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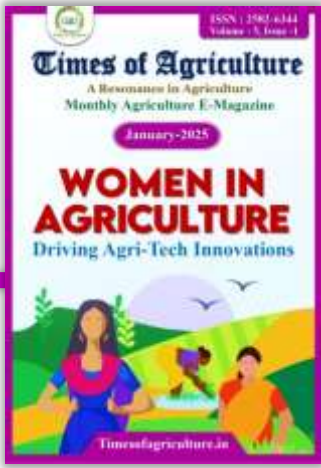
A Resonance in Agriculture
Monthly Agriculture E-Magazine

January-2025

WOMEN IN AGRICULTURE Driving Agri-Tech Innovations



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Times of Agriculture

A Resonance in Agriculture

From the Editor's Desk

Dear Readers,

We are delighted to present the 5th volume of **Times of Agriculture** Magazine. We sincerely hope to continue serving you with valuable content in the future. **Times of Agriculture** Magazine keeps you informed about the latest and most informative topics through its monthly editions. In this issue, we have highlighted the importance of women in agriculture through our cover story.

Today, women are not only serving food on the plate at home, but they are also contributing significantly to various agricultural enterprises, helping to feed the world. Women comprise approximately **47%** of India's agricultural workforce, yet they own only **12.8%** of the land. Increasing their ownership rights could unlock the vast potential of the women's workforce, playing a crucial role in transforming the face and direction of Indian agriculture.

In this century, women have accomplished many inspiring feats, showcasing their efficiency and dedication. The involvement of women in agriculture not only boosts the economy but also strengthens rural development. However, despite their contributions, women are still not receiving equal wages or opportunities compared to men. Bridging this gap and promoting women's participation in agriculture can lead to significant increases in agricultural productivity, improved food security, and sustainable rural economic growth.

Let us all work together to empower women in agriculture, paving the way for the upliftment of our nation and the advancement of the agricultural sector.

We hope this edition of **Times of Agriculture** Magazine provides you with valuable knowledge and inspiration.

Thank you very much, and enjoy reading!

Happy Republic Day!

Editor-In-Chief



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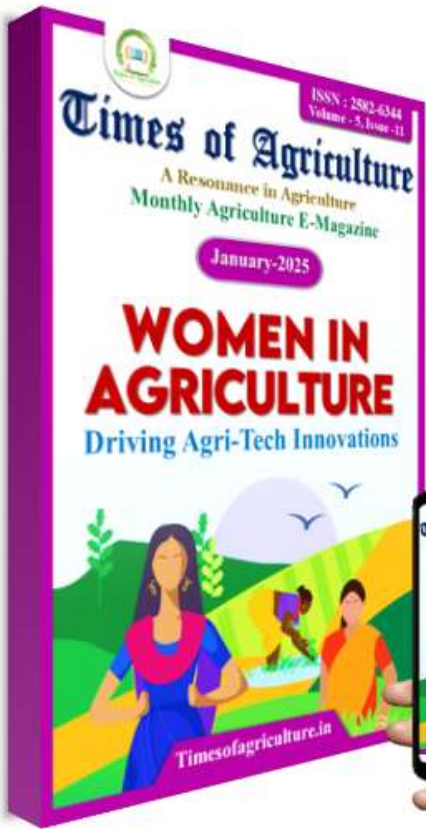
January, 2025/ Page | 2

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WOMEN IN AGRICULTURE



CONTENTS

1

Agriculture Updates

2

Cover story

Women in Agriculture: Driving Agri-Tech Innovations.

3

The impact of veganism on India's dairy economy: Trends and challenges.

4

Affordable special dap fertilizer subsidy extended to strengthen farmer welfare.

5

Challenges faced by farmers in using social media for agriculture.

6

Application of relevant innovative approaches in agricultural extension through KVKs.

7

A harvest of hope: Seven schemes nurturing Indian agriculture's transformation.

8

Cauliflower curse: Farmers forced to use harvest as cattle feed amid wholesale price drops.

9

The silent threat: Ignoring potassium fertilization poses a risk to global food security.





AGRICULTURE UPDATES



Cabinet Approves Extended DAP Fertilizer Subsidy to Boost Agricultural Productivity

The Union Cabinet has approved the extension of a one-time special package for Di-Ammonium Phosphate (DAP) fertilizer beyond the Nutrient-Based Subsidy (NBS) scheme. The package, amounting to ₹3,500 per metric ton (MT), will remain in effect from January 1, 2025, until further notice.

This decision ensures the continued availability of DAP at subsidized and affordable prices for farmers, with a tentative budgetary requirement of approximately ₹3,850 crore.

Under the NBS scheme, introduced on April 1, 2010, 28 grades of Phosphatic and Potassic (P&K) fertilizers, including DAP, are made available to farmers at subsidized rates. Despite challenges posed by global geopolitical tensions and market volatility, the government has prioritized farmer welfare, ensuring that the prices of DAP remain stable and affordable.

In July 2024, the Cabinet approved a one-time special package for DAP at ₹3,500 per MT for the period from April 1 to December 31, 2024, with a financial implication of ₹2,625 crore. With this latest extension, the total special package allocated for DAP since April 2024 exceeds ₹6,475 crore. The extended subsidy will:

- Ensure the availability of DAP at affordable and reasonable prices.
- Provide financial relief to farmers, enabling them to sustain agricultural operations without undue economic burden.
- Support stable agricultural productivity, which is critical for India's food security.



Government Launches National Turmeric Board with Headquarters in Nizamabad

Union Minister of Commerce & Industry, Shri Piyush Goyal, today inaugurated the National Turmeric Board in New Delhi. Shri Pallo Ganga Reddy has been appointed as the first Chairperson of the Board, with its headquarters located in Nizamabad.

The newly established Board will focus on promoting research and development of new turmeric products, as well as enhancing the value addition of turmeric-related products for export. It will also work towards creating awareness about the essential and medicinal properties of turmeric, improving yield, and strengthening logistics and supply chains to expand trade into new markets. Shri Goyal emphasized that the Board will play a crucial role in ensuring the quality and safety standards of turmeric production and exports.

In the year 2023-24, India cultivated turmeric on 3.05 lakh hectares, yielding 10.74 lakh tonnes. India accounts for over 70% of global turmeric production, Shri Goyal informed. He also highlighted that there are 30 different varieties of turmeric produced across the country.

In addition to the Chairperson, representatives from the Ministry of AYUSH, Department of Pharmaceuticals, Department of Agriculture & Farmers Welfare, and the Department of Commerce have been nominated to the Board. Representatives from Maharashtra and Telangana, the top two turmeric-growing states, as well as Meghalaya, known for its Lakadong turmeric, will also be included. States will be represented on the Board on a rotational basis. The National Turmeric Board will concentrate on the overall development and growth of the turmeric sector in India, aiming to tap into the vast potential for increasing the trade of turmeric and its products, especially given the growing demand for its health and wellness benefits.



Union Cabinet Approves Continuation of Crop Insurance Schemes with ₹69,515 Crore

The Union Cabinet, chaired by Prime Minister Shri Narendra Modi, has approved the continuation of the **Pradhan Mantri Fasal Bima Yojana (PMFBY)** and the **Restructured Weather-Based Crop Insurance Scheme (RWBCIS)** until 2025-26. The initiative comes with a total outlay of ₹69,515.71 crore for the period 2021-22 to 2025-26, aiming to provide comprehensive risk coverage for farmers against non-preventable natural calamities.

To enhance transparency and improve claim calculation and settlement processes, the Cabinet has also approved the establishment of a **Fund for Innovation and Technology (FIAT)** with a corpus of ₹824.77 crore. This fund will support technological advancements and research initiatives under the scheme, including projects such as **Yield Estimation System using Technology (YES-TECH)** and **WINDS**.

YES-TECH utilizes remote sensing technology to estimate crop yields, assigning a minimum of 30% weightage to technology-based yield assessments. Currently, nine major states—Andhra Pradesh, Assam, Haryana, Uttar Pradesh, Madhya Pradesh, Maharashtra, Odisha, Tamil Nadu, and Karnataka—are implementing this system, with efforts underway to onboard other states swiftly.

With the expanded adoption of YES-TECH, traditional crop-cutting experiments will gradually be phased out, ensuring greater efficiency in claim settlements. For the 2023-24 period, claims in Madhya Pradesh have been calculated and settled entirely using technology-based yield estimation, marking a significant step forward in modernizing the scheme's implementation.



