## Oct/ 2022



## **APART:** Adding Value to Increase Resilience, Production And Value Addition of Horticulture Value Chain

DoH & FP is the Operational Project Implementation Unit (OPIU) under APART supported by two international agencies





AKIAS Society

Rural Infrastructure and Agricultural Services Socie

World Vegetable Center

#### **Major Project Interventions**

- Development of 167 clusters in 
   APART district
- Demonstration of Climate Resilient Technology and Market-Led Activities
- Demonstration of Post– Harvest
   Management (PHM) Techniques
- Application of IPM systems to reduce the use of pesticides and promote vermicomposting units

- Market linkage through
- Value Chain Schools
- Cold Chain Storage Facilities
- Provision for specially designed
   4 wheeler transport vehicles
- Formation of FFS (Farmer Field Schools) and FPCs (Farmer Producer Companies)
- Intensification of Vegetable Nursery for Seed Production
  - Awareness and Capacity Building

Assam Rural Infrastructure and Agricultural Services Society (ARIASS), Agriculture Complex, Khanapara, GS Road, Guwahati-781022

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#### ASSAM AGRIBUISNESS AND RURAL TRANSFORMATION PROJECT (APART)

## **Second Edition**

#### Message From The Director's Table

The Quarterly Online e-newsletter **"Horticulture Bytes"** was initiated by OPIU-Horticulture and Food Processing to disseminate information and impact of APART activities in field level in the districts. In the second issue published in October 2022, emphasis has been placed on Medicinal and Aromatic Plants, Natural Farming, VNEDP (Vegetable Nursery Development Programme) promotion and newly introduced technology "Grafting of Tomatoes on Brinjal rootstock" for disease resistance in collaboration with WorldVeg. A target of 40000 grafted seedlings to be produced by the 40 Nursery entrepreneurs has been set to them which they can produce and sell in the market. The feedback from the field is encouraging and we are hopeful the farmers will adopt this technology and shall be benefitted from it for growing off season tomatoes.

It is also to be mentioned here that the Potatoes Conclave which was successfully completed in collaboration with CIP (International Potatoes Center) on 26<sup>th</sup> Aug -27<sup>th</sup> Aug 2022 at Assam Administrative Staff College, Jawaharnagar, Khanapara, Guwahati has pushed Potatoes Value Chain Development in Assam to a great extent. **36** (Thirty Six) Memorandum of Understanding have been inked between four FPCs viz., Luitporia Agro Producer Company Ltd., Nagaon, Sathani Potato Producer Company Ltd., Biswanath and Mandia Milanjyoti Producer Company Ltd., Barpeta with nine potato seed companies viz., Sidhivinayak Agri Processing Pvt Ltd, Maharastra; Technico Agri Sciences Limited, Chandigarh; BhattiAgritech, Punjab; Jalandhar Potato Growers Biotech Producer Co Ltd (JPG Biotech), Punjab; Sangha Refrigeration, Punjab; DS Agro Service, Haryana; Jalandhar Potato Seed Growers Self Supporting Co-op Society Ltd (JALPO), Punjab; Gopal and Company, Punjab and Noor Agri Farm, Haryana for high quality potato seed supply to enhance potato production in Assam.in the Conclave which shall go a long way in sourcing high quality potatoes seeds of CRML ( Climate Resilient and Market Led) varieties suitable in Assam. Linkages between Potatoes Value Chain Schools, FPCs and Multi National Companies like Pepsi, Haldhiram were established during the same conclave to address branding and marketing.

A total of **6667** farmers have been benefitted directly from various APART activities like introduction of improved production guides, demonstrations, introduction of different CRML technologies, Farm Mechanizations, Seed production, CRML Potatoes varieties introduced in Cafeteria, Value Chain Schools (Farmer Business Schools) etc. Apporximately **9201** farmers adopted the technologies and got indirect benefits. In addition, **44** Vegetable Nursery Entrepreneurs were promoted and **470** members of Board of Directors, CEOs, Accountants from 89 FPCs were trained on Organizational Management of FPCs, Legal Compliances and Financial Management till date.

We are hopeful that this e-newsletter shall encourage all the stakeholders involved in the Fruits and Vegetables Value Chains under OPIU- Horticulture and Food Processing and shall act as a conduit between general public, Farmer Collectives, stakeholders and the project.

Shri Triranga Bharatiya Borah , Director Horticulture and Food Processing, Assam

fam very much pleased to forward the second issue of the Quarterly Online e-newsletter 'Horticulture Bytes'.

OPIU-Horticulture and Food Processing through the dedicated team of District Horticulture Coordinators (DHCs) have given their efforts in putting together the updates from all the districts for the last quarter ending September 2022.

Being an alternative farming system maximum focus has been given on Natural Farming without using synthetic fertilizers and pesticides. I am pleased to share that OPIU-Horticulture and Food Processing has been entrusted with Natural Farming promotional activities. 3 (Three) days TOT for the 15 Master Trainers and DHCs of the pilot 5 districts (Kamrup,Karbi Anglong, Sonitpur, Golaghat and Nagaon) at SpreadNE farm in Sonapur was completed during 17th August -18<sup>th</sup> August 2022. Following which the Master Trainers have started their activities through community mobilization , awareness camps which are being held at selected FIGs/FPCs covering pilot districts. Special mention may be made of the Master Trainer Ms Moneeta Das, Ghoramara Janpam, Chandrapur who started the mobilization and practiceal training on the Natural Farming tools and practices. We are hopeful Natural Farming will boost the organic farming practices as parts of Assam and North Eastern Region are organic region by default. Natural farming practices can serve dual purpose of promoting Dairy sector as Cow dung and Urine are main ingredients of this farming system. It will not only improve soil hygiene, soil condition also fetch premium prices of the organic products for the farmers in the market through concentrated branding efforts.

