CIP's Contribution in Improving Rural Livelihood in Afghanistan



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CENTRO INTERMACIONAL DE LA PAPA

International Potato Center

ONAL

CIP's Mission

The International Potato Center (CIP) seeks to reduce poverty and achieve food security on a sustained basis in developing countries through scientific research and related activities on potato, sweetpotato, and other root and tuber crops and on the improved management of natural resources in the Andes and other mountain areas

CIP in Afghanistan

Potato Seed Production and Marketing (2002-2006)

Activity I: Production of good quality seed to meet the emergency seed requirements of Afghanistan. *Project Duration: August 2002-May 2003*

Activity II: Potato seed production and multiplication for increased potato production in Afghanistan *Project Duration: December 2002-August 2003*

Present

Activity : RAMP Job Order 06 -00: Clean seed production, multiplication and marketing for increased potato production in Afghanistan. *Project Duration: November 2003 to April 2006*



Activity 1 and II: Production of good quality seed to meet emergency seed requirements of Afghanistan

- Farmers trained on improved potato seed production technologies before supplying the seed
- 2.2 mt seed (G-2) from India and 20 mt certified seed from Pakistan imported and supplied to 24 farmers for multiplication in 2002 the fall season in Jalalabad
- Approximately 37 mt seed produced by participating farmers.
- 30 mt seed produced in the fall of 2002 supplied to farmers in Chaursiab, Miadanshar and Bamyan for further multiplication in spring 2003.

Good quality seed multiplied in spring 2003 to meet seed requirement of farmers^{*}

Location	No.of farmers	Seed Potato planted mt	Seed potato produced mt
Chaursiab	16	10	55
Miadanshar	18	10	65
Bamyan	17	10	120
Total	51	30	240

* USAID project completed in August 2003

Objectives of RAMP: Job Order 06-00

Overall Objective

Clean seed production, multiplication and marketing for increased potato production in Afghanistan

Specific objectives

- Produce, multiply and maintain health standards of seed potato of existing and newly introduced improved varieties
- Building Capacity for production, multiplication, marketing and certification of potato seed of existing and improved varieties
- Establishment of *in vitro* seed production facility to produce good quality starter seed material
- Establish potato seed storage facilities in the seed production sights
- Develop an "organized marketing chain" to sell locally produced seed and ware potato in domestic and regional markets"

Milestone achievements

Seed Production and Multiplication at Farm-level

- Technical assistance on seed production and multiplication at farm-level was provided to farmers and project site coordinators. Farmers produced 732 metric tons of seed during 2004
- During 2005, clean seed production in three major provinces was 2,341.43 mt
- Total quality seed production during 2004-2005 was 3,073.43 mt
- The farmers of Helmand and Kunduz also produced 109.0 and 210.0 mt of high quality clean potato of KCM and Desiree varieties using 5.80ha and 12.50ha land, respectively, which could be used as seed.

Clean seed potato production in Afghanistan during 2004-2005

		Year -2004		Year -2005		Total	
Province	Variety	Farmers	Seed	Farmers	Seed	Farmers	Seed
		involved	produced	involved	produced	involved	produced
			(MT)		(MT)		(MT)
Ghazni	KCM/	77	533	165	644.42	242	1177.42
	Desiree						
Nangarhar	KCM/	17	69	153	972.33	170	1041.33
	Desiree						
Parwan	KCM/	25	130	104	724.68	139	854.68
	Desiree						
Tota	al	129	732	422	2,341.43	551	3,073.43

Seed Production and Multiplication at Farmlevel (Cont.)

- The project established 72 demonstration plots in five target provinces
- Under the strict supervision of the project team an amount of 225.0 mt of clean potato was produced
- The average potato yield has increased by 40.0 % due to the introduction of improved seed and technologies
- CIP introduced seed/ ware potato production in autumn season (September-December) in Nangarhar that lead to production of two crops/ year

Area and production of potato through demonstration plots during 2005 in five provinces

Province	Area and production of Potato during 2005 in Demonstration plots in Five Provinces*								
	Spring			Autumn			Total		
	No.	Area	Yield	No.	Area	Yield	No.	Area (h)	Yield
		(h)	(mt)		(h)	(mt)			(mt)
Ghazni	10	1.73	58.32	-	-	-	10	1.73	58.32
Helmand	10	2.00	43.38	18	2.65	nil	28	4.65	43.38
Kunduz	-	-	-	1	0.2	0.35	1	0.2	0.35
Nangarhar	6	1.20	26.56	15	3.00	51.63	21	4.20	78.198
Parwan	12	1.50	44.37	-	-	-	12	1.5	44.37
Total	38	6.43	172.63	34	5.85	-	72	12.28	224.61

