

Scenario of Goat Rearing and Marketing of Goats and their Product - A Case Study in West Bengal)

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The potentiality of goat sector in Indian economy is obviously important. Goats are distributed across all agro-climatic regions of the country. Rapid urbanization combined with continued economic growth has been continuously pushing up the market demand for livestock products – mainly meat. By the given number of goats, production of goat meat stands at the level of 0.37 million tonnes. Thus, growth in the demand of meat could provide great opportunity to the goat keepers to reap higher income from goat keeping. The marketing of goats is mostly a neglected sector. Goat market in most parts of India is unorganized - operating under the clutches of a nexus of small traders, market agents, middlemen and “Aratdars” etc. Due to absence of strong networks of market access and information, an inefficient market is being operative so far, the transaction of goat is concerned. The paper attempts to find out the nature of goat keeping and access to the marketing of live goats and goat meat with the following objectives (i) To study the goat keeping system of sample households, to ascertain the marketing access to goats and their constraints, to study the marketing system of goat products and to suggest suitable development strategies for efficient marketing of goats and their products. A multistage sampling technique has been adopted for the selection of the districts, markets, villages and goat keepers, in West Bengal. Thus, a total of 100 goat keepers, 20 butchers, 20 retail and 8 whole sale skin traders relating to the period July 2007 to June 2008. Goat husbandry is mainly limited to the people of lower income groups in the rural areas. Goat enterprising units per household comprised of 5.5 goats, which consists of 1.19 male, 2.43 female and 1.88 kid goats. Average annual income (Rs. /Goat) from goat is Rs. 573.54. However, income from male, female and kids are Rs. 930.96, Rs. 606.81 and Rs. 404.95 respectively. Traders’ margin to goat keeper’s price is Rs. 108.08 per goat. Goat keepers sell their goats to local traders, butchers, whole sellers and consumers in their village and local market, whenever they are in need of cash. In the absence of weighing practice and awareness about the price for goats, the traders and others are heavily exploiting the goat keepers. The main products of goats are meat and skin. The butchers are involved in the production of the same. Prices of meat (2008) varies from Rs.206.00 to Rs. 270.00 and each raw skin fetches Rs. 50.00 to Rs. 70.00. There are no major investments by the Government to either promote goat husbandry. Lack of feeding, health care facilities and poor marketing facilities, goat keepers have been struggling hard to maintain their occupation without any success. Hence, sufficient investment for creation of physical and marketing infrastructure for goats and their

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product (skin) is quite essential. The developed infrastructure would obviously remove the constraints of goat keeping.

Fish By-Catches and Sustainability of Livelihoods – A Catch 22 Paradox

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The study examines the paradox between by-catch management and sustaining livelihoods of fishers in Tamil Nadu's Kasimedu and Pamban harbors. Analyzing responses from 224 fishers across different fishing systems, the research highlights significant differences in by-catch trends and fishers' willingness to reduce by-catch. Kasimedu fishers show readiness to explore alternative livelihoods and implement by-catch reduction strategies, while Pamban fishers hesitate due to limited opportunities. The study suggests that regulatory interventions, combined with livelihood diversification, can mitigate the ecological impact of by-catch while securing long-term income stability for fishing communities. There are key differences in perceptions and behavior, calling for location-specific solutions. The findings underline the complex balance between economic needs and conservation efforts.

Business Performance of Women Self Helps Groups Involving in Allied Sector in Chhattisgarh: A Case Study

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The present study was conducted to assess the business performance of women self-help (SHGs) groups involve in different allied sectors. Overall, 219 respondents of 20 SHGs of selected from the two districts of Chhattisgarh plains which were Rajnandgaon and Khairagarh. Maximum respondents found in 25 to 35 age group (36.07 per cent). Most of the respondent were primarily educated. About 67 per cent women are married. Almost all the women are working are agricultural activities besides SHGs works. Results indicated that the level income and employment of members was increased after joining self-help groups. In case of goat rearing the per member net income was Rs. 22200, followed by milk production per member net return was Rs. 16617. Highest net income earning SHG member was in case of poultry production i.e. Rs. 394133 per year. Average income before joining SHGs and after joining SHGs were Rs. 1782.19 and Rs. 2686.52 monthly. NRLM Rajnandgaon gave the guidance for producing and marketing of SHG products. Increase income, rate of employment, awareness and financial aid after joining the SHGs. All women were very much interested in different activities; the purpose of this research was to study

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about the women empowerment through income/savings, social issues, awareness, education etc. The major problems were high price of raw material, lack of advertisement, delay in credit facilities and problem of family responsibilities. It is recommended to advertise their products on social media platforms and FM radio. Additionally, increasing the SHGs' loan amount and establishing links with local supermarkets can boost their operations. Organizing training programs to develop entrepreneurial capabilities and improving the quality of packaging and grading are also advised.

Resource Use Efficiency within the Integrated Farming System Models of Punjab and Haryana

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The very essence of integrated farming system (IFS) is to ensure better utilization of on and off-farm resources. Therefore, the present study was conducted with 200 farmers practicing the three prevalent IFS models: Crop + Dairy, Crop + Dairy + Mushroom and Crop + Dairy + Beekeeping in a ratio of 40:30:30 in the states of Punjab and Haryana during 2020-21. Marginal value product and marginal input cost were implied on the coefficients of Cobb-Douglas production function for crop, dairy, mushroom, and beekeeping enterprises individually for all the models under consideration to estimate resource use efficiency. It was observed that most of the resources were utilized inefficiently in all the three models under consideration for both the states, suggesting that the farmers overuse or underuse the resources within their farm enterprises. However, it was observed that farmers were judiciously using the inputs purchased by them indicating that the cost of an input may have a direct bearing on the use efficiency of the resource.

Resource Use Efficiency of Buffalo Milk

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The marginal value product (MVP) of inputs whose regression coefficients were shown to be statistically significant in the milk production function was compared with their corresponding unit pricing in order to analyze the resource utilization efficiency. T-statistics were used to examine the importance of an input's MVP deviation from its unit price. When the MVP of an input is significantly greater than its unit price, it means that more of that input can be utilized to boost productivity, while when the MVP of an input is significantly lower than its unit price, it means that

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the input is being used excessively and needs to be rationalized. The significant inputs' marginal value products (MVP) for buffaloes.

Four Decade Spatio-Temporal Appraisal of Livestock Economy of Himachal Pradesh

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Income from livestock sector has come to be regarded as more inclusive and sustainable for millions of rural households. And it is more so for rural households in hilly areas like Himachal Pradesh which lack alternative livelihood options. The livestock population and hence production undergo changes over time and hence need occasional appraisal. The present paper is an attempt in this direction for Himachal Pradesh drawing upon secondary data for about four decades. The results showed that while the overall livestock population has shifted slightly in favour of buffaloes and sheep, the breed improvement efforts have clearly delivered the result in terms of sustained increase in milk production which is the major contribution of livestock sector. However, the spatial disparities across districts need to be attended to make livestock development more holistic in the state to sustain the livelihoods of the people in hilly areas.