**PRADHAN MANTRI
FASAL BIMA YOJNA**
Ministry of Agriculture & Farmers Welfare



Union Cabinet Approves WINDS Initiative to Enhance Hyper-Local Weather Data for Farmers

The **Weather Information and Network Data Systems (WINDS)** initiative aims to establish **Automatic Weather Stations (AWS)** at the block level and **Automatic Rain Gauges (ARGs)** at the panchayat level to enhance the availability of hyper-local weather data. WINDS plans a fivefold increase in the current network density, enabling precise weather monitoring and forecasting. Under this initiative, the Central and State Governments are only required to cover data rental costs, ensuring cost-effectiveness.

Currently, 9 states- Kerala, Uttar Pradesh, Himachal Pradesh, Puducherry, Assam, Odisha, Karnataka, Uttarakhand, and Rajasthan are in the process of implementing WINDS, while other states have shown interest in adopting the system.

Although WINDS was initially scheduled for implementation in 2023-24 as per the Expenditure Finance Committee (EFC), it faced delays due to the need for preparatory and planning work before tendering. The Union Cabinet has now approved 2024-25 as the first year of implementation, providing states the advantage of higher central fund sharing under a 90:10 ratio.

However, due to the voluntary nature of the scheme and the relatively low gross cropped area in these regions, flexibility has been introduced to reallocate unutilized funds to other development projects and schemes with pressing financial needs. The WINDS initiative reflects the government's commitment to leveraging technology for improving agricultural outcomes and addressing the specific needs of farmers across diverse regions.

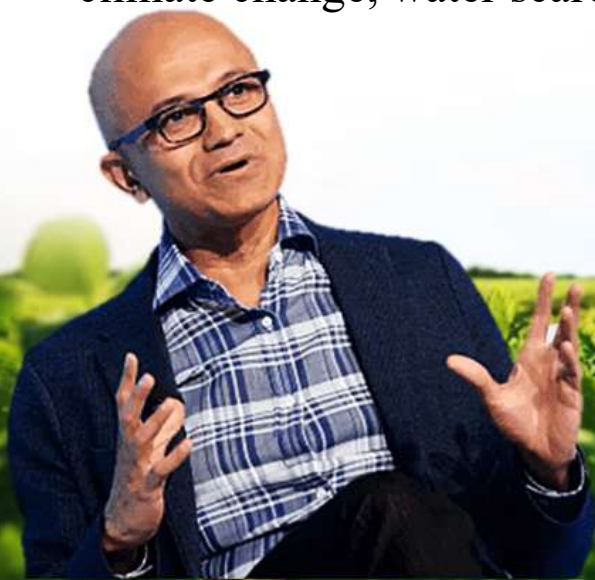


Microsoft CEO Praises Agricultural Development Trust (ADT) of Baramati for Leveraging AI in Agriculture

Microsoft CEO Satya Nadella commended the Agricultural Development Trust (ADT) of Baramati, Maharashtra, for its innovative use of Artificial Intelligence (AI) in aiding farmers to achieve healthier and more sustainable harvests. Nadella highlighted ADT's efforts to integrate cutting-edge technology into agriculture, showcasing how AI can benefit the farming community.

Former Union Agriculture Minister and ADT founder Sharad Pawar expressed gratitude for Nadella's recognition. *"Thank you, Satya Nadella, for highlighting the benefits of AI in agriculture. At ADT Baramati, we are committed to bringing the latest technologies to farmers to help them thrive. We also look forward to collaborating with Microsoft to ensure these technologies are utilized to their fullest potential,"* Pawar stated.

The Agricultural Development Trust, established in 1968 by Sharad Pawar and his elder brother Appasaheb Pawar, aims to foster agricultural and educational development. One of ADT's initial initiatives was constructing percolation tanks in the drought-prone regions of Baramati tehsil in Pune district to meet water requirements for drinking and agriculture. In recent years, ADT has expanded its efforts to include sustainable farming practices, rural education, and technological advancements to improve the lives of farmers in the region. By incorporating AI and other modern technologies, enhancing agricultural productivity ensuring that farmers are equipped with tools to tackle climate change, water scarcity, and other challenges.



Uttar Pradesh Launches AI-Powered Open Network with Google Cloud

The UP Government has signed an MoU with Google Cloud (India) to launch the *Uttar Pradesh Open Network for Agriculture*, powered by Google's Gemini and enabled by the Beckn Protocol. This groundbreaking initiative aims to revolutionize agriculture by providing farmers with a one-stop platform for advisory services, credit, mechanization, and market linkages. The agreement was signed by Chief Secretary Manoj Kumar Singh and Google Cloud (India) Vice-President Anil Bhansali. With this open network, farmers will receive real-time, accurate information on microclimates, market prices, and weather patterns, helping them make informed decisions and enhancing productivity. The project is part of the state government's vision to double farmers' income and digitize the agricultural ecosystem.

The open and decentralized network, built as a Digital Public Infrastructure (DPI), encourages the participation of various stakeholders, including input suppliers, financial institutions, and government agencies. It also promotes innovation by enabling entrepreneurs to create customized solutions for farmers. The platform aims to bridge the digital divide while fostering competition and innovation within the agricultural ecosystem.

This first-of-its-kind state-level initiative in India marks a milestone in integrating AI and digital technologies into agriculture. By digitizing the agricultural ecosystem, Uttar Pradesh seeks to empower its farming community with modern tools and resources to thrive in the 21st century.



WOMEN IN AGRICULTURE

Driving Agri-Tech Innovations



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Small-scale farmers are at the backbone of the world food system, and they produce almost 70-80% of the world's food. These people are very significant in agricultural labor in most countries around the world, including India, Africa, and Southeast Asia. The bad news, however, is that there are quite a few bottlenecks preventing them from achieving their optimal production. Chief among these are typically the lack of modern technology, low capital availability, poor linkages to market, and vulnerability to climatic shocks.

Despite being overwhelmingly represented by the unsung heroes, or women, who make up nearly 43% of the total, women farmers still face systemic challenges, such as limited land ownership and poor credit availability without training. However, there is hope for the first time as women-led agri-tech startups are popping up all over the place, aiming to close gender distribution gaps, empower small-scale farmers, and bring about much-needed socioeconomic changes in rural communities.

Women are an integral part of this sector, with approximately 80% of rural women depending on agriculture for their livelihood. In India, women constitute 33% of the agricultural labor force and 48% of self-employed farmers (FAO, 2021). Their contributions extend beyond farming, as they play vital roles in cattle management, fodder collection, post-harvest processing, and allied activities such as livestock rearing, horticulture, and fishing. These efforts collectively account for 60–80% of food production in the country (FAO, 2020).

Despite their significant contributions, women in agriculture face systemic challenges that limit their growth and productivity. Globally, women make up 43% of the agricultural workforce but are often employed in unpaid or low-wage roles with limited access to land ownership and financial resources account (UN Women, 2023). In developing countries, women for only 10–20% of landowners, highlighting the disparity in ownership rights (FAO, 2020). Empowering women in agriculture not only ensures gender equality but also enhances food security, strengthens rural economies, and fosters sustainable development.



Inspiration from Women-Led Agri-Tech Startups

The number is the same; throughout the past ten years, there has been a surge of female entrepreneurs in the agri-tech sector. Here, every technology is employed to close gaps in value chains related to agriculture. The same is true for India, where statistics show a 25% increase between 2019 and 2023, in line with global trends.

Because they are envisioning solutions that are remarkably diverse and specifically address grassroots challenges, the female entrepreneurs have brought to the table exactly what's needed. Whether it's an app-based pesticide management application or an AI-aided crop advisory service, all of them have impacted positively and directly on women's business productivity, income, and sustainability. In recent years, women entrepreneurs have been at the forefront of transforming the agricultural sector through innovative startups.

1-Animal

Founded by *Neetu Yadav & Kirti Jangra* in 2019, the platform has connected cattle buyers and sellers across several northern states in India, including Haryana, Uttar Pradesh, and Rajasthan. This aimed at improving the livestock trading ecosystem in India. It provides a digital platform that connects farmers to buy and sell cattle without middlemen, ensuring transparency and fair pricing.



2-Greenday

Founded by *Aishwarya Bhatnagar* in 2017, Greenday incentivizes farmers to grow nutrition-dense crops enriched with essential micronutrients. The startup operates around various agri-input stores and procurement centers across India under its '*Kisan Ki Dukan*' brand. Greenday's Better Nutrition, secured investment from badminton player PV Sindhu, aiming to address micronutrient deficiencies in India through biofortification.



