Dr. M. S. Swaminathan Foundation Day Lecture

From Food Security to Farmer Prosperity

The Chairman of the foundation day lecture, Prof Ramesh Chand; Dr M.L. Jat, President, NAAS distinguished Past Presidents, NAAS Fellows, esteemed invitees,

ladies and gentlemen,

Tribute

There are moments in the history of nations when one individual makes a change not merely in policy—but also in its destiny.

In the mid-1960s, when I had joined IARI for my Ph.D., India stood vulnerable, dependent, and uncertain of its ability to feed its own people. At that defining moment, science found a statesman, agriculture found a visionary, and India found a great son in Bharat Ratna Prof. M. S. Swaminathan.

Millions today know him by name, and millions eat today because of his life's work.

Prof. Swaminathan was not merely an architect of India's Green Revolution, he was, in fact, the conscience keeper of Indian agriculture. He made our head high.

He would often remind:

"If agriculture goes wrong, nothing else will have a chance to go right."

Today, as India moves towards becoming a Viksit Bharat, those words echo with greater urgency – calling for a renewed resolve, bold actions and a transformative new strategy towards evergreen revolution– thus aiming at productivity in perpetuity without ecological harm.

It is because the challenges before us have fundamentally changed.

We had successfully met the first national mission on:

How to feed India.

The next national mission, before us, is:

How to make the farmer secured – how to make our FARMER FIRST.

Hence, while agricultural past Revolutions (Green, White, Blue & Rainbow) succeeded in achieving food security, the next revolution must lead us to Farmers' Prosperity.

This memorial address is, therefore, not merely a tribute to Bharat Ratna Prof. M.S. Swaminathan but rather an invitation to us all to shape our future which is rooted in farmers' prosperity i.e. how to make the FARMER FIRST.

1. We are aware that Swaminathan Legacy had been Science with Human Face

Let us, therefore, briefly reflect on the magnitude of his legacy.

In the 1960s, India faced recurring food shortages, dependence on imports when we had no foreign exchange to buy, and fears of famine. Through scientific innovation, political will, institutional support, and extraordinary farmer participation, all being important cradles of success, according to Dr Norman Borlaug, India could transform itself into a food-secure nation.

On the contrary, Prof. Swaminathan's efforts never confined to increasing yields alone.

His deeper philosophy and concern had been that:

- Science must serve the humanity – through physical access to food
- Productivity must reduce poverty – through economic access
- Equity cannot be ignored – therefore, we must have ecological access, and above all;
- Agriculture must remain humane - feeding all those below poverty line, thus – serving science with human face.

Long before sustainability became a global slogan, he warned against excessive exploitation of land, water and agrobiodiversity resources.

Economic survey of India also had been raising this concern lately.

He, thus proposed the idea of "Evergreen Revolution" - in other words: productivity in perpetuity without ecological imbalance.

Today, decades later, that vision of his appears remarkably **prophetic**.

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2. India's Agricultural Paradox: Success and Stress Together

When we talk about the "New India," what usually comes to our mind? Technology hubs, bustling startups, drones on the fields or rockets heading into space, right?

But a massive revolution has been happening that rarely makes the front page headlines. It's quieter, it's deeper, and it's the bedrock of everything else we could build.

It is happening out in our fields. Think about this:

In 2025-26, last crop season, India produced 376 million tonnes (mt) of foodgrains. That is nearly 19 mt more than the previous year. Imagine, we talk proudly of landing on moon, but undermine that we had landed six decades ago on the farmer's fields to feed our burgeoning population.

This is the kind of headline that should echo louder across the nation now. NAAS be the institution to bring forth this message loud and clear. Isn't it a matter of national pride today that India has become now the world's number one producer of rice, overtaking China. Our rice production has just crossed a historic 154 mt. That number isn't just a data point; it represents sweat, it represents late nights, scaling of innovation, and the sheer grit of millions of farmers who wake up before most of us open our eyes.

This isn't an off fluke either. Look across the entire landscape:

Wheat production has climbed past 120 mt. We are certainly poised to become number one in wheat production in the next one decade.

Maize has hit a record-breaking 55 mt- a jump of more than five fold since year 2001 when single cross maize hybrids were first bred, released and introduced.

Even in oilseeds, where we have heavily become dependent on imports, we are moving towards independence back, pushing past 43 mt with record yields in groundnut and mustard. Groundnut taking 1st position again over soybean.

And in case of pulses, the very cornerstone of our nutrition security, we are steadily on a rise again. Progress in other commodities like milk, eggs, fruits, vegetables, fish (especially prawn) are mind boggling.

These aren't isolated successes. This is a systematic upgrade in how we farm, transforming slowly our agriculture into national confidence.

Why does it matter so deeply now? Because at the end of the day, agriculture isn't about commodities. It's about dignity.

