

Status and Growth Trends in Area, Production and Productivity of Assam Lemon in Nalbari District of Assam

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The objective of this study is to analyse the growth trends in the cultivation of Assam Lemon in Nalbari district. For the purpose data relating to the area under cultivation, production, and productivity of Assam Lemon in both Nalbari (undivided) district and the entire Assam region was gathered from secondary sources. The study examines the trends and variations of area, production and productivity of Assam lemon covering the period from 2009-10 to 2018-19. The findings of the study reveal that there has been a significant and positive increase in the area under cultivation, production, and productivity of Assam Lemon. Besides considerable instability in area, production and productivity was also observed in the Nalbari district and in Assam as a whole. The interaction effect between the area under cultivation and the yield of Assam Lemon varied over time. However, these variations were relatively stable compared to the individual effects of changes in area and yield. This suggests that both the expansion of cultivation area and the improvement in yield played significant roles in contributing to the production of Assam Lemon.

Millets - Emerging Solution for Nutritional Security under Climate Change

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India is the leading producer of millets at global level. Millets have been widely recognized as 'nutricereals' as they are rich in nutrients. Millets are hardy crops which require low moisture, are short duration and can bear elevated temperatures hence grown in semi-arid regions. The rise in temperature and alterations in rainfall due to climate change will have a negative impact on Indian agriculture. Hence, there is a pressing need to look for solutions that ensure food security, income security as well as nutritional security of the growing population. This study is an attempt to provide a comprehensive overview of status of millets in India. Growth trends were calculated for pearl millet, finger millet, sorghum and small millets. The results revealed that the growth rate of area and production for small millets have shown negative trends while the yield has shown positive trend. In decadal analysis the highest negative growth was witnessed in the last decade i.e.,

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2010-2020, while varied trends were reported for jowar, bajra and ragi individually. Millets be it pearl millet, finger millet or small millets are used as antidiabetic food option and are proven to be a solution for food and nutritional security in case of climate change events. Thus it becomes imperative for these crops to be incentivised by government through proper market linkage and remunerative price.

Public Distribution System: A Cornerstone for Food and Nutrition Security

Gangadhar Banerjee and Sarda Banerjee Ganguly*

The Public Distribution System (PDS) of India reduces food insecurity and acts as a safety net by distributing essentials at a subsidized rate. While the PDS focuses on government food and nutrition policy, India accounts for a large population of hungry and malnourished people. This paper examines the functioning and efficiency of the PDS in attaining food and nutritional security in India. A total of 23 high-quality papers meeting the inclusion criteria are accessible on the topics of "food insecurity" or "food security" in conjunction with "Public Distribution System" or "PDS." This paper emphasizes the role of PDS in tackling hunger and malnutrition and highlights its limited role in improving food security and childhood mortality because of operational inefficiencies. The PDS can be a solution to food insecurity in India if the operational inefficiencies and environmental issues are addressed by adequate policy reforms.

Exploring Organic Farming in Punjab: Ensuring Food Security Sustainably

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The study aims to assess the potential, performance and scope of organic wheat production in Punjab. Specifically, an attempt is made to examine the scope and performance of organic wheat farming in Punjab with the objectives: 1) To examine cost, returns structure and marketing pattern of organic wheat; 2) To study the level of chemicals used by wheat growers and availability of organic fertilisers; 3) To study organic farming of wheat versus food security and 4) to highlight the availability of farm yard manure, a crucial input in organic wheat cultivation in Punjab. For the purpose primary data was collected from 40 farmers practicing organic cultivation of wheat and an equal number of farmers cultivating inorganic wheat. The results indicate that the farmers mainly grew organic wheat to meet their personal needs and not for commercial purposes. The price of organic wheat ranges

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between Rs 3000 to more than Rs 7000 with an average price of Rs.5277.27 against the minimum support price (MSP) of Rs 2015. It was also found that farm yard manure (FYM) which is the key input for the cultivation of organic wheat is not sufficient if the area under this crop is increased. It is only in the initial years that a huge quantity of FYM is needed. Once soil health improves, it naturally fosters earthworm populations, reducing the need for a significant quantity of Farm Yard Manure (FYM). With just a 20 per cent increase in the area dedicated to organic wheat cultivation, the current FYM supply would prove sufficient. However, it's important to note that the low yield of organic wheat (11.3 quintals per acre) poses a potential threat to the country's food security, particularly since Punjab plays a crucial role in contributing to the central food pool. To address this, the state can gradually expand its organic wheat cultivation area to enhance the well-being of both its citizens and the soil. Additionally, the government can allocate specific areas for organic wheat production and offer assured marketing support to further incentivize this sustainable practice.

Adoption of System of Rice Intensification and Its Determinants in the Dry-Land Region of the Telangana State

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This paper endeavors to tackle the issues related to the adoption of the System of Rice Intensification (SRI) practice, including both full adoption and partial adoption. Furthermore, it seeks to examine the difficulties and challenges associated with the adoption of various components within the SRI practice. Seven neighbouring villages in the Warangal and Nalgonda regions have been chosen for their high prevalence of System of Rice Intensification (SRI) adoption where entire paddy is cultivated under lift irrigation (bore well irrigation). All the SRI households (113) and 73 Non-SRI households in *kharif* 2017 have been selected from these villages. The study revealed that 95 per cent of the farmers have adopted slightly modified components of the SRI practice due to risk and uncertainty involved in adoption of the SRI components especially in weeding, spacing, transplanting operations. They also faced labour related issues like lack of labour availability especially for weeding, spacing and transplanting operations. Farmers who receive higher amounts from non-institutional sources are more inclined to adopt the SRI practice. Similarly, farmers who possess livestock, particularly large ruminants, have also embraced the SRI practice. Notably, all SRI farmers have received extension services, technical guidance, and equipment support from non-governmental organizations.