3-Salam Kisan

Founded by *Dhanashree Mandhani*, Salam Kisan is a tech-enabled end-to-end agriculture platform powered by artificial intelligence and data to increase profitability for farmers. In few years, Salam Kisan has amassed a significant number of farmers, making it one of the fastest-growing full-stack startups in the ag-tech space. The platform offers precision agriculture recommendations, market linkage; AI-powered crop advisory, and serves as an information hub for farmers.



4-Hoovu Fresh

Founded by *Yeshoda Karuturi* and *Rhea Karuturi*, Hoovu Fresh is transforming the traditional flower industry in India. The startup, also featured on Shark Tank India, focuses on delivering fresh, high-quality flowers directly to customers. By leveraging advanced technology to preserve flower freshness and extend their shelf life, Hoovu Fresh has made a remarkable impact on the religious, cultural, and ornamental flower markets across the country.



5- Kheyti

Saumya, as a co-founder and Chief Program Officer of Kheyti, has been instrumental in developing the "Greenhouse-in-a-Box" solution to support smallholder farmers. This low cost modular greenhouse helps farmers protect crops from extreme weather, pests, and diseases while reducing water usage. Kheyti's innovative approach earned them the prestigious Earthshot Prize in 2022.



Socioeconomic Impact of Women-Led Agri-Tech Startups:

1. **Increased farmer income-** They have, in the process, hugely transformed farm families' living standards through efficient remedies and resource intensification. Analysis indicates that agritech innovations can raise yields by 20-30%. In such an industry, this impact is felt much more strongly at the level of rural incomes.
2. **Women's empowerment and gender equality-** They help women venture into careers in technology, entrepreneurship, and agriculture, which have dominated men. They advocate for equality in opportunities that have never been granted throughout history in the majority of areas dominated by men but reject and repress the gender stereotype.
3. **Rural economy recovery-** They have much more to sell when the production and profitability of the rural sector have improved. The purveying effect of purchasing power encourages local enterprise, which in turn enhances economic growth.

Opportunities and Challenges for Women-Led Agri-Tech Ventures to Grow

One of the most significant hurdles is the funding gap, as women entrepreneurs struggle to access adequate financial resources. A recent study revealed that women-led start-ups receive only 2.3% of venture capital, highlighting the urgent need for improved financial inclusion. Another critical challenge is the dependence of digital agri-tech solutions on widespread smartphone and internet penetration. The digital divide, particularly in rural areas, creates connectivity issues that limit the reach and impact of these ventures.

Government grants, subsidies, and training programs can play a transformative role in scaling women-led ventures. Similarly, public-private sector collaborations can enhance operations and expand outreach to marginalized communities, fostering growth and inclusivity in the agri-tech sector.



A Call to Action for Sustainable Agriculture

It is, above all, an investment in food security and sustainable agriculture, but it is also a very much an equality problem. Because these kinds of businesses are transformative within themselves because they incorporate innovation, technology, and gender inclusiveness. Supporting such a business requires teamwork among the government, investors, and other vested interests to build enabling environments. We can do this as consumers by promoting products that would help small-scale farmers. As a collective group, we will help bring about a sustainable agriculture industry, improve people's lives, and build stronger communities.

Key Takeaways for Female Entrepreneurs of the Future:

Women-owned businesses make 63 percent more profit than those owned by men, a wise yet futile move. By exploring Salam Kisan and Greenday, the innovative pursuit towards reform changed the outlook of farming. The next generation of entrepreneurs would require the following:

- **Grass root understanding-** Know what small farmers do and how they tackle problems.
- **Partnerships with other stakeholders-** Partnership with other stakeholders in your agriculture community. Aligned alliances which can be operated along your value chain.
- **Technology adaptation-** Mobile application, IoT and AI for scalable solutions.

Empowering women small-scale farmers and entrepreneurs enables this sector to unlock its enormous potential for sustainability and productivity. While these women play a critical role in food production, they often face barriers to accessing resources, such as technology, credit, or land. Addressing such issues would ensure fair opportunities for the promotion of economic growth, food security, and poverty reduction. The empowerment, thus, not only makes an agricultural sector more resilient to challenges in the marketplace and climate but also provides an excellent foundation on which future generations will thrive- if we invest in women today.



The Impact of Veganism on India's Dairy Economy: Trends and Challenges

India has been long touted for its milk production. It is one of the globally largest producers of milk and dairy products. However, with Western culture moving in, the country is waking to the physical, ethical and economic strength of consuming plant-based and dairy-free produce. Attributed to the rising health consciousness of the urban population, the trend of adopting a vegan diet is rising at an unprecedented pace.

Veganism is a lifestyle by choice that eliminates the consumption of animal products. It has been gaining traction worldwide and India is no longer behind the league. Traditionally, India has been a dairy-loving country. For decades, it has relied on dairy milk as an integral part of the diet and cultural practices. However, the shift towards veganism poses both opportunities and challenges for the country's dairy industry.

The rising shift towards Veganism

With the changing diet preferences, India has continually witnessed a steady rise in veganism over the past decade. Consumers, especially the urban population, are becoming more aware of animal rights, environmental sustainability and health benefits of dairy alternatives. In tandem, the growing influence of social media plays a pivotal role in promoting vegan lifestyles, encouraging the high demand for plant-based alternatives by the urban and health-conscious populace.

Subsequently, there is an increased demand for plant-based milk alternatives such as sweetened / unsweetened almond milk, soy milk and oat milk. Apart from this, the demand for vegan cheese and tofu has also made a significant way into Indian markets. Many health startups and established brands are capitalizing on this trend to cater to this niche yet growing consumer base.



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The emergence of the vegan industry

The paradigm shift towards veganism has opened several avenues for innovation and business growth within the beverage industry. Non-dairy startups are emerging at an unprecedented pace to address the growing demand for plant-based products, especially dairy milk alternatives. These companies are continuing to introduce a range of vegan-friendly milk drinks to cater to diverse taste preferences of the customers.

Apart from this, this emerging trend is not only focusing on replicating or at least supplementing the nutritional benefits of dairy products but are also aiming to make them more affordable and accessible. With advancements in food technology and continuous product development, these companies are bridging the gap between demand and supply, building a robust veganism ecosystem in India. Moreover, the entry of multinational vegan brands has further augmented this lifestyle, providing Indian consumers with a wider variety of dairy alternatives.

Key veganism challenges in India

Though veganism is gaining popularity in India, it is still an impractical choice for the majority of the population. India's per capita income ranks 141st in the world and is significantly lower than that of developed countries with a substantial portion of the population below the poverty line. In such scenarios, dairy products like milk, curd, and paneer serve as primary sources of nutrition and are also less burdened on the pocket.

On the other hand, dairy alternatives such as almond milk and tofu are priced higher due to their production costs and limited supply chains. For instance, one liter of almond milk is four to five times costlier than traditional cow's milk. This disparity in pricing plays a huge role in making veganism inaccessible to the average Indian consumer, limiting its widespread adoption.

Veganism's impact on India's dairy industry

For decades, India has been renowned as the world's largest producer of milk and contributes nearly 22% of global production. The dairy industry plays a critical role in the country's economy as it employs millions of farmers from rural and semi-urban areas. Dairy farming serves as a primary or supplementary source of income for many small-scale farmers.



Any decline in domestic dairy consumption could result in a milk surplus. Eventually, this will lead to wastage or the need for export, which might not always yield profitable returns. Additionally, dairy processing units such as logistics and packaging may experience demand reduction which can impact employment in the sector, ultimately downsizing the industry.

The critical need to spread consumer awareness

The adoption of veganism offers significant benefits to consumers. A vegan diet, rich in plant-based foods can lower the risk of heart disease, diabetes and certain cancers while promoting better digestion and overall well-being. However, it may not be suitable for everyone, especially for individuals with specific nutritional requirements such as growing children, pregnant women or those who require high protein or calcium. They may benefit from dairy in their diets.



Unlike dairy, vegan alternatives like almond or soy milk lack comparable traditional medicinal properties. It creates a potential gap in accessibility and natural treatments. This transition highlights a crucial challenge in balancing ethical dietary choices with the preservation of age-old medicinal wisdom. Hence, consumer awareness and understanding of dietary needs are essential in adopting non-dairy products.

Turning vegan is ideal for individuals seeking a healthier lifestyle and those with lactose intolerance or anyone looking to reduce their environmental impact. Additionally, those concerned about animal rights also embrace veganism to align their food choices with their ethical values.