In the coming days Natural Farming will be promoted in a massive way for sustainable Agriculture as well as for making available clean and healthy food and safe environment.

We are hopeful APART shall be able to bring in a good impact in transformation of the Horticulture sector through improved system, processes and efforts.

Shri Khagendra Sarmah

DDA (Seeds) cum Nodal Officer, OPIU, APART

Horticulture & Food Processing, Assam

## **FUTURE PROSPECTS OF HORTICULTURE CROPs**

Horticulture is perceived as an important part in potential diversification and value addition in agriculture sector. Assam is known for reservoir of genetic variability and diversity of different kinds of fruits, vegetables, spices, ornamental plants also medicinal and aromatic plants. Some of the recent approaches in the state in Horticulture sector include intensive vegetable crop production system through selection of suitable genotypes, natural farming, cropping system, integrated nutrient management, contract farming, development of community nurseries / seed village for raising seedlings. Further evaluation of processing qualities of different crops should be studied by research agencies for propagation and production maximization. Facilitation of processing of private-public partnership along with its value addition and marketing. Cultivation of black pepper in the tea gardens should be mandatory of Assam as well as in the foothill areas of adjoining states. One model village near urban area supported with modern sales centres at nearby city and linkage with APEDA for export. Emphasis should be given on sustainability and commercialization





of horticultural crops especially indigenous crops along with creation of other infrastructural facilities e.g. good storage cold chain facilities. Introduction of product or region intensive individual crops to attain specific targets along with post- harvest facilities, preparing large scale planting materials. Horticulture sector has been playing a pivotal role in becoming a major source of positive growth itself and for the nation. It will transpire as a significant source for income acceleration, poverty alleviation with employment generation and export promotion also with forward and backward linkages as an organized industry can stimulate and sustain growth.



Submitted by

Dr. Ningma Doma Sherpa District Horticulture Coordinator, Karbi Anglong

**Second Edition** 

# **APART PROMOTED CLIMATE RESILENT TECHNOLOGY INCREASES CROPPING INTENSITY GROWING POTATO, TWO TIMES IN A SEASON**

Mr Sunil Deka is a progressive farmer and Milijuli VCS members and associated in since last 30 years and used farminfg traditional methods of farming. With the passage of time on 2019 he joined as a member in Potato VCS, he was selected as a beneficiary of APART as he was interested of doing his farming with new technology. He proved that potatoes can be cultivated two times in a season by raised bed +mulch, a climate resilient technology promoted by APART through demonstrations given in in 2020-21. Milijuli VCS practice evaporation reduces and results in he had planted K Pukhraj and Chipsona3 in less water requirement, weeds are under Raised bed and mulching control, low infestation of pest and diseases, out applying additional fertilizer and harreduces cost of cultivation and protecting the vesting started from last week of March to environment. He Rangpuria, Chipsona3 and K Pukhraj in an of 12 Mt/ha and market price of 13.5 Rs per area of 1 bigha of land with Raised bed kg. Sunil Deka was so happy with the tech-+mulching technology. He had planted in the nology he informed that size of the potatoes last week of October 2021 and had harvested and number of tubers increases in Ragfrom 8<sup>th</sup> Jan 2022 to 28<sup>th</sup> of Jan 2022, he puria, Chipsona3 and Pukhraj variety with was able to get 19.5 MT / Ha in Rongpuria Raised bed + mulching practice and producpotato and 22 Mt/ha in K Chipsona3 variety tion was almost double than conventional and got market price of 50 Rs per kg in Ron- practice. Being influenced by his achievepuria potato and 25 Rs per kg in Chipsona 3. ment, other farmers of nearby villages got





By mulching Again on second week to last week of January technology withplanted Potatoes of first week of April 2022, with the production inspired to start farming under his guidance. cultivated paddy, mustard and other He vegetables in addition to potatoes and he has fishery, cows, goats, ducks etc. In 2020 he bought power tiller by selling potatoes that were provided him in the demonstration.

#### Submitted by

**Dr Minsura Begum** 

**District Horticulture Coordinator, Barpeta** 

#### **SOCIO-ECONOMIC UPLIFTMENT OF FARMER ANANTA BORAH**

Ananta Borah, a marginal farmer lives in a small Bamboo constructed house ushers hope through selling Vermicompost and Vermiwash to the people engaged in farming profession.

Early in the morning, he aspires for good hopes and results into whooping income in the evening by selling Vermicompost @Rs.15 per kg to the people in Harmoti Market.

Low cost Vermicompost of dimension 20ft\*6ft\*3.5 ft tank was being provided by APART to Pragati Merbil FIG and Ananta Borah is a keen member of the group.

He takes initiative to create awareness among the fellow farmers on use of Vermiwash for prophylactic sprays in the Horticulture crops.

His customers were especially women farmers and Nursery Entrepreneurs.

The group raised Earthworm Eisenia Foetida sourced from Krishi Vigyan Kendra, Lakhimpur.

