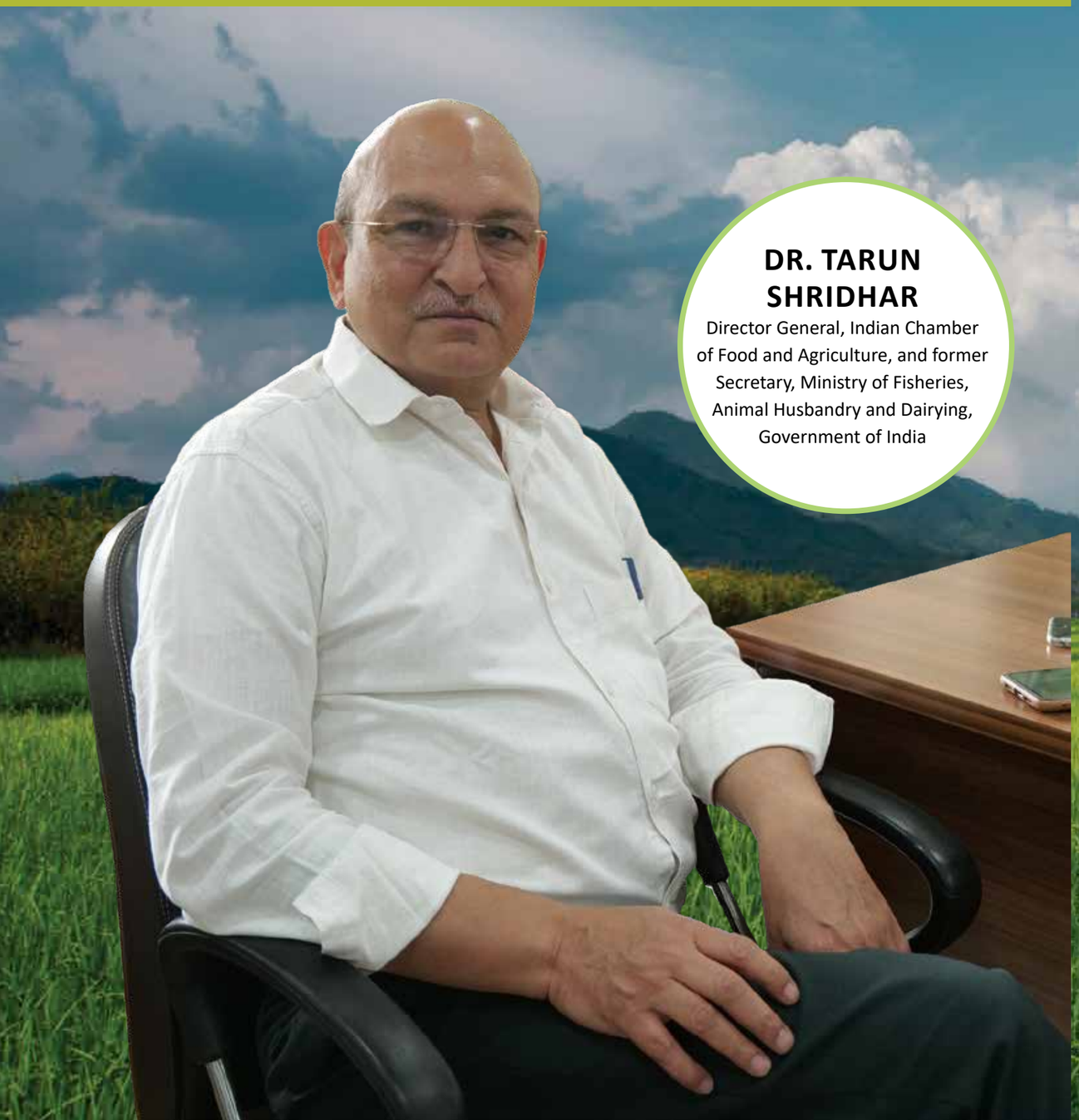
Animal Husbandry and Climate Change Plea for a Sane and Smart Response



DR. TARUN SHRIDHAR

Director General, Indian Chamber of Food and Agriculture, and former Secretary, Ministry of Fisheries, Animal Husbandry and Dairying, Government of India

It was sometime in the 1980s that the issue of global warming got a wide recognition, and since then its impact on agriculture and food production systems has emerged as a serious area of research. All evidence is a pointer towards an alarm; food production is expected to be the hardest hit, including in the regions which get to be called the breadbaskets of the world; and India is not only one but sits atop with a chosen few. Despite concerted measures for mitigation and adaptation, some scientists estimate that reduced availability of food would mean a loss of 120 calories per person for each additional degree of rise in global temperature. A heating planet poses the biggest threat to food and nutritional security. And even more than agriculture, it is the livestock that is threatened the most as in addition, it also faces multiple attacks from diverse individuals and groups. A basic google search throws up derisive and derogatory comments about livestock as the perpetrator of climate change and global warming caused by Greenhouse Gas (GHG) emissions. Alas! The victim is being hounded as an accused. What compounds this travesty is that it is the celebrities and ideologues whose voices are the loudest, driven more by sentiment and ill-founded belief rather than science or any rationale.