Way forward

The impact of veganism on India's dairy economy is complex and has multipronged cultural, economic, and environmental dimensions. While the trend highlights the importance of intelligent and sustainable choices, it also calls for the need to consider affordability and nutritional staples for the majority of Indians. Hence, it is significant to adopt a balanced approach between tradition and innovation in overcoming bottlenecks in retaining the growth of the dairy industry while also responding to the demand for vegan products for the urban, diet conscious population.



AFFORDABLE SPECIAL DAP FERTILIZER SUBSIDY EXTENDED TO STRENGTHEN FARMER WELFARE

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The Union Cabinet, headed by Prime Minister Shri Narendra Modi, has decided to extend the one-time special package for Di-Ammonium Phosphate (DAP) fertilizer beyond the Nutrient-Based Subsidy (NBS). The step is taken with the objective of maintaining the availability of DAP at subsidized and affordable prices for Indian farmers to ensure their

welfare in the backdrop of challenging global market conditions.

Background

Since the launch of the NBS scheme on April 1, 2010, 28 grades of Phosphatic and Potassic (P&K) fertilizers, including DAP, have been supplied to farmers at subsidized rates through manufacturers and importers. Geopolitical tensions and the volatility of the global market did not deter the Indian government from continuing to safeguard farmers from the vagaries of price fluctuations and ensuring the availability of critical agricultural inputs like DAP.

The Union Cabinet had sanctioned a similar one-time special package for DAP for the period from April 1 to December 31, 2024, at a subsidy of ₹3,500 per MT in July 2024. This package, with a financial implication of ₹2,625 crore, has kept DAP prices stable during the crucial Kharif and Rabi agricultural seasons.

Latest extension

The Cabinet on January 1, 2025 announced continuation of this special package from January 1, 2025 till further orders. The extended package will have

a subsidy of ₹3,500 per MT over and above the existing NBS subsidy. This will incur an estimated financial outlay of ₹3,850 crore. This latest approval takes the total financial commitment towards the DAP special package since April 2024 to over ₹6,475 crore.

The package is a reflection of the government's commitment to farmers, especially in times of global economic instability and market uncertainty. This major step shows the government's commitment to protecting agricultural productivity and ensuring that inputs are available at affordable prices.

Advantages to farmers

The extended package offers the following benefits to the agricultural sector:

- 1. Reasonable prices:** DAP will be available at subsidized, reasonable prices, thus reducing the burden on farmers.
- 2. Economic support:** Provides financial assistance to farmers, allowing them to continue agricultural activities without undue economic pressure.
- 3. Agricultural security:** Promotes secure agricultural production, which is crucial for India's food security.



4. Increased farmer confidence:

Inspires farmers to adopt new agricultural technologies and invest in their crops without fear of increased input prices.

5. Protection from market volatility:

Protects farmers from volatile global price shocks, promoting long-term stability in the agricultural economy.

Government's commitment

Union Minister for Information and Broadcasting, Ashwini Vaishnaw, said that the government has remained committed to farmers even in the face of global challenges. "Despite geopolitical constraints and market volatility, we have ensured the availability of DAP at affordable prices for Kharif and Rabi 2024-25," he said.

This proactive approach reflects the government's continued focus on farmer welfare, ensuring the agricultural community remains resilient and productive. The initiative aligns with the broader vision of fostering sustainable agricultural growth and supporting rural livelihoods.

Implementation strategy

The special package on DAP will be implemented immediately, and

the fertilizer will be available all over the country without any disruption. The government has tasked relevant departments and agencies with monitoring the supply chain to prevent any disruptions. Mechanisms will be established to ensure transparency and efficiency in subsidy disbursal, ensuring that benefits reach farmers directly.

The government will work with fertilizer manufacturers and importers to optimize the production and distribution channels. The idea is to ensure that there are no logistical bottlenecks that can disrupt supply during peak agricultural seasons.

Wider implications for Indian agriculture

It forms part of a set of initiatives intended to bolster the agricultural sector. Coupled with other programs, including the Pradhan Mantri Fasal Bima Yojana and the Restructured Weather-Based Crop Insurance Scheme, the government hopes to establish a sound safety net for farmers. In all these initiatives, it tackles different facets of agricultural risk - input costs, climate uncertainty, and market volatility.

The government would be ensuring farmers' safety through the

availability of critical inputs, such as DAP. Through stable fertilizer prices, farmers would be able to plan their cropping patterns, with consistent yields and increased productivity in the long run.

Future prospects

The government's decision to extend the special package is a signal of its long-term commitment to the agricultural community. The welfare of farmers will be prioritized by the government, which will form the foundation for a resilient and self-sufficient agricultural sector. Continuous evaluation of global market trends and proactive policymaking will be essential to sustaining this momentum.

This initiative has seen the Union Cabinet reaffirm its commitment to welfare for farmers so that Indian agriculture can thrive amidst global challenges. This forward-looking approach will prove to be instrumental in achieving both economic development and food security for the nation.

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Top 15 Most Profitable Farming in India



CHALLENGES FACED BY FARMERS IN USING SOCIAL MEDIA FOR AGRICULTURE

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Social media has become an essential tool in modern agriculture, transforming how farmers, agribusinesses, and organizations communicate, share knowledge, and promote agricultural practices. With the increasing use of digital platforms such as Facebook, Twitter, Instagram, YouTube, and LinkedIn, social media offers a unique space for information exchange, marketing, and networking within the agricultural sector. In India, social media

has become a vital tool for farmers, with **77% of farmers** using **WhatsApp** for receiving farming advice, sharing knowledge, and staying informed about government schemes. Social media platforms like **Facebook** and **Instagram** are increasingly used for marketing, connecting farmers directly with consumers. **69% of Indian farmers** are reported to use social media for accessing agricultural information, with a growing trend of digital adoption in rural areas. This digital shift helps farmers enhance their productivity, improve access to markets, and participate in online agricultural communities for knowledge sharing and support.

Discussion

Social media in agriculture is transforming the way farmers, agribusinesses, and agricultural organizations communicate, share information, and promote products. Platforms like **Facebook**, **Instagram**, **WhatsApp**, **Twitter**, and **YouTube** have become essential tools for farmers and stakeholders to access real-time

information, learn about new technologies, and engage with their communities.

Key roles of social media in agriculture

- 1. Information sharing:** Social media provides a platform for farmers to share farming techniques, weather updates, and pest control methods. Online communities and groups facilitate knowledge exchange, helping farmers solve challenges and improve productivity.
- 2. Market access:** Farmers use social media to market their products, connect directly with consumers, and promote their businesses. Platforms like **Instagram** and **Facebook** allow farmers to showcase their products visually and engage with a wider audience, expanding their market reach.
- 3. Networking and collaboration:** Social media enables farmers to connect with peers, experts, and agribusinesses, fostering collaboration and networking. These connections help



share resources, learn from industry leaders, and support each other in times of need.

4. **Advocacy and policy influence:**

Social media serves as a powerful tool for advocacy, allowing farmers to raise awareness about key issues such as sustainability, climate change, and government policies. Organizations and individuals use social platforms to advocate for changes in agricultural practices or policies.

5. **Digital tools for development:**

In countries like India, social media is used not only for communication but also for accessing agricultural development programs and government schemes, helping farmers improve their knowledge and practices.

Challenges

While social media offers many benefits to farmers, its use in agriculture also comes with several challenges:

1. Digital literacy: Many farmers, especially in rural areas, may not have the necessary skills to effectively use social media platforms. Low levels of digital literacy can hinder their ability to access information, engage in online communities, or take advantage of online marketing opportunities.

2. Internet connectivity: In many rural regions, poor internet connectivity or a lack of access to reliable networks can limit farmers' ability to fully utilize social media. Slow speeds and frequent outages may make it difficult to access timely information or engage in online transactions.

3. Misinformation and reliability of sources: The spread of misinformation on social media can be a major issue. Farmers may come across inaccurate or misleading agricultural advice, which could negatively impact their farming practices. It can be challenging for farmers to differentiate between credible sources and unreliable information.

4. **Privacy and security concerns:**

Farmers may be wary of sharing personal or business information on social media platforms due to concerns over privacy and security. With the growing risk of data breaches or cyberattacks, some farmers may hesitate to engage online.

5. **Overload of information:**

While social media provides a wealth of information, the sheer volume of content can be overwhelming. Farmers may struggle to filter through the noise to find the most relevant and practical advice for their specific needs.

6. **Financial constraints:**

Many farmers face financial limitations that prevent them from investing in smartphones, data plans, or other technology required for effective use of social media. This can further exclude them from the benefits of online resources and marketing tools.