They are selling earthworm Eisenia Foetida @Rs.2 5 per to the desired customers.

In this process, Pragati Merbil FIG group benefitted expontially and and generated an income of Rs.2.5 lakhs in a period of 6 months by selling earthworm's variety, Vermiwash and Vermicompost.

#### **PUMPKIN MAN OF MORIGAON**

Mr. Bishnu Deka is a progressive farmer from Morigaon block, Morigaon district and has been total land of approx. 15 Bigha. Where he has been cultivating local vegetables and mainly Pumpkin and Potato and selling the produce in the local haats and weekly markets. In 2021-22, he was selected as a beneficiary for the Pumpkin beneficiary demonstration under APART-ATMA, Morigaon. He was provided with seeds (Variety: Arjuna ) along with fertilizers and other inputs for 0.15 ha under the scheme. As per the terms of the demonstration, He cultivated pumpkin in 0.15 ha of land and additional aprox. 7 bighas with his own capital under the supervision of , Morigaon APART officials and Technical guidance of WVC( world vegetable Centre), the knowledge partner of APART. His hard work was rewarded when her average yield of 35.00 Qntls per bigha earned almost Rs. 42,000 @ rate of Rs. 12/Kg. He has also collected the pumpkin, produced by the members of Marakolong Pumpkin FPC and market lingkage has been done to WB from his farm. Where he got farm gate price Rs. 12/ Kg. His total production was approx. 26.25 MT from 8 bighas. He has earned approx. Rs. 3,15000 from pumpkin plot and he has purchased a 2<sup>nd</sup> hand tractor for his farm adding some own capitals.

He is very much happy with the result in comparing with the yield of demonstration plot and Control plot. It was found that the yield of demo plot much higher than controlled plot yield.



## A short note on Grafting Technology for Bacterial Wilt Resistance

Among diseases of Tomato, bacterial wilt (BW) is usually the most damaging in India. Grafting tomato scions and eggplant rootstocks increased the survival rate of seedlings by 20 to 95% compared to nongrafted plants and doubled the yield in field. Grafting of popular brinjal variety on bacterial wilt tolerant rootstock is an efficient technology to mitigate the problem through a zero-chemical approach. Grafting of tomato variety on BW tolerant rootstock of eggplant is a promising method to overcome the BW disease in tomato. Healing of the grafted seedlings is very crucial for grafting success. Grafting chamber is used for about one week to provide high humidity and reduced light intensity during development of the graft union

#### The main important steps on this technology are :

Step 1: Choosing the rootstock and scion

Step 2: Raising Rootstock and scion

Step 3: Construction of the Healing chamber

Grafting technique

Splice grafting, also known as "Japanese top grafting" or "tube-grafting," is the most commonly used technique when grafting Solanaceous crops. Cleft and side grafting are the other two main grafting techniques used to graft tomato.

WorldVeg introduced this technique in collaboration with OPIU-Horticulture and FP in Assam in the month of Aug and September 2022 in all the APART districts through Training of Trainers mode to 444 Vegetable Nursery Entrepreneurs and Farmers. It is envisaged that this technique will help the farmers of Assam in increasing off season production of vegetables and earn more incomes for farmers.



## **Pilot Project On Medicinal & Aromatic Plants**

The 9<sup>th</sup> State Project Coordinating Committee (SPCC) meeting held on 19<sup>th</sup> January, 2022, has taken up decision on Cultivation & Processing of Aromatic and Medicinal Plants (Lemongrass & Tulsi) on Pilot basis. Lemongrass have been decided to cultivate in four districts, namely, Biswanath, Goalpara, Karbi Anglong and Kokrajhar and Tulsi in two districts i.e. Goalpara and Kokrajhar.

Accordingly, in the AWP 2022-23, the Kokrajhar district has been selected as pilot districts for taking up the demonstration activity on Enhancing Medicinal & Aromatic Plants, Lemongrass for 16 acres of area and Tulsi for 7 acres of area. In this regards awareness campaign & training on Lemongrass & Tulsi productions were given by CI-MAP officials along with PD- ATMA-APART staff in the district and total 19 numbers of interested beneficiaries were selected from Bodoland Agro. Organic Producers Company Ltd., Kokrajhar block for Lemongrass cultivations and a total 12 numbers of beneficiaries from Jwogapu FIG of Swmkwm Agro Producers Company Ltd., Kachugaon block and 1 no. of beneficiary from Jwlwi FPC, Dotma Block were selected for Tulsi cultivation.

The plantation of Lemongrass for 16 acres of area was completed by 7<sup>th</sup> June, 2022 by the selected beneficiaries of different cluster villages at Patgaon region of Kokrajhar block. Due to continuous heavy rainfall and flood just after the planting during June, 2022, only 20% of area i.e. 3 acres of plants have survived to result in good growing stages. As per suggestions from different central and state monitoring teams, we are planning to compensate the damage & targeted area by replanting some area & multiplying from the existing plants by the next planting or kharif season.

