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AGRICULTURE TODAY

FEBRUARY 2023

The National Agriculture Magazine

VOLUME XXVI | ISSUE 2

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AGRI EXPECTATIONS

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BUDGET PROSPECTS**



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Publisher & Printer – Dr. MJ Khan on behalf of M/s Concept Agrotech Consultants Limited, Published from 306 Rohit house Tolstoy Road New Delhi-110001 and printed by Everest Press E-49/8, Okhla Industrial Area-II New Delhi-110020
Phone No. 011-23731129 Fax No.011- 23731130
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AGRICULTURE SECTOR Optimistic and Hopeful

There is a sense of hope that has been lingering in the agriculture sector since the last few years. Covid contracted growth in other sectors; agriculture emerged as the saving grace for the Indian economy. The ensuing years saw the government's active engagement and enthusiasm in revving up the sector. We saw a slew of measures, accompanied by a thrust on agricultural technologies.

Once again the month of February has returned, and the agriculture sector is expectant of reforms, remodelling and realignment. Union Budget 2023 is expected to further relive to its past glories and prioritise development and reforms in agriculture. There is a general sentiment that the importance that was imparted to agri tech in the last budget will be reflected this year as well. As the numbers of start ups are ever increasing in agri business segment and with JVs and investments a sure possibility, government may consider easing the norms of doing business. Expanding infrastructure has always remained a persistent demand for the agriculture sector. Storage facilities, cold storage, processing and value addition may also be returning as beneficiaries in the budget.

While agriculture will remain a priority, it remains to be seen whether there will be any climate-linked interventions that emerge in the budget. Agriculture being closely linked to the environment, the slightest change in climate impacts farmers.

The government's low carbon development strategy enunciated under Pancharmit at the COP26 Summit in Glasgow gives hope to the agriculture sector. The Energy Conservation (Amendment) Bill, 2022, which was introduced and passed in the Lok Sabha on August 8, incorporated the aim of developing the domestic carbon market. Regenerative farming practices farmers can monetise the carbon credits. This is an interesting area which Agriculture Today intends to pursue in its next edition.

In my new responsibility as the Group Editor of the illustrious Agriculture Today Group, I intend to carry forward the good work of my predecessors and work towards developing enriching and holistic contents. I request the support of our readers in helping me achieve the same and continue supporting us with your reviews and suggestions.

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Millets Jingle All The Way

The government's thrust on the production and consumption of millets is a laudable move. We now need a boost to this new sector on the marketing front. Millets must become popular among Gen X and the children to really boost demand.

It must be appreciated that GOI has launched a plethora of nationwide activities and contests to make millets popular.

Jingles can play a major role to achieve this objective. The consumption of eggs got a huge push with the popularity of the advertisement campaign. We all remember the lilting ad jingle, *Khana meri jaan meri jaan murgi ke ande*. And the simple, straight-forward advertising catch-line: *Sunday ho ya Monday, roz khao ande*. Children loved it, youth loved it, parents loved it. The consumption of eggs increased manifold.

MNCs that make and sell junk food found India a lucrative market. Their ad campaigns effectively sold the illusion that to seem cool, you have to drink carbonated drinks or eat foods loaded trans-fat and other harmful stuff. Now these groups are making huge sales, and raking in big money.

We need some super advertisement campaigns for millets. The government should engage some suitable advertisement agency that can sell the idea of millets to the children, to the youth, to parents. The magic of millets shall be unleashed once our domestic population starts believing in them. The right advertising can achieve this objective. And give the country the message that it's time for millet magic.



RAJNI SHALEEN CHOPRA



Budgeting for FISHERIES AND LIVESTOCK: LET THE MONEY COUNT

Budget is now much more than a money bag or a collection of numbers. It is an expression of the values and aspirations the nation holds

The annual budget of the union government has since long ceased to be a mere statement of revenue receipts and expenditure. Nor is it confined to just an allocation of resources amongst various arms of the government and the allocation of financial re-

sources, according to the priorities of the political government of the day.

A major portion of the budget expounds the policy direction the government intends to take and seeks to outline a road map for the development of important economic and social activities permeating the lives of the citizens. No wonder, the annual budget arouses much anticipation and is followed by intense analysis and debate, though the debate is characterised more by personal, rather than informed opinions.

The agriculture sector has always remained at the forefront of any budgetary exercise and is generally the centrepiece of discussion and debate around the budget.

On the other hand, the livestock and fisheries sectors have traditionally been pushed to the margins in all mainstream deliberations. This is indeed surpris-

ing considering these sectors contribute more than 30% to the GDP of agriculture. Moreover, bucking the trend of long years of stagnancy which have plagued agriculture, these sectors have been registering a consistent growth. Times are changing though.

Pro-Active Policy Design Needed

Let not money be the focus of our concern. Ministries and departments tend to be sensitive about budgetary allocations and are possessive of the money apportioned to them. Irrespective of the outlay, it is almost a religious obligation to gripe upon the inadequacy of financial resources. "A revolution in the sector would be ushered if enough was provided in the budget."

It is ironic that the striking evidence that budgetary investment in the sector has not really translated into better performance and greater outcomes is either ignored or just lost sight of.

More resources need support of efficient execution, but more importantly robust policy design. This could not be truer when it comes to Fisheries, Animal Husbandry and Dairying. No doubt they have been crying for adequate budgetary support, but they have never had it so good as in the past few years. But has the performance been as spectacular as the allocation of financial resources? If not, why not? And

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what should the forthcoming budget look like for the sector?

Developments in the sector(s) over the past few years have been significant. It came of age in the year 2019 by breaking away from the Ministry of Agriculture and establishing a strong independent identity as the Ministry of Fisheries, Animal Husbandry and Dairying.

A noteworthy feature in the moniker is that Fisheries has been accorded the prime of place. The erstwhile department had it at the tail as it was called the Department of Animal Husbandry, Dairying and Fisheries. Within the ministry too it is a separate and independent department.

A strong expression of political will that should have been capitalised upon, and efforts should have been to mainstream the sector(s) within the priorities of the governance agenda rather than restricting the efforts to lobbying for more funds. Financial interventions too have been beyond the wish list of the stakeholders: a Rs 8000 crore Fisheries Infrastructure Development Fund followed by Rs20,000 crore Pradhan Mantri Matsya Sampada Yojna (PMMSY); an ambitious national programme, with an outlay of Rs13,343 crore for animal disease control (NADCP) with an objective to control and then eradicate the debilitating, both physically and economically, the Foot and Mouth Disease (FMD) as also Brucellosis; above ₹10,000 crore Dairy Infrastructure Development Fund (DIDF); and an Animal Husbandry Infrastructure Development Fund (AHIDF) of ₹15,000 crore. These financial resources are over and above the normal budget allocation to the sector(s) through the department which is now a ministry.

Robust Growth Of Dairy, Poultry, Fishery

Let us remind ourselves that the annual rate of growth of agriculture has been unimpressive and stagnant at about 2-3% over the past several years despite multiple subsidies and all round support. But the livestock and fisheries sector, including all its sub-sectors viz. dairy, poultry, fishery etc. have been consistently registering an annual growth between 6 to 12%. Livestock and fisheries are the poor country cousins, yet they always outshine the big brother agriculture. Surely a case in point that subsidies should not be confused with investment.

Fisheries, Animal Husbandry and Dairying – these sectors have been crying for adequate budgetary support, but they have never had it so good as in the past few years. But has the performance been as spectacular as the allocation of financial resources? If not, why not? And what should the forthcoming budget look like for the sector?

Focus On Outcomes Essential

How much more money can we ask for, and why? All the erstwhile Department of Animal Husbandry, Dairying and Fisheries, subordinate to the Ministry of Agriculture, had to show and apologise for was a couple of thousand crore rupees for the entire sector(s). So forget the money as it would always be less than demanded and hence serve as an alibi for non performance.

The finance ministry would do its own balancing and give you what it wishes to, no matter what noise you create. So why not instead focus on the future road map; focus on policy, strategy and the desired





interventions. Focus on outcomes rather than expenditure and physical targets. Focus on investment and infusion of capital rather than subsidies; investment in sound policy and creation of enabling ecosystems is as important, if not more, than money.

Subsidies Cannot Be Substitutes Of Investment

While important to pull the sector and its stakeholders to a competitive level, subsidies also carry the potential to become an impediment in development of competitive spirit and entrepreneurship. Income support, yes. Subsidies to offset high cost of farming, yes. But do not allow them to be the substitutes of investment.

Invest as much in infrastructure, value addition, R&D, digitalisation, basically in every activity that gives greater productivity and hence better returns to the farmer. This should not be mixed up with the government's welfare and income support programmes. Let the investment be evaluated on the threshold of financial return. A rupee spent should return more than a rupee, and efficacy of this conversion should be measured by how much more. Treat animal husbandry and fisheries as



The flagship programme Pradhan Mantri Matsya Sampada Yojna (PMMSY) targeted 25 million tonnes of fish production by the year 2025.

business and encourage financial returns on business principles. Let the focus shift from production to farmer, not merely in the idiom of welfare, but the measure of prosperity. I would risk repeating: the budget for the livestock and fisheries sectors should rise above mere allocation of financial resources and advocate and define effective policy and outcomes.

Focus On Breed, Feed and Seed

Let there be no new schemes or announcements; there has been a surfeit of them in the years gone by. As expressly mentioned, the political will backed by financial resources has been stated loud and clear. We already have a plethora of programmes and schemes. Ideally, instead of carrying the entire burden a la Atlas, the coming budget should aim at consolidation by reducing their numbers and integrating these schemes under select broad priorities. And what should these priorities be for livestock and fisheries? None other than Breed, Feed and Seed. All else, including infrastructure, should circle around this poetic rhythm.

A condition precedent would be to review each and every existing scheme and programme, conduct an honest introspection and take strong corrective measures. An illustration would be the flagship programme Pradhan Mantri Matsya Sampada Yojna (PMMSY). The scheme targeted 25 million tonnes of fish production by the year 2025.

Is not the time already overripe to assess where we stand with respect to this target and undertake a cost benefit analysis of the public investment vis-a-vis the gains; and whether there is a reliable methodology to correlate budgetary expenditure with output of production? Further, what is the level of integrity of data in the public domain which forms the basis of such an evaluation, and thus also the picture portrayed by the Economic Survey.

Merge MPEDA with NFDB

Offloading all to NFDB should be the dictat of the budget. Marine Products Export Development Authority (MPEDA) does not export but being an authority regulates export, although there is an Export Inspection Council too. MPEDA does everything under the sun even if remotely concerned with fisheries. It runs hatcheries, sells seed, conducts research, registers fishing vessels and what not; and it happens to be an institution of the Ministry of Commerce. The past may have necessitated this arrangement, but why should the government be obliged to continue with it? A sure and decisive step should be to merge MPEDA



Integrate Relevant Research Institutions Of ICAR With Newly Formed Ministry

Integration and consolidation of schemes and programmes should necessarily be followed by such an integration, including merger, of public institutions. Owned and managed by the government but working at cross purposes defines these institutions; in fact, quite often as hostile adversaries. So collaboration appears a far cry. Governance, research, development, trade et.al. have all become independent domains, none accountable to the other. Therefore, a condition precedent for an accelerated growth of the livestock and fisheries sector would be to integrate the relevant research institutions of the Indian Council of Agriculture Research (ICAR) with the newly formed ministry. Does it not make sense that once fisheries, animal husbandry and fisheries have been separated from agriculture, so should the research institutions of these sectors be, and then brought under the umbrella of a council for animal husbandry and fisheries research. Another case in point would again be from fisheries.

When an exclusive body like the National Fisheries Development Board (NFDB) has been created for the express objective of fisheries development, what is the rationale for the ministry to directly administer development schemes and manage release of funds?

Let the focus shift from production to farmer, not merely in the idiom of welfare, but the measure of prosperity. I would risk repeating: the budget for the livestock and fisheries sectors should rise above mere allocation of financial resources and advocate and define effective policy and outcomes

with NFDB. Besides putting an end to a long continuing warfare it would streamline the government activities in the sector; the right and the left hand may join to clap.

Budget was always about money. Its origin is bougette, a French word meaning a leather bag/wallet/pouch to carry money. Over a period of time, it became bouget and then the archaic English word budget which refers to the king's bag containing money. The journey from bougette to budget has transformed not only the lexicon but also the character of the traveller. Budget is now much more than a money bag or a collection of numbers. It is an expression of the values and aspirations the nation holds.

BUDGET 2023

AN OPPORTUNITY TO BOOST THE SEED SECTOR



The annual union budget exercise plays an important role in shaping the growth of some of the sectors in the country. A well calibrated budget can have a great impact on the economy. Agriculture is certainly a sector that needs to be supported. Within agriculture seed industry plays a pivotal role and the requirements of the industry need a special attention during the process of budget preparation.

With climate change driven weather extremities affecting us more frequently now the phenomenon of climate change is well and truly upon us already. Its impact on crop yields could be catastrophic. We had a glimpse of it with the impact of high temperature on wheat yields in March last year in India.

About the AUTHOR

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Thrust On R&D

Well targeted cutting edge research is required to develop tools that the farmer can use to fight climate change. Seed technologies have to be strengthened to equip the crops with capacity to withstand high and low temperatures, droughts, floods and similar extremities.

Crop improvement research to fight climate change is to be developed as a public good which is made freely available to all. Some of the private players may contribute their CSR money and their facilities towards such an effort. It is worthwhile to allocate some budget towards a PPP project of five year duration between ICAR and private industry which will develop public good, open access technologies that can help farmers with fighting climate change.

Seed research by private industry needs to be stepped up to increase yields and develop crops with abiotic and biotic stress tolerance. Currently seed industry invests less than 3% of the annual revenues in research which is way below the global standards of 10-12%. This is one of the reasons why we are falling short of the desired yield improvements.

Boost For Private Industry

Private industry has to be incentivised to invest more in seed research. Earlier the industry had a weighted deduction of 200% on the research investments made in seeds and biotechnology under section 35(2AB) of IT Act. However this has been progressively brought down since 2016 and right now there is no such incentive available to the industry. At a time when more research investments are required it is ironical that this incentive has been withdrawn. It is of extremely high importance that this incentive of 200% IT deduction on research investments is restored in this budget. This will give the right signal to the industry to step up investments which are crucial for development of high potential crops.

Seed research plays an important role in developing crop varieties that can conserve natural resources by using less water and needing less chemical fertilizers. Natural resource conservation is a high priority area. Water and Soil conservation are extremely important.

Focus on Seed Export Development

Seed export development needs the attention of the government. The global seed trade is almost 15B\$ in size and we should aim for at least a 10% share in that market by the end of this decade. However this needs investments in creating the necessary infrastructure, formation of a seed export development council and enabling policies for the seed industry. The budget may look at allocation of budget for creation of infrastructure like storage facilities closer to airports, encouraging industry to set up production and processing units in designated export zones, monetary support to Indian companies to promote their seed varieties in International markets, etc.

Seed production needs to be strengthened to equip our industry to produce adequate seed to meet growing domestic needs and export requirements. Currently seed production is concentrated in some parts of the country. Diversification of production areas is required. This can be facilitated through budgetary support to companies who will go to try new production locations whose efforts will result in



It is very important that ISTA accredited quality laboratories are set up in all the major states in the country. Budget may try to provide support to such a specific effort which will go a long way in enhancing seed quality standards in the country and will help in increasing seed exports



losses in the initial years.

Quality Adherence

Quality standards need to be upgraded to global standards. It is important that all

the quality control laboratories of the govt are upgraded to the latest equipment and processes. It is very important that ISTA accredited quality laboratories are set up in all the major states in the country. Budget may try to provide support to such a specific effort which will go a long way in enhancing seed quality standards in the country and will help in increasing seed exports.

It is essential that we improve the International competitiveness of our farmers. Good quality seed and use of modern biotech tools, etc are some of the tools required by the farmer. Budget may aim to support these efforts.

Overall the budget is a great opportunity to give a big boost to Indian agriculture. Investments made now can produce multiplier effect for the farmers and Indian agriculture in this decade.



Food Subsidy Critical For Achieving SDGs

India Required To Have 'No Poverty' And 'Zero Hunger' By 2030

As per commitment to the UN to meet SDGs, India is required to have 'no poverty' and 'zero hunger' by 2030.

Such a stupendous task definitely needs a determined action and policy support of the government.

The recent cabinet deci-

sion to extend food subsidy till the end of 2023 under the National Food Security Act (NFSA, 2013), also called Food Law, is indeed a bold step of the Prime Minister Shri Narendra

Modi towards achieving sustainable development goals (SDGs).

