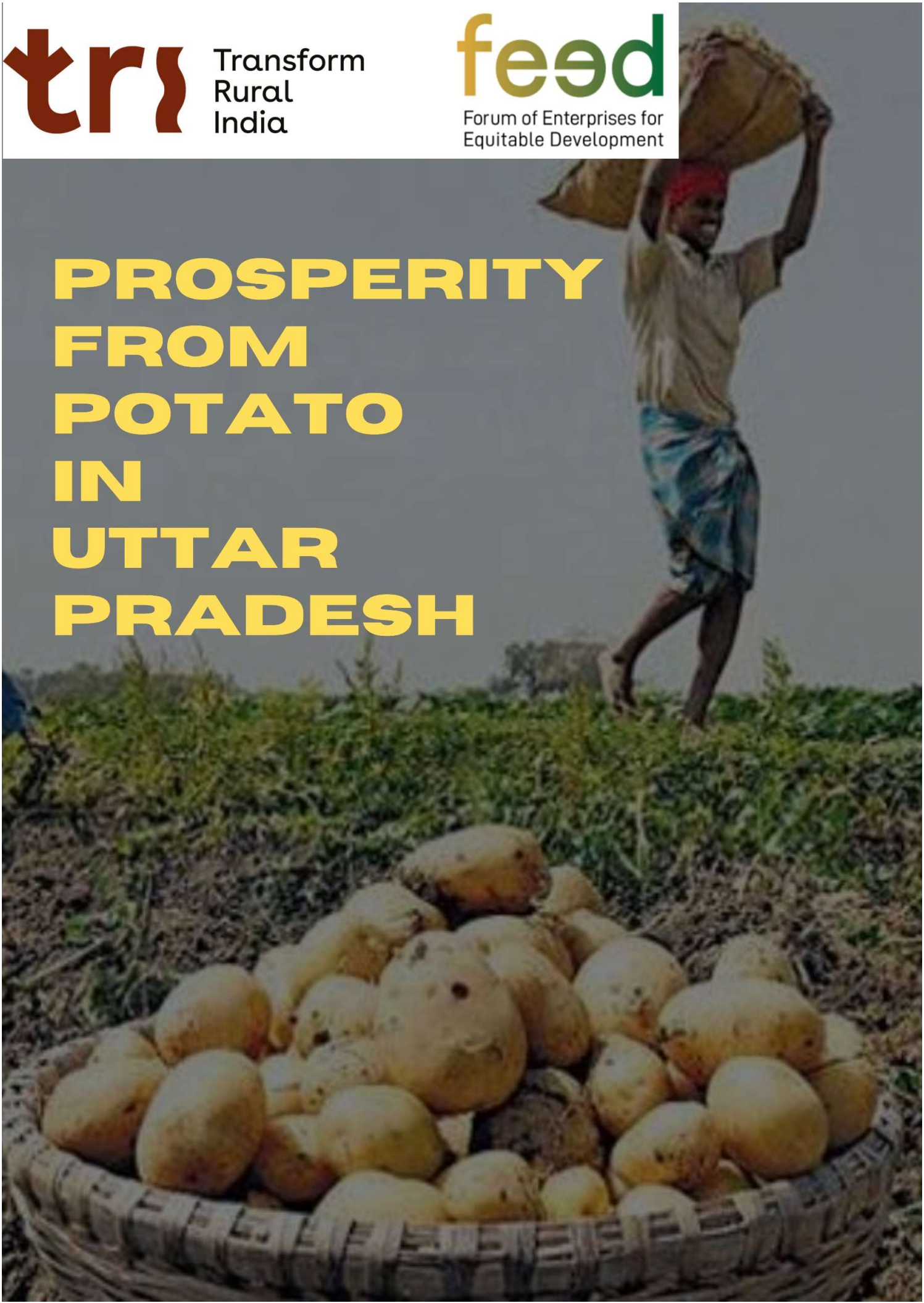
Transform Rural India

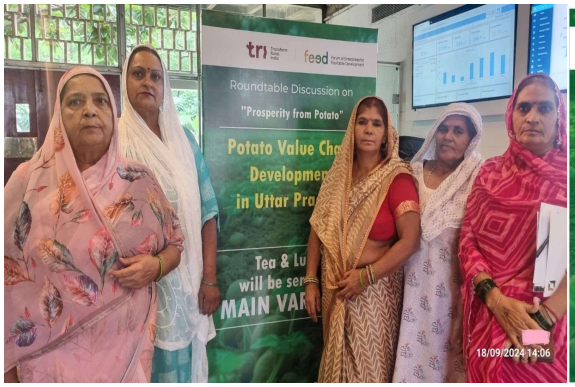
Forum of Enterprises for Equitable Development

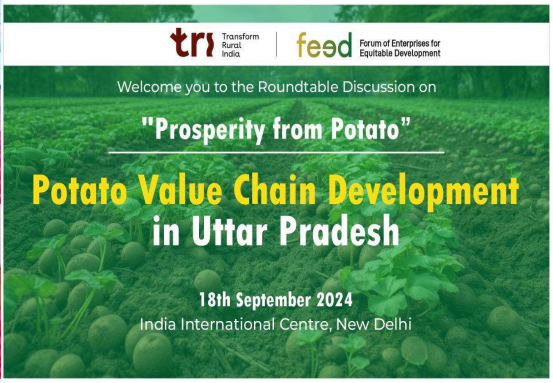
PROSPERITY FROM POTATO IN UTTAR PRADESH



Prosperity from Potato in Uttar Pradesh

Potato Round Table Discussion





Date: 18 September 2024
Time: 10:00 AM - 2:30 PM
Venue: India International Centre (IIC), Lodhi Road, New Delhi