On the other hand, the sowing of Tulsi by broadcasting method had been completed in the 2<sup>nd</sup> week of August, 2022 in 7 acres of area at Hatigarh F.V., Kachugaon block and 2 acres of area at Hogmabil, Dotma. The germination percentage at Hogmabil, Dotma was very poor and beneficiary could not manage the weed problems inspite of repeated guidance and suggestions. The Tulsi cultivations by Jwogapu FIG group of Swmkwr FPC, Kachugaon is performing very well with timely weed managements and plant protections. Unfortunately, we are observing fungal wilt problems in the field at present, for which we have contacted Dr. Vinod Upadhyay, Plant pathologist of RARS, Gossaigaon; Advisor MAP & Horticulture specialist from DOH& FP, Khanapara, CIMAP officials- Lucknow seeking suggestions for control measures of the disease observed. Accordingly, farmers were suggested for mechanical control – to uproot the infected plants along with the soil and spraying along with soil drenching of surrounding plants of infected one with fungicides containing Propiconazole (Tilt or Bumper) and other systemic fungicides like Mancozeb @ 2g per litre of water.

#### **Reports of Field visits :**

1. Till the date of 27<sup>th</sup> June, 2022, CIMAP officials have been visited Kokrajhar district for monitoring & Technical guidance of Lemongrass & Tulsi cultivations two times.

2. District Agriculture Officer, Shri Burlungbutur Narzary visited and monitored the Tulsi plots on 8th Sept. 2022.

3. District Nodal Officer have also visited the Tulsi plots at Dotma for monitoring & guidance to farmer on 10<sup>th</sup> August, 2022.

4. Recently, on 22<sup>nd</sup> September, 2022 Advisor MAP & Horticulture Specialist from Directorate of Horticulture & Food Processing, Guwahati have also visited and monitored the Lemongrass and Tulsi plots in Kokrajhar district.

#### Submitted by

Kabita Mushahary Narzary

District Horticulture Coordinator, Kokrajhar

## **Glimpses from Kokrajhar, MAP Pilot Project**



Activities/	20	18-19	201	19-20	202	20-21	20	21-22	202	22-23	Cum	ulative
Sub-activities	Plan	Achvt	Plan	Achvt	Plan	Achvt	Plan	Achvt	Plan	Achvt	Plan	Achvt
Potato	504	504	450	450	270	270	540	540	680		1764	2444
Tomato	150	150	126	126	189	189	477	477	180		942	1122
Cabbage	150	150	112	112	168	168	348	348	120	The state of the	778	898
Cauliflower	150	150	96	96	144	144	324	324	120		714	834
Brinjal	150	150	108	108	162	162	270	270	80	a line to state	690	770
Pumpkin	150	150	112	112	168	168	276	276	90	1 Conf	706	796
Ginger	150	150	25	25	5	5	4	Ongoing	20		184	204
Banana	180	180	75	75	30	30	4	Ongoing	30	A STATE	289	319
Pineapple	1000 (000) (	and a survey of the			ALC: NO.	and the second	20	Ongoing	40		20	60
РНМ	1 1 Silv		180	180	255	255	135	135	225	III III IIII	570	795
IPM			25	25	25	25	25	25	30		75	105
Mechanization Demo for Potato	35	35	70	35	70	65	70	70	60		245	305
Grant to private nursery development	10	7	10	8	10		44	40	NA		59	59
Demonstration on Nursery grafting Techniques									40	40		

# **Core Physical Progress**

## <u>Financial Status</u>

201'	7-18	201	8-19	2019-20		2020-21		2021-22		2022-23	
Fund	Fund	Fund	Fund	Fund	Fund	Fund	Fund	Fund	Fund	Fund	Fund
received	utilized*	received	utilized*	received	utilized*	received	utilized*	received	utilized*	received	utilized*
NA	NA	469	370	591	316	596	625	1526	1247	318	512
Percen Utiliz	tage of				n p		87.71%				

# **Environmental & Social Safeguard Compliances**

## **Environmental Safeguard -**

- 1. Soil testing of all the demo plots were taken up.
- 2. The Best Management Practices for Horticulture Value Chain commodities provided by the International Agencies are in compliance with the Environmental Safeguards and the same has been disseminated through technical trainings.

## Social Sector Safeguard -

Sector	General	SC	ST	OBC & Others	Male	Female
Horticulture Value Chain	2841	912	878	1761	4989	1403

#### **Second Edition**

<b>Status of</b>	Post H	Iarvest M	lanagement

PHM	201	9-20	202	20-21	20	21-22	202	22-23	Cun	nulative
Demonstration	Plan	Achvt								
Tomato	25	25	38	38	15	15	25		103	78
Cabbage	20	20	34	34	15	15	25		94	69
Cauliflower	20	20	29	29	15	15	25		89	64
Brinjal	20	20	32	32	15	15	15		82	67
Pineapple					15	15	25		40	
Pumpkin	25	25	34	34	15	15	15		89	74
Potato	25	25	40	40	15	15	45		125	80
Banana	25	25	32	32	15	15	25		97	
Ginger	20	20	16	16	15	15	25		76	
Total>>>	180	180	255	255	135	135	225		795	432

## PHM so far:

i) Awareness & sensitization on different pre harvest measures & post harvest handling
ii) Learning on harvesting procedures & maturity indices for better PHM of commodities

iii) For better farm gate PHM practice adoptions

iv) PHM machineries & accessories support provided to 203 FIGs of 41 FPCs.

#### PHM 2022-23:

i) All PHM demos conducted on cluster basis through FIGs/FPCs and alongwith the BoDs & Promoters of FPCs

ii) Knowledge sharing for better market linkage

iii) Focus was on equal adoption of PHM practices by every member of FIG/FPC

iv) BoDs / Progressive farmers of FPCs trained on pre & post harvest handling of Horti commodities of their interest.

v) Facilitated market linkages with good quality product having longer shelf-life.

