



## “Integrating Climate Resilience Into Agriculture Is Vital For Safeguarding Our Food Future”

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### "To Combat Climate Risks, A Transformative Approach To MSP Is Essential For Farmers' Livelihoods"

**Intro:** These days we talk a lot about climate change and ruined agriculture. But what's the strategy to combat the former for betterment of the masses? On **Socio-economic Voices** this week we have Agricultural Economist **Dr. K J S Satyasai** who highlights the urgent need for integrated policy frameworks to tackle the multifaceted impacts of climate change on agriculture. Speaking to senior journalist **Mahima Sharma**, Dr Satyasai emphasizes that food security hinges on innovative approaches, including the reevaluation of the Minimum Support Price (MSP). In an exclusive conversation with **Indiastat**, he calls for a collaborative effort to empower farmers, enhance resource access, and promote sustainable practices, setting the stage for resilient agricultural systems in an increasingly uncertain future.

**MS:** Given the increase in extreme weather events and erratic climate patterns in the last five years, how do you assess the vulnerability of global agricultural systems, particularly in low-income countries India?

**Dr Satyasai:** The vulnerability of agricultural systems is here to stay under business as usual scenario. First step towards addressing the vulnerability is to measure it and understand the factors that lead to it. There is a reasonably well developed climate risk - vulnerability framework in place where climate risk arises as a net result of vulnerability, exposure and hazard. The IPCC Fifth Assessment Report has suggested this framework where Risk is the potential for consequences where something of value is at stake and where the outcome is uncertain, recognizing the diversity of values. Risk results from the interaction of vulnerability, exposure, and hazard.

**Vulnerability is the propensity or predisposition to be adversely affected. Exposure is the presence of people, livelihoods, species or ecosystems, environmental functions, services, and resources, infrastructure, or economic, social, or cultural assets in places and settings that could be adversely affected. Hazard is the potential occurrence of a natural or human-induced physical event or trend or physical impact that may cause loss of life, injury, or other health impacts, as well as damage and loss to property, infrastructure, livelihoods, service provision, ecosystems, and environmental resources. The ICAR-CRIDA, Hyderabad has done pioneering work on assessing vulnerability index for all districts and sub-district levels.**

**There are two issues here to be taken care of.**

- **One, the assessment depends on the indicators used.** Any deviation in the indicators and their specification can lead to differences in the assessment. I have demonstrated earlier how a given district in Uttar Pradesh, India was classified as most vulnerable and least vulnerable by two scholars.
- **Two, the availability of reliable data uniformly across various districts poses serious challenges, especially at sub-district level.** In the particular case of India where every now and then new districts are carved out, the

assessment is exceptionally tricky and temporal comparison will be near impossible.

**MS: What better policy framework is required towards a more climate resilient agricultural economy also, to mitigate the economic losses farmers face?**

**Dr. Satyasai:** It's difficult to evolve policies towards a climate resilient agricultural economy in a country of India's proportion and diversity. However, the policy framework should take care of interdependent areas such as pre-production, production and post-production phases covering biological, physical and socio-economic realms. **The policy areas should, for instance, include crop varieties, credit, insurance, infrastructure and marketing duly reckoning with the interplay among these areas.** A priority risk coping strategies crop/variety selection, irrigation for drought proofing, interlinking water corridors for flood management, are crucial to protect farmers incomes. Insurance is the single most important factor in indemnifying farmers from economic losses.

**MS: Recent global reports have indicated a significant rise in food insecurity in 2024, especially in regions like Sub-Saharan Africa and parts of Asia. How much of this crisis do you attribute to policy failures versus environmental challenges?**

**Dr. Satyasai:** It is not easy to segregate food insecurity and attribute it to either of the factors listed above, viz., policy failure or environmental challenges. **I would word it to say that the food problems we are inheriting are more due to the slow and inadequate response of policy making to climate change as a phenomenon.**

The climate change and policy response happen with a lag due to poor climate education at higher levels of governments and corporations that matter. For instance, we all know that groundwater depletion is happening irreversibly across most parts of India which has emerged as a major environmental challenge. **Show me at least one state that made any policy decision to arrest it.** Andhra Pradesh (combined state), India has made a WALTER Act, 2002 which was to take care of these things. However, no one knows what happened in actual implementation. Similarly, spacing norms between wells are followed more in violation. It is one thing to have a policy and quite different to implement it.

