

**International  
E-Conference**

**MARKET LED EXTENSION MANAGEMENT  
Focus on COVID-19**

**17th-18th October 2020**



# ABSTRACTS

**Compiled by**  
**Dr. Hema Yadav**  
**Dr. Satish Chandra Pant**  
**Dr. Sathyendra Kumar AD**  
**Dr. Mahesh Kadam**  
**Mr. Ajit Kumar Rowniyar**

**Organised By**

**CH. CHARAN SINGH NATIONAL INSTITUTE OF AGRICULTURAL MARKETING, JAIPUR**

**Sponsored By**



**INTERNATIONAL E–CONFERENCE ON  
MARKETING LED EXTENSION MANAGEMENT:  
FOCUS ON COVID -19**

Dedicated to Food Warriors of India

**ABSTRACTS**

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Dr. Hema Yadav  
Dr. Satish Chandra Pant  
Dr. Sathyendra Kumar AD  
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**Organised By**

**CCS NATIONAL INSTITUTE OF AGRICULTURAL MARKETING**  
(An Autonomous organisation of Ministry of Agriculture & Farmers' Welfare, Government of India)  
**JAIPUR INDIA**

**&**

**INTERNATIONAL SOCIETY OF EXTENSION EDUCATION**  
**NAGPUR, INDIA**

**October 2020**

**SANJAY AGARWAL  
SECRETARY**



भारत सरकार  
कृषि एवं किसान कल्याण मंत्रालय  
कृषि, सहकारिता एवं किसान कल्याण विभाग  
Government of India  
Ministry of Agriculture & Farmers Welfare  
Department of Agriculture, Cooperation  
& Farmers Welfare

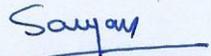


**MESSAGE**

Market Led Extension Management: Focus on COVID-19 is a timely theme relevant to the ongoing Policy Reforms and Agriculture in COVID situation. Globally, it is evident that the production decisions are governed by changing consumer preferences, markets, industry and export opportunities. Linking farmer to market rather is critical for ensuring the social and economic security of the farmers and sustainability of the Agriculture. This fact has also been emphasised by Doubling Farmers Income Committee constituted by Government of India. Recent policy reforms have clearly demonstrated the will of the Government to ensure freedom in Agricultural Marketing. The theme of the International e-Conference Market Led Extension Management by CCS NIAM and INSEE is vital and very contextual for enhancing income of farmers. As COVID-19 has impacted both on production front and more on marketing front, Market Led Extension Management in all the domain of Agriculture such as Pre-production activities, Production, Post-harvest Management, Value Addition, Agri-services, Processing, Marketing and organizing farmers into productive group is very much required to achieve productivity and profitability of the sector and thereby ensuring food security for all.

Ministry of Agriculture and Farmers Welfare is working intensively to support Market Led Extension and committed to reach out to farmers to strengthen the extension services in all the domain of Agriculture with focus on marketing.

I hope the International e-Conference will deliberate on arriving at appropriate solution to the emerging challenges and bring exchange of ideas, information and knowledge for better management of Market Led Extension practices. I wish the Organizing Committee, INSEE, CCS NIAM and all the participants for successful event and look forward to learning the outcome of your deliberation for the benefit of farmers.

  
[Sanjay Agarwal]

October 21, 2020

डॉ. पी. चन्द्र शेखरा  
महानिदेशक



Dr. P. Chandra Shekara  
Director General



### MESSAGE

International e-Conference on "Market Led Extension Management: Focus on COVID-19" has been successfully organized jointly by CCS National Institute of Agricultural Marketing (CCS, NIAM), Jaipur and International Society of Extension Education (INSEE), Nagpur.

International e-Conference has attracted attention of large number of Academicians and Practitioners including 283 Research Abstracts. International e-Conference covered Six Technical themes showcasing different dimensions of Market Led Extension Management and sessions were chaired by renowned Academicians and Practitioners in the field of Market Led Extension Management. The deliberations resulted in fruitful recommendations which are Guide Post for Policy-makers, Academicians and Practitioners. This publication covering important Research Abstracts which were presented in the International e-Conference will give highlights and benefits of Research Programs quickly to the users. These Research Abstracts are highly useful when Market-led Policy Reforms are being implemented.

I would like to compliment Organizing Committee of the International e-Conference, INSEE and CCS NIAM team, who have successfully brought out for the benefit of stakeholders of Market Led Extension Management ultimately benefitting farmers.