Thanks mainly to the Green, White, Blue and Rainbow revolutions, India is able to achieve household food security and reduce poverty from earlier 70.0 to now 16.4% and also help in eliminating hunger to a major extent. Despite this, we still have 5.7 million children (around 40%) below 5 years of age, who are mal-

About the **AUTHOR**

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We still have 5.7 million children (around 40%) below 5 years of age, who are malnourished, as per UNICEF report (May 2022). The main reasons for malnutrition are economic inequality, poverty, affordability of food, lack of sanitation and clean drinking water

nourished, as per UNICEF report (May 2022). The main reasons for malnutrition are economic inequality, poverty, affordability of food, lack of sanitation and clean drinking water.

Economic And Ecological Access To Food For The Poor

The proposed free distribution of 5 kg foodgrains through the targeted public distribution system (TPDS) to 81.35 crore people, as pronounced by Shri Piyush Goyal, Minister of Consumer Affairs, Food and Public Distribution is indeed laudable. Additionally, the provision of 35 kg foodgrains (21 kg rice + 14 kg wheat) to very poor families under the Antyodaya Anna Yojana (AAY), is expected to cost the exchequer around 2 lakh crores annually. No doubt, these initiatives will ensure both economic and ecological access to food for the poor.

Globally, NFSA is considered a unique Parliamentary Act of Government of India to address the concern of the poor for their food and nutrition security, economic stability, long term health benefits, women empowerment, and environmental security. In this context, India is also fortunate to have a comfortable buffer stock position (ranging between 50 - 70 million tons during the last one decade), whereas according to the World Food Programme (WFP) availability of food is becoming a major concern for many developing countries.

During Covid, globally around 150



million additional people, above the earlier 800 million below poverty line, have become food-insecure. Prior to Covid, 815 million people were estimated to be hungry, and every third person was malnourished, reflecting a food system out of balance. Present distress migration is also at unprecedented high level in the past 70 years threatening the social cohesion and cultural traditions of rural people due to limited access to land and water resources.

Ripple Effects Of The War In Ukraine

According to the World Food Program (WFP), a global food crisis fuelled by conflict, climate shocks and Covid has emerged because of the ripple effects of the war in Ukraine driving rising prices of

food, fuel and fertiliser. As a result, millions of people across the world are at the risk of being driven into starvation unless action is taken on priority by the developing countries to respond together and at scale. Fortunately, in India, in addition to NFSA and AAY, we have a National Nutrition Mission, also called POSHAN Abhiyan, aiming to reduce the number of stunted children to 25%. Also, an effective implementation of the Mid-Day Meal Scheme (1995), with strategy around increased use of milk, pulses and also soybean having double protein (40%) than all pulses, will obviously help overcome the problem of malnourishment among children.

The decision of merging PM Garib Kalyan Anna Yojna (PMGKAY), started 28 months back owing to Covid with that



of NFSA, and providing now 5 kg grains free of cost to almost 81.35 crore is another step towards long term sustainability, presuming that NFSA is likely to continue till 2030 with an aim to achieve SDGs. At the same time, a critical review as to whether all 81 crore (around 58%) people proposed to be covered under the Act really need free ration is urgently warranted.

The Impact of MGNREGS

It is appreciative that support under Mahatma Gandhi National Rural Employment Guarantee Scheme (MGNREGS), started in 2006, with current outlay of Rs 98,000 crore, has helped reduce poverty by a third (32%). The smallholders and marginal farmers (with < 2 ha), accounting for nearly 86.2 percent of 146 million farm families, tilling around 47.4 per cent of total cultivable land and accounting for > 50 per cent of the total agricultural production, are vital not only for India's agrarian economy (10th Agriculture Census 2015-16), but also for alleviating current problems of hunger and poverty in the country.

It must be recognised that SDGs do present a unique opportunity for the agricultural sector to get aligned for achieving a better tomorrow as we do have the largest number of undernourished and poor people in the world. Therefore, the current pace to achieve SDGs will have to be accelerated through higher agricultural growth. Obviously, there is no room for complacency.

It is imperative, therefore, that high

The decision of merging PM Garib Kalyan Anna Yojna (PMGKAY), started 28 months back owing to Covid with that of NFSA, and providing now 5 kg grains free of cost to almost 81.35 crore is another step towards long term sustainability, presuming that NFSA is likely to continue till 2030 with an aim to achieve SDGs

priority is accorded to agricultural research for development (AR4D), with enhanced budgetary allocation to ICAR, which unfortunately has remained stagnant for almost the last one decade. On the contrary, returns from investment in AR4D are 10 -15 times, much higher than any other sector be it education, energy, road, transport, infrastructure etc.

Well-Designed Strategy Warranted

SDGs are both an opportunity and a future vision for India. It is also quite evident now that for meeting SDGs at the global level, India emerges at the centre stage requiring urgent action to achieve them well in targeted time (2030), failing which, probably UN targets would not

be met globally. In view of this, a well-designed strategy with a well monitored implementation plan is warranted. Some suggestions are made below.

* Scaling agricultural growth in a Mission Mode approach around: (i) promoting nutri-rich high yielding varieties and hybrids, (ii) adoption of GM food crops such as Mustard, Soybean, Maize etc., (iii) crop diversification and conservation agriculture for sustainable intensification, (iv) promoting secondary and specialty agriculture, (v) using local food systems ecoregion-wise, with emphasis on farming systems around crops, horticulture, livestock, fishery, agro-forestry, etc.

* Providing enabling policy environment and institutional infrastructure for improving sustainable development index (SDI) in the regions that remained by passed by the green revolution, but otherwise offer great potential being rich in natural resources so critical for accelerated agricultural growth, and

* Revisiting and strengthening the on-going national programmes aiming to ensure rural credit, health insurance, crop and livestock insurance, housing for the poor, improved and efficient irrigation/micro-irrigation systems, construction of village godowns, youth skill development and self-employment, need based fertilizer use based on soil test analysis, linking farmers to markets, including eNAM, etc.

In conclusion, time is short and we need to act fast to achieve SDGs for better food, nutrition and environmental security for all.

STRENGTHENING AGRICULTURAL UNIVERSITY-INDUSTRY LINKAGES

THE WAY FORWARD



University-Industry Linkages (UILs) are key drivers between industries and universities/public working on innovation projects and or technological knowledge. These collaborations deliver far reaching and enduring socio-economic impact that cannot be achieved by working in silos. UILs synonymous to Academia-Industry Interface, now has been turned out as sustainable strategy for public-private Universities throughout India.

The industrial associations with universities scale-up research studies and commercialization of knowledge base. The gap between functioning of industry and academia is the greatest challenge impeding innovations. Need of today is to strengthen UILs. Universities have different stakeholders. Industry linkages therefore, will depend on stakeholder requirements.

Major stakeholder in Agricultural Universities (AUs) is farmer and hence, the universities have to strengthen industry linkages to farmers' driven supply chain. This article presents various measures to strengthen UILs, so that issues

and challenges of stakeholders of AUs can be addressed.

University-Industry Linkages

AUs must strengthen their linkages with industry to structure dialogue with State government to catalyze their participation to raise quality and relevance of agricultural higher education. UILs can play a crucial role in technological catch-up in agriculture for developing countries. Meanwhile, agricultural companies can gain access to appropriate and cheaper technologies and become more competitive in the world marketplace. Moreover, Universities can improve their financial position and gain first-hand technological experience, through these linkages, to become more entrepreneurial towards economic development process.

How To Strengthen UILs: Proposed Measures

Universities-industry collaborations are on the rise. It is imperative to understand how UILs can be strengthened for welfare of farming community. Some proposed measures to strengthen UILs are listed as:

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Self Help Groups

AU targets marginal farmers, small scale agriculturalists and food processing units. Therefore, Self Help Groups (SHGs) can significantly contribute towards agriculture industry for sustainable livelihood. Cooperatives business models can integrate small farm holdings and achieve benefits of economies of scale. This is an excellent resilience style which can respond better against supply chain disruptions. Either AUs can offer them a market or can purchase produce of such SHGs. This will focus on quality production only as the rest of the marketed related aspects can be well taken care by AUs only.

Establishment of Cooperatives

AUs should ensure establishment of more cooperatives in agriculture and allied areas. AUs should mentor such cooperatives towards registration to meet common purpose of economic devel-

opment of small and marginal farmers. However, in the country, large number of these cooperatives is currently in financial crisis and is in the position of increasing dependency on state subsidy for their survival. Therefore, AUs in such case becomes more critical and individual hand holding needs to be done to mentor right marketplace for such cooperatives.

Farmer Produce Organizations

Cooperatives entail farmers' benefits via state interventions, Farmer Produce Organizations (FPOs) are perceived through collective bargaining along with instilling an entrepreneurial quality. Small/ marginal cultivators sold their produce at the farm gate, often to middlemen at low prices. Producer organizations are reported to be positioned well through innovative approaches to transform market arrangements of marginal farmers.

Significant efforts need to be initiated by AUs to ensure the sustainability of new FPOs including offer them a marketplace as an extension mandate.

Several processes can be followed including the following.

- i) Encouraging SHGs and Cooperatives that are not been able to outperform in the market must be regularly mentored to register as FPOs,
- ii) ii) Disseminating Policy Support from the Government to ensure policy support that can be transmitted at larger scale through on/ off campus capacity building programmes,
- iii) iii) Expert meetings/ skill development interventions must be undertaken by respective AU focusing on farm production, input/ output management, agribusiness operations, regulatory compliance, internal organizational structure, good governance, etc. ICAR institutes, AUs and KVKs can help FPOs to acquire appropriate technology.

Long term goal of Technology Innovation Centers (TICs) in AUs should be to develop global leadership in a dedicated thrust area. These TICs will have a dedicated scientific staff, high-end instrumentation facility and active industry participation. Each TIC may work under Hub model, by networking with other research institutes and public/ private organizations and relevant industries



Academic Curriculum

Good scientific personnel are in great demand in industrial laboratories. Temporary mobility of researchers from university to industry and vice-versa need to be encouraged. This will offer a significant exposure to the major stakeholders of AUs. Given the complexity of business environment and to match the requirement of sustainable competitive edge, will necessitate for entities to come closer for productive interface.

Technology Innovation Centers and UILs R&D Schemes

Scientific innovations are the mantra for economic success in 21st century. It is also emphasized that AUs must establish Technology Innovation Centers (TICs) in consultation with the industries to ensure the new technology can be developed for the welfare of farming community. Long term goal of TICs in AUs should be to develop global leadership in a dedicated thrust area. These TICs will have a dedicated scientific staff, high-end instrumentation facility and active industry participation. Each TIC may work under Hub model, by networking with other research institutes and public/private organizations and relevant industries.

In recent times, agriculture and allied sector share is only 20.2 per cent. This captures a lot of attention, why agriculture sector has declined as a contributor to the nation's economy. There is a common perception that there are not enough job opportunities in the market. Many times, we have seen the industry people saying that there are ample opportunities. Young graduates are lacking the desired skill set. This contradiction on the part of young graduates and industry can only be filled by strengthening UILs. This necessitates academic, research and extension mandate have to be effectively addressed by AUs in association with the UILs. These UILs does not only guarantee graduates with the desired skills of industry but it also offers a sustainable model across the globe.

CFTRI, Mysore is an important source of technologies in food processing. CSIR institutions are resource centers of many industrial technologies, industry associations, commodity boards and technology advisory sources.

The market research should not only be conducted in the respective states but more opportunities must be created outside the respective states of FPOs also. The findings must be transferred to registered FPOs well in time to sustain FPOs. Moreover, AUs must mentor all FPOs before establishment as a facilitator and a connecting link with stakeholders such as NGOs, Banks, Government departments, commodity Boards, Corporations, Corporate, cooperatives, Federations, Trade bodies, etc. for identification, promotion, nurturing, capacity building, evaluation etc. Besides, product development helps farmers cope with market demand for various needs.

Given that many farmers have limited resources and new markets are emerging, they will undoubtedly need to develop a business model that builds on effective UILs and helps budding entrepreneurs to incubate ideas to develop products. Every AU must have at least one business incubator (BI) established itself or some designated places that will ensure development of new technology as per industrial needs. Some collaboration examples are; i) Dr YS Parmar University of Horticulture and Forestry, Naini, Solan, HP has been able to establish and promote one of its very first kind of Natural Farming FPO i.e., Chaupal Naturals Farmers Producer Company Limited. This unique FPO promotes natural

AUs should ensure establishment of more cooperatives in agriculture and allied areas. AUs should mentor such cooperatives towards registration to meet common purpose of economic development of small and marginal farmers

farm produce.

Such organizations have also been provided with sale counters in some districts of the State, thereby provide a market place for better price of the produce. The University is also incubating 14 agriculture based start-ups including food processing, and ii) Wageningen University, The Netherlands, is a reputed University in Agriculture, has established BIs in Science Park. The country is known for Floriculture and Animal Husbandry. Such BIs are in direct connect with industries to address various challenges to cater contemporary farm issues.

The very first measure to strengthen the UILs is to ensure that AUs are undertaking research on real or applied research issues. The research problems must be identified with strong deliberations with the industry people. This ensures right technology for transfer to farming community.

Mobility of Faculty / Researchers And Introduction Of industrial

INDUSTRY ACADEMIA PARTNERSHIP

Scope, Challenges, Opportunities

The agribusiness sector in India is a significant contributor to the country's economy, providing employment to a large portion of the population and accounting for a significant share of the country's exports. The Indian government has implemented various policies and programs to promote the growth of the sector, such as the Pradhan Mantri Fasal Bima Yojana, the Pradhan Mantri Krishi Sinchai Yojana, and the National Food Security Mission. However, the sector still faces several challenges such as low productivity, lack of access to modern technology and markets, and inadequate infrastructure.

The Indian government has been working on improving infrastruc-

ture, such as irrigation and cold storage facilities to increase agricultural productivity, and also on creating market linkages for farmers to sell their produce to get better prices. The Government has also been focusing on developing the food processing industry and reducing post-harvest losses.

Industry-Academia Partnerships for Proliferated Agriculture & Allied Sectors

The industry-academia collaboration may be aimed at promoting growth and development in the agribusiness sector, which includes agriculture and allied sectors such as fisheries, dairy, and animal husbandry. The partnership involves conducting research, developing new technologies, and providing training and education to students and industry professionals. This partnership also offers students hands-on experience through internships and job opportunities, while providing businesses access to the latest research and technology.

About the AUTHOR

Prof KML Pathak is a veterinary and animal scientist of national and international repute with more than 40 years of working experience in premier institutes in India and abroad. In addition to his various other roles, Prof Pathak has served as Deputy Director General (AS), ICAR and Vice Chancellor, DUVASU, Mathura

The ultimate goal of this partnership is to support the sustainable growth and development of the agribusiness sector, increase productivity and efficiency, and improve the quality of agricultural products. Additionally, the partnership can facilitate the transfer of new technologies and innovations from academia to industry, provide training and education, and connect businesses with a talented and motivated workforce, thus benefiting the livestock sector.

Policy Environment and Ecosystem

In India, the policy environment and ecosystem for industry-academia partnerships in agriculture is aimed at promoting innovation and improving the productivity and competitiveness of the agricultural sector. GOI has established a number of initiatives to support collaboration between industry and academia in agriculture, such as the National Agriculture Innovation Project (NAIP) and the Agricultural Research and Education (ARE) project. These initiatives provide funding and support for research and development projects that aim to improve agricultural productivity, and also encourage collaboration between industry and academia.

ICAR is India's premier research organization for agriculture. It has a number of research institutes that conduct research on various aspects of agriculture. ICAR also has a number of programs that promote collaboration between industry and academia, such as the Adoption of Innovations in Agriculture (AIA) program, which provides funding for the commercialization of agricultural innovations.

In addition to government initiatives, there are also a number of NGOs and industry associations that support industry-academia partnerships in agriculture in India. For example, National Centre for Cold-chain Development (NCCD) works to improve the cold-chain infrastructure for perishable agricultural products. National Horticulture Board (NHB) works to promote the horticulture sector in India.

The policy environment and ecosystem for industry-academia partnerships in agriculture in India is supportive and

CHALLENGES

- Lack of communication and coordination
- Funding constraints
- Intellectual property issues
- Limited access to technology
- Lack of standardization
- Difficulty in measuring impact
- Limited scalability
- Limited involvement of small farmers

OPPORTUNITIES

- Research and Development
- Extension Services
- Collaboration on Projects
- Entrepreneurial Support
- Student Internships and Employment

it is focused on improving the productivity and competitiveness of the agricultural sector. Government and non-government organizations are working to facilitate collaboration between industry and academia and to support innovation and research in agriculture.