## **Potato Value Chain Initiative by International Potato Center (CIP)**

#### **KEY INTERVENTIONS**

Module A. Value chain development plan.

Module B. Varietal selection, introduction and seed production.

Module C. Demonstrating sustainable and climate resilient production practices.

Module D. Post-harvest management.

## **GOVERNANCE & IMPLEMENTATION**

STATE LEVEL	<u>Technical partner</u>
•Overall monitoring by ARIAS Society	
•Implementation of activities against	•International Potato Center
deliverables through OPIU (Horti.) and OPIU	(CIP)
(AAU)	•Contract Agreement signed on
•Review of Six Monthly Report by the	16 <sup>th</sup> March, 2018 (for Five
respective OPIUs.	years) between CIP and
•Payment from PCU through the AWP	ARIAS Society
provision under OPIU (Horti.)	

#### **Implementation**

•Implementation of activities in the districts through District Agriculture Office- PD, ATMA office.

• One Resident Consultant, One Agronomist & PHM Specialist, One Breeder & Seed Specialist, One Value Chain Expert at the State Office.

## Major activities under Potato Value Chain

Activity	Number	Status	
<b>Cluster Demonstrations</b>	90	Completed	
Seed Kit Demonstrations	450	Completed	
Mechanization Demonstrations	70	Completed	
Country store (0.3-0.5 ton)	20	Completed	
Net-house for seed production	6	Completed	
Value chain schools (2 <sup>nd</sup> phase)	21	Completed	
Potato Cafeteria	14	Completed	

# **Cluster Demonstrations under Potato Value Chain**

**<u>Objective:</u>** To bring small farmers together to increase the area and production for easy marketability



**Impact:** Each cluster was provided forward linkage with processing companies and the whole of the produce was easily sold as each cluster had minimum one truck load of potatoes which made the marketing easy. There was competition among processing companies and traders so farmers got good rates (Rs. 14-16 by the processing companies & Rs. 18-20 by the local traders).

**Way Forward:** The Cluster model will be up scaled in few selected districts involving FPCs to develop processing potato hubs covering large area with backward linkages for inputs and forward linkages for marketing

# Seed Kit Demonstrations under Potato Value Chain

**<u>Objective:</u>** To access adoption of climate resilient technologies by farmers. (Farmers were given seed only and they purchased other inputs )

Results	
No of districts covered	14
Area (450 X 0.1 ha) (ha)	45
Average yield across districts (t/ha)	22.4
Zero tillage with paddy straw mulch (t/ha)	21.4
Raised bed with paddy straw mulch (t/ha)	24.3
Best management practices (BMP). (t/ha)	23.7
Total quantity sold by farmers (tons)	850
Average selling rate (Rs/Kg)	14
Total value realized by farmers (Rs)	1,19,00,000



**Impact:** The three climate resilient technologies disseminated have been well adopted by the chosen farmers.

<u>Way Forward:</u> More similar demonstrations covering more farmers for wider adoption of climate resilient technologies

## **Mechanization Demonstrations under Potato Value Chain**

#### **Objective**: To popularize the use of machines for field preparation, planting, harvesting & grading.

Results							
No of districts covered 7							
Area (0.5 - 1 ha)	40						
Average yield across districts (t/ha)	20.7						
Labour cost saved @ Rs. 3200/Ha (Rs.2000 during harvesting & Rs.1200 during planting)	Rs.128000						

**Impact:** Use of machines is gaining popularity. These machines were used in cluster demonstrations as well as farmer's own potato fields other than demonstrations.

**Way Forward**: Use of machines to be popularized by easy availability of machines from custom hiring centers and developing local servicing facilities.



## Country store (0.3-0.5 ton capacity) under Potato Value Chain

**Objective:** To tide over low price period immediately after harvest and to enhance profitability of farmers

Results	
No of districts covered	9
No of stores	20
Potato stored (ton)	6
Storage losses (rottage/shrinkage)	5%
Price at the time of storage in March (Rs./kg)	12-16
Price at the end of storage in of June	20-22
Profit earned by farmers through storage (Rs.)	35,700

**Impact:** Farmers have been shown the feasibility and importance of short term potato storage in their homes.

**Way Forward:** To encourage farmers to store at least a part of the produce in country stores for better profitability





# Net-house for seed production under Potato Value Chain

<b>ODJECTIVE</b> : Initiate local seed production to reduce the cost of cultivation										
District	Variety	Prod.(kg)	Cold stored (kg)	Name of the cold store						
Barpeta	Lady Rosetta	1225	1200	Himalaya cold storage, Sorbhog, Barpeta						
Golaghat	Lady Rosetta	1200	900	M/S Suniti Prova Cold Storage, Gingia						
G	Lady Rosetta	2150	2100	M/S Suniti Prova Cold Storage, Gingia						
Sontpur	Lady Rosetta	1350	1300	M/S Suniti Prova Cold Storage, Gingia						
Nagaon	Kufri Surya	2950	1900	Chouhan Cold Storage, Hojai, Nagaon						
Darrang	Kufri Surya	1950	1450	Kamrupa Thanda Ghar Pvt. Ltd.						
Total		10,825	8,850							

**Impact:** The crop quality in the net-house impressed the farmers and many of them were eager to buy seed produced in the net-house.

**Way Forward:** Local seed production need to be enhanced by establishing more net -houses and to develop seed production hubs in districts with low aphid population.



