USAID
FROM THE AMERICAN PEOPLE

EVALUATION

The Hill Maize Research Project, Phase IV
Report of the External Evaluation

June 2014

This publication was produced at the request of the United States Agency for International Development. It was prepared independently by the Institute for Integrated Development Studies (IIDS). The study team consisted of Dr. Hari Krishna Upadhyaya (team leader/agricultural economist), Dr. Krishna Ram Khadka (evaluation specialist), Mrs. Ramrajya Joshi (GESI specialist), Mr. Durga Prasad Acharya (seed and marketing specialist) and Mr. Manbar S. Khadka (economist).

The Hill Maize Research Project, Phase IV
Report of the External Evaluation

"*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*" was designed to respond to food insecurity and income constraints of farm households in the hills of Nepal, especially focusing on poor and disadvantaged groups (DAGs).

The goal of the project is "Farm households in the hills of Nepal, especially of poor and disadvantaged groups, have improved food security and income". The project aims to achieve this goal by scaling up and consolidating the achievements made in the past phases. The development hypothesis of the project is that "if the disadvantaged communities in the mid hills in Nepal are mobilized to produce quality maize seed and the capacity of the private and the public sectors are enhanced in order to place the appropriate seed system in the country, they are more likely to increase maize production and productivity with a sustained and participatory way of seed management, resulting in increased income and improved food security of rural farm households".

June, 2014

Ref Number: 367-13-000042

CONTENTS

Contents 3

Acronyms 1

Executive Summary 2

Evaluation Purpose & Evaluation Question 6

Project Background 8

Evaluation methods & limitations 10

Findings, conclusions & Recommendations 13

Annex I: Evaluation Statement of Work 37

Annex II: Evaluation Methods and CONTEXTS 48

Annex III: Data Collection Instruments 56

Annex IV: Sources of Information 72

Annex VI: Disclosure of any Conflicts of Interest 79

ACRONYMS

ADB	=	Asian Development Bank
ADS	=	Agriculture Development Strategy
CBSP	=	Community-based Seed Production
CDD	=	Crop Development Directorate
CEAPRED	=	Center for Environmental and Agriculture Policy Research, Extension and Development
CIMMYT	=	International Maize and Wheat Improvement Center
DADOs	=	District Agriculture Development Offices
DAGs	=	Disadvantaged Groups
DISSPRO	=	District Seed Self-Sufficiency Program
DoA	=	Department of Agriculture
GDP	=	Gross Domestic Product
GON	=	The Government of Nepal
HMRP	=	Hill Maize Research Project
IRD	=	Informal Research and Development
KIs	=	Key Informants
KISAN	=	Knowledge-Based Integrated Sustainable Agriculture Development Nepal
MoAD	=	Ministry of Agricultural Development
NAP	=	National Agriculture Policy
NARC	=	Nepal Agriculture Research Council
NGOs	=	Non-governmental Organizations
NSB	=	National Seed Board
PSM	=	Propensity Score Matching
PVS	=	Participatory Variety Selection
QPM	=	Quality-protein Maize
R/ARS	=	Regional/Agricultural Research Stations
RCT	=	Randomized Controlled Trial
SC	=	Steering Committee
SDC	=	Swiss Agency for Development and Cooperation
SEAN	=	Seed Entrepreneurs' Association of Nepal
SGP	=	Small Grant Programme
SQCC	=	Seed Quality Control Center
SRR	=	Seed Replacement Rate
TC	=	Technical Committee
USAID	=	United States Agency for International Development
VDCs	=	Village Development Committees
VSP	=	Vegetable Seep Project

EXECUTIVE SUMMARY

EVALUATION PURPOSE AND EVALUATION QUESTIONS

This evaluation was designed to examine the effectiveness of HMRP interventions, and document the lessons learned and good practices that can be shared with the Government of Nepal (GON), USAID and SDC to improve their development learning and future programming. The evaluation focused on seven questions concerning the (i) contribution of the project towards maize seed production and commercial distribution, (ii) degree of adoption of HMRP varieties by farmers, (iii) Government engagement in the project (iv) contribution to policy reforms, (v) capacity of project partners to sustain program activity, (vi) cost effectiveness, and (vii) future directions. The evaluation used primary data collected from the interview of key informants as well as from a survey of 400 households and 20 focus groups in 10 Village Development Committees (VDCs) of five districts, and secondary data obtained from various documents and reports. Both qualitative and quantitative methods were used to analyze the data. The main target audiences of the evaluation report are GON, SDC, USAID and CIMMYT.

PROJECT BACKGROUND

The Hill Maize Research Project, Phase IV (HMRP or the project), jointly funded by the Swiss Agency for Development and Cooperation (SDC) and the United States Agency for International Development (USAID), was designed to respond to food insecurity and income constraints of farm households in the hills of Nepal, especially focusing on poor and disadvantaged groups (DAGs). The project ends in December 2014. The research and development partners of the project, which covers 20 districts of mid-hills, include the Crop Development Directorate (CDD) of the Department of Agriculture (DOA), the Nepal Agriculture Research Council (NARC), several non-government organizations (NGOs), the private sector (cooperatives, agro-vets, etc), and the International Maize and Wheat Improvement Center (CIMMYT).The project also works closely with the Seed Quality Control Center (SQCC) and the National Seed Board (NSB) under the Ministry of Agricultural Development (MOAD).

EVALUATION DESIGN, METHODS AND LIMITATIONS

The evaluation used primary data collected from the interview of key informants as well as from a survey of 400 households and 20 focus groups in 10 Village Development Committees (VDCs) of five districts, and secondary data obtained from various documents and reports. Both qualitative and quantitative methods were used to analyze the data. The quantitative analysis was done using the propensity score matching (PSM) approach. The main limitations of this evaluation study have stemmed from the lack of proper base line data for the project, short period of time available to complete the evaluation, small sample size, and limitations of the PSM approach.

FINDINGS AND CONCLUSIONS

The project has made significant contribution towards improving the supply of maize seeds in Nepal. The quantity of maize seed produced through CBSP has increased over the years and presently meets 30% of the total demand in the hills. The quality and timeliness of seed supply has improved; and maize area, production and sale have increased, especially in the project areas. The seed retention rate has more than doubled in the past six years.

The HMRP has positively contributed to maize technology development and dissemination. The new varieties developed with HMRP assistance have shown high and stable yield performance, are tolerant to major insects-pests, and are widely adopted by farmers, irrespective of gender and social groups and land holding size. Non-project households have also adopted the new varieties, but the level of adoption varies across districts. The project has also introduced maize-based technologies and practices that improve soil fertility and contribute to biological control of insects.

There is a fairly high level of government engagement in planning, implementation and monitoring of HMRP activities. At the planning and policy level, the SC is the highest body chaired by the Secretary of MOAD and represented by other government agencies. Several NARC stations and DADOs participate as project implementing agencies. The project has also adopted additional measures, such as annual planning workshop and "Traveling Seminar", to involve government officials in project planning and monitoring.

The project contributed to seed policy reforms that have paved the way for decentralized source seed production and seed quality control. HMRP's experiences with CBSP and participatory variety selection approaches have been instrumental in revising the operational guidelines of CDD, and in integrating the CBSP and DISSPRO into the regular programs of the MOAD/DOA. The project has also contributed to capacity development of its partners in both public and private sectors in seed quality control.

Efforts have been made to develop the capacity of project partners – government agencies, NGOs and the private sector – through technical training, and financial and material support. Yet, from the point of view of sustaining the program activities in the absence of external funding, there are areas where the capacity of CBSP cooperatives/ groups is still weak and needs further strengthening, especially in market-based seed production system, post-harvest processing, marketing, and internal quality control. The capacity related issues stem from both the internal factors – such as the limited technical, financial and institutional capacity – and the external factors, such as the shortage of farm labor due to large-scale outmigration of rural youths.

Being a knowledge-oriented project, it is difficult to measure the cost effectiveness of HMRP. The project management cost, which includes the cost of an internationally recruited CIMMYT scientist, constitutes nearly a third of the project fund. While this has increased the cost, this has benefited the project from the international scientific knowledge, experience and germplasm from CIMMYT.

The project had a significant impact on technology adoption, maize productivity and income of the participating households. There was no significant difference between the treatment and control group in the level of food self-sufficiency from own production, mainly because the households in the control group produced other high-value commercial commodities, such as vegetable crops and vegetable seeds, that raised their income at par with the treatment households.

The project has empowered the women and DAGs. Many women, including from the DAGs, have assumed a leadership role. Participation in the CBSP has increased their incomes and their food security has gone up by at least 3 more months. They take part in many technical and decision-making activities. Their confidence level has increased and they now sit and eat together with dalits in public places.

So far there are not any significant unintended consequences of the project. Although the project households reported increased insect-pest infestation over the years, there are no indications of increased use of pesticides in maize crop. But caution should be exercised in the future to avoid the possible danger of increasing the use of pesticides to control insect-pests and of herbicides to control weeds.

All the respondents agreed that the project had empowered women and DAGs, and increased maize productivity and production, resulting in increased income and food security of the beneficiaries. But they also pointed out to some shortcomings and suggested that future interventions should support capacity development of CBSP cooperatives, especially in post-harvest processing, marketing and quality control, and of other partners in GESI tools and approaches; decentralization of source seed production; mechanization, and development of irrigation and storage facilities; strengthening of seed supply system for all the three main cereals (rice, wheat and maize); expansion of geographic coverage to Terai; and research and development of hybrid maize.

There are some important lessons learned and issues emerging from the implementation of HMRP. The key lessons learned are that the CBSP is an effective strategy to promote inclusion, partnership with local bodies, decentralized source seed production and seed marketing (see section L, page 33 for details). Other lessons learned are those that provide insights into how the project benefits can be maximized and sustained. The issues that need to be addressed include sustainability, targeting, inadequate monitoring database, labor shortage, weak role of private sector in seed marketing, low seed productivity and retention rate, weak cross-project linkage and synergy, unclear links with local bodies, and possible side effects of technologies.

RECOMMENDATIONS

In order to consolidate and scale up the past achievements and also to sustainably meet the growing domestic demand for food, feed and seed, there is a need to continue external funding in maize. In the light of the findings discussed above, the following measures need to be adopted in designing future interventions in order to maximize the contribution to sustainable development and growth of maize seed industry in Nepal.

Adopt a Coordinated and Subsector Development Approach

There is a rising trend of external donor support to projects that aim at improving seed supply in Nepal. However, most of these projects are operating independently with little or no cross-project learning and synergies. In this context, adopting a coordinated and subsector development approach to formulation and implementation of future support will provide an effective way forward for developing Nepal's seed industry in an efficient, effective and sustainable manner. While donors and development partners should more effectively and regularly share their lessons learned and support strategies, MOAD will need to play a proactive role in streamlining and harmonizing external support in seed subsector to avoid duplication and ensure synergy among different projects/programs.

Support Decentralization of Source Seed Production and Seed Quality Control

Source seed production was the mandate of government farms and stations, and the supply was unreliable. Recent reforms in seed policies have opened the mandate to non-state actors also. In the spirit of these policy reforms, source seed production should be fully decentralized and entrusted to NGOs and the private sector. Trained experts from both within and outside the government must be licensed to carry out the seed certification and inspection activities. The primary focus of NARC should be on research and development of new varieties, both open-pollinated and hybrid, as well as on minimizing the post-harvest and processing losses, which currently are very high.

Support Development of Hybrid Maize

While the open-pollinated varieties will continue to dominate maize varieties in the hills, most parts of the Terai are already under hybrid varieties, the demand of which will grow even faster in the future. Hybrid varieties give much higher yields than open-pollinated varieties, and are gradually spreading in the hills also. Most of the maize produced in Terai and almost the entire maize imported to Nepal are hybrid maize. The growing demand for hybrid maize seeds is met by increased level of imports and the quality is not always reliable. In order to substitute the import of maize seeds and grains and also to meet the future growth in demand for maize for food and feed, a greater attention must be paid to research and development of hybrid maize in Nepal. It is not possible for NARC alone to develop and maintain all the hybrid lines. Hence, it is necessary to engage NGOs and private sector too in research and development of hybrid varieties.

Strengthen the Capacity CBSP Partners

In order to sustain the past achievements as well as to decentralize and strengthen source seed production, the current capacity of all the CBSP partners –government, NGOs and the private sector, including the cooperatives, agro-vets and seed companies – needs to be strengthened. But a greater attention must be paid to developing the technical, physical (infrastructure) and institutional capacity of the CBSP groups and cooperatives.

Support Value-Chain Development

Sustainable development of seed subsector hinges on the sustainable development and growth of the commodity under consideration, and the latter will not be achieved without developing the commodity value chain. Hence, it is necessary that future support be focused on value-chain development, especially on post-harvest processing, storage, quality control, and marketing.

Integrate CBSP into the Program and Budget of Local Bodies

The local bodies (VDC/DDC) are responsible to plan, monitor, coordinate and facilitate development at the local level and are also mandated to allocate at least 15% of their annual budget to agriculture. Integrating CBSP into their annual program and budget will be necessary to ensure sustainability and growth of CBSP. This will also serve as part of the strategy for developing the capacity of the CBSP groups/cooperatives.

Extend Geographic Coverage to Terai

Maize is still largely a food crop in the hills, but it is a commercial crop in Terai, which is and will continue to be a major supplier of hybrid maize to be used as feed and as raw materials for other processed food products. Given the relatively higher scale of production and a larger volume of seed business (and economic returns), Terai can more easily attract the private sector than hills. In view of this and also other factors discussed above in relation to hybrid maize development, future support should extend its geographic coverage to Terai.

Implement a Special Support Package for DAGs

Given the small size of holdings and the pressing economic and livelihood support needs of the DAGs, more particularly dalits, their continued involvement in CBSP may be doubtful, mainly because the seed production activity alone may not generate enough to meet their daily subsistence and livelihood needs. In such cases, the seed retention rate may also be reduced, particularly if the seed is not sold and cash payment is not made timely. Hence, for such households, it is necessary to design and implement a special support package, which may include technical and financial support for creating a revolving fund, developing micro-irrigation, and implementing income-generating activities.

Introduce Mechanization and Women's Time Saving Measures

In the context of large-scale outmigration of youths resulting in serious shortage of farm labor in rural areas, mechanization has become a necessity to minimize the adverse impacts on farm production and productivity. Introduction of mechanization and other measures to save women's time, as part of future interventions, will help reduce women's workload, which has increased due to rural outmigration.

Strengthen Monitoring and Database

An effective monitoring system and a proper and regularly updated database are important parts of project implementation strategies, and must be given due emphasis while designing future interventions. Maintenance of gender and socially disaggregated database will help objectively monitor and keep track of the expected outcomes and outputs of the interventions.

EVALUATION PURPOSE & EVALUATION QUESTION

The HMRP IV is currently in the fourth and final year. Significant achievements have been made in the past three years. In order to examine the effectiveness of HMRP interventions, and document the lessons learned and good practices that can be shared with the Government of Nepal (GON), USAID and SDC to improve their development learning and future programming, USAID and SDC have jointly commissioned this external evaluation of HMRP. The purposes of this evaluation are as follows.[1]

- Examine the effectiveness of the HMRP's approach of engaging host country government mechanisms in fund management and project implementation to achieve the intended results;
- Assess the effectiveness of HMRP and institutional framework in achieving sustainable results in terms of both farmers' access and adoption of improved technologies and policy changes required for the decentralized quality seed system;
- Identify and document good or best practices and lessons learned and factors that influenced program effectiveness;
- Examine the intended and unintended consequences of the program; and
- Provide recommendations and direction to SDC and USAID for design of future interventions of GON, USAID, SDC, NGO and private sector.

EVALUATION QUESTIONS

The evaluation attempts to answer the following key questions:

1) What is the contribution of HMRP towards maize seed production and commercial distribution in Nepal?
2) To what degree were the varieties *developed* by HMRP adopted by farmers?
3) How successful was HMRP in engaging and contributing to the host country government at the central and local levels in project planning, implementation and monitoring?
4) How has HMRP supported work on policy provisions to support maize promotion in Nepal in terms of varietal and technological advancement, extension and scaling up to different geographic regions?
5) To what degree have participating institutions (GON, Cooperatives, NGOs and the private seed companies) demonstrated capacity to sustain program activity once funding ends, bearing in mind the transformation of the agriculture economy taking place because of population dynamics such as internal mobility and outmigration of youths from rural areas?
6) How cost effective is the project management and the institutional control management system?
7) From the vantage point of Nepal Agriculture Development Strategy and its Three Year Plan, what opportunities exist beyond the current scope for new intervention area/s that would enhance the impact of HMRP (both geographic and thematic)?

The specific contexts – social, economic, policies and institutional – in which the project is operating and in which the current evaluation is carried out are described in Annex II.

[1] See Annex I for the Statement of Work

TARGET AUDIENCE AND USE

The main target audiences of the evaluation report are GON, SDC, USAID and CIMMYT. But the lessons learned and best practices identified by the evaluation will benefit all other agencies that are planning and implementing agriculture development programs in partnership with GON and the NGOs. The evaluation report will be used primarily as a basis for designing future interventions or phase of the project for SDC and USAID support. The lessons learned and best practices will contribute to increased understanding for all other donors and development partners around participatory and demand-driven approaches to technology development and dissemination, and adaptation to changing context of outmigration, climate change and commercialization of maize production. The lessons learned and best practices will also be instrumental in informing the implementation approaches of the USAID-funded Knowledge-Based, Integrated Sustainable Agriculture and Nutrition (KISAN) project. CIMMYT can use the project's learning and experiences to design and implement its own future activities and as well as to approach other potential donors for funding its research and development activities in Nepal.

PROJECT BACKGROUND

HMRP, which was initiated in 1999 with SDC funding, has come a long way in the past one-and-a half decade in terms of focus, geographic coverage and achievements.[2] During this period, the project focus has shifted from 80% research and 20% development to 20% research and 80% development. The HMRP IV is implemented through 10 NARC stations and divisions, 20 DADOs, 5 Regional Seed Testing Laboratories, 5 Regional Agricultural Directorates, 18 NGOs and 5 private companies.

A. GEOGRAPHIC COVERAGE AND BENEFICIARIES

HMRP IV covers 20 districts, which include the seven Swiss cluster districts and four USAID strategic districts, and also a few districts covered in the previous phases (See Annex II for the location of the project districts). The number of VDCs and beneficiaries vary among districts. But, in general, the project covers more VDCs and beneficiaries within a district in this phase than in the previous phases.

The main target beneficiaries are small and marginal farmers, especially from the poor and disadvantaged groups, a majority (80%) of which belong to the socioeconomic category in which the households' own production meets less than 11 months of food requirements. The emphasis is on poor farm families located in more remote parts of mid and far western Nepal, where poverty is rampant, food insecurity is chronic, and improved livelihood options are limited.

B. THE PROJECT OUTCOMES AND OUTPUTS

The project has two broad outcomes:

(i) Hill maize farmers, especially from poor and disadvantaged groups, adopt new and profitable maize varieties and improved technologies to enhance productivity and marketing opportunities
(ii) National Seed Board (NSB), NARC and DOA enforce quality control through both public and private institutions

The project focuses on eight major outputs. The outputs under Outcome A are related to the knowledge and adoption of improved technologies by the community-based seed production (CBSP) groups, access to quality seed and proven technologies by DAGs, commercial supply of quality seeds by cooperatives and CBSP groups, and access to multiple productivity-enhancing agricultural interventions by the poor and disadvantaged households. The outputs under Outcome B are related to decentralization of source seed production, provision of seed inspection mandate and license to public and private institutions, management of internal seed quality control by CBSP and cooperatives, and internalization of HMRP's experience by NSB and NARC.

C. PROJECT MANAGEMENT

CIMMYT-Nepal manages the project through a team of experts led by a full-time nationally recruited Agronomist, who acts as the Team Leader and is assisted by a national Seed Value Chain Expert in the center and four cluster agronomists in the field. Until February 2014, a full-time internationally recruited CIMMYT maize scientist led the project. A Steering Committee (SC) chaired by the Secretary of the MOAD provides guidance and policy oversight to the project team. The SC is composed of high-level representatives from related government and non-government partners, including NARC, DOA, SDC, USAID and CIMMYT. A Technical committee (TC) co-chaired by the Director General of DOA and the Executive Director of NARC and represented by the

[2] See Annex II for the Genesis of the project

government, NGO and private sector partners provides guidance and technical oversight at the implementation level. The NARC National Maize Coordinator serves as a Member Secretary to both the committees.

D. FUND FLOW AND MANAGEMENT

Project funds from SDC and USAID are channeled to CIMMYT-Nepal through CIMMYT-Mexico, which retains part of the fund (11%) on account of the expert assistance – to meet the salary, allowance and relocation cost of internationally recruited CIMMYT staff involved in the project – and of the indirect costs (5% of the budget for outcomes A and B and 15% of budget for CIMMYT-Mexico and CIMMYT-Nepal components, which together account for about 30% of project funds). The proportion of total project funds allocated to outcomes A and B are about 47% and 19%, respectively. The remaining part (6.7%) of the fund is earmarked for nationally recruited scientific staff. About two-thirds of the project funds are allocated to Outcomes A and B, of which 75% goes to seed production and dissemination activities (Outcome A) and 25% to improving seed quality control (e.g. truthful labeling, etc) and other activities targeted to achieve Outcome B. CIMMYT-Nepal manages the project funds (except the fund allocated to CIMMYT-Mexico component).

E. PROJECT MONITORING

The SC and TC also serve as monitoring mechanisms. In addition, the project organizes a planning workshop at the end of each year to review results of the previous year and SGP proposals for the next year. The overall project results and future plans are presented at the national maize workshops. Each year, the project organizes a "Traveling Seminar" with a team of high-level government officials and representatives of other related partner agencies, to monitor field activities, discuss any emerging or outstanding issues, and recommend solutions at the field level.