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Millets Cultivation in India with Special Reference to Economics of Millets Production in Himachal Pradesh

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The present study examined the trend of millets cultivation in India with special emphasis on economics of millet cultivation in Himachal Pradesh (HP). The economics of millet cultivation pertained to Chamba district in North-Western region of Himachal Pradesh where 95.70 per cent area is rainfed. The results of the study revealed that in terms of state-wise analysis West Bengal has recorded the highest growth in area as well as production between 2014-15 and 2020-21, while, Telangana witnessed the highest growth in yield. As regards the cultivation of millets in Chamba district (HP), it was found that finger millet and pseudo/minor cereals were grown in high altitude areas of Bharmaur block (E-IV) and accounted 6.46 per cent of total cropped area. The resource use pattern indicated that growers were using very high seed rate on their farms and no fertilisers and pesticides were used in millet cultivation. The average productivity of finger millet (mandal/kodra) was found to be 13.74 q per ha whereas, the yield of pseudo/minor cereals was 6.00 q per ha. The output-input ratio over cost A 1 was found to be 2.61 for ragi whereas for pseudo-cereals and sorghum/bajra (fodder) it was found 1.66 and 1.67, respectively. Given the policy thrust on natural and organic farming, millets hold great promise for the hill agriculture provided appropriate technology, value addition and marketing mechanisms are put in place.

Why are Indian Farmers Leaving the Cultivation of Nutri-Cereal Crops? : A Temporal and Spatial Analysis

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The introduction of the Green Revolution in the mid-sixties, aimed at boosting the production and yield of various crops, has led to a significant reduction in the cultivation area for nutri-cereal crops in India, which has decreased from 44.34 million hectares (mha) in 1965-66 to 22.65 mha in 2021-22. This kind of drastic reduction in the area under cultivation has not been observed in any other crops in India over time. An attempt is therefore made in this study to find out why the area under nutri-cereal crops has been declining in India over time with a focus on the profitability of such crops. The data from the cost of cultivation survey from 1971-72 to 2019-20 covering four nutri-cereal crops namely jowar, bajra, ragi and maize has been used for the analysis. For each crop, two leading states in terms of

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area have been considered. The results of the study show that the farmers have not reaped any appreciable profit in terms of cost C2 in any of the four crops and states selected for the analysis at 2004-05 prices. The farmers cultivating the four nutri-cereal crops have reaped very low levels of profit or incurred losses mainly due to the increased cost of cultivation without a commensurate increase in the value of output. For the entire period of the study the farmers have reaped profit less than 30 per cent of the total number of years in most states and crops considered for the analysis. It is inferred that the reduced profitability due to the poor procurement facility available from the state agencies could be the main reason for the continuous decline of the area under nutri-cereal crops in India.

From Field to Market: Analysing the Potential of Black Gram Agri-value Chain in Punjab

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The study was undertaken to analyse the value chain dynamics and farmers' willingness to join the value chains of black gram crop in Punjab. To accomplish the objectives of the study, a sample of 60 mash growers was selected from sixteen villages in Pathankot and Gurdaspur districts of Punjab. Additionally, two markets, namely, Qadian and Pathankot (for retailers and wholesalers), were purposively selected from the respective districts. The study also involved the participation of various Farmer Producer Organisations (FPOs), Self-Help Groups (SHGs), and processing units to examine the agricultural value chains of black gram thoroughly. The analysis indicated that the returns over variable costs were by and large equal in case of summer and *kharif* season black gram crops (Rs. 400/qlt). Marketable surplus accounted was 5.80 qtl/farm about 91 per cent of the marketed surplus. Six major channels of black gram were identified, and the market channel I was the most preferred by the growers. Among those channels in which processors are involved, six value chains involving value-added products such as packed mash, mash flour, mash wafers, and mash nuggets were identified. Among these channels, wholesalers received the highest share of marketable surplus, followed by retailers. The most efficient channel was observed to be Channel V and VI, in which processors are involved. Among the agri-value chains (in channels V and VI), the study also revealed the producer's share in the consumer rupee, with VCPB-II having the highest share followed by VCPB-I, VCBF, VCW and VCN-II. The findings highlight that value addition achieved by FPO and SHG in terms of cleaning and packaging whole black gram contributes to the increased processor margin. As the perceptions of black gram growers regarding their awareness, willingness, and the challenges faced in value chains are crucial before making recommendations for fostering linkages, the study investigates the perceptions and awareness of agri value chains and the willingness of black gram growers to link

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with black gram processing units. The results revealed that 53 per cent of black gram growers were interested in participating in agri value chains of black grams on the condition that they receive support from the government. It also suggests transport incentives, a particular focus on capacity building for quality production, and the encouragement of processors to encourage black gram production and ensure better returns to the farmers. The expansion of black gram cultivation and better integration of the farmers with agri value chains will contribute toward sustainable crop diversification in Punjab.

