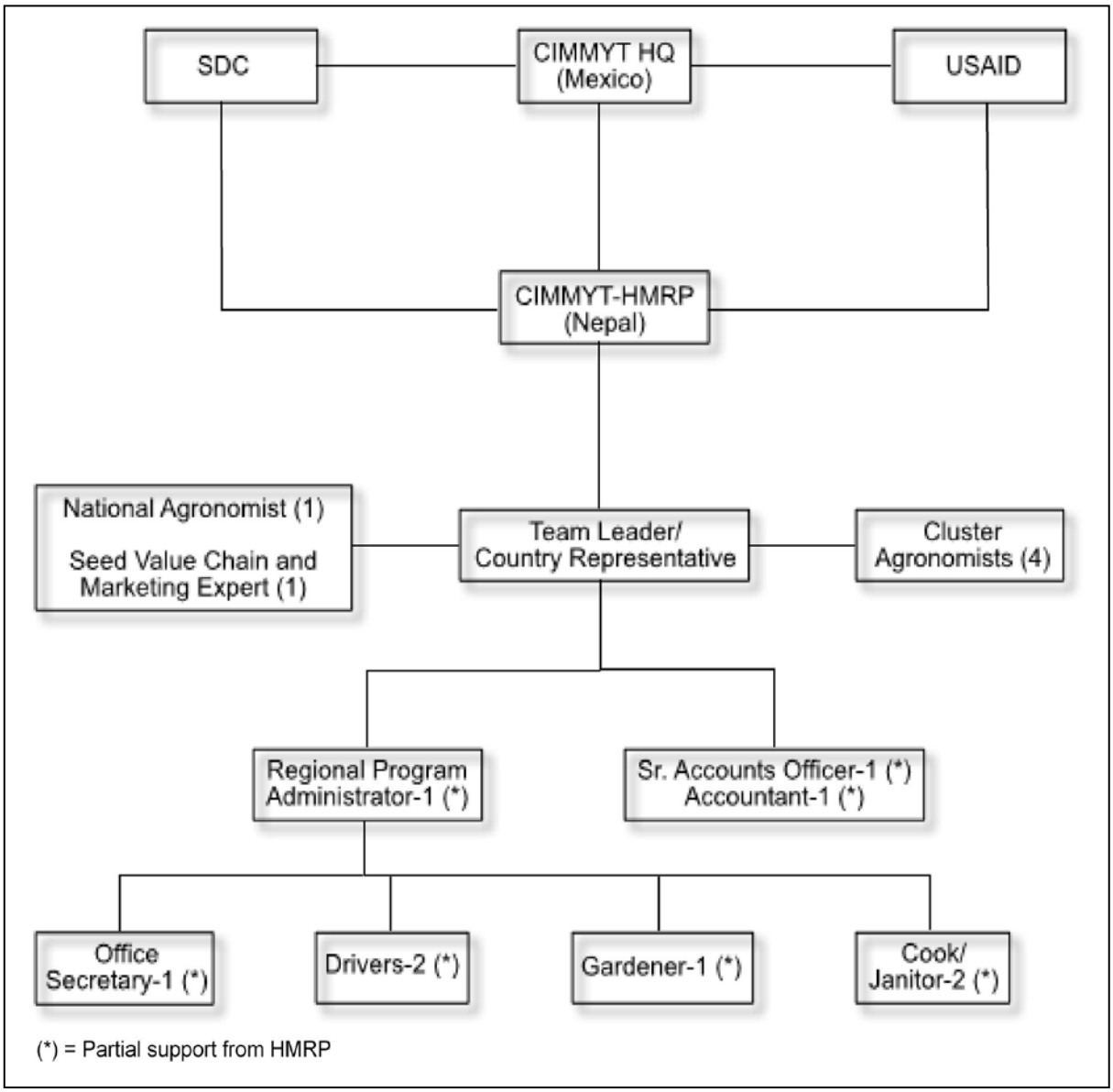
		Fund Receivers					Fund Allocation			Fund Beneficiaries					
	Budget/Expense Headings	**Budget/ Expense Amount**	**Geographical Outreach**			**Discrimination Perspective (Caste, ethnicity / gender)**		**Cluster perspective (Swiss cluster districts and others)**			**Disadvantaged group perspective (Economically poor and socially discriminated)**			**Gender Perspective Female and Male Beneficiaries**		
		994,335	District/rural	Central	International	Discriminated	Non - Discriminated	Central cluster districts	Western cluster districts	Others and National	DAG	Non-DAG	General and common costs	Male	Female	Non-attributable
1	2	3	4	5	6	7	8	15	16	17	9	10	11	12	13	14
A.1	CBSP Groups know and use available improved maize varieties and technologies	120,431	85%	15%	0%	65%	35%	20%	20%	60%	65%	25%	10%	25%	65%	10%
A.2	Poor and disadvantaged households have increased access to quality maize seed and proven technologies	85,600	85%	15%	0%	65%	35%	20%	20%	60%	65%	25%	10%	25%	65%	10%
A.3	CBSP groups/Cooperatives supply quality seeds at competitive market price	132,101	90%	10%	0%	45%	55%	20%	20%	60%	65%	25%	10%	25%	65%	10%
A.4	Poor and disadvantaged maize producing HHs have access to multiple agricultural interventions for enhanced productivity	10,450	95%	5%	0%	70%	30%	20%	20%	60%	70%	20%	10%	25%	65%	10%
	Sub-Total	**348,582**														