( Dr. P. Chandra Shekara )

28<sup>th</sup> October, 2020

**Prof. K. Narayana Gowda**  
**President, INSEE and**  
**Former VC, UAS, Bangalore**



## **MESSAGE**

International Society of Extension Education (INSEE), Nagpur, in collaboration with CCS National Institute of Agricultural Marketing (CCS NIAM), Jaipur and Indian Council of Agricultural Research (ICAR), New Delhi organized **International e-Conference on “Market Led Extension Management : Focus on COVID-19”** from 17<sup>th</sup> -18<sup>th</sup> October, 2020 at CCS NIAM, Jaipur.

INSEE is an International professional body engaged in organizing the conferences, seminars and workshops both in India and abroad on the contextual themes to foster the exchange of academic information, experiences and research findings, finally to facilitate formulation of policies for sustainable Agriculture. The Conference was organised in virtual mode for the first time provided greater opportunity to reach out to professionals across the globe.

**“Market Led Extension Management: Focus on COVID-19”** concerns with empowering the farmers and all stakeholders at all stages right from production to marketing focussing on COVID-19 impact with effective functional linkages to realise maximum profit for the farmers and ensure sustainable Agriculture. The Conference had overwhelming response from India and abroad receiving 284 abstracts and 69 full length papers from academicians, experts and practitioners with right focus on six sub-theme areas of the e-Conference.

Very enlightened and distinguished professionals chaired the six Technical Sessions namely; Dr. V. V. Sadamate, Former Adviser (Agriculture), Planning Commission, GoI, Dr. Yogendra Kumar Karkee, Secretary Agriculture, Government of Nepal, Shri S. K. Goel, IAS (Retd.), Agriculture Policy Expert, Dr. T.N. Prakash, Former Chairman, Agriculture Price Commission, GoK, Dr. K. P. Vishwanath, V.C., MPKV, Rahuri. Dr. R.R. Sinha, Founder, INSEE and Former Director of Extension PDKV, Akola, Dr. J.P. Sharma, Vice Chancellor, SKUST, Jammu and other experienced professionals in Extension. Each session was assisted by very experienced Rapporteurs. I wish to express my sincere gratitude to each of them for conducting the session meticulously and also finalising the recommendations very timely.

Inaugural Keynote Address was delivered by an International expert in Agriculture Marketing, Dr. Suresh Babu, Head of Capacity Strengthening, IFPRI, Washington DC on various aspects and problems of marketing particularly in developing countries. Chief Guest of the occasion, Dr. G.R. Chintala, Chairman, NABARD spoke on current issues on marketing in the country and how NABARD is intervening through the promotion of Farmers Producer Organisations. Equally, enlightened internationally known guests participated in the Valedictory Function highlighting importance of marketing of the farm produce in particular and Agricultural Development in general including the Doubling the Farmers Income by Dr. Ashok Dalwai, CEO, NRAA, GoI, Dr. A.K. Singh, DDG (Extn.), ICAR, Dr. S. Rajendra Prasad, Vice Chancellor, UAS, Bangalore and Sri Rajkiran Rai, M.D. & CEO, Union Bank of India besides the Executive Members of INSEE. My heartfelt thanks to each one of them.

Full length papers and abstracts submitted to the e-Conference will be made available online for the benefit of professionals. I am sure the recommendations emerging from the conference will have far reaching impact on the future of marketing of farm produces in India and other developing countries. My greetings to all the members of INSEE for contributing papers and their effective participation.

My special appreciation and congrats to Dr. P. Chandra Shekara, Director General, CCS NIAM, and Organising Secretary, Dr. Hema Yadav, Director and all the Staff of CCS NIAM for the successful conduct of the e-Conference in a memorable way.

**President, INSEE**



# चौ.चरण सिंह राष्ट्रीय कृषि विपणन संस्थान

(कृषि एवं किसान कल्याण मंत्रालय, भारत सरकार का संगठन)

कोटा रोड, बम्बाला, प्रताप नगर, जयपुर-302033 (राज.)