EVALUATION METHODS & LIMITATIONS

A. DATA COLLECTION

The evaluation used both primary and secondary data. The primary data were collected at the household and community levels. While a structured and pre-tested questionnaire was used to collect data at the household-level, a semi-structured checklist with a number of open-ended questions was used to collect data at the community level. A focus group (FG) discussion approach was adopted for this purpose. In addition, a number of key informants (KIs) – representatives of NARC, DOA, SQCC, HMRP, NGOs and private sector at the central level; of District Agriculture Development Offices (DADOs), NGOs and other related agencies at the district level; and of CBSP cooperatives at the community level – were also interviewed using similar semi-structured checklist with open-ended questions (See Annex IV for the list of persons interviewed). The questionnaire and checklists used for the survey are presented in Annex III.

The main information collected through household survey included landholding size, area and productivity of local and improved maize, quality and sources of improved seeds, seed production and marketing channels, use of chemical fertilizers and pesticides, gender roles, seed production problems and possible solutions, migration and its effects on maize production, household food self-sufficiency, project impacts and sustainability, and suggestions for maximizing the project impacts.

The focus group discussion generated data mainly on trends in improved maize area, production and productivity across gender, caste/ethnic group and landholding size; production and sale of improved seeds; seed producers, marketing channels and dealers; demand and supply of improved seeds; seed production and marketing problems; positive and negative aspects of HMRP and measures to mitigate the negative aspects; measures to strengthen local supply and marketing of improved seeds; GESI aspects and unintended consequences of HMRP; and suggestions regarding future project interventions.

The information collected through the survey of key informants, which included the government, NGO and private sector representatives, were mainly related to the effectiveness of HMRP and its implementing arrangements, fund management and control system, cost effectiveness, sustainability of project impacts, capacity of project partners, status and problems of maize seed industry, and seed sub-sector development priorities and suggestions for future project interventions.

Enumerators trained on the questionnaire and checklist carried out the household survey and FG discussions in the field. The members of the evaluation team visited the field to supervise the work of the enumerators as well as to interact with the community members and conduct the KI survey at the district and community levels. The team also identified, discussed and documented best practices and lessons learned on various aspects of the project from the field. The field survey was completed within two weeks in the second half of February 2014. The main sources of secondary data were the published and unpublished documents and reports obtained from various government agencies, HMRP and NGOs as well as the websites of other related agencies.

B. DATA ANALYSIS

Both quantitative and qualitative tools were used to analyze the data. The data collected through KI and FG surveys were used for descriptive and qualitative analysis, whereas those collected through household survey were used for quantitative analysis. The estimation of counterfactuals, which represent the true conditions of the participating households in the absence of the project, is a key issue in evaluating the impact of any project. The randomized controlled trial (RCT) is an approach that is popularly used for such purposes. However, due to lack

of proper baseline data, the evaluation used the propensity score matching (PSM) approach.The PSM offers two clear advantages. First, it allows mimicking some of the characteristics of randomized controlled trial; and second, it is a single period analysis and hence minimizes the problem associated with the selection biasness.

The propensity score is estimated as a function of individual characteristics, typically using a statistical model such as logit or probit model.[3]The project impact was evaluated in terms of its impact on maize productivity (maize yield per hectare), rate of technology adoption (ratio of improved maize area to total maize area) and food self-sufficiency (number of months of food sufficiency from own production), and hence, these were used as dependent variables. The size of landholding, proportion of irrigated land, years of schooling, and family size of the farmers were used as explanatory variables. The level of significance of the coefficients was tested using t statistics.

Application of PSM involves a number of steps and logical derivations. The detailed steps are outlined in Annex II. The final equation can be expressed as:

$$\text{Impact} = E(Y_1|x, D=1) - E(Y_0|x, D=0)$$

Where
Y_1 = outcome for the treated farmer for given observable variables x
Y_0 = outcome for the untreated (control) farmer for given observable variables x
D =1 represents treatment and D=0 represents control

The project impact is the difference between outcome of the project households (treatment group) and non-project households (control group). The treatment group refers to members of CBSP groups or cooperatives that are directly covered by the project, whereas the control group refers to farmersthat are in the same VDC with similar observable characteristics, but are not directly covered by the project. The statistical packages used for estimating PSM were SPSS and R packages.

C. SAMPLING FRAMEWORK AND SAMPLE SIZE

Selection of Sample Districts

The project covered six districts in the first phase, extended its coverage to 30 districts in the second and 40 districts in the third phase. In the current phase, it covers 20 districts, which include 6 districts from the first phase, 5 districts from the second phase and 5 districts from the third phase. The remaining 4 districts are new. Hence, for the purpose of this evaluation, it was considered necessary that the sample districts represent all the phases and clusters. Other criteria used for the selection of the sample districts were:

- Presence of road network
- Presence of caste/ethnic group representing at least 50% of the population
- Food security status and centrality of the HMRP clusters
- Number of VDCs with sufficient number of HMRP beneficiaries

Considering the above criteria, five districts – Sindhupalchok from Phase I, Ramecchap and Palpa from Phase II, Doti from Phase III and Surkhet from Phase IV – were selected in the first stage. These districts represent five SDC clusters.

[3] Also see Heinrich C. Maffioli, A. and Vazquez, G. (2010), Impact Evaluation Guidelines Technical notes No IDB-TN-161, A Primer for Applying Propensity Score Matching, Inter-American Development Bank

Selection of Sample VDCs

Not all VDCs of the selected districts are covered by HMRP. Within the VDCs covered by the project, the number of CBSPs/cooperatives varies, usually from one to four. Similarly the size of the CBSP/cooperative also varies widely, from 6 to more than 100.The project VDCs were based divided into two groups: VDCs with more than 20 group members and VDCs with less than 20 group members. Two sample VDCs were selected from the fist group of VDCs using the following criteria:

- Around 50% of the total population of the VDC must be DAGs
- Women constitute at least 50% of the group members
- Accessibility by road[4]

Selection of Sample Households

The sample households consist of both project and non-project households. The project households were divided into two groups: DAG and non-DAG households. From each sample VDC, 20 households – at least 50% from DAG and the remaining from non-DAG – were randomly selected. These households, which numbered 200, represented the treatment group. Similarly, from each of the selected VDCs, 20 households not participating in the project but having similar observable characteristics as the treatment households were randomly selected to constitute the control group. The number of such households was also 200. Hence,altogether 400 households were surveyed for the evaluation purpose.

D. LIMITATIONS

The main limitations of this evaluation study have stemmed from the lack of proper base line data for the project, short period of time available to complete the evaluation, small sample size, limitations of the PSM and other factors usually associated with such surveys. The major limitations of PSM include its inability to (i) include the effects of unobserved characteristics of the households, and (ii) correct the total spillover effects of the project. There is also a problem associated with the identification and selection of control group of farmers for comparison. Because of limited time (30 days effectively) available for the evaluation, the team had to compromise the sample size (districts, VDCs and households) and the length of fieldwork.

Another major limitation is that the findings or results of the evaluation cannot be attributed entirely to the project interventions made in the fourth phase. The project's current outreach includes households that were also covered in the previous phases; and as such, the impact currently observed is rather a cumulative impact of all the phases, rather that of the fourth phase alone. This also limits the comparability of the impact across households.

[4] The names and demographic details of the sample VDCs are presented in Annex II.

FINDINGS, CONCLUSIONS & RECOMMENDATIONS

A. COMMERCIAL PRODUCTION AND SALE OF IMPROVED MAIZE SEEDS

Evolution of CBSP Groups/Cooperatives

The number of CBSP groups promoted during the first phase was 16. The number increased to 90 in the second phase and to 174 in the third phase. The fourth phase adopted the strategy of promoting new CBSP groups and institutionalizing the old CBSP groups into cooperatives. Accordingly, at present, there are altogether 207 CBSP entities (174 groups, 31 cooperatives and three seed companies) consisting of 5,019 members – 56% women and 44% men – engaged in seed production. Among these, five entities (Cooperatives and Companies) are being developed as regional hubs/centers, and 42 entities (17 cooperatives and 25 groups), as strategic groups/cooperatives, which are equipped with some basic infrastructure and equipment base for commercial seed business.

Commercial Production and Sale of Improved Seed

The level of improved seed production through CBSP has increased by several folds over the years, from 14 ton in 2000 to 830 ton in 2010. During the current phase, the quantity of commercial, marketable source seed production increased with increase in the number of CBSP entities, from 1146 ton in 2011 to 1,216 in 2013. The quantity of improved seed produced in 2013 is sufficient for improved maize production in 60,800 hectare, which is about 30% of the total maize area in the hills.[5]As shown in Table 1 below, increasingly large parts of the production are sold in the market every year. While 75% of the production was sold in 2011,90% of the production was sold in 2013.

Table1: Production and sale of maize seeds, 2011-2013

	2011	2012	2013
Production (ton)	1,146	1,036	1,216
Sale (ton)	860	863	1,100
Sale (%)	75	83	90

Source: CIMMYT-HMRP Annual Progress Report, 2013 (draft)

Major marketing channels include CBSP cooperatives/seed companies and private businesses, including agro-vets, which together marketed about a third of the marketable seed production in 2012. A vast majority of the seed producer households relied on CBSP entities for marketing of their seeds. As shown in Table 2 below, 81% of the households sold their seeds through CBSP cooperatives and seed companies, whereas only about 8% households sold their seeds to the private businesses and 11% to other agencies, which included government agencies, NGOs

[5] Based on HMRP sources

and farmers. The CBSP currently serves not only as a major channel for marketing of seeds but also as a major supplier of improved seeds to maize farmers. As shown in Table 3 below, more than half of all the sample households – both treatment and control groups combined together – considered CBSP as the main source of maize seeds in the survey areas. Nearly 40% of the households – most of them from the control group – used seeds from their own production.

Table 2: Seed marketing channels*

Gender/ caste/ethnic group[6]	Seed marketing channels		
	CBSP	Private business	Others
Female	77	9	14
Male	87	7	6
Dalit	93	0	7
Janjatis	92	4	4
Others	66	16	18
All	81	8	11

* Includes only project households (treatment group)
Source: Household Survey

Table 3: Sources of maize seeds

Gender/caste/ Ethnic group	CBSP	Own production	Others
Female	49	40	11
Male	53	35	12
Dalit	46	44	10
Janjatis	60	34	6
Others	44	40	16
All	51	38	11

Source: Household Survey

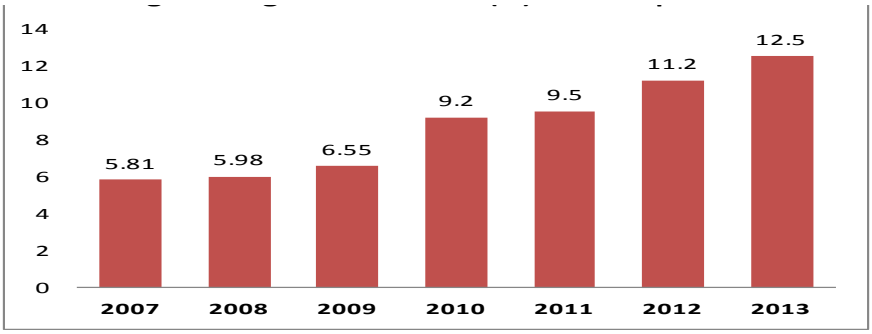
The project has adopted a number of different marketing strategies, including pre-sowing contracts, linking small and remote CBSP groups with strategic cooperatives, establishment of seed companies, and provision of seed revolving fund to the CBSP groups. In 2013, 42 cooperatives signed pre-sowing contracts with different entities for the marketing of 207 ton of improved maize seeds.

Seed Replacement Rate

Increased commercial production and sale of improved seeds has contributed to improved seed replacement rate (SRR), from 5.8% in 2007 to 9.5% in 2011 and is estimated to have improved further to 12.5% in 2013. The SRR doubled in the past six years. If this trend continues, it is likely that the SRR in maize will reach 25% well before 2025.

[6] Gender disaggregation of the household survey data is based on who is responding to the survey questions, not on who heads the household.

Figure1: Changes in Maize SRR (%) over the period



Source: CIMMYT-HMRP Annual Progress Report, 2012

Quality and Timeliness of Seed Availability

Almost all (99%) of the treatment households reported that improved maize seeds were available in time, and the same proportion reported that the available seeds were of good quality. Interestingly, among the control households, while a fairly large proportion (about three quarters) felt that quality seeds were available locally, less than a quarter felt that the seeds were not available when needed (Table 4). The treatment group refers to members of CBSP groups or cooperatives that are directly covered by the project, whereas the control groups refers to farmers that are in the same VDC with similar observable characteristics, but are not directly covered by the project.[7]This suggests that the non-project households were aware of the quality seeds produced by the CBSP, but they were not always able to access those seeds when needed. This is possibly because the seeds are mostly marketed through CBSP cooperatives and seed companies, which supply the seeds within and outside the project districts. There is no information regarding the proportion of seeds marketed within and outside the project area.

Table 4: Quality and timeliness of seed availability (% HH reporting)

Gender and caste/ethnic group	Treatment		Control	
	Quality seeds	Available in time	Quality seeds	Available in time
Female	100	99	72	19
Male	99	98	75	30
Dalit	96	100	83	11
Janajati	100	99	68	37
Others	100	98	72	18
All	99	99	73	23

Source: Household Survey

Informed sources, which include the NARC scientists, and DOA and HMRP officials, suggest that use of improved seeds alone can increase yield by at least 20%. As such, it is expected that improvement in seed quality and availability will lead to an increase in maize productivity. This was supported by the focus group discussions, which revealed an increasing trend in maize production and sale among the treatment households in four of the five

[7] Refer to para 24-25 for the procedure used in selecting the two groups of sample households

sample districts (Table 5). The exception was Sindhupalchok, where there was no recent increase in maize production, possibly because the possible gains in productivity were already realized in the past.[8] In three (Sindhupalchok, Palpa and Doti) of the five sample districts, there was an increasing trend in maize production and sale even among the control households. This may be due to increased maize area and or productivity resulting from the adoption of improved varieties by the control households.

Table 5: Trends in maize production and sale in sample districts

District	Maize production		Sale	
	Control	Treatment	Control	Treatment
Ramechhap	Constant	Increasing	Constant	Increasing
Sindhupalchok	Increasing	Constant	Increasing	Constant
Palpa	Increasing	Increasing	Increasing	Increasing
Surkhet	Constant	Increasing	Constant	Increasing
Doti	Increasing	Increasing	Increasing	Increasing

Source: Focus Group Discussion

The results of the household survey corroborate the above findings. As shown in Table 6 below, among the treatment households, while 38% reported an increase in maize area, a vast majority – about three-quarters – reported an increase in maize production in recent years. Among the control households, 17% reported an increase in maize area and 31% reported an increase in maize production, which suggests that part of the increased production came from increased productivity per unit area.

Table 6: Increase in maize area and production (% HH reporting)

Gender/caste/ ethnic group	Maize Area		Maize Production	
	Treatment	Control	Treatment	Control
Female	42	17	73	30
Male	31	15	78	31
Dalit	37	17	74	36
Janajati	37	13	82	35
Others	38	19	66	26
All	38	17	75	31

Source: Household Survey

[8] Why Sindupalchok was an exception is discussed later in relation to Figure 4.2

B. HMRP TECHNOLOGIES AND ADOPTION BY FARMERS

Improved Maize Varieties

HMRP appears to have made an important contribution to development of maize varieties in Nepal. Altogether 23 maize varieties have been released in Nepal since 1960, and eight of these were released after 2000. Seven varieties, which include one quality-protein maize (QPM) variety, were developed and released with HMRP assistance during the last three phases. These varieties, which were developed through farmer participatory approaches, are reportedly very popular among farmers throughout the hills, including the non-HMRP districts.[9] Some of the specific characteristics of these varieties are described in Annex IV. The germplasm used in these varieties obtained from CIMMYT, and reportedly produce much higher yields – 5 to 6.5 tons per hectare – than other varieties. Their maturity period is relatively longer (145-160 days compared with 120-130 days for other released varieties), but their yield performance is more stable. In addition, most of these varieties are tolerant to major insect-pests such as stem borer and Gray Leaf Spot, which can cause severe damage to maize crop, and to drought and lodging. There are at least seven other varieties in pipeline, four of which have already been submitted for release.

Other Maize-Based and Climate-Resilient Technologies

HMRP has developed or validated a number of different technologies and agronomic practices that can increase yield, improve soil fertility, and contribute to biological control of insect-pests. One of such technologies is seed priming (soaking seed overnight and drying before sowing), which reportedly contributes to drought resistance, increased yield and reduced maturity period (by 7-10 days). Similarly, intercropping of maize with legumes (soybean and groundnut), vegetables and other cash crops has proved to be a very profitable option. Other technologies include improved composting (covering compost by black plastic, preparation of vermi-compost using earthworms), organic pesticides (e.g. *Bojho* for stored grain pests, cattle urine), conservation practices (planting leguminous grasses on the terraces), and use of super grain bags for storage.

An important characteristic of the HMRP technologies, including the new varieties, is that they are relatively more resilient to climate change, which is a serious issue with potentially large impact on agriculture in the hills. Most of the new varieties are tolerant of drought and major insect-pests, and this characteristic enables them to perform well under a wider range of production environments. Other maize-based technologies that can adapt to climate change include seed priming, composting and conservation practices.

Technology Adoption by Farmers

Due to lack of disaggregated technology adoption data, it is not clear what proportion of the project households adopted a particular variety or technology. According to the latest progress report, the project has reached nearly 51,000 households – 72% DAGs and 58% women – which have adopted either new varieties or improved technologies or both. About 5,000 of them organized in 207 CBSP groups, which are involved in seed production, have clearly adopted one or more of the new varieties and improved production technologies. Similarly, some 10,000 households adopted *"PoshiloMakai"* – the QPM maize variety.

According to the findings of the household survey, the rates of adoption of improved varieties, defined as the percentage of maize area planted to improved varieties, in the treatment and control groups are 90%, and 23%, respectively (Table 7). There is no significant difference in adoption rates across gender and caste/ethnic groups. This is understandable, especially in the case of treatment group, as the project mostly focused on women and DAGs. The rate of adoption does not vary according to the size of landholding either. The findings of the focus

[9] CIMMYT-HMRP (2013)

group discussions suggested that all treatment households in all sample districts, irrespective of their holding size, had fully adopted the improved varieties.[10]

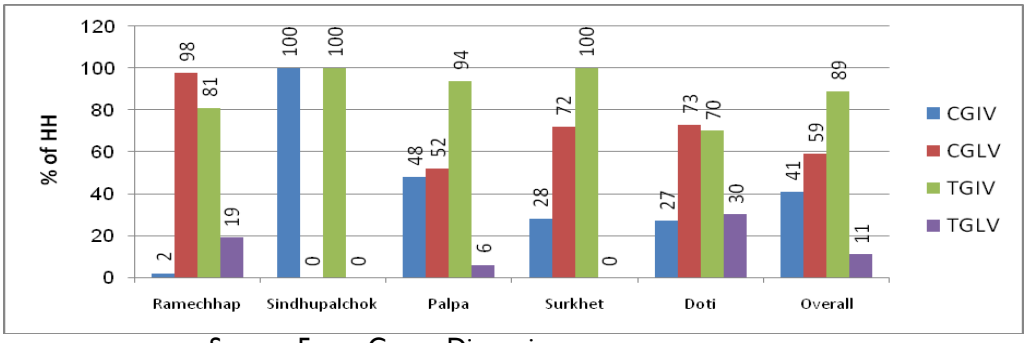
According to the district-level key informants (DADOs), improved varieties cover up to 70% of the maize area in the project districts. The popular varieties are: Manakamana-3, Rampur Composite, Deuti, Arun-1 and Arun-2. Poshilo Makai (QPM) is also becoming popular among farmers. All categories of farmers irrespective of gender, caste/ethnic group and size of holding, have adopted HMRP varieties. Adoption of other improved technologies or agronomic practices is not as extensive as that of improved varieties, and is limited to the households within the treatment group. Among these technologies, the intercropping of maize with soybean and vegetables is highly profitable and popular among small holders. The other technologies such as conservation practices, improved composting and seed priming are relatively more technical, and only trained farmers can properly adopt them.

Table 7: Improved variety adoption rate in maize

Gender/ Caste/Ethnic group	Treatment (% Improved maize area)	Control (% Improved maize area)
Female	94	23
Male	84	22
Dalit	89	29
Janajati	88	14
Others	93	26
All	90	23

Source: Household Survey

Figure 2: Variety adoption in sample districts (% HH adopting)[11]



Source: Focus Group Discussions

Overall, in the sample districts, the proportion of households adopting improved varieties was 41% in the control group and 89% in the treatment group (Figure 2). The sizeable level of adoption of HMRP varieties by control households suggests that the project benefits have spilled over to non-project areas also. The extent of such spillover benefits, however, varied greatly across districts, as indicated by the varying level of adoption of improved varieties by the control households, from 1.5% in Ramechhap to 100% in Sindhupalchok. The highest adoption rate in Sindhupalchok is mainly because of the development activities of "Tuki" – a local NGO that is operating in the district for a long time with support from SDC.

[10] The adoption rate was 100% for all members of the CBSP groups/cooperatives (treatment households).

[11] CGIV and CGLV refer to improved and local variety adoption by control group, and TGIV and TGLV refer to improved and local variety adoption by treatment group.

C. GOVERNMENT ENGAGEMENT IN THE PROJECT

Engagement in Project Planning, Implementation and Monitoring

There is a fairly high level of government participation in planning, implementation and monitoring of HMRP activities. At the planning and policy level, the SC is the highest body chaired by the Secretary of MOAD and represented by other government agencies, including NARC, DOA, NPC and Ministry of Finance. The SC approves the Yearly Plan of Operation and budget of HMRP and also makes decision on policy issues associated with the project. At the implementation management level, the TC co-chaired by the DG of DOA and the ED of NARC reviews and recommends for approval the annual budget and other interventions proposed by HMRP. At local level, 10 NARC stations, 20 DADOs, 5 Regional Seed Testing Laboratories and 5 Regional Agricultural Directorates are implementing partners of HMRP.

