The Indian Society of Agricultural Economics

84th Annual Conference

November 11—13, 2024, Karaikal (Puducherry)

The Indian Society of Agricultural Economics (ISAE) is pleased to announce its 84th Annual Conference to be held in Karaikal (Puducherry) November 11-13, 2024. This Conference is being organised by Pandit Jawaharlal Nehru College of Agriculture and Research Institute, Karaikal (Puducherry). Dr R.S.Sidhu,, Former Former Dean, College of Basic Sciences and Humanities Registrar, Punjab Agricultural University, Ludhiana – 141 004 (Punjab) is the Conference President. Dr. A. Pouchepparadjou is the Local Organising Secretary of the Conference.

Conference Themes

1. Transforming Horticulture for Sustainable Growth in India

2. Sustaining Livelihoods: The Role of Livestock, Poultry and Fisheries in Rural Economy

3. Innovations in Agri-Input and Services Market towards Sustainable Agriculture

Dates to Remember

- Last Date for Submission of papers **June 30, 2024**
- Communication from ISAE about Acceptance of Paper **August 15, 2024**

Conference Duration

As has been the convention every year the Conference will start at 9.30 am on the first day and will conclude on the third day of the Conference. Delegates and members are advised to reach Karaikal (Puduchherry) one day prior to the Conference and schedule their departure for the evening of the concluding day or the morning of next day.

SUBMISSION OF PAPERS

The Conference is open to research scholars both from India and abroad. The papers may relate to India at the macro level or regional level. However, ground level studies would be preferred.

The papers should be submitted by email on the Society's email id at isaeindia1939@gmail.com

Length of the paper should not exceed 3500 words or 10 pages and should adhere to the current writing style of The Indian Journal of Agricultural Economics (IJAE). For further details, please visit http://www.isaeindia.org

All papers should include a summary not exceeding 250 words. As usual the summaries of all accepted papers will be included along with selected Full Length Papers in the Conference Number of our Journal. **Please note that an author can submit one paper under each theme of the Conference either on his own or in collaboration with others. However, at the most only one full length paper will be accepted in the whole conference issue, either as first author or as co-author.**

Authors must ensure that their submissions are original. Please note that all papers will be screened for plagiarism and accordingly accepted or rejected. Further, authors are solely responsible for any violation with respect to plagiarism. A final undertaking will be sent to all papers accepted for full length.

Best Paper Awards and Fellowship: Every year Indian Society of Agricultural Economics (ISAE) gives best paper awards – Dr. N.A. Mujumdar Prize Award to young scholars below 40 years for the best paper on each of the Conference theme and ISAE fellowship to a senior Indian scholar who has made outstanding contribution in the field of agriculture and rural development.

Presentation by Ph.D. Scholars

In view of the overwhelming response received last year, it is proposed to continue to organise a special session containing paper presentations by Ph.D scholars from different Universities of India.

The award to the maximum best 10 presentations would consist of a memento and a certificate.

It is mandatory for Ph.D. Scholars who present their papers to be a member of the Society. The student's concessional membership fee is Rs. 800/-

In this context, we invite a paper presentation from Ph. D Scholars in the form of Abstract as well as ppt presentation on the basis of their Ph.D Research or any relevant topic pertaining to Agricultural Economics at the 84th Annual Conference of ISAE at Pandit Jawaharlal Nehru College of Agriculture and Research Institute, Karaikal (Puducherry).

Entries for the presentation along with the membership fee in the form of Abstract along with their PPT should be sent before September 30,2024 to:

Hon. Secretary and Treasurer Indian Society of Agricultural Economics, C-104, First Floor, Sadguru Complex I, Near Vageshwari, Gen. A.K. Vaidya Marg, Goregaon (East), Mumbai-400 063. Tel: 022 40143951. Email: isaeindia1939@gmail.com

Travel Arrangements

The Indian Society of Agricultural Economics does not have any regular source of funding. As such, it is expected that the Conference Presidents, the Keynote paper-writers, Rapporteurs, paper presenters, resource persons and other participants will fund their travel costs through their own institutions or other sources.

SOCIETY'S MEMBERSHIP

The rates for Membership is as follows:

Life Membership Fees	Rs. 10000*
Annual Membership Fees	Rs. 1000
Student Membership Fees	Rs. 800

***** Please note that Research Assistant/ Research Associate of a University/Department and College Lecturer/Assistant Professor can avail the option of paying the Life Membership fee in two equal instalments.

MODE OF PAYMENT

The Society's fee may be paid by way of NEFT/RTGS transfer/Demand draft (DD) or local cheques.

Details for NEFT/RTGS transfers:

Account Name	: The Indian Society of Agricultural Economics
Account Number	: 54025434745
Bank Name	: State Bank of India
Branch	: M G Road, Fort, Mumbai
IFSC Code	: SBIN0020634
MICR Code	: 400002467

Kindly inform us when the amount is remitted to our account.