Comparison of the demonstration plots average yield of different crops in five provinces with the farmers' field during 2005

Crops	Demo yields	Farmers yield	Differences	Percent difference
Wheat	4.89	2.87	2.20	70.38
Rice	7.1	4.82	2.19	45.43
Potato	23.31	16.65	6.66	40.00
Onion	34.03	23.14	10.89	47.06
Tomato	33.44	22.15	11.19	50.97
Okra	12.65	8.68	3.97	45.73
Mung bean	1.69	1.09	0.60	55.40
Peanut	5.08	2.88	2.20	76.38
Cotton	3.51	2.47	1.04	42.1

Comparison of average net income of crops in demonstrations and in those of farmers' fields in Nangarhar



Capacity Building: Workshops and Trainings

In five target provinces and in Bamyan, a total of 1125 farmers, staff of MAAHF and NGOs were trained in integrated crop management (ICM), integrated disease management (IDM), and in aphid monitoring and post-harvest management and marketing of potato seed

Capacities building in potato clean seed production in Afghanistan during 2004-2005

	Training	Location	Person (Person trained	
			2004	2005	
Α	A two days training course on	Ghazni	83	57	140
	Integrated Crop Management	Helmand	61	63	124
	(ICM)	Kunduz	15	50	65
		Nangarhar	88	52	140
		Parwan	130	58	188
Sub-to	otal		377	280	657
B	A two days training course on	Ghazni		33	33
	Integrated Disease Management	Helmand		49	49
	(IDM)	Kunduz		48	48
		Nangarhar		48	48
		Parwan		50	50
Sub-to	otal			228	228
С	Training course on potato aphids,	Ghazni	09	-	09
	their importance and management	Parwan	25	-	25
	in seed production				
Sub-to	otal		34	-	34
D	A two days training course on seed	Ghazni	17	33	50
	potato marketing	Helmand	_	06	06
		Nangarhar	_	51	51
		Parwan	35	52	87
Sub-to	otal		52	142	194
E	A two weeks training course on tissue culture, micro-propagation and mini-tuber production techniques	Kabul	07	05	12
Sub-to	otal		07	05	12
Grand	Total (A+B+C+D+E)		470	655	1125

ICM Training Activities









IDM Training Activities











Demonstration of aphids

Capacity Building: Workshops and Trainings (Conti.)

- Additionally, 2824 farmers have been trained on improved technologies through 30 field days.
- Over 20,000 farmers, extension workers, village elders, and staff of other agencies have directly benefited from project activities.
- Three radio programs on potato production and marketing were produced and broadcasted by more than 50 local radio stations and reached over an estimated 15 million listeners.
- In addition to this, during 2004-05, a total of 26 formal trainings were conducted which were covered by national, and international electronic and print media, and expected to reach almost entire population of the country.

Developing and strengthening micro-propagation facilities for basic seed production

- A tissue culture laboratory and a screen house was established at Badam Bagh, Kabul at the cost of more than US\$1,00,000 and handed over to the Ministry.
- Twelve personnel of MAAHF were trained in tissue culture, micro-propagation and mini-tuber production techniques.
 - Micro-propagation cultures of four improved varieties (Kufri Chandramukhi, Desiree, Kufri Badshah, Kufri Phukraj) were established and multiplied and transplanted for basic seed production

Potato storage and marketing

- 35 country stores were built in four target provinces and in Bamyan providing an economical and improved way of seed potato storage.
- Each store is 6x 5x 4 meters in size with a capacity of 20 metric tones each.
- More than 720 metric tones total capacity
- Seed potato marketing channels has been developed

Establishment of country stores and storage capacity

S.	Province	District	No. of country	Storage
No.			stores	capacity (MT)
1	Ghazni	Khwaja Omari	4	80
		Center	3	60
		Qara Bagh	2	40
		Sub-total	9	180
2	Helmand	Grishk	2	40
		Nawa	1	20
		Center	1	20
		Germ Seir	1	20
		Sub-total	5	100
3	Nangarhar	Khogiani	7	140
		Sub-total	7	140
4	Kunduz	Khinjan	2	40
		Sub-total	2	40
5	Parwan	Sia Gard	2	40
		Surkh-e-Parsa	5	100
6		Sub-total	7	140
	Bamyan	Center	3	80
		Sub-total	3	80
		Total	33	680

