

A BOOKLET ON

Potato Value Chain Development in PMAMP



Government of Nepal

Ministry of Agriculture and Livestock Development

Prime Minister Agriculture Modernization Project

Project Management Unit

Khumaltar, Lalitpur

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Collected and Prepared by

Mr. Pushpa Raj Poudel

Senior Agriculture Officer, PMAMP PMU

Mr. Bikash Poudel

Agriculture Officer, PMAMP PMU

Mr. Hikmat Kumar Shrestha

Project Director, PMAMP PMU

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Khumaltar, Lalitpur

Phone No.: 01-5420364, Email: pmamp.pmu@gmail.com,
Website: www.pmamp.gov.np

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Prime Minister Agriculture Modernization Project

1. PMAMP in brief

- Prime Minister Agriculture Modernization Project (PMAMP)
 - » Only one project self-financed by GoN under MOALD.
 - » A project recognized as GAME CHANGER project in 15th Plan.
 - » Project of national consideration in 16th Plan.
 - » Project for Agricultural Development Strategy (ADS) implementation support, prepared by Nepali thought, implemented by Nepali investment with use of internal institutional manpower.
- Executing Agency- MOALD
- Project Duration – 10 yrs (FY 73/74 to 82/83)
- Total Projected budget for 10 yr- NPR 130 billion (1000 M USD)
- Project Area – 77 districts (through 1 PMU, 48 PIU)
- PMAMP aims to develop self-reliant economy through modernization, specialization, mechanization and industrialization of the agriculture sector.

1.1 Vision

- Developing a modern, commercial, sustainable and self-sufficient agricultural sector transformed from an agriculture-based economy to an agro-based industry

1.2 Goal

- Ensuring food nutrition security through the integrated combination and operation of the components of the overall agricultural value chain, creating sustainable economic opportunities oriented towards agricultural industrialization and contributing to the overall development of the nation.

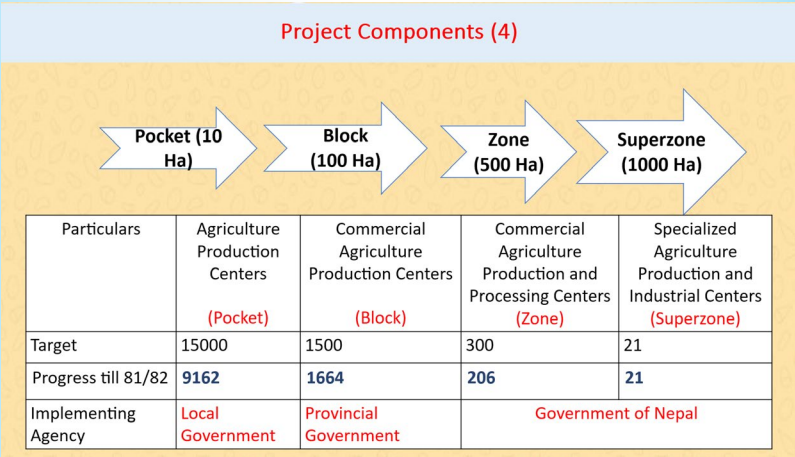
1.3 Objectives

- To create specialized areas for major agricultural products,
- To enhance competitiveness by value addition of exportable agriculture products,
- To develop agriculture as a worthy profitable business and create employment opportunities,

- Ensuring effective service delivery through functional multi-stakeholder coordination

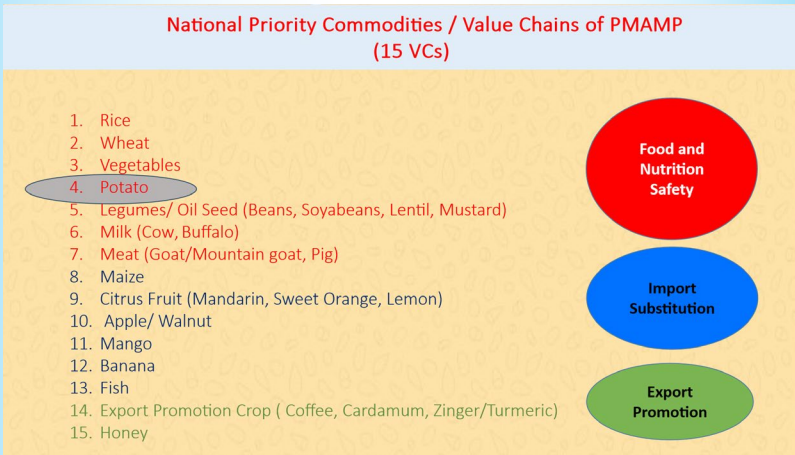
2. Components

Project has 4 components namely Pocket, Block, Zone and Superzones. The summary of these components is presented below



3. National Priority Commodity

Potato is one of the major priority commodity/ Value Chain among 15 VCs supported by PMAMP. Project intervention in this commodity is supposed to support for food and nutrition security of the country.