In a recent conference I attended, a speaker proclaimed that agriculture is both a culprit and a victim of climate change, but then qualified that livestock happens to be the bigger culprit, while crops were the bigger victim. It is such misgivings, rooted less in science and more in populist jingoism, that tend to stigmatise an important sector of our economy. The livestock sector is routinely vilified as a major contributor, now curiously termed culprit, to environmental damage and climate change. A call to adopt vegan lifestyle is another offshoot of this clamour, without realising that such a call not only compromises nutritional security but also hits at the livelihoods of millions of livestock farmers, majority being poor. Reduced consumption, if not outright elimination, of meat and dairy products would arrest the problem of climate change is the view these activists hold, albeit without any empirical data. Unfortunately, many responsible organisations, even international ones follow suit as such views project them as sensitive and concerned entities.

Powerful voices in the developed world that influence global agenda have begun to question the how, and how much of the animal protein we should produce. Perhaps they have missed out that all this while, in other parts of the world, many are experiencing extreme hunger, malnutrition and poverty; and access to sufficient livestock foods is a far cry for them. At the same time, national governments through the United Nations, have agreed to work towards achieving the Sustainable Development Goals (SDGs); a collaborative effort to tackle the severest of global problems such as hunger, poverty, pollution and climate change. Despite the irony of the situation, what is appreciable is that along with the commitment to the SDGs is the declaration to move towards prosperity for all. This is not to undermine the problem; the challenge posed by climate change, greenhouse gas emissions in particular, is serious; and the livestock sector too needs to become smarter and resilient to stand up to it. Therefore, let us analyse and understand the issue scientifically and dispassionately.

The gases in the atmosphere that absorb radiation are known as greenhouse gases because they are largely responsible for the greenhouse effect, which in turn, is one of the leading causes of global warming. The most significant greenhouse gases are water vapor, carbon dioxide, methane and nitrous oxide. The argument against livestock centres around the methane produced by livestock, particularly by the cows. Concentration of methane in Earth's atmosphere is small (around 1.8 parts per million), but it is an important greenhouse gas because it is a potent heat absorber. The concentration of methane in our atmosphere is said to have risen by about 150% in the past 275 years or so, primarily due to ever expanding human activities. Methane accounts for about 20% of the heating effects by all of the greenhouse gases combined. Both natural and human sources supply methane to Earth's atmosphere. Major natural sources of methane include emissions from wetlands and oceans, and from the digestive processes of termites. Sources related to human activities include rice production, landfills, raising cattle and other ruminants, and energy generation.

It is abundantly clear that livestock is only one of the several sources of atmospheric methane. Moreover, innumerable studies conclude that of all the greenhouse gases attributed to anthropogenic activities, the contribution of livestock is only 14.5%. Besides the animals' digestive emissions, this includes emissions from transportation of the produce from farm to table, the gases' footprint from growing feed; and food processing. It is evident that the figure has been upped to 14.5% artificially. Therefore, we all would be well advised to shun the ever growing tendency to blame the farmers for everything that goes wrong with the urban air quality. In fact, we should celebrate their remarkable achievement of producing food without overwhelming our limited resources.

Let us not forget that global warming and the greenhouse gases that cause it occur naturally; without them, earth's average surface temperature would be minus 18 degree Celsius. Try living in such conditions. So for life on this planet to survive and thrive, greenhouse gases are a critical necessity. The cause of concern is that the amount of greenhouse gases in the atmosphere has skyrocketed to detrimental levels in the recent past, thus upsetting the temperature balance.

Human population is expected to increase from 7.2 to 9.6 billion by 2050 . This represents a population increase of 33%, and as the global standard of living increases, demand for agricultural products is projected to increase by about 70% in the same period. Meanwhile, total global cultivated land area has not changed since 1991, nor is it likely in future. If anything, the indicators point towards its shrinkage. Lack of expansion has been compensated, to some extent, by increased productivity and intensification of agriculture.

Livestock products provide 17% of global calorie and 33% of global protein consumption. The sector contributes to the livelihoods of more than one billion of the poorest people in the world. The demand for livestock products has been consistently and impressively growing over the past decades. In fact, its rapid growth in developing countries has been characterised as the ''livestock revolution". Demand for animal products is expected to scale up with the growing global population. Therefore, worldwide livestock production is registering a consistent increase in response to demands from an increasingly affluent and urbanised population. According to the United Nations' Food and Agriculture Organisation (FAO), demand for animal-source foods (ASF) in low and middle-income countries more than quadrupled from 1970 to 2012. Though growth had slowed thereafter, demand is still predicted to increase by 35 percent from 2012 levels by 2030, and by 50 percent by 2050.