Executive Summary:

Insights, Recommendations & Action Points from the Convening -

1. Fragmentation in the Supply Chain

Insights:

- The current supply chain for potatoes in Uttar Pradesh is heavily dependent on intermediaries such as local traders and commission agents, which results in fragmented supply and inconsistency in quality.
- Unlike the Punjab model where PepsiCo's contract farming aggregates produce efficiently through established farmer networks, Uttar Pradesh lacks such structured aggregation models, leading to inefficiencies and reduced price realisation for farmers.

Recommendation:

- The Government of Uttar Pradesh should look at marketing of the perishable commodities like Potato, Tomato where organised buyers may work without much challenge.
- The Uttar Pradesh Government is also requested to relook at the APMC Act and look at modifications with suitable incorporations which can be done at state level to facilitate Market Linkage. Some experiments can be done within the legal framework which can be a win-win for all stakeholders - Government, Farmers & Private Players.
- Encourage the Formation of Farmer Producer Organizations (FPOs): Facilitate the formation of FPOs with clear governance structures to aggregate produce, streamline input supply, adopt POP - package of practices and market access. Linking FPOs with large-scale buyers like food processors and organised retail can provide better bargaining power and reduce dependency on middlemen.

Action Points:

- Preparation of a Market Linkage framework for perishable commodities with involvement of Private Entities, Farmers and Farmers' collectives such as FPOs & Government. FEED & TRI can facilitate this framework building.
- Support FPOs through capacity-building programs and financial assistance to enable the bulk purchase of inputs and collective marketing.
- Promote direct marketing linkages between FPOs and retailers like BigBasket, Reliance Fresh, and Walmart to bypass traditional mandis and reduce post-harvest losses.

2. Post-Harvest Losses Due to Inadequate Storage and Infrastructure

Insights:

- Existing cold storage facilities in Uttar Pradesh are mostly single-product storages focused on table potatoes, which are not suitable for storing process-grade potatoes needed for industries like chip and french fry production.
- The need is not only varying temperature storage, but also for advanced, automatic ventilation, humidity and CO2 controls: these are a must for the 4-8 month storage period that processing varieties require.
- Existing stores can be upgraded with advanced/automatic ventilation, humidity and CO2 controls, but the current government schemes are not suited for either store upgradation or

investment in large scale, automatic stores (more than 20,000 MT), which are required for processing.
- The storage charges for processing grade cold storages in UP are much higher compared to Gujarat, due to the smaller scale & older infrastructure of stores in UP and higher electricity rates.

Recommendation:

- Develop & Upgrade Cold Storage Facilities: Develop and upgrade Cold Storage Facilities for storage of seeds, table variety and Processing variety separately to cater to the different needs of the Market.
- Explore the Buyer-Linked Subsidy where various tie-ups can happen between the Private players and the FPOs/ Farmers and the Government can support this with Scheme benefits etc.
- The government can provide a capital subsidy for the upgradation of stores. The cost norm need not be very high: ~Rs. 1500/ton is adequate.
- Cold storage is a key enabler for the creation of the processing industry. Thus the government should include modern, advanced/automatic large-scale cold storages for processing a variety of potatoes within the ambit of the UP Food Processing Industry Policy 2023.
- To prevent misuse of subsidies meant for processing variety storage in table variety storage, the government can also think of a Buyer Linked Subsidy, wherein the subsidy can be linked to actual direct procurement & storage volume verified through a processor (e.g. a subsidy of Rs. 40/bag, which is paid out directly to FPOs/Cold Stores but based on data filled out, certified & shared by the Processor). In this manner, the subsidy is paid only for the actual quantity of potatoes procured and processed, not for dormant capacity creation. Only companies competing on the global stage (e.g. through exports) should be eligible for the subsidies since competitiveness matters to them.

Action Points:

- Bring together and collate best practices across states to implement similar models for the benefit of the entire value chain. FEED & TRI can prepare a concept note on this which can then be presented to all the stakeholders including the Government for their buy-in.
- Collaborate with companies like PepsiCo and other food processors to establish dedicated cold storage facilities for process-grade potatoes to ensure consistent quality for processing.
- Implement a grant/subsidy scheme for farmers and FPOs to invest in modern cold storages, supported by central and state government funds.

3. **Low Yield and Poor Quality of Produce**

Insights:

- India's protection period for new potato varieties is only 15 years, compared to 30 years internationally, which does not allow innovation since the effective time period for reaping the monetary benefits of the same is only 5 years.
- The average productivity of Potatoes in the U.P. is 25.30 MT/Ha which is higher than the national average but 20% less than the highest i.e. West Bengal 30 MT/ Ha. Also, this is much lower than the productivity of other countries such as the USA (49 MT/Ha), Germany (44 MT/Ha), and Netherlands (42 MT/Ha).
- Inadequate access to quality seed material and poor adoption of best agricultural practices lead to low yield and inconsistent quality of produce. This is evident from the Rajasthan case

study, where consistent seed quality and good agricultural practices (GAP) led to higher yields and better quality produce.