Self-Employment in Livestock Farming for Livelihoods in Rural India

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India occupies a significant place in the livestock sector of the World economy. It is first in milk production, third in Eggs production and sixth in meat production. Livestock sector is considered as second major land – based livelihood opportunity and provides livelihoods to millions of Indian rural households. Population of livestock has nearly been doubled during last seven decades. This sector plays significant role in generating employment, particularly self-employment and supplementing income of marginal farmers and landless labourers and contributes significantly in many forms, such as, milk, meat, eggs, fish, draught power, energy for rural households and maintaining soil fertility, etc. It has enough scope to grow, as it has vast track of common property resources (land and forest) for grazing and fodder production besides adequate crops residues for fodders. This is a descriptive exercise based on secondary data for understanding trends of share and growth of this sector and source of livelihoods of rural households in India with special reference to self-

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employment in livestock sector. Data were collected from various issues of National Accounts Statistics and various rounds of National Sample Survey. This paper is an attempt to understand the livelihood opportunities of rural households through status of self-employment in livestock farming in India. This paper finds that livestock farming in rural India has been growing significantly to expand opportunities of livelihoods and supplement income of the households. Share of livestock in GVA of agriculture and allied sectors has significantly increased over the years and farm size and social groups still remain important to understand livelihood structure of rural households. Households with lower farm size are found with higher concentration of livestock farming to supplement their livelihoods and income. Landless and near landless agricultural households across social groups and states are found self-employed in livestock farming as a significant source of income.

A Study of the Pork Meat Market in Karur District of Tamil Nadu

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Meat is an essential part of the human diet which provides nutrients for growth and maintenance. With the changing dietary scenarios, the popularity of meat in Indian households is gaining due importance. The present study deals with the pork meat market in Karur District of Tamil Nadu. Black or desi pork meat is majorly consumed in the district. Four different marketing channels are prevailing in the district. They are Marketing Channel 1 (Producer – village based butcher retailer- consumer), Marketing Channel 2 (Producer -butcher cum cooked meat retailer - consumer), Marketing Channel 3 (Producer – butcher retailer – cooked meat retailer – consumer), and Marketing Channel 4 (Producer – butcher retailer – hotel – consumer). The study inferred that Marketing Channel 1 has the lowest and Marketing Channel 4 has the highest marketing margin. Marketing channel 1 also depicted the highest percentage of farmer's share. Marketing channel 4 has more than one-third of the total pork meat as white pork meat. The study highlighted the importance of a flourishing pork market in the district as well as eliminated the involvement of more numbers of middlemen in the markets to increase marketing efficiency.

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Determinants of Lease Rents of Village Ponds for Aquaculture: Evidence from Central Gujarat

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The fishery sector in the country is undergoing a remarkable transformation, with India now being the second-largest fish producer in the world, and fish becoming the highest-exported item from India. Despite the sector's growth, challenges persist for smallholders, limiting their productivity and curbing livelihood opportunities. Maximizing profitability is imperative amidst rising input costs. One key factor identified in this study is the lease rent paid for community ponds allocated to farmers. By focusing on Central Gujarat's village pond leasing policy, the study examines the dynamics surrounding the auctioning of village ponds and the factors influencing them. Contrary to other states, Gujarat employs an open auction policy for village ponds to encourage competitive bidding among interested parties. However, the prevalence of information asymmetry on pond values among bidders hinders auction efficacy, leading to inefficient allocation. The study hypothesizes that auctions for village ponds resemble common value auctions, where bidders face uncertainty regarding the true value of the asset. Identifying the determinants of bidder valuation and integrating them into the determination of upset prices can mitigate information asymmetry, enhance auction efficacy, and reduce adverse selection. The study also identified considerable variance between the bid values of different ponds. On average, the bid value comprises 25 per cent of the total cost for a fish farmer in Anand district of Gujarat, with a tremendous difference between the highest and lowest bid values per hectare. While the highest bid value of the surveyed pond was Rs 1.7 lakh/hectare, the lowest bid value was recorded at Rs 900/hectare. This huge variance in bid value data and contributing factors was considered a crucial area of exploration. The study deployed Directed Acyclic Graphs and Linear Regression methodologies to identify the extent of this influence. The key findings could inform strategies to address such cost constraints, ultimately empowering smallholders to capitalize on opportunities within this rapidly evolving sector. By optimizing the auction process, stakeholders can unlock the full potential of village ponds, driving inclusive growth and sustainable development in India's fisheries sector.

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Perception and Preferences of Urban Consumers for Liquid Milk in North India

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The present study analyzes the perception and preferences of urban consumers for liquid milk. Primary data collected from 270 households were analysed using percentage scores, conjoint analysis and ordered logit model. Processed milk, buffalo milk and full cream milk were most popular in their respective categories. Consumers were ready to pay a price premium for indigenous cow milk (Rs.10.53/l) and buffalo milk (Rs. 7.31/l). Raw milk received higher scores for taste and nutrition, while processed milk was ranked higher for safety, availability and affordability. Indigenous cow milk was preferred for its taste but scored low on availability. Consumer satisfaction can be enhanced by preserving original flavour even after processing, assuring the availability of processed buffalo milk and ensuring the quality of indigenous cow milk.

Livestock Income: A way of Sustaining Livelihood Among Rural Farmers and its Determinant Factors in Nagaland

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The present study analysed the primary income sources of farm households and examined the role of livestock income in sustaining livelihoods in Nagaland. A multi-stage random sampling design was used to survey 200 farm households from Dimapur district of Nagaland. On an average, annual income per household from farm sources is at 60.93 per cent and non-farm source is at 39.01 per cent. Mixed farming that includes income from crop and livestock, constituted 53.54 per cent of the total income and represented the highest share among all sources. Among different farm sizes, income from both crop and livestock constituted 38.89 per cent for marginal farmers, 54.09 per cent for small farmers, 61.10 per cent for semi-medium farmers, and 47.46 per cent for medium farmers. These results confirm the importance of the livestock sector in supplementing farmers' income alongside crop production. The study also indicates that factors such as farmers' participation in livestock management, number of livestock, and education significantly and positively contribute to livestock income. While other factors such as operational holding and non-farm income were found to be significant and positive for the marginal farmers and crop income were found significant and positive for the medium farmers. Since development of the livestock sector in Nagaland has the potential to uplift the economic position of the people a collective effort of public and private sectors investment is required for rapid and inclusive growth in this sector.

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Promoting Sustainable Rural Livelihoods –Learnings from the IFS Model of ICAR-IARI

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India remains predominantly rural, with over half the population projected to live in rural areas by 2050. The Integrated Farming System (IFS) approach has emerged as a holistic solution, aligning with the Government of India's goal to double farmers' income and achieving Sustainable Rural Livelihoods (SRL) with inclusive growth. This paper begins with reviews of recommended IFS models across various regions, and evaluates the financial feasibility of the IFS model developed at ICAR-Indian Agricultural Research Institute (IARI) New Delhi, and brings out the constraints faced by different stakeholders for sustainable growth through IFS. The ICAR-IARI has developed a nine-module IFS model aimed at improving livelihood security. Using primary data from ICAR-IARI personnel, financial viability of IFS model was assessed using discounted cash flow measures employing project appraisal techniques. It identifies dairy, horticulture, and apiary modules as top performers in terms of Net Present Worth (NPW), Benefit-Cost (B:C) ratio, and Internal Rate of Return (IRR), respectively. The IFS model not only creates employment opportunities but also ensures food security. In essence, the IFS model holds a promising solution to the sustainable growth of Indian agriculture leading to sustainable rural livelihoods.