Some additional measures adopted to involve government officials in project planning and monitoring include annual planning workshop organized by HMRP, the National Maize Workshop organized by DOA, and "Traveling Seminar" and other forums organized by HMRP. The overall project results and future plans are presented at the National Maize Workshop. Each year, the project organizes a "Traveling Seminar" with a team of high-level government officials and representatives of other partner agencies, to monitor field activities, discuss any emerging or outstanding issues, and recommend solutions at the field level.

Majority of the government and NGO officials met by the Evaluation Team at both the central and district levels considered HMRP as a successful project and expressed satisfaction in being a part of it. According to them, a major desirable feature of HMRP was that it brought together government, non-government and private sector institutions to work for a common cause. The government partners appreciated the project's modality of involving government mechanism, but expressed that they should be involved in more ways and at more stages of the project. The areas where more frequent and active engagement was sought include planning and budgeting of annual activities, and monitoring of project activities implemented by other partners.

Engagement in Fund Management

In 2012, of the total annual operational budget provided to all HMRP partners, 44% went to NARC, 25% to CDD, and 31% to NGO partners. HMRP was designed to adopt a competitive Small Grant Projects (SGP) system to allocate and manage its fund. However, because of various reasons, it has adopted a mixed system. Part of the HMRP fund – allocated for capacity development and infrastructure and equipment support to partners – is managed centrally by HMRP. Funding to NGOs is based on a competitive SGP system. Funding to NARC is based on a simple one-page activity budgeting. Finally, DOA, being the Government line department, gets funding from HMRP directly under a program called "Mega Project". This mixed system has been able to address the issues and concerns that were initially raised by DOA and NARC regarding the proposed funding modality involving a competitive SGP, and is now fully accepted by all partners. Although a fully competitive SGP is desirable from the point of view of efficiency and transparency, this is difficult to bring in practice, especially when partners involve government, NGOs and the private sector. This is mainly because the government partners do not normally show their willingness and interest to compete with NGOs and private sector, as supported by HMRP's experience too.

D. CONTRIBUTION TO SEED POLICY REFORMS AND SEED QUALITY CONTROL

HMRP, together with another SDC-funded project[12], provided financial and technical assistance in bringing about important reforms in seed policies. Traditionally, seed production – especially source seed production – was the

[12] Vegetable Seed Project (VSP) implemented by CEAPRED

mandate of government research farms and stations, and this was seen as a constraint to improved supply of quality seeds to farmers, with respect to quantity and timeliness. Realizing this, the GON revised the National Seed Act of 1988 to decentralize source seed production and quality control. The revision allowed private sector participation in source seed production and quality control through a system of "Truthful Labeling". Subsequently, the GON revised the Seed Regulations of 1997 and introduced Seed Vision 2025, both of which are important milestones towards establishing a decentralized seed production system in the country.

HMRP's experiences with CBSP and participatory variety selection approaches have been instrumental in revising the Agriculture Extension Guidelines of CDD, in integrating CBSP and DISSPRO into regular programs of MOAD/DOA, and in taking into account farmers' feedback and preference to release new varieties. The recently introduced "Mega Maize" program of the Government has also adopted the CBSP model. The directives for decentralized source seed production are being processed for approval by NSB. HMRP also contributed to capacity development in seed quality control through training to NARC scientists and DADO officials, and financial support to 42 CBSP groups and cooperatives to develop modest infrastructure and equipment base for internal quality control system.

E. CAPACITY OF PROJECT PARTNERS TO SUSTAIN PROGRAM ACTIVITIES

The project has significantly contributed towards increasing the research resources and capacity of NARC. Although the share of NARC in the total HMRP fund has consistently declined over the phases, from 43% in the first phase to 11% in the fourth phase, a significant part of NARC research is still based on HMRP assistance.[13] The decline happened mainly due to a declining research focus over the phases. Nonetheless, the size of contribution to research resources of NARC is still significant – about US$620,000, which is nearly double the amount contributed in the previous phase (about US$315,000).

The project has also made efforts towards developing the capacity of other partners – DOA, NGOs, cooperatives, farmers and the private sector organizations – through technical training, and financial and material support. Yet, from the point of view of sustaining the program activities in the absence of external funding after the current phase, there are areas where the capacity of project partners, especially the CBSP cooperatives/seed companies, is still weak and needs further strengthening. The main areas where further capacity strengthening is needed include improved agronomic practices, market-based production, post-harvest processing and quality control (cleaning, grading, packaging, storage, truthful labeling), and marketing.

A major issue also relates to the capacity of the seed producers to cope with the growing shortage of farm labor resulting from large-scale outmigration of rural youths, mainly male, leaving the farm activities in the hands of women and the aged population. An average of 1,237 workers left the country each day during the first half of 2013/14.[14]The shortage of labor is particularly serious during peak agricultural seasons.[15]The household survey conducted for this evaluation also points to this problem.

As shown in Table 8 below, 38% of the treatment households and 45% of the control households reported serious adverse effects (in terms of serious shortage of labor) of outmigration on maize seed production. The male respondents appear to have felt more seriously about the problem than female respondents, which may be because most of those who left the country were men, leaving their farm work in the hands of those men that are left behind.[16] But, in the focus group survey, while the shortage of labor did come out as a major problem, there was no indication that men and women faced the problem differently.

---

[13] In 2012/13, HMRP contribution was equivalent to about 10% of the total operational budget of NARC.
[14] Asian Development Bank (2014)
[15] According to a study (CEAPRED, 2012) conducted in five districts of Terai, about 20% of the households reported labor shortage throughout the year, whereas about 80% experienced this problem during peak agriculture seasons. An overwhelming majority (80%) reported labor shortage during transplanting and harvesting of rice. The labor shortage reportedly caused delayed transplanting (in some cases, no transplanting at all) and delayed harvesting, both resulting in significant crop loss.
[16] The difference between the male and female responses is not statistically tested.

Table 8: Adverse Effects of outmigration on maize seed production (% HH reporting)

Gender/caste/ethnic group	Treatment	Control
Female	34	40
Male	44	55
Dalit	37	53
Janajati	41	52
Others	35	38
All	38	45

Source: Household Survey

Despite the labor shortage and other issues raised above, there is strong willingness and interest among the project households to continue seed production even after the project phases out. Almost all the treatment households, irrespective of gender and caste/ethnic group, expressed their willingness to continue commercial maize seed production even after the end of HMRP (Table 9). Asked about the scale, while 81% said they would continue the present scale of production, about a quarter said they would do it on a partial or reduced scale. This may be seen as an indication of the positive impacts that the project had on its beneficiaries and as a contributing factor to the sustainability of the CBSP system. There is a clear potential to increase the present level of seed production, as some of the non-project farmers have also shown interest in commercial maize seed production.[17]

Table 9: Continuity of maize seed production (% HH reporting)*

Gender/caste/ethnic Group	Willing to continue after the end of HMRP	Scale of continuation	
		Current	Partial
Female	94	78	22
Male	96	85	15
Dalit	89	88	12
Janajati	95	79	21
Others	98	80	20
All	95	81	19

* Only treatment households
Source: Household Survey

F. COST EFFECTIVENESS

It is difficult to assess the cost effectiveness of research or knowledge-oriented projects such as HMRP, in which the initial costs are high but benefits span over a long time. The project is not only about producing improved seeds, but also about helping to put in place a structure and a support system that promotes decentralized seed production system in the country. The project cost includes the cost of infrastructure development, research, training and technical assistance. As such, it will not be proper to measure the cost effectiveness on the basis of unit cost of production or cost per beneficiary.

[17] For example, during the focus group discussions in Surkhet, a number of farmers in the control group expressed interest in commercial maize seed production like their neighbors in the treatment group, but regretted that that they were not covered by the project.

The project management cost – the cost associated with CIMMYT-Mexico and CIMMYT-Nepal Office components – accounts for 30% of the project budget. One may argue that the portion of the project budget (11%) associated with the CIMMYT-Mexico component could be significantly reduced, if the project were managed locally with national scientists. But, such interpretations may not be proper, because, as an international institution specialized in maize (and wheat) research, CIMMYT has contributed resources in the form of its scientific knowledge, germplasm and learning from its large international network, which would have been difficult for any other local or international organization to contribute.

G. PROJECT IMPACTS: A QUANTITATIVE ASSESSMENT

As stated in its development hypothesis, the project impacts are expected to be realized through a chain of consequences: Farmers adopt new varieties, obtain higher yields, realize increased production/income, and achieve food self-sufficiency for a longer time of the year. The quantitative assessment will need to be focused these variables. However, HMRP does not maintain an updated database on these variables. Quantitative time-series information on these is scanty and based on sample surveys of a limited number of beneficiaries. The counter-factual analysis will, therefore, be based on the household survey data conducted for this evaluation. The impact on the adoption of new varieties has already been discussed. The impacts on productivity, income and food self-sufficiency are discussed below.

Impact on Maize Productivity

Invariably, all the respondents surveyed by the Evaluation Team agreed that there were very significant yield gains from the new maize varieties, and the gains ranged from one-third to hundred percent over the previous level. Table 10 shows the overall average maize yields in the treatment and control groups.[18] The average yield in the treatment group is significantly higher than in the control group.[19] But there is no noticeable difference in the average yield among gender and caste/ethnic groups within either of the groups.

Table 10: Average maize yields in treatment and control groups

Gender/ Caste/Ethnic group	Treatment group (ton/ha)	Control group (ton/ha)
Female	2.0	1.5
Male	2.4	1.5
Dalit	2.1	1.7
Janajati	2.2	1.5
Others	2.1	1.5
All	2.1	1.5

Source: Field Survey

[18] The average maize yields reported here are likely to be underestimated, especially in the case of treatment groups, mainly because the respondents may have reported seed yield rather than total maize yield.

[19] The initial attempts to collect yield data by variety did not succeed, as they were time-consuming and the respondents also expressed difficulty to provide yield data for each variety. The maize yields reported here are the averages of maize yields across all varieties and households within each of the treatment and control groups.

Impact on Household Income

Again, while the project does not keep records of the income of its beneficiaries, the field surveys indicate a sizeable increase in income of the seed producers (treatment group) through increased maize yields and better price of maize seeds.[20] In many cases, the CBSP members received double yields and/or double prices for their seeds, implying an increase in maize income by more than two folds. Accordingly, among the respondents, 86% in the treatment group, against 23% in the control group, reported increase in maize income over the years (Table 11).

Table 11: Households reporting increase in maize income over the years

Gender/ Caste/Ethnic group	Treatment group (%HH)	Control group (%HH)
Female	82	26
Male	92	18
Dalit	78	22
Janajati	91	24
Others	83	24
All	86	23

Source: Field Survey

Impact on Food Security

From the discussions above, a logical conclusion would be that the food self-sufficiency of the beneficiaries has increased over the years as a result of their participation in HMRP. The project's progress reports also support this conclusion.[21]The average numbers of months of food self-sufficiency from own production for treatment and control groups are summarized in Table 12 below. Except in the case of dalits, there is no noticeable difference between the two groups. The duration of food self-sufficiency for the control group stood at 8 months, only slightly lower than for the treatment group (8.8 months). This does not necessarily mean that the project did not positively contribute to food self-sufficiency of its beneficiaries. What this means is that the control households adopted other non-maize production technologies and practices, such as production of commercial high-value crops or commodities like fresh vegetables and vegetable seeds in Surkhet, which raised their income and food self-sufficiency at par with the treatment households. Dalits seemed to lag behind in this regard. As a result, dalits in the treatment group have a longer duration (7 months) of food self-sufficiency than in the control group (less than 5 months), suggesting a positive impact of the project on dalits.

[20] In general, the maize prices were Rs 22 to 25 per Kg for grain and Rs 50 to 60 per Kg for seed.

[21] According to a survey of 183 beneficiaries conducted by the project, the proportion of households reporting increased food self-sufficiency from own production during 2010-2013 increased from 8% to 41% and from 37% to 49% in category A and B, respectively, and decreased remarkably from 55% to 10% in category C. Category A, B and C refer to food self-sufficiency for >=12 months, 6-12 months and <6 months, respectively.

Table 12: Number of months of food self-sufficiency from own production

Gender/ Caste/Ethnic group	Treatment group (Months)	Control group (Months)
Female	8.5	8.0
Male	9.2	8.2
Dalit	7.1	4.8
Janajati	8.8	8.1
Others	9.2	9.2
All	8.8	8.1

Source: Household Survey

Propensity Score Matching (PSM)

The PSM analysis was used to analyze the impacts of the project on technology adoption rate, maize yield and food security, expressed in terms of percentage, kilogram per hectare, and number of months of food self-sufficiency from own production. The results are presented in Table 13below.

Table 13: Paired Sample Statistics

		Mean	N	Std. Deviation	Std. Error Mean
Pair 1 (Adoption)	Treatment	89.89	200	22.71	1.61
	Control	26.48	200	42.45	3.00
Pair 2 (Food Sec)	Treatment	8.76	200	3.37	0.24
	Control	8.30	200	3.69	0.26
Pair 3 (Yield)	Treatment	107.37	200	51.93	3.67
	Control	58.10	200	45.07	3.19

	Paired Differences					t - value	df	P - value (2 sided)
	Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
				Lower	Upper			
Pair 1	63.40	49.27	3.48	56.53	70.27	18.20	199	.0000*
Pair 2	0.46	4.82	0.34	-0.21	1.13	1.34	199	.1809**
Pair 3	49.27	68.99	4.88	39.65	58.89	10.10	199	.0000*

The very high t-values for Pair 1 (Adoption rate) and Pair 3 (Yield) indicate highly significant difference between the treatment and control groups in the level adoption rate and maize yields, suggesting that the project had a very significant impact on technology adoption and maize yields. The differences are significant at 99% confidence level. However, as explained earlier, the impact of the project on food self-sufficiency, although positive, is not quite significant, judging from a small t-value of 1.34.

H. GENDER EQUITY AND SOCIAL INCLUSION

The project does not have a complete database of its beneficiaries disaggregated by gender and ethnic/caste groups. But from the project documents and field survey, it is clear that there is a fairly high participation of women and DAGs in the project. A sample survey of 4,137 farmers conducted by the project in 2012 estimated the involvement of dalit, janajati and women farmers at 16%, 33% and 58%, respectively.

High level of participation of women is a very positive outcome of the project. Many women, and in some cases, from DAGs too, have assumed a leadership role. A clear and consistent message that came out during field survey was that the CBSP group members, including women and DAGs, were highly empowered as a result of project support. Participation in the CBSP has increased their incomes and their food security has gone up by at least 3 more months. The women have been empowered to take part in project meetings, seed selection, and other decision-making activities. Their confidence level has increased and they can raise and make their voices heard (Annex IV). As shown in Table 14 below, vast majorities of the project households reported positive change in women's life and economic status. The positive changes mainly refer to the increased confidence, voice, and social status of women.

Table 14: Impact on women's empowerment (% HH reporting)

Gender/caste/ ethnic group	Positive change in women's life	Increased economic status	Increased leadership
Female	93	88	45
Male	90	87	49
Dalit	89	90	48
Janajati	93	88	45
Others	91	85	48
All	92	87	47

Source: Household Survey

The knowledge of seed production is a great learning for women farmers. In addition, they received seed storage containers, proper storage bags, grading machines, shelling machines etc. The exposure visits also gave them a new perspective of vegetable gardening and inter-cropping. Through exposure visits and work in groups, the women have learnt not to discriminate against dalits and other women. They now talk about the need to provide education to both girls and boys equally. They now sit and eat together with dalits in public places. The social stigma of untouchability has reduced in the community.

I. UNINTENDED CONSEQUENCES

The most common unintended consequences of productivity-enhancing technologies are generally the adverse impacts on environment and human health resulting from increased use of chemical fertilizers and pesticides, as observed in the case of Green Revolution technologies introduced in the 1960s and the 1970s. Attempts were made to find out if similar consequences were emerging in the context of HMRP. The households in both the control and treatment groups were asked if they observed any increase in recent years in the incidence of insect-pest infestation in maize crop. The responses are summarized in Table 15 below. As generally expected, larger proportions of households in the treatment group irrespective of gender and caste/ethnicity reported increased insect-pest infestation in maize crop compared with the households in the control group.

Table 15: Increased insect-pest infestation in maize crop (% HH reporting)

Gender/caste/ethnic group	Treatment	Control
Female	69	33
Male	69	45
Dalit	89	36
Janajati	64	32
Others	68	41
All	69	37

Source: Household Survey

Normally, increased pest build-up leads to increased use of pesticides by farmers, and if the use of pesticides continues to increase haphazardly and without consideration of its possible negative side effects, this leads to a serious undesirable and unintended consequences. Attempts were made to examine the situation by asking the households about the trends in the use of chemical fertilizers and pesticides. The responses are summarized in Table 16.

Table 16: Increased use of chemical fertilizers and pesticides in maize production (% HH reporting)

Gender/caste/ethnic group	Increased use of chemical fertilizers		Increased use of pesticides	
	Treatment	Control	Treatment	Control
Female	55	36	8	3
Male	54	35	6	0
Dalit	59	42	4	0
Janajati	52	33	8	0
Others	56	36	9	4
All	55	36	8	2

Source: Household Survey

In both the treatment and control groups, the households reported increased use of chemical fertilizers over the years in maize crop. Such responses were more common in treatment than in control group. However, despite increased insect-pest infestation reported by the project households, as shown in Table 13 above, there was hardly any incidence of increased use of pesticides among those households, which is a matter of relief. But, considering the insect-pest situation, this does point to the need to educate and prepare farmers against any haphazard use of pesticides in the future.

J. Partnership and Linkages

The HMRP has clear partnership and linkages with NARC, and DOA through CDD, which coordinates the CBSP and DISSPRO implemented by DADOS. The "Mega Maize" program implemented by CDD requires 600 ton of maize seeds, the primary source for which is the CBSP of HMRP. The HMRP, by design, had aimed at establishing

close collaborative links with VSP and other SDC-funded projects.[22] The mechanism for such collaborative links identified at the design stage involved exchange of results and information through joint dissemination and training activities. While there is some interface between CIMMYT- HMRP and other SDC-funded projects in SDC clusters, the partnership and linkage with CEAPRED-VSP is fairly strong at both policy and operational levels. Both organizations participate in the SC of both projects and share project implementation modalities, including organization of cooperatives and pre-sowing contracts between the producer groups/cooperatives and the private traders. The two projects jointly supported the recent policy reforms in seed subsector.

K. Stakeholder Perceptions

Households

The HMRP varieties have increased the production and productivity of maize, resulting in increased income of dalits, women and poor families. The productivity of maize has almost doubled. The project has contributed to improved food security and nutritional status of its target group. Participation in the project has empowered women and DAGs. Gender and social inclusion, decentralization of source seed production, and participatory approaches to varietal development are some of the desirable features of the project.

The project has some shortcomings too, which need to be addressed in order to maximize the project benefits. The key areas that need to be considered in the next phase of the project include the following:

- Development of irrigation facilities to increase maize yields as well as to enable the households, especially DAGs, to grow other cash crops that would increase their household income and food security.
- Provision of storage facilities, including metal bins
- Improved crop protection practices against insects such as army worm and weevil and diseases such as gray leaf spot and stalk rot
- Support for farm machinery and other labor-saving devices to address the problem of labor shortage, especially during peak seasons

Focus Group Members

The HMRP is a successful project because of its reach to large number of poor and marginal households in different districts. The beneficiaries have been organized in CBSP groups/cooperatives, which provide the links between farmers and the private sector. A desirable feature of the project is that it has brought on board different institutions involved in research (NARC), development (DADO, NGOs, Cooperatives) and private business (seed companies, agro-vets, private firms). Although the project has empowered large number of women and DAGs, the CBSP groups/cooperatives have not received proper training on GESI approaches and tools, and on how these can be internalized by the organization.

The members of the focus groups suggested improvement in the following areas before the phasing out the project:

- Further training and skill development of CBSP groups/cooperatives in quality seed production, grading, packaging and labeling; and in GESI approaches and tools
- Seed pricing in favor of producers, and timely payment for seeds by private traders

[22] These include Sustainable Soil Management Project and Local Infrastructure for Livelihood Improvement Program, both funded by SDC and implemented by HELVETAS.

- Support for farm machineries that are suitable for hilly areas and that can be easily operated by women farmers (e.g. Chinese power tiller)

- Support to CBSP cooperatives/groups for grading machines and storage facilities

- Provision of insect-pest resistant maize varieties

Key Informants – Government Partners

So far the project has achieved encouraging results – socially, economically, and institutionally in terms of helping to put in place a decentralized source seed production system in Nepal. The HMRP's modality of involving government mechanism in fund management and project implementation is highly appreciated. However, the project needs to continue its support towards developing the capacity of its partners, especially the CBSP groups/cooperatives in order to sustain past achievements and maximize future impacts.

The CBSP cooperatives and groups have evolved over the past phases. Some 50 of them have been organized in the current phase, and hence, they are fairly new and may not sustain without further capacity building support. If the project is phased out and the current provision of revolving fund is withdrawn, the DAGs may find it difficult to continue seed production, particularly when payment for their seeds is delayed for 5-6 months. This will also limit their capacity to retain the seeds. There is also an issue of shortage of farm labor due to large-scale out-migration of youths, especially male. This has resulted in feminization and ageing of agriculture, and must be addressed urgently.

The project needs to pay increased attention to the following areas while designing future interventions:

- Focus on capacity building of CBSP groups/cooperatives in production, processing, marketing, and internal quality control, and on training in market-based seed production system and seed quality control.

- Improvement in packaging – such as packaging of seeds in containers of marketable size and quality (plastic sacks with aluminum coat inside)

- Focus on strengthening the seed supply system for all the three main cereal crops (rice, wheat and maize), not just for maize

- Link CBSP groups/cooperatives with big seed companies with formal contract agreements

- Expand the CBSP program in Terai districts, where there is relatively large scope for commercial maize production

- Provide training and skill development support to all project partners on GESI approaches, tools and practices, and how these can be internalized by the partner organizations

- Include intervention on research and development of hybrid maize, which appears to be the only way to substitute the growing imports and meet the requirements for feed and food within the country. There is no further scope to increase maize production by increasing maize area. Hence, large-scale increase in production must come through increased productivity per unit area, and this is possible only through hybrid varieties, which yield 2-3 times higher than improved open-pollinated varieties.