Scope

There are several potential scopes for industry-academia partnerships in promoting growth in the agribusiness sector:

- **Research and Development:** Collaboration between industry and academia can lead to the development of new technologies, products, and services that can improve the efficiency and productivity of the agribusiness sector. This can include research on new crop and



animal breeding techniques, precision agriculture, and sustainable farming practices.

- **Training and Education:** Possibilities for training and education programs for industry professionals and students, improving their skills and knowledge. Programs on modern farming techniques, business management, food safety etc.

- **Access to Resources:** Provide businesses with access to specialized equipment and facilities, such as research labs and greenhouses, that may not be available in the industry. Beneficial for R&D, training and education programs.

- **Innovation and Entrepreneurship:** Foster innovation and entrepreneurship, opportunities for students and professionals to develop new products and services.

- **Community Outreach:** Can seek to promote sustainable agriculture and food security in local communities, connecting industry and academia with community, promoting social and economic development.

- **Collaborative Research:** Address agribusiness challenges. Industry can access latest research, academia can validate findings in real-world conditions.

Partnerships between industry and academia can be a powerful tool for promoting agricultural growth, and efforts should be made to overcome these challenges in order to maximize their potential benefits.



Prof Pathak likes to read books and listen to retro music

ACHIEVING HIGHER FARMER PROSPERITY

Digital agriculture is proving to be a powerful tool in India's quest for a more efficient and profitable agricultural system.

AI is being used to create better algorithms for predicting demand and optimizing crop production schedules. In the age of big data, AI allows for the analysis of massive datasets to identify patterns and correlations that can be used to anticipate changes in market conditions.

GOI has announced several policies,

schemes, and programs to facilitate and incentivize the agriculture sector through air transportation, adoption of AI, and developing portals to provide agriculture-related marketing services through a single digital platform. There is higher expectation in the agriculture sector for transformation and higher prosperity.

Ease in doing business for accelerated growth

The demand for allied sectors such as food processing, organic farming, smart proteins, floriculture, dairy, and nutraceuticals is increasing. It is necessary for GOI to allot a budget and develop mechanisms to support these sectors on the ground. There is a need for a single window process with documentation processes, approval, and

clearance. This will ease and encourage the entry of entrepreneurs to invest in this sector and will help them to expand their businesses across the country.

GOI should promote international tie-ups, and foreign investments, and train and educate the stakeholders about the best, innovative, and sustainable practices in agriculture and manufacturing. GOI should encourage the stakeholders to adopt international standards in quality, packaging, storage, food safety, etc to support export. This will boost exports and strengthen the position of Indian Agriculture in the global market.

Formulate strong policies to support innovative and sustainable technology, adoption at ground level

AI, ML, Remote Sensing, Big Data, blockchain, IoT, Geo-tagging, use of drones and robots in agricultural activities and



About the AUTHOR

Mr Debabrata Sarkar is CMD of MicroAlgae Solutions India Pvt Ltd & Vice President – Asia Pacific (AlgaEnergy). He has held different leadership roles in Monsanto, Chemtura, Syngenta and a US-based biological company

operations has led to a revolution. This is transforming agricultural value chains and modernizing operations.

To support the development and adoption of these new technologies, GOI launched the Digital Agricultural Mission (2021-25). It is expected from the government to increase the intensity of efforts, and programs to ensure the adoption at the farmer level.

Strengthen infrastructure to optimize agribusiness value chain

With the emergence of new allied sectors, supply chains and operating models need to be more flexible, adaptive, and resilient. Efficient management of food products by creating a network of advanced primary processing, storage, and distribution facilities will add value to the products, mitigate losses and increase the profitability of key stakeholders.

GOI should emphasize creating policies to provide incentives to build facilities such as micro cold storage to address supply chain issues. GOI should increase investments to improve infrastructure, including irrigation facilities, logistics, warehousing, etc. across states.

Build awareness, develop market linkages

GOI should emphasize imparting knowl-

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Mr Sarkar is a skilled artist

edge, increasing awareness, and providing training about schemes and best practices (crop diversification, organic farming, biologicals). It should focus on developing market linkages through portals/apps that provide market information and provide a platform for companies to buy the produce. These platforms will facilitate buying and selling of agricultural produce without using visiting mandi premises and will help develop new markets for stakeholders.

Higher focus on practicing sustainable agriculture

Indian farmers are facing the problems of low productivity, poor soil health, etc due to excessive use of inorganic fertilizers and plant protection chemicals. The planet is

facing climate change crisis. New alternatives should be developed and adopted. Organic farming, natural crop solutions, and sustainable agriculture practices that will secure soil health, and the planet and also ensure profitable farm income must be encouraged.

GOI should strengthen policies, improve, and regulate the marketplace for such solutions and should focus on ease of documentation, approval, and clearance of such alternatives so that their adoption by farmers is easy.

Vital for Govt And Private Sector To Work In Tandem

Increased investments in agro-processing technology, transportation infrastructure and digital connectivity can provide greater efficiency for farmers who are looking to grow their businesses. The technology adaption and implementation of digital technology can be beneficial to farmers in both the short-term and the long-term. It is essential that farmers take advantage of technology adaption and incorporate it into their operations in order to remain competitive.

A coordinated national effort is necessary from both public and private sectors. Government and private sector need to come together and work in tandem to provide technology resources and support for the farmers.



NUTRITION-SENSITIVE AGRIBUSINESS GROWTH



of malnutrition with both under-nutrition and obesity together signals a diluted food system and agri-business growth. Time has come to set the agenda for a nutrition sensitive inclusive food systems and agribusiness growth.

The agri-food systems needs to be enterprise driven, climate smart and nutrition sensitive. The investment on nutrition sensitive food systems and agri-business would be both strategic and practical drivers to achieve POSHAN Abhiyaan and UNSDG targets. The time has come to realise atmanirbhar (self-reliant) agri-nutrition sector and take

The nutrition sovereignty is the foundation for national sovereignty. The nation's demographic dividend and human capital potential are dependent upon good nutrition and people's wellbeing. Recognising the power and potential of good nutrition, the Prime Minister launched POSHAN Abhiyaan, an initiative to achieve Holistic Nourishment in the year 2018.

With renewed commitment, Poshan

2.0 commenced in 2021. It is the outcome driven integrated nutrition program focused on maternal nutrition, infant and young child feeding, treatment of malnourished children and wellness through AYUSH . A number of states have further gone ahead to bring changes with numerous innovative policy and program delivery measures.

India's double burden

About the **AUTHOR**

Mr Basanta Kumar Kar is an international development professional. He is the recipient of the prestigious Global Nutrition Leadership Award and was recognized by GOI for his contribution to the POSHAN Abhiyaan. He can be reached at basantak@rediffmail.com





“Eat Right Campaign” and “Fit India Movement” should be a Jan Andolan (people’s movement). Social behaviour change campaigns with production and value chain efficiency can generate demand for safe and nutritious foods. GOI may consider establishing a high powered Nutrition MSME Council to promote this in a mission mode

advantage of the ecosystem. The Cooperatives, FPOs and MSMEs can play a major role.

Nutrition Sensitive Agri-Business Ecosystem

Through a food systems transformation, India’s agile agribusiness sector can super charge the demographic dividend and shape human capital potential. It can spur growth in farm and non-farm sector and change the position of small and marginal farmers including women small holder farmers. Policy measures to enable nutrition sensitive agri-business ecosystem are suggested below.

Atmanirbhar (Self Reliant) Local Food System

The single commodity agri-business cooperatives and FPOs would be a key enabler to transform local food value chain and production to be self-sufficient. Each district should be self-sufficient on food groups such as cereals and millets, pulses, milk and milk products, roots and tubers, green leafy vegetables, other vegetables, fruits, sugar, fat/ oil and meat, fish, and eggs.

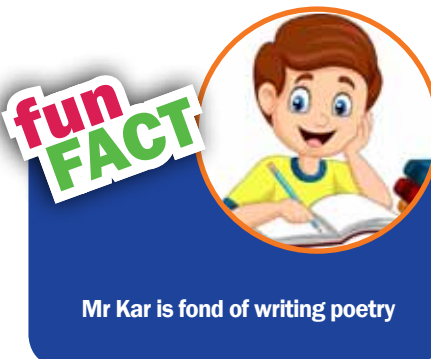
Agri-nutrition value chain transformation specifically efficient forward and backward linkages with convergence at district level would be important to re-

alise atma-nirbhar local food system.

MSMEs- From Food Entrepreneurs to Nutrition Entrepreneurs

Agriculture-based industries in MSME sector should be promoted to benefit nutrition and agri-business sector. Our food MSMEs need transformation. We need to promote nutrition entrepreneurs who can improve access to safe and nutritious diets.

Women nutrition agri-food start-ups will be an important enterprise measure. With a renewed focus on quit high sugar, salt and fat, let “Eat Right Campaign” and “Fit India Movement” be a Jan Andolan (people’s movement). Social behaviour change campaigns with production and value chain efficiency can generate demand for safe and nutritious foods. GOI may consider establishing a high powered Nutrition MSME Council



to promote this in a mission mode.

Industry Academia Partnership

The industry-academia and civil society partnership need revitalisation. The islands of excellence need to be scaled up and mainstreamed through policy measures.

Research and innovation Fund for Nutrition Sensitive Agri-Business

Investing on state of art and breakthrough research on food systems, digital technology, forecasting models and health infrastructure would be future need. Research and innovation funds may promote action research models at district level. For example, an agri-nutrition program on bio-fortified millet reducing protein deficiency in an aspirational district will have tremendous potential for scale up.

Nutrition Sensitive Agri-Business Investor Summit

2023 is the International Year of Millets. In order to promote bio-fortified millets and other nutritious diets, states may organise an international health and nutrition investor summit in partnership with G 20 platform. This would be an opportunity to show case success of state’s achievements in agri-business value chain transformation, rich culinary practices and enterprise ecosystem. This investment summit can attract global investors to invest on food, nutrition, agriculture, health, and allied industries that can boost state’s investment.

A New Generation Agenda

The global agribusiness market is undergoing significant structural changes. We are witnessing the growth of bio-fortified agri-business start-ups. The Centre and state governments need to work together with the civil society, industry and academia to transform infrastructure, technology, research and policy ecosystem that can work for the poor. It can add value to sustainable planet and business agenda which India needs today.

TRADITIONAL COARSE GRAINS ARE HEALTHY MILLETS ARE MULTI-USEFUL

In the race of modernity, human life is surrounded by diseases. Big diseases are fast knocking in every house. The easiest way to avoid all these is to pay attention to your food and drink and pay special attention to purity in daily life. Along with this, the coarse cereals like Jowar, Bajra, Barley, Oats, Sawa, Ragi, Kondo etc. eaten by our forefathers have to be included in our daily diet.

The Corona period has also changed the food habit of the people and now people are paying attention to health along with taste. Coarse grains are very nutritious. Malnutrition can be overcome by the consumption of coarse cereals. Health is cured by its consumption. These coarse grains can be produced



easily with very low cost and less irrigation.

Due to being more fibrous, coarse grains do not stop in the intestines and prevent constipation. These coarse grains were part of our lifestyle before the Green Revolution. The yield of coarse cereals in the cultivable land decreased progressively. The traditional coarse grain which people do not like considering it to be a rustic food and was thrown out of the kitchen, today after being certified by scientists, big companies are making pack-

ets of these grains and launching them in the market in the name of multigrain flour, which is now becoming the choice of people of high income group.

On the recommendation of the Government of India, the UN has declared 2023 as the International Millet Year. The reason for this is to promote food products produced from millet so that global diseases can be controlled. The government is paying special attention to the promotion of coarse grains, especially millets.

In the meeting of the United Nations, GOI proposed to declare 2023 as the International Millet Year, and 72 countries supported it. With an aim to promote millets, the government celebrated the National Year of Millets in 2018 to generate domestic and global demand and

About the AUTHOR

**Professor Mamta Tiwari is
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Development,
Agricultural University,
Kota**



Nutritional Value of Millets (per 100g)

S. No.	Name of the food	Energy kcal	Calcium mg.	Iron mg.	Protein gm	Carbohydrates gm
1	Oats	-	50	4.25	12.5	67.5
2	Sawa	-	1-4	17.5	11.6	45.9
3	Kodo	-	-	-	8.3	65.9
4	Ragi	328	344	3.9	13.0	80.0
5	High tide	349	25	4.1	10.4	66.2
6	Maize	342	10	2.3	10.0	70.0
7	Millet	361	42	8.0	11.6	67.5

Source: Dr. T. Vishwapushpam and Ms. Amulya Rao, National Institute of Nutrition, Hyderabad

Millet cookies can be prepared with Millet flour, chocolate crunch, ghee, sugar and cardamom. One of the Self Help Groups of Agriculture University, Kota started selling millet cookies, which are now a popular product

provide nutritious food to the people.

In view of the nutritional value of millet, the government notified millet as a nutritious grain in April 2018. It was included under the Nutrition Mission campaign. The average yield of millet in India is 1239 kg per hectare. Which is more than the global average yield of 1229 kg per hectare. The Prime Minister & Union Ministry of Agriculture is taking several necessary steps to popularize coarse grains such as Jowar, Bajra, Barley, Oats, Sawa, Ragi, Kondo etc. to promote production, increase productivity, consumption, export, branding, processing, price promotion etc.

Seeds and Sowing Time of millet

In areas where rainfall is scanty millets (bajra) should be sown with the onset of monsoon. The first week of July is good for bajra cultivation in North India. Use 5 kg per hectare seed in sowing. Sow the seeds at a distance of 40 to 50 cm. Sow the seeds in a row. After 10 to 15 days, if the plants have become dense, then prune them. If the rainy season comes late and sowing is not possible, then transplanting is better than sowing.

Prepare nursery in first week of July

using 2 to 3 kg seed in about 500 sqm area for planting sapling in one hectare area and add 1 to 15 kg urea. After about 2 to 3 weeks the plants should be transplanted in the main field. Apart from this, it is also necessary to have sufficient moisture in the nursery. There is no need to invest much in the cultivation of millet. Its cultivation is done at very low cost. It is sold very expensive, so farmers can earn good profit from its cultivation.



fun FACT

My passion is to make youth and women self supporting and nutritionally sound. For that I am developing skills among them in different areas. Along with this I always try to innovate nutritious food products to make India healthy



Processing & value addition of millets

Various products can be prepared by processing of millet such as millet smoothie, laddoos, halwa, rabadi, cheela, biscuits, patties, cakes, stuffed paratha, idli, missi roti, salad, khaman, pua (with jaggery and sesame) khichdi, cookies etc.

Millet cookies can be prepared with millet flour, chocolate crunch, ghee, sugar and cardamom. One of the Self Help Groups of Agriculture University, Kota started selling millet cookies, which are now a popular product. Chemical testing has revealed that these cookies are rich in Calcium 27.4 mg. and iron 3.09 mg. per 100 gm. Children have loved these cookies, which is a healthy sign.

Power To University Spinoffs



Increased competition and globalization motivate us to join forces to enhance the impact of the research conducted. Collaboration between organizations with different views can, however, be difficult to manage and needs awareness and skills to meet different expectations.

The Industry – Academia Partnership (IAP) is an association that fosters R&D and innovation by bringing together industry and University partners in pursuit of timely themes. IAP hosts workshops and webinars on University campuses with experts from academia and industry to discuss their work and spark new ideas and activities. Industry gains work – ready talent with specialist knowledge and practical training, and Universities benefit by having opportunities to work on relevant technologies and challenging problems.

Key To Catalyse Innovation

Collaboration between industry and academia is key to catalyse innovation and growth in technology. While industry often focuses on addressing solutions that are of near –term commercial value and academia focuses on building new knowledge through research and imparting education to students, the combination can yield accelerated development of new breakthroughs.

Incubators - Technology, Access To Capital, Knowledge Of Process

The Framework of Industry –University Linkage in Research, released in 2019 by the Ministry of Science and Technology, GOI, found that though industry and academia work in tandem, the lack of a clear policy is preventing optimum co-

About the **AUTHOR**

Prof K Prathapan is Vice Chancellor, DY Patil Agriculture & Technical University, Kolhapur, Maharashtra



University Incubators play a key role in providing assistance to nascent entrepreneurs, particularly in the initial stages of their firm's life-cycle. Such support gives the start-up companies a relatively secure environment and a head start over others

operation. The report determined that a strong industry – academia collaboration with a focus on innovative ideas and R&D investment can help increase research capacity, and enrolments in Ph.D. programmes.

To be able to carry out this mission, universities have now started encouraging researchers and students to utilize the research results for direct contribution to the economy. This encouragement results in university spinoffs that need breathing space to begin with or till they learn the tricks of the industry to survive in open competition. This facility is called incubation and is provided by the university incubation centre.