Transforming Rural Assam: The Role of Pisciculture in Rural Livelihood

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Rural communities in Assam have traditionally relied on agriculture as their primary source of livelihood. However, the economic challenges posed by fluctuating crop yields, market instabilities, and the impacts of climate change have necessitated the exploration of alternative income sources. In this context, Pisciculture/fish farming emerges as a viable option for rural livelihood that benefits rural households. This paper aims to assess the economic impact of Pisciculture on rural households in Assam and to identify best practices and challenges in implementing Pisciculture for sustainable livelihoods. The study is based on both the primary and secondary data. The primary data was collected by the sample survey method from selected sample village of the Barpeta District, which ranked first in fish seed production in the state of Assam. It was found that the annual

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income, consumption, and savings, of the pisciculture farmers are more than the traditional crops farmers. Implementing pisciculture in the Barpeta district of Assam presents a promising pathway towards sustainable livelihoods despite several challenges. The region's seasonal water variations, coupled with water quality concerns and technical knowledge gaps, pose significant hurdles. Moreover, financial constraints, market access issues, disease management, and environmental impacts underscore the complexity of transitioning to fish farming. Addressing these challenges requires comprehensive strategies focusing on capacity building, financial support, infrastructure development, research, policy interventions, and community engagement. These efforts are crucial for enhancing the economic viability and environmental sustainability of pisciculture in Barpeta district.

Market Dynamics of Dairy Farming: Implications for Sustainable Livelihoods Among Small and Marginal Farmers in Uttar Pradesh

Vandana Sehgal¹, Amandeep Kaur¹ and Sumit Kumar²

Dairy farming plays a crucial role in the livelihood strategies of small and marginal farmers in Uttar Pradesh, contributing significantly to rural economies and household incomes. The study examines the economic viability of dairy farming as a sustainable livelihood option in the region, considering factors such as price received through different milk market channels and cost incurred. The results of the study are based on recent unit level data from the 77th Round of NSSO survey for the year 2018-19. Findings reveal that dairy farming offers substantial potential for enhancing livelihoods, particularly for resource-constrained farmers. Cost analysis reveals that marginal farmers manage a monthly profit of ₹903.80 from total expenses, while small farmers earn ₹295.58, reflecting the financial pressures they endure. Feed costs constitute the largest component of expenses, with marginal and small farmers spending ₹1,187.13 and ₹1,898.28, respectively, highlighting the financial burden of animal feed. Developing cost-effective feed solutions and promoting local feed production could enhance profitability. Addressing these areas through targeted interventions can significantly enhance the economic viability and sustainability of dairy farming in Uttar Pradesh, particularly for marginal and small farmers. The findings reveal that dairy farming offers substantial potential for enhancing livelihoods, particularly for resource-constrained farmers. Moreover, the study underscores the challenges faced by farmers, including fluctuating milk prices and high imputed costs. The analysis contributes to understanding the dynamics of dairy farming as a pathway to sustainable rural development in Uttar Pradesh, emphasizing policy recommendations to foster inclusive growth and resilience among smallholder dairy farmers.

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Evaluating the Impact of Cooperatives on Livestock Marketing in India: Evidence from NSSO Surveys

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This study investigates the role of cooperatives in marketing livestock products in India, using data from the National Sample Survey Office's (NSSO) Situational Assessment Surveys and the 20th Livestock Census. Key findings reveal that while cooperatives play a significant role in livestock marketing, farmers often achieve higher prices through other channels. For instance, selling cattle milk directly to other households fetches an average price of Rs 33.4 per litre, compared to Rs 27.9 per litre through cooperatives. The state-level analysis highlights significant disparities, with Gujarat leading in cooperative participation due to its well-developed infrastructure, handling over 76 per cent of its cattle milk production through cooperatives. The study employs binary logit analysis to identify socio-economic determinants influencing cooperative involvement. Results indicate that higher education levels, Hindu religion, and membership in Other Backward Classes correlate positively with cooperative participation. At the same time, female-headed households and those from Scheduled Castes are less likely to participate. Despite the lower immediate financial returns, cooperatives offer benefits like market stability and collective bargaining power. The research underscores the need for improved cooperative infrastructure and localized strategies to enhance cooperative participation and profitability. It also emphasizes the importance of government support mechanisms such as Kisan Credit Cards and animal health cards. Furthermore, the study advocates for refined data collection methods to better capture breed-wise and item-wise production costs and prices, enabling a clearer understanding of the benefits of cooperatives. Addressing these gaps can significantly bolster cooperative participation, making them a robust pillar for sustainable agricultural growth and rural development in India.

Trade, Emissions and Sustainable Food Systems - Case of Global Meat Markets

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Food systems are the key contributor to climate change, generating 21 to 37 per cent of global anthropogenic greenhouse gases (GHGs). Panel dataset of four major bovine meat producing countries in the world were used to examine the influence of the meat production and exports on its emission rate over the years. In

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order to study the effect, the panel data analysis with random and fixed effect models were studied with few macroeconomic variables like gross domestic product, foreign exchange rate, population growth of the countries. Our econometric study results show that there is a statistically significant association between production and exports of the bovine meat and GHG emission rates in the Four nations of panel set. The results also indicate that there is a positive and significant impact of independent variables on the GHG emissions. The bovine meat production with various input usage acts as one of the main contributors for the emissions, but exports of the meat to the world nations was found positively affecting the emission rates, but only to the meagre level. The existing Paris Convention emission reduction policy framework (2015) has to be revised with a focus on moving industries towards sustainability through the use of green energy.

Impact of Cooperatives for Enhanced Income in Indian Dairy Value Chains: Evidence from Household Survey of Haryana

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The study was aimed at identifying the major determinants influencing the membership decision of milk producers in the dairy cooperatives of Haryana. This paper uses data from a primary survey of 200 dairy farmers and 20 dairy cooperative societies from two districts of Haryana to empirically analyze the impact of cooperative membership on the net income level of dairy farmers. Heckman's two-stage model was employed to eliminate the sample selection bias in the sample. At the first stage of the econometric analysis, the binomial probit estimates showed that the procurement price of milk, provision of veterinary services, and herd size were the significant factors positively influencing the farmers' decision to take membership in cooperatives, whereas, factors like family size, age and distance to milk collection centers negatively influenced the farmers' membership decision. OLS estimates from the second stage of Heckman's model indicated that procurement price, herd size and veterinary assistance were the most influential factors of net income i.e. for every one-unit rise in these factors subsequently lead to an increase in net income (per litre) level by ₹1.963, ₹1.712 and ₹0.95, respectively. Similarly, every one-kilometer increase in distance to the milk collection center resulted in a reduced net income level by ₹0.342/litre. The study reveals the need for cooperatives to improve the procurement infrastructure by establishing collection centers in unexplored areas to harness the milk supply potential. Efforts must be taken to create awareness among the producers regarding the importance of cooperatives and encourage the value chain actors to participate

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in dairy cooperatives to tap the commercial potential of the dairy sector and enhance the remuneration of the milk producers.

Impact of Industrial Water Pollution on Livestock Health in Bhavani River basin of Tamil Nadu

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The Bhavani River basin in Tamil Nadu, India, has experienced significant industrial growth, leading to increased concerns about water pollution and its impact on livestock health. This study examines the effects of industrial water pollution on livestock in the region, highlighting the critical health challenges faced by animals due to contaminated water sources. Industrial effluents, often rich in heavy metals, chemicals, and other pollutants, enter the river system, adversely affecting water quality. Livestock, which rely on these water sources for drinking and other purposes, are exposed to harmful substances that can lead to various health issues, including gastrointestinal disorders, skin diseases, reproductive problems, and reduced milk yield. For the present study, eighteen affected villages which are very near to the industrial area of Gobichettipalayam block of Erode district were selected. In total, 360 sample households were selected, constituting twenty samples in each affected village. Hence, this study underscores the urgent need for stringent regulatory measures and effective wastewater management practices to mitigate industrial pollution and protect livestock health in the Bhavani River basin.