L. BEST PRACTICES AND LESSONS LEARNED

The HMRP introduced a number of different technologies and practices that led to what may be termed as best practices, few of which are presented in Annex II. The best practices highlight some of the project's impressive results and outcomes, which include increased productivity and income of its beneficiaries, including Dalits, janajati and women; improved food availability from own production, especially among Dalits; enhanced technical knowledge and skills of farmers in seed production and internal quality control; and improved nutrition and health

of children through consumption of quality protein maize. Similarly, the self-esteem and confidence of women has risen and their involvement in economic activities has increased. Women are now in decision-making positions in many groups/cooperatives, and discrimination against women and dalits is now becoming rare.

A number of important lessons are learned from HMRP. Some of the key lessons that are learned and that can be applied to other projects of similar nature are listed below:

- The CBSP provides an effective way to mobilize and empower women and poor farmers, including DAGs, in seed production.
- The CBSP provides an effective method to increase the access to and adoption of improved seeds by farmers, including the poor and DAGs.
- The CBSP can serve as a partnership model, and an institutional mechanism for mobilizing technical, financial and infrastructure support to seed producers from local bodies (VDCs/DDCs) and line agencies.
- Together, and in partnership, with the related public and private sector agencies, the CBSP can provide a strategy for decentralized source seed production, which can improve the timely availability of breeder and foundation seeds in the country.
- Pre-sowing contracts between CBSP groups/cooperatives can help strengthen seed marketing and also promote market-based seed production.
- The poor and marginal farmers benefitted from the project mainly through improved varieties, which significantly increased (usually doubled) maize yields, and in some cases, also contributed to improved nutrition.
- Intercropping of maize with ginger, vegetables and soybeans is highly profitable, especially for small and marginal farmers.
- Well-designed and implemented partnership approaches with the related government line agencies helped internalize and institutionalize the project achievements and strategies in NARC and DOA systems.
- Learning from other similar projects (e.g. VSP) helped adopt some of the already tested and validated strategies (e.g., pre-sowing contracts, cooperatives formation) in project implementation.
- Collective and coordinated actions of government, non-government and the private sector are necessary to increase (and sustain) project impacts.

M. EMERGING ISSUES

- ### SUSTAINABILITY

Undoubtedly, the project has made some important impacts on the community and on the lives of its target group. But whether these impacts will sustain if the project support is phased out is an issue, especially considering the current capacity of the project partners and other factors, as discussed below.

- Many of the CBSP groups/cooperatives are new and their technical and institutional capacity is limited to give continuity to the project activities. According to HMRP sources, only about a half of the CBSP groups that have the required technical capacity and skills in seed production and quality control will be able to sustain their activities, should the project be discontinued after the end of the current phase.
- Availability of foundation seeds of desired variety and in desired quantity is still a problem facing many CBSP groups.
- Truthful labeling and private seed certification are new developments that are yet to be fully institutionalized.
- More and longer-duration trainings – preferably a season-long training following the Farmer Field School model – are needed to develop the required technical skills of farmers in seed production and internal quality control.
- Private sector involvement is seed marketing is still weak. Pre-sowing contracts have started only recently since 2012. A major bulk (more than half) of the CBSP seeds is marketed by government program (e.g., Mega Maize).

- **SOCIAL AND GEOGRAPHIC TARGETING**

Socially, the project has been largely successful in targeting the poor and DAGs. But, given the small size of their holdings, it may be difficult for such families to sustainably adopt commercial seed production as a viable business and as an option for improved livelihood. This also has implication on the scale of business for private sector seed marketing and on the seed retention rate. Geographically, there is a large unmet demand for maize seed and maize grain in Terai. Large quantities of hybrid maize are imported to Nepal to meet the demand of feed industries, mostly located in Terai.[23]The value of maize imports rose from Rs 1.4 billion in 2009/10 to Rs 2.3 billion in 2010/11.[24] The value of maize imports more than doubled to Rs 4.73 billion in 2012/13, with corresponding increase in the volume of imports from 136,000 tons to 241,000 tons during the period.[25]Officially, the import of maize seeds increased from 458 ton in 2008/09 to 978 ton in 2009/10.[26] In the case of hybrid maize seed, almost all of which is currently met by imports, the estimated requirement is projected to grow from 1,275 ton in 2010 to 3,750 in 2025. The quality of imported hybrid maize seeds is not always reliable, as faced by maize farmers in Terai this year and two years ago.

- **INADEQUATE MONITORING DATABASE**

The HMRP does not maintain adequate and updated database on critical outcome indicators of the project, such as changes in the level of technology adoption, household income and food security. Lacking such data, it is difficult to monitor and measure the progress towards achieving project goal.

- **Shortage of Farm Labor**

The large-scale and continued outmigration of youths, mainly male, has left farming in the hands of women and the aged population, and it is causing a serious labor shortage in rural areas, especially during peak agricultural seasons. This may have adverse consequences on maize seed production as well as on women's workload, who are already over burdened by other work in farm and household chore.

- **Weak Role of Private Sector in Seed Marketing**

The involvement of private sector in seed marketing is still in the initial stage, and the share of marketable surplus seed handled by the private sector is still small. The engagement of private sector in seed marketing started in the current phase, and the pre-sowing contracts were introduced even more recently, in 2012. The private sector marketed about one-third of CBSP seeds in 2012, and signed pre-sowing contracts with CBSP groups/cooperatives for less than one-fifth of the total quantity of seeds produced in 2013. About 300 ton (or 30% of total production) of CBSP seeds could not be marketed in 2012. Seed prices were not negotiated and set at the time of pre-sowing contract, and there were cases of breaching of contracts from both the buyers' and producers' sides. There were also concerns that private traders were usurping the marketing margin by selling seeds at much higher than buying prices.

- **Low Seed Productivity and Retention Rate**

According to informed knowledge, the farmers should be able to achieve a maize seed productivity rate of more than 3 t/ha – at least an average of 2.5 t/ha – from the new varieties. But the actual average seed productivity is

---

[23] Reportedly, some 60 to 90 tons of hybrid maize are imported daily to meet the demand of feed industries.
[24] *The Kathmandu Pos*t, 13 February 2012
[25] *Karobar National Economic Daily*, 12 June 2013
[26] *My Republica*, 11 May 2011

less than 1 t/ha, and the seed retention rate is 83%.[27]A study conducted by the CDD suggested that only about 35% of the total seeds produced was recycled as seed. The main reasons for such low seed productivity and retention rates include high post-harvest losses (of about 40%), and delayed marketing of seeds and delayed payment to seed producers. The latter reason is particularly serious for the DAGs, who are facing serious food shortage.

- **Unclear Links with Local Government Bodies**

Although the project has been able to mobilize local bodies' resources and support for CBSP in some districts, there is no clear mandate and strategy to link CBSP with local government bodies (VDCs/DDCs), which are responsible to coordinate, regulate, monitor and facilitate all development activities at the local level.

- **Weak Cross-Project Linkage and Synergy**

In recent years, with growing emphasis on seeds for increasing productivity, external support in seed subsector has increased and a number of on-going projects funded by various donors are focused in varying extents on seed production in the hills.[28]However, there is no clear linkage and synergy between HMRP and these projects, except the SDC-funded Vegetable Seed Project (VSP). There is a strong coordination and linkage between HMRP and VSP at both policy and operational levels.

- **Possible Side-Effects of Technologies**

The improved varieties and conservation technologies introduced by HMRP have positive impacts on yield. So far there are no negative side effects reported, but caution should be exercised to avoid the possible danger of increasing the use of pesticides to control insect-pests and herbicides to control weeds in the future.

[27] CIMMYT-HMRP (2013)
[28] See Annex II for some of the on-going donor-funded projects

CONCLUSIONS

The project has made significant contribution towards improving the supply of maize seeds in Nepal. The quantity of maize seed produced through CBSP has increased over the years and presently meets 30% of the total demand in the hills. The quality and timeliness of seed supply has improved; and maize area, production and sale have increased, especially in the project areas. The SRR has more than doubled in the past six years.

The HMRP has positively contributed to maize technology development and dissemination. The new varieties developed with HMRP assistance have shown high and stable yield performance, are tolerant to major insects-pests, and are widely adopted by farmers, irrespective of gender and social groups and land holding size. Non-project households have also adopted the new varieties, but the level of adoption varies across districts. The project has also introduced maize-based technologies and practices that improve soil fertility and contribute to biological control of insects.

There is a fairly high level of government engagement in planning, implementation and monitoring of HMRP activities. At the planning and policy level, the SC is the highest body chaired by the Secretary of MOAD and represented by other government agencies. Several NARC stations and DADOs participate as project implementing agencies. The project has also adopted additional measures, such as annual planning workshop and "Traveling Seminar", to involve government officials in project planning and monitoring.

The project contributed to seed policy reforms that have paved the way for decentralized source seed production and seed quality control. HMRP's experiences with CBSP and participatory variety selection approaches have been instrumental in revising the operational guidelines of CDD, and in integrating the CBSP and DISSPRO into the regular programs of the MOAD/DOA. The project has also contributed to capacity development of its partners in both public and private sectors in seed quality control.

Efforts have been made to develop the capacity of project partners – government agencies, NGOs and the private sector – through technical training, and financial and material support. Yet, from the point of view of sustaining the program activities in the absence of external funding, there are areas where the capacity of CBSP cooperatives/ groups is still weak and needs further strengthening, especially in market-based seed production system, post-harvest processing, marketing, and internal quality control. The capacity related issues stem from both the internal factors – such as the limited technical, financial and institutional capacity – and the external factors, such as the shortage of farm labor due to large-scale outmigration of rural youths.

Being a knowledge-oriented project, it is difficult to measure the cost effectiveness of HMRP. The project management cost, which includes the cost of an internationally recruited CIMMYT scientist, constitutes nearly a third of the project fund. While this has increased the cost, this has benefited the project from the international scientific knowledge, experience and germplasm from CIMMYT.

The project had a significant impact on technology adoption, maize productivity and income of the participating households. There was no significant difference between the treatment and control group in the level of food self-sufficiency from own production, mainly because the households in the control group produced other high-value commercial commodities, such as vegetable crops and vegetable seeds, that raised their income at par with the treatment households.

The project has empowered the women and DAGs. Many women, including from the DAGs, have assumed a leadership role. Participation in the CBSP has increased their incomes and their food security has gone up by at least 3 more months. They take part in many technical and decision-making activities. Their confidence level has increased and they now sit and eat together with dalits in public places.

So far there are not any significant unintended consequences of the project. Although the project households reported increased insect-pest infestation over the years, there are no indications of increased use of pesticides in

maize crop. But caution should be exercised in the future to avoid the possible danger of increasing the use of pesticides to control insect-pests and of herbicides to control weeds.

All the respondents agreed that the project had empowered women and DAGs, and increased maize productivity and production, resulting in increased income and food security of the beneficiaries. But they also pointed out to some shortcomings and suggested that future interventions should support capacity development of CBSP cooperatives, especially in post-harvest processing, marketing and quality control, and of other partners in GESI tools and approaches; decentralization of source seed production; mechanization, and development of irrigation and storage facilities; strengthening of seed supply system for all the three main cereals (rice, wheat and maize); expansion of geographic coverage to Terai; and research and development of hybrid maize.

As discussed above, there are some important lessons learned and issues emerging from the implementation of HMRP. The key lessons learned are that the CBSP is an effective strategy to promote inclusion, partnership with local bodies, decentralized source seed production and seed marketing. Other lessons learned are those that provide insights into how the project benefits can be maximized and sustained. The issues that need to be addressed include sustainability, targeting, inadequate monitoring database, labor shortage, weak role of private sector in seed marketing, low seed productivity and retention rate, weak cross-project linkage and synergy, unclear links with local bodies, and possible side effects of technologies.

RECOMMENDATIONS

In order to consolidate and scale up the past achievements and also to sustainably meet the growing domestic demand for food, feed and seed, there is a need to continue external funding in maize. In the light of the findings discussed above, the following measures need to be adopted in designing future interventions in order to maximize the contribution to sustainable development and growth of maize seed industry in Nepal.

Adopt a Coordinated and Subsector Development Approach

There is a rising trend of external donor support to projects that aim at improving seed supply in Nepal. However, most of these projects are operating independently with little or no cross-project learning and synergies. In this context, adopting a coordinated and subsector development approach to formulation and implementation of future support will provide an effective way forward for developing Nepal's seed industry in an efficient, effective and sustainable manner. While donors and development partners should more effectively and regularly share their lessons learned and support strategies, MOAD will need to play a proactive role in streamlining and harmonizing external support in seed subsector to avoid duplication and ensure synergy among different projects/programs.

Support Decentralization of Source Seed Production and Seed Quality Control

Source seed production was the mandate of government farms and stations, and the supply was unreliable. Recent reforms in seed policies have opened the mandate to non-state actors also. In the spirit of these policy reforms, source seed production should be fully decentralized and entrusted to NGOs and the private sector. Trained experts from both within and outside the government must be licensed to carry out the seed certification and inspection activities. The primary focus of NARC should be on research and development of new varieties, both open-pollinated and hybrid, as well as on minimizing the post-harvest and processing losses, which currently are very high.

Support Development of Hybrid Maize

While the open-pollinated varieties will continue to dominate maize varieties in the hills, most parts of the Terai are already under hybrid varieties, the demand of which will grow even faster in the future. Hybrid varieties give much higher yields than open-pollinated varieties, and are gradually spreading in the hills also. Most of the maize

produced in Terai and almost the entire maize imported to Nepal are hybrid maize. The growing demand for hybrid maize seeds is met by increased level of imports and the quality is not always reliable. In order to substitute the import of maize seeds and grains and also to meet the future growth in demand for maize for food and feed, a greater attention must be paid to research and development of hybrid maize in Nepal. It is not possible for NARC alone to develop and maintain all the hybrid lines. Hence, it is necessary to engage NGOs and private sector too in research and development of hybrid varieties.

Strengthen the Capacity CBSP Partners

In order to sustain the past achievements as well as to decentralize and strengthen source seed production, the current capacity of all the CBSP partners –government, NGOs and the private sector, including the cooperatives, agro-vets and seed companies – needs to be strengthened. But a greater attention must be paid to developing the technical, physical (infrastructure) and institutional capacity of the CBSP groups and cooperatives.

Support Value-Chain Development

Sustainable development of seed subsector hinges on the sustainable development and growth of the commodity under consideration, and the latter will not be achieved without developing the commodity value chain. Hence, it is necessary that future support be focused on value-chain development, especially on post-harvest processing, storage, quality control, and marketing.

Integrate CBSP into the Program and Budget of Local Bodies

The local bodies (VDC/DDC) are responsible to plan, monitor, coordinate and facilitate development at the local level and are also mandated to allocate at least 15% of their annual budget to agriculture. Integrating CBSP into their annual program and budget will be necessary to ensure sustainability and growth of CBSP. This will also serve as part of the strategy for developing the capacity of the CBSP groups/cooperatives.

Extend Geographic Coverage to Terai

Maize is still largely a food crop in the hills, but it is a commercial crop in Terai, which is and will continue to be a major supplier of hybrid maize to be used as feed and as raw materials for other processed food products. Given the relatively higher scale of production and a larger volume of seed business (and economic returns), Terai can more easily attract the private sector than hills. In view of this and also other factors discussed above in relation to hybrid maize development, future support should extend its geographic coverage to Terai.

Implement a Special Support Package for DAGs

Given the small size of holdings and the pressing economic and livelihood support needs of the DAGs, more particularly dalits, their continued involvement in CBSP may be doubtful, mainly because the seed production activity alone may not generate enough to meet their daily subsistence and livelihood needs. In such cases, the seed retention rate may also be reduced, particularly if the seed is not sold and cash payment is not made timely. Hence, for such households, it is necessary to design and implement a special support package, which may include technical and financial support for creating a revolving fund, developing micro-irrigation, and implementing income-generating activities.

Introduce Mechanization and Women's Time Saving Measures

In the context of large-scale outmigration of youths resulting in serious shortage of farm labor in rural areas, mechanization has become a necessity to minimize the adverse impacts on farm production and productivity.

Introduction of mechanization and other measures to save women's time, as part of future interventions, will help reduce women's workload, which has increased due to rural outmigration.

Strengthen Monitoring and Database

An effective monitoring system and a proper and regularly updated database are important parts of project implementation strategies, and must be given due emphasis while designing future interventions. Maintenance of gender and socially disaggregated database will help objectively monitor and keep track of the expected outcomes and outputs of the interventions.

Strengthen Gender Equity and Social Inclusion Capacity of Project Partners

The project partners lack adequate technical and institutional capacity to analyze gender and social inclusion issues. There is a need to provide training and skill development support to all project partners on GESI approaches, tools and practices, and on how these can be internalized by partner organizations.

ANNEXES

ANNEX I: EVALUATION STATEMENT OF WORK

External Evaluation for Hill Maize Research Project (HMRP)

Project Document/ToR

1. Purpose:

This purchase order (PO) is for an external evaluation of Hill Maize Research Project (HMRP), jointly funded by USAID/Nepal and Swiss Agency for International Development and Cooperation (SDC). USAID/Nepal received an unsolicited application from International Center for Maize and Wheat Improvement (CIMMYT) to support the fourth phase of "Hill Maize Research Project (HMRP) - "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" on May, 2010 for its IVth phase[1]. HMRP-IV is a four-year, $5.65 million project that includes $2 million from USAID/Nepal and $3.65 million from SDC, designed to respond to food insecurity and income constraints of farm households in the hills of Nepal, especially focusing on poor and disadvantaged groups (DAGs)[2]. This project includes the interventions on promotion and dissemination of maize based improved technologies[3] to enhance productivity and marketing opportunities as well as support public sector institutions (National Seed Board, Nepal Agriculture Research Council and Department of Agriculture) to enforce quality control through both public and private institutions. HMRP's primary beneficiaries are disadvantaged groups, women and poor in the 20 mid hill districts in Nepal. The fourth phase of the project started in September 2010 and ends in August 2014. This evaluation will examine the effectiveness of the HMRP interventions, and document lessons learned and good practices that can be shared with the Government of Nepal (GoN), USAID and SDC to improve development learn and future programming. In addition, the evaluation will serve as a basis to design the potential fifth phase considering the rapidly changing rural context. The scope of the evaluation is guided by the evaluation questions in Section 6.

2. Project Context:

Maize is the most important food crop in the hills of Nepal, where it is grown mainly by small-scale, resource-poor farmers. It is the traditional crop, cultivated as food, feed, fodder and fuel. After rice, maize is Nepal's most important cereal, both in area under cultivation and in total production. The crop is currently cultivated on approximately 0.875 million ha with an average yield of 2.5 t/ha (MoAD, 2012). In the hills, where 78% of the maize in Nepal is grown, the strategic importance of the crop in food security is summarized in the common proverb: ***"If there is no maize, there is nothing to eat."*** Many resource-poor farmers in Nepal greatly rely on maize grain for their food, income and employment. However, as a result of poor yield and productivity, the per capita availability of food grains has decreased (Paudyal et. al., 2001). One of the major reasons for the low and stagnant maize yield is that farmers have less exposure and access to improved technologies. Moreover, the crop is mostly grown under rainfed conditions.

The Hill Maize Research Project (HMRP), initially funded by the Swiss Agency for Development and Cooperation (SDC), was begun in 1999 with the objective to increase the food security of farm families in the hills by raising the productivity and sustainability of maize-based cropping

---

[1] Earlier three phases has been funded by SDC only
[2] Disadvantaged Groups are defined as groups suffering simultaneously from poverty and discrimination
[3] Technology here refers to a package inclusive of inputs such as varietal development, agronomic practices, information and market management

systems. The current fourth phase of the project has reversed the ratio of research versus development (dissemination/validation, seed production) of about 80% to 20% given to project activities during Phase I, to about 20% research and 80% development during the new phase. This change occurred in response to the urgent need to disseminate and promote the adoption of farmers selected technologies for the benefit of the hills poor and DAGs. The primary research and development partners are the Department of Agriculture (DoA), the National Agricultural Research Council (NARC) under the Ministry of Agricultural Development (MOAD), several NGOs with strong presence in key districts in the hills of the country, the private sector (Agrovets, etc.), and the International Maize and Wheat Improvement Center (CIMMYT). Funding for the project being was provided by SDC and USAID.

3. Development Hypothesis:

If the disadvantaged communities in the mid hills in Nepal are mobilized to produce quality maize seed and the capacity of the private and the public sectors are enhanced in order to place the appropriate seed system in the country, farmers are more likely to increase maize production and productivity through a sustained and participatory seed management system, resulting in increased income and improved food security for rural farm households.