7. **Cultural barriers:**

In some regions, traditional farming communities may be resistant to adopting new technologies or digital tools, preferring established, offline methods. Cultural barriers to change can make the widespread adoption of social media in agriculture more difficult.

8. **Lack of localized content:**

While global agricultural content is available online, much of it may not be tailored to the specific needs, languages, or farming practices of local communities. This can limit the effectiveness of social media for farmers in diverse regions with unique agricultural conditions.

Recommendations

To overcome the challenges farmers face in using social media for agriculture, several recommendations can be implemented to improve access, usability, and effectiveness. Here are key strategies:

1. Digital literacy training

Recommendation: Provide targeted digital literacy programs and

training sessions for farmers, particularly in rural areas. Government agencies, NGOs, and agricultural organizations can collaborate to offer workshops or mobile training units that teach farmers how to use smartphones, social media platforms, and digital tools effectively.

Solution impact: Empowering farmers with digital skills will increase their confidence in using social media, enabling them to access valuable agricultural content, market products, and connect with peers and experts.

2. Improving internet connectivity:

Recommendation: Invest in rural broadband infrastructure and mobile network expansion to improve internet connectivity in remote areas. Governments and telecom companies can work together to provide affordable internet access or subsidized data packages tailored for farmers.

Solution impact: Enhanced connectivity will allow farmers to stay updated on agricultural trends, access online support, and engage with global markets, thus reducing the digital divide.

3. Ensuring reliable and credible information:

Recommendation: Develop platforms or apps where farmers can access verified, peer-reviewed, and region-specific agricultural information. Agricultural experts, universities, and government bodies should be involved in curating content and ensuring its accuracy.

Solution impact: By providing credible sources, farmers can make informed decisions, avoid misinformation, and adopt better farming practices, leading to improved productivity and sustainability.



4. Enhancing privacy and security measures:

- **Recommendation:** Encourage farmers to use secure platforms and educate them about online privacy practices, such as data encryption and securing personal accounts. Governments and NGOs can also provide resources on data protection and online safety.
- **Solution impact:** Reducing concerns about privacy and security will increase farmers' willingness to engage with social media, sharing information and collaborating with others more freely.

5. Curating relevant content:

- **Recommendation:** Create social media channels and online communities specifically for farmers in different regions, languages, and crop types. Content should be localized to meet farmers' specific needs and challenges, whether it's related to weather, pests, or market prices.
- **Solution impact:** Tailored content will make it easier for farmers to find practical advice and solutions that are directly applicable to their farming practices, leading to better engagement and application of knowledge.

6. Affordable technology and devices:

- **Recommendation:** Provide low-cost smartphones, tablets, and internet packages for farmers through government schemes or partnerships with tech companies. Additionally, farmers could benefit from discounts on devices through agricultural cooperatives or cooperatives.
- **Solution impact:** Access to affordable technology will ensure more farmers can participate in the digital agriculture ecosystem, boosting their capacity to use social media effectively.

7. Promote cultural adaptation and acceptance:

- **Recommendation:** Engage local agricultural leaders, influencers, and respected community figures to advocate for the benefits of social media in farming. Demonstrating success stories of farmers who have benefited from social media can help change mindsets.
- **Solution impact:** When local leaders advocate for digital adoption, farmers may be more inclined to embrace new technologies, overcoming cultural barriers and building trust in the digital tools.

8. Develop platforms with local language support:

- **Recommendation:** Develop or promote agricultural platforms that support multiple local languages and dialects. This can help overcome language barriers and ensure that farmers can engage with content in a language they are comfortable with.
- **Solution impact:** By offering content in native languages, more farmers will be able to access and benefit from social media resources without facing language barriers.

9. Strengthen government and private sector collaboration:

- **Recommendation:** Governments, NGOs, and private sector companies should collaborate to create initiatives that provide farmers with practical digital tools, educational resources, and reliable agricultural platforms. Joint efforts can ensure that digital tools are designed to address specific farming needs.
- **Solution impact:** A collective approach from multiple sectors will ensure that the challenges are addressed holistically, fostering a sustainable digital agriculture ecosystem.

Success Story: "Digital India" and the role of whatsapp in agricultural advancements

In India, WhatsApp has become an incredibly valuable tool for farmers, particularly in the state of **Madhya Pradesh**. The state government, in partnership with agricultural organizations, launched a program called "**Digital Green**" to improve agricultural practices through mobile-based technology. Farmers were introduced to WhatsApp groups where they could receive information on crop diseases, weather updates, and best farming practices in real time.

Key elements of success:

- **WhatsApp for knowledge sharing:** Farmers in these WhatsApp groups exchange agricultural tips, solutions for pest control, and advice on crop management. The groups also provide timely weather alerts and government scheme updates.
- **Improved access to experts:** Farmers who had no access to agricultural extension services were able to directly communicate with experts and share photographs of their crops for advice.
- **Increased yield and profitability:** As a result of this digital intervention, farmers reported higher yields, reduced crop losses, and better decision-making, leading to an increase in income.

Failure Story: The challenges of misinformation in social media

While social media can be a powerful tool, it also has its pitfalls. A **failure story** from the state of **Uttar Pradesh**, India, highlights the issue of **misinformation** that can spread on social platforms, leading to significant consequences for farmers.

In 2020, during the early stages of the **COVID-19 pandemic**, rumors about a supposed **fertilizer shortage** and exaggerated **market prices** spread rapidly through WhatsApp groups and Facebook. Many farmers, acting on this



misinformation, over purchased fertilizers and seeds, only to find that the rumors were false.

Key challenges faced:

- ➔ **Misinformation:** Farmers were misled by false information on social media regarding product shortages and price hikes, which led to unnecessary financial losses.
- ➔ **Lack of verification:** The absence of proper checks and credible sources in some agricultural groups led to the spread of rumors and inaccurate agricultural advice.
- ➔ **Negative impact on livelihoods:** The incorrect purchases and decisions based on misinformation left farmers in financial distress, as they had invested more money than needed

into supplies that were ultimately not required.

Lessons learned:

- **Success:** The Digital Green initiative in Madhya Pradesh showcases how the correct use of social media platforms can directly improve agricultural practices, enhance access to information, and boost farmers' productivity.
- **Failure:** The Uttar Pradesh case highlights the need for credible sources of information on social media. Misinformation can lead to harmful financial consequences, especially when farmers rely on unverified advice.

Conclusion

Social media has great potential to transform agriculture, these challenges can hinder its effective adoption and use

by farmers, particularly in rural and underserved areas. Addressing issues like digital literacy, connectivity, and information reliability will be key to maximizing the benefits of social media for agriculture. By addressing these challenges with targeted interventions, farmers can be empowered to use social media effectively, leading to better productivity, improved market access, and enhanced agricultural development. Overall, when used effectively and responsibly, social media has the potential to significantly improve the lives of farmers, help them stay informed, and connect them to global markets, thus contributing to the advancement of agriculture.



[Bharatagri: Revolutionizing Indian agriculture](http://Timesofagriculture.in)



Previous Issues



Website Statistics (December 2024)

154K

Monthly
Pageview

67K

Monthly
Visitor

3.2M

Monthly
Impression

Social Stats



6.5K



5.4K



8.3K



1.7K



2K





APPLICATION OF RELEVANT INNOVATIVE APPROACHES IN

AGRICULTURAL EXTENSION THROUGH KVKs

About Author



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Agriculture serves as the backbone of many economies worldwide, providing food, livelihood, and raw materials for industries. However, the sector faces multifaceted challenges, including climate change, resource constraints, market fluctuations, and the increasing need for sustainable practices. To address these issues and ensure farmers' growth and resilience, agricultural extension services play a pivotal role.

Krishi Vigyan Kendras (KVKs), the frontline agricultural extension centers in India, have emerged as vital institutions for disseminating knowledge and innovative technologies to farmers.

By bridging the gap between research institutions and the farming community, KVKs facilitate the practical application of scientific advancements to enhance agricultural productivity and sustainability.

The dynamic nature of agriculture necessitates the adoption of relevant and innovative approaches in extension services. Traditional methods, while foundational, often fail to meet the evolving demands of farmers in a rapidly changing world. As a result, integrating technology-driven solutions, participatory techniques, and context-specific strategies has become imperative.

Krishi Vigyan Kendras (KVKs) play a crucial role in bridging the gap between research institutions and the farming community. However, to ensure their relevancy, efficiency, and outreach, KVKs must adopt innovative approaches that address the ground realities of modern agriculture. Below is a detailed discussion of such approaches:

1. Leveraging digital tools and platforms

➔ **Mobile applications:** Developing user-friendly mobile

apps in local languages to provide real-time information on weather forecasts, pest and disease management, crop advisory, and market prices. For instance, apps like Kisan Suvidha and Pusa Krishi have empowered farmers by providing timely and region-specific information.