Details of payment through demand draft or cheques

Demand draft/cheque may be sent in favour of "Indian Society of Agricultural Economics" payable at Mumbai at the following address:

The Indian Society of Agricultural Economics,
C-104, First Floor, Sadguru Complex -1,
Near Vagheshwari, Gen. A. K. Vaidya Marg,
Goregaon (E), Mumbai - 400 063.
Tel.: 022-40143951; Email: isaeindia1939@gmail.com

Society's President

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SUGGESTIVE BRIEF AND DETAILED INDICATIVE OUTLINES ON CONFERENCE THEMES FORPROSPECTIVE CONTRIBUTORS

The 84th Annual Conference of the Society is scheduled to be held under the auspices of Pandit Jawaharlal Nehru College of Agriculture and Research Institute, Karaikal (Puducherry) from November 11-13, 2024.

The following subjects are selected for discussion:

1. Transforming Horticulture for Sustainable Growth in India
2. Sustaining Livelihoods: The Role of Livestock, Poultry and Fisheries in Rural Economy
3. Innovations in Agri-Input and Services Market towards Sustainable Agriculture

Research Papers on the above themes are invited from members and other paper-writers for discussion at the Conference. The scope of each of the three themes is spelt out in the enclosed brief and detailed synopsis on three Conference themes given below to enable the paper writers to initiate the process of preparing their papers. The brief and detailed Indicative Outlines are also available on the Society's website www.isaeindia.org.

The soft copy of the paper (not exceeding 3500 words or 10 pages), with its Summary not exceeding 250 words need to be submitted. The last date for the receipt of the papers at the Society's office is June 30, 2024.

SUBJECT I

TRANSFORMING HORTICULTURE FOR SUSTAINABLE GROWTH IN INDIA

The horticulture sector has emerged as a pivotal sector in Indian agriculture, contributing approximately 30 per cent to the agriculture Gross Value Added (GVA) from hardly 13 per cent of the Gross Cropped Area (GCA) (2021-22) thus making it a significant contributor to the agricultural growth of the national economy. The horticultural crop sector encompasses a number of crop groups including fruits, vegetables, flowers, medicinal & aromatic crops, spices, coconut, cashew and mushrooms. Evolving from a predominantly rural-focused domain, the country has become the second largest producer of fruits and vegetables in the world beholding the position of global leader in the production of a variety of horticultural crops (Viz., Banana (26.08 per cent), Mango (46 per cent), Lime and Lemon, Papaya (44 per cent); ginger and Okra) and second largest producer for potato, onion, cauliflower, cabbage etc. (FAO,2019) accounting for 11 per cent of global vegetables and 15 per cent of global fruit production. The significance of horticultural sector emerges from the fact that it has successfully transformed itself into a commercial sector surpassing food

grain production (315.7 million tonnes) with an impressive output of 341.63 million tonnes by 2021-22.

While the comparative agro climatic advantage helps India grow a vast variety of horticultural crops throughout the year with substantial output, the crop productivity is not necessarily the highest in the world nor has it succeeded in harnessing its competitive advantage globally. Due to inefficient production and marketing networks, about 25-40 per cent of the produce continues to be reported lost during post-harvest transportation. Despite the efforts through R&D for enhancing the post-harvest storage and value addition, India lags far behind in utilising its vast horticultural production into value added products in comparison to other developed /emerging economies.

Concerted efforts through favourable policy and focused enhancement into research & development expenditure, India has been in the forefront in expanding the crop base as well, by introducing high value crops with specific growing advantage in to the country's ecosystem. Among these, kiwi, gherkins, kinnow, date palm and oil palm, dragon fruit, strawberry etc. have shown feasibility & commercial successes in the country.

India is fast emerging as the third largest economy in the world which is characterised by rising urbanisation, growing household income leading to changes in consumption pattern in preference to nutritious, easy to make, dietary diverse value added products. These changes in particular are anticipated to have direct bearing on the demand for horticultural crop production as well.

A closer look into the growth of horticulture sector over the last few decades is suggestive of an area lead expansion than a productivity lead one. Being highly seasonal in nature, and short duration crops, many of the horticultural crops, especially vegetables, medicinal and aromatic crops appear to fit well into the crop rotation patterns of the small and marginal farmers there by leading to a pattern of crop diversification with the potential for a second green revolution with measurable higher profitability and returns to farming households.

Backed by appropriate policy support from the government pronounced schemes like National Mission on Horticulture, export promotion, processed /value added products etc., targeted production of high-value crop systems, such as organic farming, exotic fruits, and specialty spices, have expanded in helping farmers to command premium prices for their produce, fostering economic sustainability. Notable among these also is the increasing significance and contribution of flowers (both traditional and modern(cut) flower trade) as agribusiness options enhancing the income and profitability to rural and semi-urban households. Analysing the export performance of cut flower trade as also the inter-state movement would specially be of significance for drawing future policies for sustainable growth of horticulture sector.