4. Project interventions and achievements:

The vision for HMRP is that all the farmers in the targetted districts will have improved food security and livelihood options through the sustained access to quality maize seed of locally adapted, farmers-accepted varieties and improved resource conserving technologies. The goal of HMRP is "Farm households in the hills of Nepal, especially of poor and disadvantaged groups, have improved food security and income".
HMRP is aimed at improving food security and livelihoods of poor and DAGs in the hills of Nepal by up-scaling and consolidating past phases achievements. The impact made by project partners is maximized by selective intensification of key project activities; capacity of partners is strengthened and facilitated to continue and build on the project achievements.
In order to achieve the goal of reaching more farmers from poor and disadvantaged groups in remote areas of Nepal, while narrowing the gap between supply and demand for improved maize technologies in the hills, HMRP has focused on the following interventions:

- Institutionalization of priority technologies for research and dissemination by the end of the current phase;
- Promote sustainable maize seed production and marketing system in the hills of Nepal (formation of several maize villages) and foster wider adoption of improved maize varieties and resource conservation technologies (formation of several FAMPARE[4] villages) for sustainable food security, nutrition and livelihood of hill farmers;
- Build capacity of partners and mobilize collective works to achieve the agreed priorities;
- Foster the inclusive development and make policy makers mainstreamed and aware of the importance of Gender Equity and Social Inclusion (GESI) in their research and extension services;
- Enhance strategic linkages and synergies with the SDC-funded vegetable seed project to encourage maize farmers to produce maize and vegetable seeds as an intercrop as well as policy lobby for seed sub sector promotion;
- Conduct field level training to the farmers focusing on poor and DAGs;

[4] Farmers Participatory Adoptive Research and Extension

- Build capacity of scientists and development workers on participatory crop improvement and variety selection, resource conserving technologies, seed multiplication and marketing, gender and social inclusion, etc.;
- Target food chronic areas in the hills such as, west, mid-west and far west regions of Nepal, including SDC's and USAID's strategic focus of food deficit hill districts;
- Promote and decentralize source seed production system in the hills of Nepal;
- Facilitate the State institutions such as VDC/DDC to allocate resources for maize based farming system in its periodic and annual plan and performance measures;
- Facilitate seed truthful labeling procedures, and
- Assist community seed producers to develop community managed seed related infrastructures of modest level and establish commercial relationships with seed traders.

The project has following two broad outcomes:

Outcome 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.

Outcome B: National Seed Board (NSB), NARC and DoA enforce quality control of seed through both public and private institutions

Key project achievements

The major achievements of the HMRP IV are summarized below:

Achievements under Outcome A:

- National Maize Research Program and Community Based Seed Production program met 30% of national OPV maize seed demand of 5,086 ton by producing 1,250 tons of seed produced by 195 CBSP groups for the area of about 1,150 ha.
- 45,000 households used new maize varieties and improved technologies. About 60% of these households are from Disadvantaged Communities (DAG).
- 195 CBSP groups (6,000 HHs with 50% women and 50% DAGs representation) engaged in seed multiplication and at least 40 of them developed commercial seed businesses.
- 10,000 HH produce Quality Protein Maize.
- In terms of inclusiveness, 55% women and 65% DAGs represented in CBSPs and 60% women and 70% DAGs represented in participatory research and extension activities.

Achievements under Outcome B:

- 27 CBSP groups started producing source seed which otherwise was mandated only to the public sector institutions only. Preparation of directives and procedures for decentralized source seed production is in process.
- 200 NARC breeders, DADO's Subject Matter Specialist (SMS) and private sector experts (at least 38 women and 10 from private sector) are trained and authorized for field inspection, sampling and seed testing by the Government of Nepal.
- 4 maize varieties including 1 QPM have been released.
- Contribute to develop participatory seed production guideline

5. The Evaluation: Purpose, Audience and Use:

The primary purposes of the evaluation are to:

- Examine the contribution of HMRP towards the livelihoods of beneficiaries and assess how the latter beneficiaries assess the interaction of HMRP with them.
- Assess how gender and social inclusion was reflected in HMRP
- Examine how program sustainability (local continuity and ownership) has been taken into account and implemented
- Examine the effectiveness of the HMRP's approach for engaging host country government mechanisms in fund management and project implementation to achieve the intended results.
- Assess the effectiveness of HMRP and institutional framework in achieving sustainable results in terms of both farmer's access and adoption of improved technologies and policy changes required for the decentralized quality seed system
- Assess whether HMRP is aligning with government policies and whether public and private institutions have capacity to maintain coherence so as to ensure sustainability.
- Identify and document good (or best) practices and lessons learned and factors that influenced program effectiveness.
- Identify and examine unplanned consequences, both positive and negative of the program.
- Provide recommendations and direction for implementing multi-stakeholder agriculture programs between GoN, donors, NGO and private sector.

With these purposes in mind, the evaluation team must tailor recommendations so that they improve the development learning and future programming for GoN, USAID and SDC.

The audiences for the evaluation report are the GoN, CIMMYT, SDC and USAID/Nepal. Lessons learned from the evaluation will benefit the GoN, implementing partners for both SDC and USAID, other donors and local organizations that are planning and implementing agriculture development programs and projects by engaging host country systems. Learning from HMRP should also help both USAID and SDC in Nepal to increase understanding around demand driven approaches for technology promotion and dissemination, capacity building to work towards local and national government priorities, adaptation in the changing context of migration, climate change and market structure and commercialization of maize crop. Specifically, the lessons learned and best practices for GoN, USAID and SDC will be instrumental in informing the implementation approaches for their existing initiatives.

The evaluation questions in the next section will further define these areas.

6. Evaluation Questions:

The external evaluation will focus on achievement of all the eight outputs under two outcomes of HMRP. The evaluation must be framed in order to answer the key evaluation questions listed below.

1) What is the contribution of HMRP towards maize seed production and commercial distribution in Nepal?

2) To what degree were the varieties released by HMRP adopted by the farmers?

3) How successful was HMRP in engaging and contributing to the host country government at the central and local levels in project planning, implementation and monitoring?

4) How has HMRP supported work on policy provisions to support maize promotion in Nepal in terms of varietal and technological advancement, extension and scaling up to different geographic regions?

5) To what degree have participating institutions (GON, Cooperatives, NGOs and the private seed companies) demonstrated capacity to sustain program activity once funding ends, bearing in mind the transformation of the agriculture economy taking place because of population dynamics such as internal mobility and outmigration of youths from rural areas ?

6) How cost effective is the project management and the Institutional control management system?

7) From the vantage point of Nepal's Agriculture Development Strategy and its Three Year Plan, what opportunities and challenges exist beyond the current scope for new intervention area/s that would enhance the impact of HMRP (both geographic and thematic)?

7. Evaluation Method:

The evaluation methodology should have an appropriate balance of quantitative and qualitative methods and procedures. Some of the possible methods include secondary data analysis, focus group discussions, interviews and surveys. Information can be collected through a review and analysis of secondary information paired with collection and analysis of primary information. Triangulation of findings will be required to address inherent bias.

HMRP Phase IV was a unique project in terms of implementation the approach through a wide range of implementing partners. A desk review must include design and project documents (e.g. planning performance reports). The core indicators, targets and achievements identified in the project log frame will provide limited information on project outputs and progress. Evaluators should specifically look for additional results-oriented information.

Semi-structured interviews with focus groups and key informants can be interspersed for flexibility and efficiency. For quantitative methods, the process must fulfill adequate statistical rigor and data should be disaggregated by gender. Round tables and short workshops might also be appropriate for assessment and learning with implementing partners, the GoN, SDC and USAID staff, NGOs, the private sector, and other relevant donors. Evaluators should rely on a number of sources and techniques to answer the evaluation questions and propose appropriate qualitative and quantitative methods. Evaluators should select representative project sites, beneficiaries and activities independently for data collection.

The evaluation team is required to make a presentation of its evaluation methodology including all the tools and instruments that will be used for data collection to the SDC and USAID/Nepal team before finalizing the methodology.

8. Performance Information Sources:

Documents for desk review will be made available and include the following:

- GoN policies, plans and regulations related to agriculture, seed production and work in maize.

- SDC and USAID country cooperation Strategies, Project Documents, Statement of Work, Project Log Frame and Yearly Operational Plans
- Annual report, Half Annually Report, Outcome Monitoring Summary,
- Success stories.
- Audit reports

These documents will be made available at the start of the assignment. The evaluation team will consult with following stakeholders and others as necessary:

- Direct and indirect beneficiaries
- Community members
- District Coordination Committee, Secretaries of selected VDCs
- Local Development Office (LDO)
- District Agriculture Development Office
- HMRP staff
- Crop Development Directorate
- Agriculture Research Station
- Nepal Agriculture Research Council
- Swiss Agency for Development and Cooperation
- District Development Committees/DADC
- Village Development Committees/AFECs
- Staff of selected other donors and INGO staff
- USAID SEED team
- Seed companies and distributors that purchase and distribute HMRP facilitated seed

9. Work Schedule

Activities	January	February				March				April	
	IV	I	II	III	IV	I	II	III	IV	I	II
Team meetings: Planning, discussion on methodology and sampling framework, preparation of draft checklists and questionnaires											
Review of documents, initial round of meetings with project staff, USAID, SDC and NARC, preparation and finalization of plan of work and methodology											
Orientation and training of enumerators, pre-testing and finalization of questionnaires, and deployment of enumerators											
Survey (Household, key informants and focus-groups), and identification and preparation of case studies and lessons learnt											
Data entry and analysis											
Interpretation of findings, Team discussion and agreement on the structure and contents of draft report											
Presentation of initial findings, conclusions and recommendations (including preparation of preliminary draft report)											
Preparation and submission of draft final report											

- Annexes: SOW, evaluation methods, schedules, interview lists and tables in succinct, pertinent and readable formats. Should also include any "statements of differences" regarding significant unresolved difference of opinion by funders, implementers, and/or members of the evaluation team.

5. Within five days of receiving the comments on the draft report, the evaluation team will submit to the COR the final evaluation report: two hard copies of evaluation report, 30 pages, excluding graphs, diagrams, tables, annexes, cover pages, and table of contents, with good quality spiral binding.

   The evaluation report should demonstrate a clear line of analysis between findings, conclusions and recommendations. The report must be in concise and clear English with visual summaries such as graphics, charts and summary data tables. The evaluation report should meet the criteria outlined in the Evaluation Report Review Sheet in Annex 3.

6. A soft copy of evaluation report, in MS Word and PDF format.

7. Raw data and records of the evaluation report (e.g. interview transcripts, survey responses etc.) in electronic form collected by the evaluation team separately from the report.

The Team Leader has the final responsibility for prioritizing which conclusions and recommendations are highlighted in the report. If there are additional recommendations or alternatives in addition to those highlighted, they can be included in an annex.

Different perspectives or subject matter expertise within an evaluation team will sometimes lead to a different interpretation of facts. Footnotes may be used to draw attention to different interpretations of findings.

11. Contract type and payment schedules:

This is a firm-fixed Price Contract/Purchase Order. A firm-fixed-price contract provides for a price that is not subject to any adjustment on the basis of the contractor's cost experience in performing the contract. Payments will be made upon successful completion, submission, revision and acceptance of the required deliverables in section 10 by SEED Office.

The Contractor shall submit an invoice along with the "Public Voucher SF-1034" to the Office of the Controller (OC) for payment indicating the purchase order number and description of services. Invoices may be submitted electronically to payments-kathmandu@usaid.gov. OC, pursuant to FAR Clause 52.232.25 "Prompt Payment", will make payment close to 30 days in consideration of services rendered and as required by this order and accepted by SEED. The Contractor will be paid in the total amount of US Dollars 53,790 (NPRs 5,364,477) as per the below plan. The Consultant team leader/firm (contractor) will be responsible for all the payments for the consultants working with him/her or with the firm for the evaluation.

SN	Deliverables	% of total cost to be paid	Organization responsible for payment
1	Deliverable no 1 and 2	40%	USAID/Nepal
2	Deliverable no 3, 4 and 5	30%	USAID/Nepal
3	Deliverable no 6, 7 and 8	30%	USAID/Nepal
	Total	100%	

12. Budget :

Accounting and Appropriation Data:

Program Area	Program Element	Obligation Record No.	BFY Fund Code	Start BFY	End BFY	Total (US$)
A26	A140	367018202GDO13	DV/-GFSI/2011/2012	2011	2012	2,994.52
A26	A140	367018201GDO12	ES/2010/2011	2010	2011	48,189.48
A26	A140	367018202GDO12	DV/2011/2012	2011	2012	2,606.00
						53,790.00

13. Terms and Conditions of the Consultancy:

Each member of the evaluation team will be required to sign a Non-Disclosure Agreement (Annex 1) and Disclosure of Real or Potential Conflict of Interest for USAID evaluations (Annex 2).

14. Competition limited to local entities:

As authorized under Section 7077 of Public Law 112-74, the Consolidated Appropriations Act, 2012 (P.L. 112-74), "Local Competition Authority," USAID/Nepal limits this competition to local entities.

Local entity means an individual, a corporation, a nonprofit organization, or another body of persons that—

(1) is legally organized under the laws of Nepal;
(2) has as its principal place of business or operations in Nepal; and
(3) either is—
(A) majority owned by individuals who are citizens or lawful permanent residents of Nepal; or
(B) managed by a governing body the majority of whom are citizens or lawful permanent residents of Nepal.

"Majority owned" and "managed by" include, without limitation, beneficiary interests and the power, either directly or indirectly, whether exercised or exercisable, to control the election, appointment, or tenure of the organization's managers or a majority of the organization's governing body by any means. Additionally, at least 50 percent of the cost of contract performance incurred for personnel must be expended for employees of the prime/local entity.

By submission of an offer and execution of a contract, applicants represent that they are local entities and agree to the limitation on subcontracting above. Applications from entities who do not meet this definition will not be included in the competition.

15. Composition of the Evaluation Team:

The evaluation team will be made up of at least four non-USAID and SDC development professionals with expertise in project evaluation and agriculture development, as described below. The lead for the evaluation will be led by a highly experienced foreign national with extensive knowledge and experience leading and conducting project evaluations and evaluation methodologies with experience in agricultural development projects. One member must be an agriculture expert and one member must have expertise on inclusive agri-business management. There should be both male and female members in the evaluation team. The team will also include the participation of a representative from the MOADs Monitoring and Evaluation Division. The evaluation team members should not be employees of any of the organizations that are receiving funds from the HMRP.

Following paragraphs specify requirements and responsibilities for the Team Leader, Agriculture Expert and Seed Marketing expert.

Team Leader: The Team Leader must have a minimum of Master's Degree in relevant areas and at least 10 years of relevant research experience as a lead with proven experience in agriculture and evaluations of development projects. S/he must have excellent written and spoken English language skills as well as demonstrated knowledge and application of the proposed team evaluation methodology. The Team Leader will have the authority and responsibility to conduct and manage the evaluation and submit deliverables to USAID/Nepal. He or she will be contracted out by the local organization. The responsibilities include: technical leadership for and supervision of team members; quality control and timeliness of all deliverables; preparation or supervision of evaluation methodology, logistical plan, data collection, and report preparation; serve as a primary point of contact for the evaluation team to USAID Agreement Officer and his/her representative. The Team Leader will lead the presentations to USAID/Nepal and other stakeholders on the findings, conclusion, and recommendations of the evaluation.

Agriculture Specialist: The candidate must have at least ten years of experience in the agriculture sector, preferably experience on community based development and work on participatory based research and/or community based seed production (CBSP). S/he must have extensive experience in project evaluation.

Seed Marketing Specialist: Master's Degree in related area, with at least seven years of experience in seed marketing and private sector with proven experience in managing agriculture projects including evaluation. The Seed Marketing and Private Sector Specialist will work with the team to develop evaluation methodology and evaluate the appropriateness and effectiveness of project interventions on commercialization of seed marketing. S/he should have a good knowledge of cereal seed production and distribution system in Nepal. The Seed Marketing and Private Sector Specialist will interact with subcontractors, the private sector, local NGOs on various aspects of maize seed production and marketing of the program implementation, including planning, design, implementation, sustainability, and best practices.

GoN Representative: The individual will have experience in monitoring and evaluation of agriculture programs and will be nominated from within MOADs Monitoring and Evaluation Division.

16. Logistics:

The Contractor is responsible for managing all logistics required for completing the evaluation. This includes but is not limited to arranging for transportation, meeting venues and appointments for meetings. CIMMYT or its sub-contractor staff may assist in organizing meetings. USAID/Nepal and SDC will provide at least one copy of the HMRP planning and reporting documents and may provide other reference materials as required.

USAID/Nepal and SDC Participation

USAID/Nepal and SDC staff may join the evaluation team as and when necessary. USAID/Nepal staff may participate as an additional member of the team during primary data collection, specifically during Semi Structured Interviews with focus groups, key informants, implementing partners. The USAID/Nepal and SDC team participants will manage their own logistics through close coordination with the Team Leader. To ensure against bias or conflict of interest, the USAID/Nepal and SDC team members role will be limited to participating in the fact-finding phase, and contributing to the analysis. The final responsibility for analysis, conclusions and recommendations will rest with the independent members and Team Leader.

17. Reporting and Dissemination:

The evaluation team must provide GoN, USAID/Nepal and SDC with at least two original hard copies in good quality spiral-bound documents and one electronic version of the presentation and the final report. The electronic version of the final report should be provided in MS Word and PDF format including the raw data and records should be given to the AOR as mentioned above under Deliverables.

The final, approved report must be entered in the Development Experience Clearinghouse database (DEC). The evaluation team leader is responsible for submitting the final, branded and approved report into the DEC. Please see <https://dec.usaid.gov/> for instructions on how to submit reports into the DEC database.

18. Technical Direction:

Technical directions for this work will be provided by the COR/in country point of contact. Technical directions, as used herein, are directions to the Contractor that fill in details, suggest possible lines of inquiry, or otherwise complete the general scope of work. Technical directions must be within the terms of this PO, shall not be changed or be modified in any way, and shall not constitute changed within the meaning of the clause FAR 52.243-4 Changes (Jun 2007).

Note: The Contractor must notify the Contracting Officer through the COR/POC of any changes in the performance of the contract per FAR 52.243-7 Notification of Changes (APR 1984).

19. Purchase Order Clauses:

This purchase order incorporates one or more clauses by reference, with the same force and effect as if they were given in full text. Upon request, the Contracting Officer will make their full text available. Also, the full text of a clause may be accessed electronically at this address: http://www.arnet.gov.

Drug-Free Workplace, FAR 52.223-6
Availability of Funds, FAR 52.232-18
Prompt Payment, FAR 52.232-25
Changes-Fixed-Price, FAR 52.243-1
Termination for Convenience of the Government (Fixed-Price), FAR 52.249-2
Excusable Delay, FAR 52.249-14

20. Executive Order on Terrorism Financing (FEB 2002):

The Contractor/Recipient is reminded that U.S. Executive Orders and U.S. law prohibits transactions with, and the provision of resources and support to, individuals and organizations associated with terrorism. It is the responsibility of the contractor/recipient to ensure compliance with these Executive Orders and laws. This provision must be included in all subcontracts/subawards issued under this contract/agreement.

Acknowledgement:

INSTITUTE FOR INTEGRATED DEVELOPMENT STUDIES
Kathmandu

ANNEX II: EVALUATION METHODS AND CONTEXTS

A. Propensity Score Matching (PSM) Method

The impact of treatment on individual HH is estimated as δi, which is the difference between outcomes with and without the treatment and can be expressed as[29]

$$\delta i = Y1i - Yoi \quad \text{Eq 1}$$

1 and 0 correspond to the treated and untreated observations, respectively

The average treatment effect (ATE) can be estimated as;

$$ATE = E[\delta i] = E(Y1 - Yo) \quad \text{Eq 2}$$

The average treatment effects of treated (ATT), which measures the impact of development intervention on farmers who participated the program, can be expressed as

$$ATT = E(Y1 - Y0|D = 1) \quad \text{Eq 3}$$

Where D = 1 if the household participated in the project, 0 otherwise

In order to measure (quantify) these effects, the counterfactual needs to be computed using the following expression:

$$ATT = E(Y1|D=1) - E(Y0|D=1) \quad \text{Eq 4}$$

The second term of Eq 4; that is, E (Y0|D =1), shows the average outcome of the treated individuals in the absence of treatment, which cannot be observed. The term E (Yo|D=0) shows the outcome of the untreated individuals.

The difference between the post-project outcome of treated and pre-project outcome of non-treated can be expressed as follows:

$$\triangle = E(Y1|D=1) - E(Yo|D=0) \quad \text{Eq 5}$$

Adding and subtracting E (Y0|D =1) in Eq 5, we get the following expression:

$$\triangle = E(Y1|D=1) - E(Y0|D=1) + E(Y0|D=1) - E(Yo|D=0) \quad \text{Eq 6}$$

$$\triangle = ATT + E(Y0|D=1) - E(Yo|D=0) \quad \text{Eq 7}$$

The term E (Y0|D =1) - E (Yo|D=0) gives the differences between counterfactual of treated individuals and the observed outcome for untreated individuals. This is associated with the selection bias.
If there is no selection bias, E (Y0|D =1) - E (Yo|D=0) = 0

ATT can be estimated by the differences between the mean observed outcomes for treated and untreated, as shown below

$$ATT = E(Y|D=1) - E(Y|D=0) \quad \text{Eq 8}$$

If the matching of the treated and untreated individuals is properly selected, PSM provides the impact of the interventions.

$$\text{Impact} = E(Y_1|x, D=1) - E(Y_0|x, D=0) \quad \text{Eq 9}$$

Where
Y_1 = outcome for the treated farmer for given observable variables x
Y_0 = outcome for the untreated (control) farmer for given observable variables x

---

[29] The equations are based on Heinrichc C. Maffioli, A. and Vazquez, G. (2010), Impact Evaluation Guidelines Technical notes No IDB-TN-161, A Primer for Applying Propensity Score Matching, Inter-American Development Bank.

D =1 represents treatment and D=0 represents untreated

In the above equation, the project impacts are the differences between the outcomes of the treated or participating households (treatment group) and the non-treated or non-participating households (control group).

B. The Contexts

1. Social and Economic Context

Nepal is a rural – and socially and physically diverse – country. About 83% of its population of nearly 28 million lives in rural areas. The population is composed of 126 caste/ethnic groups speaking 123 languages and is spread across regions ranging from the tropical Terai in the south to temperate mountains in the north. The population growth rate declined from 2.3% in 2001 to 1.4% in 2011, while 27 of the 75 districts experienced negative growth rates during the decade.[30] Women constitute 51% of the population. The proportion of female-headed households increased during the period from 15% to 26%.