**MS: While agri-tech has seen huge advances in 2024, especially in AI and precision farming, adoption rates among smallholder farmers remain low. What are the key barriers to widespread adoption, and how can governments address these?**

**Dr. Satyasai:** Like adoption of Green Revolution or any other technology, there will be lag in adoption in case of AI, precision farming, etc. We scouted across the country during 2021-22 to identify progressive farm innovations and technology adoption and published the case studies. The report is available on NABARD's website. We learnt that there are many farmers who innovated and adopted advanced technologies such as drones, better farming practices, remunerative crops, integrated farming systems and so on, even in the geographically challenged places. Though we just documented a score of them, the experience showed that agriculture is dynamic and quickly adapting to the new-gen ideas. However, the scale of adoption is yet to be higher.

**Apart from socio-economic reasons, what else limits the technology adoption is as below:**

- lower incomes
- lower social status
- lack of education
- inadequate physical infrastructure such as electricity, irrigation, connectivity, etc.
- low digital rural connectivity (internet),

Governments have been addressing most of the above constraints. They alone cannot make it happen without private sector engagement. Governments should remain enablers and encourage private players. Predominance of

small and marginal farmers and tiny, fragmented land holdings poses serious constraints to technology adoption. Building the network of Farmers' Producer Organisations into a platform that can serve as the delivery points and anchors to include small and marginal farmers in the process.

**MS: With trade tensions between major economies like the US, China, and Europe still impacting agricultural exports in 2024, how do you foresee these disruptions affecting food prices globally?**

**Dr. Satyasai:** Global meltdown of 2008, Covid pandemic of 2019-20, geopolitical situations arising out of the Ukraine war, tensions in the middle east, Bangladesh unrest, adverse relations among countries, etc have caused serious impact on global food prices impacting food importing countries severely. Trade wars between major trading countries can lead to dumping elsewhere, and cooling of food prices. **Supply chain disruptions, supply shortages, export restrictions, currency fluctuations, etc lead to price volatility.** Countries often resort to price and non-price trade barriers to protect their producers and consumers.

**Ironically, a small country like Ukraine could impact even a large country like India while the latter has limited influence due to low export volumes.** Recent permission for rice exports has led to a 10% fall in global rice prices, as reported speaks about how a major producing country like India can influence global food prices. The solution for preventing global food price volatility is to collaborate across trading countries and diversify import sources.

**MS: With food-insecurity staring at the world in face, deforestation and land-use changes have continued to expand despite global efforts to combat them. How do you propose balancing agricultural expansion with the urgent need for environmental conservation?**

**Dr Satyasai:** Deforestation and land use changes are two major factors behind food insecurity. The United Nations Convention to Combat Desertification's (UNCCD) estimated that the global extent of land degradation is between 20-40% of the total land area, directly affecting nearly half of the working population and spanning the world's croplands, drylands, wetlands, forest and grasslands. **For instance, allocating more land for non-food crops and for biofuel crops reduces food availability. Utilizing forest lands for alternative uses such as tourism, industrial and farming purposes can have a long term adverse impact on the environment.** Urbanization has disturbed the land use balance due to demand for residences and other amenities.

The UNCCD's Performance review and assessment of implementation system, Seventh reporting process for India, 2023, reports that deforestation changed tree-covered areas into crop lands and urbanization led to change of land use from crop lands, tree-covered areas, and grasslands to artificial surfaces such as buildings, factories, etc. **Given these challenges that reduce land availability for crop cultivation, the major interventions should focus on increasing productivity, reclaiming the problem soils (acidic, sodic, etc), diversifying towards non-land based (i.e., animal and sea based) food sources, among others.** In a country like India where land holding size is dwindling and large numbers of farmers are marginal, institutional innovations like the FPOs, Cooperative farming, etc, need to be scaled up. Natural resource management interventions such as participatory watershed development, Joint Forest Management. Setting the right policy matrix, of course, is important.