These incubators are focussed on facilitation of the transfer of knowledge created in the universities by way of technology to the industry. Another focus area is to commercialize research results either through transfer or creation of spinoff firms. They are very specialized in this area and are thus very different than traditional industrial incubators.

With technology, access to capital and knowledge of the process, incubators provide spinoffs the opportunity to utilize the knowledge that they have into commercial offerings in the market. The incubators are close to the knowledge creating hub and thus are almost always first to receive information regarding any incremental technology. They help the spinoff companies to out-do the challenge of being new and small in the market.

Major Activities

- Nurture spinoff firms from the university itself in the initial period.
- Build infrastructure, both physical and managerial, to support spinoff firms.
- Create a network of specialized personnel in the areas of management, technology, legal to be able to provide expert advice when needed by the spinoffs.
- Scan and store information regarding new technologies that can be used to create value in the market.
- Encourage the idea of entrepreneurship.
- Assist spinoff firms in creation and use of knowledge products so as to contribute to economic growth and development.

University Spinoffs

Universities play an important role in re-

gional and national economic development through education and research. Universities must undertake the third mission of direct interaction and contribution to the industry through university spinoffs.

University spinoffs experience many management challenges. Research results are patented by the Technology Licensing / Transfer Office of Universities and are ready to be commercialized. Beginning with Product Development, many entrepreneurs face the Technology Push Problem. It is easy to create a technology but to market it requires consumer consciousness of the technology as well.

Finance is the backbone of any company, including university spinoffs. They face financial problems because investors might not be sure of success. Market uncertainty is a challenge for any enterprise, including university spinoffs. They also face the challenge of unique human capital – it can make or break the company. The challenge of formulating a strong yet workable business strategy is faced by university spinoffs too.

Strategic Management

Technology is central to business strategy, although strategic management encompasses much more than just technology. R&D creates valuable opportunities, but these are converted to survival, growth and profits only through a linkage between technology and business strategy.

There is a dynamic relationship between technology and strategy. University spinoffs face challenges from the business environment without being really prepared for them. To mitigate the risk of failure and to provide them with a cushion of assistance, many universities have incubators where start-ups can have a foundation to leap high to success. Incubators play a key role in providing assistance to nascent entrepreneurs particularly in the initial stages of their firm's life-cycle. Such support gives the start-up companies a relatively secure environment and a head start over others.

fun FACT

I love to cook and eat native food. I also love reading and listening to music

BRING BACK HONOUR TO AGRICULTURE

DR. P. CHANDRA SHEKARA



A leading professional in the field of Agriculture with more than three decades of experience and expertise in areas of Agricultural Extension Management, Agri-Entrepreneurship Development, Agricultural Marketing Management and Public-Private Partnership, Dr. P. Chandra Shekara currently serves as Director General of National Institute of Agricultural Extension Management (MANAGE).

Early Years

Born on 20th December 1965 in Kenchi Koppa, Chikamagalur district of Karnataka to farmer couple, Late Putte Gowda

and Late Manjamma, Chandra Shekara was a keen student. "My home provided free facility for tuitions to the students in the village. After the class hours, the teacher used to visit my home and teach students from 1st to 4th standards. This gave me great opportunity to learn from all the classes before joining school and I picked up reading newspapers in Kannada. That created lot of curiosity among the villagers and they used to bring a piece of newspaper, give it to me and ask me to read the same. "

An Exceptional Student

Chandra Shekara completed his 10th standard from Shri Lakshmana Rao Gurjar High School, Javali, Chickmagalore district in Karnataka during 1981 on national Merit Scholarship. For further studies, agriculture was a natural choice for him. "I was born in a farming family from a village and naturally grew with Agriculture. I found Agriculture as the easiest, interesting and useful subject."

He Pursued B.Sc in Agriculture at UAS, Bangalore during 1983-1987 and went on to complete M.Sc in Agricultural Extension during 1987-1989 in the same University. Chandra Shekara emerged as a Topper and completed Doctorate in Agricultural Extension at UAS, Bangalore during 1996-99 with three Gold Medals.

Dr Chandra Shekara has played a monumental role in promoting agripreneurship development for unemployed rural youth, transforming input dealers into para-extension workers, nurturing agri startups and imparting post-graduate diploma programs in agri-business management, agricultural extension management and agri-warehousing management.

tête-à-tête with Anjana





Dr Chandra Shekara reintroduced modified Kisan Business School concept and initiated CCS-NIAM Krishi Gyandeeep Knowledge Lecture Series

Stellar Career

During his illustrious career, Dr. Chandra Shekara headed three premier agricultural institutions in India. Apart from his current position in MANAGE, he had also served as Director General (In-charge) of National Institute of Plant Health Management (NIPHM) and Director General of CCS National Institute of Agricultural Marketing (CCS NIAM).

As Chief Executive of these Institutions, he led important schemes, programs and policy interventions to strengthened Agricultural Extension System, sustainable and integrated plant health management and promoted reforms in agricultural marketing functions for the benefit of farmers in India. He has also served as Director of several Centres, Research Projects and International Training Programs.

Exceptional Achievements

Dr Chandra Shekara has played a monumental role in promoting agripreneurship development for unemployed rural youth, transforming input dealers into para-extension workers, nurturing agri startups



Dr Chandra Shekara has initiated the following initiatives in order to strengthen agricultural extension ecosystem in the country:

- Established MANAGE FPO Academy
- Initiated SEVA-MANAGE- involving retired Agri. professionals in agricultural development
- Initiated National Network of Agri Journalists-MANAGE (NNAJ-MANAGE)
- Massive expansion of partnership activities with public and private organizations
- Introduction of rewarding mechanism for Agri-start-ups, Agripreneurs and Academicians in Agricultural Extension
- Krishi Gyan Deep Knowledge Lecture Series introduced to connect last mile extension worker with inspiring leaders
- Establishment of project formulation centre to facilitate PPP in consultancy
- Webinars to connect all stakeholders in Agricultural Extension
- Initiated National Network of Agricultural Extension Management Experts
- Initiated Induction Training Programmes for fresh officers
- Initiated MANAGE CSR Academy
- Initiated National Facilitator Development Programme

- **Karnataka Science and Technology Academy (KSTA) Fellowship Award 2021**
- **Life Time Achievement Award 2019 by NITTE-Karnataka Bank Limited**
- **Dewang Mehta Education Leadership Award 2019.**
- **Award of Excellence during the International Conference on “Doubling of Farmers Income of SAARC Countries” in 2018**
- **Life Time Achievement Award 2019 from SRDA**
- **Dr. D K Mishra Memorial Award 2015**
- **Special Appreciation Award from International Society of Extension Education during International Conference on “Extension Strategies for Sustainable Agriculture” in 2013**
- **Magnum National Honour Award 2011**
- **Young Scientist Award 2006 by Indian Society of Extension Education**
- **Recognized as National Extension Expert by Indian Coffee Board**
- **Awarded Kannada Kanteerava by Kannada Welfare Society in 2016.**
- **Awarded three Gold Medals for Ph.D. thesis on Coffee Extension Management in 1999.**
- **Topper of M.Sc. (Agriculture Extension) batch of 1987-89, University of Agriculture Sciences, Bangalore**



Krishi Gyandee Knowledge Lecture Series. He had mentored 59 Agri-Startups and helped in securing funded Rs.4.68 crore as grants. NIAM Innovation Centre was also established by him. He provided Policy Support to Government of India, promoted Private Extension and PPP in Agricultural Development and performed as Centre of Excellence in Agricultural Extension for many African and Asian countries for capacity development through the Government of India Missions. He organized International Training Programmes, Study visits funded by USAID, UNDP and Government of India and worked for implementation of bilateral MoUs with 40 foreign countries.

With the funding support from USAID and Govt. of India he directed and organised highly focused and demand-driven training programs for senior executive officers of 20 countries of Asia and Africa. The training programs aimed at building capacities of stakeholders in developing countries for achieving sustainable agriculture and food security. As the Founder Director of Centre for Agri-Entrepreneurship Development (CAD) at MANAGE, he guided and implemented the Central Sector Scheme of Agri-Clinics and Agri-Business Centres (ACABC) of Ministry of Agriculture & Farmers Welfare, Government of India.

A prolific writer, Dr Chandra Shekara has penned 25 Books, 53 scientific articles and produced twelve films. Four Research papers were presented in International Conferences. His Compilation, “100 Years of Coffee Research in India”, which contains more than 1200 technologies was well received by scientists, extension functionaries and farmers.

“I want to be known as a Professional who brought respect to the occupation of Agriculture and respect to the farmers and made efforts to position Indian Agriculture as Global Leader. I always remember with respect my teacher Shri Gangadharappa, who taught me many things before I got into schooling. I always live by quote of Swami Vivekananda who says ‘Arise, Awake and Stop Not till the Goal is Reached’.”

and imparting post-graduate diploma programs in agri-business management, agricultural extension management and agri-warehousing management. He took keen interest in organising training programs and research for extension professionals in agriculture and allied sectors in India and developing countries.

He took the lead in creating National Network of Plant Health Management Experts in India and was instrumental in strengthening phytosanitary inspec-

tors training by opening the sector for private participation. He introduced Agri Start-up promotion program through RKVY-RAFTAAR and Research Internship Programme. National Facilitators Development Programme was also his intervention. He believed in the importance of Agri-Business Management education programme and made every effort to strengthen it. Dr Chandra Shekara reintroduced modified Kisan Business School concept and initiated CCS-NIAM

POWER TO DAIRY SECTOR WILL POWER RURAL ECONOMY

We are hopeful that the forthcoming Union Budget will include several initiatives to strengthen the dairy and livestock sector and make it more sustainable.

The budget carries the Government of India's ambitious vision to take the economy on the pathway of high growth by doubling milk processing capacity to 108 million tonnes by 2025. Dairy products are India's primary focus, contributing 5% of the national economy. The sector employs 80 million dairy farmers directly and has been instrumental in generating immense income opportunities, especially for the people of rural areas.

Robust Growth In Milk Production In 2021-22

The dairy sector in India saw a robust growth in 2021-22, thanks to several factors, including a

recovery in economic activity, rising per capita consumption of milk and milk products, shifting dietary choices, and increasing urbanization. After being severely impacted by Covid, the sector has seen a gradual rebound in consumption across all end segments. Over the five years through 2020, the livestock industry will have risen at a CAGR of 8.15 percent.

From 146.31 million tonnes in 2014-2015, milk production has increased at a compound annual growth rate of 6.2%, reaching 209.96 million tonnes in 2020-21. Compared to the unorganized dairy market, the organized market for milk and dairy products, which accounts for between 26 and 30 percent of the industry's value, has witnessed quicker development.

Higher Demand For Dairy Products

More than half of the dairy mar-



ABOUT THE AUTHOR

Mr Radhey Shyam Dixit is the Founder and Chairman of The Ananda Group

JOINING HANDS WITH SBI TO HELP FARMERS

Ananda is aligned with the PM's vision of ushering in a new era of development for the dairy sector to reduce poverty and unemployment. We have collaborated with India's largest bank - SBI and designed a joint liability programme where farmers get loans without any security to buy cattle. This programme is helping farmers to start work with Ananda and pave the path of self-reliance.

ket comprises liquid milk. This sector's growth is forecast to be steady (six-seven percent). Demand for most types of value-added dairy products is predicted to increase by between 13 and 15 percent. During 2022, the demand for frozen yogurt and ice cream recovered slowly because of the customers' reluctance to consume cold dairy products in the wake of the epidemic. Because of the anticipated uptick in demand during celebrations, the price of skimmed milk powder is likely to rise.

Prices for acquiring raw milk, which had been down the previous fiscal year owing to low demand, have risen due to the uptick in consumer spending.

Both the government's ongoing backing and the industry's favourable cost of capital have contributed to expanding processing capacities.

Thrust On Livestock And Dairy Farming

About 95% of India's livestock producers reside in rural areas. The Vibrant Villages Programme's investment will improve market access for livestock farmers.

GOI's dedication to develop the livestock and dairy farming industries was demonstrated by a 40 percent increase in allocation for the livestock sector for 2022-23m and a 48 percent increase in allocation for central sector projects.

Livestock health is prioritized enough that funding has increased by nearly 60% from 2022-23 over the previous year to help prevent and treat diseases.

The livestock industry will benefit through more transparency by expediting payments for milk procurement. Farmers should be provided with incentives for digital banking, digital payments, and advances in fintech. To streamline the purchasing process, GOI can consider



implementing the electronic billing system that will be entirely paperless.

Path Forward

Challenges and threats to the dairy business come from dairy alternatives, plant-based products, and adulteration. Recently, Food Safety Standards Authority of India updated rules regarding substitutes and ghee specifications.

Milk and dairy products in India now have a specific "Dairy Mark" logo designed by National Dairy Development Board and Bureau of Indian Standards to increase customer trust in the goods. When taking into consideration the per-



**fun
FACT**

For every festival, the Ananda Group makes charming animated advertisements, featuring Mr Dixit. Recently, the group released the advts for Makar Sankranti and Lohri

ishable nature of milk and milk products, short shelf life and the vast cold chain involved, the certification program is innovative and the first of its kind.

Awareness of clean milk production and different programs implemented by the Department of Animal Husbandry and Dairying and the new Ministry of Cooperatives will assist dairy farmers in ensuring higher quality.

Ananda's Efforts To Empower Dairy Farmers

During Covid, consumers felt a strong need to improve immunity. Ananda treated the consumers' requirements as a priority area and focused on protein-based products to improve their immunity.

Ananda transformed uncertain times into opportunities for growth with technology. It strengthened infrastructure by setting up an automated line for hygienic and 'untouched by hand' Paneer for consumers. It also developed various new paneer variants, i.e. Herbal Paneer, Cow Milk Paneer, to fulfil the immunity requirements of the consumers.

The pandemic played a major role in making consumers more conscious of hygiene. The demand for higher immunity made consumers aware of the goodness offered by the dairy products. With the right use of technology, Ananda addressed the growing consumer need and also boosted the rural economy by handholding the dairy farmers.

To supply the nation's growing population with the nutrients it needs, Ananda focussed on various new and innovative products to boost dairy farmers' income by developing and launching products ranging from Whey Jaljeera drink, Kheer, Kalakand, KesarPeda, etc.

Emphasis On Export

Ananda is promoting dairy exports to bring in foreign exchange. We are exporting our products to a number of countries. Our products are exported to Australia and Gulf countries. Our export network is further expanding. Ananda participated in World Dairy Summit'22 and connected with international buyers.

BOOST FARM TECH TO DOUBLE FARMERS' INCOME

Enhance Export Incentives



With the upcoming Union Budget 2023, here sharing my expectations for the agriculture sector to strengthen and achieve the next level of growth.

Boost Farm Mechanization

This is needed in order to enhance operating efficiency to achieve the objective of doubling farmers' income. The subsidy schemes, guidelines and budgetary support of the Central Government are interpreted and implemented by State Governments in varying degrees.

However, matching the budgetary support of the State Government and hence the timely release of subsidy funds for farm machinery schemes vary from state to state. In some states, the subsidy schemes are perfectly implemented. Payment to farm equipment suppliers are made in reasonable time.

But in several other states, not all subsidy schemes are implemented thereby denying farmers of those states the accruable benefits of improving farming efficiency and thus their income. In

About the AUTHOR

**Mr Mrityunjaya Singh is Managing Director,
CLAAS India Pvt Ltd**



In several states, not all subsidy schemes are implemented thereby denying farmers of those states the accruable benefits of improving farming efficiency and thus their income. In addition to erratic implementation, payments to machines suppliers are severely impacted, leaving suppliers no option but to approach the law for redressal

addition to erratic implementation, payments to machines suppliers are severely impacted, leaving suppliers no option but to approach the law for redressal.

In order to address this, the following policy level changes can be considered by the government.

- It is recommended to have the Central Government issue a list of mandatory farm mechanization schemes to be implemented by the State.
- It is also recommended that these schemes should be under reserved budget of both Central and State as per contribution ratio and payments should be made within 7 days of receiving verified claims by the State Treasury.

Promote domestic manufacturing

For example, the domestic manufacturing of Combine Harvester under 'Make In

Import of Combine Harvesters in the last four years

Machinery	FY-19	FY-20	FY-21	FY-22
Track Type Combine Harvesters	1687	2820	4241	4500+

The above graph clearly indicates that India has increased import of Combine Harvesters impacting the Make In India story. In order to encourage local manufacturing, I expect the following changes in the upcoming Budget.

India' program should be promoted.