4. Potato Value Chain program in PMAMP

4.1 Crop wise Zone/Superzone detail

- Project is implementing 206 zone and 21 superzones till date. Among them 2 Superzones and 20 Zone of Potato are being implementing throughout the country. The crop wise detail of zones and superzones and also district wise distribution of potato zone/superzones is as below.

Crop	Superzone no	Zone no	Crop	Zone no
Rice	5	21	Legumes	7
Maize	2	13	Oilseed	2
Wheat	1	3	Cow/ Buffalo	10
Vegetables	2	35	Pig	2
Potato	2	20	Areca nut	1
Apple/ Walnut	1	12	Sheep/ Goat/Mountain goat	14
Citrus	2	18	Rubber	1
Coffee	1	1	Olive	1
Fish	3	11	Kiwi	3
Banana	1	4	Mango	4
Cardamum	1	7	Honey/ Honey bee	5
Zinger/ Turmeric	-	10		
Total	21			206

4.2 Distribution of potato Superzones/Zones in PMAMP

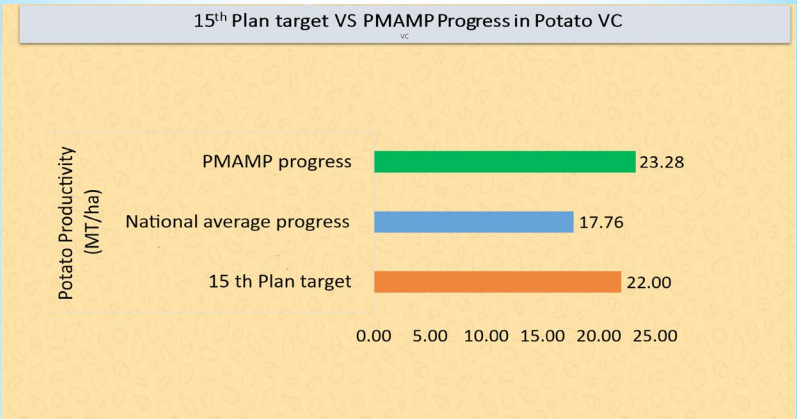
- As we see the district wise distribution of potato zone/superzone, it is distributed in all ecological and climatic region of country from terai to mountain and also from east to west of the country

Component	No	Coverage
Superzone	2	Kavrepalanchok, Dadeldhura
Zone	20	Okhaldhunga, Ramechhap, Rasuwa, Nuwakot, Bhaktapur, Kathmandu, Baglung, Dailekh, Bajhang, Achham, Panchthar, Dolkha, Gorkha, Manag, Myagdi, Rolpa, Rukum East, Mustang, Rupandehi, Jumla
Block	147	
Pocket	580	

4.3 PMAMP’s Contribution in National Production and Productivity of Potato

- The total area covered by potato in Nepal is 198,256 ha which produces 3,410,839 MT potato per year. The national average productivity of potato is 17.2 MT/ha while the productivity of PMAMP is quite high (23.28 MT/ha). The contribution of PMAMP in national potato area and production is 42.97% (12345 ha) and 46.21% (287391 MT) respectively.

Crop	PMAMP Area and Production		National Area and Production		Contribution of PMAMP %		Productivity	
	Area	Prod.	Area	Prod.	Area	Prod.	PMAMP	National
	ha	MT	ha	MT			MT/ha	MT/ha
Potato	12345	287391	198256	3410829	6.22	8.42	23.28	17.2



4.4 15th Plan target VS PMAMP progress in Potato Productivity

- Major programs in Potato Value Chain
- Subsidy Based Programs
- Co-investment Program
- Capacity Development Program

4.5 Major activities in Potato Value Chain

- Project is supporting the farmers in all value chain functions of potato starting from input supply to production, processing, storage