Recommendation:

- Relook at the policy surrounding new potato varieties to encourage innovation.
- Introduce High-Quality Seed and Good Agricultural Practices (GAP): Collaborate with research institutions like the Central Potato Research Institute (CPRI) to introduce new high-yielding, disease-resistant potato varieties.
- Promote GAP training programs for farmers focused on efficient irrigation techniques, pest management, and soil health improvement.

Action Points:

- Establish seed production and distribution centers in collaboration with CPRI and private seed companies. Offer subsidised quality seed to farmers to encourage the adoption of high-yielding varieties.
- Implement a state-wide GAP certification program to provide technical assistance to farmers and promote sustainable farming practices.

4. Limited Processing Capacity and Value Addition

Insights:

- Most of Uttar Pradesh's export to Southeast Asia happens through Gujarat Port which is counter productive and cost intensive.
- Uttar Pradesh's potato processing capacity is highly underutilised, and the state lacks sufficient large-scale processing units to handle the volume of potatoes produced.
- There is a mismatch between the types of potatoes produced and the demand from processors for specific process-grade varieties, which hampers the establishment of long-term procurement relationships.

Recommendation:

- Clear mapping of the demand and supply so that efficient logistical corridors can be established for Internal Consumption & Export.
- Establish Potato Processing Clusters basis demand type: Develop dedicated processing clusters with facilities for manufacturing potato-based products like chips, frozen fries, and flakes. Introduce incentives for private investors to set up these facilities in collaboration with FPOs and local entrepreneurs.
- Develop Export centric interventions which can ease the process of exporting specially to the Southeast Asia region.

Action Points:

- Policy facilitation by TRI & FEED to modify/develop policies focussed on Export.
- Offer fiscal incentives such as tax exemptions, capital subsidies, and interest subventions to encourage the setup of potato processing units in key production districts like Agra, Farrukhabad, and Kanpur.
- Promote contact/contract farming agreements with processors to ensure a steady supply of process-grade potatoes. This can be facilitated by establishing farmer–processor forums to create a dialogue between stakeholders.

5. Lack of Market Intelligence and Price Volatility

Insights:

- Farmers lack access to real-time market information, which results in poor price discovery and forces them to sell at low prices during the harvest season.
- The absence of a robust market intelligence system leads to inefficiencies in matching supply with demand, resulting in price volatility and wastage.

Recommendation:

- Implement ICT-Based Market Intelligence Systems: Develop a digital platform for farmers and FPOs to access real-time market data, including prices, demand forecasts, and inventory levels at cold storages.

Action Points:

- Create a mobile app or SMS-based service to disseminate daily market prices, weather forecasts, and storage availability to farmers.
- Partner with agri-tech startups to develop predictive models for price trends and supply-demand forecasting to enable farmers to make informed decisions on when and where to sell their produce.

6. Weak Financial Support Mechanisms

Insights:

- Farmers and FPOs in Uttar Pradesh have limited access to formal finance. High-interest rates from informal lenders lead to a debt trap, which constrains investment in productivity-enhancing inputs and infrastructure.

Recommendation:

- Experiment with the Warehouse receipt financing for the farmers so that the produce can act as collateral.
- Develop UPI transaction based credit financing models for the farmers with no collateral/ bank statements. TRI & FEED can help in facilitating this discussion with Credit Companies.
- Introduce Tailored Financial Products for the Potato Sector: Design specific loan products, such as crop loans, post-harvest loans, and working capital loans, with flexible repayment options linked to the cropping cycle. Offer credit guarantees for FPOs to reduce risk and encourage banks to lend.

Action Points:

- Work with NABARD and other financial institutions to develop risk-sharing mechanisms, such as partial credit guarantees and insurance products for the potato value chain.
- Develop working capital solutions in collaboration with private players to support the establishment of small-scale processing units, storage facilities, and direct marketing initiatives.

7. Policy and Institutional Support

Insights:

- There is a lack of coordinated policy support for value chain development in the potato sector, which results in fragmented efforts by various government and private entities.

Recommendation:

- Create a Unified Policy Framework for the Potato Value Chain: Formulate a comprehensive policy that integrates aspects of production, processing, storage, and marketing to support holistic value chain development. Establish a state-level Potato Value Chain Council to coordinate efforts across departments and stakeholders.

Action Points:

- Establish a state-level task force involving representatives from the Agriculture Department, Food Processing Industries, private sector, and FPOs to oversee the implementation of the potato value chain strategy. TRI & FEED can facilitate this.
- Leverage existing central government schemes like PM Kisan Sampada Yojana and Atmanirbhar Bharat Abhiyan to access funding and technical support for value chain interventions.

By focusing on these insights and recommendations, the Uttar Pradesh potato value chain can be significantly strengthened, resulting in higher farmer incomes, better quality produce, and a more resilient supply chain.

7. Funding from Outside the Government ecosystem -

Recommendation:

- Approach various Venture Capital and Development Funding Agencies for funding of large scale Public Private Partnership projects such as Infrastructure Development, Farmer Welfare through value chain development etc

Action Points:

- Establish a Working group which would approach and negotiate with the Development Funding Organisations with projects received from the Private Sector. The working group may comprise of the stakeholders from Government, Private Sector, Processors, Value Chain Start-ups, Cold Chain Association, Development Organisations.