**MS: Synthetic biology and lab-grown foods are being touted as potential solutions to global food shortages in 2024. Do you believe this technology can scale to meet global demand, and what are the economic implications for traditional farmers and rural economies?**

**Dr Satyasai:** Food shortage is a serious issue. But one has to understand if the shortage is due to supply problems or poor distribution. They need different approaches. The question assumes supply is the problem and considers supplementing with synthetic lab grown foods. **First, we find food wastage is there on a large scale even in countries like India** which has seen food shortages not very long ago and even today a sizable undernourished and hungry population exists. Some sections of the society have access to unlimited food while others go hungry as they

cannot afford to buy food. This has to be addressed (already being addressed through the Food Security Act and supply of free/subsidized grains to the majority population) in the short run and ensuring higher purchasing power to the low income population through various inclusive income generating schemes.

**Coming to scaling up food supply** through synthetic and lab-grown foods, I feel there are limits to such solutions. The nutrition content may not be as balanced as the natural foods. The cost of production may be high. The cost to the economy may be very high as even today 50 to 60 % workers still depend on agriculture for their livelihood which gives them purchasing power needed to buy food. Most of them may lose their livelihoods if we start producing food in factories.

**Further, I am skeptical about the capability to produce as much food as needed in a country like India.** Our Indian food preferences by most people even today are very specific and determined by taste and appearance rather than mere nutritional content. Producing artificial arhar dal did not get much momentum mostly because of this.

**MS: Agricultural debt crisis continues to worsen, particularly in developing nations like India where farmers are heavily reliant on credit. Is there any realistic solution to the debt traps faced by smallholder farmers?**

**Dr Satyasai:** The above statement kind of indicates that most farmers are reliant on credit. Surveys do not support this. Eg. NABARD's NAFIS 2016-17 or NSSO's situation assessment Survey, 77th round put the incidence of indebtedness to around 50%. This is from all sources- formal and informal. **Also, NAFIS survey tells us that around half of the farmers are not willing to borrow.**

Still, indebtedness is a serious problem especially when they borrow from private money lenders who charge upwards of 24% to 36% per annum. That farmers are in debt trap has been noted even before Independence in British India. But solutions are eluding us. Institutionalization of rural credit in India has been done through social control, Nationalization of banks, strengthening cooperatives, incorporating Regional Rural Banks, SHG movement (microfinance) and various other innovations that have taken us so far and future efforts should be not more of the same but more of different interventions. **For the cost of reaching the last mile disproportionately increased and traditional institutions and approaches cannot help further inclusion.**

**Transaction costs (including cost of delivery) should be reduced. Cost of credit too should be kept optimal.**

Some of the innovations like KCC need revamp to serve the original purpose. Right now rural credit became a political tool and during every election poll promises include loan waivers. This vitiated the credit market by distorting it. Now it is time the relief to farmers be given without distorting credit markets. **The element of trust between the banker and customer, the crux of banking philosophy, must be brought back.**

From farmers' angle, credit related education has not been imparted to them. Hence, they resort to financial imprudence adding to their debt burden. For instance, they take money and divert it for non-intended purposes, money being fungible. This renders their project short of funds and the project benefits will not flow as expected. Financial discipline for farmers must. **Farming costs have been increasing over the years without check, reducing the net incomes (even making them negative for small farmers) and repayment capacity. Technology adoption, improving the package of practices that encourages efficient input use, reducing post-harvest losses, proper marketing facilities, are a few steps to be taken.**

**MS: And what should be the practical solution to deadlocks over matters like the MSP and more?**

**Dr Satyasai:** Originally MSP is supposed to be the price at which the government is willing to buy any quantity of produce from farmers if the prices fall below market prices. From this stance which was needed to encourage farmers to grow more food during the mid sixties without getting affected by output price fall due to glut. The policy

did not run as such and buying at MSPs has been a routine irrespective of market prices, that too in limited geographies.

**Hardly 12% of produce is covered by MSP and that too mostly in Punjab, Haryana, Andhra Pradesh and Tamil Nadu. I consider the policy a failure as it failed to get reasonable prices to farmers, say in Eastern India, who still get much lower prices than MSP for their produce. The policy benefits rich states where farmers have better bargaining power and enjoy well developed marketing facilities.**

The policy was brought in during severe food shortages and should the same policies be continued even when we are food surplus? Another question is can we keep on increasing MSP year after year endlessly to keep the economics of farming attractive? The answer is no for both.