The Make In India program is seeing uneven movement in the Agriculture sector because of conflicting situation created by free-for-all imports of farm equipment that are already being built in India to global quality standards. The Combine Harvester executes a key farming operation for the farmer and they are being short-changed by cheap, poor quality imports from China, Thailand, etc. that do not have a proper warranty or aftermarket support. This has led to the creation of a lot of NPAs and bankruptcy for thousands of farmers who got lured to buy such machines by their initial cost and then could not get any support from importing agents or their manufacturers for spare parts and service support.

The sharp rise in imports is at the

cost of continually reducing domestic installed capacity utilization as can be seen from the chart below:

- Levy Customs duty on imported Combine Harvesters of 75% to bring a level playing field for imported and domestic options at Farm Gate Level.
- Deny enlistment of such imported equipment by any state in their approved subsidy list of equipment so as to deny any subsidy support for imported equipment, as done by many democracies in the world.
- The above changes will help in substantially increasing domestic production of the same type and class of equipment by the SME sector in India.

Enhance Export Incentives

The government can enhance export incentive for farm equipment in order to make India a world factory.

RoDTEP benefit for export of Combine harvesters HSN 84225100 to be increased to 4% from current benefit of 1%.

I may highlight that this is not clear. If this is a specific model of CLAAS' harvesters we should do away with it. Rather we should talk how overall export of combine harvesters can be increased from x% to x% with encouraging incentive support from the government.

fun FACT

Mr Mritunjaya Singh likes to play golf

EXPECTATIONS FOR AGRICULTURE

PPPs NEEDED FOR AT LEAST TOP 30 MANDIS

Ideal opportunity to put into place timetable for PPPs of top Mandis in the country (largest in each State/UT) in this fiscal



change the mindset of mixing agriculture with poverty alleviation. This is because the latter does not allow sustainable livelihood from agriculture.

In this write-up, I am focusing on the key enablers which have to be facilitated by the Government. Thereafter, the indomitable spirit of the Indian farmers and the associated organized private entities shall achieve the rest. This Government has enough and more examples of success from deep reforms than any time

A lot has been written in the media and, I am sure, submitted to the Government by luminaries of agriculture on their expectations from the forthcoming Union Budget for 2023-24. I am confining myself to my aspirations from the Government for a comprehensive growth of Indian agriculture into sus-

tainable agribusiness.

I have no hesitation in saying that the Government has shown a much better understanding of the travails of agriculture to find practical solutions in the last eight years than ever before. The biggest and most important item is to

About the **AUTHOR**

Mr Rajesh Srivastava is Chairman, Prowess Advisors and Executive Chairman, Rabo Equity Advisors. He was earlier heading RABO Bank in India





It is time that the Auction Markets are moved to PPP models. It is not necessary that they are privatized per se. Shareholding could be differentiated with management and operational control. GOI should invite corporates well entrenched into agribusiness in India to invest some equity into SPVs and takeover the management on a fee cum incentive basis

before and hence should not hesitate. In the limited space here, I am giving suggestions on these key areas.

Definition of agriculture infrastructure

There is no consistency in definition of agri infrastructure as per the Ministry of Agriculture (in the investment policy for agri infra fund), Ministry of Commerce & Industry (in its Master Circular on Foreign Direct Investments), Reserve Bank of India (there is actually no definition anywhere but by some stretch in the Master Circular on Priority Sector Lending), Banks (who rightfully have to follow the RBI but wistfully refuse to more often than not refuse to give any preferred treatment to ag infra projects), NABARD (which, barring cold storages and dry warehouses which it funds at a low rate of interest, does not have any refinancing scheme for other segments of ag infra),

fun FACT

I am very fond of ghazals, Sufi music and watching cricket. I also like being in the mountains, admiring valleys and snow peaks

and Indian Income Tax Act (where Sections 10(23FA) and 80-IA barely touch upon ag infra).

If agriculture is to achieve a sustained “good growth” and farmers have to multiply their incomes, development of ag infra is critical. The Government and its institutions, including the Banks, have to

act uniformly and concertedly to define it in unison and grant its due place. Here are some suggestions:

Definition: Ag infra should be defined (consistently by all) as following activities (list is illustrative and should be EXPANDED and not shrunk with a conservative mindset):

- *Irrigation, Farm Mechanization, Ag Tech*
- *Grain Silos and other warehousing models, Cold Chain, Logistics*
- *Food Parks/Hubs, Packaging, Quality/Testing Labs*
- *Commodity Exchanges, Auction Markets, Rural/Agri Retail*
- *Credit and Insurance*

I am including (dedicated) credit institutions and ag insurance companies in the list since credit and insurance are as important enablers for growth as any other input. My short argument is that development and growth can come faster



and better if a holistic approach is taken rather than a piecemeal approach.

Budget 2023-24 can certainly make the necessary amendments in Income Tax Act and create place holders for the other institutions to paly their part.

We have no time to lose.

Better dispensation of agriculture infrastructure fund

All praise for the agri infrastructure fund of Rs 1 lac crores but the end use is not necessarily what will help because back ended interest subvention pre-supposes an efficient lending process by the lenders which is deficient. The scheme should thus be modified to include:

a. Direct equity support: Capital has to precede debt and hence the Government has to step in a Venture Capitalist. Such a product obviously needs investment skills for which the Government can contract investment management firms directly or through its institutions (just as the Ministry of MSME has requisitioned NSIC for its deployment). Suggested % deployment of the fund: 25%

b. Indirect equity support: In addition, the agri infra fund can be deployed through chosen external funds which have the ability to seek out ag infra projects. It is always helpful to augment direct funding with indirect funding. Suggested % deployment of the fund: 25%

c. Direct lending: Knowing that long term debt is not possible for Indian Banks

and Nabard does not have the capacity either, the Government should get part of the fund deployed as long term debt for ag infra projects directly through its own institutions with tight control to ensure that they do not overlay their own additional conditions which often frustrates the intent. Such institutions could be Nabard and IIFCL. Suggested % deployment of the fund: 30%

d. Interest subvention: As per the existing scheme but the suggested deployment of the fund should be: 10%

e. Grants for Viability Gap Funding: Often enough the returns from ag infra projects may not be attractive enough for the lenders or investors in a project which, though, may have a great impact in relation to ecology (example: agri waste to energy projects). For such projects, the ag infra fund should provide a VGF grant (limited to Rs 5 crore or 5% of the project cost) which can catalyze investors/lender for the projects. Suggested deployment: 10%

The Budget can provide for an amendment of the ag infra fund construct as above.

Auction Markets/Market Yards/ Mandis

It is painful to see our (most) Mandis. The conditions in which the produce is brought, stored or strewn across and auctioned are woeful. The consumers are doled out ag products which may be sub-standard, unhygienic and often in-

fected/infested.

It is grossly unfair to the consumers who unfortunately have no recourse. I am aware that most of the Mandi Boards are flushed with money but it surprises me as to how the infrastructure of these yards is not improved.

It is time that the Auction Markets are moved to PPP models. It is not necessary that they are privatized per se. Shareholding could be differentiated with management and operational control. The Government should invite corporates well entrenched into agribusiness in India to invest some equity into SPVs and takeover the management on a fee cum inventive basis. The Government would do well to sit at a distance to just ensure that there is no unfair practice or inequitable dispensation to farmers and small traders but not interfere with the management. The arrangement can have a provision to transfer majority to the private sector operator after a few years if all is handled well. There can be variants of BOT, BOOT models.

Let us look after our country – what we eat is critical for well-being of the nation!

The Budget is the ideal opportunity to put into place a timetable for PPPs of at least the top 30 Mandis in the country (largest in each State/UT) in this fiscal.

This Government fortunately is very receptive to ideas. I hope that what I am suggesting above will resonate well with the Hon'ble Finance Minister.



ODISHA STATE COOPERATIVE BANK

- Provision of over 58% of crop loans in Odisha by OSCB/ Cooperative Banks through Kisan Credit Cards.
- Provision of interest free crop loans up to Rs.1.00 lakh and at 2% interest from Rs.1.00 lakh to Rs.3.00 lakh to the farmers.
- Crop loan insurance for all loanee farmers.
- Crop loan finance to tenant farmers/ share croppers through Joint Liability Groups.
- Facility to avail loans through RuPay Kisan Credit Cards.
- Implementation of computerization of PACS/ LAMPSCS with financial support of State Government.



www.odishascb.com

Union Budget FY 2023-24

IDEAS FOR INCLUSIVE ECONOMIC GROWTH AND COLLECTIVE PROSPERITY

GOI is taking enormous steps to revolutionize the agri sector by encouraging innovations and creating favourable policy frameworks including Agricultural Infrastructure Fund, formation of 10,000 FPOs scheme, and AgriStack initiative. Here are some suggestions for a robust year ahead.

■ Support for Agri-focused NBFCs to enhance flow of agri credit

Rising to the challenge posed by inadequate credit flows to agriculture, agri-focused NBFCs, driven by digital innovations, have pioneered new lending approaches to farmer producer organisations (FPOs) as well as agri enterprises. Since their launch about 6 years ago, these agri-focused NBFCs collectively lent nearly Rs. 700 Crore to the FPOs, benefitting millions of farmers till date. But their biggest challenge is the 'relatively higher cost of capital'. Hence, policy amendments are required to help these NBFCs access diverse sources of finance for the players and funds at competitive rates (Preferential interest rates) enhance the flow, last-mile reach, and volume of agri credit. Further, ensuring access to the schemes and initiatives by the Government and resources, and a level playing field for the NBFCs, will result in enhanced financial inclusion mainly for the unserved and underprivileged.



■ Credit guarantee mechanism for NBFCs lending to the FPOs

Credit guarantee is an important enabler for these NBFCs to ensure those who

otherwise remain excluded from the formal financial system are served. But currently, no credit guarantee mechanism is available for these NBFCs that are lending to the FPOs and MSMEs. Hence, NBFCs, complying to certain qualifying criteria, must be considered as Eligible



About the AUTHOR

Mr Sai Prasad Somayajula is Group Head, Samunnati Agri Innovations Labs. He is a career banker with 33 years of experience in banking and IT Consultation in India and Canada.

Lending Institutions (ELI) for credit guarantee other similar schemes of the government.

■ **Prioritizing enablement of FPOs: Need of the hour**

India is aiming to not only become a US\$ 5 trillion economy but also be self-reliant, and resilient. Farmer collectives are all set to play a big role in ensuring food and nutritional security for its 1.3 billion population. But to make it happen, a lot needs to be done as mentioned in the 'The State of Sector report 2022 on FPOs' to enhance their access to capital, technology, and markets, which are crucial for the evolution of the FPO sector to integrate them into agri value chains.

Hence, a dedicated line of credit (similar to PSL) at preferential rates exclusively for the FPOs will be of immense help to ensure their financial needs are met adequately. Further, enhanced support through a fund set up specifically for handholding of nascent FPOs (training and capacity building) can do wonders. It is also important to ensure flow of private funds for example, inclusion of those activities that are directly related to FPO enablement under the mandatory CSR expenditure, will help channelize more funds.

■ **Leveraging the International Year of Millets 2023 (IYM2023)**

India's millet area remains stagnant at 17 – 18 million ha with an average productivity of just around a ton per hectare. Millet farmers face huge challenges as they lack access to good quality, improved varieties, inputs, storage, and processing facilities. They usually have poor or no access to markets, and credit from formal institutional financial sources. Hence, a 'Millet revolution' is needed urgently and it requires concerted efforts across the value chain. IYM2023 is a great opportunity recognize millets as nutritious yet eco-friendly attributes to promote awareness as the "Super Nutritious Foods" by encouraging all the stakeholders, globally and nationally to collaborate as given below:



■ **Recognition for millets**

- o Providing special grants, tax holidays and/or other sops for example, 150% or 200% of expenditure spent towards R&D on millets can be eligible for tax deduction.
- o Policy support for channelizing funding through the 'Climate-Smart, Green funding' obligations from private venture capital, HNI and philanthropic organizations.

■ **Promoting R&D**

- o Improved R&D on agronomic traits (e.g., pests & diseases resistance, drought tolerance, improved yield), enhancing nutritional profile (e.g., Micronutrients content)
- o Promoting R&D on utilization of fractions (e.g., dietary fiber) in foods like atta.

■ **Strengthening millet value chain - Production**

- o Promoting millet based

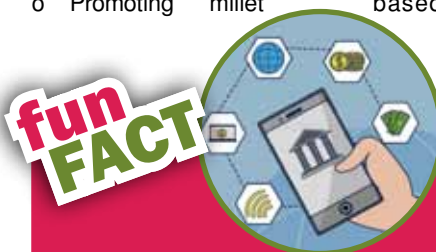
FPOs by synergizing various schemes (e.g., RKVY, PM KISAN, AIF)

- o Establishing primary processing units, dedicated storage, processing facilities, value addition at farm levels
- o Assuring marketing and procurement systems with participation from private players
- o Training & capacity building for millet farmers particularly for adoption of better varieties, judicious use of inputs, and financial literacy

■ **Demand generation**

- o Fostering culinary innovations and New Product Development through nurturing start-ups and entrepreneurs
- o Promoting wider awareness on the nutritional superiority of millets particularly among children
- o Inclusion of millets in existing government schemes such as mid-day meal schemes
- o Promoting millet consumption domestically and exports through promotional programmes, Buyer Seller meets, Road Shows, and expos etc.,

Other key issues that must be addressed on priority include crop diversification, training and capacity building for farmers to adopt GAP (Good Agricultural Practices); improving farmers' access to institutional credit; cutting wastage (on-farm and post-harvest); and enhancing storage, processing and value addition.



fun FACT

Mr Somayajula likes to write on social media on fintech, agtech and agricultural industry

CHEAPEST, SUSTAINABLE MODE OF WATER PURIFICATION

Project For Tribals in 3 districts of MP

Caritas India's Water and Climate India project launched in August 2021, supported by HELIOZ Global Services Private Limited (HGS), aims to provide safe drinking water to 28,700 households in tribal communities of Madhya Pradesh using the method of Solar Water Disinfection (SODIS) with WADI device, the project is implemented by Caritas India with the help of 2 partners (Khandwa Diocesan Social Services and Pragati Society) in 3 districts- Khandwa, Barwani and Jhabua. The project aims at providing households in rural Madhya Pradesh, with access to safe drinking water through the method of Solar Water Disinfection (SODIS) with



WADI- Water Disinfection device, to reduce the burden on the environment through an environmentally friendly water treatment practice and increase awareness on proper WASH-Water Sanitation & Hygiene measures on household and community level as well as environmental protection.

The 28,700 households covering a total population of 143,500 beneficiaries belonging to various marginalized communities rely on unimproved water sources for their drinking water needs and treat drinking water by either boiling the water on simple cookstoves using firewood or not treating the water at all due to common barriers (financial,

access, awareness).

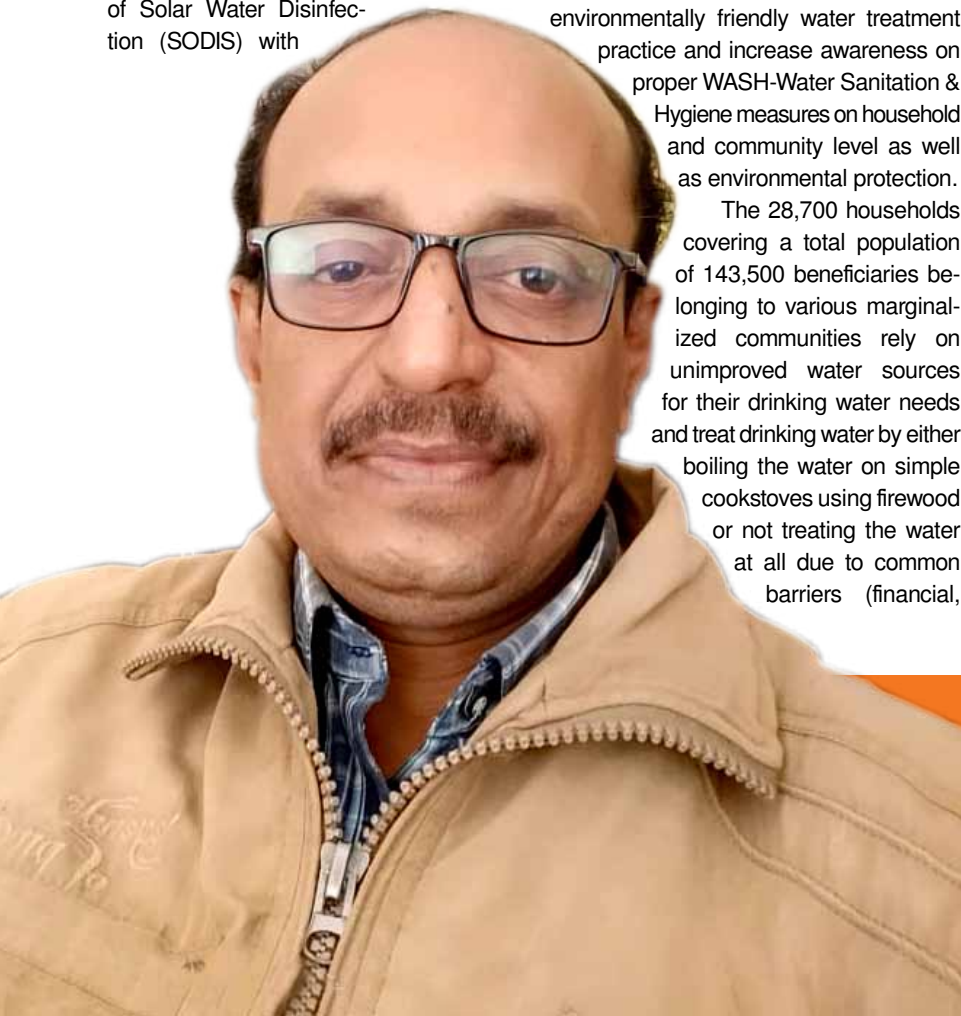
Increasing Access To Safe Water

The project aims to alleviate the burden on the environment as well as the risk of water-borne diseases caused by microbiologically contaminated water and increase access to safe water at point-of-use (household level) by raising awareness for WASH measures and water treatment using the method of Solar Water Disinfection (SODIS) with WADI. It specifically targets households in rural communities that do not have access to safe drinking water sources and disinfect the water by boiling the water using firewood on simple cookstoves (traditional chulha).