Despite the decade-long armed conflict and the ensuing political instability that continued till recently, Nepal succeeded in reducing poverty from 42% in 1994/95 to 31% in 2003/04 and to 25% in 2009/10.[31] But one-quarter of the population still living below – some of them far below – the poverty line means poverty remains a serious problem in Nepal. Poverty is higher and deeper in rural than in urban areas and particularly severe in the Mountain (42%) and in the Far-Western (46%) and Mid-Western (32 %) regions. At the household level, the incidence of poverty is highest among Dalits (42%) and among households headed by agricultural wageworkers (47%), and it increases with increase in family size. In contrast, poverty falls sharply for households with higher level of education and with more than one hectare of agricultural land.

Nepal is a low-income, slow-growing economy with an estimated nominal per capita income of US$717 and a growth rate of 3.6% in 2012/13.[32] Agriculture - the single largest sector providing livelihoods to 76% of the population and generating 35% of GDP – is estimated to grow at a meager 1.3%, down from 5% in 2011/12. Agriculture is the main source of income for 83% holdings in Nepal. In most parts of rural Nepal, non-farm employment opportunities are limited or non-existent and agriculture is often the only source of employment and income for rural people, including the poor. Consequently, every year, large population of youth is forced to move out to cities or outside the country in search of employment, and the trend has continued to grow. An average of 1,237 workers left the country each day during the first half of 2013/14.[33] The massive outflow of rural youths for foreign jobs has brought home large amount of remittance income accounting for nearly 26% of GDP in 2012/13. But it has also had a serious repercussion in the form of shortage of farm labor, especially during peak agricultural seasons.[34]

Nepalese agriculture is mostly smallholder, subsistence farming dominated by cereal crops, which account for over 90% of the cropped area and 46% of the agricultural GDP. About 94% of the 3.7 million agricultural holdings produce cereals. Crop yields are low and nearly a half of all these holdings operate on less than 0.5 hectare of land,

---

[30] Central Bureau of Statistics (2012), National Population and Housing Census, 2011 (National Report) Government of Nepal, Kathmandu

[31] Central Bureau of Statistics (1996, 2005, 2011), Nepal Living Standards Survey (NLSS) I, II and III, Government of Nepal, Kathmandu.

[32] Ministry of Finance (2013), Economic Survey 2012/13, Government of Nepal, Kathmandu.

[33] Asian Development Bank (Feb 2014), Macroeconomic Update, Volume 2. No. 1, Manila.

[34] According to a study (CEAPRED, 2012) conducted in five districts of Terai, about 20% of the households reported labor shortage throughout the year, whereas about 80% experienced this problem during peak agriculture seasons. An overwhelming majority (80%) reported labor shortage during transplanting and harvesting of rice. The labor shortage reportedly caused delayed transplanting (in some cases, no transplanting at all) and delayed harvesting, both resulting in significant crop loss.

from which a household is unable to produce enough to meet its food requirement for the whole year. About 60% of the total agricultural holdings do not produce sufficient to meet their household food requirement for the whole year.[35] Among the food deficit households, 44% face food shortage for 4-6 months, 23% for 7-9 months and 15% for 10-12 months.

Maize is grown in 0.67 million hectares or 27% of the cropped area.[36] About two-thirds of all holdings grow maize, supplying 26% of the food grains in Nepal. With a decline in area by 12% between 2001 and 2011, maize now occupies third position – after rice and wheat – in terms of area. But it continues to occupy the most important and strategic position in the hills, where 78% of maize area is located and maize is the main source of food, feed and livelihood. However, domestic production is increasingly falling short of demand, leading to increased level of import over the years, from Rs 1.4 billion in 2009/10 to Rs 2.3 billion in 2010/11.[37] The value of maize imports more than doubled to Rs 4.73 billion in 2012/13, with corresponding increase in the volume of imports from 136,000 tons to 241,000 tons during the period.[38] It is estimated that 20% of the production in the hills and 80% of the production in Terai are used as feed. Yet the domestic production is able to meet less than half of the maize demand of feed industry. Over 90% of the imported maize is used as feed.

The national average maize yield of 2.5 ton/ha is far below the yield levels that farmers can obtain with improved technologies, suggesting a wide gap between the actual and potential yields at the farm level.[39] A large part of this gap is a result of lack of adequate access to improved technologies, extension and markets. Only about 18% of total holdings are using improved seeds in maize. Informed sources suggest that use of improved seeds alone can increase yield by at least 20%. But the supply of improved seeds is severely constrained. While the quantities of breeder and foundation seeds produced in the country are reportedly sufficient to produce the required quantity of improved seeds, the quantity of improved maize seeds actually produced in the country is less than a quarter of the requirement. In 2010, the quantity of maize seed produced in the country was 1,592 ton, against the requirement of 6,132 ton estimated on the basis of a seed replacement rate (SRR) of 25%.[40] In the case of hybrid maize seed, almost all of which is currently met by imports, the estimated requirement is projected to grow from 1,275 ton in 2010 to 3,750 in 2025. Officially, the import of maize seeds rose from 458 ton in 2008/09 to 978 ton in 2009/10.[41]

2. Policies and Institutional Context

The Government of Nepal (GON), with support from the Asian Development Bank and a range of other donors, has drafted a long-term Agriculture Development Strategy (ADS) to replace the Agricultural Perspective Plan (1995-2015) introduced in 1995. The ADS is being currently reviewed for official government endorsement. The ADS vision statement is "A self-reliant, sustainable, competitive, and inclusive agricultural sector that drives economic growth, and contributes to improved livelihoods, and food and nutrition security." ADS will also promote and support productivity improvement of food crops in the hills and mountainous regions in order to assure national and local self-sufficiency. The ADS focuses on four strategic pillars – governance, productivity, commercialization and competitiveness. Improvement in the supply of quality seeds is critical to the achievement of ADS goal. In the present context of Nepal, increased commercialization is not possible without increased competitiveness and the latter is not possible without increased productivity. The increased productivity will not be possible without improving the supply of quality seeds/breeds.

The GON has been implementing periodic development plans – most of them covering a five-year period – since 1953. After the completion of its Tenth Plan, GON implemented two three-year plans up to mid-July 2013, and is

---

[35] Central Bureau of Statistics (2012b), National Sample Census of Agriculture, 2011/12, Government of Nepal, Kathmandu.
[36] Central Bureau of Statistics (2012b) op cit
[37] *The Kathmandu Pos*t, 13 February 2012
[38] *Karobar National Economic Daily*, 12 June 2013
[39] Based on discussion with CIMMYT-HMRP scientists
[40] Ministry of Agriculture Development (2013), Seed Vision 2025, Government of Nepal, Kathmandu.
[41] *My Republica*, 11 May 2011

currently on its Thirteenth Plan, which is also a three-year plan (2014-2017). The strategic priority of the current Plan is "increasing productivity, diversification and commercialization of agriculture". The Plan has accorded priority to production and certification of good quality seeds and high-yielding breeds for which it aims to strengthen government and private farms/centers that produce them.

The National Agriculture Policy (NAP) was introduced in 2004 as an umbrella agricultural development policy. The NAP fully embraced the long-term Agriculture Perspective Plan with respect to its agriculture-led economic growth and poverty reduction strategy, but took a wider scope in the light of developments that happened after the introduction of APP in 1995. The main objective of the NAP, which is still the main national agriculture policy of the GON, is to contribute to food security and poverty alleviation by means of higher economic growth to be realized through (i) increased productivity and production, (ii) development of commercial and competitive agricultural system, and (iii) conservation and sustainable utilization of natural resources and environment.

The GON has passed new Seed Policy and Regulations. This has paved the way for the implementation of the new Seed Act, which empowers the private sector and non-governmental organizations (NGOs) to play a wider role in seed subsector development, including seed production, inspection, testing and truthful labeling. As yet another important development, GON has also formulated the Seed Vision 2025 with the objective to increase crop productivity, raise income and generate employment through self-sufficiency, import substitution and export promotion of quality seeds.

Various stations and farms under the Nepal Agriculture Research Council (NARC) and the Department of Agriculture (DOA) are engaged in producing breeder and foundation seeds. The quantity of breeder seeds currently produced is reportedly sufficient to meet the requirement.[42] But there is a shortage of foundation seed and a serious shortage of improved seeds resulting from the current level of production. As a strategy to increase the supply of improved seeds, DOA has been implementing the District Seed Self-Sufficiency Program (DISSPRO) through District Agriculture Development Offices (DADOs). The DADOs mobilize and train farmer groups to produce and supply improved seeds both within and outside the district. Recently, following the implementation of "Mission Maize" program from 2007 to 2011, the government has introduced the "Mega Maize Program" under which the target is to distribute 600 tons of improved maize seeds with 75% subsidies. The Program, which is coordinated in the center by CDD and implemented in the district by DADO, covers 2 Village Development Committees (VDCs) each of 40 districts.

In recent years, the seed subsector has received increased emphasis and support from bilateral and multilateral development partners, which are funding projects with one or more components focused on seeds. Such partners include the Asian Development Bank funding the "High Mountain Agriculture and Livelihood Improvement" and "Raising Incomes of Small and Marginal Farmers" projects, the International Fund for Agricultural Development funding "Improved Seeds for Farmers" and "High-Value Agriculture" projects, the United States Agency for International Development (USAID) funding the "Hill Maize Research Project (HMRP)", and the Swiss Agency for International Cooperation (SDC) co-funding HMRP and additionally funding the "Vegetable Seed Project" (VSP) implemented by CEAPRED.

SDC has recently formulated its Cooperation Strategy for Nepal for 2013-2017, which focuses on two interrelated domains: (i) Inclusive Federal State, Human Security and Rule of Law, and (ii) Improved Livelihood and Increased Resilience for People Living in Rural Areas and Small Urban Centers.[43]SDC's support to agriculture, including the seed subsector, falls within the second domain. Similarly, as part of its support towards sustainable agricultural development and food security improvement in Nepal under the "Feed the Future" initiative, the USAID has funded "Knowledge-Based Integrated Sustainable Agriculture Development Nepal (KISAN)" project, which includes seed production as a significant component.

C. The project genesis and implementation strategies

[42] MOAD (2013) op cit

[43] Swiss Agency for International Cooperation (2013), Swiss Cooperation Strategy for Nepal 2013-2017.

I. Genesis of the Project

The first phase (1999-2002) activities were mainly focused on research – screening maize germplasm obtained from CIMMYT using Participatory Variety Selection (PVS) trials in the command areas of four Regional/Agricultural Research Stations (R/ARS) in the hills. The second phase (2003-2007) covered a wider geographic area (more than 30 hill districts) and a wider range of activities, including PVS, community-based seed production (CBSP), diamond trials[44], and small grant projects (SGPs). The gender equity and social inclusion (GESI) was added as an approach to implementing the project activities. Major results achieved during this phase included the release of three maize varieties (Manakamana-3, Deuti and Shitala) and development of CBSP system as a strategy to establish participatory variety development system in the hills. This phase also introduced a number of other production technologies and agronomic practices, such as intercropping of maize with cash crops, integrated plant nutrient system, improved composting, and organic pest control.

In Phase III (2008-2010), the project further expanded its geographic coverage to more than 40 hill districts. This phase focused on institutionalization of PVSP, CBSP, diamond trials and informal research and development (IRD) approaches by NARC, DOA and collaborating NGOs. The GESI was given a greater emphasis and prominence. Four new maize varieties (Manakamana-4, 5 and 6, and *Posilo Makai*-1) were released, and seed production of these and other farmer-selected varieties were carried out through 174 CBSP groups. The quantity of improved maize seed produced by these groups in the third phase was 664 tons.

Cumulatively, over the last three phases, the project has made significant progress towards developing and disseminating maize technologies that can contribute to improved livelihood and food security of the people in the hills of Nepal. The current Phase IV (2010-2014) was rationalized on the ground that the project, by the end of Phase III, had developed a number of new, more profitable technologies that required further validation and wider dissemination to farmers, with emphasis on women and DAGs, and that there was a need to consolidate and institutionalize the decentralized system of seed production, certification and marketing to strengthen the national seed system in Nepal. Accordingly, the current phase was designed to achieve two interrelated outcomes: (i) Hill maize farmers, especially from poor and disadvantaged groups, adopt new and profitable maize varieties and improved technologies to enhance productivity and marketing opportunities; and (ii) National Seed Board, NARC and DOA enforce quality control through both public and private institutions.

The Phase IV differs from the preceding phase in that it has reduced number of districts, but increased coverage of Village Development Committees (VDCs) within a district, increased emphasis on institutionalization of CBSP groups and strengthening their internal seed quality control system, and greater emphasis on building synergies and linkages with CEAPRED-VSP and other projects funded by SDC and USAID. The HMRP IV has identified, and accordingly planned to adopt, a number of measures, such as the merger of CBSP and DISSPRO programs, to strengthen and sustain the seed supply system in the hills.

II. Implementation Strategies

CIMMYT-Nepal manages the project through a team of experts led by a full-time nationally recruited Agronomist, who acts as the Team Leader and is assisted by a national Seed Value Chain Expert in the center and four cluster agronomists in the field.[45] A Steering Committee (SC) chaired by the Secretary of the MOAD provides guidance and policy oversight to the project team. The SC is composed of high-level representatives from related government and non-government partners, including NARC, DOA, SDC, USAID and CIMMYT. A Technical committee (TC) co-chaired by the Director General of DOA and the Executive Director of NARC and represented by the government, NGO and private sector partners provides guidance and technical oversight at the

[44] Diamond trials are experiments with a 2*2 factorial design, where two varieties (local vs new) and two crop management practices (farmers' vs improved) are compared.

[45] Until February 2014, the project management was led by a full-time internationally recruited CIMMYT maize scientist, assisted by the national Agronomist, Seed Value Chain Expert and four cluster agronomists

implementation level. The NARC National Maize Coordinator serves as a Member Secretary to both the committees.

Project funds from SDC and USAID are channeled to CIMMYT-Nepal through CIMMYT-Mexico, which retains part of the fund (11%) on account of the expert assistance – to meet the salary, allowance and relocation cost of internationally recruited CIMMYT staff involved in the project – and of the indirect costs (5% of the budget for outcomes A and B and 15% of budget for CIMMYT-Mexico and CIMMYT-Nepal components, which together account for about 30% of the project fund). The proportions of total project funds allocated to outcomes A and B are about 47% and 19%, respectively. The remaining part (6.7%) of the fund is earmarked for nationally recruited scientific staff. About two-thirds of the project funds are allocated to Outcomes A and B, of which 75% goes to seed production and dissemination activities (Outcome A) and 25% to improving seed quality control (e.g. truthful labeling, etc) and other activities targeted to achieve Outcome B.

CIMMYT-Nepal manages the project funds (except the fund allocated to CIMMYT-Mexico component). The project operates a competitive SGP scheme to finance the approved projects of its partners – NARC, DOA, NGOs and private sector. The project proposals submitted by the partners are screened by a SGP Committee composed of HMRP scientists and other experts with relevant expertise, who have no linkage with any of the project partners. The Committee develops guidelines for project proposals to meet the project outcomes and outputs, and selects and recommends project proposals for approval by the TC, on the basis of a set of transparent institutional and technical criteria. The project follows official Nepali fiscal year (ending on mid-July).

A planning workshop is organized at the end of each year to review results of the previous year and SGP proposals for the next year. The overall project results and future plans are presented at the national maize workshops. Each year, the project organizes a "Traveling Seminar" with a team of high-level government officials and representatives of other related partner agencies, to monitor field activities, discuss any emerging or outstanding issues, and recommend solutions at the field level. Overall, the strategies adopted by the project involve engaging government mechanisms in project planning, implementation and monitoring.

III. Beneficiaries and Geographic Coverage

The main target beneficiaries are the small and marginal farmers, especially from the poor and disadvantaged groups, majority (80%) of which belong to the socioeconomic category in which households' own production meets less than 11 months of food requirements. Women and DAGs have received increased emphasis in the current phase. The project has targeted to benefit at least 35,000 poor and disadvantaged families through new maize varieties and technologies that enhance productivity, increase income and improve livelihoods. This provides justification to the allocation of relatively higher proportion of project resources to Outcome A activities, which have more direct and immediate impacts on the poor and DAGs. The project aims to benefit seed producers through more efficient seed certification (truthful labeling) and varietal release processes, and women through technologies that reduce labor and or improve nutritional status of women. Emphasis is on poor farm families located in more remote parts of the mid and far western Nepal, where poverty is rampant, food insecurity is chronic, and improved livelihood options are limited.

In the previous phase, the project activities were thinly spread into more than 40 hill districts, with limited coverage of VDCs and beneficiaries within a district. In the current phase, the direct geographic coverage of the project has been reduced to 20 districts, which include the seven Swiss cluster districts and four USAID strategic districts, and districts covered in the previous phases (Figure 1). The number of VDCs and beneficiaries vary among districts. But, in general, the project covers more VDCs and beneficiaries within a district in this phase than in the previous phase.

D. Demographic Characteristics of Sample VDCs

Selected District	Selected VDC	Population of the VDC			CBSP members		
		Brhaman/ Chhetri	DAG	Total	Male	Female	Total
Ramechhap	Kathjor	2800	1979	4779	23	13	36
	Tilpung	2086	2232	4318	21	29	50
Sindhupalchowk	Yamunadanda	628	1094	1722	40	66	106
	Thumpakhar	3021	1525	4546	27	39	66
Palpa	Chirtungdhara	1341*	3897	5238	27	20	47
	Pokharathok	947	1359	2306	15	46	61
Surkhet	Gumi	1233**	4349	5582	19	21	38
	Kalyan	1108**	3359	4467	20	38	58
Doti	Laxminagar	3063**	1719	4782	26	18	44
	Mudhegau	1763**	822	2585	10	12	22
Total	10	17963	22335	40298	228	302	530

*Including Thakuri , ** Majority of Chhetries, who are poor and are included in DAG

Source: CBS, Census Report 2011; and CIMMYT-HMRP, Roster of Community Based Seed Production (CBSP) Groups, 2012

E. Map of Nepal showing the project districts

ANNEX III: DATA COLLECTION INSTRUMENTS

Questionnaire and Checklists

A. Evaluation questions and sources of information

Question	Data		Source (secondary)	Method of collection	Respondents	Information sources: questionnaire no			
	Nature	source				HH	FGD	KII - Go	KII-2 Dono
1) What is the contribution of HMRP towards maize seed production and commercial distribution in Nepal?	MIX	PR/ SE	Annual reports Annual production stat of DoA	Review& survey FGD KII	Ministry, CIMMYT, DADO, NARC, NSB, seed companies, HH, CBSP/coop	207 and 208	7	2	3
2) To what degree were the varieties released by HMRP adopted by the farmers?	MIX	PR/SE	Annual reports	Review, HH surveys FGD, KII	Ministry, Department, CIMMYT, DADO, NARC, HH	1012	3	3	4
3) How successful was HMRP in engaging and contributing to the host country government at the central and local level in project planning, implementation and monitoring?	QUL	PR/SE	Annual reports	Review KII	Ministry, Department, CIMMYT, DADO, NARC, other development partners			6	9
4) How has HMRP supported work on policy provisions to support maize promotion in Nepal in terms of varietal and technological advancement, extension, and scaling up to different geographical regions?	MIX	PR/SE	Reports	Review FGD and KII	Farmers, government officials, donors		8	10	15
5) To what degree have participating institutions (GON, cooperatives, NGOs and the private seed companies) demonstrated capacity to sustain program activity once funding ends, hearing in mind the transformation of the agriculture economy taking place because of population dynamics such as internal mobility and outmigration of youths from rural areas?	MIX	PR/SE	Reports	Review, HH survey, FGD, KII	HH, Farmers, government officials, donors	401 and 402	23	7	10 and 11
6) How cost effective is the project management and the institutional control management system	MIX	SE/PR	Reports	Review and KII	donors				8
7) From the vantage point of Nepal's Agriculture Development Strategy and its Three Years Plan, what opportunities and challenges exist beyond the current scope for new intervention area/s that would enhanced the impact of HMRP (both geographic and thematic)	MIX	SE/PR	Reports	Review, HH survey, FGD, KII	HH, Farmers, government officials, donors	802	22	12	20

Note: MIX = combination of qualitative (QUL = qualitative) and quantitative (QNT = quantitative), PR = primary, SE = Secondary , DoA = department of agriculture, FGD = focus group discussion, KII0-1 Gov = Key informant interview (Government Officials) ,KII-2 Donor = Key informant interview (Project staff, donors and development partners), DADO = district agriculture development office, NARC =Nepal Agriculture Research Council, NSB = national seed board, RSTL = regional seed testing laboratories, SQCC = seed quality control centre, HH = household,

B. Household survey questionnaire

Hill Maize Research Project (HMRP)
Impact Evaluation 2014

USAID

Survey by IIDS

Questions to be asked to household involved in the project (Treatment Group)

Household Survey

Introduction and agreement

Good morning! My name is ……I have come from IIDS to conduct this survey at your village. If you are interested to participate in this survey, I would be extremely thankful to you. If you do not feel like answering to a particular question, you may do so. But if you provide your valuable suggestions and inputs on these questions, it would be extremely helpful for the policy makers to make policy reforms and strengthen the ongoing projects. This interview will last for …….minutes. Your answers will be kept confidential and your identity will not be disclosed.

Are you willing to participate in this survey?