Objective of the Convening:

1. To identify opportunities and challenges in the potato value chain, including seed quality, storage infrastructure, mechanisation, and market linkages.
2. To explore collaborative opportunities between government, private sector, and farmers for seed breeding, cold storage, and export potential.
3. To identify short, mid, and long-term strategies for improving potato production, processing, and marketing in Uttar Pradesh.
4. To promote inclusive growth through cluster-based approaches, women-led FPOs, and sustainable agricultural practices.

Introduction

Potato Market Scenario in India & Uttar Pradesh

- The size of the Indian Potato Market is about **$11.12 Billion (about 53 million MT production),** of which **Uttar Pradesh has a share of 30%,** the largest among all states.
- Of the $11.12 Billion, **Table/Fresh potatoes comprises $7.25 Billion** whereas **Processed Potato is at $ 2.59 Billion. Exports are only 2.5% by value**
- Owing to strong domestic consumption and increasing export demand of potato and processed potatoes from India due to conflicts in Europe/Middle East, There is explosive growth in potato processing sector in India specifically French fries, flakes as well as chips.

- **Potato chips production** would double by 2030 while exports will increase 5 times. **Frozen French fries** production and its export would triple by 2030.
- About **64% of Potatoes are processed in the USA** whereas in **India, the number is only 6%.** This highlights a huge gap and potential for Processed Potato. The **Processing Potato Production** would triple in the next 5 years to **~10 million MT**
- **The average productivity** of Potatoes in the **U.P. is 25.30 MT/Ha** which is higher than the national average but 20% less than the highest i.e. West Bengal 30 MT/ Ha. Also, this is much **lower than the productivity of other countries** such as the USA (49 MT/Ha), Germany (44 MT/Ha), and Netherlands (42 MT/Ha)
- **92% of the farmers** are small and marginal farmers leading to increased intermediation in the value chain and decreased price realisation by farmers
- U.P. lacks cold storage which fit for storage of processing grade potatoes and also produces of that quality resulting in dependence of UP based processors on Gujarat potatoes.

Key Insights & Deliberations from Potato Convening

Cold Storage Infrastructure

1. Only around 10 cold storage units in Uttar Pradesh are suitable for processing potatoes out of close to 2000 storage units existing, indicating a need for specialised facilities.
2. There is a lack of awareness and incentives for advance booking of cold storage, which could help preserve produce and avoid losses. Also, there are logistical challenges in implementing the advance booking due to pressure on the cold storages.
3. Cold storage policies are under review, with plans to consult stakeholders and determine a consensus-based subsidy rate.
4. The impact of cold weather increases sugar content in potatoes, particularly during storage, requiring new solutions.
5. There is a push for variety-specific storage requirements, as current government policies treat all potato varieties uniformly, which is inefficient.
6. Investment needed for Modernization of the Cold storage systems (existing & new)

Diversification and Market Trends

6. A shift is occurring from table potatoes to processed potatoes, with over 100 chips manufacturing companies adopting automated systems.
7. Approximately 90% of Uttar Pradesh's potato production is still consumed as table potatoes, but new processing areas are emerging, creating opportunities for small and marginal farmers.
8. The rise of retail involvement in the potato supply chain has changed market dynamics, with retailers now focusing on varieties with longer shelf lives.
9. Uttar Pradesh will need to have adequate and modern post-harvest Infrastructure in place according to the shift in demand dynamics.

Seed Crisis and Quality

10. The seed replacement rate in Uttar Pradesh is significantly lower than in other states, requiring competitive pricing and government support to incentivize farmers.
11. Processing varieties like Lady Rosetta (LR), which accounts for 60% of chips produced in India, need mainstream government support.
12. The current seed distribution system is inefficient, and a quota system should be implemented to ensure timely and effective seed availability.
13. Climate-resilient varieties, like Kufri Surya and Kufri Chipsona, have been developed to reduce farmers' risk and increase yield potential.
14. Advanced seed technologies like True Potato Seed (TPS), Apical Rooted Cuttings, Tissue Culture, and Aeroponics are being promoted to meet quality seed demand.

International Influence and Innovations

15. India's protection period for new potato varieties is only 15 years, compared to 30 years internationally, prompting calls for an extension to encourage innovation.

16. With the ban on CIPC in Europe, the registration process for alternative varieties in India needs to be fast-tracked to maintain competitiveness.
17. Good Agricultural Practices (GAP) for potatoes, in collaboration with industries, are necessary to improve export potential and meet international standards.
18. Dehydrated potato varieties are being promoted for use in chips and fries, creating opportunities for crop diversification and benefiting small and marginal farmers.
19. Biofortified potato varieties, rich in zinc, iron, and antioxidants, have been developed to offer nutritional benefits and align with global health trends.

Subsidies and Financial Incentives

20. Incentives for private sector participation and exports are currently low in Uttar Pradesh, leading to high transaction costs for stakeholders.
21. Credit support is essential to enable farmers to use high-quality inputs and improve crop yields.
22. There is a need to waive the mandi fee for processors in Uttar Pradesh to encourage more investment in the processing sector.
23. Policy adjustments are needed to provide variety-specific subsidies and relaxations, ensuring that all potato varieties receive the care they require.

Processing and Export Potential

24. There is a significant gap in government awareness regarding the varieties required by the processing industry, necessitating better coordination between public and private sectors.
25. Uttar Pradesh’s largest potato processing plant, with a capacity of 500 tonnes per day, is being set up in Gajraula by JK Organisation, which will drive large-scale contract farming with high quality seed provision and guaranteed buybacks.