Trend and Pattern on Small Millets in Visakhapatnam District of Andhra Pradesh: An Instability Analysis

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The primary food source for rural inhabitants in arid terrain areas has historically been small millets, which are nutrient-rich and drought-resistant. The Indian government has designated 2023 as the International Year of Millets to encourage the production and consumption of these grains in recognition of their significance. The focus of this study is on the volatility and trend of small millets in the Andhra Pradesh district of Visakhapatnam. The Cuddy Della Valle Index was employed to collect and analyse secondary data from 2000 to 2019 in order to evaluate instability. The study found a gradual decrease in the area under small millets' cultivation in Visakhapatnam and Andhra Pradesh. While crop output in Andhra Pradesh originally dropped before increasing, it fluctuated without a distinct trend in Visakhapatnam. In general, Andhra Pradesh outperformed Visakhapatnam in yields. The results highlight the need for policy changes to support sustainable small-scale millet farming practices and emphasise on the significance of creating high-yielding cultivars and suggests regulations to aid small millet growers. The findings contribute to a better understanding of the current situation and provide recommendations for agricultural improvements and regulatory measures aimed at boosting the production of tiny millets.

Impact of COVID-19 Pandemic on Dairy Farmers in Mandya District of Karnataka – An Economic Analysis

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The objective of this study is to assess the financial impact of the COVID-19 pandemic on dairy producers and the dairy cooperative in the Mandya district of Karnataka. The study also examines the coping mechanisms adopted

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by dairy farmers to mitigate the negative impact of the pandemic on their livelihoods. The research encompassed three distinct phases: pre-lockdown, lockdown, and post-lockdown. A comprehensive analysis was carried out, involving a single milk union and a sample of 100 dairy farmers pertaining to the agricultural year 2021-22. For studying the impact of covid pandemic on the functioning of dairy cooperatives namely The Mandya District Cooperative Milk Producer's Societies' Union limited, (MANMUL) Gejjalagere which is serving as major cooperatives in the study area was selected. Various analytical tools, including trend analysis, Wilcoxon signed-rank test, quantity gap analysis, and price gap analysis, were employed to achieve the study's objectives. The findings revealed that nearly 85 per cent of dairy farmers in the Mandya district experienced a decrease in their income from dairy farming either during or after the lockdown period. Specifically, the net return per liter of milk for crossbred cattle with moderate output dropped by a significant 52.42 per cent when compared to the period before the lockdown. During both the lockdown and post-lockdown phases at MANMUL, there was a noticeable decline in the quantity of milk being purchased and sold. Interestingly, the production of Skimmed Milk Powder (SMP) increased during the lockdown due to reduced milk sales. Additionally, sales of curd and ghee, among other dairy products, declined both during and after the lockdown. In light of these findings, it becomes imperative to leverage modern technology to stimulate demand for milk and dairy products. To ensure a sustained demand, milk unions should consider forming strategic partnerships with online consumer platforms such as Zomato, Swiggy, Dunzo, and others. This collaborative approach could help in revitalising the dairy industry in the Mandya district and beyond.

Major Issues in Millet Cultivation in India: A Supply Side Analysis

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The present study examines supply side issues with the millet cultivation in India which has received renewed interest in recent times. Using the latest round of NSS data, pertaining to agricultural year 2018-19, on agricultural households in India, we find a discernible low share of area under millets in both total cultivated area as well as total area under cereals; and a very low percentage of millet cultivator agricultural households. This suggests a clear preference for other cereal crops which is exacerbated by low yield of millets and other socio-economic challenges such as high extent of illiteracy among millet cultivators, lower participation of SC and ST households, lack of market access and awareness about minimum support price (MSP), and meagre percentage of trained millet farmers. However, there is a scope for upscaling the millet production in India by increasing its yield, provision of better marketing facilities, provision of wheat and rice like

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MSP mechanism, taking advantage of higher productivity of marginal and small millet cultivators, and wide spread government programmes in targeted states which have suitable agro-climatic conditions for millet cultivation.

Role of Self Efficacy and Social Capital in Performance of Producer Organisations in Chhattisgarh: A Qualitative Approach

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Farmer producer organizations are characterized by farmer groups organized with an objective to make profits by increasing economies of scale and working like a corporate organization. Establishment and promotion of farmer collectivization can provide a platform to farmers for receiving much-required information, sharing of knowledge, sharing the production, and marketing risks and adoption of market-led production of agricultural products. Grass root level actions on collectivization of the marginal agrarian folks can improve their livelihood support as income, self-respect, bargaining power etc. as compared to the individual approach. present study was conducted to analyze the relationship between social capital, self-efficacy and perceived performance and thereby proposing a model by joining two streams of thought; the role of social capital and self-efficacy that influence the perceived performance and role of self-efficacy as mediator that influence the relationship between social capital and perceived performance. In the process of social capital influencing performance of FPCs, self-efficacy played a significant role as a partial mediator. Hence a policy shift on training motivating and critically evaluating members of FPCs should be of utmost importance right from the stage of forming the FPCs. Since self-efficacy had a mediating role, variables like means to get things done if opposed, ability to achieve aims and goals, dealing efficiently with unexpected events, ability to handle unforeseen situations, finding several solutions of a problem and capacity to handle any situation indicated the areas where individual capacity building and training programmes must be focused upon. A strong sense of building these variables will help the policy makers on the focus shift towards group performance variables.