Horticultural crop production being highly labour intensive also appears to have helped a large number of women with gainful employment opportunities, though a comprehensive data regarding their involvement remains limited.

The transition from a supply-driven value chain to a demand-led market-oriented supply chain still poses challenges for the rural economy, including issues such as, on-time delivery, grading, packaging, market infrastructure, agro-processing facilities, marketing credit access, price discovery/realisation, grading uniformity, standardisation of weights and measures, and post-harvest handling practices. Robust value chains, essential infrastructure development, and export-quality produce assurance are crucial for unlocking the sector's full potential.

Input supply is an essential component for successful production with input use efficiency. Innovative institutional arrangements involving public and private sector players such as start-ups, public funded institutions, Farmer Producer Organizations (FPOs) and the like play a pivotal role in ensuring timely access to empower small-scale farmers, while adequate financial support is integral to increasing productivity, market competitiveness, and overall sustainability.

Beyond meeting global market demands, the horticulture sector addresses health and medicinal needs, especially through medicinal, aquatic crops and minor vegetables. Utilising swamp lands and shallow ponds for large-scale cultivation requires innovative techniques and could significantly contribute to nutritional security and economic upliftment.

On the policy front, consolidating agricultural markets and supply chains, addressing price volatility, and market reforms are the crucial steps, that have already been addressed to some extent. Addressing price volatility in horticulture has incorporated a comprehensive approach, including effective market information systems, improved supply chain management, risk mitigation strategies for farmers, and supportive policies that promote stability in production and market conditions. Sustainable practices and innovations in cultivation techniques can also play a role in minimizing the impact of external factors that contribute to price fluctuations.

Thus, the horticulture sector in emerging economies, with a focus on India, plays a multifaceted role in ensuring food security, diversifying agricultural activities, and contributing to economic growth. Tackling challenges such as global trade constraints, value chain development, and infrastructure gaps is crucial for unlocking the full potential of the horticulture sector. Additionally, gender disparities must be addressed for sustainable and inclusive growth. Timely and robust information is key to improving the socio-economic conditions of Indian farmers, fostering self-reliance, and contributing to environmental protection. Furthermore, value addition in the horticulture sector enhances economic returns, creating new avenues for market diversification and increased profitability.

Given these challenges and opportunities, researchers may focus on these key questions to further advance the sector:

1. Several new crops have been introduced or being a part of diversification effort in horticulture, the extent of spread, relative profitability in comparison to the

earlier grown ones for small and marginal farmers, considering factors like input costs and market demand could be useful.

2. What are the new/ modern methods in place to ensure quality seeds and other inputs at farm level? And how are these being distributed/ supplied for horticultural crop production?
3. In what ways can climate-resilient practices be integrated into horticulture cultivation to mitigate the impact of climate change on crop yields?
4. What role does gender play in the horticulture sector, and how can gender disparities be addressed to ensure inclusive growth and empowerment?
5. What are the potential opportunities for integrating technology and innovation in the horticulture sector to enhance productivity, quality, and sustainability?
6. How can the horticulture sector contribute to achieving Sustainable Development Goals, particularly in terms of environmental sustainability, innovation, and socio-economic development?
7. What innovative value chain strategies can be implemented to address the challenges of infrastructure and storage facilities in the horticulture sector? What are the key constraints in the horticulture value chain that hinder the growth of the sector, particularly for smallholder farmers, and how can these be effectively addressed?
8. Analysis of successful case studies of horticultural sub-sectors such as export vs domestic trade of floriculture, speciality vegetables etc. to highlight sustainable models of trade in horticulture?
9. How can information dissemination and communication networks be improved to provide timely and robust information to farmers, fostering self-reliance and environmental protection?
10. How have market reforms influenced the competitiveness and market access for horticultural products?
11. What are the contributions, opportunities, challenges associated with niche cultivation in horticulture, and how can small farmers benefit from such specialized approaches? How have successful case studies in horticulture influenced the overall livelihoods and income of small and marginal farmers?
12. What strategies can be implemented to mitigate the impact of price volatility on horticultural products, particularly for vulnerable farmers?
13. How can the horticulture sector enhance global market competitiveness, overcoming trade challenges and ensuring sustained growth in exports?
14. How can institutional mechanisms involving public and private partnerships, start-ups, Farmer Producer Organizations (FPOs) be integrated into the ecosystem so as to empower small-scale farmers and enhance their access to markets, financing, and technical assistance in the horticulture sector? Are there successful cases that could be analysed and replicated?