WADI device is designed for communities that are in need of an easy-to-use solution for water disinfection. The solar-powered device not only provides people with safe water daily, it also has a positive impact on the environment.

Adoption Of Technology By The Communities

With support of the project each household was distributed with a WADI device and 10-13 PET bottles (of 2 litres capacity) in all the 3 districts- Khandwa, Barwani and Jhabua. The combined kit of WADI device and matching bottles has reached in 28,700 households. This work is facilitated and done by the 21 CF- Community Facilitators with 2 Co-ordinators each, who work for both the diocesan partners (KDSS, Khandwa



About the AUTHOR

Mr Varghese Mathew is Program Associate- Technical Documentation, Water & Climate India, Caritas India



Bariya family along with Pet bottles after WADI treatment

and Pragati Society, Jhabua) and technical guidance and implementation done by Caritas India.

The communities are trained on how the WADI device and the bottles should be kept in sunlight for the whole day period (6-7 hours) and with help of UV rays the water in the bottles get disinfected and purified from all disease-causing bacteria and pathogens. The WADI device helps to

measure the intensity of UV rays needed to disinfect the water completely and potable for drinking. In the tribals there were many myths i.e., they do not drink stored water for more than a day and on daily basis they used to get fresh water from open wells and handpump sources but after the intervention of the project they are now changing their approach and behaviour towards it and collecting the water in the evening from all

the 10-13 bottles (20-26 litres water) and fill it in the pot and drink it the next day. In the meantime, they keep again the fresh lot of filled bottles from the sources and keep it in sunlight for the WADI and SODIS for the disinfection and purification process to be complete.

**Good Practices Adopted By The Communities
New Learning Of Water Disinfection - Wadi Technology**

Myself, Mrs. Babudi Bariya, W/O Mr. Nansingh Bariya resident of village Barod in Jhabua district, Madhya Pradesh. We have total 5 members in our family including children and have 1 acre of land for farming purpose.

Our family used to drink water from hand pump and open well sources which are near to our house and used to drink it after boiling water. It was found that mostly in general either someone or other gets sick with diseases i.e., dysentery, diarrhoea, cholera, jaundice, typhoid etc. For the treatment and curing of the disease's family had to spend Rs. 1000-1500/ month and the children suffered most as they were not able to go to school and attendance felt short always.



Collecting SODIS water in container for drinking



Using the same water for Roti making and cooking food



WADI device and bottle distribution done by the WCI project for the communities



WADI device is designed for communities in need of easy-to-use solutions for water disinfection. It is solar-powered



New technology of SODIS -Solar Disinfection being adopted by the communities



Training and capacity building done by the WCI teams for the tribal communities



Disinfection Process

From the WCI project we received 1 WADI device and 10 Pet bottles at the starting of the programme. We started to use as directed by the project staff after receiving training from Caritas India and Pragati Society (partner organization) staff. In the disinfection process WADI device along with the 10 Pet bottles (2 litre each capacity) are kept in sunlight from morning till evening for period 7-8 hours and then water is used for drinking purpose. Since we are using the WADI technology purified water, we have found in our family that lot medical expenses have been reduced drastically in the past 1 year duration and thereby reducing the fuel (firewood) consumption.

Finally, we as whole would like to share that now we are able to save money spent on medicine and time spent on wood collection from forest is saved. Economically we are able to save more than Rs. 15,000/Year on doctor fees and medicines for the whole family. Also it is environment friendly as we are using solar energy and not using other like electricity for water purification purpose. And we are all happy and thankful to Helioz and Caritas India for bringing changes in our lives which is very low cost and Sustainable for household use and poor people in the community.



Adoption of WADI device for solar disinfection technology by the rural communities



Villagers drinking the disinfected water after SODIS treatment



DIGITAL FARM SCHOOL REACHING THE UNREACHED IN TECHNOLOGY AIDED FARMING ERA

Digital Farm School (DFS), an initiative of Reliance Foundation (RF) is a useful technology-based platform that gives required thrust to cater to the needs of farmers across wider geographies. Group learning process through the digital platforms equips farmers with required skill sets for deeper understanding of their local Agro-ecosystem. DFS builds partnerships with farmers and other anchors in the ecosystem to build local knowledge system for sustainable food production.

Reliance Foundation piloted DFS with 100 paddy growing farmers of Villupuram district, Tamil Nadu. Pilot study analysis show that real time problem solving has enabled farmers to take right decisions on various aspects viz, seeds selection, soil nutrient management, pest & disease management etc and has resulted in reduction of input cost by 34% and increase of average yield by 11%.

Digital Version Of Farmer Field School

DFS is the digital version of Farmer Field School - a participatory education approach that brings together a group of small-scale farmers to solve production problems through sustainable agriculture.

Presently, there are many web portals and mobile applications that provide Agro or weather advisories to farmers. There are also many toll-free helpline call centers where farmers may call for queries/issues. But, there is no such



digital platform, where farmers' needs are comprehensively addressed with tailored solutions, depending on the season and phase of the crop through cross-learning with farmers and experts from institutions across geographies.

Institutional Partnerships

DFS functions through Institutional partnership that channels authentic information through advisories (WhatsApp groups, mobile-based audio advisories, Chatbot and YouTube Instructional video stream-

About the **AUTHORS**

Ms Jasbir Sandhu, Mr Mugilnilavan Palani, Mr Balakumar Sudalaimuthu, Ms Anjali C, Mr Jayakrishnan Govindasamy, Mr Ganesan Mutiah and Mr Senthilkumaran are with the Reliance Foundation

ing) and interactive programs (multi-location audio conference, multi-location video conference, RF Toll-Free Helpline). DFS learning follows the crop cycle right from seed selection to harvest.

Digital Farm School – Experimental study and Impact Assessment
Study area: Villuppuram district, Tamil Nadu

Villuppuram taluk has 235 revenue villages of which 10 revenue villages were randomly selected for the DFS experimental study. As per the District Agriculture department, there were 995 families involved in paddy cultivation in these ten revenue villages. Among them, 100 families (10 percent) were selected for the DFS study through a simple random sampling technique.

Study timeline - Timeframe targeted Rabbi Paddy crop cycle i.e. November, 2019 to March 2020.

DFS Knowledge Partner

RF associated with Perunthalaivar Kamaraj Krishi Vigyan Kendra (PKKV), Puducherry to carry out the experimental study with paddy growing farmers in Villuppuram district.

Problems statement as per Baseline survey

The findings from the Baseline survey carried out with 100 paddy-growing farmers across ten selected villages of Villuppuram taluk show high input cost and poor yield as issue. On average, the farmer spent Rs 19,560 to buy inputs, especially chemical fertilizers, pesticides, and seeds and got an average paddy yield was 2594 kg per acre.

Frequent pest and fungal infestation was also major problem that lowered the yield. Leaf folder, leaf blight, sucking pests in the vegetative stage and fungal infestation such as blast, and sheath rot disease in the crop maturing stage were major.

DFS engagement

DFS channeled its support through various digital platforms that linked the farmers with experts at each crop stage and promoted

Supporting Farmers At Micro-Level With Real-Time Solution

Increasing vulnerability in Agriculture due to climate change calls for real-time solutions. Farmers can no longer rely only on their local knowledge and past experiences to deal with unfamiliar problems and their intense impact.

Digital Farm School can support farmers at the micro-level with a real-time solution that fits specific local conditions and socio-economic conditions, thereby, allowing farmers to master the skills required for sustainable production.

The Impact Assessment of the pilot Digital Farm School in Villuppuram experimental study substantiates the positive impact in reducing the input cost, avoiding losses, and improving the yield. This reduced the input cost by 34%, increased the average yield by 11%, and increased the average income per farmer by 32.3%.

DFS works on real-time needs and challenges of farmers in a local ecosystem through group learning that equips farmers to take an informed decision to decode local agro-ecological threats.

‘Digital Farm School’ (DFS), an initiative of Reliance Foundation, is a useful technology-based platform that gives required thrust to cater to the needs of farmers across wider geographies. DFS builds partnerships with farmers and other anchors in the ecosystem to build local knowledge system for sustainable food production

iii. Mechanization of labour intensive activities such as use of Rotavator for plowing, Tray nursery, machine sowing, machine transplanting, mechanical Weeding – using Cono weeder and combine harvester saved the labour cost and time. Early transplantation (i.e 15 days against 60 days) of saplings resulted in increased tillers and ultimately higher yield. Right crop spacing eased the weeding process and improved crop health.

iv. Pest and disease management - Farmers are able to take informed decision and use recommended dose of pesticide and fungicides to get rid of leaf folder, leaf blight, sucking pest and blast disease.

Along with it farmers switched to cheaper and effective natural bio-stimulants eg. Panchakaviya, use of neem cake oil spray to control pests, use of cost effective ‘T’ shaped Bird perches and ‘Solar light traps’ to arrest the crop damage caused by birds and pests.

v. Nutrient management - Use

group learning, field observation, cross-learning. The advisories were disseminated on land preparation, seed selection-its processing and sowing, application of organic manures and fertilizer, pests and weed management, water management, reaping and threshing etc. For additional queries, farmers directly interacted with PKKV scientist through multi location video conference or called on RF toll free helpline number.

Best Practices promoted through DFS that brought the change

i. Seasoning agricultural land with Farmyard and Green manure instead of traditional chemical fertilizers to reduce the input cost.

ii. Seed treatment measures using bio fertilizers (pseudomonas) and Integrated Nutrient Management practices such as usage of compost, vermi compost and coconut wastes in Tray Nursery as substitutes for soil helped to get healthy seedlings and lowered the seed requirement.

Reliance Foundation piloted DFS with 100 paddy growing farmers of Villupuram district, Tamilnadu. Pilot study analysis show that real time problem solving has enabled farmers to take right decisions on various aspects viz, seeds selection, soil nutrient management, pest & disease management etc and has resulted in reduction of input cost by 34% and increase of average yield by 11%

of recommended dose of Strait fertilizer (symptom based i.e. change in leaf colour to light yellow) instead of random application of harmful chemical fertilizers

Impact created as per End line survey

Rise in Yield

- The graph presents the comparisons of the paddy yield obtained by farmers before and after the RF intervention.
- 11% increase in paddy yield, on an average from 2,590 kgs/acre to 2,885 kgs/acre.

Lowered Input cost due to better management practices

The cost of paddy cultivation was dropped by 34.41% after DFS engagement.

Rise in Income

- 32.3% increase in income per farmer
- With the adoption of better management practices, the cost of cultivation per acre has been reduced to Rs. 6,767.
- The savings in the input cost has proportionately contributed to the increased net income.

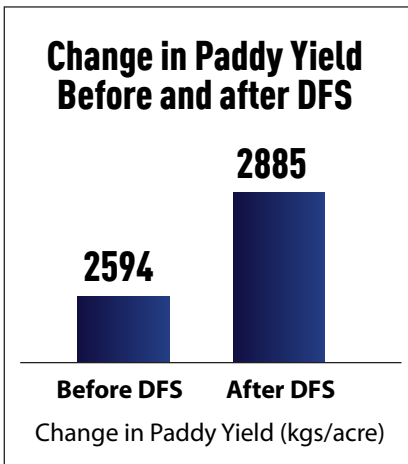


Supporting Farmers At Micro-Level With Real-Time Solution

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From DFS farm in Tamil Nadu

Harnessing crop yield, saves on Inputs and Adopts natural practices

‘Adopting natural practices has given a new life to the soil is much softer and I must say it breaths! The best part of DFS was that I don’t have to go anywhere. I continued my daily chores while attending the school,’ says Mr G.Velmurugan, Villupuram District, Tamil Nadu.

Raised the confidence and belief in organic practices

“I could arrest rice yellow mottle virus by applying an organic mix of fresh cow dung and water as suggested by DFS. Else, I used to rely to chemicals to overcome such problem.” Mr A. Vinayagamurthy, Gengarampalayam Village, Villupuram District, Tamil Nadu.

The Significance Of BUILDING AGRI-LOGISTICS

Budget 2023 must encourage areas of post-production infrastructure (supply chain, logistics), market support (market linkages, physical infra, digital trade), enablement services (finance, credit and insurance, transportation, quality assaying infra), connectivity infrastructure (IoT, Sensors etc.), agri informatics (big data), digital and emerging technologies (aerial imagery, automation, food traceability, artificial intelligence)

Mostly congenial time to commence deliberations on strategies to make India lead the sector globally is now! To promote the sector in achieving this objective, initial seeding must commence with focus on certain strategic areas.

About the AUTHOR

Mr Dushyant K Tyagi
is Chief Executive
Officer, Farmgate
Technologies Pvt Ltd
Fertis India Group
Company



Supply Chain Infrastructure

One of the eye openers from the Covid crisis is the significance of building agri-logistics and an efficient supply chain in agriculture sector.

It is expected that the government drafts policies encouraging enough to build infrastructure facilities for agriculture, critical of which are small cold storage facilities that can overcome supply chain issues - food wastage, storage infrastructure, adequate logistics etc. Financial incentivization as well as investments in these areas is the need of the hour to encourage businesses such in food processing, logistics, warehousing and silo storage.

Most mandis in India are yet to invest in upgrading infrastructure. State Govts play a crucial role in some states through setting up assaying labs, testing and drying machines. Unfortunately, big states such as Punjab and Haryana are still at a low pace in establishing this set-up. Inadequate infrastructure with regards to cold storage facilities is resulting in considerable losses during trade of horticulture, poultry and meat products.

Marketing facilities and mandi infrastructure

The government is expected to cover infrastructure requirements to achieve better marketing of agriculture produce. Unlike earlier schemes of the GoI that have been primarily focussing on production, it is time now to provide better marketing avenues for better price realization and that which is commensurate to the quality of produce.

Digital Marketplaces are the key. Exposure to more selling

avenues is the prime requirement to achieve better prices, which can only be attained from marketing digitally viz. digital buying and selling. Quick and better reach to a higher number of buyers creates competition for quality produce implying higher negotiation power and therefore better price to the producer.

e-NAM is one such successful program to set example for digital trading in agriculture at the national level. Studies indicate that the platform was able to realise higher prices to farmers at a time when prices were plummeting in manual markets. It is expected that the reach of e-NAM network expands and spread across the country to more markets, to reach the 2000 mark as announced in the last budget. States must be encouraged to build their own digital platforms/e-markets for agriculture or unified platforms, which could interoperate between them at the national and global level.

However, since trading in agriculture necessarily involves physical activity in the background, it is also important that digital markets can thrive in the long run only when facilitated with enablement services. Physical infrastructure of the mandis needs to be improved and modernised and encouraging for the buyers and sellers to conveniently do business.

Enablement Services

Logistics, credit & finance, insurance, sorting & grading and quality assaying are crucial to the success of agriculture trading activities. These end-to-end enablement services for transaction completion and delivery settlement, enhances business operations and achieves seamless fulfilment of orders.