Food Security in North-Eastern Region of India: Performance and Policy Imperatives

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The study was carried out with the objective of examining the performance and requirements of food crops in North East India during the year 2023–24. The

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study relies on secondary data collected from various official sources like UDAI, FAOSTAT, Agri-exchange, Government of India. To estimate the growth and instability of area and production of food crops, the semi-log model and Cuddy-Della Valle index were used, respectively. The findings of the study indicate that the region is moving towards self-sufficiency in food crops, as expected. Other crops like foodgrains and vegetables revealed positive growth, whereas vegetables and other foods are already in surplus in the region. Therefore, the study concludes that there is a need to increase the productivity of food crops, which can be maintained by the adoption of high-yielding varieties of seeds, planting materials and improved cultivation practices in the states of the North Eastern region.

Dynamics of Crop Diversification in West Bengal: A Spatial and Temporal Study

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Crop diversification plays a vital role in managing risks, boosting income for the farmers, and maintaining food and nutritional security. This study focuses on exploring the pattern, trend, and factors influencing crop diversification in various districts of West Bengal as well as the state as a whole by utilising secondary data over the period of 2000-01 to 2020-21. To assess diversification, the Simpson index, Herfindahl index, and Entropy index have been employed. The findings indicated that as a whole and most of the districts in West Bengal have witnessed higher levels of crop diversification in the new millennium compared to the 2000s. The factors like average land holding size, literacy rate, cropping intensity, rainfall, etc., influence diversification. Some of them have positive and some of them have negative impacts. A need is suggested that the government has a duty should intensify efforts to step up and formulate well-crafted policies that actively promote the diversification of crops to mitigate climatic risk and food scarcity threats.

The Impact of Pricing Policy on Farmers' Livelihoods: A Case Study of Punjab and Bihar

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The study examines the impact of pricing policy on farmers' livelihoods in Punjab and Bihar states. Using a mixed methods approach, the study addresses five research questions related to pricing policy and its implications for farmers. The

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quantitative phase analyses CACP and NSSO data to examine the farmers' income, profitability, and the relationship with pricing policy. It also explores the economic effects of pricing policy on poverty levels, debt, and rural migration in Punjab and Bihar. Complementing the quantitative analysis, the qualitative phase gathers insights from farmers in selected villages in Punjab and Bihar. Interviews uncover farmers' perceptions, attitudes, and behaviour towards pricing policy, as well as the social implications on community dynamics and relationships. By integrating quantitative and qualitative data, the study provides a comprehensive analysis of the impact of pricing policy on farmers' livelihoods in Punjab and Bihar. The findings identify the patterns, contradictions, and relationships, offering a holistic understanding of the complex dynamics involved. Ultimately, the study suggests policy recommendations to enhance the agricultural productivity, sustainability, and social welfare in these regions.

Reassessing Sustainable Food Security and Nutrition through Chakhao (Black Scented Rice) Value Chain: A Micro Level Evidence from Imphal East and West Districts, Manipur

Thongam Kanyalaxmi Devi and Hulas Pathak*

The primary objective of this study is to examine the obstacles hindering the achievement of sustainable food security, particularly in light of the exacerbating impact of the COVID-19 pandemic. Additionally, the research seeks to assess the Chakhao value chain's role in promoting sustainable food nutrition. In the current context, the overarching challenge is to address the disruptions caused by the pandemic, fortify agrifood systems against climate-related risks, and lay the groundwork for more sustainable systems going forward, all while minimizing food wastage. Chakhao, the indigenous rice variety of Manipur with its tremendous nutritional factor and its anthocyanin content serves as one of the safest, healthiest and environment friendly crop to consume which thrives the very purposes of green economy. The conceptual framework of competitiveness, inclusiveness, sustainability and scalability and access to finance (CISS-F) laid down by Gulati et al., 2022 has been used to analyse the value chain of Chakhao in Manipur. In value chain 1 and 2, Poha was observed to be the most efficient product with an efficiency of 5.16 and 4.45 while Chakhao flour was the most efficient in value chain 3 in accordance to Conventional method. Likewise, the CISS-F framework has proven Chakhao to be of not only environmentally friendly but also the safest crop to consume which is quite competitive and economically efficient. The markup thus obtained in terms of farmers' share was 15.07 per cent in value chain 2 which was the highest, and it can be said that it was the most efficient value chain.

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Why are Foodgrain Farmers Shifting Towards High Value Crops? An Analysis of Cost of Cultivation Data

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The main objectives of the paper are (i) To study the cost and returns from the selected foodgrain and non-foodgrains crops in Tamil Nadu. and (ii) To examine whether any increase in the area under high yielding varieties (HYV) crops, viz., horticulture crops has taken place in Tamil Nadu or not. The study has used the cost of cultivation data from 2011-12 to 2018-19 compiled from various publications of the Commission for Agricultural Costs and Prices (CACP). Five major foodgrain and non-foodgrain crops (paddy, maize, finger millet, groundnut, cotton, sorghum and sugarcane) of Tamil Nadu, for which the cost and income related data was available on a continuous basis were selected to study the profitability. The CACP uses different cost concepts (A1, A2, A2+FL, B1, B2, C1, C2, C2* and C3) for estimating costs and returns. In the present study, the cost C2 was considered for computing profitability. The results of the analysis indicate that the area and yield under the selected foodgrain and non-foodgrain crops have increased but have fluctuated sharply. It is also understood from the analysis, that almost all the foodcrops and the non-foodgrain crops in the state are not profitable at all. The rapidly rising cost of cultivation is hindering the profits of the farmers. so much so that the foodgrain farmers are seen shifting towards cultivating HYV crops such as the horticulture crops.