➔ **Social media for knowledge sharing:** Platforms like WhatsApp, Facebook, and YouTube can be used to share success stories, video tutorials, and live Q&A sessions with farmers. Regular updates through these platforms keep farmers informed and engaged. For example, the "Digital Kisan" YouTube channel by a KVK in Maharashtra demonstrates practical solutions for crop management, attracting thousands of subscribers.

➔ **GIS and remote sensing technology:** Using Geographic Information Systems (GIS) and remote sensing for soil health mapping, water resource management, and crop pattern analysis enables the provision of site-specific recommendations to farmers. For example, a KVK in



Gujarat uses GIS to provide customized fertilizer recommendations to farmers, improving productivity and reducing costs.

2. Farmer-led knowledge networks

➔ **Farmer Field Schools (FFS):**

These schools emphasize experiential learning where farmers actively participate in hands-on experiments under the guidance of KVK experts. It ensures the adoption of proven practices. In Madhya Pradesh, FFS sessions on soybean cultivation have helped farmers achieve higher yields by adopting improved pest control methods.

➔ **Community radio programs:**

Localized radio programs addressing region-specific issues, featuring expert advice, and sharing success stories can significantly enhance the reach of extension services, especially in remote areas. Localized radio programs like "Kisan Vani" broadcasted in Uttar Pradesh address region-specific agricultural issues, featuring expert advice and farmer success stories.

➔ **Farmer-to-farmer learning:**

Encouraging progressive farmers to mentor others fosters trust and quick adoption of technologies. For example, a farmer in Punjab, known for innovative organic farming, has trained over 500 fellow farmers under a KVK-led initiative.

3. Participatory and feedback-driven approaches

➔ **Need-based extension programs:**

Regular interaction and surveys with farmers to identify specific challenges and needs ensure that extension activities are relevant and impactful. For instance, in Odisha, KVKs conducted feedback-driven programs to tackle brown plant hopper infestation in paddy fields.

➔ **Farmers as co-investigators:**

Collaborative trials where farmers

participate in research projects help in tailoring solutions to local conditions and increase trust in the recommendations. In Rajasthan, farmers participated in trials for drought-resistant pearl millet, leading to its wider adoption.

➔ **Participatory Rural Appraisal (PRA):**

Engaging farmers and other stakeholders in identifying challenges and co-developing solutions promotes ownership and sustainability of agricultural interventions.

4. ICT for real-time problem solving

➔ **Tele-advisory services:**

Establishing helplines and call centers for real-time advice on crop diseases, nutrient deficiencies, and pest management. Farmers can instantly access expert opinions without needing to travel.

➔ **Artificial Intelligence (AI) and machine learning:**

Using AI for predictive analytics in pest outbreaks, disease forecasting, and yield predictions ensures proactive solutions. Tools like chatbots can also be deployed to provide automated answers to frequently asked questions. AI-driven tools, like the "CropIn" platform, are used by KVKs to predict pest outbreaks and offer timely interventions. For example, AI helped predict a locust attack in Rajasthan, allowing farmers to take preventive measures.

5. Integrated and customized training programs

➔ **Localized training modules:**

Developing training programs specific to local cropping systems, soil conditions, and climatic challenges. Topics such as organic farming, precision agriculture, and water management should be emphasized.

➔ **Women and youth-centric programs:**

Designing special modules for women and youth to involve them in agricultural

activities such as value addition, mushroom cultivation, and kitchen gardening ensures inclusivity.

➔ **Skill development programs:**

Hands-on training in advanced agricultural machinery, post-harvest technologies, and entrepreneurship development.

6. Collaborative and public-private partnerships

➔ **Partnerships with agribusinesses:**

Collaborating with private companies for access to modern inputs such as high-yield seeds, bio-fertilizers, and precision farming equipment. Collaborating with seed companies, such as Mahyco, has helped KVKs provide high-yield seeds to farmers in Maharashtra.

➔ **NGO and research collaboration:**

Partnering with NGOs and research institutions for capacity building and access to additional resources. NGOs like PRADAN collaborate with KVKs in Jharkhand to enhance the productivity of tribal farmers through better practices in vegetable cultivation.

➔ **Integration with government schemes:**

Aligning extension activities with programs like PM-Kisan, Soil Health Card, and Rashtriya Krishi Vikas Yojana ensures a seamless delivery of services to farmers.

7. Scaling demonstration units and model farms

➔ **On-farm demonstrations:**

Establishing demonstration plots within farmers' fields to showcase the effectiveness of new practices and technologies. It builds confidence among farmers.

➔ **Cluster approach:**

Implementing extension activities in clusters of villages ensures efficient resource utilization and widespread impact.

➔ **Integrated Farming System (IFS) demonstrations:**

Promoting diversified farming



systems combining crops, livestock, aquaculture, and agroforestry to enhance income and sustainability.

8. Focus on sustainability and climate resilience

➔ **Climate-Smart Agriculture (CSA):**

Training farmers in practices like conservation agriculture, agroforestry, and crop diversification to mitigate climate risks.

➔ **Water conservation techniques:**

Promoting micro-irrigation, rainwater harvesting, and efficient water management practices in water-scarce regions. Rainwater harvesting and micro-irrigation are promoted by KVKs in Rajasthan to address water scarcity issues.

➔ **Sustainable practices:**

Encouraging the use of bio-fertilizers, organic farming, and integrated pest management to reduce environmental impact.

9. Use of behavioural science for enhanced adoption

➔ **Nudging techniques:**

Using reminders, incentives, and motivational stories to encourage the adoption of new practices. In Gujarat, KVKs use SMS reminders for timely sowing and fertilizer application, leading to improved crop outcomes.

➔ **Gamification:**

Introducing rewards and recognition programs for farmers who adopt innovative practices successfully. Reward programs, such as "Best Innovative

Farmer," encourage farmers to adopt and share new practices. For instance, a farmer in Telangana was awarded for successfully implementing integrated pest management.

Conclusion

To enhance the **relevancy, efficiency, and outreach** of KVKs, it is crucial to adopt a multi-faceted approach that integrates technology, participatory methods, and sustainability principles. By addressing ground realities and tailoring solutions to local needs, KVKs can empower farmers, improve productivity, and contribute significantly to the agricultural sector's growth.



[From Tea Stall to Farming Frontiers: The Journey of Gramik's Founder](#)





A HARVEST OF HOPE

SEVEN SCHEMES NURTURING INDIAN AGRICULTURE'S TRANSFORMATION

About Author



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Agriculture has been the backbone of the Indian economy for years since independence. During independence, agriculture contributed more than half of the country's GDP. Though its contribution decreased with the increase in industrialisation and service sectors, it still accounts for around 18 per cent of the GDP and provides employment opportunities to more than 50 per cent of the Indian population. Various schemes implemented during the times of the green revolution such as the High Yielding Varieties Programme, Intensive Agricultural Development Programme etc., have led us to significantly increase the production levels. Though we have achieved self-sufficiency in food grains,

certain threats are looming agricultural sector at present. Threats such as loss of soil fertility, shrinking water resources, degrading natural resources, increasing land fragmentation, climate change, increasing cost of inputs etc., are impacting farmers' prospects. The Government of India (GOI) from time to time enacts various schemes to assist the farmers carry out farm activities effectively and also to make sure that farmers earn respectable incomes. Recently, GOI heeding the current threats poisoning the agricultural sector approved the operationalisation of seven new schemes to enhance farmers' livelihoods with a total outlay of Rs.14,235 crore. Understanding the importance of implementing such schemes will be useful for all agricultural stakeholders, which this article aims for. All the seven schemes are described in the sections below:

1. Digital Agricultural Mission

With the penetration of mobiles into majority of the households both rural and urban, and access to the internet, every piece of information is available at the fingertips of everyone. The farming community can also capitalise on such technology to improve

the efficiency and ease of operations. However, there is a need to create a strong database on various metrics related to agriculture for the government and farmers to be able to leverage the technology. GOI under the Digital Agricultural Mission aims to achieve that with a focus on two foundational pillars namely Agri Stack and Krishi Decision Support System.