Cluster Approach & Inclusive Potato Value Chain

26. Strengthen and expand women-led Farmer Producer Organizations (FPOs) within the potato value chain, enhancing their participation in production, processing, and marketing activities. This will promote gender inclusivity and empower women farmers economically.
27. Develop and expand cluster-based programs focusing on potato farming, ensuring better access to inputs, credit, storage, and market linkages. This will enable economies of scale, improve productivity, and foster regional specialization.

Policy

28. FEED & TRI would like to be a part of and contribute to the formulation of the new Policy guidelines on Potato being undertaken by the Govt of U.P. This would also include geo-mapping & geo-tagging of potential clusters for Potato.

Blueprint for Potato Value Chain Development in Uttar Pradesh

I. Key Challenges

1. **Seed Variety**: Limited availability of high-yielding, climate-resilient, and processing-specific varieties hampers growth in both production and exports.
2. **Seed Quantity & Quality**: Low seed replacement rates (7-8%) and insufficient quality seeds result in lower yields and diminished crop quality, impacting farmer incomes.
3. **Mechanisation**: Low access to efficient planting and harvesting equipment leads to seed loss and lower productivity, especially among small and marginal farmers.
4. **Laboratories**: Inadequate facilities for seed certification, quality testing, and disease management hinder innovation and scaling of advanced seed technologies.
5. **Storage**: Lack of specialised cold storage facilities for processing-grade potatoes increases post-harvest losses and reduces export potential.
6. **Market Linkage**: Farmers face challenges in linking with processors and retailers, leading to inefficient price discovery and lower returns.

II. Opportunities and Strategies

A. Short-Term Opportunities (1-2 years)

1. **Government-Processor Collaboration**:
    - Encourage joint ventures between government agencies and processors to ensure a steady supply of processing-grade potatoes.
    - Facilitate contract farming and guaranteed procurement schemes for processors to ensure higher farmer participation.
2. **Joint Breeding Trials**:
    - Promote public-private partnerships for joint breeding trials, focusing on developing new varieties suited for processing, climate resilience, and disease resistance.
    - Include exotic seed varieties in government policy frameworks for contract farming and mainstream adoption.
3. **Mechanisation & Good Inputs**:
    - Provide subsidies for modern machinery, including automated planting and harvesting equipment, to minimize seed loss and improve operational efficiency.
    - Enhance access to high-quality inputs, ensuring that farmers can prevent seed damage during planting and harvesting.

B. Mid-Term Interventions (2-5 years)

1. **Varietal Development**:
    - Focus on the development of cold-tolerant and climate-resilient varieties to support year-round production, reducing losses from winter frost and other climatic challenges.
    - Support private sector involvement in breeding through favourable policies and intellectual property protections.

2. **Policy Reform**:
    - Extend the protection tenure for new potato varieties from 15 to 30 years to safeguard breeder rights and encourage investment in varietal innovation.
    - Introduce incentives and additional subsidies for upgrading cold storage facilities to cater to specific needs (processing, seed storage, or table-grade potatoes).
3. **Cold Storage Expansion**:
    - Promote the establishment of specialised cold storage for processing-grade potatoes, ensuring that different varieties are stored under optimal conditions.
    - Implement an additional subsidy scheme for cold storage upgradation, encouraging private investments in modern facilities.

C. Long-Term Goals (5+ years)

1. **Private Sector-Led Breeding**:
    - Shift breeding responsibilities to the private sector, encouraging research and development (R&D) through incentives and partnerships to innovate with new, high-yield, and disease-resistant varieties.
2. **Replacement of CIPC & Crop Chemicals**:
    - Develop and fast-track the adoption of safer alternatives to chemicals like CIPC (used in storage) to meet international standards, enhancing India's export avenues for potatoes.
    - Collaborate with global certification agencies to ensure compliance with export market requirements.
3. **Credit Linkage for Farmers**:
    - Strengthen credit access for small and marginal farmers, providing loans for the adoption of quality inputs, mechanization, and infrastructure improvements.
    - Introduce insurance products tailored to potato farming, protecting farmers from market volatility and climate risks.
4. **Safeguarding Breeder Rights**:
    - Establish a robust legal framework to protect breeder rights and enforce intellectual property laws, ensuring fair compensation for innovators in seed development.
5. **GAP Certification and Technology Transfer**:
    - Set up local GAP (Good Agricultural Practices) certification agencies to standardize production practices and improve export readiness.
    - Develop a structured technology transfer mechanism to educate farmers on advanced farming techniques, soil testing, and water management, particularly focusing on micro-irrigation and frost protection using sprinklers.

III. Sector-Specific Strategies

Seed Sector:

1. **Contract Farming for Seed Production**:

- Allow contract farming of seeds, ensuring a stable seed supply chain and reducing reliance on imports.
- Encourage the inclusion of exotic and processing-specific seed varieties within government policy, enabling farmers to access high-yielding, market-aligned seeds.

2. **Improved Seed Storage**:
   - Develop specialized storage solutions for seed potatoes, separate from table and processing potatoes, to ensure quality preservation and minimize spoilage.

Cold Storage Sector:

1. **Process-Grade Cold Storage**:
   - Modify existing cold storage infrastructure to cater to processing-grade potatoes, ensuring separate handling and temperature management.
   - Introduce processing storage linked to industry needs, optimizing the supply chain for processing varieties.
2. **Cold Storage Policy Review**:
   - Revise storage policies to ensure alignment with industry requirements, encouraging investment in processing and seed-grade storage infrastructure.
   - Streamline cold storage operations through digital platforms to monitor stocks and manage information asymmetry.