B.1	National Seed Board (NSB), NARC, DoA allow decentralized source seed production system	173,894	60%	40%	0%	40%	60%	20%	20%	60%	55%	25%	20%	25%	65%	10%
B.2	Public and private institutions obtain seed inspection mandate and license	10,739	85%	15%	0%	40%	60%	20%	20%	60%	65%	15%	20%	25%	65%	10%
B.3	CBSP/cooperatives manage supply of quality seed	152,769	85%	15%	0%	40%	60%	20%	20%	60%	65%	15%	20%	25%	65%	10%
B.4	NSB and NARC consider HMRP's experience in variety development, certification and release system	20,503	40%	60%	0%	40%	60%	20%	20%	60%	65%	15%	20%	25%	65%	10%
	Sub-Total	**357,905**														
1	NRS Agronomist and SVC Expert-2	27,743	15%	85%		50%	50%	20%	20%	60%	50%	50%	0%	100%	0%	0%
2	Cluster Agronomists-4	20,518	90%	10%		10%	90%	25%	50%	25%	25%	75%	0%	85%	15%	0%
	Sub-Total	**48,261**														
C.1	Expert Assistence-IRS	108,080	0%	0%	100%	0%	100%	0%	0%	100%	0%	90%	10%	100%	0%	0%
C.2	Indirect Cost	72,282	0%	0%	100%	0%	100%	0%	0%	100%	0%	90%	10%	0%	0%	100%
	Sub-Total	**180,362**														
D.1	Travel	17,482	40%	40%	20%	60%	40%	0%	0%	100%	45%	45%	10%	85%	15%	0%
D.2	Services (i.e. consultancies)	2,601	20%	80%	0%	0%	100%	0%	0%	100%	20%	60%	20%	100%	0%	0%
D.3	Office support (cost sharing)	13,992	20%	80%	0%	70%	30%	0%	0%	100%	0%	0%	100%	40%	40%	20%
D.4	Vehicle repair and maintenance	15,038	10%	90%	0%	70%	30%	0%	0%	100%	0%	0%	100%	100%	0%	0%
D.5	Equipment	5,791	0%	100%	0%	0%	100%	0%	0%	100%	0%	0%	100%	0%	0%	100%
D.6	Vehicles and motorbikes	4,321	0%	100%	0%	0%	100%	0%	0%	100%	0%	0%	100%	0%	0%	100%
	Sub-Total	**59,225**														
	Total amount	**994,335**	**589,907**	**220,570**	**183,858**	**390,576**	**603,759**	**151,976**	**157,105**	**685,255**	**469,738**	**358,711**	**165,886**	**367,981**	**470,513**	**155,841**

Annex 8: Districts covered by HMRP



Annex 9: HMRP organizational chart



Annex 10: Short term training courses and training participants 2012

S.N.	Type of short term training course (less than 1 month)	Areas	Male (No)	Female (No)	Total (No)	Youth (age 20 to 45 years)	Total BCTN (No)	Total Dalit (No)	Total Janajati (No)	FSS-A (No)	FSS-B (No)	FSS-C (No)	DAG	Non-DAG
1	Central level training	Policy, technology,	387	17	404	202	275	20	109	404	0	0	73	331
2	Farmer's level training	Skill oriented	3,035	3,753	6,788	2,547	3,347	1,845	1,596	757	2,810	3,221	4141	2647
TOTAL			**3,422**	**3,770**	**7,192**	**2,749**	**3,622**	**1,865**	**1,705**	**1,161**	**2,810**	**3,221**	**4,213**	**2,979**

Annex 11: CBSP Program: Case studies in Nepal

Case 1: Access to new technologies: Key to empower women farmers

Padma Devi Bhitriya, a *Dalit* women farmer, lives in a small village called Chattiban in Palpa district, western Nepal. She has two daughters and husband in her family. She is typically a subsistence women farmer owing 5 *ropanies* land (0.4 ha). Until 2004 most of her field was planted with local maize and finger millet. Maize production seldom met her family requirement for food and livestock feed. Poor productivity and lodging were major problems associated with maize production. Her farm produces were just sufficient to meet food requirement for less than 6 months. As other rural women in Nepal, most of her time used to be spent in the maize field, caring children and husband, fetching water and fire woods, etc. Therefore, she had not had the opportunity to interact in social groups and networks. She never heard about the maize production for the market for income.

