Sustainable global animal agriculture: Building on India’s successes
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The importance of global animal agriculture
All of us are familiar with the Green Revolution, ending in the late 1960s, and for many years now we have been speaking about a subsequent Livestock Revolution, which started in the 1970s. But research-based predictions that began to appear in 1999 about an expected doubling in demand for livestock commodities were largely ignored. In many developing and emerging economies today, the growth in consumer demand for milk, meat and eggs has been as surprising as it is unprecedented. And that growth will only continue.

Globally by 2050, the world will need one billion more tonnes of dairy products and half a billion more tonnes of meat than it required in 2000.

This rapidly rising demand is being driven by increasing populations, urbanization and incomes. The UN estimates that the planet’s population will grow from 7.4 billion today to 10 or more billion by mid-century. As people everywhere move to cities and earn a little more income—starting at the equivalent of just over US$2 per person per day—they begin to supplement their heavily starchy diets with more energy-dense animal-source foods.

Within the next decade, and for the first time ever, most people will be classified as ‘middle class’ and by 2050 over two-thirds of the earth’s inhabitants will live in cities. India itself will have some 1.3 billion middle-class citizens by 2030, which will represent almost one-quarter of the entire world’s middle class population.

As consumer demand for meat, milk and eggs rises, so does consumer demand for better quality and safer foods and eventually for greater welfare of the farm animals themselves.

What’s unprecedented and largely under-appreciated in the on-going Livestock Revolution is that virtually all of the increasing demand for animal-source foods is taking place outside of industrialized nations. But although the huge increases in demand for dairy, eggs and meat are generated by many millions of people in poor countries newly being able to afford just a little more of these foods, per capita levels of consumption of animal-source foods in emerging economies are likely to remain at less than half those current in the developed world.

Meeting the increasing global demand for livestock products is of course a challenge. It’s also big business, presenting major economic opportunities for individuals; for small, medium and large businesses; and for multilateral companies. Five of the highest value commodities globally are animal-source products (including fish), which had a total value in 2013 of more than $700 billion.
More than a billion people one way or another earn their living from the livestock sector. Whether or not developing nations can meet the skyrocketing demand for livestock commodities—and how they do so and who gets to participate—will impact most if not all of their major development challenges, from food and nutritional security to economic growth and foreign exchange to public health and environmental sustainability.

Many alternatives, options and solutions can and will be used to meet the growing demand for milk, eggs and meat. Policies, regulations and incentive structures will strongly influence socio-economic, health and environmental choices and opportunities. Now is the time to consider these to ensure we don’t miss windows of ‘win-win-win opportunities’ that are now opening.

If, for example, developing countries choose to meet the growing demand for animal-source foods by importing significant amounts of these foods, they will have to manage a skewed foreign exchange and greater unemployment, especially among the young, while the countries producing the foods will likely have to expand their resource-intensive and environmentally unfriendly production systems. And both exporting and importing countries will be responsible for increasing environmental damage and climate change by transporting these (highly perishable) foods over long distances.

To generate economies of scale, livestock producers in many developing and emerging economies are already rapidly expanding their industrial-scale poultry and swine operations, thereby increasing potential threats of environmental pollution, zoonotic disease and consumption of contaminated foods. Such industrial-scale establishments rarely provide significant and equitable employment opportunities or new opportunities for millions of men and women raising and selling animals for their livelihoods.

If industrial operations rapidly become major sources of livestock commodities in developing and emerging economies, another downside will affect today’s 700 million ‘mixed’ smallholder farmers, who raise animals as well as grow crops. These integrated farmers produce over 50% of the milk and meat in developing countries and some 50% of the cereals. We must help a significant proportion of these ubiquitous mixed smallholders to transition their enterprises into efficient systems, connected to markets and providing safe products.

Livestock trajectories providing widespread benefits will not happen by chance. I hope those of you graduating today will apply the knowledge and skills you have acquired to help Indian farmers make this transition over the coming decades. A fundamental basis for a more productive and sustainable sector lies in the underlying productivity of the animals themselves, an area where many of you and this institute have an immense amount to offer. Your skills—not only in efficient production of milk, eggs and meat but also in socio-economics, gender issues, policymaking, extension education and institutional change—can ensure that appropriate markets, policies and institutions together manage to bring about transformation of India’s livestock value chains.

Your country gives you an immediate, and large, advantage. India is one of the few countries in the world already finding and implementing profitable, efficient, equitable and sustainable ways to meet the increasing demand for animal-source foods.

India is one of the few nations that heeded and took early advantage of predictions about the ‘livestock revolution’. Consider a few well-known facts.