Marketing Sector:

1. **Export Incentives & Organic Farming**:
   - Review export incentives to make Indian potatoes more competitive globally, reducing transaction costs and encouraging private sector participation.
   - Facilitate the emergence of organic potato buyers and link them with producer groups, expanding market access for sustainably farmed produce.
2. **Producer Purchase Agreements**:
   - Strengthen producer-purchase agreements between farmers and processors, offering guaranteed buyback schemes and market stability for farmers.
   - Ensure MSP (Minimum Support Price) is implemented for processing potatoes to offer price security and boost farmer confidence in growing these varieties.
3. **Farmer Education Programs**:
   - Launch educational initiatives for farmers on sorting, grading, and selecting seed varieties that align with market demand and processing needs.
   - Promote best practices in post-harvest management, including handling, storage, and transportation, to reduce post-harvest losses and enhance product quality.

IV. Environmental and Technological Inputs

1. **Micro-Irrigation and Frost Protection**:

- Encourage the use of micro-irrigation sprinklers to protect crops from winter frost, particularly in Uttar Pradesh, where cold conditions can negatively impact yield.
- Offer subsidies for the adoption of these technologies to improve water use efficiency and mitigate climate-related risks.

2. **APMC Fee Reforms**:
    - Advocate for the removal or reduction of APMC (Agricultural Produce Market Committee) fees for processing-grade potatoes to reduce operational costs for processors and improve profitability.

ANNEXURE - I

Key Insights from Shri Kaushal Kumar

- **Disease-Free Seed Production**: Emphasized as crucial for consistent productivity and production enhancement. The private sector's involvement, alongside public efforts, is necessary for addressing the seed challenges in Uttar Pradesh.
- **Cold Storage Upgradation**: Efforts are ongoing under the **MIDH (Mission for Integrated Development of Horticulture)** scheme to upgrade existing cold storage infrastructure and develop advanced units. So far, 500 cold storage units have been set up, with further expansion included in the program.
- **Regional Transformation Potential**: A focus on strengthening the potato value chain in 30 districts could lead to a complete transformation of these regions, with optimum production already ensuring remunerative prices for farmers this year.
- **Seed Challenges in UP**: The biggest challenge identified is seed availability. The limitations in the public sector necessitate private sector involvement and streamlined processes to overcome bottlenecks.
- **Advanced Cultivation Techniques**: Advanced techniques like **True Potato Seed (TPS)**, **Apical Rooted Cuttings**, **Tissue Culture**, and **Aeroponics** are being promoted. Two centres of excellence for aeroponics have been approved in Kushinagar and Hapur.
- **International Collaboration**: The **International Potato Centre** in Agra (regional office of the Peru headquarters) was noted as part of the global collaboration for better seed varieties.
- **Subsidies for Seed Production**: New seed production units receive ₹1 crore with a subsidy of ₹40 lakh, and type-2 units receive ₹1 crore with a ₹70 lakh subsidy.
- **Incentivizing Food Processing Industries**: Efforts are being made to attract entrepreneurs and generate better outcomes in the food processing sector by providing transparent and efficient incentives.
- **Export-Oriented Focus**: Quality remains paramount in the export sector, with efforts underway to make UP's potato production meet international standards.

Key Insights from Shri Hemant Gaur

- **Transition to Processed Potatoes**: A shift from table potatoes to processed potatoes is being observed, with over 100 chips manufacturing companies now utilising automated manufacturing systems.
- **Variety Challenges**: Hemant highlighted the critical issue with potato varieties, especially the **Lady Rosetta (LR)** variety, which accounts for 60% of the chips produced in India. The LR variety was introduced by the private sector and is the only export variety from the country. He requested that the government support and adopt these varieties into the mainstream system.
- **Market Dynamics**: With 90% of UP's potato production still consumed as table potatoes, new areas of processing are emerging, where the potato's color doesn't matter. This provides a competitive advantage for small and marginal farmers, though large-scale farmers are increasingly moving towards contract farming.
- **Seed Replacement Rate**: The seed replacement rate in UP is significantly lower than in other states. To incentivize farmers, competitive pricing is required, and the risk of loss decreases substantially when processing varieties are produced.

- **Coordination Between Government and Private Sector**: A major gap exists in terms of government awareness regarding the varieties required by the processing industry. Private sector participation is crucial to bridge this gap.
- **Water and Irrigation**: While UP does not suffer from water scarcity, **drip irrigation** improves the quality of potato crops and should be incentivized.
- **Cold Storage Infrastructure for Processing Potatoes**: Only 10 cold storage units in UP are suitable for storing processing potatoes, underscoring the need for more specialized facilities.
- **Contract Farming**: The execution and enforcement mechanisms for contract farming in UP are weak and need strengthening. Hemant urged UP to learn from Gujarat, where greater stability exists in contract farming.
- **Incentives for Exports**: Incentives for exports or private sector participation provided by the UP government are currently low, with high transaction costs making it difficult for stakeholders to remain competitive.
- **Impact of Climate Change**: Climate change has had a positive impact on potato farming in UP, with increased sunshine hours and less fog. However, the market dynamics are shifting, with Assam producing its own potatoes and decreasing its reliance on UP. Gujarat is emerging as a potential buyer due to its focus on processing potatoes.
- **Retail Involvement and Price Increases**: Retailers are entering the potato supply chain, buying in substantial quantities and focusing on varieties with longer shelf lives. This shift is giving retailers an upper hand and changing the dynamics of the market entirely.