SUBJECT II

SUSTAINING LIVELIHOODS: THE ROLE OF LIVESTOCK, POULTRY AND FISHERIES IN RURAL ECONOMY

The animal husbandry (livestock, poultry and fisheries put together) has played an important role in sustaining the livelihoods of especially resource-poor rural households in the past and the same is relevant in the present context despite multi-fold economic development. It not only converts otherwise-waste biomass into value-added products but also provides regular income and readily encashable assets in the hands of poor. Thus, the animals are the source of insurance, investment, energy and power in agricultural & household operations, food and nutrition security, income and wealth. It is an asset which multiplies itself. Moreso, less land and capital is required to draw income from the livestock, poultry and fishery enterprises. Due to the concentration of animals in the hands poor, its contribution in alleviation of poverty and malnutrition in India and other developing economies cannot be over-emphasised. As derived from the estimates of the Situation Assessment Survey (NSSO 77th round), more than 70, 58 and 52 per cent of the total bovines, ovine and other mammals, and poultry birds, respectively are held by small and marginal farmers; the poorer section of rural India. Ameliorating poverty can be attributed to more equitable distribution of animals and labor intensive nature of smallholder production system. Factors driving the demand for livestock products are expected to remain strong in the near future and this scenario presents enormous opportunities to boost farmers' income and accelerate the pace of poverty reduction.

Nutrition plays an important role in achieving the Sustainable Development Goals. Malnutrition has emerged as a severe problem with ever-increasing population of India falling short of availability and purchasing power. Studies have revealed association between sub-optimal protein intake and low or negligible animal-sourced food consumption among nutritionally vulnerable population groups. Livestock have the potential to be transformative; by enhancing food and nutrition security, and providing income to pay for education and other needs. High-value animal-sourced foods, viz. milk, meat, and eggs, are among the best sources of high-quality protein and micro-nutrients that are essential for normal development and good health. The demand for animal products is highly income elastic and is being boosted by the rise in education level and urbanization. A recent study by NITI Aayog[1] reported that demand for liquid milk for household consumption is projected to reach 78 million kilolitres in 2021-22 and 90 million kilolitres by 2032-33; further the aggregate demand for milk will touch 220 million kilolitres in 2032-33; while demand for eggs, fish and meat will be 25 million tonnes. Accompanied by enhanced infrastructure and processing facilities, there is an upward shift in demand and supply of animal products. Consequently, animal production is slowly shifting from a smallholder production system to commercial production. Poultry has become a highly commercial business and the enterprises like goat, piggery and dairying is moving in the same direction.

The commercialization of livestock production has ushered new livestock-based enterprises like improved semen production, animal seed/ calf rearing and fodder production. On the demand side also, demand is increasing for animal products from indigenous breeds, organic products and animal products meeting the requirements of people with changed lifestyle and tastes.

The concerted efforts of farmers, scientists, policymakers, and other stakeholders in the past have brought about revolutions in livestock, poultry and fishery sectors. The White Revolution refers to the phase when milk production in the country increased significantly. The Silver Revolution ushered in an era of commercial egg and poultry production, while the Red Revolution did the same for meat production. The Blue revolution has set in with the steering of fish and aquaculture production to meet the growing demand in the domestic market and abroad, through export.

India has set the target to become a developed nation by 2047 and to realize this aspiration, an indicative roadmap has been envisioned that India's economy must grow at a rate of 7.6 per cent per annum over the next 25 years. A crucial aspect of this transformation is the proper development of the agriculture and allied sectors by adopting data-driven forecasting and strategic planning, with a thriving and resilient livestock, poultry and fisheries sector contributing significantly to its economic growth trajectory.

Livestock Sector

India has the world's largest livestock population (536.76 million) accounting for over 12.80 per cent of cattle, 54.38 per cent of buffalo, 13.42 per cent of goats and 5.99 per cent of sheep in the world. The country hosts 10.56 per cent of the world's livestock population in 2.4 per cent of global land area and only four per cent of the global water resources; hinting a mismatch between livestock population and available resources. With the increase in livestock production, new problems are also emerging like sustainability of production and productivity, climate change and degraded natural resources. The future strategy of livestock development needs to be focused on more output from less number of animals. There are 1.63 livestock per hectare of geographical area and 2.75 livestock per hectare of gross cropped area. However, the contribution of livestock to agricultural Gross Domestic Product (AgGDP) is substantial. Since the onset of the present century, though the contribution of agriculture and allied sectors, to the national GDP has declined (about 23 per cent in1999-2000 to about 8 per cent in 2019-20), the share of livestock sector to agricultural GDP has increased consistently from about 23 per cent to 31 per cent during the same period[2]. Livestock sector has a favourable distributional impact than land. Landless agricultural labourers, marginal and small landholders constitute the core livestock production sector (they own about 69 per cent of total livestock units)[3]. In fact, India's livestock sector has been acknowledged as a major pillar in the Indian Union's ambitious goal of doubling of farmers' income.