Impact of COVID-19 on Rural Economy in India: Need for Reforms

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The present study sheds light on the challenges faced by migrant labourers and the impact of the COVID-19 pandemic on India's rural economy. The primary finding of this research indicates that approximately 400 million workers in India's informal economy are at significant risk of sinking deeper into poverty amid this crisis. This heightened risk is exacerbated by the low reported cases of COVID-19 due to limited testing, which may lead to community transmission. The phenomenon of reverse migration, where urban laborers return to rural areas, is exerting substantial pressure on the agriculture and rural economy. This, in turn, is causing a significant number of people to slip into abject poverty. The repercussions of COVID-19 on the rural economy in India are both short-term and long-term in nature. While the government's economic package primarily comprises long-term measures, it is imperative to provide short-term relief in the form of cash incentives and wage subsidies to safeguard the livelihoods of migrant laborers and marginalized

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farmers. Furthermore, it is crucial to address the issue of widespread corruption within the system, as this poses the most significant challenge to the effective implementation of these plans.

Measurement of Households' Food Security: Evidence from Rural Uttar Pradesh, India

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The study tries to analyse the status of food security, along with its various components, such as food accessibility, food availability, food stability, and food utilisation with the help of a food security index of rural households in Lucknow, India based on an indicator approach. A comprehensive field survey was conducted in six villages of Sarojini Nagar development block of Lucknow district of Uttar Pradesh. Using a multistage sampling technique, 348 samples were collected. The results indicate that food accessibility was the highest among the households that belong to the General social group (0.509), and lowest among the households that belongs to SC social group (0.3.82). Food availability was high among the people of the General group (0.488) and lowest among the SC social group (0.447). Also, Food stability was lowest among the General group (0.258) and found highest among the SC group (0.353). Food utilisation was found to be highest among the General group (0.553) households and was lowest among the SC group (0.404). The food security index was highest among the General social group (0.452), highest among the OBCs group (0.410), and least among the SC group (0.397). Therefore, the study underscores the pressing need for occupation diversification and crop diversification to safeguard food security. Additionally, it highlights the alarming lack of awareness regarding the minimum support price among the households surveyed, emphasising the necessity for government-led awareness campaigns about various programmes. Furthermore, it is recommended that investments be made in rural infrastructure, including local agricultural markets, enhancing access to mid-day meals, promoting effective water management practices, and expanding the reach of rural employment programs like MGNREGA. These measures are essential steps towards ensuring food security for the households included in the study.

Agricultural Credit and Farm Productivity: A Study on Selected Crops in Cuttack District of Odisha

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The study has examined the agricultural credit and farm productivity of selected crops in Cuttack district of Odisha. The objective of the study is to examine

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the relationship between agricultural credit and farm productivity in the study area by using primary data. The relationships between variables are measured by using multiple regression technique. The study found that agricultural credit has a rising trend in recent years and there is fluctuation of both agricultural area and production of crops due to various reasons. The study also found that the agricultural credit is influencing the production of green grams but there is no effect of credit on other grams in the study area. Several factors have contributed to the ineffectiveness of agricultural credit on crops production in the study area including high interest rate, delay in loan disbursement, high securities and rigid in loan procedure. Given that agricultural production serves as the primary source of income in this district, with a significant focus on cash crops like grams and sugarcane, it is imperative for the Odisha government to develop and implement policy measures aimed at enhancing farm productivity in the study area.

Minor Millets in Chhattisgarh: Exploring Opportunities for Sustainable Agriculture Development in Tribal Areas

Vijay K. Choudhary* Reshma Kaushal , M R Chandrakar* and Mukesh Kumar Seth*****

A study was carried out specifically in the Bastar district of Chhattisgarh to provide valuable insights into both the opportunities and challenges related to the cultivation of minor millets in the tribal regions of Chhattisgarh. Out of the total seven blocks of Bastar district, only one-third of the total blocks, i.e., Lohandiguda and Bastanar blocks, were selected purposely on the basis of the maximum area under selected course cereals for the purpose of the study. Through a comprehensive analysis of data, this research explores the economic variability, market potential, constraints, and policy implications of minor millet cultivation, with the ultimate goal of promoting sustainable agriculture development and improving rural livelihoods. The findings of the study reveal that the average cropping intensity in the region is 131.35 per cent. Additionally, it highlights the average cost of cultivating Kodo millet at Rs. 26,838.45 per hectare, little millet at Rs. 11,674.57 per hectare, and finger millet at Rs. 33,281 per hectare. The overall input-output ratio was obtained as 1:1.20, 1:1.40, and 1:1.16 for Kodo millet, little millet, and finger millet, respectively. For marketing of minor millets, there two marketing channels were identified i) Channel-I: Producer–Consumer. ii) Channel-II: Producer – Retailer – Consumer. The overall marketable surplus of Kodo millet was found to be 90.70 percent, little millet at 88.60 percent, and finger millet at 91.80 percent per quintal per farm. This economic analysis provides valuable information for farmers