Agri Stack

Agri Stack is being set up as the foundation for digital agriculture wherein farmers can avail various services such as access to inputs, credit, advisory services, market access etc. It relies on various data and digital services. GOI under this plan is developing a Farmers' Registry, Crop Sown Registry and Village Landmap Registry. Under these registries, the details of all the farmers, their land records, and the crops grown will be collected using digital technologies such as smartphones, drones, satellite images and stored. State governments will compile the necessary data which will be later stored by the central government under Agri Stack. A unique farmer ID will be assigned to farmers which will be digitally verifiable. This ID will be

useful for the transparent delivery of services and scheme delivery by the government.

Krishi Decision Support System (KDSS)

Krishi Decision Support System is being developed to facilitate all the diverse stakeholders such as farmers, policymakers, scientists etc for making informed decisions. It will feature various data such as geospatial, weather/satellite, groundwater availability, drought/flood monitoring and modelling for crop yield and insurance. With all such data layers, KDSS will act as a repository integrating various ecosystems that can be capitalised by the stakeholders. It can be used for sustainable resource usage, crop planning, crop condition, verifying insurance claims, timely response during floods/droughts, etc. GOI has allocated an outlay of Rs. 2817 crores for this scheme.

2. Crop science for food and nutritional security

Research and education in pure sciences is a lynchpin for agriculture as the eventual outputs from such sciences will result in newer crop varieties, technologies and management practices. There is an imminent requirement for climate-resilient varieties among farming communities as extreme weather events are becoming a new normal. Though we have attained self-sufficiency in food grains, we still exert dependence on imports for oilseeds and also pulses during lean production times. Also, India is a



Figure 1: Seven schemes for the agricultural sector recently approved by the Government of India

leading producer of milk, milk products, eggs, meat etc., with their growth rates exceeding that of agriculture. Thereby, it is also pertinent to improve the availability of fodder crops by increasing the productivity and area cultivated. GOI is vying to address all the above issues by implementing this scheme where an outlay of Rs. 3,979 crores has been allocated. It focuses on:

- 🌱 Research and education
- 🌱 Plant genetic resource management
- 🌱 Genetic improvement for food and fodder crop
- 🌱 Pulse and oilseed crop improvement
- 🌱 Improvement of commercial crops
- 🌱 Research on insects, microbes, pollinators etc.

3. Strengthening agricultural education, management and social sciences

To provide reliable advisory and other services to farmers, there is a need to increase the number of personnel who are competent in agriculture. Also, improving the research capabilities of researchers by providing various trainings, improving the lab infrastructure, and funding for research activities is required to meet the ever-dynamic needs of farmers by the agricultural scientific community. With an outlay of Rs. 2,291 crores, GOI is aspiring to upgrade the capabilities of stakeholders of the Indian Council of Agricultural Research. This scheme will also increase the percentage of agricultural GDP that is spent for research activities and

agricultural education which is currently a dismal low of 0.6 to 0.7 per cent in comparison to 4.2 per cent in Israel and 2.1 per cent in China. Strengthening social sciences in agriculture is also crucial as it forms the crucial link between farmers and the scientific community. Researchers in Agricultural Extension,

Agricultural Economics and Agricultural Statistics will assess the needs of farmers, the extent of success of various schemes, assess vulnerabilities of farmers, distress among farmers etc. Also, the current extension worker-to-farmer ratio in India is very wide at around 1:1100 ratio, creating more burden and reducing effectiveness and efficiency. The above scheme also has the potential to reduce the widening gap between farmers to extension personnel.

4. Sustainable livestock health and production

As mentioned earlier the leading front India plays in the dairy sector globally, certain other metrics assure the importance of the dairy sector nationally too. In recent years, milk production has grown multi-fold times from 55.6 million tonnes during 1991-92 to 239.3 million tonnes during 2023-24. The livestock sector registered a compound annual growth rate of 7.38 per cent from 2014-15 to 2022-23 along with a significant increase in total gross value added in agriculture from 24.32 to 30.38 during the same period. As the livestock sector is poised for further growth, the sector is even being considered as a sunrise sector for further investments. Accordingly, GOI is providing an impetus with an outlay of Rs. 1,702 crores in investments in the sector. The scheme focuses on:

- 🌱 Animal health management and veterinary education.
- 🌱 Dairy production and technology development.
- 🌱 Animal genetic resource management, production and improvement.
- 🌱 Animal nutrition and small ruminant production and development.

5. Sustainable development of Horticulture

India is focusing on a shift from calorie-oriented food consumption to more nutrition-oriented food consumption. Horticulture has a pivotal role to play in achieving such nutritional objectives. Also, the horticulture sector can help the farmers in crop



diversification and also increase their incomes as the government is heavily promoting horticulture activities through various schemes. Increasing the production of fruits, vegetables, spices etc is very much necessary as they exert a strong impact on the consumer price index (CPI). Food and beverages weighing around 45 per cent under CPI is the component with the highest weightage, under which cereals, vegetables, fruits, spices, and processed foods contribute substantially. Therefore, any price changes in horticultural commodities have a huge effect on the pockets of consumers. Also, TOP commodities which comprise tomatoes, onions and potatoes have far-reaching effects as their prices fluctuate steeply. Covering all such aspects, an outlay of Rs. 1,129 crores has been allocated for the horticultural sector for various investments. It encompasses various crops such as tropical, sub-tropical, and temperate horticultural crops.

6. Strengthening of Krishi Vigyan Kendra (KVK)

Krishi Vigyan Kendras since their inception in 1974 till now have been an integral part of our agricultural system acting as a farm science centre. As of December 2024, a total of 728 KVKs are present overall in India with total farmers registered for various activities at more than seven lakhs. With its presence all over the nation, KVKs

have the potential to reach farmers and upgrade their capacities as relevant to their location and available resources. Each KVK will have its unique mandate, however, all these mandates will be working on Technology Assessment and Demonstration for its Application and Capacity Development (TADA-CD). Also, KVKs act as knowledge and resource centres which provide information on various new technologies that are developed under the National Agricultural Research System. With the advent of Artificial Intelligence, Machine Learning, Drone technology etc., there is a need to integrate such new advances in the service delivery by KVKs. With such an objective, an outlay of Rs. 1,202 crores has been allocated by the GOI for strengthening KVKs.

7. Natural Resource Management

Though the Green Revolution is acclaimed for increased productivity and production, there is a lot of criticism in both scientific and general communities about the negative effects it had on natural resources such as soil, water, air etc. Earlier, improving production was the major motive of any schemes targeting the agricultural sector but currently, the emphasis drifted towards sustainability which anchors on 3 pillars, economic, environmental and social sustainability. Reducing the emissions of greenhouse gases (GHG) arising out of the agricultural sector is a

global concern. In India, agriculture accounts for 18 per cent of the total GHG emissions. Agriculture thereby is both a catalyst of climate change and also inherently gets affected negatively by it. To limit climate change from exacerbating, natural resource management is the key. GOI has implemented various schemes in the past such as Soil Health Card, Pradhan Mantri Krishi Sinchai Yojana, Paramparagat Krishi Vikas Yojana etc., that promote sustainable agriculture. To further bolster the aspect of natural resource management, an outlay of 1,115 crores has been allocated under this new scheme.

Conclusion

With a total outlay of Rs. 14,235 crores for all the seven schemes combined, GOI is ambitious to strengthen the agricultural sector altogether. All seven schemes are devised to address the contemporary challenges faced by agriculture. While the schemes have been approved by the government, they take effect in the coming days. To achieve all the objectives, effective implementation, monitoring and evaluation of the schemes is necessary. Overall, the schemes upon successful implementation will strengthen the agricultural sector and farming communities.

■ ■ ■



[Top 24 Agriculture Startups in India Transforming Agriculture \[2024\]](#)





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CAULIFLOWER CURSE

FARMERS FORCED TO USE HARVEST AS CATTLE FEED AMID WHOLESALE PRICE DROPS

An abundant cauliflower harvests this winter has compelled hundreds of farmers in Haringhata, Nadia, West Bengal to use their produce as cattle feed, as the wholesale prices fail to even cover transportation expenses. A vegetable farmer from Haringhata, Nadia, West Bengal said that he cultivated cauliflowers on nearly two acres. With prices dropping to ₹2 per piece, He chose to feed a large portion of produce to his cattle instead of letting it waste in the fields, Unlike potatoes, cauliflowers can't be stored for future sales and others shared that they refrained from selling their produce as the cost of hiring a mini-truck to transport it to wholesale markets exceeded the selling price. While wholesale rates are dismal, retail prices of cauliflowers in Kolkata, West Bengal ranges from ₹15 to ₹20, and around ₹10 in nearby districts.

Why such low prices?