Key Insights from Shri Raman Wadhwa

- **Introduction to DAY-NRLM**: Raman Wadhwa presented the key aspects of the **Deendayal Antyodaya Yojana - National Rural Livelihoods Mission (DAY-NRLM)**, emphasising the significance of value chain development in rural farming communities.
- **Farmer Aggregation and Resource Mobilization**: He stressed the importance of aggregating farmers into **Farmer Producer Organizations (FPOs)** and **Self-Help Groups (SHGs)** as the first step. However, the real challenge lies in mobilizing resources, which continues to be the biggest obstacle to improving farmers' prosperity.
- **TOP Scheme Linkages**: The **Operation Greens - TOP (Tomato, Onion, Potato)** scheme was highlighted, particularly its potential for strengthening the linkage between producer groups and value chains.
- **Value Addition and PM-FME**: Wadhwa pointed out the growing importance of value addition in agriculture and how the **Prime Minister's Formalization of Micro Food Processing Enterprises (PM-FME)** scheme is aligned with this need, aiming to foster value addition at the grassroots level.
- **Private Sector Involvement**: While FPOs are being formed and **Primary Agricultural Credit Societies (PACS)** are being modernized, a stronger push is needed from the private sector to create a **win-win situation** for all stakeholders involved in the agricultural value chain.

Key Insights from Director, Central Potato Research Institute (CPRI)

- **Three Core Areas of the Potato Value Chain**:
    1. **Seed Quality**: Focus on developing high-quality, climate-resilient seeds that allow farmers, especially small and marginal farmers, to achieve returns within 60 to 65 days of sowing.

2. **Value-Added Products**: Exploring varieties suited for processing into products like chips and fries.
3. **Farmer Income**: Enabling small and marginal farmers to receive remunerative prices through these efficient seed varieties.

- **Varietal Development**: CPRI has developed **75 potato varieties** to date, with **Kufri Bahar** being the most prevalent. The institute has made strides in developing **climate-resilient varieties**, such as **Kufri Surya** (heat-tolerant) and **Kufri Bhaskar** (temperature-resilient). Additionally, processing varieties such as **Kufri Chipsona 1, 2, 3 & 5** were highlighted, with the latest variety recently released and dedicated to the nation by the Prime Minister.
- **Biofortified Varieties**: CPRI has also developed biofortified varieties like **Kufri Manik**, **Kufri Keshak**, and **Kufri Jamunia**, which are rich in zinc, iron, and antioxidants, offering enhanced nutritional benefits.
- **Potato Production in UP**: Uttar Pradesh accounts for **0.6 million hectares** of potato acreage, producing **15 million tonnes** of potatoes annually. However, the state requires **2 million tonnes of seeds** to reach the targeted **2.5 to 3 tonnes per hectare** yield.
- **Challenges in Seed Replacement**: Despite multiple incentives and initiatives, UP's seed replacement rate remains low, at **7 to 8 percent**. The Director discussed various advanced techniques to overcome this challenge, including **True Potato Seed (TPS)**, **Apical Rooted Cuttings**, **Tissue Culture**, and **Aeroponics**. These techniques have helped meet **22 percent of quality seed demand**.
- **Processing Potential**: The institute is promoting **dehydrated potato varieties** for use in chips and fries manufacturing, which can drive crop diversification, particularly benefiting small and marginal farmers.

Key Insights from DMM, NRLM, Aligarh

- **SHGs and Women's Participation**:
    - **80,000 Self-Help Groups (SHGs)** have been formed in Aligarh, involving **170,000 women**.
    - Both **Producer Groups** and **Farmer Producer Organizations (FPOs)** exist alongside these SHGs to strengthen the rural farming system.
    - The target is to form **88,000 SHGs**, with the objective of promoting **integrated farming culture** in the near future.
- **Community Challenges**:
    - The main challenge remains **farmers not receiving desired prices** for their produce, along with the **spread of disease** and **lack of availability of inputs** to minimize waste. These issues contribute to losses on both the **market** and **production** sides.
    - Additionally, there is a need for **initiatives to curb these challenges**, particularly in the areas of **input accessibility** and **waste reduction**.
- **Challenges in Aggregation**:
    - The initial difficulty was aggregating farmers, especially **women farmers**, who often face **dual responsibilities**—caring for both their farms and their households.
    - These challenges have been exacerbated by **changing climatic conditions**, adding complexity to efforts aimed at mobilizing and supporting rural women in agriculture.