#### Enterprise development (Value Chain School-VCS) under Potato Value Chain

**Objective:** Link potato farmers with the markets, develop new products, and establish small scale potato-based enterprises through Value Chain Schools (VCS) with a focus on encouraging women enterprises

VCS cycle	Districts covered	VCS formed	Modules completed	Total female enrolled	Total male enrolled	Total members
Cycle 1	7	13	All 7 modules completed	146	152	298
Cycle 2	10	22	Till Module 4 completed	285	219	504
Total		35		431 (54%)	371	802

**Impact and outcome:** Different VCS have started businesses *viz.*, production of different processed products like chips, potato pickles, Khurma, potato papad, dried potato chips, potato seed production under net house, potato grading etc. The VCS have also received machinery support from the project to expand their business activity.

**Way forward:** Linking VCS with FPC and become a member of Industry Association (IA) under MSME to connect with Business Service Provider and financial institutes. Registration of the product under FSSAI and GST to fetch market outside district/state. Branding, product promotion, advertising, marketing and sales of the business by the different sub committee formed under FPC







**Second Edition** 

# **POTATO CAFETERIA**

**<u>Objective</u>**: To showcase different varieties in one plot of land to find out the suitable varieties both for table purpose and processing purpose in a district.

District	Tab	le Purpose Varieties	Processing Varieties		
Barpeta	Kufri surya	Kufri mohan Kufri chipson		Lady rosetta	
Cachar	Kufri mohan	Kufri jyoti and Kufri himalini	Lady rosetta	Kufri chipsona 3	
Darrang	Kufri mohan	Kufri himalini and Kufri suryya	Kufri chipsona 3	Lady rosetta	
Golaghat	Kufri surya	Kufri mohan	Lady rosetta	Kufri chipsona 3	
Jorhat	Kufri surya	Kufri himalini	Kufri chipsona 3	Lady rosetta	
Kamrup	Kufri surya	Kufri himalini	Lady rosetta	Kufri chipsona 3	
Karbi Anglong	Kufri jyoti	Kufri surya	Kufri chipsona 3	Lady rosetta	
Kokrajhar	Kufri surya	Kufri himalini and Kufri mohan	Lady rosetta	Kufri chipsona 3	
Lakhimpur	Kufri surya	Kufri himalini and Kufri mohan	Kufri chipsona 3	Lady rosetta	
Morigaon	Kufri surya	Kufri himalini	Kufri chipsona 3	Lady rosetta	
Nagaon	Kufri surya	Kufri himalini	Lady rosetta	Kufri chipsona 3	
Nalbari	Kufri himalini	Kufri surya	Kufri chipsona 3	Lady rosetta	
Sivasagar	Kufri surya	Kufri mohan	Lady rosetta	Kufri chipsona 3	
Sonitpur	Kufri surya	Kufri himalini	Kufri chipsona 3	Lady rosetta	

**Impact and outcome:** Crop Cafeteria provided an opportunity to witness relative performances of various varieties of potato having different maturity period, diseases resistance, purposes (table/ processing), tuber shape, size colour, uniformity along with suitable agronomic production technologies.

**Way forward:** For scale up, the district may take the table variety and processing variety identified as suitable for their respective district. This will also help in increasing the varietal adoption too.



# **POTATO CONCLAVE**

#### Key outcome of the event:

The Potato Conclave and Business launch event was organized by CIP in collaboration with the DoH&FP on 26<sup>th</sup> August, 2022 and 27<sup>th</sup> August, 2022 with an aim to give a common platform to the different stakeholders of potato value chain to showcase their businesses and interact with each other and strengthen the potato value chain of Assam. The Chief Guest of the event, Hon'ble Minister of Agriculture, Horticulture and Food Processing, Veterinary and Animal Husbandry, Govt. of Assam, ShriAtul Bora, inaugurated the event. The Event was also attended by many other dignitaries, officials, Value Chain Schools, FPCs etc. Many stalls were also setup to showcase the products by the VCS, varieties of potato, potato machineries etc were also present in the stalls.





A joint meeting was conducted by the Hon. Minister of Agriculture, ShriAtul Bora with the representatives of private seed companies, processing companies, Joint Director, DoH, Haryana, Regional Director, CIP, Resident Consultant, CIPfor strengthening the potato seed chain in Assam.

A total of 36 MoUs were signed between four FPCs viz., LuitporiaAgro Producer Company Ltd., Nagaon, Sankar Azan Agro Producer Company Ltd., Nagaon, Satbhani Potato Producer Company Ltd., Biswanath and MandiaMilanjyoti Producer Company Ltd., Barpeta with nine potato seed companies viz., SidhivinayakAgri Processing PvtLtd,Maharastra;TechnicoAgri Sciences Limited, Chandigarh; BhattiAgritech, Punjab; Jalandhar Potato Growers Biotech Producer Co Ltd (JPG Biotech), Punjab; Sangha Refrigeration, Punjab; DS Agro Service, Haryana; Jalandhar Potato Seed Growers Self Supporting Co-op Society Ltd (JALPO), Punjab;Gopal and Company, Punjab and Noor AgriFarm, Haryana for high quality potato seed supply to enhance potato production in Assam.

Potato seed growers should be enlisted or empaneled for seed supply with the Govt.ofAssamand they should be rated on the basis of feed-back from the end-users about quality, price, timely delivery and other parameters.