In 2002, District Agriculture Development Office (DADO) approached her to conduct Participatory Varietal Selection in maize and intercropping trial being in a farmers' group. Women and men farmers and scientists were involved in the implementation of these trials. Women were given the priority in selecting the variety by themselves, which was encouraging. This was an initiation of participation and decision making process by the project, Ms. Bhitriya recalled. Through PVS, farmers selected Manakamana 1 as the most preferred improved maize variety.

In 2004, Mr. Birendra Bahadur Hamal, Chief of DADO, Palpa asked participating farmers to form a group and go for seed production. This was a sort of eye opener to the team and they decided to go with a community based seed producer group named Shiva Shakti Maize Seed Producer Group. When the community formed a seed producer group, Ms. Padma Devi Bhitriya from the Dalit Community was democratically elected as vice president of the group, explained Ms. Bhitriya.

HMRP-CIMMYT in collaboration with DADO, Palpa provided exposure visits, technical trainings on quality maize seed production and intercropping in maize. Then the group started producing maize seed commercially with intercropping practices. Similarly, Ms Bhitriya, grow maize seed and took production of intercropped finger millet, ginger, soybean in 0.4 hectare of her land. She reported that the seed rate of maize, now practiced is 30 Kg/ha which is due to good quality maize seed, which was 60 Kg/ha before 2002. Finger millet and soybean are now planted in rows. Change in seed rate and row planting of maize are outcomes of the training, reported by Ms. Bhitriya. She explained that during these days, the food self sufficiency from own production has shifted from < 6 months to 12 months. Further, the income from maize seed and vegetables are under women control these days because the group has made decisions to provide the cash to the women in the family. She further added that, when resources are under women control they are more likely to benefit children than when controlled by men. Besides her increased food availability, she got cash income of US $788 in 2012 (Figure 1) by selling maize seed (US$350.0), grain (US$313.0) and Ginger (US$ 125.0). She is exemplary women for the Nepalese rural society who made significant progresses economically and socially after gaining access to new knowledge and technologies. Ms. Bhitriya says "CBSP group has brought villagers together irrespective of caste and gender".

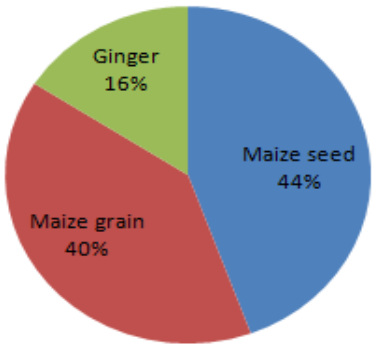


Figure 1: Annual farm income of Ms. Bhitra for 2012 (US$ 788.0)

Case Study 2: Deuti maize brought change in farmers' livelihood

Farmers' are finally on upbeat after the intervention of seed production program in Karkigaun and Jobra VDCs of Jajarkot district. Farmers' facing hand to mouth problems five years ago are now in a position not only for sufficient year round consumption, but also for selling surplus grain … they are very happy with this change.

Mr. Man Bahadur Khatri, a farmer of Sirugar, Karkigaun VDC-3 said, despite large quantity of maize stored at his house of the last year's production and new crop is being harvested … he remembered food insecurity situation of past days and said that it is mainly due to technical backstopping support of CIMMYT/HMRP for the formation of Community Based Seed Production Group (CBSP) to cultivate Deuti maize which significantly contributed to the livelihoods of the village residents.

As a result of obtaining high production from Deuti maize variety Mr. Khatri has been recognized as a nodal farmer in his village. Currently, most of the farmers of Sirugar and Jobra villages who are cultivating maize since last five years had got-rid from hand to mouth problem, Mr. Khatri said. Having doubled production performance of Deuti variety compared to local, the neighboring farmers are also encouraged cultivating Deuti maize in their areas.

Over 247 farm households of Karkigaun VDC- 3 are cultivating Deuti variety of maize. The Deuti variety of maize is liked by many farmers in the area due to its good post harvest characteristics like tasty bread and other cooked items. Doubled grain yield and less storage pest infestation in Deuti variety attracted many farmers, Mahatara added. Mr. Mahatara produced more than 15 quintals of Deuti maize. The farmers groups of Sirsyani and Jobra have produced 9 t of Deuti maize seed in 2012.

Mr. Hari Bahadur Mahatara, a member of the CBSP group said that they were able to sale 70 quintals of maize seed @ Rs 35-40 per Kg in 2012. The improved maize seed production program of maize variety significantly increased farmers' income, he further added.

Due to an excellent production performance of Deuti maize in Karkigaun VDC, a multiplier effect was seen in the entire Jajarkot district and the outcomes have been reflected in addressing food insecurity situation of the district. Having excellent maize seed production programs being implemented in Karkigaun and Bhoor VDCs of Jajarkot district, fund outsourcing (NRs. 2,086, 256) has been achieved from the Integrated Water Resource Management Program (IWRMP/World Bank) of DoA for the construction of seed storage house. The seed storage house is near completion and after finalizing, the Karkigaun VDC will be the source center for supplying quality improved seed to the remote, women headed food insecure VDCs of Jajarkot district.