**Also, consider if MSP is kept high artificially ignoring the market forces and global supply-demand dynamics, who will at the price?** It doesn't make business sense to traders and businesses. It does not equally make sense for governments to buy unlimited food stock at high MSP and sell at higher prices. Consumers cannot afford very high food prices. Then, food subsidies swell beyond the fiscal capacity.

**Farmers should be provided efficient marketing services and better technologies** for production and post-production stages, and in case of severe exigencies Govt should step in providing compensation over and above the indemnity received from insurance companies. Insurance and other mechanisms available for ex-ante and ex-post risk coping for farmers. **Farmers are economic agents who have to participate in the whole system on their own merit rather than constantly being propped up by governments.** The role of the government is to provide policy direction to enhance R&D, Technology generation and adoption, provide enabling infrastructure, **provide rule-based and efficient safety nets, etc., rather than directly pumping money and trying to over-protect. Markets should be allowed to function and serve farmers** and the government should protect people from market imperfections and failures.

**MS: Reports from 2024 indicate that biodiversity loss continues to accelerate due to agricultural expansion and monocropping practices. What role should agricultural economists play in designing policies that incentivize biodiversity-friendly farming practices?**

**Dr Satyasai:** There is no doubt the Green Revolution technology ushered in the food revolution solving food security problems in many countries. At the same time the pursuit of solving food problems encouraged monocropping, large scale conversion of natural ecosystems to agriculture, use of chemicals on large scale leading to land and water pollution, loss of predators and biological pest control agents, extinction of several plant and animal species, among others.

**The recent Chatham House report highlights how the global food systems led to loss of biodiversity and natural ecosystems.** This trend has exceptionally accelerated during the last 50 years or so at an unprecedented pace not seen even during the last 10 million years! The measures to reverse this trend need to focus on: sparing farm land for natural ecosystem recovery, change in consumption patterns towards plant-based food, adopting low input, biodiversity-friendly natural farming methods, etc.

**Role of agricultural economists is not possible in isolation.** The Agricultural Economists can, however, help evaluate alternative technologies, measure the impact, and evolve mutually coherent policy matrices, in collaboration with other discipline experts. The evaluation should be not just from a commercial or viability angle, but from a larger social and economic perspective that ensures an inclusive approach taking care of the disadvantaged sections as well.

**The golden rule for evolving better measures/policy should be to 'think big, think far, think noble'.**

## About Dr. K J S Satyasai

Dr. K J S Satyasai, Agricultural Economist, has served for 30 years in National bank for Agriculture and Rural Development (NABARD), Mumbai before demitting office in Nov 2022. His research interests include production economics, water, credit, microfinance, agricultural policy and development and has over 100 publications to his credit. His latest works include measuring farmers' welfare, study of agriculture over 75 years and charting way ahead for Amrit Kal, developing and measuring Financial Inclusion based on NAFIS 2016-17 Survey of NABARD, among others. He steered the NABARD All India Rural Financial Inclusion Survey (NAFIS) 2016-17 and has initiated the second round (this report is on NABARD's website now). He is coauthor of the book 'Agricultural Development in Andhra Pradesh' and Chief Editor of Conference Volume on Share and Stake of Agriculture in Economy.

## About the Interviewer

Mahima Sharma is an Independent Journalist based in Delhi NCR. She has been in the field of TV, Print & Online Journalism since 2005 and previously an additional three years in allied media. In her span of work she has been associated with CNN-News18, ANI - Asian News International (A collaboration with Reuters), Voice of India, Hindustan Times and various other top media brands of their times. In recent times, she has diversified her work as a Digital Media Marketing Consultant & Content Strategist as well. Starting March 2021, she is also a pan-India Entrepreneurship Education Mentor at Women Will - An Entrepreneurship Program by Google in Collaboration with SHEROES. Mahima can be reached at [media@indiastat.com](mailto:media@indiastat.com)

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