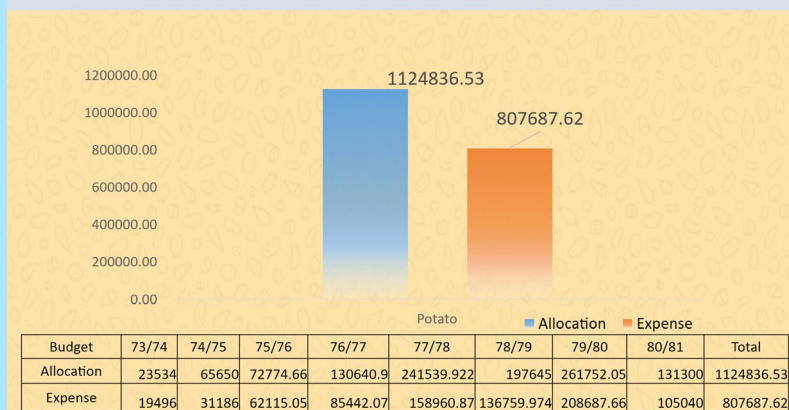
and marketing. The major activities that the project is supporting through its annual program are as below.

<ul style="list-style-type: none"> • Crop area expansion • <i>Chaklabandi kheti</i> (Crop pooling) • Mechanization support • Small irrigation support • Rustic stores, Cold rooms/ Cold stores • Demonstration • Training, Exposure visits • Soil health improvement • Farmers' Field School 	<ul style="list-style-type: none"> • Seed Multiplication • Technology package for Potato seed cycle • PBS/TPS Production • Varietal demonstration • Crop protection • Marketing and postharvest support (bagging and labelling) • Training packages –Seed to market
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4.6 PMAMP investment in Potato Value Chain

- Till FY 2080/81 project has invested 1124 million NPR for development of potato VC. This investment is mainly for production support, potato area expansion, seed production, construction of storage facility, processing and marketing. The FY wise investment in Potato VC under PMAMP is presented as below.

PMAMP investment in Potato Value Chain (Rs ,000)



4.7 Project output and outcome in Potato Value Chain

- The major output and outcome in Potato Value Chain are listed as below.
- 2 Zone 20 Superzones

- Seed potato production through PBS
- Screen house for PBS production (8 no)
- Seed Potato production
- Rustic Store (68 no)
- Potato Chips industry (10 no)
- Chaklabandi kheti
- Potato area expansion
- Small irrigation
- Collection centre/ Store house
- Machinery and equipment support



Area Expansion in Dadeldhura



Seed multiplication Nuwakot

The project contribution in potato area expansion is quite significant. Till date, 3355 ha of potato crop area expansion is completed. This area increment contributes for production of additional 59,551 MT potato per year (17.75 MT/ha). Total income of 1480 Million NPR from marketing of this additional production (NPR 25/Kg).



Mechanization, Kavre



Chaklabandi Kheti Dadeldhura

5. Achievement in Potato Storage under PMAMP support

Project has supported for establishment and operation of 3 cold storage (Dhanusha 5000/Nuwakot 5000/Dhading 2500 MT. It has also supported for construction of 64 cold room/chamber with the 512 MT storage facility and 68 rustic store with 684 MT potato storage capacity.



Cold Room, Dolakha



Cold Store, Dhanusha (5000 MT)



Rustic Store, Gorkha (50 MT)



Rustic Store, Baglung

5.1 Potato Varieties in PMAMP area

Major potato varieties promoted and supported by PMAMP in Zone/ Superzone

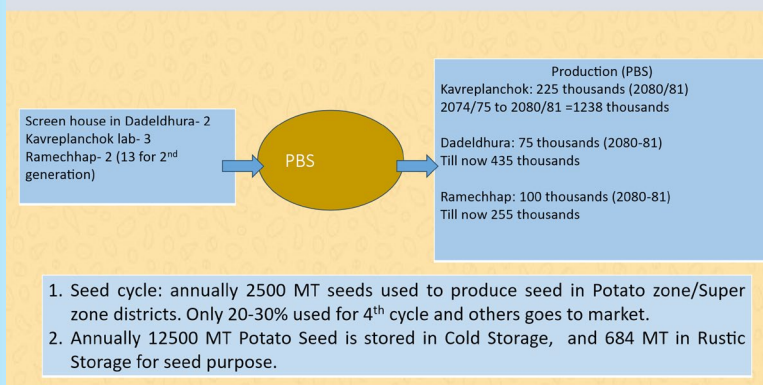
- Khumal rato
- Khumal seto
- Janakdev
- Khumal Ujjwal
- Khumal Upahar
- MS-42
- Khuaml Bikas