Therefore, incentivizing agri value chain players and proactive policy support to encourage this area are critical. Technology intervened initiatives in this value chain such as farming as a service, delivery as a service, farm to fork, micro financing, farm mechanization etc all of which are making services more affordable to small farmers are needed to be encouraged by providing tax incentives to allow them to enhance their business



GOVT SUPPORT FOR DIGI TECH ADOPTION

It is expected that policies congenial to support digital technologies and their adoption will be apparent in the budget. Also investments from Govt. in these technologies and tax sops to businesses operating here is important.

Digital Agriculture Mission also plays a vital role with integrating data/ information and encouraging the above technologies.

It is needed that there is a substantial increase in budget allocation from last year with focus also on horticulture and animal husbandry. Also required is the need to make EXIM policy more agile.

operations. These services play a greater role in boosting trade across geographies viz. between states.

Likewise, NBFCs in agriculture sector have a vital role in supplying finance to small and marginal farmers, which should be offered tax benefits, just the way Govt. provides subsidized capital to NABARD.

Emerging Technologies

Emerging technologies in agriculture such as Internet of Things (IoT), Geographical Information Systems (GIS), aerial imagery – both satellite and drones, automation, mech-

anization, big data, artificial intelligence, machine learning etc. Currently adoption rate of these technologies in India may be slow but it soon catches up as with any other major transformation in this sector and are potential to achieving economic sustainability, by

- Optimized farm operations and minimal resources helping farmers increase yields while reducing costs
- Assurance of food sustainability from blockchain tech for transparency, controlled environment agriculture, and biotech
- Data for smarter decisions helping in optimal production at lower costs – automation, imagery analysis, IoT, sensors are paving way
- Reduced harm through chemicals and help conserve non-renewable resources

Potential technologies for radical transformation of farming by 2030 are Smart-crop Monitoring, Drone Farming, Autonomous Farming Machinery, Smart-building and equipment management and Smart Livestock Monitoring that could together unlock a value of \$400 bn.



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FACT**

Reading, listening to music
and off-beat travel

RECIPE OF A NUTRITIOUS BUDGET



sive and productive food value chains. Farmers should be promoted as nutrient providers and trained on a set of agriculture and agro-processing technologies and practices that contribute to the improvement of nutrition and increase of the farm and agribusiness-level productivity and revenue.

Bridging the gap between Agriculture & Nutrition

From increasing the availability of total calories, to specific measures on nutrient deficiencies, agriculture can play an important role in addressing nutrition security.

Positively impact household nutrition

Nutrient-enriched crops, bred to have higher amounts of micronutrients and can help provide essential vitamins and minerals. ICAR under the National Agricultural Research System (NARS) has developed 71 varieties of nutrient-enriched also known as biofortified cereals, millets, pulses, oilseeds, and vegetables.

For example, Iron biofortified Pearl Millet-having 30% more Iron than the regular variety- is ideal for arid regions in India, with low water needs and high heat tolerance. Besides providing up to 80% of daily iron needs, this variety is bred for early maturity, reducing its vulnerability to a range of climate-related risks. HarvestPlus has already published studies proving feasibility, impact, and adoption of biofortified pearl millet and wheat in



Now the time has come for India to be a shining example for the world in nutrition security as it has been in food security. In the agricultural budget for 2023, we call for a greater emphasis on nutrition & climate-smart farming, improved nutritional outcomes, and the creation of more inclu-

About the AUTHOR

Mr Ravinder Grover is Regional Coordinator-Asia, Harvest Plus

India. In human terms, adoption of these varieties by the farmers will likely mean far fewer people suffering from anemia, stunting, and other health and developmental issues linked to micronutrient deficiency.

Improving soil health

It is important to correct soil micronutrient deficiencies to support higher yields of more nutritious food. Forty-eight million soil samples collected and analyzed under the Soil Health Card (SHC) scheme in India revealed that 37% of the soils are Zn deficient and 34% in Iron.

Linking Nutrition & Agriculture

Feeling the country's nerve, PM Shri Narendra Modi has dedicated 17 biofortified varieties to the nations and announced that, by 2024, rice provided to the poor under any government scheme (PDS, mid-day meal, anganwadi, etc.) will be fortified. With India's efforts, The UN General Assembly also declared 2023 as the International Year of Millets.

To build the country's capabilities to fulfill its nutrition security needs, the ministry can look into the following points:

Increase expenditure on nutrition-focused agriculture R&D

The expenditure on agriculture R&D in India has been broadly hovering around 0.3 to 0.4 per cent since 2001. The amount spent on agriculture R&D is drastically low in comparison to many developed countries and with comparable developing countries. Its share in agriculture GDP is much higher in Brazil (1.8 per cent), Mexico (1.05 per cent), Malaysia (0.99 per cent), China (0.62 per cent) and in the high-income countries at 3.01 per cent.

R&D should also focus on nutrition smart agriculture technologies which are cost effective and can reach underserved, rural populations. Biofortification can play a key role here. An upfront investment in plant breeding can yield micronutrient-rich biofortified planting material for farmers to grow at virtually zero marginal cost. Post development,



Post-harvest value addition in millets is vital. We need startups to tap into this opportunity and promote a localized but diversified consumption of millets across India

nutritionally improved crops can be evaluated and adapted to new environments and geographies, multiplying the benefits of the initial investment. Once the micronutrient trait has been mainstreamed into the core breeding objectives of national crop development programs, recurrent expenditures by agriculture research institutes for monitoring and maintenance are minimal.

Developing Start-up Ecosystem for Nutritious Foods

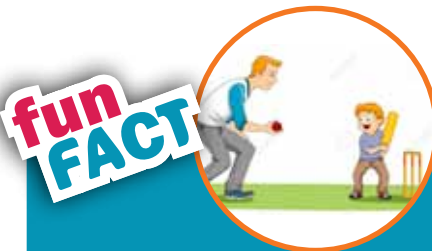
Post-harvest Value addition in Millets is the need of the hour. Expectations are already high from the Union Budget

2023-24 to focus on coarse grains or millets as means of sustainable cultivation that can raise income of small farmers besides providing food and nutritional security globally. And we need startups to tap into this opportunity and promote a localized but diversified consumption of millets across India. The Agriculture ministry has funded 66 startups to promote millet consumption, with more in the pipeline. This year there is a need to earmark funds focusing on a value chain approach and support startups for post-harvest handling, branding, and developing millet-based food items.

Inclusion of Nutritious foods in Welfare Schemes

With millions of people accessing the Public Distribution System and Mid-Day Meals daily, integration of millets and nutrient-enriched crops in them will help India alleviate malnutrition at a much greater speed. This means that both the objective and quantum of the budget should prioritize the nutritional needs of people, especially women and children.

India, the third-largest economy in Asia, is currently self-sufficient in food production and is running the largest food security program accessed by 80 crore people. There is an urgent need to shift focus to nutritional security and scale up climate and nutrition smart agriculture. Boosting biofortification, developing startup ecosystem for nutritious foods and Inclusion of nutritious foods in welfare schemes can be the priority areas.



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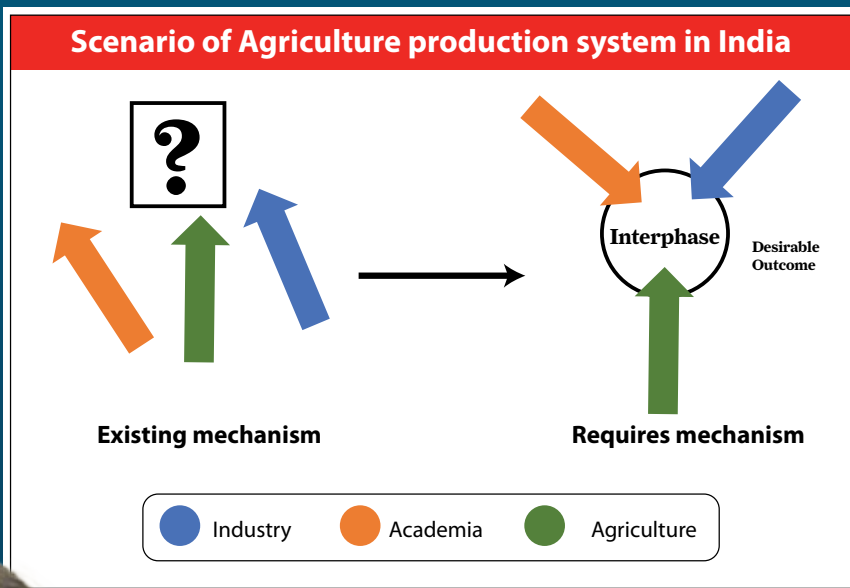
Mr Grover loves talking about everything and playing corridor cricket with his five-year-old son

Agriculture Production System, Industry, Academia

NEED FOR NEXUS

Demand and supply are two important components of the market that regulates inflation. In an agrarian economy like India, volume of agriculture produce, demand for particular commodity and their strategic marketing are the important aspects that determine the outcome from this sector.

With increase in population and limited cultivable land it becomes important to undergo diversification in agriculture, improve per unit production potential, reduce input cost of production and optimize the utilization of resources to increase the outcome from existing



ing resources. In addition to it mechanization of farms, use of advance agricultural techniques for cultivation and development of high yielding, disease resistant crops and livestock are the key area that requires immediate intervention.

To enhance the output from agriculture sector we need to examine every aspect of agriculture production system that includes identification of major contributors of agriculture

sector, their specific role in upscaling the production system. For agriculture development, in addition to the existing system we need to formulate strategies, develop concrete plans and implement them to uplift this sector for its higher proportion in national GDP. Identification of the individual sectorial responsibility and convergence of different agricultural subsectors on common platform are required.

Agriculture production systems rely on industry and academia to optimize the produce. Industry contributes through supply of farm inputs, procurement of produce and mechanization

About the **AUTHOR**

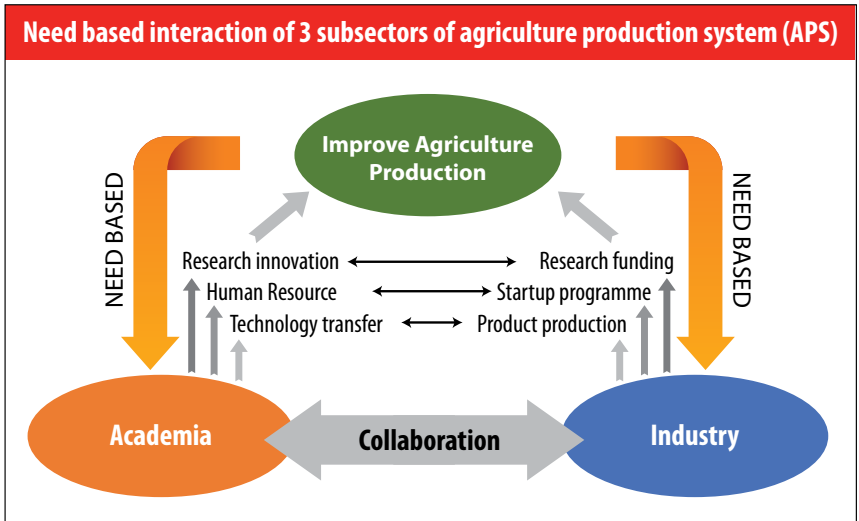
Dr Mukul Anand is Assistant Professor, Department of Physiology, DUVASU, Mathura. He can be contacted at drmukulanandvet@gmail.com

of agricultural farm production system. Need based technology generation is an important responsibility of academia both for the agriculture and industry. Altogether, agriculture production system, industry and academia need to develop a nexus for its efficient working. Incubation centers to promote startup and skill development programs are a recent example of efficient interface of industry and academia to promote agriculture. Academic institutes develop human resource but the dimension and extent of refinement that a human resource needs to develop skill to become a successful agriculture entrepreneur requires the intervention of industry.

Challenge Areas

What is lacking in Industry academia partnership that has limited the agriculture to achieve its optimum level? In India, we have well established industrial and academia sectors. But these two sectors work independently as a parallel system that lacks an interface between the two. Ideally, academia that includes universities and higher research institute should focus on need-based research. Indian academia lacks connect with the farmers and industry to decide the priority area for scientific intervention. This has misled the science from its original path especially in context of agriculture and allied science. Today, despite knowing about the difference in the agricultural practices and other factors we look upon the developed countries and follow their trend of research leaving behind our priorities. This has led to dependency of farmers on foreign technologies that are basically meant for their system and thus, outcomes don't replicate.

In India, the academic institutes are being funded by government. The accountability of their research is being evaluated in terms of publication. There is little assessment of research impact on farmers community and technology transfer to farmers. Unlike the top institutions of world where industry have the major stake in funding the research, involvement of industry in funding the research



programme is also lacking in India.

The involvement of industry in conceptualizing the concept of research and their involvement in the funding can make the research much more practical and focused for farmers. Academia requires to connect it with the industry and reorient itself to improve the existing agricultural techniques.

Meet Tech Deficit Gaps

For its excellent production system in

terms of technology, industry requires scientific assistance. Technology advancement of Agri based industries is a major challenge in country. Dependency of Indian agri-based industries on advanced foreign technology and import of farm equipment for cultivation itself explains the story of technological deficit in industrial production system.

With small landholding the need and requirement of Indian farmers are entirely different compared to the other developed nations. Industrial contribution to Indian agriculture can be effective only when the industry identifies the required agricultural practices and develop designs and mechanism for its use in existing Indian agrarian system. Industry requires to present the farmer-based needs to academia for conceptualizing the need-based research programme and develop mechanism that in real sense can optimize the agricultural outcome.

The industry and academia linkages should not be limited in seminars, workshops and technical sessions. The academia should design the research programmes and projects based on the inputs from industry. The academia and industry should connect for profitable outcome. There is a need of an interactive platform where in, academia and industry can share their requirement and need based research can be planned for the development of agriculture by linking the two components.

fun FACT

Dr Anand is fond of football, cooking and reading

NEED TO IMPROVE INFRASTRUCTURE, LOGISTICS



The recent years have witnessed a shift in the agriculture industry. Many entrepreneurs, also known as agripreneurs, have entered the field to promote sustainability, digitization, and mechanization to achieve prosperity and empower farmers. However, there are still challenges that need to be addressed in the sector

Some of the challenges are listed below.

- **Low productivity:** Despite being one of the largest producers of food grains in the world, Indian agriculture is characterized by low productivity levels due to outdated technology and poor infrastructure.

- **Water scarcity:** India is facing a severe water crisis, and agriculture is one of the sectors most affected by it. This is due to over-extraction of ground water, lack of irrigation facilities and inefficient use of water resources.

- **Climate change:** India's agriculture is heavily dependent on monsoon, and the changing weather patterns and increasing frequency of extreme weather events resulting from climate change are causing crop failures and reduced yields.

- **Soil degradation:** The overuse of chemical fertilizers and pesticides, combined with poor farming practices, has led to soil degradation and loss of fertility.

- **Dependence on rain-fed agriculture:** A majority of Indian farmers are dependent on rain-fed agriculture which

makes them vulnerable to the uncertainties of monsoons.

- **Lack of access to markets:** Many farmers in India lack access to markets, which makes it difficult for them to sell their produce at fair prices and limits their ability to invest in their farms.

About the AUTHOR

Ms Anu Meena is an IIT Delhi Graduate. She is the Founder of Agrowave. Ms Meena has featured in Forbes magazine '30 Under 30'. She has been engaged with agri-tech for six years and has worked with more than 5000 farmers



● **Availability of Infrastructure:** Poor post-harvest storage infrastructure has been a long-standing challenge for farmers, as it leads to significant losses in their produce. The lack of adequate facilities for storage, preservation and transportation of agricultural goods results in a significant amount of wastage and a decrease in the overall value of the crop.

Infrastructure & Logistics

The infrastructure and logistics systems in Indian agriculture have traditionally been inadequate, which has led to inefficiencies and losses in the sector. Many farmers have difficulty getting their products to market in a timely manner, which can lead to spoilage and reduced prices. Additionally, the lack of proper storage facilities can also lead to post-harvest losses.

In recent years, the Indian government has taken steps to improve infrastructure and logistics in the agricultural sector. This includes investments in building and upgrading rural roads, airports and ports to facilitate the movement of agricultural products. The government has also launched several schemes such as the Pradhan Mantri Kisan Sampada Yojana and Pradhan Mantri Fasal Bima Yojana to improve the post-harvest infrastructure and reduce the losses in the sector.

However, the government needs to continue to invest in these systems to ensure that farmers are able to get their products to market efficiently and at a fair price.

R&D and Innovation

Research and development (R&D) in Indian agriculture has been ongoing for many years, but the level of investment and the impact of R&D has been limited. The Indian government has recognized the importance of R&D in the agricultural sector and has taken steps to increase investment in this area in recent years.