It's about the profound pride of knowing that a nation of over 1.45 billion can confidently nourish itself. Behind every single digit in these data is a real human story. It's a father staring at an unpredictable sky, a mother calculating the cost of inputs, and a family taking a massive gamble on the earth, and winning. It is an entire ecosystem learning, adapting, and growing together.

So, perhaps the question we should be asking ourselves today is not just, "How much food did India produce?"

Instead, let's ask: "How can a nation truly back the hands that feed it?"

Infact, we must recognise that - beneath this success lies a **troubling paradox**.

The farmer who toils the land and feeds the nation often remains economically insecure on account of.

- declining profitability,
- shrinking landholdings,
- deteriorating soil health,
- depletion of groundwater,
- rising climate risks,
- nutritional insecurity,
- and growing disinterest of youth in farming.

Climate change is no longer a future threat to Indian agriculture. It has already entered our farmer's field.

Heat stress, erratic rainfall, including flash floods, new pest outbreaks, and water scarcity in rural India are all seen before our eyes.

The crisis before us, therefore, is no longer merely agricultural. In fact,

i) it is ecological,
ii) economic,
iii) nutritional,

iv) and increasingly, socio-economic-creating two India according to Nobel Laureate Dr Amartya Sen

Because agriculture in India is not merely an economic activity, it is a way of life on which 46% to 50% of our population is still dependent.

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3. Hence a Central Question: What Makes a Farmer Prosperous

As we look forward, we must now ask:

What does a truly developed agricultural system should be to make farmer prosperous?

Surely, it cannot be measured only by the production statistics.

A Viksit agricultural system has to ensure:

- Sharing of good knowledge without dissemination loss
- Reduction on cost of inputs
- Improved input use efficiency
- Linking farmers to market-both internal and external
- Sustainability for natural resources,
- Resilience against climate risks,
- and dignity for farming profession.

Our expectation from future farmer beyond just annadata is, therefore

He or she must now be:

- a poshanadata,
- an urjadata,
- a jal-samvardhak,
- and a climate steward.

This certainly demands **a fundamental reimagining of Indian agriculture** - with policy reorientation away from subsidies to incentives for adoption of good agronomic practices – including environmental services, and from traditional agriculture away to secondary and speciality agriculture.

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4. Five Pillars for Reimagining Indian Agriculture

Pillar 1: From Production to Post-Production Farmer Prosperity

For decades, our success metric had been yield per hectare.

The next era must measure:

- income stability,
- value addition,

- risk reduction,
- and dignity of farm households.

We know that a farmer just cannot remain the backbone of the nation while remaining economically fragile.

We must, therefore, move:

- from production-centric approach to income-centric initiatives,
- from subsidies to incentives for smart farming,
- from fragmented markets to integrated value chains, avoiding exploitation by the middle men. Hence, Acts such as Essential Commodity Act - APMC Act – Contract farming Act – Seed Act - National Food Security Act (NFSA), MANREGA etc. must be revisited on priority. According to NITI Aayog, poverty has declined from 29% in 2014 to 12% in 2023. Thus, 16-20 crores under poverty line but NFSA distribute food to 67% of population i.e. 80 crores – 4 times higher?

Farmer Producer Organizations, SHGs, Cooperatives, agro-processing, rural enterprises, and digital market access must become now the engines of prosperity.

India's flagship Central Sector Scheme launched in 2020 had a target of 10,000 FPOs by 2027-2028, which has already been achieved and now revised to 20,000? We understand around 56 lakh farmers have already been mobilized, consisting of 22 lakh women farmers. Women only FPOs registered are currently 1,175.

Compared to 14 crore households, this number looks dismal, and hence an aggressive approach is warranted to ensure farmers' prosperity.

Pillar 2: Climate Smart Agriculture

The Green Revolution in the past had solved major problem of food scarcity.

The next revolution must now ensure agricultural sustainability.

We now need to produce more with less for more (MLM) – through resource conservation and improved efficiency, aiming at using:

- less water,
- less land,
- less energy, and
- lowering emissions.

This would require a paradigm shift towards:

- climate-resilient crop varieties,
- diversification toward local food systems: millets, pulses, and oilseeds,
- precision irrigation and ban on floor irrigation,
- regenerative agriculture,
- and integrated farming systems.

We know that the future belongs to the nations that can align productivity with ecological stewardship by scaling faster technological innovations – requiring enabling policy environment and faith in science.

Pillar 3: Technology with Inclusion

There is no doubt that the next agricultural revolution will certainly be data-driven i.e. digital agriculture making use of:

Artificial Intelligence, remote sensing, precision agriculture, genomics, genetic engineering, genome editing, and digital advisory systems. To harness these, agri-startups are transforming possibilities.

But technology without inclusion can deepen inequality – thus we must focus on disruptive innovations – ex: dwarf wheat and rice varieties, GM cotton, single cross maize hybrids, conservation agriculture, protected cultivation, micro-irrigation etc.

India must ensure that Artificial Intelligence does not become “Artificial Exclusion.” We also must ensure that policy decisions for scaling of innovations are science based.