- Cardinal
- Desire etc
- Project is also supporting for promotion of local varieties
- Aru Alu, Lyanthe, Gajale, Nilo Alu, Chisapani, Chakre

5.2 Zone/Superzone Implementation Status (Case of Few PIUs)

- PMAMP is basically implementing zone/superzones program in Value Chain approach
- PMAMP is supporting major potato stakeholder in different value chain functions like input supply, production, post harvest handling, storage and marketing
- The major Potato VC actors working with PMAMP are input supplier, producer (Group, Cooperative, Agri entrepreneur), Collector, Wholesaler/Retailer etc.

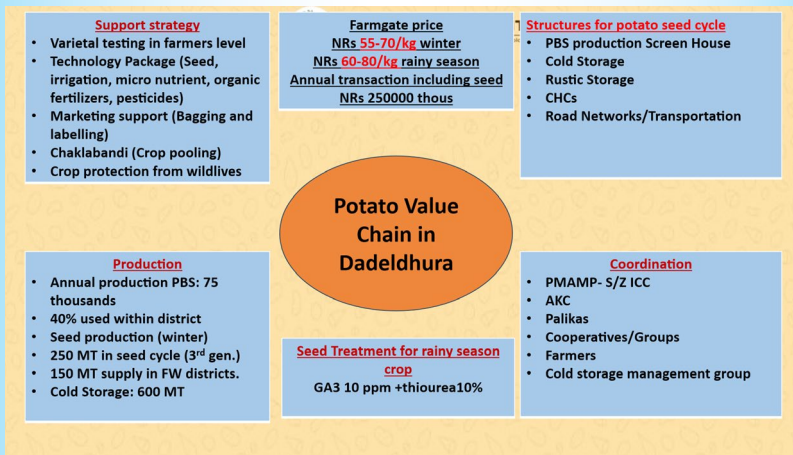
Scenario of PBS Production in PMAMP



Case 1: Potato status in Dadeldhura

- 70-75 thousands of PBS potato seed from 2700 bottles Dizere and Cardinal variety
- Source of PBS seed potato for Far western Province in Hilly districts(Annual supply of 35-40 thousand PBS)
- Yearly production of 250 MT of 3rd generation of PBS seed
- Storage of 550-600 MT of seed Potato in Coldstore (Constructed by RISIMFP and Upgraded by PMAMP)
- Export of 150 MT of seed from Dadeldhura district.
- 382 Small irrigation Schemes irrigating about 950 ha of land.

- 900 small and medium machinery Support in Superzone area for mechanization
- Cash support to farmers who store Seed Potato in cold stores @ NRs 2 per kg and NRs 5000 per ropani to potato seed producers.
- NRs 4000 per ropani support to farmers for area expansion for 2 years for new area.
- Area Expansion in coordinated efforts with local and Provincial government



Case 2: Potato status in Kavre

- Farm Mechanization Program (Potato planter, harvester etc)
- Demonstration of new Technology like Plastic Mulching
- Productivity in plastic



Mulching is recorded up to 40Mt/ha

- PBS Seed Production in Screen House
- Capacity of production of 250000 PBS seed yearly
- Export seed Potato up to 1200 MT/ Yearly to 65+ districts
- Area expansion by 377 ha and productivity increases from 18.8 to 29 MT/ha
- Involvement of cooperatives and private sector in seed production and marketing
- Irrigation Schemes
- Source seed support program
- Primary processing and Storage facility
- Value chain concept in production to marketing and storage



Packing, labeling and marketing of Kavre Potato



Mini packet for market delivery (Marketed 5 MT till date)

Case 3: Potato status in Nuwakot

- 90000 PBS seed for seed potato production.
- 55 MT of improved seed export to other districts.
- Productivity Increased to 36.51 MT/ha from 17.63 MT/ha in Rasuwa and 29.85 MT/ha in Nuwakot
- Seed production from private and cooperative sector
- Mechanization increasing (> 1000 machinery in 2 districts)

- Problem in availability of fertilizers and other agro chemicals during planting season