The Indian government has launched several initiatives such as the National Agriculture Development Programme (NADP) and the National Mission on



Ms Meena is an enthusiast of psychology and philosophy. She enjoys observing people's behaviour

Agricultural Extension and Technology (NMAET) to increase investment in R&D and technology transfer to farmers.

However, there is still much room for improvement in R&D in Indian agriculture. There is a need for more investment in R&D and a greater focus on applied research that addresses the specific needs of farmers. Additionally, there is a need for better coordination between research institutions, farmers, and the private sector to ensure that research findings are effectively translated into practical solutions for farmers.

Overall, R&D in Indian agriculture is a key area for growth, as it can lead to the development of new technologies and practices that can increase yields, reduce costs, and improve the livelihoods of farmers.

Women Empowerment

Agriculture is considered as an engine

of economic growth. It builds a healthy and prosperous economy. Women play a crucial role in building this economy. The role of women in agriculture is vital, yet often overlooked. Women make up a significant portion of the agricultural workforce in many countries, and they play a crucial role in producing food and supporting their families and communities. However, they often have limited access to resources, such as land, credit, and technology, which limits their productivity and income potential.

Despite their vital role in agriculture, women often face significant barriers to participation in the sector. They may face discrimination and lack of access to education and training, which can limit their ability to improve their skills and increase their productivity.

Addressing these barriers and increasing support for women in agriculture is crucial for improving food security and rural livelihoods. This can be done through targeted policies and programs, such as providing access to land, credit, and training, as well as supporting women's organizations and cooperatives to achieve feminization of Indian Agriculture.

The government should set aside specific funding to recognize and support the hard work and contributions of women farmers, who have historically gone unrecognized.



OUR NATION NEEDS AGRICULTURE TRANSFORMATION



About the AUTHOR

Mr Deepak Pareek, an agriculture strategist, has been honoured by World Economic Forum. He is a global influencer in the agriculture and technology domain being a regular speaker, moderator and evangelist

The opportunity of transforming agriculture is what government should be looking at – not as not the silver lining but a bright light to guide us.

This is critical based on the turbulent past three years which puts serious stress on food security as well as farmers' livelihoods.

The agriculture and allied sector is expected to grow by 3.5% in 2022-23 as compared to 3% in 2021-22. Agriculture has been a bright spot to keep the economy shielded from uncertainties to some extent during the past three years. It is time we initiate steps to ensure we achieve 7% annual growth in the sector over the next ten years.

While agriculture has shown strong

resilience, yet many challenges exist. These need structural changes and higher investments. A US\$ 200 billion investment in the sector has the potential to more than double the contribution to touch US\$ 1 trillion. We need a substantial increase in budget allocation from the previous year's US\$ 17 billion (4.5% of the budget) to the sector.

Higher Allocation To Horticulture And Animal Husbandry Sub-Sectors Is Vital

The share of the crop sector in agriculture's GVA was 55.3% while the non-crop sector contributed 44.7%. This is also corroborated by the Situation Assessment Survey which found that on average, a farm household earned Rs 10,218 per month out of which Rs 3,798 came from crop production and Rs 1,582 from animal husbandry.

Schemes For Modernization Of APMC Infrastructure

Nearly every APMC needs to invest in upgrading its infrastructure. In some states, funds were provided by the state governments to APMCs for installing testing and drying machines, under Rashtriya Krishi Vikas Yojna (RKVY) but such equipment is not available in most APMCs. Investments in this area must be promoted by making incentives available for private sector players to set up this much-needed infrastructure.

Digital Agriculture Mission - Multifold Increase In Allocation, Coverage

The mission has not been cohesive with a lack of resources. The mission will be able to perform well if the government moves away from the approach of an interventionist to a main player in the ecosystem. A clutch of MoUs will not enable the use of advanced technologies in Agriculture. Having a few hundred crores as a corpus to invest in AgTech startups will serve not the purpose. Both are counter-productive as it takes away the focus.

The government will need to own and



invest in digital infrastructure. We are already seeing states trying to implement the digitization exercise in a piecemeal manner which will make it more inefficient. The government will have to take it as a UIDAI-like initiative and allocate US\$ 5 billion for the same by setting up an Agriculture Digitization Authority.

Better Incentives For Agriculture Value Addition

The government is implementing the "Production Linked Incentive Scheme for Food Processing Industry (PLISFPI)" to support the creation of global food manufacturing capabilities commensurate with India's natural resource endowment and support Indian brands of food products in the international markets with an outlay of Rs.10900 crores.

The scheme period is from 2021-22 to 2026-27 and has not shown the desired outcomes because it limits it to four major food product segments viz. Ready to Cook/ Ready to Eat (RTC/RTE) foods including Millets based products, Processed Fruits &

Vegetables, Marine Products, and Mozzarella Cheese. We need to broaden this to include all segments which can lead to value addition. Further, PLI schemes are also required to increase productivity at the grassroots level at the farm gates as well for which more allocations must be made.

Reduction In Fertilizer Subsidies Needed

This is vital for financial prudence and reforming agriculture.

While the last budget allocated US\$ 18 billion for fertilizer subsidies yet the total bill for 2022-23 might end up close to US\$ 26 billion. This was predominantly due to the historically high cost of fertilizers in the global market. India consumes 20.5 million metric tons (MMT), produces 13.8 MMT, and import approximately 6.8 MMT of nitrogenous fertilizers, similarly for phosphate fertilizers it consumes 8 MMT, produce 4.7 MMT and import 3.3 MMT and for potash, its total consumption of 3.3 MMT is met by import.

The current fertilizer usage and financing pattern is financially unsustainable. It is leading to distortion in nutrients being provided for farming. It is high time the practice be stopped.

The fertilizer subsidy must be cut to 50%, especially for nitrogenous and phosphate fertilizers. This should be supplemented by providing more incentives for the production and application of biological fertilizers which currently are less competitive due to subsidies.



THE ROADMAP

Some Of The State Bureau Chiefs Of The Agriculture Today Group share vital inputs for policy direction

MR NARENDRA SINGH MEHRA State Bureau Chief, Uttarakhand



- Reduction of GST on agricultural machinery
- Need to increase the use of green energy. GOI must promote hydroelectricity, wind power, solar energy for works related to agriculture.
- List of products under purview of Ministry of Agriculture should be increased, like Tea, coffee, spices etc. They will get benefit of agricultural policies. This will boost their export. Currently, they are part of Ministry of Commerce.
- Limit of Kisan Credit Card should be increased for marginal and small farmers. This will increase production, lead to farmer prosperity.
- Ban on export of agricultural products like wheat should be removed
- Import of those agricultural products should be banned whose price is less than MSP.

MR RAKESH JANI State Bureau Chief, Gujarat



- Farmers need higher technology involvement and support. All agricultural universities should have a science and technology department for higher focus on sustainable farming techniques, especially for small and marginal farmers.
- All engineering and management colleges should include agriculture as a subject
- GOI must focus on farmers' education in best farming practices suitable for their area. This will mean saving on labour cost, water conservation, quality food generation, quality storage logistics
- Farmers must be extended with the required financial support

MR RAJU NARASIMMAN State Bureau Chief, Tamil Nadu



- GOI support for farmers must increase from Rs 6K to Rs 12 K
- GOI should provide subsidy for vital agricultural equipments
- GOI must charge low rate of interest on loan given to farmers
- GOI must provide policy support so that farmers are able to sell agricultural products at the right price
- GOI must start agricultural co-operatives societies in all villages. These must be linked across the country so that farmers get all-India market for their produce
- Farmers should be given shops in agriculture mandis. Mediators should be removed from mandis.
- GOI should provide separate budget allocation for agro-forestry

MR JYOTI BIKASH NATH State Bureau Chief, Assam



- Urgent need to introduce and promote climate resilient technologies
- Old redundant practices must be replaced with progressive agriculture technologies
- Strict policy and budget allocation to save agricultural land, improve soil health
- Subsidise farmer input costs, ranging from seed to machine.
- FPOs need budget allocation to establish facilities for storage, drying processing.
- More Custom Hiring Centres in villages to boost mechanization.
- Farmers must be trained in sharing and easy access of the best management practices, agricultural information including day to day market price, availability of input and other related information
- Provision of MSP for each and every agricultural commodity

MR RAKESH DUBEY, State Bureau Chief, Madhya Pradesh

- GOI should train farmers in adoption of digital technology for agriculture
- GOI should promote good agricultural practices for widely accepted accreditation such as carbon credits, which will make the produce fetch higher rates domestically and internationally
- Ban on rice wheat export has adversely affected farmer income. Such conditions should be handled with functional contingency plans to prevent farmers from incurring huge losses
- Ban on agricultural produce and products should be imposed only if GOI makes sure that farmers are not going to suffer losses.
- International participation in India's agricultural produce will ensure quality consciousness. It will help increase the share of farming in GDP, raise our economy
- Domestic produce and processing of edible oils such as soybean oil, groundnut oil and sunflower oil should be promoted
- GOI must extend support to farmers in helping them to grow high value crops, train for value addition. This will increase farmer share in profit
- GOI must boost vertical farming in barren, high terrain areas etc.

**MR UMESH CHANDRA SHUKLA
State Bureau Chief, Uttar Pradesh****Challenges Faced By Farmers**

- Need to connect youth to agriculture, promote dairy, food processing
- Boost avenues for marketing of village products – agro and non-agro
- Companies should make products and bio-fertilizers from cow dung and cow urine. Farmers should be trained similarly.
- Agricultural labour should be linked to MNRGA
- Solar pic should be promoted for use of pump sets, small agricultural machines
- Need huge efforts for water conservation through public participation and government help

**MR SATISH BABU, State Bureau Chief, Andhra Pradesh**

- GOI must promote cow-based natural farming
- GOI must stop import of milk powder. GO must increase price of milk collected from farmers.
- Higher adoption of cow-based natural farming will lead to better soil health, low water consumption, low chemical use, increase of nutritious value of productivity and many other benefits.

**MR GIRENDRA NARAYAN
State Bureau Chief, Bihar**

- Farmers must have right to decide MSP. It must be followed strictly.
- Agriculture Infrastructure needs high investment and growth
- Coarse grains must be promoted
- GOI must be aware of production price of farmers and compensate them accordingly
- Small godowns should be constructed on large scale for storage
- GOI must fix the price of aromatic plant oil. Synthetic aromatic oil should be banned.
- Kisan Samman Nidhi should be increased to at least Rs 12,000 annually

**MR AFFAN YESVI
State Bureau Chief, Jammu and Kashmir**

- GOI must introduce model farms for all sectors of agriculture and livestock. Farmers can visit these farms to learn correct farm practices to save cost, ensure prosperity
- GOI must boost soil health care and management at farmer level
- Farmers need regular training in how to choose correct inputs, use them wisely
- Farmers need training for better practices of post-harvest management, marketing
- There is huge need for more cold storage infrastructure across J&K
- There is need for greater thrust for bio-fertilizers, other biological farm inputs
- J&K needs more Custom Hiring Centres



NUTRIFRESH AIMING TO BE INDIA'S LARGEST SOIL-LESS FARMS



Mr Sanket Mehta with Mr Ganesh Nikam

C OVID propelled Indian consumers to re-visit their daily food habits and adopt lifestyle changes in terms of eating and fitness habits. There has been an impetus on eating healthy foods that are hygienically grown. Consumers are demanding healthy, pesticide-free, and residue-free food.

As an agri tech startup operating since last three years under the name of Nutrifresh Farm Tech India Pvt Ltd., having operations in Pune and Mumbai currently running a 33cres farm, we are into soilless and hydroponic cultivation. Nutrifresh is the only Hydroponic grower that boasts of over 42 SKUs of fruity vegetables such as Bell Peppers, Cherry Tomatoes, Zucchini, Seedless Cucumbers, and Broccoli, as well as leafy vegetables such as Lettuces, Spinach, Fenugreek, Coriander, Mint, Kale, Arugula, Celery, Parsley, and Mustard Green, and herbs such as Oregano, Thyme.

Nutrifresh now sells its products to over 100 B2B aggregators in India, as well as modern trade aggregators and delivery partners such as Nature's Basket, Big Basket, Swiggy, Kissan Connect, and Zomato Hyperpure.

Nutrifresh is co-founded by two agripreneurs, Sanket Mehta and Ganesh Nikam. Nutrifresh is one of the few farmers with ISO, FSSAI, APEDA, HACCP, and GLOBAL GAP certifications.

USD 5 Million Raised

Nutrifresh has raised USD 5 million in pre-series seed capital. The funding is led by Mr. Theodore Cleary (Archer Investments), Mr. Sandiip Bhammer (Managing Partner - Green Frontier Capital), Sky Kurtz (CEO & Cofounder of Pure Harvest UAE), Mr. Mathew Cyriac (Florintree Advisors & ex MD of Blackstone India), Dr. Soumitra Dutta (Dean Elect - Saïd Business School, University of Oxford), Mr. Shaishav Dharia (Regional CEO, Lodha Group), Mr. Karan Goshar (Samarthya Investment Advisors LLP) among others, for setting up India's largest soil-less farms. The funds will be used to expand farm operations, implement total traceability and transparency of output, market products, and develop an integrated farm-tech platform.

Nutrifresh has an established protected growth facility that uses high quality seeds from Israel and the United States, where air is given in controlled amounts, water is RO cleansed, and nutrients are water-soluble. From seed procurement to germination, nursery, harvesting, packaging, and finally delivery to the end user, the entire production is under control. The produce is delivered to the consumer within 24 hours of harvest, demonstrating that the supply chain is fully linked and in sync to ensure consistency of freshness.

Budget Expectations

- To be recognized by GOI as part of the Horticulture Department where the policies of Horticulture extend to hydroponics.

- Request to be seen as part of the exceptional Agricultural Infrastructure Fund (AIF), Ministry of Agriculture and Farmers' Welfare, GOI

- Labels such as "Organic" labels and certifications are given to various Agri-based companies by the Agriculture or Horticulture Department. We request a proper Label that will classify residue-free or soilless cultivation produce. A proposal has been submitted for labels like "Residue-free", "Safe Food" and "Sustainable Farming" for the CEA model farms. As an industry, we are willing to curate



Nutrifresh has raised USD 5 million in pre-series seed capital for setting up India's largest soil-less farms. The funds will be used to expand farm operations, implement total traceability and transparency of output, market products, and develop an integrated farm-tech platform

a detailed checklist of norms and regulations for these categories of produce.

- Farm operations require the use of solar motors and electric tractors. Use of pumps and other machineries are also evident. But these are expensive and a request has been to receive subsidies to the soilless farming sector for the use of these machines and motors. These subsidies for the first couple of years will promote the use of solar and electric equipment and will reduce industrial pollution and thus be environment-friendly. It will help penetration into the orthodox Indian markets.

- A Horticulture Park has been proposed to the government where these hydroponic companies can trade fresh, organic fruits and vegetables. Government of Maharashtra recently announced an MIDC Floriculture Park. Similarly, open field cultivation in a protected environment will enable the growth of horticultural crops in one area.

Open field cultivation includes certain crops while protected cultivation can

produce various crops. These clusters will boost setting up of processing units, thereby formulating the entire supply chain. The aim is to build communities and increase employment.

- Special subsidies for Mega projects are given by the government for many industrial MSME units. As of now, there are no Mega Project Incentives for CEA models or Horticulture Parks. A proposal has been made for incentives for Mega Projects in particular zones. This could be under terms and criteria like 50 acres plus projects including indirect and direct employment. The intention is to increase cluster-based horticulture parks while upholding cost-effective projects.

- The hydroponics sector is also looking for consideration on GST Returns. A request has been made to the Central Board of Indirect Tax (GST Department) in this regard.

Currently, the procurement of agricultural inputs and cape-related materials attract heavy GST. The final produce from the farming is sold as fresh produce in the market and therefore does not attract GST. Thus, the input credit the company attracts is much larger since they do not have set-off like other MSME companies.

MSME Companies are allowed to take credit on Input GST for operational expenses and machineries. These can be set off by goods and services that are later sold in the market. This helps boost Industrial Development. The same needs to be done for the Horticulture sector and the CEA Models. Refunding Input GST will boost the horticulture economy throughout the country.



India Ka Pranam Har Kisan Ke Naam



The dedicated hardworking farmers of India deserve recognition. Year after year our farmers who battle great odds and adversities to make India self-sufficient deserve our salute.

For the last 4 decades, Dhanuka Agritech Limited is working with farmers and moving forward together. During this journey, Dhanuka took a pledge to bring prosperity in the lives of these farmers using advanced tools and technology. Dhanuka's trained field force is empowering farmers with new age ways of increasing farm yields and crop production.

Dhanuka is committed to bringing a positive transformation to the lives of farmers. At Dhanuka, we believe every citizen of India will salute the farmers for their dedication, determination and grit.



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