Charting a Course for Agricultural Value Chain Success Amidst Global Trends and Climate Challenges

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“Inclusive Strategies and Tech Solutions are Necessary to Revolutionize Indian Agriculture”

Intro: This week on Socio-economic Voices we have agri-expert **Chintan Meghwanshi, Madhya Pradesh State Manager at ACCESS Development Services,** sharing invaluable insights into the challenges and opportunities shaping India's agricultural sector. Speaking to senior journalist **Mahima Sharma for an exclusive conversation at Indiastat,** helps us explore the dynamic landscape of agriculture, the complexities of value chain management and the imperative role of technology in enhancing efficiency and transparency. So what will be the key drivers propelling agricultural innovation, against the backdrop of global trends and emerging innovations? Let's check this out and more in this intense insight.

MS: For the understanding of our vast mix of readers, please share a deep insight into Agricultural Value Chains? And how efficient ones are important for any and every economy?

Meghwanshi: Value chain is the system which ensures receipt of a product at consumer level from the producer of the product at the time, at the place, at the price and in the form in which the consumer wants it. Value chains are important because no Agri business/service can be designed without it. Agricultural value chains are quite complex considering the economic contribution, varied production-processing-logistic-consumption patterns and climate factors. It is impossible to ignore gaps in it. I humorously say at many forums that agri value will remain most important in the gamut of all kinds of value chain until we start eating microchips to pacify hunger.

In India where more than 60% of population directly or indirectly depends on agriculture it becomes imperative to deep dive in issues and challenges of Agri value chains.

I am quoting an example of the onion value chain. Export of onion globally constitutes 96% of fresh and chilled onion and 4% of dehydrated onion. India has 95% share in dehydrated onion export. So, India is actually playing in 4% of the global onion market. This is because the onion value chain in India does not have many participants for “fresh and chilled onions”. Impact on onion prices is pretty evident.

Another example is the tomato value chain. India is 2nd largest producer of tomatoes and contributes 11% of total world production but export wise India ranks 13th in the world tomato export claiming just 2%. For processed products we import tomato puree from China. The reason for this is the lack of potato varieties suitable for processing. China puree cost around INR 90 per kg while Indian puree costs around INR 130 per kg. This gap has to be filled if we want the tomato value chain to be developed further.

In grains, we can take an example of the Wheat value chain in Punjab. Once the “Granary of India” with among the highest wheat producing states now not even producing 20%. Productivity being just 9 quintals per hectare in 1950 shooted like a rocket and reached to 45+ quintals in the year 2000. Don’t you think it was an abrupt trend. Punjab is being quoted in examples of “cancer trains'' because of high uses of chemicals in production.

Also, soil degradation and irrigation has become a major challenge in the wheat value chain in Punjab. We must learn that the value chain evolves organically but there is always a scope of giving that evaluation a right direction. If it is not done carefully, it will affect the whole ecosystem and the economy is not out of it. A single factor in the value chain adversely affects price dynamics and thus inflation. Diversification in the value chain brings sustainability. For example. Soymeal value chain, on the other hand, grew phenomenally because of the varied uses for humans and animals.

MS: In your expertise what are the key challenges and opportunities in optimising agricultural value chains in India? How can technology be leveraged to improve efficiency and transparency in agricultural value chains in India?

Meghwanshi: Well, I should start with challenges in market linkage. Because of the presence of multiple Intermediaries in the agri value chain which lengthened it, just as to ensure decrease in efficiency and its value proposition. Agri value chain is a time bound system, making it more lengthy, definitely will not help. Many experts demonize intermediaries but the question is that have they not been part of the value chain for a long time? Of Course they are. Presence of intermediaries is part of the evaluation of the value chain. They have a definite role and in the past they have played their role well. That is why they are in the value chain. **Issues have risen because of transparency and lobbying. But if their presence is degrading the value chain then there must be a suitable & most important - “Worthy” alternative to replace them. You can not just remove any part of the chain.**

Here Farmer Producer Companies (FPCs) and technology can play a crucial role. FPCs can break lobbying while technologies can bring transparency. Here, in our project in MP, we have pushed digital transactions for FPCs business.

We have achieved 90% online transaction target in transaction with farmers. You can observe the change in weighing which is now mostly electronic.

Small small interventions can affect agri value chains. We all know, in Fruits and Vegetables (F&V), the major value chain issue is perishability and wastage. Wastage can go high up to 50% or more. **In F&V value chain the most significant intervention is the use of crates for transport. It seems very small but it has revolutionized the entire F&V value chain impacting perishability and wastage significantly.** Considering the impact, the government even started providing subsidies on crates.