OPIU- Horticulture will arranged for an online meeting among the FPCs, district agricultural officials and the private seed companies participated in the conclavefor timely procurement of quality potato seeds for this season.

Siddivinayak Agri Processing Pvt. Ltd., Maharastra will provide some of their own variety for demonstration in farmers filed in Assam with an assurance of buy back business.

OPIU- Horticulture will procure ARC plants from CPRS, Shillong for demonstration in farmers field for this season.

Different micro-enterprise group established under APART project through Value Chain School (VCS) had showcased their new and innovative products and formally launch their business during this event.

A book on "Potato Value Chain School in Assam" was also released during this event.





Contributed by: Manoshi Chakravorty SRA & VC Specialist, CIP,SIPC, Ghy

# Vegetable Value Chain Initiatives by World Vegetable Center

## **KEY INTERVENTIONS**

#### A. Improving the Quality and Availability of Planting Inputs

A1: Varietal Assessment, Trials and Selection of Optimum Varieties (mainly in association with AAU)

- A2. Enterprise Development through Vegetable Seedling Nurseries.
- B. Promoting the adoption of Climate Resilient good agricultural practices:

#### Crop demos:

- B1: Climate resilient production demonstrations
- B2: Application of IPM systems for reduced pesticide usage for all non-legume crops

#### Vegetable crops:

- a. Brinjal
- b. Tomato
- c. Cabbage
- d. Cauliflower

#### **GOVERNANCE & IMPLEMENTATION**

#### STATE LEVEL

•Overall monitoring by ARIAS Society

•Implementation of activities against deliverables through OPIU (Horti.) and OPIU(AAU)

•Review of Six Monthly Report by the respective OPIUs.

•Payment from PCU through the AWP provision

#### **Technical partner:**

- World Vegetable Center, Taiwan
- Contract Agreement signed on 18<sup>th</sup> November, 2018 (for Five years) between WVC and ARIAS Society

#### **Core Target Activities:**

- •Nursery Enterprise Development- 40 nos
- •Brinjal demo nos 486 (97)
- •Tomato demo nos –567 (108)
- •Cabbage demo nos 504 (101)
- •Cauliflower demo nos 432 (87)
- •Pumpkin demo nos 504 (101)

#### Implementation:

- Implementation of activities in the districts through District Agriculture Office- PD, ATMA office.
- Technical Officer 8 nos
- One Resident Consultant, One Agronomist, One MIS Specialist at the State Office.



**CRML Tomato Demo- as Additional income** 



CRML-as early season Cauliflower & Cabbage

**Economic Analysis in CRML Demonstration** 

SI No	Сгор		Benefit :Cost			
51. 190			Contro	1	Demonstration	
1	Tomato		2.48		3.04	
2	Brinjal		3.76		4.39	
3	Cabbage		3.51		4.2	
4	Cauliflower		2.84		3.86	
5	Pumpkin		2.11		2.91	
Pesticides spray - A Comparison						
Crop		Control		D	Demonstration	
		No. of Pesticide sprays		No. of Pesticide sprays		
Brinjal		9			5	
Cabbage		4		2		
Cauliflower		4		2		
Pumpkin		3		2		
Tomato		6		3		

-	1
Staking	96.36
Border Crop	69.28
Trap crop	61.44
Intercropping	82.35
Biopesticides	69.93
<b>Pheromone trap</b>	71.24
Sticky trap	81.70
Localised application	84.97
Enriched vermicompost	81.05
Nursery Protray	93.46









CRML Activities



Minimum Tillage, Tomato

Rain Shelter, Tomato

## FPC activities – A cluster based approach

- From 2021-2022, all demos/activities are taken up on a cluster based approach, in the FIGs under FPCs. Moreover, the members of FPCs were also provided technical training as well as Capacity building for Market linkage & Price realization
- Two days Residential Training and Capacity Building of the Board of Directors (BoD) of FPCs were conducted across 6 project districts & at Guwahati covering 450 Board of Directors of 91 FPCs and 35 CEOs and 9 Accountant during the month of September, 21 to August, 22.



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Few glimpses of BoD training

#### New Initiative during 2022-23 -Pilot Mission on Medicinal and Aromatic Plants (MAPs)

KEY INTERVENTIONS	<b>GOVERNANCE &amp; IMPLEMENTATION</b>
<ul> <li>Market led production demonstrations</li> <li>Lemongrass</li> <li>Vetiver</li> <li>Patchouli</li> <li>Tulsi</li> </ul>	<ul> <li>State Level:</li> <li>By DHFP at State level through State PMU</li> <li>State PMU will have representation of CIMAP &amp; Ayush Deptt</li> <li>A State Nodal Officer of PMU</li> <li>Monitoring at State level by SPD, ARIAS Society</li> </ul>
<ul> <li>B. Post harvest/ processing demonstrations</li> <li>Proper drying &amp; processing</li> <li>One PH demo for every 15-20 crop demos</li> </ul>	<ul> <li>Regular reviews by Senior most Secy of Department of Agriculture</li> <li>Transit cert to be issued by Hort &amp;FP</li> </ul>
<ul> <li>C. Mini processing plants for processing of medicinal and aromatic plants</li> <li>Buyer seller meets</li> <li>Marketing tie up with leading Ayurveda and Marketing tie up with leading Ayurveda and Ayur</li></ul>	<ul> <li>Technical partner:</li> <li>CSIR- Central Institute of Medicinal and Aromatic Plants (CIMAP), Luckhnow</li> <li>Agreement signed on 18<sup>th</sup> May 2022 (for two years)</li> </ul>
<ul> <li>D. Training and capacity building         <ul> <li>Technical trainings</li> <li>Exposure visits</li> </ul> </li> </ul>	DIST. LEVEL : •District Project Management Unit (DPMU) headed by Deputy Commissioner
	<ul> <li>Implemented by District Agriculture Offices</li> <li>Monitoring by the office of Deputy Commissioner</li> <li>Monthly monitoring reports to the DHFP &amp; ARIAS Society</li> </ul>