**CH.CHARAN SINGH NATIONAL INSTITUTE OF AGRICULTURAL MARKETING**

(An Organization of Ministry of Agriculture & Farmers Welfare, Government of India)

Kota Road, Bambala, Pratap Nagar, Jaipur-302033 ( Rajasthan )

Telephone : 0141-2795111(D) Fax:0141-2771938,2770595



## Preface

As India transitioned from a food deficit nation to a surplus one, the focus of policy has rightly shifted to linking production to market. Market Led Extension is vital for appropriate enterprise, enhancing the productivity, minimising the post-harvest losses, improve Value Added and Process Products, profitable marketing and organizing farmers into meaningful group to derive sustainable profit.

In the wake of recent promulgation of Act on Farmer Produce trade and Commerce which provides freedom for farmers to sell anywhere is a leap forward in enhancing marketing opportunities for farmers. The Act on Farmers (Empowerment and Protection) Agreement on Price Assurance and Farm Services provides for a national framework on farming agreements that 'protects and empowers' farmers to engage with agri-business firms, processors, wholesalers, exporters and large retailers, for farm services.. Increasingly in this reformed scenario there a greater need to focus on market led extension to build capacity of farmers to negotiate and strike profitable deals. The advent of Covid 19 scenario has transformed the agribusiness sector by having direct marketing, online marketing and increasing use of digital tools for managing supply chains efficiently.

The International conference on Market Led Extension, organized from 17-18th October by INSEE and CCS NIAM has received research papers and abstracts from Scientists, Academician, Research scholars from research organizations, Universities from India as well from Other countries. This compendium comprises of 68 abstracts under different themes. The papers presented in the conference will provide valuable input for Market Led Research, Training and Education for reaping the maximum benefit to farmers.

Dr Hema Yadav  
Director, CCS NIAM  
Organizing Secretary- INSEE Conference

## **International e-Conference on “Market Led Extension Management: Focus on COVID-19”**

Agriculture is the primary occupation of 66-86% of the population in SAARC countries, whereas, agricultural contribution to national GDP varies from 16.5 to 40%. Hence, agriculture is important from the point of equity and development for all the SAARC countries in particular and developing countries in general. Average income of SAARC citizen varies from 345 to 3277 US\$ per year. Agriculture has the potential to contribute more to the income of the farmers at micro level and national GDP at macro level. National Bank for Agriculture and Rural Development (NABARD) reported during 2017 that average monthly gross income of Agriculture household is 8931(US\$128)in India and around 22.50% of the farmers are below official poverty line.

Despite country recorded high food production of 292.5MTduring2019-20, agri imports havebeengrowingat9.8percentCAGRinthelast five years while exports growth stands at 1.1 percent. Minimum Support Price (MSP) fixed by GOI, did not benefit significantly all category of farmers because of inadequate market infrastructure facilities at the grass root level and unorganized farmers to avail. Every year huge losses are seen due to excess production such as sugarcane, fruits, vegetables and other farm produce, which runs to several Trillions. Migration is another important challenge bothering very existence of agriculture profession.

The migration of youth from agriculture to other sector are of grate cause of concern. The Centre for Study of Developing Societies (CSDS)found that given an option, 76% of the farmers in the country would prefer to take up some other vocation. The farmers share in consumer rupee is around one third signifying the importance of marketing. The problem is surplus not moving to appropriate markets to fulfil demand which will impact income of the farmers significantly. The real challenge for not providing profitable price in India and other developing countries in the world is due to inadequate data base information on how much to produce to meet the domestic requirement, opportunity for processing and value addition, export provision and import commitment, if any. Undertaking farm enterprises on agro-climatic zones and data base information basis, besides organizing farmers and providing infrastructure to all the grassroots level stakeholders are the true solutions to sustainability in farming.

Rural Bio-Resource Project (RBRC) implemented by the University of Agricultural Sciences, Bangalore demonstrated tripling Farmers income in the project area besides ensuring farmers share in consumer rupee by 78% in Biofuels and 67% in Jackfruit through organized farmer's groups. Attracting and Retaining of Youth in Agriculture (ARYA) project of Indian Council of Agriculture Research implemented through Krishi Vigyan Kendra across the country revealed that promoting profitable enterprises to attract farm youth, resulted in reversal migration. Every Agripreneur established under Agri-clinic Scheme provided jobs to six rural youth. There might be many such experiences both in India and abroad. The experience and success from these initiatives are ray of hopes for the future of farming.