The livestock production in India is dominated by dairy production followed by meat production. The total milk production in India stands at 214.4 million tons and rank first in the world milk. Milk and milk products account for two-thirds of the total output value from the sector, followed by meat (23.13 per cent). If the value of dung is added, then the contribution of dairying exceeds 71 per cent. The income per household from milk accounts for 93.6 per cent of the gross monthly income from livestock farming. The interesting fact is that a major share of milk is coming from smallholder milk producers. About 90 per cent of the small and marginal farmers are producing more than 83 per cent of the total milk in the country while their average production is less than two litres per day. The practice of milk production is lower among large farmers. Only 39.4 per cent of the large farmers produce milk and they contribute only 10.5 per cent of the total milk production in the country. Total meat production is 9.29 million MTs, including poultry meat contributing 53 per cent. India has emerged as a major exporter of buffalo meat (carabeef) in the international market (carabeef export from India accounts for about 75 per cent of the country's total value of livestock and livestock products exports).

The practices of rearing small ruminants and pigs by low-income groups and in agro-climatically marginal areas are well-proven livelihood-sustaining activities when no other productive resource is in hand. India ranks first in goat population (148.88 million) and it contributes 6.47 million tonnes of milk (3.24 per cent), 1.27 million tonnes of goat meat (13.67 per cent), and 0.18 million tonnes of skin to the central pool. Sheep can survive in areas, where cattle would perform poorly. The total sheep population in the country is 74.26 million and the wool production is 33.13 million kg which has been continuously decreasing for the last ten years. Goat and sheep value chain is basically small holders' value chain and the commercial aspect is increasing with demand-specific production. On the other hand, pigs are highly efficient food converters. The meat production from pigs was 365.63 thousand tonnes in 2021-22 which was 3.93 per cent of the total meat production in the country. There is considerable untapped potential for advancing the small ruminants and pig production in the country to tap substantial economic benefits.

The common property and waste lands, and water bodies were the main resources available to landless farmers for drawing income from small ruminants and other livestock holdings. The decrease and encroachment of these resources have adversely affected the livelihood of smallholders, landless farmers and nomads. The restoration, conservation and upgradation of these so-called common property resources (CPRs) is essential not only for sustaining the livelihood of above mentioned special category of farmers but also that of whole livestock economy in the country.

Though the demand for draught animals is decreasing with the increase in mechanization, still their role cannot be overlooked in hills and terrains not suitable for mechanization. When the world is confronting the problems of air pollution and emission of GHGs, we have to look for alternatives of surplus livestock replaced due to low productivity and mechanization e.g. Gaushalas and their financial sustainability.

Addressing challenges and implementing sustainable practices are essential for realizing the full potential of the livestock sector. In the context of these issues and opportunities, researchers may focus on the following research questions:

1. How can the country ensure sustainable expansion of livestock production to meet the rising demand for animal-source foods? How to develop a sustainable development index pertaining to animal food systems for particular agro-ecological regions of the country? How indicators for developing the index, (including water foot print, energy foot print, efficiency of animal feed to animal food, degree of animal biodiversity, affordability of animal food, welfare of animals, economic affect of grazing, etc.) can be quantified and captured.
2. What pivotal economic and social contributions does the livestock sector make and how to quantify various contributions of livestock in the rural household economy in the developing countries, viz. source of insurance, capital investment (banking), energy in agricultural (draught power) and household operations (fuel), food & nutrition security and income & wealth? How have these various contributions transformed over the past decades? Women contribute significantly to the workforce engaged in the livestock sector. Can their ownership and empowerment be elevated within the sector?
3. What is the extent of yield gap in the livestock sector? What are the reasons behind this? What evidences are available on technical efficiency analyses in specific livestock sectors, like dairy, small ruminant production, pig, etc. be analysed?
4. How to achieve inclusive value chain development for livestock sector for milk, small ruminants, pigs and export-oriented commodities like buffalo meat (carabeef)? How to capture the interconnectedness of these chains and their social, economic, and ecological dimensions? How to quantify the multidimensional impacts that value chain policies and interventions (viz. disease control interventions, financing, feed & fodder interventions, introductions of improved breeds/varieties, etc.) may have throughout the chains? Evaluate the short-, medium-, and long-term impacts of specific interventions and policies.
5. What is the economic burden due to priority endemic livestock diseases in India (viz. Foot & Mouth Disease, Peste-des-petits Ruminants, Classical swine fever, Brucellosis, Haemorrhagic Septicaemia, etc.)? What is the impact of disease outbreaks on various value chain actors and how to identify disease risk hotspots across the chains for effective interventions?
6. How can a reliable database on cost of milk/meat production be built? How to develop standardized methodology for cost estimation for milk and meat (small ruminants and pig) for different parts of the country and estimate costs of milk and meat production?
7. What is present estimate of feed & fodder shortage/deficiency? What is the economic impact of feed & fodder technologies/practices, viz. fodder improvement, circularity of food/feeds, precision technologies, expanding feed

resources, etc.? Crop and livestock in agri-food system is deeply interlinked. How can we reduce trade-offs and maximize the synergies in crop-livestock farming systems in the process of reducing feed & fodder deficiency?