## New Initiative during 2022-23- Pilot Intervention on Community Based Natural Farming

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KEY INTERVENTIONS	<b>GOVERNANCE &amp; IMPLEMENTATION</b>	
<ul> <li>&gt; 15 nos Master Trainer will be provided capacity building and training on Natural Farming with monthly remuneration.</li> <li>&gt; 3 batches for Training cum Exposure visit of progressive farmers and officials to the state of Andhra Pradesh/Karnataka/Maharashtra/Gujarat on Natural Farming.</li> <li>&gt; 15 nos of Training/Awareness program on Natural Farming at the district level for 5 districts.</li> <li>&gt; 120 nos of Training/Awareness and Demonstration for Natural Farming at the cluster level for 5 districts.</li> </ul>	<ul> <li><u>State Level:</u></li> <li>By DHFP at State level through APART cell</li> <li>State Level Resource Pool</li> <li>Monitoring at State level by SPD, ARIAS Society</li> <li>Regular reviews by Senior most Secy. of Department of Agriculture</li> <li>Transit cert to be issued by Horti &amp;FP</li> </ul>	
<ul> <li>&gt; 15 nos support for village level Natural Farming Input producing Entrepreneurs</li> <li>&gt; 3 nos. of State level workshop with Resource Pool and Stakeholders.</li> </ul>	Technical partner: •Assam Agriculture University, ICAR-KVKs and Private/ NGOs/Agency Practitioner	
<ul> <li>Progress Till Date:</li> <li>•15 Clusters &amp; 15 Master Trainers identified</li> <li>•One day training &amp; exposure visit was conducted for the identified Master trainers</li> <li>•3 days residential practical training to be imparted for the 15 master trainers in the last week of July, 2022.</li> </ul>	DIST. LEVEL : •Implemented by District Agriculture Offices •Monitoring by the office of DC •Monthly monitoring reports to the DHFP & ARIAS Society	
	<complex-block></complex-block>	

Three Days residential training program on Natural Farming

#### **Nine Principles of Natural Farming:**

- 1. Soil to be covered
- 2. Minimal disturbance to soil
- 3. Bio stimulants as necessary catalysts
- 4. Use of indigenous seed
- 5. Diverse crops/trees of 15-20 crops
- 6. Integrate animals into farming
- 7. Increase organic residues on the soil
- 8. Pests and diseases management through botanical extracts
- 9. No synthetic fertilizers , pesticiudes and herbicides



## Natural farming a new approach for the farmers ......

In ancient times, the farmers mainly practised the growing of crops which are naturally found by using the natural resources. With time farmers became more production oriented and as a result they have given emphasis on judicial use of chemical fertilisers, pesticides and use of farm mechanisation, use of hybrid seed etc. to get more production in short period. This leads to the distortion of cultivable land due to repeated intensive ploughing practices resulted in unfertile soil.

Govt. of India has given emphasis on the practice of natural farming which is also called zero budget natural farming to tackle this issue. It helps to conserve the soil water, seed flora and fauna for our future generation. Some of the benefits of natural farming are:

- It minimizes cost of production, thereby increase farmer's yield and income. ...
- It ensures better health with elimination of chemical input and favour traditional farming practises.
- Natural farming is one the key ingredient of Environment Conservation. ...
- It also supports reduction in water consumption.
- It also creates employment generation. ...

With this objectives APART project has included natural farming demonstration in the Annual work plan of 2022-23 on pilot basis for 5 districts Kamrup, Karbi Anglong, Golaghat, Sonitpur and Nagaon. OPIU- Horticulture & Food Processing organized a three days residential training on compassionate Natural Farming from 17<sup>th</sup> August to 19th August 2022 at SPREAD -NE learning centre ,Sonapur Kamrup with 15 nos of master trainers and 5 nos of district facilitator.

During the training programme practical demonstrations were given on preparation of

1. Liquid formulation like Jeevamrut and local formulation, 2.Heap compost 3.Zero tillage bed preparation 4.Bio intensive raised bed preparation 5.Use of mulching for live fence 6.Seed consevation technique7.Biochar preparation.



Ms Monisha Das one of the master trainer of Kamrup district from Chandrapur has demonstrated on the importance of natural farming and also showed preparation of biochar, a liquid formulation which is a replacement of pesticide by using natural resources only which is easily available in field. She has targeted on the gender involvement and school children who can also contribute in natural farming in near future.

Another master trainer from Sonapur area Shri Direshwar Tiwa has demonstrated on preparation of bio intensive raised bed and growing of different vegetables, which will motivate the farmers of that area to adopt this practise and will balance the environment by both soil and water conservation.

We should keep involving these Master Trainers for their contribution towards their society and keep provision for exposure visits to increase their knowledge in the field.

Submitted by

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