Technology must democratize opportunity for smallholders, not concentrate advantage for a few – hence reaching the unreached and making drylands from grey to green must be our priority.

Pillar 4: From Calorie to Nutrition Security

Despite surplus production, malnutrition and micronutrient deficiencies do persist.

This is a profound contradiction and currently our biggest challenge.

Nutrition for our malnourished children – According to National Family Health Survey NFHS-5 during 2019-21, India has 35.5% of 120 million children under 5 years of age as malnourished – of which 33% are stunted, reflecting chronic hunger.

Worlds largest absolute burden of child malnutrition is therefore in India. Hence, globally maximum challenge of achieving zero hunger (SDG2) is before us to be met. According to WHO our GHI is 111 out of 125.

Agriculture must, now shift: from feeding populations to nourishing citizens, especially our children.

In this context, we must diversify our food basket – around local food systems that provide immunity including millets, nutri-cereals, pulses - especially soybean, biofortified crops, vegetables and fruits. Integration between agriculture and public health systems – such as newly initiated SEHAT program by ICAR and ICMR be taken up as a National Mission on priority.

In fact, the future of Indian agriculture must reconnect:

soil health,

plant and animal health

human health,

and planetary health. – leading to one health

Pillar 5: Youth (including Women) as Leaders of Change

No agricultural transformation is possible without social transformation and improvement in our social development index (SDI), especially in states that were bye passed by Green Revolution – a critical need for achieving sustainable development goals (SDGs).

The future farmer of India is increasingly a woman – thus empowering them is an urgent national priority.

Yet our policies, institutions, and ownership systems often fail to recognize her adequately, and equip women for decision making.

Recently held GCWAS, inaugurated by Hon'ble President Murmu, came out with "Delhi declaration", which strongly recommend that women farmers need urgently access to:

- land,
- credit,
- extension,
- technology,
- decision making,
- and market opportunities.

Given these, women can help increasing agricultural productivity by 15-30 % as also claimed by FAO. Equally important is attracting youth back into agriculture—not as subsistence workers, but as agripreneurs, innovators, extension agents, input providers, technology leaders - above all job creators – in this context reimagining the KVKs now to knowledge – skill – innovation centres" is urgently warranted.

In true sense, agriculture must become aspirational again through greater motivation and attraction of youth in agriculture (MAYA) – a dream that Prof. Swaminathan and most of us had visualized.

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5. Institutional Reforms are Critical for the Next Revolution

Institutions such as the Indian Council of Agricultural Research, the State Agricultural Universities and the private sector organizations, all as strong NARS must lead the next transformation with renewed vision and purpose. We all know - Science once powered India's food security. It must now power farmers' prosperity

We, therefore, need:

- mission-oriented research and delivery,
- interdisciplinary science aiming towards innovations,
- stronger extension systems - including private extension,
- climate intelligence and climate smart agriculture,
- and closer collaboration by breaking silos between central and state government, public institutions, private enterprises, startups, and farmer organizations.

Also the institutional reforms such as establishment of Agricultural Development and Farmers Welfare Council on par with GST council, National and State Farmers' Commission, and enhanced funding of ICAR are critical to make Indian farmers prosperous.

6. Vision for India's Agricultural Future

When India celebrates its 100th year of Independence, let us envision:

- villages transformed into vibrant bio-economy hubs,
- farmers functioning as knowledge entrepreneurs,
- every farm becoming climate resilient,
- every drop of water valued, our soils made healthy and agrobiodiversity well conserved,
- every child becomes nutritionally secure,
- and every farmer lives with dignity and respect.

Let the world say:

India did not merely feed its people. India showed humanity how agriculture can coexist with ecology, equity, and sustainability; and that

India is a global leader in making FARMER FIRST.

That according to me would be the best tribute to Prof. Swaminathan.

7. In Closing let us look at Our Collective Responsibility

As we remember Prof. M. S. Swaminathan today, we must remember that great scientists do more than just generate knowledge.

They enlarge the moral imagination of nations.

Prof. Swaminathan taught us that agriculture is ultimately about human dignity – farmer's dignity.

Therefore, Not merely crops, but farming systems.

Not merely production, but post-production and value addition.

Not merely growth, but harmony between humanity and nature.

The ultimate test of India's progress will not only be the size of our economy or the quantity of grain in our warehouses or the food that we export. Currently, India occupies 5th position in agricultural exports fetching around US$ 55 billion

It will be this:

Can the Indian farmer live with dignity, security, and prosperity?

If we can achieve that, we would truly honour the legacy of beloved Prof. Swaminathan.

And perhaps then, India will not only become a Viksit Bharat—it will make farmers prosperous and agriculture more secure and sustainable.

A unique example for the entire world.

Finally, let me compliment NAAS for instituting this memorial

lecture on its foundation day and giving me the honour to deliver it today.

Thank you and Jai Hind.