Economic Impact Assessment of Hilltop Rain Water Harvesting Ponds on Horticulture, Livestock and Fisheries Sector: A Case Study of Adoption of Jalkund in Tribal Areas of Meghalaya

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The study evaluated the economic impact of Jalkund on water productivity, farm income, and employment in tribal villages of East Khasi Hills and Ribhoi districts of Meghalaya in 2021. Stored water was used for cultivating high-value vegetables and maintaining livestock and fisheries. Results showed that Jalkund adoption allowed farmers to cultivate additional high-value vegetables on 450 m², earning an extra Rs. 27,000. Vegetable cultivation yielded 22.21 kg per 1,000 liters of water, while poultry and piggery operations had water productivities of 16.67 kg/1,000 L and 26.67

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kg/1,000 L, respectively. The benefit-cost ratios for vegetable cultivation, piggery, poultry, and fish growing were 2.32, 2.70, 2.04, and 5.00, respectively. Farm household income increased from Rs. 1,45,000 to Rs. 1,91,125 due to Jalkund technology. All farm components significantly contributed to income from stored water use, with livestock components (poultry and piggery) increasing gross income by Rs. 58,125. Livestock rearing generated an additional 20 man-days of employment, while fish raising added 4 days and Rs. 3,125 in income. Piggery saw the largest income increase (36.21 per cent), followed by vegetable production (26.73 per cent) and poultry (24.17 per cent). Overall, Jalkund adoption increased farm household income by 31.81 per cent and created an average of 46 extra employment days. Jalkund technology was crucial in enhancing sustainable livelihoods for hill agricultural households, providing essential water exclusively for vegetable cultivation and livestock rearing during the post-monsoon dry months.

Deciphering the Dynamics of Milk Production in Kerala

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The present study investigated the dynamics of milk production to understand the growth and instability of milk in the state of Kerala. The data utilized for the study were sourced from secondary documents, such as livestock reports and integrated sample survey report published by Government of Kerala and the Government of India. The methodology employed for the study included the calculation of compound annual growth rate and Cuddy Della Valle Index to assess the growth and instability of milk production, bovine population, and milk prices across the 14 districts of the state. The state's milk production experienced a modest growth rate of 0.99 percent. The in-milk bovine population in the state has shown a negative compound annual growth rate of -3.26 per cent. Indigenous species experienced the most significant decline at -14.02 percent than the buffalo and crossbred. The growth rate analysis of milk prices has shown that goat milk prices witnessed the highest growth rate of 12 per cent when compared with buffalo milk prices and cow milk prices. Goat milk has high demand due to its medical and nutritional value, but its productivity per animal is very low, leading to a surge in prices caused by its shortage. The state-level milk production instability was classified as low with CDVI value of 8.99, suggesting that the overall milk

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production at the state level remained stable throughout the period of 1995-2021 with minimal changes and low volatility.

Understanding the Marketing Behaviour of the Dairy Supply Chain in Andhra Pradesh: Marketed surplus and Marketing efficiency

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The present study was conducted in Chittoor and East Godavari district of Andhra Pradesh, India to analyze marketed surplus and marketing efficiency of milk across different market agencies in the state. Acharya's approach was used to assess the marketing efficiency of different marketing channels. The overall marketed surplus was 85.25 per cent in the study area. The study identified two types of marketing channels, organized and unorganized channels. The producer share in consumer rupee was highest in channel I (direct consumer), followed by channel II (producer-milk vendor-consumer) and channel III (producer-vendor-contactor-consumer). The price spread was low in channel II (₹ 8.25) after channel I, followed by channel III (₹ 9.57). Marketing efficiency was high in channel-II (4.94) followed by channel-III (4.90) in the unorganized sector. In the organized sector, channel -VII (3.62) has higher efficiency than channel-VI (3.20). The major constraints faced by marketing agencies are difficulty in milk availability throughout the year, cost of transportation, labour costs and increase in competition among the vendors and contractors. Apart from the above constraints, all the marketing channels are facing a shortage of milk in the summer season, especially the creameries and halwai's are facing this problem. They are buying milk from the cooperative and private dairy industry to run the enterprises.

Costs and Returns in Milk Production: Developing Standardized Methodology and Estimates for livestock Production

M.N. Waghmare and Y. C. Sale⁴

This study was initiated to standardize the methodology for cost of milk production, to estimate the cost of milk production. Data were collected from 45 dairy farmers of each of the randomly selected districts, namely Pune and Solapur totaling sample of 90 dairy farmers during 2021-22. Land inventory, cropping pattern, herd composition and asset ownership The average size of operational land holding was 1.67 ha and 1.84 ha. About 65 per cent of the operational holdings were irrigated. Ginger being the cash crop is cultivated by majority of the farmers in both the districts. The average number of in milk animal was higher in case of cross breed than the local breed. The number of animals unfit for breeding was higher in case of local cattle than

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the cross breed. The stall feeding was restricted mainly to the cross breed cattle whereas the local cattle are fed mainly through grazing. About 8.00 kg per animal per day of dry fodder was fed to cross breed animals and it was zero to 5.00 kg per day for local animals. The amount of concentrate fed was higher in case of cross breed (2.kg/animal/day) than the local animals (1.00 kg/animal/day). In local cattle the total variable cost was as high as 94 per cent and remaining was the total fixed cost. The share of feed cost was 55 per cent of the total variable cost. The gross maintenance cost per day per animal was Rs. 83.80. The gross returns per local animal per day were very low due to low productivity of the local animals which makes the enterprise non-profitable across season and districts. In case of cross breed, the share of feed cost comprised of 61 per cent of the total variable cost. The gross maintenance cost per day per animal was Rs. 164.80. The average milk production was 9.10 litre per day per animal. A standardized methodology for estimating cost of milk production should be followed so that it can be comparable. As the net returns from milk were negative in case of local cattle it is not recommended for dairy purpose whereas the net returns were significantly positive in case of cross breed it is recommended that government should encourage for rearing of cross breed.

Balancing Nets and Lives: A Socio-Ecological Analysis of Sustainable Fisheries in the Gulf of Mannar

Deepanjana Saha¹, Devarajulu Suresh Kumar¹, Pandian Krishnan², Rajdeep Mukherjee²

The Gulf of Mannar, a UNESCO World Biosphere Reserve, faces severe overfishing and habitat degradation threats. In this study, we investigate the pivotal role of ecosystem services in sustaining local livelihoods and overall well-being. By conducting a comprehensive survey of 480 respondents across two districts, we gathered extensive data on demographics, livelihoods, fishing practices, reliance on ecosystem services, and community management participation. The analysis reveals a critical dependence on the Gulf's resources (income, food security, traditions) with gender disparities (men fish, women in pre/post-harvest), but fishing is only allowed in the 10km buffer zone (not the core zone). The findings emphasize the promise of community-based strategies, such as Marine Protected Areas and reviving co-management committees, for achieving sustainable fisheries management. However, we also identify gaps, including the need for more nuanced well-being indicators and improved models for community management participation. To address these challenges, we advocate for sustainable fishing practices, tackling social inequities, especially gender disparities in resource access and decision-making, and investing in healthcare, education, and social safety nets for fishing communities. Promoting alternative livelihoods can alleviate pressure on fish stocks, and empowering local

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communities through capacity building and community-based management initiatives is crucial for ensuring the long-term sustainability of both the Gulf of Mannar ecosystem and the well-being of its dependent communities. This multifaceted approach holds significant promise for balancing ecological health with human prosperity.