RAMP Job Order 06 -00

Establishing potato seed storage facilities in the seed production sights (Fall/Winter 2004/05)

Existing facilities in the upper elevations



Underground storage for winter storage



Store Under Construction in Gazni



An underground potato store completed in Ghazni



Publications

- a) Eight research papers and publications in English
- b) Publications in local languages (under preparation)
- Improved Agronomic practices for Informal Seed Potato Production in Afghanistan (Pashto)
- Late Blight of Potato (Dari)
- Diseases and insects of potato in Afghanistan and their control (English, Pashto, Dari)
- Clean potato seed production manual (English, Pashto, Dari)

Project Impact on farmers' income, value added sale and capacity building

Project activity	Impact and economic growth			
	Short term	Long term		
	(2004-05 Estimated figures in US\$)	(10 years Estimated		
		projection in US\$)		
A. Seed Production and Multiplication at Farm-Level				
Clean seed production in three provinces	Amount of income	Estimated income		
	generated=US\$922,029 (0.992 million)	projection=10 million		
Ware potato production	4.8 million	48 million		
• Increase in potato yield due to improved seed and technologies	40% increase in yield impact=	6 million		
	U\$\$557,040 (0.557 million)			
Increase in potato yield/production due to increase in area	1.6 million	16 million		
Sub-total	8.0 million	80 million		
B. Developing and Strengthening Micro-propagation Facilities of	Impact study was not conducted	_		
Basic Seed Production				
• Establishment of capacity building and infrastructure development				
in in vitro production of seed production				
• Sale and use of in vitro developed clean seed				
• Increase in yield due to adoption of disease-free seed				
C. Potato Storage and Marketing				
• Improvement in seed storage to minimize losses (40%)	US\$ 95,200	1 million		
• Value added, improve price of seed potato after storage (30%)	US\$258,400	2.5 million		
Sub-total	US\$ 353,600	3.5 million		
Total estimated income generated (A+B+C)	8.35 million	83.5 million		
D. Capacities building in clean seed production and marketing	over 1000 farmers and 100 extension	Projected impact will be		
	workers were trained	10,000 farmers		
		and 1000 extension workers		

Proposal for sustainability

- The project has built capacities in clean seed production and established infrastructure and technical manpower in three provinces (Ghazni, Nangarhar and Parwan) for clean seed production; and in Helmand and Kunduz for ware potato production. For sustainable food security, the seed production activities must be extended to Bamyan, Madian Wardak and as an alternative to illicit crop to southern, eastern and Northern provinces.
- Tissue culture laboratory at Badam Bagh, Kabul started producing basic seed of selected varieties. To make the laboratory sustainable and functional for longtime, the ministry / research directorate should appoint at least four already trained scientists to continue basic potato seed production as a priority.
- A total of 35 country stores playing an important role in reduction of post-harvest losses of seed potatoes and in improving the seed marketing. However, construction of cold storages in Jalalabad, Helmand and Kunduz is strongly recommended.
- Cultivation of white skin varieties are generally in practice but introduction and use of red skin varieties must be encouraged. More CIP materials should be evaluated and made available as standby because the present germplasm is susceptible to major diseases including late blight
- Establishment of value added processing of potato to improve the livelihood of the farmers and to reduce nutrient deficiency that is common in the rural communities, particularly in Northern and eastern provinces.

Lessons to be learned from the project to provide a sustainable seed-potato system in Afghanistan

Ghazni and Parwan are proved to be good seed producing areas Seed production can be extended to Bamyan and Maidan Wardak These places can be developed as hub for clean seed potato production

Province	District	No. of seed producers	Variety	Total areas	Total seed produced
Ghazni	Center	55	KCM	6.69	185.80
	Khoja Omari	68	KCM	9.38	276.18
	Qarabagh	26	KCM/Desiree	9.38	128.81
	Jaghori	7	КСМ	1.19	31.84
	Nawar	9	KCM	1.33	30.78
	Sub-total	165		21.92	644.42

A case study of one farmer at Ghazni:

Name	CIP-ICARDA Inputs	Seed produced (mt)	If he sell at the time of harvest	Stored in Country store and then sell
Amir Khan	Clean seed production technologies, seed, fertilizer, etc.	17 metric tones	Afg 10/kg Afg 170,000	Afg20/kg Afg 340,000

Ministry of Agriculture and Irrigation





Potato - a potential alternative crop

Potato - a potential alternative crop



Source: <u>www.unodc.org/pdf/afghanistan_2005</u> (for poppy and wheat)

Potato - a potential alternative crop



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