5.3 Problems and challenges in Potato VC- PMAMP experience

- High fluctuation in market price (Low in potato season)
- Uncertain market due to uncontrolled import of potato.
- Lack of proper storage facility to store in harvesting season
- Issue of strengthening provincial seed lab capacity in PBS certification
- Potato crop damage and loss due to wild animals is being great challenge
- Migration and labor shortage in rural area for potato farming
- Lack of availability of chemical fertilizer in planting season
- Lack of seed for the high hill farmers for February to April planting
- Lacking varieties for two season cropping pattern, chips, French fries, dalmoth etc.
- Lack of adequate irrigation facility in potato zone/superzone area
- Increasing trend of fallow land and unavailability of guidelines to utilize these land in potato farming, crop pooling or contract farming
- No assurance in quality of agro chemicals (50 ropani potato in Nuwakot burned due to wrong formulation of fungicide last year)
- Potato Tuber Moth (PTM) is major uncontrolled pest for potato storage
- Transportation problems for the rainy season potato. (Road network disturbed)
- Demand and supply chain of potato seed is not strong. seed is lacking and at the same time somewhere may be stock piling.
- Different price rate of PBS in govt. farm and private farm.
- Spread of virus due to poor quality seeds in the border area brought through unauthorized channel; specifically brought for kitchen purpose and goes to the farmers field as seed.

5.4 Way forward for Potato VC development-PMAMP Suggestion

- Development of large production site through crop area expansion

- Promotion of *Cbhaklabandi kheti/ Sahakari Kheti* or Contract farming in potato for VOLUME production
- Establish the mechanism to export hill potato to terai and India in off season
- PMAMP should lead for implementation of Minimum Support Price in potato
- Work for widespread availability of irrigation facility in potato zone/superzone area
- Implement the mechanism for subsidy on agriculture credit and agri-inputs
- Allocation of Chemical fertilizer QUOTA for potato zone/superzone
- PMAMP should increase technical backstopping to potato growing farmers
- Support farmers in Quality Potato Production
- Replacement of old degenerated seed by higher generation seed
- Strengthen PBS to Seed cycle of potato through special package and facilities.
- Increase Expert involvement in Tissue culture labs for potato
- Raising awareness among farmers on the need for quality seed
- Assist Farmers in the selection and adoption of appropriate Variety
- Establishment of seed village both in the Hills and Terai for high quality seed potato production
- Training and mobilization of seed producer for the production of higher generation seed potato
- Adoption and strengthening of seed quality control system
- Support for easy access to appropriate variety
- Identify a pool of recommended varieties which are compatible with the market demand
- PMAMP should work with the producers to manage supply based on demand situation.
- Facilitate the farmer in the preparation of Production Plan according to demand.
- In the commercial production area the producers should support facilities/sheds for post-harvest curing, grading and packaging.

- Improved short term storage facilities in the collection points and wholesale markets.
- The current capacity of cold storage/rustic store is very nominal and cannot support any increase in supply. This bottleneck has to be removed.
- The cost of cold storage is quite high. PMAMP should identify the ways to reduce the cost.

5.5 Recommendations

- Time expansion of PMAMP project.
- Implement the PRI report
- Sharing of good practices
- Rules regulations, directives, working procedure and other legal concerns should be implemented immediately to avoid obstacles practically faced by the farmers and suppliers.
- ATWG meeting with NARC for the researchable problems and issues
- Need of strong coordination and linkages among 3 tier governments.
- B.Sc.Ag intern and their adaptive research need to focused for the practical issues faced by farmers.
- Capacity building of technician, farmers and input suppliers
- Suitable and high yielding varieties of potato for high hill conditions.
- Infrastructures like storage facility, transportation, mechanization
- Soft loan for producers, suppliers and processors.
- Crop insurance
- High yielding varieties of potato to be developed
- Buy back guarantee with traders,
- Branding, labelling and packaging of potato
- Subject Matter Specialist in each working area.

5.6 Conclusion

- PMAMP should be extend at least for 10 yrs for further development of potato VC
- Technology that are approved and promoted in potato by PMAMP should be rapidly disseminated

- Enhance effective linkages and coordination between Research, Extension and Education for the overall Potato VC development.
- Develop and implement special potato package programs for women and youth
- Implement investment decade focusing in Potato VC development with sufficient budget and human resource
- Regular ATWG in Potato is prime concern for the update in recent technologies and feedback of the adopted technologies



Mulching for potato, Kavre



Area Expansion, Bajhang



Area Expansion in Dadeldhura



PBS Seed Production Dadeldhura



Cold Room, Morang



Rustic Store, Okhaldhunga



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