Yes……1 (Start interview)

No…….2 (Stop interview)

Introduction

1	District	1. Ramechhap 2. Sindhupalchowk 3. Palpa 4. Surkhet 5. Doti
2	VDC	……
3	Ward No.	
4	Name of the village	
5	Respondent's name	
6	Respondent's sex	1. Female2.Male 3. Third Gender
7	Respondent's age	…… Years
8	Respondent's education	…….class passed 10. SLC passed 11. 11 class passes 12. +2 passed 13. BA passed 14. MA passed 15. Read and write only 16. Illiterate
9	Relationship to household head	1. Self 2. Husband/wife 3. Son 4. Daughter 5. Brother 6. Daughter in law 7. Sister in law 8. Grandson 9. Granddaughter 10. Uncle 11. Aunt 12. Others (Specify)
10	Number of household member	Male……. Female…….
11	To which group do you belong?	1. CBSP group 2. Cooperative 3. Seed Company 4. Other (Specify)
12	Caste ethnicity (self-assessed)	1. Dalit 2. Ethnic groups 3. Others (specify)
13	Type of house	1. Mud and thatched roof 2. Cemented roof
14	Total cultivable land	**Own land** 1. Total baari…….(ropani) 2. Irrigated baari….(ropani) 3. Total land……(ropani) 4. Irrigated **Other's Land** 1. Total Kitchen yard…… (ropani) 2. Irrigated Kitchen yard….(ropani)

		3. Total land…….. (ropani) 4. Irrigated land…….. (ropani)
15	How many years have you been involved on maize seed production?	1. Less than 5 years 2. 5-10 years 3. More than 10 years

Last year's maize production

S.N.	Maize	Area (Ropani)	Production (kg)	Productivity	Sale (kg)	Income from sale (Rs)
1	2	3	4	5	6	7
1011	Local variety maize					
1012	Improved variety maize (variety name)					

1. Questions related to seed

201	From where do you get maize seed	1. DADO 2. CBSPs/Cooperative 3. Agro-vet 4. NGO/Projects 5. Seed company 6. Others (specify)……
202	Do you get the desired maize seed type timely?	1. Yes 2. No
203	Is the quality of seed reliable?	1. Yes 2. No
204	What is the trend of getting quality maize seed over the years?	1. Good 2. Bad 3. Same
205	Do you produce maize seed?	1. Yes 2. No (Go to question no. 213)
206	If yes then how much seed you produce this year?	1. Area (ropani) 2. Total production (kg) 3. Seed production (kg) 4. Sale (kg)
207	What is the trend of maize seed production over the years?	1. Decreased (1/4, 2/4, 3/4, 4/4) 2. Increased (1/4, 2/4, 3/4 , 4/4) 3. No change
208	Where do you sell your maize seed?	1. CBSP group/ cooperative 2. Seed company 3. Private trader 4. Farm gate 5. Local businessman 6. Local seed trading Centre 7. Regional seed trading center 8. Government Offices 9. Others (specify)
209	Problems faced on maize seed sale	1. ……. 2. …….. 3. ……..
210	What type of seed packaging you do?	1. Jute sack 2. Cloth sack 3. Jute sack with plastic inside 4. Cloth sack with plastic inside 5. Ordinary sack 6. Others (specify)
211	What is your trend of maize cultivation area?	1. Decreased (1/4, 2/4, 3/4, 4/4) 2. Increased (1/4, 2/4, 3/4 , 4/4)

		3. As usual
212	What is your trend of maize production?	1. Decreased (1/4, 2/4, 3/4, 4/4) 2. Increased (1/4, 2/4, 3/4 , 4/4) 3. As usual
213	What is your trend of fertilizer use?	1. Decreased (1/4, 2/4, 3/4, 4/4) 2. Increased (1/4, 2/4, 3/4 , 4/4) 3. As usual
214	What is your trend of maize infestation?	1. Decreased (1/4, 2/4, 3/4, 4/4) 2. Increased (1/4, 2/4, 3/4 , 4/4) 3. As usual
215	What is your trend of insecticide use?	1. Decreased (1/4, 2/4, 3/4, 4/4) 2. Increased (1/4, 2/4, 3/4 , 4/4) 3. As usual 4. No change

3. Women related questions

301	Has your income increased from maize production?	1. Yes 2. No (go to question 304) 3. No production (go to question 304)
302	If increased by how much has your income increased in a year?	…….Rs. per year
303	On what items do you spend your increased income?	1…… 2…….. 3……..
304	Have women's lives changed after being involved in this project?	1. Yes 2. No (go to question 306)
305	If yes then what are the significant changes?	1……. 2…… 3…… (go to question 401)
306	If no then why?	1…… 2…… 3…….

4. Project's sustainability related questions

401	How will you produce maize seed after the termination of HMRP?	1. Continue production of HMRP varieties 2. Stop production (go to question 601)
402	If maize seed production is to be continued then to what level?	1. Full level 2. Partial level 3. As usual
403	What type of assistance you need to continue production?	1. ……. 2. …….. 3. ……

5. Questions related to HMRP adoption

501		
502		
503		

6. Questions related to food security

601	For how many months you feel food secured from your own production?	……months
602	What is the trend of food security over the years?	1. Decreased (1/4, 2/4, 3/4, 4/4) 2. Increased (1/4, 2/4, 3/4 , 4/4) 3. No change

7. Questions related to household decision making

701. Who makes the decision on following topics at your house?	Male	Female	Jointly
1. Crop cultivation and harvesting	1	2	3
2. Sowing maize seed as well as cultivating cash crops and harvesting	1	2	3
3. Sale of maize seed	1	2	3
4. Related to money	1	2	3

5.	Participation to institutions and groups	1	2	3
6.	Management of income from maize sale	1	2	3
7.	Utilization of income from male members	1	2	3
8.	Utilization of income from female members	1	2	3

8. Open questions

801	Main problems seen on maize seed production	1……. 2…… 3……
802	What should be done to increase crop productivity and food security at the household level?	1……. 2…… 3……
803	What impact has youth in-and out-migration made on maize production?	1. Very high 2. High 3. Medium 4. Low 5. Not at all
804	Main problems seen on trade of maize seed?	1……. 2…… 3…….

Hill Maize Research Project (HMRP)
Impact Evaluation 2014

USAID

Survey by IIDS

Questions to be asked to household involved in the project (Control Group)
Household Survey

Introduction and agreement

Good morning! My name is ……I have come from IIDS to conduct this survey at your village. If you are interested to participate in this survey, I would be extremely thankful to you. If you do not feel like answering to a particular question, you may do so. But if you provide your valuable suggestions and inputs on these questions, it would be extremely helpful for the policy makers to make policy reforms and strengthen the ongoing projects. This interview will last for …….minutes. Your answers will be kept confidential and your identity will not be disclosed.

Are you willing to participate in this survey?
Yes……1 (Start interview)
No……..2 (Stop interview)

Introduction

1	District	2. Ramechhap2. Sindhupalchowk 3.Palpa 4. Surkhet 5. Doti
2	VDC	……
3	Ward No.	
4	Name of the village	
5	Respondent's name	
6	Respondent's sex	2. Female2.Male 3. Third Gender
7	Respondent's age	…… Years
8	Respondent's education	…….class passed 10. SLC passed 11. 11 class passes 12. +2 passed 13. BA passed 14. MA passed 15. Read and write only 16. Illiterate
9	Relationship to household head	2. Self 2.

		Husband/wife 3. Son 4. Daughter 5. Brother 6. Daughter in law 7. Sister in law 8. Grandson 9. Granddaughter 10. Uncle 11. Aunt 12. Others (Specify)
10	Number of household member	Male……. Female…….
11	To which group do you belong?	5. CBSP group 6. Cooperative 7. Seed Company 8. Other (Specify)
12	Caste ethnicity (self-assessed)	4. Dalit 5. Ethnic groups 6. Others (specify)
13	Type of house	3. Mud and thatched roof 4. Cemented roof
14	Total cultivable land	**Own land** 5. Total baari…….(ropani) 6. Irrigated baari….(ropani) 7. Total land……(ropani) 8. Irrigated **Other's Land** 5. Total Kitchen yard…… (ropani) 6. Irrigated Kitchen yard….(ropani) 7. Total land…….. (ropani) 8. Irrigated land…….. (ropani)

2. Last year's maize production

S.N.	Maize	Area (Ropani)	Production (kg)	Productivity	Sale (kg)	Income from sale (Rs)
1	2	3	4	5	6	7
1011	Local variety maize					
1012	Improved variety maize (variety name)					

3. Questions related to seed

201	From where do you get maize seed?	7. DADO 8. CBSPs/Cooperative 9. Agro-vet 10. NGO/Projects 11. Seed company 12. Others (specify)……
202	Do you get the desired maize seed type timely?	3. Yes 4. No
203	Is the quality of seed reliable?	3. Yes 4. No
204	What is the trend of acquiring quality maize seed over the years?	4. Good 5. Bad 6. Same
205		
206		
207		
208		
209		

210		
211	What is your trend of maize cultivation area?	4. Decreased (1/4, 2/4, 3/4, 4/4) 5. Increased (1/4, 2/4, 3/4 , 4/4) 6. As usual
212	What is your trend of maize production?	4. Decreased (1/4, 2/4, 3/4, 4/4) 5. Increased (1/4, 2/4, 3/4 , 4/4) 6. As usual
213	What is your trend of fertilizer use?	4. Decreased (1/4, 2/4, 3/4, 4/4) 5. Increased (1/4, 2/4, 3/4 , 4/4) 6. As usual
214	What is your trend of maize infestation?	4. Decreased (1/4, 2/4, 3/4, 4/4) 5. Increased (1/4, 2/4, 3/4 , 4/4) 6. As usual
215	What is your trend of insecticide use?	5. Decreased (1/4, 2/4, 3/4, 4/4) 6. Increased (1/4, 2/4, 3/4 , 4/4) 7. As usual 8. No change

3. Women related questions

301	Has your income increased from maize production?	4. Yes 5. No (go to question 305) 6. No production (go to question 305)
302	If increased by how much has your income increased in a year?	…….Rs. per year
303	On what items do you spend your increased income?	1…… 2…….. 3……..
304		
305		
306		

4. Project's sustainability related questions

401		
402		
403		

5. Questions related to HMRP adoption

501	Why are you not participating in HMRP programs?	1. Not interested 2. Outside project area 3. Others (specify)……
502	What do you think are the facilities one receives via participating in this program?	1. Better access to quality seed 2. Increase in production 3. Food security improvement 4. Better access to agricultural inputs 5. Increment in crop intensity (maize) 6. Others (specify)……. 98 Don't know
503	In your opinion, what are the negative impacts of HMRP?	1. Increment in maize infestation 2. Decreased in productivity 3. Problems in the sale of maize seed 4. Additional workload for women 5. Others (specify) 98 Don't know

6. Questions related to food security

601	For how many months you feel food secured from your own production?	……months
602	What is the trend of food security over the years?	4. Decreased (1/4, 2/4, 3/4, 4/4) 5. Increased (1/4, 2/4, 3/4 , 4/4) 6. No change

7. Questions related to household decision making

701. Who makes the decision on following topics at your house?	Male	Female	Jointly
9. Crop cultivation and harvesting	1	2	3
10. Sowing maize seed as well as cultivating cash crops and harvesting	1	2	3
11. Sale of maize seed	1	2	3
12. Related to money	1	2	3
13. Participation to institutions and groups	1	2	3
14. Management of income from maize sale	1	2	3
15. Utilization of income from male members	1	2	3
16. Utilization of income from female members	1	2	3

8. Open questions

801	Main problems seen on maize seed production	1……. 2…… 3……
802	What should be done to increase crop productivity and food security at the household level?	1…….. 2…… 3……
803	What impact has youth in-and out-migration made on maize production?	6. Very high 7. High 8. Medium 9. Low 10. Not at all
804	Main problems seen on trade of maize seed?	1……. 2…… 3…….

C. Checklist for Key Informants Survey

Key Informant Survey (Project staff, Donors and Development partners)
Checklist

Name of the respondent..... **Date.....**

1. What do you know about HMRP?

2. How are you involved in HMRP?

3. What are the most important outcomes of HMRP?

4. How do you assess the effectiveness of HMRP with respect to improvement in
   a. Local seed supply
   b. Maize productivity and income
   c. Household food security and nutrition
   d. Livelihood options for the DAG

5. What are the main problems in seed subsector?

6. How is HMRP addressing these problems?

7. How do you assess the strengths and weaknesses of HMRP's implementation modalities involving GO and NGO?
   a. NGO modality
   b. GO modality

8. What are the advantages and disadvantages of channelling project fund through government mechanisms (Red Book) vis-a-vis through NGOs?

9. How and at what level of authority does HMRP engage NARC and DOA officials in project planning, implementation and monitoring? How can such engagement be made more effective?

10. How do you assess the level of ownership and internalization of HMRP by line agencies?

11. What conditions will make the project activities and impacts sustainable after HMRP phases out?

12. What should be done to put these conditions in place?

13. What are the best practices and lessons learnt from HMRP?

14. How has HMRP impacted on gender equity and social inclusion?
    a. Gender equity
    b. Social inclusion

15. What are the strong and weak aspects of HMRP from the point of view of the following:
    <u>Strong aspects</u>
    a. Design
    b. Implementation
    c. Institutional framework
    d. Impact
    <u>Weak aspects</u>

a. Design
b. Implementation
c. Institutional framework
d. Impact

16. What are the main challenges and constraints faced by HMRP in delivering the intended results?

17. How can these challenges and constraints be relaxed in future?

18. What were the unexpected consequences or outcomes of HMRP?

19. What were the measures taken to respond to these consequences and how effective were these measures?

20. What specific suggestions would you like to make for designing future interventions to improve local seed supply system in Nepal?

D. Survey questionnaire and Checklists

Name of the respondent..... **Date.....**

1. What do you know about HMRP?

2. What are the most important outcomes of HMRP?

3. How do you assess the effectiveness of HMRP with respect to improvement in
   e. Local seed supply
   f. Maize productivity and income
   g. Household food security and nutrition
   h. Livelihood options for the DAG

4. What are the main problems in seed subsector?

5. How is HMRP addressing these problems?

6. How and at what level of authority does HMRP engage NARC and DOA officials in project planning, implementation and monitoring? How can such engagement be made more effective?

7. What should be done to sustain the activities and impacts of HMRP?

8. What are the best practices and lessons learnt from HMRP?

9. How has HMRP impacted on gender equity and social inclusion?
   c. Gender equity
   d. Social inclusion

10. What are the strong and weak aspects of HMRP from the point of view of the following:
    <u>Strong aspects</u>
    e. Design
    f. Implementation
    g. Institutional framework
    h. Impact

    <u>Weak aspects</u>
    e. Design
    f. Implementation
    g. Institutional framework
    h. Impact

11. What were the unexpected consequences or outcomes of HMRP?

12. What specific suggestions would you like to make for designing future interventions to improve local seed supply system in Nepal?

E. Checklist for Focus Group Discussions

Checklist (Treatment group)

1. District……VDC ……Ward……

2= Total Number of Respondents:

Total: Male…… Female……

3. List of commonly cultivated maize varieties

S.N.	Variety	Household (%)	Area (%)	Productivity (kg/Ropani)
1				
2				
3				
4	Local variety			

4. Household (%) if they use improved variety
Large farmers……Medium farmers……Small farmers……Marginalized……

Based on social composition:
Dalit……Ethnic group……Others…….

Based on sex:
Male……Female……

6. Trends on maize production, productivity, and income and food security related:

(a) Maize cultivated area: increased ……decreased……no change……
(b) Productivity: increased ……decreased ……no change……
(c) Production: increased ……decreased……no change……
(d) Income: increased……decreased……no change……
(e) Food security: Increased……decreased……no change……

6. Trends on out migration
Increased……decreased……no change…….

7. Maize production and sale related
Area…… (Ropani)
Total production…… (kg)
Seed production….. (kg)
Sale…… (kg)

Where and to whom did you sale maize? Have you contracted with Seed Companyfor sale? Where else do you sell your seed?

8= Trends on maize production and sale at the local level
(a)Production: increased……decreased……no change……
(b) Sale increased ……decreased……no change……

(c)Number of producers: increased……decreased……no change……
(d) Number of traders: increased……decreased …… no change……
(e) Seed price: increased…… decreased …… no change……

9) Trends on demand for improved seeds and quality at the local level:
(a)Seed quality: has improved……has deteriorated ……no change……
(b)Seed demand: has improved……has deteriorated ……no change ……
(c)Seed abundance: has improved……has deteriorated ……no change……

10) Difficult problems that arise on maize seed production:

(a)

(b)

(c)

11) List of remedial options:

(a)

(b)

(c)

12) Positive outcomes of HMRP: (if you know)

(a)

(b)

(c)

13) Negative aspects of HMRP(if you know)

(a)

(b)

(c)

14) What should be done to address the negative aspects?

15) What impact has HMRP made on the women and the society?

16) Has any member of DAG or women led the group?

17) Has your income increased by the sale of maize?

18) If your income has increased, on what items you spend your increased income?
Priority 1……
Priority 2……
Priority 3……
Priority 4……

19) What challenges you see to make the positive outcomes of HMRP sustainable?

20) What methods should be applied to address those challenges, thereby making the positive outcomes of HMRP sustainable?

21) What are the best examples brought about by this project?

22) How the project should contribute to increase household maize productivity, income and food security in future?

23) If maize seed production is a profitable business then can it improve the livelihood of the poor farmers? If yes then how.

24) Please provide your suggestions on strengthening seed supply system at the local level

25) Percentage of project beneficiary household that are food secured based on their own farm production.

(a) Food sufficiency for more than one year ……..(%)
(b) Food sufficiency for 6-11 months ……..(%)
(c) Food sufficiency for less than six months……..(%)

Manakamana 3 (2002), Devati (2006), Shitala (2006), Manakamana 4 (2008), PoshiloMakai 1 (QPM 2008), Manakamana 5 (2009), Manakamana (2009)

F. Checklist (Control group)

1. District……VDC ……Ward……

2. Total Number of Respondents:

   Total: Male…… Female ……

3. List of commonly cultivated maize varieties

S.N.	Variety	Household (%)	Area (%)	Productivity (kg/Ropani)
1				
2				
3				
4				
5	Local variety			

4. Household (%) if they use improved variety
   Large farmers……Medium farmers……Small f
   armers……Marginalized……

   Based on social composition:
   Dalit……Ethnic group……Others…….

   Based on sex:
   Male……Female……

6. Trends on maize production, productivity, and income and food security related:

   (a) Maize cultivated area: increased……decreased……no change……
   (b) Productivity: increased ……decreased ……no change……
   (c) Production: increased ……decreased…… no change……
   (d) Income: increased……decreased……no change……
   (e) Food security: Increased……decreased……no change……

6. Trends on out migration
   Increased……decreased……no change…….

7. Maize production and sale related
   Area…… (Ropani)
   Total production…… (kg)
   Sale…… (kg)
   Where and to whom did you sale maize?

8= Trends on maize production and sale at the local level
   (a)Production: increased……decreased……no change……
   (b) Sale: increased ……decreased……no change……
   (c)Number of producers: increased……decreased……no change……
   (d) Number of traders: increased……decreased …… no change……
   -e_Price: increased…… decreased …… no change……

9) Trends on demand for improved seeds and quality at the local level:
   (a)Seed quality: has improved……has deteriorated ……no change……
   (b)Seed demand: has improved……has deteriorated ……no change……
   (c)Seed abundance: has improved……has deteriorated ……no change……

10) Positive outcomes of HMRP: (if you know)

(a)

(b)

(c)

11) Negative aspects of HMRP(if you know)

(a)

(b)

(c)

12) What should be done to address the negative aspects?

13) What impact has HMRP made on the women and the society? (If you know)

14) Has your income increased by the sale of maize?

15) If your income has increased, on what items you spend your increased income?
Priority 1……
Priority 2……
Priority 3……
Priority 4……

16) If maize seed production is a profitable business then can it improve the livelihood of the poor farmers? If yes then how.

17) Please provide your suggestions on strengthening seed supply system at the local level.