Along with the gains in production efficiency, GHG emissions from livestock too are, obviously, on the rise. The Intergovernmental Panel on Climate Change (IPCC) special report flags considerable emissions originating from the Agriculture, Forestry, and Livestock sectors; livestock, as stated earlier, is estimated to generate between 14 to 15 percent of global anthropogenic GHG emissions, with cattle contributing nearly two thirds of this. National commitments to reduce GHG emissions are, therefore, expected to include livestock systems in climate change mitigation and adaptation plans. Successful action on climate change through practical action in livestock agrifood systems is an urgent priority, but it must not come at the expense of other sustainability objectives, particularly those relating to ending poverty and achieving zero hunger by 2030. Hence, the FAO advocates a balance between the benefits of livestock for nutrition, health and well-being, and the pressing need to reduce GHG emissions to tackle the climate crisis, which too threatens food security. "Low-carbon livestock" would help create a balance whereby ASF, such as meat, milk, eggs, cheese and yoghurt feed the hungry and malnourished, yet are produced in a way that minimises the overall output of greenhouse gases. And while there are many opportunities to reduce livestock-related emissions, the FAO estimates that improved management practices alone could reduce net emissions from livestock systems, methane in particular, by about 30 percent.

Climate change is a global problem that demands integrated solutions at local, national, and regional levels. So the burdens should be addressed, rather than shifted. Shaping a sustainable future will depend on understanding the diversity and complexity of livestock systems and the particular challenges stakeholders face against the odds of climate change. What works for a producer in a capital-intensive system can be very different from what works for a pastoralist or a mixed crop-livestock smallholder. Sustainable action means respecting these differences, and working closely with these diverse stakeholder groups to develop relevant and practical actions for everyone. Our policies and interventions, inter alia, should aim at boosting efficiency of livestock production and resource use; intensifying recycling efforts and minimising losses for a circular bioeconomy, capitalising on nature-based solutions to ramp up carbon offsets, striving for healthy, sustainable.

Livestock stands apart from other sectors because it is organic, so carbon can never be eliminated from it, as it could for example from the transport or energy sectors. The key to promoting "climate smart" practices is simple: improve productivity and resource use efficiency. Emission intensities vary widely within and across livestock systems, particularly for ruminants. Adoption of better management practices would result in production efficiency. Technological innovations such as improved feeding, genetics, animal health, general husbandry and information technology are scaling up productivity, making resource use more efficient and with a potential to reduce environmental impact.

Agrifood systems rely on natural resources as primary inputs. However, the future of food would remain under threat if resources are consumed unsustainably and inefficiently. FAO encourages promoting a circular bioeconomy, i.e. recycling resources at every possible step in agrifood systems and thus minimising the loss of resources and nutrients. Countries making better use of the biomass would see better economic and environmental returns. Unused crop residues, food waste, and agro-industrial by-products are lost opportunities to recycle and optimise resource use efficiency and can be repurposed for animal feed. Manure and slaughterhouse waste can be used to generate fertiliser and biogas as a source of renewable energy.

The Global Livestock Environmental Assessment Model (GLEAM) of the FAO takes a life cycle assessment approach to estimating emissions from livestock systems. It is a GIS framework that simulates the biophysical processes and activities across the livestock supply chains. The aim of GLEAM is to quantify and identify environmental impacts of livestock so that appropriate adaptation and mitigation scenarios could be created for a more sustainable livestock.

Looking across livestock species in GLEAM, cattle are the main contributors to GHG emissions, producing about 5 gigatonnes (Gt) CO2 equivalent (eq.) per year, accounting for more than 60 percent of all livestock emissions. Pigs, chickens, buffaloes and small ruminants contribute much less, each representing between 7 and 10 percent of the sector's emissions. Total emissions (expressed in CO2 eq.) vary considerably by commodity, with those from cattle far outstripping the combined impacts of all other livestock species, accounting for over 60 percent of all livestock emissions. Emissions from beef cattle are greatest, followed by those from dairy cattle. The breakup in Gigatonnes emission CO2 eq. per year is as follows: Cattle beef: 3.2; Cattle milk: 1.6; Small ruminant meat: 0.4; Small ruminant milk: 0.2; Buffalo meat: 0.2; Buffalo milk: 0.5; Pork: 0.8; Chicken meat: 0.5; Chicken eggs: 0.3.

Another study of FAO categorically concludes that "Climate change has major impacts on livestock keepers and on the ecosystems, goods and services on which they depend". Climate change impacts livestock in multiple ways such as adverse changes in production patterns, quality of feed crop and forage, water availability, animal growth and milk production, diseases, reproductive health and cycle, biodiversity et al. Regions identified as the most vulnerable to climate change are Sub-Saharan Africa and South Asia. And these are also the regions where farmers and rural communities rely the most on livestock for food, income and livelihoods, and where livestock is expected to contribute increasingly to food security and better nutrition.

Livestock systems in these regions, especially in India, have evolved over a long period based on the availability and opportunities afforded by the diverse natural resource base supported by strong traditional knowledge, and in modern times also by robust scientific research. Since India is the biggest nation in South Asia, both in geography and population, it is imperative that we guard and protect our livestock from the debilitating effects of climate change; global warming to be specific, and not fall prey to the clamour and efforts to paint livestock farming as a perpetrator of the adverse climate phenomenon; rather livestock should be recognised as a victim of global warming and rescued. The GLEAM data too substantiates this. With no beef industry and negligible industrial dairy, how low our share in these greenhouse gases would be is anybody's guess.

Let us celebrate our livestock, encourage it to grow and become smart.