Profit Efficiency Among Smallholder Broiler Farmers in Aizawl District, Mizoram: An Application of Stochastic Frontier Profit Function

Lalrinsangpuii¹, S. Yuvaraj² and Esther Lalruatsangi¹

This study provided a direct measure of production efficiency of the smallholder broiler in Mizoram using a stochastic profit frontier and inefficiency model. The primary data were collected from 80 sample broiler farmers in Aizawl district of Mizoram during 2023-24 using structured interview schedule. The result showed that profit efficiencies of the sampled farmers varied widely between 4 and 93 per cent with a mean of 51 per cent suggesting that an estimated 49 per cent of the profit is lost due to a combination of both technical and allocative inefficiencies. This study further observed that level of education influenced profit efficiency positively while profit efficiency decreased with increase in the size of family. Results found a considerable capacity to improve profitability among broiler farmers in the state.

Contribution of Livestock in Sustaining Rural Household Income: A Gini and Vertical Decomposition Approach

N. Prasanth⁴ and T. Ponnarasi⁵

The study is an attempt to analyze the income inequality of different diversified households in the rural area. The vertical and decomposition inequality was calculated based on the households' livelihood options. The Gini inequality of Less, Moderately and Highly diversified households were 0.30, 0.25 and 0.20 respectively. The Gini income inequality analysis indicated that, the Highly diversified household have more equality compared to other diversified categories. Therefore, the income inequality within these income sources was very high. Especially livestock has played a vital role in rural economy after agriculture.

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Understanding the Economic Dynamics Across Livestock Rearing Systems in Telangana

Ajay Anto Soy¹, Josily Samuel², T. Lavanya³ and B. M. K. Raju²

Livestock holds immense significance in India, especially in Telangana, as it contributes to agricultural sustainability, rural livelihoods, and the nation's economy through dairy, meat, and other by-products. Livestock rearing plays a crucial role in augmenting farmers' incomes, enhancing nutrition, and fostering rural development in Telangana, making it a vital component of the state's agricultural landscape. Mahabubnagar district of Telangana state is rich in livestock resources, which positioned first in the livestock population according to the recent livestock census. A study was conducted in Mahabubnagar district to identify the livestock rearing systems for improving the strategies for the improvement of livestock production. Primary data was collected from 120 livestock rearing farmers using multi stage random sampling technique. The data was further classified into four livestock rearing systems viz., 'Crop+ Small ruminant system' (CSR), 'Crop+ Large ruminant system' (CLR), 'Livestock only system' (L) and 'Crop+ Large ruminant+ Small ruminant system' (CLSR). The predominant systems practiced by the farmers were CSR (55.83 per cent), followed by CLR (33.33 per cent). Both the systems were categorized into two based on the flock size and herd size, of which each category was found to be economically viable systems. The composition of livestock reared by farmers depend on the agroclimatic conditions, especially aridity with sheep and buffalo representation high in arid regions. The returns per rupee invested in category I and category II in CSR and CLR systems were 1.84, 1.98, 1.18 and 1.55 respectively.

Livelihood security of dairy farmers: Assessing the impact of Model Fodder Village programme in Bundelkhand region of Madhya Pradesh

Bishwa Bhaskar Choudhary, Purushottam Sharma and Gaurendra Gupta⁴

The present study using cross-sectional data collected from 437 dairy farmers has analyzed the impact of Model Fodder Village programme of ICAR-IGFRI, Jhansi on livelihood security of the farmers in Datia district of Madhya Pradesh. We used inverse-propensity-weighting regression adjustment (IPWRA) method as main technique for impact evaluation and checked the robustness of the results using matching methods. Our findings suggest that, age, education status, household size, dependency ratio, off-farm income, adult cattle unit, access to road, market, credit and training significantly influence adoption of improved forage technologies and

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practices. The impact of forage based technological interventions on the measures of livelihood security indices is positive but statistically significant for habitat, economic and food security parameters. The implication is that, compared with non-adopters, farmers who still uses the promoted interventions under the programme are significantly more likely to self-report improvement in their livelihood assets. The magnitude of the estimated impact suggests that, relative to their counterparts, adopters have 14-19 per cent higher likelihoods of experiencing improvement in their habitat security. Further, the impact on economic and food security ranges from 19-21 per cent and 13-16 per cent, respectively.

A Study on the Dynamics of Commercially Important Fish Species in Markets of Chilika

Avisweta Nandy¹, Sarba Narayan Mishra¹, Nagesh Kumar Barik², Abhiram Das³ and Sarbani Das⁴

The present study analyses the market of commercially important fish species in Chilika Lagoon in Odisha. Both primary and secondary data were used for the study. The important fish markets of Chilika namely Kalupada, Balugaon, and Jaguleipadara were surveyed. The results provide insights into the overview of the markets in Chilika, the price trend, and the landing of commercially important species in Chilika. The heat map depicts the monthly valuation of commercially important fish species in Chilika. The high Pearson's correlation coefficient indicates a positive relation between the monthly landing and catch valuation. To maximize their marketing and sales strategies, stakeholders in the artisanal fishing sector must have a thorough understanding of these trends. The study highlights the importance of comprehending the market dynamics to practice efficient fishery management techniques to stabilize prices.

Different Dairy-Based Integrated Farming Systems in Coastal West Bengal: Analysis of Profit Efficiency

Subrata Barman⁵, Ravinder Malhotra⁶, Udita Chaudhary⁶ and Biswajit Sen⁶

The coastal region of West Bengal has a vast agricultural resource endowment, but cyclones, water salinity, and floods are major environmental anomalies. Here, a dairy-based integrated farming system acts as a climate-resilient practice to minimize risk and maximize farm income. In this light, the present study investigated the

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profitability and profit efficiency of different dairy-based integrated farming systems, using stratified random sampling methods with 150 farmers from 25 villages in 2023-24 crop years. The stochastic profit frontier model has been used to analyze profit efficiency. The study found that the Dairy + Fishery farming system had the highest profitability can be increased by the higher veterinary charge (₹)/SAU and area under fishery (ha) in the IFS model. Education level, access to credit, and access to extension service were negatively related to profit inefficiency in the dairy-based integrated farming systems. The study suggested that subsidizing fishery feed and fingerling costs and providing financial support to farmers for the IFS model will foster the growth of the farming systems.

Exploring Potentials and Challenges of Seaweed Aquaculture in Tamil Nadu

B. Vetri Selvi¹ and S. Varadha Raj²

Seaweed farming is a vital economic activity that provides socio-economic benefits to coastal communities in developing regions like Asia and Africa. In India, seaweed mariculture offers a promising alternative livelihood, providing substantial income and employment opportunities with a short payback period. Despite its potential for sustainable development, challenges persist in seaweed farming. This paper aims to identify various prospects and constraints of seaweed farming in Tamil Nadu. The study involved 60 seaweed cultivators from four villages on the east coast of Tamil Nadu in the Ramanathapuram district: Mandapam (Munnakadu), Olakkuda, Pamban (Chinnapalam) and Mangadu, using a proportionate sampling technique. Most respondents were middle-aged, with 50 per cent having completed secondary education and 31.67 per cent being illiterate. Family sizes range from 4 to 7 and 83.33 per cent of the sample respondents have been involved in seaweed farming for 4 to 8 years, indicating substantial expertise. The findings indicate that generating job prospects for women was ranked first (RPI of 0.8604) among the prospects, highlighting seaweed farming's potential to improve gender equity in coastal communities. This is followed by high returns on investment (RPI 0.7125) and low initial investments (RPI 0.6563), suggesting that seaweed farming is both economically viable and accessible to many coastal residents. The reduced vigour of seed material (RPI of 0.8056) was ranked as the topmost constrain, necessitating improvements in seed quality. This was followed by high water temperature (RPI 0.7500) and fish grazing on seaweed crops (RPI 0.6630), ranking as the second and third constraints, respectively. Addressing these issues through technological interventions to develop heat-tolerant and resilient seaweed varieties is essential. A comprehensive strategy involving technological innovation and diversified application is needed to overcome these challenges and

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realize the full potential of seaweed mariculture as a sustainable economic driver for coastal regions of India.