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considering the cultivation of minor millets. Furthermore, the market analysis conducted in the study emphasizes the growing demand for minor millets due to their nutritional value, gluten-free nature, and cultural significance. This finding underscores the economic potential of minor millets in Chhattisgarh and emphasizes the importance of sustainable development practices. Minor millets offer significant opportunities for smallholder farmers to diversify their income, improve food security, and contribute to environmental sustainability. However, several challenges need to be addressed, such as market access, infrastructure limitations, and the need for policy support from the government. To overcome these challenges, it is crucial to formulate strategies and programs that promote and embrace minor millets as a viable and sustainable agricultural option for the tribal farmers of Chhattisgarh. In conclusion, this study highlights the economic viability and potential benefits of cultivating minor millets in the tribal areas of Chhattisgarh. It emphasizes the importance of sustainable agriculture practices, the need for market access and infrastructure development, and the role of government policies in supporting and promoting minor millet cultivation. By addressing these factors, Chhattisgarh can harness the advantages offered by minor millets and create a sustainable and prosperous future for its farmers.

Mandis Matter: How Farmers Evaluate Infrastructure in Punjab's Regulated Markets

Lovepreet Singh[†]

Having sufficient infrastructure facilities within regulated agricultural markets is vital for the comprehensive advancement of the farm sector. In this regard, the perspectives of farmers regarding the available infrastructure facilities in these regulated markets hold significant importance. Farmers' perceptions serve as a valuable tool for examining any disparities within the market structure and crafting management strategies to establish an effective marketing model. Keeping in view the above factors, a study was carried out by surveying 90 farmers from Batala, Pathankot, Ropar, Amritsar, Jagraon, Tapa, Malout, Bhikhi and Raman markets of Punjab during 2020-21. To ensure a comprehensive representation of the populace, markets in Punjab were selected based on their size and the local agro-climatic conditions. The farmers' opinions were recorded using alikert scale, and it turned out that none of the market's infrastructure facilities were fully adequate. In the opinion of farmers, the majority of the facilities available in markets, including weighing facilities, mechanical handling, lighting arrangements, seating arrangements, drinking water, internal roadways and drainage systems were adequately available. The current agricultural marketing model in Punjab was analysed using a factor

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analysis to determine which infrastructure components needed to be enhanced. Covered sheds, Canteen, Price display board and parking area emerged as the significant factors with highest factor loading. The study concluded that to strengthen the existing marketing infrastructure of the regulated markets of Punjab covered sheds, canteen, price display board and parking area needs to be upgraded.

Economic Analysis of Different IFS Modules on Livelihood Security of Farmers in Telangana

Gayathri Sandrala* , O. P. Singh‡, Vaishnavi Singh* and Dharmik Borisagar*

The present paper has compared the economics of various integrated farming systems (IFS) modules with non-crop components and conventional crop farming in Telangana in order to analyse the impact of IFS on the economies of small and marginal farmers. It also examined the influence on employment generation, nutritional security, and livelihood security, as well as the comparative profitability of various components such as crop, dairy, horticulture, goat farming, and backyard poultry. Using a multi-stage random sampling method, a total of 540 farmers were selected from the three zones of Telangana; of which 270 farmers followed IFS, and an equal number of farmers practiced non-IFS. The study related to the agricultural year 2021-22. The information gathered was tabulated and analysed using rates, ratios, percentages, and discounting measures. The findings of the study indicated that any additional components, particularly non-crop components, to the main activity of crop component were found to be more profitable in terms of higher productivity, job creation, and nutritional security when compared to conventional crop cultivation of non-IFS practices in the region. Thus the performance of various modules used by IFS farmers was found to be most profitable, financially practical and economically viable as compared to non-IFS farmers.

Role of Dietary Diversity in Addressing Chronic Energy Deficiency in Tribal Women of Reproductive Age: A Case Study

Balram Kumar and Vijay Laxmi Pandey†

India's scheduled tribes (STs) are the most deprived communities in the country and are particularly vulnerable to malnutrition. The study aims to understand the association between chronic energy deficiency (CED) and dietary diversity in women of reproductive age (15-49 years) in rural areas of Odisha. It uses two measures of dietary diversity: minimum dietary diversity and food groups score. The

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multinomial logistic regression analysis findings suggest that dietary diversity is negatively associated with CED. Significant differences exist across different social groups and tribal women are relatively more vulnerable to CED. The number of pregnancies is negatively associated whereas education level, access to clean fuels and piped water are positively associated with nutritional status. Therefore, efforts are needed to enhance the overall dietary diversity, increase pulses consumption, and leverage the existing PDS infrastructure to address nutritional deficiencies.

Dairy Value-Chain and Access to Milk Market by Women Farmers: The Case Study of Odisha

Braja Bandhu Swain and Nils Teufel*

The paper tries to assess and examine the milk marketing system in Odisha and gender roles, access and control over the income earned from selling milk by undertaking a village level study covering 130 villages from two districts. The results show that 70 per cent of the produced milk was consumed as liquid form while 30 per cent was processed – into curd, ghee and cheese. In the study area the dairy co-operatives are not very strong and farmers do most of the milk processing themselves and sell it to middlemen and sweetshops. In the various market channels for dairy products, middlemen hold a significant position, whereas cooperatives have a relatively limited role. A substantial 55 percent of farmers sell their milk through middlemen, while 38 percent choose to sell to cooperatives, and 5 percent sell directly to household consumers. Interestingly, the income derived from dairy activities is predominantly managed by male farmers, with female farmers having less control over this aspect. It is noteworthy that women farmers tend to prefer selling their milk to middlemen. In regions with well-established milk markets, income generated from milk is predominantly controlled by men, especially when compared to areas with lower-intensity dairy farming. Therefore an appropriate policy framework is needed for integrating milk producers with the consumers. Efforts are needed to increase the capacity of women to negotiate with confidence and meet their strategic needs.