8. Climate change stress is major factor to consider while transforming livestock sector. What are the repercussions of climate change on the performance of livestock? Nutrition and adverse effects of livestock on climate are interlinked. What viable strategies can be implemented to adapt to and mitigate these impacts effectively in terms meeting nutritional requirements, improving productivity and mitigating climate change impact?
9. How livestock research in India has contributed towards enhancing efficiency in this sector and how to prioritise future research in livestock sector? How to allocate resources across species/breeds, regions/states and across research areas, viz. breeding, feeding, disease control and healthcare delivery and policy research?
10. What is the impact of government schemes/programmes (National Livestock Mission, Gokul Mission, Gaushalas, Dairy/Animal Husbandry Development Infrastructure Fund, Supporting FPO's etc.) for livestock development with special focus on financing sustainability?
11. Re-explore the role of common pool resources (CPRs) in the livestock economy of the country and that of landless including nomads and small livestock holders. What institutional and community-based strategies are effective in the restoration, conservation and upgradation of these resources?[5]
12. Emergence and role of new enterprises in livestock sector for the smallholders like calf rearing, semen production and breeding farms, organic and indigenous milk production and their marketing strategies.
13. Demand and supply analysis and trade possibilities in milk from non-conventional species like camel, goat, sheep, etc.

Poultry Sector

The term poultry includes fowls, ducks, Japanese quails, geese, turkeys, Guinea fowls, and emus, etc. The fowls constitute the major share of the total poultry population followed by ducks, Japanese quails, etc. The total poultry population in the country is 851.81 million (20th Livestock Census). The majority of the total poultry population in India is reared in the rural areas *i.e.,* around 95 per cent, and the rest 5 per cent in urban areas. The proportion of backyard and commercial poultry are 37 per cent and 63 per cent, respectively. The backyard poultry population in 20th Livestock Census 2019 has increased by about 46 per cent over the previous census. Thus, despite lot of commercialisation, poultry is still a source of livelihood and nutrition to majority of poor population.

The major products of poultry sector are meat and egg. According to FAO 2021, India ranked 2nd in total egg production and 6th in poultry meat production globally (FAOSTAT, 2021). Poultry meat contributed around 53 per cent to the total meat production in India, thus proving its dominance in the meat industry. In FY 2022-23,

the country's total egg production stood at 129.60 billion eggs and total poultry meat production stood at 4.80 million tonnes (GoI, 2023). Yet, the per capita annual availability of eggs and total meat in India (at 95 eggs and 6.81 kg meat) has remained far below the ICMR recommendations of 180 eggs and 11.2 kg meat per annum. The eggs are even consumed by the vegetarian population and may act as vehicle of removing the deficiency of necessary and minor nutrients. The demand for poultry meat and eggs is increasing with time but requires hygienic production, processing and marketing. Majority of poultry meat is sold in the domestic market as fresh and lacks hygienic processing and preservation.

The contribution of poultry sector to the total Gross Value Added (GVA) from the livestock sector is to the extent of approximately 20 per cent. During 2012-13 to 2021-22, the poultry meat industry in terms of the value of output has grown at CAGR of 10.30 per cent, while the egg industry has grown with a CAGR of 6.37 per cent (National Accounts Statistics 2021). However, the poultry is a highly risky enterprise on account of diseases, pandemics, marketing, etc. It is estimated that during COVID-19, projected loss in Indian poultry sector alone was approximately $ 3053 million (Rs 244 billion)[4].

The well-established fact is that the backyard poultry supplements the income and nutrition of the rural households. What is unknown is the dynamic changes that took place in backyard poultry in the recent past like small scale poultry hatcheries catering to the needs of poultry farmers. The contract farming is also gaining ground, particularly, for broiler farming. In this background, the role of poultry in supplementing the nutrients and sustaining the income of rural poor needs to be supported by adequate research, policy initiatives and economic incentives. The economic researchers need to analyse the following broad areas:

1. Changing role and scale of backyard poultry in household income and nutritional security. What are the supports and services can explore its full potential?

2. Analyse upcoming and upgradation of small commercial enterprises in poultry viz., hatcheries, feed units, processing units, etc., catering to the needs of backyard poultry and commercial poultry farms.

3. Reporting the economic contribution and marketing mechanisms in non-conventional poultry businesses which may be in birds other than fowls.

4. Trends in backyard and commercial poultry in terms of growth, risk, unusual situations like pandemics and the impact of different risk management measures.

Fisheries Sector

India's fisheries sector composed of both marine and inland fisheries, is contributing around 16.2 million metric tons (GVA Rs 2326.2 billion) to the national

production. The sector is a cornerstone for food security and livelihoods for a large section of the socially underprivileged and economically poor population. After the shift in focus of planning and support towards inland fisheries during 90's, the production of inland fish (about 12 million tons) outstands marine fish production by three times. The value of marine products exported in FY 2021-22 reached Rs 57,586 crores. The Government has fixed a national target to increase fish production to 22 million metric tonnes by 2024-2025 which will have a positive impact on 2.80 crore fishers and fish farmers. India is among the top three fish exporting countries of the world preluded by China and Indonesia.