Profitability and Technical Efficiency of Fish Farming in Union Territory of Puducherry

M. Sundariya, L. Umamaheswari, P. Nasurudeen, S. George Paradis, S. Saravanan and C. Aroutselvam¹

Fisheries is a major livelihood avenue for the people of Union Territory of Puducherry. The study assessed the economic viability and technical efficiency of fish farms in the state based on primary data obtained from a sample of 120 fish farmers. About 54 per cent of the fish ponds were owned ponds and the rest were leased in from either farmers or FFDA. The average carp yield was 1484 kg ac⁻¹ with an RPOI of 2.0. Functional analysis revealed that fingerlings and labour were important inputs contributing to higher fish yield. There was increasing returns to scale (1.810) in fish cultivation. As per Stochastic frontier analysis, mean technical efficiency of fish farms was 0.76 which indicates potentials to increase fish production through improved management practices. The mean Technology Adoption Index was 45.97 per cent and fish farming practices like soil testing, testing for water quality and feed quality, disease monitoring and removal of weeds in ponds had low adoption rates. The availability of quality fingerlings, access to credit and provision of subsidy for feed would encourage farmers to take up fish cultivation as a supplementary enterprise for income and employment generation.

Livestock Sector in Uplifting the Rural Household Economy: Stakeholders' Perspectives from the North East, India

Ram Singh² and Singyala Chiphang³

Along with agriculture dairying is perceived to be an effective instrument for socio-economic development and also serves as the most liquid assets in the hands of the rural poor. So, an attempt has been made to understand the contribution of dairy in rural economy from different stakeholders' perspective in the North East Region (NER) of India. The total respondents comprised of 127 milk producers, 13 commercial dairy farms, 35 milk vendors from the states of Assam, Meghalaya and Tripura. It was observed that for producer the overall cost of milk production was ₹180.45/cow/day where cost for feed and fodder constituted the lion's share of the total cost and the overall net return was ₹100.87/cow/day. The overall cost incurred by the milk vendor was ₹731688.36 per year with the net return of ₹172983.68 annually. In case of

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commercial dairy farm the cost of milk production was ₹201.83/cow/day with the net income of ₹298.35/cow/day. Irrespective of the stakeholders selling of milk is the major source of income. Thus, it is recommended that vermi-compost or similar products can also be prepared by the concerned stakeholders as it will aid them in deriving more income from the cow dung, cow urine etc., in addition to milk.

A Meta Analysis Study on Livelihood Sustainability of Fishermen In Mangrove Ecosystem

K. Susmitha, D. Velmurugan and R. Selvakumar¹

Mangrove forests are one among the world's most productive tropical ecosystems with main income from fishery. Mangroves, enhance fish production via two key mechanisms – the provision of food and of shelter. So, this is an attempt to study the impact of mangroves on fisheries and to estimate the economic value of the mangrove dependent lagoon fishery in Pitchavaram. Pitchavaram village is selected as the study area which is one of the largest mangrove ecosystems in India. Data is collected from both primary and secondary survey. The Mangroves has positive impact on fisheries production by providing food, shelter and good environment for fish growth. They also provide economic value for the local people and the net value for the lagoon fish production was ₹ 1.37 crore per year in Pitchavaram. So, the lagoon fishing in mangroves provides sustainable livelihood to the rural communities in and around mangroves.

Livestock Population in India: Milk and Meat Production

M. Dineshkumar, A. S. Rohini and K. P. Thakar²

Livestock rearing is one of the most important economic activities in the rural areas of the country contributing significantly to the national economy. It provides income to household dependent on agriculture and for many landless households. In India, total livestock population is 536.76 million according 20 th census (2019), which shows an increase of 4.8 per cent over the previous census (2012). Cattle, buffalo, goat, sheep, pig and yak are the major species of livestock. Uttar Pradesh ranks 1st with 68.00 millions of total livestock population in India. India ranks 1st with 230.58MT of total milk production which contributes 22 per cent globally during 2022-23 whereas per-capita availability of milk is 459g/day. Rajasthan ranks first with 14.12MT of cattle milk production in India. India ranks 8 th in total meat production (9.77MT). The meat availability in India is only about 15g/person/day against the ICMR recommendation of 30g/person/day. Government is continuously trying for bringing further improvements and developing this sector in the country as an industry. GVA of

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agriculture and allied sector varies from 20 per cent in 2020-21 and 19 per cent in 2021-22. Income generation, nutritional security, soil fertility, employment generation and others are the role of livestock in farmers' economy.

Role of Livestock Sector in Bridging Income Inequality Among Agricultural Households in India

M. S. Jagadeesh¹, Philip Kuriachen², H.T. Vinay³ and Shiv Kumar⁴

Income inequality in India poses significant challenges, particularly within agricultural households. This study examines the role of livestock in reducing income inequality among these households by using data from the 'Situation Assessment Survey of Agricultural Households' (NSSO 77th round, 2019). The Gini coefficient was used to measure income inequality, and regression-based decomposition analysis to identify the contribution of different income sources to overall inequality. The findings highlight that livestock income plays a crucial role in mitigating income inequality. Crop income constitutes the largest share of total revenue but also shows high inequality, especially in South India. Livestock income, despite regional disparities, emerges as a significant equalizer, particularly in reducing inequality in lower-income households. The study underscores the potential of livestock to enhance rural livelihoods, with states like Chhattisgarh and Kerala exhibiting notable disparities in livestock income distribution. Inequality decomposition reveals that one percent increase in the livestock share in total income can reduce inequality by 1.24 per cent. Moreover, increasing livestock productivity and income can significantly bridge the income gap, fostering equitable growth in rural communities. Policies targeting livestock sector enhancement are essential for reducing poverty, improving resilience, and combating food insecurity. This research highlights the importance of integrating livestock development into broader economic strategies to achieve sustainable and inclusive rural development. The findings contribute to understanding how targeted interventions in the livestock sector can address income inequality among agricultural households in India.

Economic Analysis of Poultry Contributions in Securing the Livelihood of Small and Marginal Farmers

R. Rajkumar⁵,

The livestock sector's role as an instrument for social and economic change in rural areas through income and employment opportunities has been well recognized. The study was carried out in the Morappur block of Dharmapuri district, and multistage

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random sampling methods. The focus of the study was on the livelihood securities of small farmers rearing poultry animals, costs, and returns. The annual average income is 9338.68. The study concludes that poultry farming significantly supports the livelihood of small and marginal farmers by providing a steady income source, despite the high initial establishment and maintenance costs.

A Study on the Marginal Impact of Determinants of Crop Diversification in the State of Rajasthan Using Tobit Regression Approach

Lekha Kalra and Rakesh Singh¹

The present study is done in Rajasthan state covering all the districts to construct the crop diversification index in the two time periods viz, 2021-22 and 2022-23 using Hirschman Herfindahl Index and Simpson Diversification Index. The study revealed that Sirohi district of Rajasthan has shown the highest diversification followed by Pali district in both the time period taken in the study. Further using Tobit regression approach, the impact of various determinants affecting crop diversification was analyzed. The Tobit regression was used in the present study because the dependent variable used in the study was continuous and left censored and therefore, the lower bound in the study was set at 0.1 and hence 2 of the observations were left censored and rest of the 31 were left uncensored. Total 33 observations were here as before March 2023, 33 districts were here in Rajasthan state. The study revealed that except factors like fertilizer consumption, area not available for cultivation and fertilizer consumption all the other determinants were significant at 5 per cent level of significance. The study further revealed that total cropped area, hybrid seed production is significantly as well as positively affecting the SID values implicating that with 1 per cent increase in the total cropped area and hybrid seed production, the diversification index increases by 2.8 and 1.7 per cent respectively.