Another thing which is unavoidable is climate factors. Climate change has seriously impacted agri value chains in India. I would like to quote that Fresh and chilled tomatoes exports from India was 2.67 lakh MT in 2017 which reduced to 0.78 lakh MT in 2023. Reason is the excess rain and heat waves in recent years which has affected it. **Similar climate related challenges have been faced in other crops as well. So, there is a need to bring more climate resilient crop practices equipped with data driven AI based solutions.**

Another big challenge is match making between institutional buyers and farmers. This often does not work because of lack of scale and quality. Small and marginal farmers constitute more than 70% of total. Small land, limited resources, debt burden lead to poor quality and lesser quantities. Value chains can be shortened by bringing

institutional buyers to the farms but are small farms ready to supply the bulk demand with matching quality? Answer is certainly NO. So, the aggregation model in the agri value chain, here, becomes more relevant. Aggregation by FPCs/Farmer Groups will definitely open the door to buyers but still they need professional support to develop desired skills of aggregation, market mapping, market intelligence, quality making along with governance and management of the collective they are working in. All these can not be possible without robust infrastructure through Government and Private investment, farm friendly policies and regulation.

Technology can definitely enhance efficiency in the agri value chain. For example a Sortex machine gives precise healthy grain which has higher value in the market. Drones are proving that their use can significantly reduce doses of inputs. **But can small & marginal farmers afford these technologies?** A big question and I know this is a biggest challenge for technology providers as well. Agriculture technologies have high investment cost but their users have least spending capacity. **NBFCs and Banks need to bring policies/products which give breathing space to these technology suppliers till farmers are able to get returns to pay back for technologies.**

MS: Are there any notable trends or innovations emerging globally that could significantly impact the future of agriculture?

Meghwanshi: Well, I have mentioned it in a previous answer.

- Drones, Precision agriculture, IoTs, AI, Robotics are emerging notable trends.
- Sustainable agriculture practices such as climate resilient agriculture, regenerative agriculture, genetic modification etc. are the need of hour.
- But it has to be affordable. There have been some failures in genetically modified crops but still this science has potential to cater the various issues in crop production.

Regenerative agriculture is not new; the only thing is that it has been forgotten. We need a suitable and affordable combination to sustain the current agri system. A fusion kind of thing. Sustainable agriculture practices adds to the longevity of the farm while Technology provides efficiency and cost optimization. Considering uncertainties such as weather and prices, agriculture weather forecasting and market forecasts can be useful.

Data driven agriculture can be proved important to understand, articulate and design needs of agriculture in the area of

- Crop management,
- Integrated Nutrient Management (INM),
- Integrated Pest management (IPM)
- Productivity enhancement.

Same data analytical tools equipped with AI can do wonders in simulating suitable customized solutions. AI has started surprising humans. **Recently I came across a technology of aircraft flying simulation to train pilots. Just think how wonderful it will be, if it is done for agriculture fields where various challenging situations (climate, pest, irrigation, Pest, Nutrient, soil health, etc,) can be simulated on virtual fields and AI powered simulators can create various scenarios based solutions and crop packages and practices.** Precision farming can shift to a new regime with such innovations. Digitisation of the agriculture system can enable a paradigm shift in agriculture.

MS: What steps India needs to take to make its agri-value chains more resilient and strong in the wake of on-going intense climate change?

Meghwanshi: We always talk about interventions but I believe that success of an intervention depends on who is driving the intervention.

It has been more than a decade since I have been working on agri value chains. I have seen success in interventions where women participation is more. We need a gender lens to look into the problem. **So, starting with a very important thing is to ensure and enhance women participation in the agri value chain interventions related to climate resilient agriculture (CRA).**

In the wake of ongoing intense climate change, **Protected Cultivation has immense potential to counter climate related issues. This offers a controlled environment which can counter various uncertainties in climate.** It has proven experiences in quality produce, yield enhancement, pest control, irrigation requirement etc. India cultivates vegetables in an area of approximately 9.58 million hectare and stands second in world production of vegetables. 1 hectare in protected cultivation can increase vegetable production by 5-10 MT and can provide a year round job for 2 people. Just think of the size of production and employment in even 1 million hectares.

Second, we need very sophisticated infrastructure (such as Controlled Atmosphere (CA) storage, Bio technology innovation centers, high tech processing facilities, technology equipped logistics, etc.) to accommodate challenges in the agri supply chain.

I just quoted an example of lack of infrastructure for “Fresh & chilled” onions. We have seen stubble burning practices has been banned by Haryana but to ensure it actually stops at farmers level, there is a need for extensive awareness drives at village level.

- IPM and INM are good tools for CRA but farmers need to be educated extensively.
- CRA interventions are time and resource taking interventions and visible results at farmer level take time in their case.
- These interventions need significant investments through the public and private sector. Policies have to be conducive for these.

Third is the use of technologies such as GPS, remote sensing, weather forecasting etc. These are present in the agri system but mostly for the scientific arena. Application and usage of such technologies **must be reached to small & marginal farmers as well.**

Investments need to be made to make agri technologies more affordable. This will increase in farm income and simultaneously reduce cost of production. This will certainly improve farm economics. The technologies that I have mentioned need massive investment.