ANNEX IV: SOURCES OF INFORMATION

A. List of persons met

SN	Name	Organisation	Position
1.	Mr.Bijay Giri	DADO Surkhet	Senior Agriculture Development Officer
2.	Ms Yamuna Ghale	SDC	Senior Program Officer
3.	Dr G. Ortiz Ferera	CIMMYT-HMRP	Advisor
4.	Dr Nirmal Gadal	CIMMYT-HMRP	Team Leader
5.	Dr Dilli KC	CIMMYT-HMRP	Value Chain Specialist
6.	Dr DilBahadur Gurung	NARC	Executive Director
7.	MrDila Ram Bhandari	SQCC, MOAD	Chief
8.	Mr Bharat Upadhyaya	Steering Committee, HMRP	Member
9.	MrIndra Raj Pandey	VSP, CEAPRED	Team Leader
10.	Dr Suraj Pokhrel	Crop Development Directorate, DOA	Director
11.	MrDurga Prasad Adhikari	General Secretary	SEAN
12.	MrBholaPoudel	AUK (HMRP Partner NGO)	Chairman
13.	Mr. Kamala Poydyal	AUK, Kavre	Secretary
14.	Ms. NanuGhotani	Kavre, NamunaNaribachattathaRinSahakariSanstha	Ex chairperson and current manager
15.	Mr. Baikuntha Khanal	DADO office, Tansen ,Palpa	Agriculture Extension officer
16.	Mr. Bishnu Prasad Bhandari	Tansen, Palpa	BhandariAgrovet
17.	Mr. Him Prasad Pathak	Focal person for HMRP, NARC, Regional Agriculture Research Station, Lumle, met in Pokhara	Senior scientist
18.	Mr. AmritPoydyal	NARC, Lumle met in regional Agriculture directorate, Pokhara	Crop Scientist
19.	Mr. Kamal Khadka	Libird, Pokhara	Program coordinater
20.	Mr. Tika Ram	CECRED	Met in Pokhara
21.	Mr. Manisha Thakuri	CECRED, met in Pokhara	Coordinater Maize program
22.	Mr.Bijay Giri	DADO Surkhet	Senior Agriculture Development Officer
23.	Mr. Yam Bdr. Rana	DADO Surkhet	Planning Assistant
24.	Mr. Suresh K. Thapa	DADO Surkhet	Agri. Extension Officer
25.	Mr.Dilli Prasad Pandey	SheetalAgrovet, Surkhet	Proprietor
26.	Mr.Sarbajeet Rana	Sambriddha Agri. Cooperative, Kalyan-4, Surkhet	EC Member
27.	Mr.Tularam Nepali	" "	EC Member
28.	Mr.YubarajRana	" "	Manager
29.	Mr.DevBdr. Rana	" "	Chairperson
30.	Ms.BakiSunar	HariyaliKrishiAnusandhantathaBikasSamuha, Melkuna-2. Poshilogaon	Member
31.	Ms. Devi BK	" "	Treasurer
32.	Ms.Meena Sunar	" "	Chairperson
33.	Ms.Sunita Sunar	" "	Member
34.	Ms.Chandrakala Oli	" "	Member
35.	Ms.Indra Pun	" "	Member
36.	Ms.Dilmaya Pun	" "	Member
37.	Ms.Nandakala Oli	" "	Member

38.	Ms. Bhimkala Karki	" "	Member
39.	Ms. Kamala Oli	" "	Member
40.	Ms.Motisara Khadka	" "	Member
41.	Ms.Nandakala	" "	Member
42.	Ms.Rupa Rokaya	" "	Member
43.	Mr.Keshab Pokharel	Agriculture Research Station, Ramghat Surkhet	Technical officer
44.	Mr. Shree Prasad Neupane	CIMMYT Surkhet	Cluster Agronomist
45.	Mr. Ram BahadurChaudhary	GATE Nepal, Khajura, Banke	Marketing Officer
46.	Mr.Yagya Raj Joshi	District Agriculture Development Office, Doti	Senior Agriculture Development Officer
47.	Mr.Hari Prasad Prasai	Regional Agriculture Research Station, Bhagetada, Doti	Chief
48.	Ms.Radhika Joshi	Salmuni Women Multipurpose Cooperative Ltd, Mudhegaon, Doti	Chairperson
49.	Ms.LaxmiSahi	" "	Secretary
50.	Ms. Saraswoti Sahi	" "	Treasurer
51.	Mr.Kirtibdr. Bogati	" "	Farmer
52.	Mr.NirgaBdr. Sahi	" "	Advisor
53.	Mr.Rishiraj Joshi	" "	Farmer
54.	Mr.Gokul Bohora	District Agriculture Development Office, Dadeldhura	Agri. Extension Officer

B. Specific Characteristics of maize varieties released during 2001-2013

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

C. Best Practice Cases

Case 1: Improved variety and technology changing farmers' life in Doti

Salmuni Women Multipurpose Cooperative Limited is situated in Mudhegaon-7 of Dotidistrict which is at the walking distance of one hour from Kalagadh. In the year 2010, District Agriculture Development Office (DADO) Doti proposed the cooperative for establishing PVS trials and testing of new varieties in the villages through IRD. About 12 farmers actively participated the PVS and IRD trials. Despite sowing seeds late and growing crops without fertilizer application, Manakamana-1 produced bigger sized cobs and more yield compared to others. In the next year, many farmers were interested in seed production of Manakamana-1 and as a result 48 households from ward number 7 and 9 started seed production in 4 ha of land. In that year, farmers could harvest good seed yield. One farmer was able to harvest up to 300 kgs of seeds. Mrs. SaraswotiSahi was one of them who was able to produce a total of 500 kgs of maize grains out of which 300 kgs were suitable for seeds. She was able to earn a total of NRs 15750.00 from the sale of maize grains and seeds. Farmers have their experience that the Manakamana-1 gives 2.5 times more yield compared to local varieties. Manakamana-1 variety is popular among the farmers in Mudhegaon not only because of its higher yield, but also because of its bolder grains attractive in appearance, superior taste while eating raw and roasted, and good quality breads compared to local. Now this variety has been grown by all households of Mudhegaon in almost all of their land.

Along with the introduction of new maize variety, HMRP also introduced the technology of legume intercropping with maize in this village. Farmers were trained on intercropping of soybean with Manakamana-1 variety of maize. This was found quite beneficial for smallholders in two ways. Firstly, soybean being leguminous crop, it improved the soil fertility and as a result the yield of wheat from the intercropped plot in the subsequent season was almost double than from non-intercropped plots. Secondly, more income was harnessed at the same time from the same plot by harvesting multiple crops. Mr. Son BhatChhetri and YagyaBhatChhetri (members of Gajuryal Seed producer group) told the evaluation team that they could harness incomes of NRs 26000 from 3 ropanies of land (1500 m^2) by intercropping soybean with Manakamana-1 maize in the last year. Now this technology has been very popular among the farmers of Mudhegaon VDC. "Looking at the economic returns from maize seeds, we are planning to expand the production area in the next year. For making the sale of seeds assured, we are planning to sign the contract agreement with seed company in Dhangadhi prior to sowing" Mr. NirgaBahadurSahi, the advisor for cooperative disclosed the plan.

Source: Field Survey

Case 2: Village declared as "PoshiloGaon"

Along the Chhinchu-Jajarkot road corridor, 18 kilometer east to the Chhinchubazzar, one village has been inhabited by about 40 households. Almost all the economically active male members from this village work as seasonal labor in India. Discussion with DADO revealed that this village is food and nutrition insecure, and is rapidly being prone to HIV. In the year2011, DADO Surkhet organized farmers of this village in a group named "*HariyaliKrishiAnusandhantathaBikasSamuha*" and introduced "*PoshiloMakai*" in this village through IRD trials. "*PoshiloMakai*" was liked by all the villagers due to its characters of full grain cover, bigger cobs, sweet and soft grains on roasting, and good quality breads. The growers also noticed non-lodging, dwarf and strong plants with thick stems which were the characters being demanded since long ago. Furthermore, pointing out the qualities of this variety, respondents told that they do not need to take any snacks throughout the day if they have eaten bread and porridge made from the grains of "Poshilo Makai" in the morning. As a result, in the second year, all households showed their keen interest to grow this variety in all of their land. But due to the shortage of seeds with NMRP, they got only 35 kilograms of seed. Most of the farmers harvested good yield in that year and almost all of the produce was consumed as food. Some farmers were able to sell 260 kgs of seeds to DADO immediately after the harvest. They could not save the seeds themselves for the next year. It was mainly due to the lack of their ability to wait for money until the seeds are sold in the market. However, they have come up with the confidence that extra income is also possible through the seed production. Ms. Rupa Rokaya has been an example as she was able to earn NRs 1920 through the sale of 48 kgs of seeds last year. Now the farmers are fully convinced that "Poshilo Makai" is the good source of nutrition and income for the marginal families like them and they have declared this village as "Poshilo Gaon" with the aim of producing food grains and seeds in all of their land right from this year.

Source: Field Survey

Case 3: Access to new technologies: Key to empower women farmers

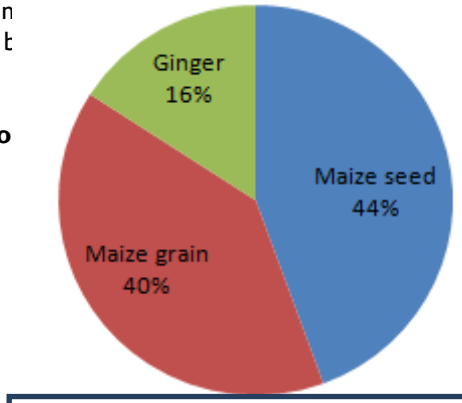
Padma Devi Bhitriya, a *Dalit*women farmer, lives in a small village called Chattiban in Palpa district, western Nepal. She has two daughters and husband in her family. She is typically a subsistence women farmer owing 5 *ropanies*land (0.4 ha). Until 2004 most of her field was planted with local maize 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 priority in selecting the variety, 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 gain ıew knowledge and technologies. Ms. Bhitriyasays "CBSP group has t ;ers together irrespective of caste and gender".

Source: CIMMYT-HMRP (2013). Annual Progress Repo 2012



Annual farm income of MS Bhitriva for

Case 4: Namuna Nari Chetana Bachattatha Rin Sahakari Sanstha

This savings and credit cooperative has been supported by AsahayaUpkarBagaicha, a registered NGO partnered by HMRP.

NanuGhotani, ex-chairperson of this Narichetana savings and credit is now working as manager of this cooperative. She is a leading figure of the cooperative, and belongs to the Dalit community. This savings and credit cooperative has 600 members, of whom 15 members are involved in the CBSP. The composition of this all female group according to caste /ethnicity is 4 Brahmin, 1 Tamang and 10 Dalit. They have been planting Poshilo, Deuti, and Manakamana varieties, but mainly focusing on Deuti for the purpose of seeds. Fifteen households cover about 140 Ropanis of land for seed production. Their annual production is about 17 tons out of which they get 7/8 tons of seed. The group found it difficult to sell the white Maize in the first year, but now the people have started to like it. Planting the Deuti variety has doubled their production and quadrupled their income. The price of seed in the market is double that of the price of maize grain.

Over 95% of the male youths from this village have migrated to Kathmandu or abroad for work or study. A few women have also gone outside. However, the majority of young girls are still in the village. Girls can study up to the 12th grade in the village and after that they generally get married. Some choose to get married even earlier as early marriage is still being practiced. In the past, all Dalit families used to travel out of the village with their children to work in brick kilns to sustain themselves. However, after their involvement in the HMRP their incomes have increased and these Dalit families including their women and children need no longer migrate for seasonal work in brick kilns.

Seed cultivation has no problems at present. However, in the past year heavy rains had caused a large amount of maize to rot, requiring it to be sold as animal feed at a price as low as Rs. 20per Kg. In the future, preventive

measures must be taken to protect the maize from the rain by using plastic sheets, etc. Women farmers suggested that they should have maize sorting machines to replace the traditional *nanglo*which is time consuming. The maize seeds are not treated for insects in individual households but at the cooperative storage facility where the seeds are deposited after having been dried four times in each home.

The income of women farmers have increased after taking part in the CBSP group. As the income from the sale is controlled by women, small household purchases and needs are decided by the women. The women have thus become more empowered and can now also make decisions on matters like the sale of animals in the absence of men.

Women of this group have had the opportunity of an exposure visit to learn intercropping techniques. With this knowledge they have started growing vegetables in their land. The supporting NGO has taught them to plant maize in rows that saves time in weeding. With Dalit and non Dalit women working together, the issue of untouchability has been cast out. They have meals together when making exposure visits and also drink tea together during meetings. Women from this group have been nominated as members of the school management/ forest management committees. This has given them a feeling of empowerment.

With their increased incomes from the sale of maize seeds women have been able to afford to educate their children. Whereas in the past girls were sent to school till only the 10^{th} grade, they are now allowed to study up to the 12^{th} grade. They now spend equally for the health needs of both girls and boys. The third important expense for women is that required for festivals.

The year when maize was damaged by rot many families criticized the decision of women to participate in maize seed production. The women stressed that the rotten crop was mainly due to the untimely rain and that they were not to be blamed for such natural causes. They hoped that the families and communities had developed a better understanding now.

Although the price of the maize is determined by the market, the farming group discusses and decides upon the rate at which they want to sell the maize seeds that particular year. Since the cooperative make pre-contracts with private companies there is no difficulty in selling the maize seeds. In fact, they haven't been able to meet the high demand in the market. The group has been highly motivated and is determined to continue even if the project is phased out. They have set aside 9 lakh Rupees for a cooperative building. They also aim to establish a company in the coming years and conduct the marketing by themselves. This has been a success story of Dalit women that can inspire other groups in other parts of the country as well.

(Source: Field Survey)

REFERENCES

Asian Development Bank (2014), Macroeconomic Update, Volume 2. No. 1, Manila.

Asian Development Bank (2006), Impact Evaluation Methodological and Operational Issues, Economic Analysis and Operations Support Division Economic and Research Department, Manila.

Central Bureau of Statistics (2012), National Population and Housing Census, 2011 (National Report), Government of Nepal, Kathmandu.

Central Bureau of Statistics (2012), National Sample Census of Agriculture 2011/12, Government of Nepal, Kathmandu

Central Bureau of Statistics (1996, 2005, 2011), Nepal Living Standards Survey (NLSS) I, II and III, Government of Nepal, Kathmandu.

CEAPRED, (2012), Review of Food Production and Agriculture in Tarai Towards Formulation of JICA's Support Strategy: Food Security Support, JICA, Kathmandu.

CIMMYT-HMRP (2013), Annual Progress Report 2013

CIMMYT-HMRP (2013), Annual Progress Report 2013 (Unpublished)

CIMMYT-HMRP (2010), The Project Document, HMRP IV

Heinrichc C. Maffioli, A. and Vazquez, G. (2010), Impact Evaluation Guidelines Technical notes No IDB-TN-161, A Primer for Applying Propensity Score Matching, Inter-American Development Bank

Ministry of Agriculture Development (2013), Seed Vision 2025, Government of Nepal, Kathmandu.

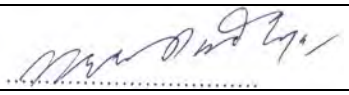
Ministry of Finance (2013), Economic Survey 2012/13, Government of Nepal, Kathmandu.

Swiss Agency for International Cooperation (2013), Swiss Cooperation Strategy for Nepal 2013-2017, Kathmandu.

ANNEX VI: DISCLOSURE OF ANY CONFLICTS OF INTEREST

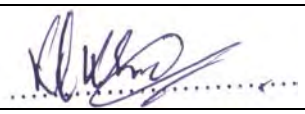
Name	Dr. Hari Krishna Upadhyaya
Title	Agricultural economist
Organization	Institute for Integrated Development Studies (IIDS)
Evaluation Position?	[√] Team Leader [ ] Team member
Evaluation Award Number *(contract or other instrument)*	367-13-000042
USAID Project(s) Evaluated *(Include project name(s), implementer name(s) and award number(s), if applicable)*	The Hill Maize Research Project, Phase IV
I have real or potential conflicts of interest to disclose.	[ ] Yes [√] No
If yes answered above, I disclose the following facts: *Real or potential conflicts of interest may include, but are not limited to:* 1. *Close family member who is an employee of the USAID operating unit managing the project(s) being evaluated or the implementing organization(s) whose project(s) are being evaluated.* 2. *Financial interest that is direct, or is significant though indirect, in the implementing organization(s) whose projects are being evaluated or in the outcome of the evaluation.* 3. *Current or previous direct or significant though indirect experience with the project(s) being evaluated, including involvement in the project design or previous iterations of the project.* 4. *Current or previous work experience or seeking employment with the USAID operating unit managing the evaluation or the implementing organization(s) whose project(s) are being evaluated.* 5. *Current or previous work experience with an organization that may be seen as an industry competitor with the implementing organization(s) whose project(s) are being evaluated.* 6. *Preconceived ideas toward individuals, groups, organizations, or objectives of the particular projects and organizations being evaluated that could bias the evaluation.*	

I certify (1) that I have completed this disclosure form fully and to the best of my ability and (2) that I will update this disclosure form promptly if relevant circumstances change. If I gain access to proprietary information of other companies, then I agree to protect their information from unauthorized use or disclosure for as long as it remains proprietary and refrain from using the information for any purpose other than that for which it was furnished.

Signature	
Date	02,May , 2014

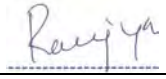
Name	Dr. Krishna Ram Khadka
Title	Evaluation specialist
Organization	Institute for Integrated Development Studies (IIDS)
Evaluation Position?	☐ Team Leader ☑ Team member
Evaluation Award Number *(contract or other instrument)*	367-13-000042
USAID Project(s) Evaluated *(Include project name(s), implementer name(s) and award number(s), if applicable)*	The Hill Maize Research Project, Phase IV
I have real or potential conflicts of interest to disclose.	☐ Yes ☑ No
If yes answered above, I disclose the following facts: *Real or potential conflicts of interest may include, but are not limited to:* 7. *Close family member who is an employee of the USAID operating unit managing the project(s) being evaluated or the implementing organization(s) whose project(s) are being evaluated.* 8. *Financial interest that is direct, or is significant though indirect, in the implementing organization(s) whose projects are being evaluated or in the outcome of the evaluation.* 9. *Current or previous direct or significant though indirect experience with the project(s) being evaluated, including involvement in the project design or previous iterations of the project.* 10. *Current or previous work experience or seeking employment with the USAID operating unit managing the evaluation or the implementing organization(s) whose project(s) are being evaluated.* 11. *Current or previous work experience with an organization that may be seen as an industry competitor with the implementing organization(s) whose project(s) are being evaluated.* 12. *Preconceived ideas toward individuals, groups, organizations, or objectives of the particular projects and organizations being evaluated that could bias the evaluation.*	

I certify (1) that I have completed this disclosure form fully and to the best of my ability and (2) that I will update this disclosure form promptly if relevant circumstances change. If I gain access to proprietary information of other companies, then I agree to protect their information from unauthorized use or disclosure for as long as it remains proprietary and refrain from using the information for any purpose other than that for which it was furnished.

Signature	
Date	02 May, 2014

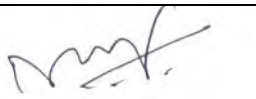
Name	Mrs. Ramrajya Joshi
Title	GESI specialist
Organization	Institute for Integrated Development Studies (IIDS)
Evaluation Position?	☐ Team Leader ☑ Team member
Evaluation Award Number *(contract or other instrument)*	367-13-000042
USAID Project(s) Evaluated *(Include project name(s), implementer name(s) and award number(s), if applicable)*	The Hill Maize Research Project, Phase IV
I have real or potential conflicts of interest to disclose.	☐ Yes ☑ No
If yes answered above, I disclose the following facts: *Real or potential conflicts of interest may include, but are not limited to:* 13. *Close family member who is an employee of the USAID operating unit managing the project(s) being evaluated or the implementing organization(s) whose project(s) are being evaluated.* 14. *Financial interest that is direct, or is significant though indirect, in the implementing organization(s) whose projects are being evaluated or in the outcome of the evaluation.* 15. *Current or previous direct or significant though indirect experience with the project(s) being evaluated, including involvement in the project design or previous iterations of the project.* 16. *Current or previous work experience or seeking employment with the USAID operating unit managing the evaluation or the implementing organization(s) whose project(s) are being evaluated.* 17. *Current or previous work experience with an organization that may be seen as an industry competitor with the implementing organization(s) whose project(s) are being evaluated.* 18. *Preconceived ideas toward individuals, groups, organizations, or objectives of the particular projects and organizations being evaluated that could bias the evaluation.*	

I certify (1) that I have completed this disclosure form fully and to the best of my ability and (2) that I will update this disclosure form promptly if relevant circumstances change. If I gain access to proprietary information of other companies, then I agree to protect their information from unauthorized use or disclosure for as long as it remains proprietary and refrain from using the information for any purpose other than that for which it was furnished.

Signature	
Date	02 May, 2014

Name	Mr. Durga Prasad Acharya
Title	Seed and marketing specialist
Organization	Institute for Integrated Development Studies (IIDS)
Evaluation Position?	☐ Team Leader ☑ Team member
Evaluation Award Number *(contract or other instrument)*	367-13-000042
USAID Project(s) Evaluated *(Include project name(s), implementer name(s) and award number(s), if applicable)*	The Hill Maize Research Project, Phase IV
I have real or potential conflicts of interest to disclose.	☐ Yes ☑ No
If yes answered above, I disclose the following facts: *Real or potential conflicts of interest may include, but are not limited to:* 19. *Close family member who is an employee of the USAID operating unit managing the project(s) being evaluated or the implementing organization(s) whose project(s) are being evaluated.* 20. *Financial interest that is direct, or is significant though indirect, in the implementing organization(s) whose projects are being evaluated or in the outcome of the evaluation.* 21. *Current or previous direct or significant though indirect experience with the project(s) being evaluated, including involvement in the project design or previous iterations of the project.* 22. *Current or previous work experience or seeking employment with the USAID operating unit managing the evaluation or the implementing organization(s) whose project(s) are being evaluated.* 23. *Current or previous work experience with an organization that may be seen as an industry competitor with the implementing organization(s) whose project(s) are being evaluated.* 24. *Preconceived ideas toward individuals, groups, organizations, or objectives of the particular projects and organizations being evaluated that could bias the evaluation.*	

I certify (1) that I have completed this disclosure form fully and to the best of my ability and (2) that I will update this disclosure form promptly if relevant circumstances change. If I gain access to proprietary information of other companies, then I agree to protect their information from unauthorized use or disclosure for as long as it remains proprietary and refrain from using the information for any purpose other than that for which it was furnished.

Signature	
Date	02 May, 2014

Name	Mr. Manbar S. Khadka
Title	Economist
Organization	Institute for Integrated Development Studies (IIDS)
Evaluation Position?	☐ Team Leader ☑ Team member
Evaluation Award Number *(contract or other instrument)*	367-13-000042
USAID Project(s) Evaluated *(Include project name(s), implementer name(s) and award number(s), if applicable)*	The Hill Maize Research Project, Phase IV
I have real or potential conflicts of interest to disclose.	☐ Yes ☑ No
If yes answered above, I disclose the following facts: *Real or potential conflicts of interest may include, but are not limited to:* 25. *Close family member who is an employee of the USAID operating unit managing the project(s) being evaluated or the implementing organization(s) whose project(s) are being evaluated.* 26. *Financial interest that is direct, or is significant though indirect, in the implementing organization(s) whose projects are being evaluated or in the outcome of the evaluation.* 27. *Current or previous direct or significant though indirect experience with the project(s) being evaluated, including involvement in the project design or previous iterations of the project.* 28. *Current or previous work experience or seeking employment with the USAID operating unit managing the evaluation or the implementing organization(s) whose project(s) are being evaluated.* 29. *Current or previous work experience with an organization that may be seen as an industry competitor with the implementing organization(s) whose project(s) are being evaluated.* 30. *Preconceived ideas toward individuals, groups, organizations, or objectives of the particular projects and organizations being evaluated that could bias the evaluation.*	

I certify (1) that I have completed this disclosure form fully and to the best of my ability and (2) that I will update this disclosure form promptly if relevant circumstances change. If I gain access to proprietary information of other companies, then I agree to protect their information from unauthorized use or disclosure for as long as it remains proprietary and refrain from using the information for any purpose other than that for which it was furnished.

Signature	मानबरसिंह खड्का
Date	02 May, 2014

U.S. Agency for International Development
1300 Pennsylvania Avenue, NW
Washington, DC 20523

Or

USAID/Nepal
US Embassy, Kathmandu
GPO Box 295, Maharajgunj
Kathmandu, Nepal