Exploring the Drivers and Outcomes of Dairy Farmer Collectives in India

Udita Chaudhary and R. Malhotra²

This study investigates the factors influencing and the outcomes of dairy farmers joining collectives, specifically a milk co-operative union and a milk producer company, based on primary data from 416 dairy farming households (both members and non-members) in Gujarat, a major dairying state in India. Using probit analysis, it was found that both the age of the household head and the size of the household negatively and significantly influence the likelihood of membership. Conversely, households that rely on livestock as their primary income source are 12.5 percentage points more likely to be members. Additionally, access to mass media and contact with

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extension services also significantly increase the probability of membership. Applying Propensity Score Matching, the study reveals positive income effects for members. Annual net returns from local cows increase by INR 3,714/-, and from buffalo by INR 6,430/-, leading to a total increase in annual net returns from dairy by INR 10,144/- for members. Furthermore, the proportion of household income from dairy increases by 14 percentage points, and the share of milk sold rises by 1.4 percentage points post-membership. The findings indicate that both the milk co-operative and producer company models are effective forms of farmer collective action in Gujarat.

Livestock, Common Lands and Livelihoods Nexus

M. S. Rathore¹

Livestock plays a crucial role, particularly in arid and semi-arid regions, providing draught power, organic fertilizer, and income, while supporting crop enterprises with feed and fodder. Despite its importance, the livestock sector is often considered a secondary component of agriculture. Dryland farming systems, where livestock and crops are intertwined, help mitigate the impacts of frequent droughts, which severely affect both crops and livestock. Droughts increase livestock mortality, particularly among those reliant on rain-fed resources, though small ruminants tend to recover faster than larger animals. Rising human and livestock populations, alongside economic growth, are reducing per capita land availability and causing environmental strain. This highlights the need for better land management and protection of common lands to stabilize the livestock sector. Strengthening institutional arrangements for managing common resources and investing in community-led land improvements can enhance resource availability and livestock livelihoods. Moreover, the livestock sector requires more resources and support, including investments in dairy infrastructure, value-added industries, and improved marketing mechanisms. Addressing the scarcity of feed and water, managing unproductive cattle, and safeguarding declining animal species are critical for sustaining rural livelihoods.

Growth in Animal-Based Food Products, Nutritional Implications, and Farming Correlates: Perspectives from Nationally Representative Data

A. Suresh¹, I.D. Rajesh, Neethu Mol Jacob and V. Vijay Kiran²

Livestock and fishery sector holds important role for improving farm income and food and nutritional security. Informed policies with regional focus are required for further improving the contribution of livestock. In this context the study is undertaken with the objectives of examining the status and trends on animal-based food production, consumption and its implication and status and correlates of holdings of livestock. The study majorly utilized the data from Food and Agricultural Organisation (FAO) on production of animal products and its nutritional contribution; and, of

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National Statistical Office (NSO)/ National Sample Survey Office (NSSO) for analyzing the value of output, consumption expenditure and pattern of livestock holding. The domestic supply of all livestock products has improved in India during the period of 2010-2021, driven mainly by production increase. About 13 and 30 per cent of marine products and bovine meat, respectively, are exported too with a high growth rate in case of the former. The value of output from milk, fish, egg, meat and other livestock sector have improved at a rate of more than 6 per cent per year- the highest in case of fish (9 per cent)- with high inter-state variations. The production increase has translated to high level of per capita availability. Poultry meat (chicken and egg) has emerged as the major drivers of non-milk-based animal food consumption in India. A quarter of Indian population consume fish too in every month. The contribution of animal sector in supply of protein and fat also have increased not only in absolute terms, but in on a relative basis as well. Cattle, buffalo, ovine, poultry and other livestock are held by 25.5 per cent, 16.4 per cent, 14.6 per cent, 10.7 per cent and 0.16 per cent of the agricultural households in India. The multivariate probit analysis indicated that the livestock holding is correlated with land ownership, income status, household labour supply, caste and religion of the farmer. Contribution of common property resources like capture fishery also contributes to animal products' consumption. Other than this, encouraging the private sector to unleash its potential as in the case of poultry sector is critical for further improving the production. The study calls for focused policies with finer granularity.

Technical Efficiency of Dairy Farmers in U.T of Puducherry– A Stochastic Frontier Approach

A. Pouchepparadjou. T. Sivasakthi Devi. N. Swaminathan. L. Umamaheswari, S. George Paradis and M. Umamageswari¹

The present study estimated the cost and returns of dairy farmers and determined the level of technical efficiency of dairy producing farms in U.T of Puducherry by using the Stochastic Production Frontier (SPF) model. Cost and returns and Technical efficiency estimates were estimated for 150 dairy farms in U.T of Puducherry. The results revealed that the gross receipt per animal per day was Rs.306, which includes milk value and cow dung. However, the dairy farm business income was Rs.129 per animal per day. Over all, the benefit cost ratio was 1.77. The results of the variable cost clearly indicated that, feed cost such as concentrates and oil cakes was the major cost component in total variable cost followed by other cost accounted very negligible contribution. Stochastic frontier production result indicated that the technical efficiency of the farmers ranges from 0.94 to 0.31 with a mean efficiency of 78 . The study indicates that for the average efficiency of dairy farmers to achieve the technical efficiency of most of the farmer, has increase the milk production by 17 per cent. Similarly, the least efficient farmers can increase the production of 67 per cent to

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achieve the required technical efficiency of the most efficient farmers. The study concluded that policymakers should give emphasis to improve the output of milk through providing the sufficient concentrates at subsidized prices, channelizing the milk marketing, remunerative price of milk, provision of training and extension contact of dairy farms to increase the level of efficiency in milk production.

Economic Analysis of Layer Farming in Namakkal District

K Gokulapriya, A. Pouchepparadjou, N. Swaminathan, S. Parthasarathi and M. Umamageswari¹

This paper attempts to analyze the economics of layer farms in the Namakkal district of Tamil Nadu. The study, based on primary data collected from 120 layer farms via proper interview schedule, categorized the participants into two groups: Group I (farms with fewer than 50,000 birds) and Group II (farms with more than 50,000 birds). Cost-benefit analysis, Stochastic Frontier Production function and Garrett ranking technique were applied to evaluate the data. The findings indicated that the total capital investment and production costs per 1,000 birds were substantially higher for Group II farms, amounting to approximately 3.82 lakh rupees and 28,478 rupees, respectively. Also, the net return per bird was significantly higher in Group II, illustrating the economies of scale in production. Key variables such as flock size, feed consumption, labor engaged, mortality rate and management practices were identified as significantly impacting egg production in both groups I and II. Poultry farmers had the potential to increase their farm efficiency by 81 per cent with the current technology. While both small and large farms were found to be technically efficient, larger farms (Group II) demonstrated higher efficiency compared to smaller farms. The major constraints identified in the study area were high feed costs, disease outbreaks, and elevated mortality rates.

Economics and Value Chain Mapping of Fishery Industry in Karaikal District of Puducherry U.T.