This price disparity exists because middlemen purchase cauliflowers at extremely low rates and sell them at a higher margin. Still, this year's retail price is relatively low compared to last year when a cauliflower in Calcutta sold for ₹25-28.

The farmers' challenges have been exacerbated by the larger-than-usual size of cauliflowers this season. Since cauliflowers are sold individually, the per-gram price has dropped significantly. Additionally, Bengali consumers traditionally prefer smaller cauliflowers, adding to the farmers' woes. West Bengal, the country's largest cauliflower producer, cultivates around 16 lakh tonnes annually across 55,000 hectares, involving some 44,000 small farmers. Major cauliflower-producing districts include North and South 24-Parganas, Hooghly, and Nadia, alongside East Burdwan. Although the horticulture department hasn't disclosed the exact surplus this winter, officials estimate a production increase of at least 20% compared to previous years. Farmers report that producing a single cauliflower costs ₹6-7, yet current wholesale prices of ₹2-3 force them into distress sales. Rising fertiliser costs—from ₹760 to ₹1,300 per bag over two years—have worsened the situation. Cultivating cauliflowers on one bigha of land costs ₹25,000-30,000, but with the current market prices, farmers earn only ₹10,000-12,000, leading to losses of ₹15,000-20,000 per bigha. Farmers in neighbouring districts like Burdwan and North 24-Parganas are facing similar

challenges, with high production and low prices.

Government address to the crisis

To mitigate the crisis, the state's agriculture marketing department has stepped in, directly purchasing cauliflowers from farmers for the first time. It has set up 85 vegetable procurement centres across the state and is also procuring directly from farms, where they are buying cauliflowers directly to prevent distress sales and selling them through Sufal Bangla stalls. Farmers are being paid 80% of the retail price, significantly more than what middlemen offers. The department purchases about 13 tonnes of vegetables daily, including cauliflowers and cabbages, which are facing record-low prices.

Conclusion

While farmers have appreciated the initiative, many say it doesn't reach all those willing to sell their crops. Officials acknowledges that the government cannot afford to buy the entire cauliflower harvest. Despite the challenges, the agriculture marketing department's efforts have provided some relief to a section of the farming community. ■



THE SILENT THREAT

IGNORING POTASSIUM FERTILIZATION POSES A RISK TO GLOBAL FOOD SECURITY

About Author



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Providing food security in the face of a growing global population, dwindling arable land, and increasing climate unpredictability is one of the 21st century's most pressing challenges. Countries and agricultural sectors are rushing to find ways to boost food production in a sustainable way. Potassium, an important but sometimes disregarded nutrient, is frequently left in the background as primary nutrients like nitrogen, phosphorus, and water receive most of the attention. The need of a balanced diet of macronutrients for crop health is well known, but potassium's contribution is usually overlooked. Despite its crucial role in crop productivity, soil quality, and plant

resilience, potassium fertilizer has not always received the attention it deserves.

Understanding the role of potassium in agriculture

One of the three main macronutrients for plants, potassium (K), along with nitrogen (N) and phosphorus (P), is essential to crop health but is frequently ignored. While phosphorus and nitrogen concentrate on growth and reproduction, potassium supports a number of important processes (Fig. 1).

1. Water regulation and drought resistance:

By regulating stomata, potassium helps plants regulate water loss. This helps crops stay hydrated during heat stress or drought, which is crucial in a changing climate.

2. Resistance against disease:

By strengthening plant cell walls, potassium increases a plant's resistance to pests and diseases like rust and blight. Additionally, it promotes the synthesis of enzymes and proteins that are essential to plant health.

3. Photosynthesis and nutrient uptake:

Potassium increases photosynthesis and facilitates nutrient absorption, which have a

direct impact on agricultural productivity and yield. Without it, plants may exhibit stunted growth and poor nutrient uptake.

4. Improved crop quality:

In addition to boosting the taste, texture, and shelf life of fruits, vegetables, and grains, potassium also increases the resilience of crops against bruising and damage.

5. Root development and soil health:

Potassium supports microbial activity and general soil health while encouraging healthy root growth and enhancing nutrient and water absorption.

The problem of potassium deficiency

Potassium deficiency is a major issue worldwide, with the Food and Agriculture Organization (FAO) stressing its widespread impact, especially in intensively farmed countries. Soil potassium levels decrease in response to increased crop demands, resulting in decreased fertility and lower agricultural output.

1. Decline in global potassium fertilization

Potassium fertilization is still not widely used, particularly in





Fig. 1. Role of Potassium in Agriculture

developing nations. Fertilizers containing nitrogen and phosphate are frequently subsidized, but potassium is overlooked, leading to nutritional imbalances that impair crop production and growth.

2. Soil depletion and mining of potassium

In comparison to nitrogen or phosphorus, potassium is gradually restored in soils, which causes its depletion. Without sufficient fertilization, this eventually leads to lower crop yields and worsened soil

health. Food security is put at risk by the unrepaired mining of potassium for agricultural purposes.

3. Symptoms and effects of potassium insufficiency

Potassium-deficient crops show distinct signs, including:

- ✚ Yellowing leaves (poor chlorophyll production).
- ✚ Stunted growth and weak stems (poor water management).
- ✚ Reduced fruit and seed development (lower yields and quality).

- ✚ Increased susceptibility to diseases (weakened plant defences).

Ultimately, potassium deficiency leads to reduced food availability and greater food insecurity.

Why global food security is at risk due to ignoring potassium fertilization

1. Impact on crop yields

Crop yields are directly impacted by potassium shortage. By 2050, there will likely be nine billion people on the planet, necessitating a 70% increase in food production. Insufficient potassium





Fig. 2. Solutions for the Issue of Potassium

stunts crop development, limits photosynthesis, and reduces nutrient efficiency, which raises prices, reduces yields, and causes food shortages.

2. Reducing soil fertility

For soil fertility to be maintained, potassium is essential. High-yield crops cannot be supported by depleted soil, which creates a vicious cycle of diminishing fertility and a greater need for fertilizers. Over time, this deteriorates soil health and lowers agricultural output even further.

3. Impacts on food quality

Crop quality is lowered by potassium deficiency, which impacts shelf life, flavour, and texture. Produce of poor quality has a higher chance of spoiling, which increases food waste. By improving crop quality, potassium helps reduce waste and ensures nutrient-dense, marketable food.

4. Increased climate change vulnerability

Potassium improves drought resistance and general stress tolerance in crops by facilitating more effective water management. Ignoring potassium

fertilization reduces crops' resilience to climate change, increasing the risk of crop failures and food output.

5. Global consequences for developing nations

Small-scale farmers in low-income nations, where agriculture is essential to the economy, are disproportionately impacted by potassium deficiency. Reduced production, more poverty, and increased food insecurity are the results of inadequate potassium fertilization. In order to guarantee food security in these susceptible areas, this issue must be resolved.

Solutions to the potassium deficiency problem

To mitigate the silent threat of potassium deficiency, several strategies (Fig. 2.) must be pursued:

- 1. Raising awareness:** It is essential to inform farmers about the value of potassium fertilization. Farmers can learn more about the nutrient's significance in soil health and crop productivity through awareness campaigns and extension programs.
- 2. Improved management of fertilizer:** Potassium availability for plants can be guaranteed by effective fertilizer management strategies, such as balanced fertilization and the application of slow-release potassium fertilizers.
- 3. Sustainable practices:** Reliance on synthetic fertilizers can

be decreased and long-term soil health can be promoted by implementing crop rotations, application of crop residues, organic matter, and agroecological techniques that naturally raise soil potassium levels.

- 4. Restoring potassium-rich soils:** Potassium levels in deficient soils can be restored by employing techniques including providing fertilizers based on minerals, utilizing fish waste or ash from burning biomass, and encouraging the recycling of organic matter.

- 5. Policy support:** Policies that promote the use of potassium fertilizers, provide financial incentives, and fund research into sustainable potassium management techniques must be put in place by governments.

Conclusion

Global food security is silently threatened by agricultural neglect of potassium fertilization. Potassium deficiency has far-reaching effects, including decreased crop yields, decreased soil fertility, poor food quality, and heightened susceptibility to climate change. Potassium must be acknowledged as a crucial part of the agricultural fertilizer mix as the globe deals with the twin problems of an expanding population and shifting environmental conditions. Raising awareness, enhancing fertilizer management, and putting sustainable agricultural methods into reality are all necessary to meet this problem. We can safeguard global food security and clear the path for a more resilient and sustainable agricultural future by making potassium fertilization a top priority.





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