Carbon credits approach can be promoted. Though its returns are very less in terms of value but while getting into the intervention, many CRA practices are done at the farm. This ultimately improves the soil quality, water retention, nutrition uptake, etc. which in turn improve productivity and quality. This is the kind of returns a farmer wants.

CSR can play a vital role in funding CRA and technological intervention. A carefully designed policy to use CSR funds can make significant changes.

MS: How can the MSP issue be resolved in India - what do you think is the real hindrance and how it can be managed to get farmers their dues?

Meghwanshi: It is a debatable issue where I cannot dive deeper than saying that the interest of farmers and farmings need to be safeguarded considering the gamut of risk they face starting from production to market. Real hindrance is that MSP is not backed by any act and calculations vary state to state. For the government it is impossible economically to guard all crops. MSP is not the root cause, it is just the effect of low farm incomes.

A holistic approach which strengthens sustainable farming must be taken which includes the following

- inclusion of technologies,
- reduction in cost of production,
- enhancing market and marketability of crops,
- risk mitigation through insurance
- a conducive policy of export can be a solution for it.

MS: There are a lot of schemes for farmers, despite this there is a wide divide in the farmer community in terms of availing the same. Where do you think we are going wrong and how can this divide be bridged?

Meghwanshi: Major issue is with awareness. I recently met a women farmer who has atta chakki, spices grinding unit, vermi-beds, nursery, etc. all from government schemes. She is aware so she is having it. But women like her few. **Intensive efforts are needed for awareness building.**

Mostly, large farmers are beneficiaries so there is a divide. Plus there are some “own contribution” needs while applying for the schemes which a small & marginal farmer may or may not have.

One more issue which I want to highlight is the “blanket approach” in designing scheme distribution. I remember. There was a scheme of onion storage by the Horticulture department. Surprisingly, it was the same across all districts of the state while onion production was limited in few districts only. We must not forget that target pressure is not only in the private sector but also in the government sector. So, Just to meet the target it was given to the farmers who are not at all in onion production. These farmers were using it as buck shed or fodder storage. This is absolute wastage of resources.

MS: What strategies can be employed to attract better investment into the agriculture sector, where the farmer can benefit in a better way?

Meghwanshi: Investors invest where there is a balance of risk and return. The Agricultural system certainly comes in a high risk zone considering uncertainty in climate & market and rapidly changing consumption patterns. These segments need specific strategies to attract investments.

- Climate risk is to be optimized first to attract investment in the agriculture system. But climate initiatives are time and resource taking and ROI is not very lucrative for investors. CRA can optimize risk and bring more sustainability to farming. **There is a need for a strategy to bring more CSR and government funded initiatives for Climate resilient agriculture promotion. The NGO sector can play a crucial role in it.**
- **Second, financial tools such as crop insurance need to improve transparency and claim settlement ratios.** Insurance premium collected in India in 2015 was 846 Cr which has increased to 27900 crore. But only 27% of arable land is under crop insurance in India. Why would any investor risk his investment in such a scenario?
- **Third, world-class, far-reaching market systems give confidence to investors.** Strategy to increase participation of farmers on tech based (Data driven) platforms & e-marketplaces, upgrading current mandi infrastructure (eg. primary processing infra support at mandi, CA storages, etc.), robust price prediction and

dissemination tools with ease of doing business, export capacity building will help in gaining the confidence of investors on the market side.

- **Fourth, consumption patterns are a deciding factor in demand creation which further boost marketability and thus ROI.** I remember we proposed and designed an initiative to increase consumption of F&V among children. We designed a comic book which gives nutritional information in a story telling way by comic characters. Similar initiatives can be done for millets and other focused commodities.

MS: How can stakeholders in the agri-sector ensure that development roadmaps are participatory and inclusive of diverse perspectives?

Meghwanshi: We in our organization organize 2 national level events for Livelihoods and Inclusive finance sectorial discussions. I think these platforms serve well in terms of participatory and inclusion of diverse perspectives. Stakeholders like us also organize district level stakeholders workshops where various initiatives are assessed by engaging beneficiaries as well.

MS: Last but not the least, if someone wants to build a career in your field, what kind of extra skill sets (beyond degrees) would be needed in an era governed by AI?

Meghwanshi: Technologically equipped but with human touch. It is a very sensitive sector. One needs to be updated with advanced knowledge as farmers know farming better. But they need to know what they do not know, so work closely with farmers as well as with their trainers to absorb both sides of the world. One has to have good passion and enough patience to work in this sector.

About Chintan Meghwanshi

Chintan Meghwanshi is the MP State Manager, ACCESS Development Services, New Delhi. He is handling farm sector interventions in Madhya Pradesh and leading a project focused on strengthening FPCs (Farmer Producer Companies) on business and sustainable agriculture along with CRA and Gender leadership. He is working with SIX all women FPCs promoted by MP SRLM and 4 mix FPCs. He is also heading a watershed project with NABARD. He has over 16 years of experience as a management professional in the Farm sector.

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