N. Avinash, A. Pouchepparadjou, N. Swaminathan, S. Parthasarathi and M. Umamageswari²

The study aims to analyze the economics of fish production and mapping the value chain of fish under various routes in Karaikal district of Puducherry U.T. The study has considered 100 sample size from ten villages and other intermediaries proportionately from the study area using randomized sampling technique. Costs and returns, Cobb - Douglas production function and mapping of value chain technique were used for analysis the primary date. The result found that the total cost of fishing per trip was estimated to be over Rs. 24,257.58 and the average net income per trip was

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estimated Rs. 7,523.57 respectively. Further, the variables fuel cost, labour cost and cost of repair were significantly influence the fishing. It implies that one per cent increase in fuel, labour, repair cost would result in 0.234, 0.122 and 0.147 per cent increase in fishing, respectively. The study identified that six marketing channels were found in the domestic market and two marketing channels were found in export market through value chain mapping. The study suggested that the government should take steps to sell fuel at subsidized rates to fishermen and providing freezing units at low cost to enhance the quality.

Temporal Analysis of Animals Slaughtered, Meat Production, and Yield In Livestock and Poultry Sector

Ravi Kumar Jha, Debopam Rakshit and Dinesh Kumar¹

The livestock and poultry sector in Indian agriculture are progressively becoming strong development drivers and attractive avenues for augmenting farm earnings. It therefore becomes imperative to understand the key drivers of growth and analyze their growth trends. The resent study has dealt with the trend analysis of livestock and poultry on parameters like total number of animals slaughtered, meat production and meat yield per animal. The datasets were collected from Basic Animal Husbandry Statistics (2003-2022). The Annual Compound Growth Rate (ACGR) was calculated to compare the growth rates for various parameters. The ACGR in total number of animals slaughtered, meat production and productivity for Goat was 1.78 per cent, 2.50 per cent, and 0.70 per cent, respectively. For Sheep, it was 7.84 per cent, 7.98 per cent, and 0.13 per cent, respectively. For Poultry, it was 9.00 per cent, 10.86 per cent, and 1.71 per cent, respectively. For Buffalo, it was 5.32 per cent, 6.55 per cent, and 1.16 per cent, respectively. For Pig, the values were -1.47 per cent, -2.40 per cent, and -0.94 per cent, respectively. All the parameters showed positive growth during inter-census period except for Pig whose ACGR depicted a negative growth. The variation of the data sets over time was captured using the Autoregressive Integrated Moving Average (ARIMA) model and the prediction was made for the next five years (2023-2027). The predicted values showed increasing trends in terms of meat production and animal slaughtered. The best fitted model for meat production and total number of animal slaughtered of Goat, Pig, Poultry and Buffalo, and yield per animal for Goat, Sheep and poultry was ARIMA(0, 1, 0). For total meat production and total number of animals slaughtered of Sheep, it was ARIMA(1, 2, 0). For yield per animal of Pig and Buffalo, it was ARIMA(0, 0, 0) and ARIMA(1, 1, 0), respectively.

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Sustainable Livelihoods: KVK's Impact on Tribal Communities

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The present study was undertaken on the beneficiary tribal farmer of the project entitled "Empowering Tribals Farmers through Capacity Building and Technology Demonstration". A survey conducted on a total of 60 farmers who were benefitted from the technology demonstration and the Poultry birds of the Kadaknath breed, the Sirohi breed of goat and some quail birds were distributed among tribes. So a pilot study was made on the tribal farmers trained through KVK, Bargaon and KVK, Vallabh Nagar for the economic upliftment and livelihood improvement of tribal people with the object of sustained economic development of the tribal area. The result indicated that tribal farmers were able to generate extra net income of ₹ 4884.00, ₹ 4988.00 and ₹ 4982.00 with goatary, poultry and quail farming respectively.

Forecasting of Milk Production of Various Animal Species in India

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The expansion of the Indian economy is greatly aided by the dairy sector. An accurate estimate of milk production is crucial since fluctuations in the amount of milk produced will have a significant impact on dairy products, as well as on farmers, investors, and policymakers in the nation. This study represents an ARIMA modelling approach for forecasting the milk production in India and milk production by five major milk producing animal species namely, Cow, Buffalo, Goat, Sheep, and Camel by using annual data from 1961 to 2018. ARIMA (0,2,1) model was selected as the best model in forecasting milk production in India. The analysis indicates that there will be an increase in India's total milk production. Moreover, milk production from buffalo, cows, and goats would rise, whereas milk production from camels and sheep would decline.

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Trends in Population, Milk Production and Milk Productivity of Buffalo, Cattle and Goat

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The contribution of livestock sector has been favourable for both agriculture GDP and national GDP. The demand for milk is been increasing continuously over the years because of population growth, nutritional awareness, rising income, diverse dairy products, cultural preferences, government policies etc. In this study, an attempt has been made to assess trend analysis in livestock population, milk production and milk productivity of Buffalo, Indigenous cattle, Crossbred cattle, and Goat, respectively, and the future observations have also been predicted. The data was collected from “Basic Animal Husbandry Statistics” from the year 2003 to 2022. The Annual Compound Growth Rate (ACGR) was obtained for the study period. ACGR of in-milk animals, milk production and milk productivity in buffalo was 2.53 per cent, 5.14 per cent, and 2.55 per cent, respectively. ACGR of in-milk animals, milk production and milk productivity in crossbred cattle was 5.58 per cent, 8.21 per cent, and 2.46 per cent, respectively. ACGR of in-milk animals, milk production and milk productivity in indigenous cattle was 1.90 per cent, 6.20 per cent, and 4.23 per cent respectively. ACGR of in-milk animals, milk production and milk productivity in goat was 2.70 per cent, 3.92 per cent, and 1.16 per cent respectively. The variation of the data sets over time has been captured using the Autoregressive Integrated Moving Average (ARIMA) model and the prediction has been made for the next five years (2023-2027). The best fitted model for population of buffalo, crossbred cattle, indigenous cattle and goat, milk production of buffalo and goat, and milk productivity in buffalo, crossbred cattle and goat is ARIMA (0, 1, 0). For milk production of crossbred cattle and indigenous cattle and for milk productivity of indigenous cattle, ARIMA (0, 2, 1) was the best fitted model. Future predictions have also shown increasing trends in all the parameters which can be attributed to positive technological change.

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Navigating Agricultural Domestic Support, Fisheries Subsidies, and Food Security: A Critical Examination of the WTO Rules

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The WTO is ambitiously negotiating rules on agriculture subsidies, fisheries subsidies and food security to achieve Sustainable Developmental Goals (SDGs) such as zero hunger, doubling agriculture productivity and preservation of marine resources. However, the negotiations have reached an impasse as reflected in the failure of the 13th WTO Ministerial Conference. This paper explores the reasons for the impasse by critically examining the food security, agriculture and fishery subsidy regimes under the WTO to inform the ongoing negotiations and facilitate the fulfilment of the SDGs. In agriculture, negotiations on domestic support and public stockholding (PSH) remain contentious due to the clashing sensitivities and interests of the WTO members. Under domestic support, there is a strong push for reducing the members' capacity to provide trade-distorting agriculture subsidies. Some members however do not concur as they fear losing policy space to subsidize their poor farmers. Similarly, calls for updating the WTO rules on public stockholding for food security purposes by some developing country members are persistently resisted by raising trade distortion concerns. In the fisheries, though the Agreement on Fisheries Subsidies has been adopted, WTO members remain divided on the disciplines regulating subsidies that contribute to overcapacity and overfishing.

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