Agricultural Extension in India since Independence focussed on Production Centric than Market Centric. Most of the production decisions are governed by changing consumer preferences, markets, industry and export opportunities. Hence, linking production to market is critical for

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enhancing the income of the farmers. This fact has also been emphasised by Committee constituted by GOI, New Delhi on Doubling farmers income. Hence, reforms in Market Led Extension and its management are vital for sustainability of Agriculture. Market Led Extension Management broadly covers efficient and effective extension. Work on choosing appropriate enterprise, enhancing the productivity, minimising the post-harvest losses, improve Value Added and Process Products, profitable marketing and organizing farmers into meaningful group to derive sustainable profit.

The conference also provides valuable input for Market Led Research, Training and Education for reaping the maximum benefit to farmers. In this endeavour, Market Led Extension Management brings management perspectives in reorienting Agricultural Extension into market oriented, supported with group led approaches, effective functional linkages empowered by Agripreneurship, ICT and Public Private Partnership besides empowering the farmers and all stakeholders at all stages to maximise their profit.

COVID 19 has impacted both on production and more so on marketing, Conference will deliberate on choosing appropriate solution to the emerging problem. In view of this, International Society of Extension Education (INSEE) in collaboration with CCS National Institute of Agricultural Marketing (CCS NIAM), Jaipur, Indian Council of Agricultural Research (ICAR), New Delhi and Mahatma Phule Krishi Vidhyapeeth, Rahuri, Maharashtra are organizing International e-Conference on Market Led Extension Management with the following themes :

### **CONFERENCE THEMES**

The technical papers were reclassified under six technical themes during the conference

1. Market Led Extension Management – Approaches
  2. Market Led Extension Models and Experiences
  3. Market Led Extension Management – Policy Reforms
  4. Emerging Agricultural Marketing Strategies
  5. Agricultural Marketing in COVID period
  6. Innovations in Agricultural Marketing Management
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The Programme Schedule of the e-Conference is as follows-

Day and Session	Speaker and Role																													
<b>Day-1 Session-1</b> <b>10.30 A.M. to</b> <b>12.00 P.M.</b>	<p align="center"><b>Inauguration by Shri Kailash Choudhary, Hon'ble Minister of State for Agriculture &amp; Farmers Welfare, Govt. of India</b></p> <p>1. Chief Guest : Dr. G.R. Chintala, Chairman, NABARD            2. Keynote Address : Dr. Suresh Babu, Head of Capacity Strengthening, IFPRI, Washington DC.</p> <p>Rapporteur 1: Dr. P.O. Ingle, Ex-HOD, Extension Education, Dr. PDKV, Akola, Maharashtra            Rapporteur 2: Dr M. K. Rathod, Prof.of Agril. Extn., COA, Nagpur.</p>																													
<b>Day-1 Session-2</b>  <b>12.00 P. M. to</b> <b>2.00 P.M</b>	<p align="center"><b>Theme : Market Led Extension Management - Approaches</b></p> <p>1. Chairman : Dr. K. Narayana Gowda, Ex-Vice-Chancellor, UAS, Bangalore            2. Co-Chair : Shri Yogesh Thorat,, Maha FPO, Pune            Rapporteur : Dr. S .R. Singh, Deputy Director, CCS NIAM</p> <table border="1" data-bbox="407 926 1421 1854"> <thead> <tr> <th data-bbox="407 926 540 982">Sr. No.</th> <th data-bbox="544 926 1076 982">Title of the paper</th> <th data-bbox="1079 926 1421 982">Author</th> </tr> </thead> <tbody> <tr> <td data-bbox="407 984 540 1062">1.</td> <td data-bbox="544 984 1076 1062">Communication Behaviour of Fruit Retailers in Kano State, Nigeria.</td> <td data-bbox="1079 984 1421 1062">S.A. Dambazau</td> </tr> <tr> <td data-bbox="407 1064 540 1182">2.</td> <td data-bbox="544 1064 1076 1182">Constraints faced by the farmers at different marketing Channels in Madhya Pradesh</td> <td data-bbox="1079 1064 1421 1182">Kinjulck C Singh</td> </tr> <tr> <td data-bbox="407 1184 540 1302">3.</td> <td data-bbox="544 1184 1076 1302">Price Forecasting of Tomato in Kolar Market of Karnataka using ARIMA and GARCH model</td> <td data-bbox="1079 1184 1421 1302">Nandini Saha</td> </tr> <tr> <td data-bbox="407 1304 540 1421">4.</td> <td data-bbox="544 1304 1076 1421">Marketing Constraints encountered by progressive rabbit farmers of Tamil Nadu</td> <td data-bbox="1079 1304 1421 1421">P Kumaravel</td> </tr> <tr> <td data-bbox="407 1423 540 1541">5.</td> <td data-bbox="544 1423 1076 1541">Role of Extension Services in disseminating the IPM technology in Rajasthan</td> <td data-bbox="1079 1423 1421 1541">Shubhaom Panda</td> </tr> <tr> <td data-bbox="407 1543 540 1661">6.</td> <td data-bbox="544 1543 1076 1661">Attitude Towards Mahatma Gandhi National Rural Employment Guarantee Act of Wardha Districts Beneficiaries</td> <td data-bbox="1079 1543 1421 1661">RAUT M.A.</td> </tr> <tr> <td data-bbox="407 1663 540 1740">7.</td> <td data-bbox="544 1663 1076 1740">Market-led Extension: Prospects and Challenges</td> <td data-bbox="1079 1663 1421 1740">Tanuja Verma</td> </tr> <tr> <td data-bbox="407 1743 540 1854">8.</td> <td data-bbox="544 1743 1076 1854">Value addition of underutilized arid fruits and vegetables for enhancing farm income</td> <td data-bbox="1079 1743 1421 1854">Dr. Raman Jodha</td> </tr> </tbody> </table>			Sr. No.	Title of the paper	Author	1.	Communication Behaviour of Fruit Retailers in Kano State, Nigeria.	S.A. Dambazau	2.	Constraints faced by the farmers at different marketing Channels in Madhya Pradesh	Kinjulck C Singh	3.	Price Forecasting of Tomato in Kolar Market of Karnataka using ARIMA and GARCH model	Nandini Saha	4.	Marketing Constraints encountered by progressive rabbit farmers of Tamil Nadu	P Kumaravel	5.	Role of Extension Services in disseminating the IPM technology in Rajasthan	Shubhaom Panda	6.	Attitude Towards Mahatma Gandhi National Rural Employment Guarantee Act of Wardha Districts Beneficiaries	RAUT M.A.	7.	Market-led Extension: Prospects and Challenges	Tanuja Verma	8.	Value addition of underutilized arid fruits and vegetables for enhancing farm income	Dr. Raman Jodha
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**Day-1 Session-3****12.00 P. M. to****2.00 P.M****Theme : Market Led Extension Models and Experiences**