- **Milk production**: India is currently the world’s largest producer of milk, accounting for 19% of global production. The country’s milk production is expected to grow 4.5% annually—more
than twice the rate of the rest of South Asia. In 2012–13, India produced 132 million MT of milk.

- **Meat production**: In 2015, India was the world’s largest beef exporter, exporting some 2 million MT; it was one of only four countries in the world to exceed beef exports of 1 million MT (http://beef2live.com/story-world-beef-exports-ranking-countries-0-106903). The annual value of these beef exports is estimated to be almost $5 billion. (Production figures: Department of Animal Husbandry, Dairying & Fisheries, Ministry of Agriculture, GoI.)

- **GDP**: In 2011, Indian livestock contributed about 26% of agricultural GDP and 4% of total GDP valued at INR4,59,051 crore (US$74 billion today).

- **Dairy**: Of the 121 million dairy farms in the world in 2014, 76 million were in India (IFCN database).

- **Smallholders**: More than 70% of the production of milk and meat in India is in the hands of some 130 million smallholders who raise more than 80% of the country’s animals.

- **Sector growth**: India’s livestock sub-sector is expected to grow annually at about 5.5% versus the total agricultural sector, which is expected to grow at 3.7% each year.

- **Milk**: In the next decade, global production of milk will increase by more than 125 million tonnes, with more than 65% of this increase in the Asia Pacific region, with India alone accounting for 45% of this growth.

**So what did India do that others didn’t?**

With milk important culturally as well as economically and nutritionally to India, there has been good political will to support this commodity in particular. In other regions of the world, animal agriculture does not get such strong political and policy attention. Clearly, to meet the increasing demands for animal-source foods, we cannot ignore such political dimensions; the profile (or lack of profile) of animal agriculture on the political stage is critically important.

Despite India’s impressive progress in advancing animal agriculture, there remain some challenges, both to the sector and to its profile, that I hope those of you graduating today will help meet.

**Tackling challenges to India’s livestock sector**

Despite impressive successes, in general yields per animal in India remain low. Part of the increase in production to date may have come from growth in the number of animals. Assessments show considerable variation in the magnitude of the yield gaps for India’s livestock production, which indicates that there are real opportunities for improving competitiveness in the country’s livestock sector.

Addressing underperformance should be a high priority for research and development, including by improving technologies that enhance animal productivity, improving animal nutrition through better feeds and forages, and improving animal breeding and health. Also needed are viable input and output markets designed to serve small-scale livestock producers. And innovative approaches are needed to leverage inputs from the private sector to better serve small- and medium-scale actors, especially women and youth.

Given that most milk, eggs and meat are purchased in informal markets in developing countries, there are also major opportunities for upgrading informal markets by working directly with informal
market actors to raise their hygiene and food safety standards through, for example, training and certification schemes; these have been successfully implemented in Assam.

And we ignore at our peril the livestock sector’s negative impacts on the environment and health. Transformation of smallholder production systems offers opportunities to mitigate such harms.

Globally, dairy farms contribute some 1.4 gigatonnes of carbon dioxide equivalent (CO$_2$ eq) from producing, processing and transporting milk. South Asian dairy is estimated to contribute 120 million tonnes CO$_2$ eq per year. As noted, improving animal performance, and thus productivity, presents good opportunities for reducing the amount of greenhouse gas (GHG) emissions per unit of milk or meat and is thus an important win-win opportunity (less GHG and more milk or meat) for reduced GHG emissions. GHG emissions can also be mitigated by better use of local feed resources, balancing dairy cow rations for improved digestibility, and better managing manure, such as through anaerobic manure digester technology. FAO estimates that a 38% reduction in the GHG emissions from South Asia dairy is feasible by implementing such interventions in integrated ways$^1$.

**Tackling challenges India’s livestock sector profile**

As you graduates move from academic theory to development practice, here are just a few of the critically important change you can accomplish:

- Raise the profile of animal agriculture, nationally, regionally and internationally
- Raise political will and policy support for smallholder animal agriculture
- Source and use livestock facts and figures that resonate across society, including the livestock sector’s contributions to food and nutritional security and employment and economic growth
- Build the case that India’s livestock sector will be advanced by combining options ranging from technical to economic to political to institutional

I hope I have provided you with some information and inspiration in that regard.

I congratulate you all. It has been a privilege to speak to you.

Finally, I thank the National Dairy Research Institute for bestowing on me today the degree *honoris causa*. I am honoured by this award and will do my best to live up to this distinguished degree from this esteemed institute.

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