Key Insights on Cold Storage

- **Farmer Education and Best Practices**: There is a significant need to **educate farmers** on best practices for **cold storage** and to strengthen the **capacity for soil testing**. This would help ensure that farmers are storing their produce under optimal conditions, preserving quality and preventing loss.
- **Variety-Specific Requirements**: Farmers need to be educated about the **different varieties of potatoes**. When processors are involved, they often specify seed varieties that meet their size preferences, leading to the **rejection** of potatoes that do not meet these standards. Farmers often face losses when forced to sell the rejected potatoes at a lower market rate.
- **Digitization of Arthiyas (Commission Agents)**: The creation of a **dedicated portal** for arthiyas has been proposed to **digitise their list** and streamline fund flow transparency. This would improve the **transparency of payments** for produce and ensure timely access to **government incentives**.
- **Impact of Cold Weather on Sugar Content**: The **sugar content** in potatoes tends to increase during cold weather, and storing them in **cold storage** exacerbates this issue in Uttar Pradesh. A **solution** is required to address this, as it affects the marketability and quality of the produce.
- **Differentiation in Treatment of Potato Varieties**: Under current government policies, all potato varieties are treated the same. However, each variety has its own storage and handling requirements, and **policy adjustments** are needed to provide **variety-specific relaxations**.
- **Advance Booking of Cold Storage**: Although **advance booking** for cold storage exists, it is not widely used. There is a need to **incentivize** its use and encourage farmers to preserve their produce effectively. Additionally, there is a call for the **marginalisation or segregation** of cold storage based on specific potato varieties.
- **Policy Consultation for Cold Storage Subsidies**: The government is in the process of forming a **new cold storage policy**, and officials will consult with stakeholders to determine a **consensus-based subsidy rate**. The goal is to establish a **long and efficient seed chain** and ensure better storage infrastructure.
- **Seed Distribution System**: The current **seed distribution system** is inefficient. It is suggested that a **quota be assigned to certified agencies** to ensure timely and efficient seed distribution, which is critical for maintaining a robust potato value chain.

Key Insights from Other Players

- **Standardization and Grading**: There is a **lack of standardisation and grading** systems in the potato value chain, forcing stakeholders to rely on multiple channels for the desired produce. Developing a **standardised system** would streamline the supply chain.
- **Balanced Fertilizer Use and Focus on Micronutrients**: Emphasis should be placed on the **balanced use of fertilisers** with a focus on micronutrients to improve the overall quality of potato crops.
- **Contract Farming Institutionalisation**: The **framework for institutionalising contract farming** needs to be strengthened, along with mechanisms for its enforcement. This would provide farmers with greater security and predictability.
- **Processor Participation in Seed Breeding**: Processors should be allowed to **enter the seed breeding domain**. This would ensure a **more reliable seed supply** for processors and help align variety development with market demand.

- **Cold Storage Upgradation and Use of Forward Instruments**: **Cold storage facilities** need to be upgraded to accommodate forward trading instruments, allowing stakeholders to better manage price fluctuations and future demand.
- **Credit Support for Quality Inputs**: **Credit support** should be provided to enable farmers to use high-quality inputs, ensuring better yields and reducing reliance on substandard materials.
- **CIPC Ban and Fast-Tracking of Alternative Varieties**: With **CIPC banned in Europe**, the **registration process for alternative potato varieties** should be fast-tracked in India to keep up with global standards and maintain export competitiveness.
- **Good Agricultural Practices (GAP) for Potatoes**: The **Central Potato Research Institute (CPRI)** should collaborate with industries to promote **Good Agricultural Practices (GAP)** for potatoes, which would improve **export potential** and align Indian potato farming with international standards.
- **Mandi Fee Waiver for Processors**: In Uttar Pradesh, it is recommended that the **mandi fee be waived** for processors to reduce their operational costs and incentivize investment in the processing sector.
- **Protection Period for New Varieties**: The current protection period for new potato varieties in India is only **15 years**, compared to **30 years internationally**. It is suggested that India extend its protection period to 30 years to **support the development** of new varieties.
- **Addressing Information Asymmetry in Cold Storage**: There is **information asymmetry** about the stocks held in cold storage in Uttar Pradesh. A **platform** should be developed, modeled on **West Bengal and Gujarat**, to provide transparency and better inventory management.
- **JK Processing Plant in Gajrula**: A new **potato processing plant** is being set up by **JK** in Gajrula, with a capacity of **500 tonnes** for producing both **flakes and fries**. **Contract farming** is being implemented at a large scale in districts such as Sambhal and Hapur, with **guaranteed buyback** arrangements for farmers and **seed provision**.

ANNEXURE II : Participant List

1. Shri. Kaushal Kishore Neeraj
2. Smt. Rajya Shree Singh
3. Dr. R.K. Singh
4. Shri. Raman Wadhwa
5. Mr. Jayaram Killi
6. Mr. Bipin Bihari
7. Mr. Hemant Gaur
8. Ms. Harita Yadav Saha
9. Mr. S.Parvez Khan
10. Mr. Praneet Pathak
11. Mr. Mohinder Liddar
12. Mr. Chaitanya Singhania
13. Mr. Sritanu Chatterjee
14. Mr. Davinder Singh Dosanjh
15. Mr. Naresh Saklani
16. Mr. Rajesh Ranjan
17. Mr. Anuj Sharma
18. Mr. Samir Kumar
19. Mr. Devendra K
20. Ms. Suman Devi
21. Ms. Raman
22. Ms. Kamlesh
23. Ms. Om Kumari
24. Ms. Savitri
25. Mr. Ajay
26. Mr. Girraj Godani
27. Ms. Tripti
28. Mr. Bhuvesh Agarwal
29. Mr. Namit Kumar
30. Mr. Vinay Varshney
31. Mr Gagan Sinha
32. Ms. Nidhi Gupta
33. Mr Sidharth Sehgal
34. Mr. Deepak Mathur
35. Mr. Suryamani Roul
36. Mr. Anish Kumar
37. Mr. Mansoor
38. Mr. Bharat Bali
39. Mr. Ankush Singh
40. Mr. Apaar Wadhwa