The freshwater and brackish water aquaculture accounts for 75-80 per cent of the inland fish production. The carps and prawns in freshwater aquaculture and shrimps in brackish water aquaculture have contributed to the bulk as well as value of the inland production. There is a greater extent of commercialisation in both prawn and shrimp aquaculture, confronting technical and economic problems like land degradation, seed unavailability, low productivity, etc. There are diverse categories and distinct characteristics of water bodies. The variations in ownership, property rights and leasing policies further complicate the management and performance of these resources. There is a need for harmonious interplay between technical and institutional arrangements[5].

The fish is not only one of the cheapest sources of protein but also rich in oils, vitamins and minerals. The consumption of fish and fish products helps in removing the problem of malnutrition and deficiencies among the poor. More than 50 per cent of Indian population is fish-eating and in some states, it is more than 90 per cent. Per capita yearly consumption of fish was over 13 kg in 2022-23 (NCAER, 2023) which is still lower than the world average (20.5 kg). Lack of post-harvest processing for domestic market and poor availability of ready-to-cook and ready- to-eat fishery products hurt overall fish consumption.

Like livestock and poultry enterprises, the fisheries in the country is still a smallholder production system. Any technological innovations, economic incentive and policy imperatives influence the income and employment of large number of fishermen and fish farmers. The gender aspect of fisheries sector is that about 44 per cent of fishermen are women both in inland and marine fisheries. In order to support and protect the livelihood of the stakeholders in fisheries sector, various schemes have been implemented like Group Accident Insurance, Kisan Credit Card (KCC), Fisheries and Aquaculture Infrastructure Development Fund (FIDF) and Pradhan Mantri Matsya Sampada Yojana (PMMSY) which has certainly impacted the welfare of these stakeholders and need to be investigated.

Papers exploring the economic and institutional dimensions of fisheries, including market structures, trade policies, and the socio-economic impact on fishing communities, are encouraged. Understanding the economic intricacies of freshwater, marine, and coastal fisheries is paramount for formulating policies that balance conservation and economic growth.

The broad researchable areas in fisheries sector may be;

1. Investigate the social dimensions of sustainable fisheries, including the well-being of fishing communities, gender dynamics, and community-based management strategies.
2. Analyse the impact of institutional schemes and policies on economic and social indicators, and community empowerment within the fisheries sector.
3. Explore innovative approaches that integrate traditional knowledge and community participation in fisheries management
4. Value-chain analysis of fish production and aquaculture to overcome the bottlenecks in production, marketing, processing and sustained profitability.
5. The supply-demand gap analysis and Trade dynamics of fish and fish products for sustaining the growth of the fisheries sector.
6. Analysis of the performance of inland and marine fisheries under alternative management regimes of water bodies[6].

Integration of Livestock, Poultry and Fisheries

The specialised production in dairying, poultry and fisheries, requires some minimum area to have economically viable units. Where the land holdings have gone below the economic viability level, various livestock, poultry and fishery integrated farming systems have been developed which are also termed as zero-budget natural farming systems (ZBNFSs). These farming systems provide sustainable livelihood to marginal and landless farmers holding a small piece of land. An economic inquiry into these farming systems highlighting their role, extent and contribution in the event of squeezing land holdings per household is also invited.

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SUBJECT III

INNOVATIONS IN AGRI-INPUT AND SERVICES MARKET TOWARDS SUSTAINABLE AGRICULTURE

The use of intensive inputs such as fertilisers, pesticides, scale appropriate farm machinery, and improved seed materials, along with services like credit, insurance, climate information, and extension in agriculture have facilitated a significant increase in agriculture production. So is the case of allied sectors. Services like diagnostics, prophylaxis, and veterinary services have aided significantly in increasing yield, minimizing losses and reducing costs in livestock production. Enhancing food and livelihood security, and achieving sustained growth in agricultural production hinges on continual improvement through technological change and innovations in agri-inputs and services. Research indicates that the contribution of quality seeds alone to total production is approximately 15-20 per cent and even goes up to 45 per cent with efficient management of other inputs. Similarly, if not adequately protected, damage and losses caused by weeds, insects, pests, diseases, and nematodes could range from one-fifth to one-third of total production. Services like agricultural credit, insurance, context-specific climate information and technology dissemination play a pivotal role in facilitating the adoption of improved technologies and innovations in agriculture. However, the access to and use of quality inputs and the adoption of improved technologies and innovations still lag far behind the desired levels. The use of fertilizers and pesticides is often unbalanced and unscientific, adversely affecting not only the environment but also farmers' income and export earnings. Access to agricultural credit from institutional sources, particularly among resource poor farmers, remains low.