Assessment of the Benefit-Cost Ratio of Farming Enterprises and Outcomes

Dinabandhu Bag*

The absence of alternate source of non-farm income in rural India, access to reliable power, infrastructure quality, etc., poses unique challenges for sustainable livelihood. This paper explores the available options among suitable extended

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activities such as inter cropping, rearing livestock, organic practices and fisheries, etc., to recommend sustainable benefits from their adoption by small and marginal farmers. Basically it tries to address the questions as to which is the right method to conduct comparative assessment of the likely benefit cost ratios across intercropping systems, allied extensions, sub-agro-climatic geographies to contain the ever-increasing variations to WPI (whole sale prices) or farm gate sale prices across mandis in rural India. It makes a comparative assessment of the potential to frame sustainable benefit cost ratio from alternate livelihood sources. It explores the contextual elements to arrive at intercropping mix for the small and marginal farmers. The study recommends a few relevant allied activities for raising the farm income of small and marginal farmers.

Impact Assessment of Covid-19 on Food Security and Livelihood in Hilly Region of West Bengal

Auindrila Biswas[†], Soumitra Chatterjee[†] and H. Ali[†]

The socio-economic disruption caused by Corona virus (SARS-CoV-2) and its mitigation responses had impacted lives and livelihoods at an unprecedented scale. The present study has been carried out to investigate the impact of COVID-19 on the total calorie intake among the population of Kalimpong district of West Bengal, India by examining the various socio-economic aspects of the sample households during pre- and post-COVID circumstances. Multi-stage sampling technique has been employed where locations have been chosen purposively. Given the significant impact of pandemic-related restrictions on the travel and tourism sector, the hilly region among the six agro-climatic zones of West Bengal as well as Kalimpong district have been selected purposively. In total, a hundred sample households were chosen using a simple random sampling without replacement (SRSWOR) method and interviewed extensively using a comprehensive and well-structured questionnaire to assess their livelihood and food security status in both pre-COVID and post-COVID scenarios. Bisalial method of decomposition has been applied in SAS software (9.3 versions) to determine the impact. The results depict a notable decline of 13.88 per cent in the total calorie intake per household per day during post-COVID situation while the estimated reduction is recorded to be 14.98 per cent with a margin of 1.10 per cent experimental error. This pandemic has demolished the overall food security and socio-economic livelihood to an extent of 8.32 per cent over pre-COVID situation. Additionally, the change in total calorie intake per household per day resulting from the substitution of quality food and non-food items for improved livelihood has decreased by 6.66 per cent over time.

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Why are Millets Often Neglected? An Economic Analysis of Millets in India

Ashish Kumar*, **P. Anbukkani****, **Nithyashree ML****, **Asha Devi***** and **K. Haritha******

Millets are an important source of food, feed, and income for millions of smallholder farmers and rural communities across the country. The present study has attempted to analyze the trends in area, production, productivity, per capita availability, and annual per capita consumption of major millets in India. In order to analyse the growth rate for area, production, and productivity for India; and the direction of change in cropping pattern in India the compound annual growth rate (CAGR), structural break analysis for millets area under cultivation and production Markov chain analysis was done to identify the patterns of transition between different crop types. The major findings revealed that the CAGR for the area of all millet crops was negative, for production was negative except for pearl millet, and positive for productivity. The structural breaks in the area of pearl millet, sorghum, ragi, and small millets occurred in 1994, 1990, 1976 and 1989 respectively and for production of pearl millet, sorghum, ragi and small millets were in 2002, 1976, 1978 and 1992. The findings from Markov chain analysis for area of groundnut, sugarcane, cotton, rice, wheat, maize and all millets revealed that rice is the most stable crop followed by wheat, maize and sorghum in India. Whereas groundnut, sugarcane, cotton, pearl millet, ragi and small millets was unstable crops and there was the loss of area from millets towards other crops. A successful price support policy linked to procurement will bring the desired improvements in the production of these crops.

The Extent of Awareness and Willingness to Pay for Environmentally Safer Pesticides Among Tomato Growers of Plains of Nainital District

Anjali Tiwari and S. K. Srivastava†

The carcinogenic properties of the chemical pesticides pose a serious threat to human health. The modern consumer preferences also incline towards organic products. Using tabular analysis and percentages an attempt has been made to examine the extent of awareness and practices followed by tomato growers of plains of Nainital district across farm size groups. To assess the producer's willingness to pay (WTP) for environmentally safe pesticides, Contingent Valuation method was used. The factors affecting WTP were assessed using ordered probit model. The level of awareness was found to be low among marginal and small farmers as

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compared to medium and large farmers. Use of protective measures during pesticide application was found to be low across all farm categories. Other pesticide handling practices of the sample farmers were also found to be flawed. The willingness to pay extra for environment friendly pesticides for most of the farmers was 5-10 per cent. Among the factors affecting Willingness to pay, education, perception, net returns and age were found to have a positive and significant effect.

Reaping the Sugary Benefits of One District One Product Approach of Atmanirbhar Bharat in the State of Jharkhand

Aniketa Horo[†], Jagruti Das[‡] and Gurleen Kaur*

The Ministry of Food Processing Industries and NAFED (National Agricultural Cooperative Marketing Federation of India Limited) has jointly implemented the One District One Product (ODOP) approach of Pradhan Mantri Formalisation of Micro food processing Enterprises Scheme (PMFME). In this approach, 724 districts of the country are assigned different agro-products for promoting production, processing, and marketing of region-specific commodities which is rendered to achieve 'Atmanirbhar Bharat'. In the state of Jharkhand, 30 districts have been chosen under ODOP for various rice-based products, dairy products, and vegetables of which Hazaribagh district was assigned jaggery under ODOP to promote cottage-based jaggery industry in the district. In this context the study attempts to examine the pros and cons of ODOP approach for Hazaribagh district. Data on sugarcane and jaggery production was collected from 100 farmers of Barkagaon block of the study district. The farmers stated that the sugarcane crop requires irrigation which is difficult for them as they practice rainfed farming in the district. In simple terms, approximately 25 kgs of jaggery could be extracted from 90 litres of sugarcane juice. Jaggery fetches almost twice the market price than what is achieved through the sale of sugarcane. Sugarcane farmers received Rs. 35 less than the announced Fair and Remunerative price (FRP) (Rs. 285/quintal), therefore efforts should be made towards ground implementation of FRP. Lack of sugar mills in the region was yet another major problem found in the study area. Farmers need better production and marketing facilities for increasing productivity which is far below the national average (76 t/ha) and fetching better price for raw sugarcane. ODOP has the potential to provide forward and backward linkages to the sugarcane farmers in the district therefore its implementation should chalk out all the possible solutions to the prominent problems of the region.

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Marketing of Tomato in Balangir District of Odisha

Udhayanithi M., Brain Ray and Partha Pratyush Tripathy[†]

The present study attempts to estimate the disposal pattern, marketable and marketed surplus, price spread, marketing costs, margins and efficiency, post-harvest losses of tomato in Balangir district of Odisha. For the purpose 46 marginal farmers, 12 small farmers and 2 large farmers were randomly selected. Four marketing channels namely, channel - I (producer-consumer), channel – II (producer-village trader-consumer), channel - III (producer-wholesaler-retailer-consumer) and channel - IV (producer-trader- wholesaler-retailer-consumer) were identified in the study area. It was observed that marketed surplus was high in the case of large farms and decreases with decrease in farm size, Producer's share in consumer's rupee increases with decrease in number of intermediary. Marketed surplus increases with increase in production on all the three categories of producers (marginal, small and large famers). Channel – I emerge the efficient marketing channel but still it is less sought. The total post-harvest losses are found to be highest that is 47.52 per cent at farm level followed by trader, wholesaler and retailer level.

Food System Transformation: The Case of Fisheries in India and Its Implications for Food and Nutritional Security

A. Suresh,* Neethu Mol Jacob and Vijay Kiran****

Sustainable transformation in the fish-based food system holds critical importance to meet the food and nutritional security, earn foreign exchange, and generate income and employment for local communities while preserving the overall health of the agroecosystem. In this context, the present study is undertaken with the following objectives: (a) to examine the transformation of fish food system in India in terms of production and domestic supply (b) to examine its implication on food and nutritional security. The study uses secondary data collected from various statistical sources. The results indicate that the fisheries sector has witnessed structural transformation over a period of time. The inland fish production has surpassed marine fish production. The potential to augment fish production utilising the under-utilised resources is high. Ensuring sustainable harvest of marine fisheries assumes importance due to its profound role in the livelihood of small-scale fishers, food and nutritional security of coastal population and export earnings. Other than shrimp, a quarter of marine fishes- both pelagic and demersal- is exported. The growth performance of the states in respect both inland and marine fisheries differed

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widely. More than three fourth of the total fish produced in India continues to be utilised fresh, and only about 15% is processed, mainly targeting the export market. The exports of demersal and pelagic fishes are growing at whopping 26 and 11 per cent per year, respectively. This could have implications on domestic food and nutritional security. The fresh water fish production, though has increased, is not exported. The per capita fish consumption in India has increased over years, albeit at slow pace, and the consumption pattern is influenced by geographical differences and cultural norms. During, 2010 to 2020, at national level, the total protein and fat supply has increased from 25.4 to 32.4 mt and from 8.3 to 12.6 mt (from all food sources) in which the share of fish has registered an increase. Consequently, the per capita supply of protein and fat from fish has increased- from 0.85 to 2.35g/ day in protein and from 0.15 to 0.5 g/ day in fat. The per capita supply of fish-based protein and fat is increasing over a period time, as supply of fish is growing above the population growth rate. However, the global data indicates that compared to several Asian neighbours, the fish-based nutrients in supply of animal-based protein and fat is lower in India, and there is potential to augment it. In view of increasing urbanisation, population growth and changes in taste and preference of consumers, demand for fish is poised to raise in future. Due to the high demand, fish as a commodity may become inaccessible to several low-income consumers, unless its production is increased to meet the demand. This warrants strategies to increase the production through sustainable intensification through technologies, institutions and policies while keeping the ecosystem healthy.