While the grassroots-level public extension programs of the states face criticism for their perceived struggles in disseminating technologies, however there has been a notable increase in farmers' access to information. According to the Situation Assessment Surveys, the percentage of farmers with access to technical support has risen from 41 per cent in 2012/13 to 49 per cent in 2018/19. To comprehend this apparent paradox, it is imperative not only to compressively assess the gross-root extension system but also to assess the role of alternative extension systems, including the frontline extension system, private extension services, digital infrastructure, agri-tech start-ups, civil society organizations, and farmers' associations, employing robust datasets and methodologies. Evidence from large-scale extension projects, whether public or private, is susceptible to methodological and identification challenges[1]. The impact and effectiveness of various models and systems for technology dissemination and service delivery have received insufficient attention. The market-led extension has been increasingly recognized as a necessity, with agri-tech start-ups playing a significant role. Evaluating the viability, challenges, and sustainability of agri-tech

[1] Raabe K. 2008. Reforming the Agricultural Extension System in India What Do We Know About What Works Where and Why? IFPRI Discussion Paper 00775, International Food Policy Research Institute, Washington, DC.

start-ups and Farmers' Producer Organizations (FPOs) is crucial for informing policy decisions and ensuring effective support for the agricultural sector. Services like credit and information on climate and market outlook are important not only to the farmers but also for the other value chain actors. Moreover, innovations in agri-inputs and service markets must also address the needs of emerging priorities of agri-food systems transformation which focuses on climate resilient and regenerative agriculture, circular economy and gender and nutrition sensitive food systems that ensures affordable healthy diets for all. The digital innovations including artificial intelligence (AI) and machine learning (ML) and modern technologies such as drones present an opportunity to revolutionize the agri-input and services market. However, it needs appropriate policy and institutional support. The proposed theme of the conference aims to bring researchers together to deliberate on issues related to the agri-input and service market, exploring how innovations can potentially address some of these challenges. Some ideas for paper writers are listed below.

Agri-Input Innovations

- Status, trends and spatio-temporal variations in use of agri-input, market structure of input industries, and impact of policies and institutions like, Seed Control Order, Fertiliser Control Order, National and state seed corporations, Seed hubs, etc. in increasing the use of improved agri-inputs.
- How seed embedded technology and innovations like BT-cotton, bio-fortification, seed priming, bio-stimulants, etc. has affected farmers' income, nutritional status and environment in the country.
- How intellectual property laws has affected Indian seed industry, technology adoption and farmers' income.
- Drivers and potential technology and policy options to increase the fertilizer use efficiency, reducing fertilizer subsidy burden, and checking imbalanced used of fertilizers.
- How the new initiatives of the Government for promoting regenerative agriculture like PM-PRANAM and Green Credit Scheme can help in improving nutrient use efficiency and sustainability?
- How the Soil Health Card scheme can be made more effective in promoting balanced and judicious use of fertilizers?
- Consumer perceptions and willingness to pay for pesticide-free or organic produce, considering the implications for market demand.
- How the pesticide residue impacting Indian agricultural export and what strategies are required to promote safe use of pesticides?
- Economic feasibility of alternative pesticides

- Evaluate the effectiveness of existing pesticide regulations and policies in India in ensuring environmental sustainability, farmer safety, and consumer protection.
- Demand and supply of livestock feed and fodder and potential for market development.
- How to promote small-farm mechanization, particularly in marginal environments?

Innovations in Agri-Services

- How access to institutional credit and interest rate subvention schemes influences farmers' adoption of modern agricultural technologies and practices, promotion of sustainable and climate-resilient farming methods.
- Relationship between farm credit availability and farmers' decisions to diversify crops and enterprises
- How digital technologies, infrastructure and fintech solutions have impacted the efficiency and accessibility of agricultural credit? What are the barriers in promoting digital technologies?
- Cost-effectiveness of different technology adoption strategies for various crops and farming systems.
- Effectiveness and impact of agricultural extension services, institutions and different technology transfer models.
- Appropriate business models for delivery of input and services for promoting regenerative agriculture and natural farming.
- Impact of and constrains in agriculture insurance.
- Effectiveness of different extension systems and models for meeting current and future challenges of agri-food systems.
- Viability, success factors, sustainability, and challenges of agri-tech start-ups, and
- How farmers’ organisations can be strengthened for extension, advisory and delivery of inputs and services?

Innovative Farming Practices

- Adoption, economic viability and scalability of precision agriculture technologies including drones' use across farm size.
- To what extent and how the data-driven decision-making can enhance farm productivity and profitability; and how it can be promoted!
- How precision agriculture technologies influence farm-level decision-making processes and what could be the economic outcomes of improved decision support systems for farmers?
- How AI can help in technology transfer, decision support and what could be the challenges in application of AI?
- How the farmer-to-farmer extension and learning exchange can be promoted?
- Innovative sustainable and inclusive business models for cost effective delivery of agri-inputs, services and knowledge products to farmers and other agri-value chain actors.