1. Chairman: Dr. V.V. Sadamate, Former Advisor (Agri.) Planning Commission, GoI
2. Co- Chairman: Sri. G.R. Soni, DGM, Punjab National Bank, Jaipur
3. Co-Chairman: Dr. Sant Kumar Choundary, Chairman, Shankara Group of Institutions

Rapporteur : Dr. Shuchi Mathur, Asst. Director, CCS NIAM

<b>Sr. No.</b>	<b>Title of the paper</b>	<b>Author</b>
1.	Fish Marketing Extension Service Model for Supply Chain Actors – A Market Led Extension Approach	Suman Dey
2.	Linking Rural Farmers to Markets by Using ICTs	Dr. Vinod Kumar Saini
3.	Dry Flowers: Way Towards Marketability Perspective Extension of Flowers	Pooja Panchani
4.	An Assessment of Marketing Channels of Poultry Products in Udaipur and Ajmer Districts of Rajasthan	Nikita Inaniya
5.	Perception of Scientist of Navsari Agricultural University towards Organizational Climate	A. M. Pandya
6.	An Exploratory Study on Agricultural Marketing Information Needs and Usage among Farmers of Madhya Pradesh	Pooja Pastore Shukla
7.	Farmer Producer Organizations: A Route to Strengthen Indian Rural Livelihood	Daya Suvagiya
8.	Internet of Things Application to State Agricultural Universities in India – A Review	A. LALITHA
9.	Perceived Effectiveness of Skill oriented Agricultural courses through Distance Learning medium	Dr.K.S.Purnima,
10.	Dairy Farmers' Organization in view of its' Supply Chain Management and Sustainability	Avijit Sarkar
11.	Socio economic characteristics of consumers and retailers of value- added	Shridhara

	products of avocado and documentation of different products	
12.	Women SHGs in Chhattisgarh: A Case of Business Performance	Hemlata Deshmukh
13.	ICTs Supported Extension Services in Agricultural Technologies Information Access for Farmers in Barnala District of Punjab, India	Suryendra Singh

**Day-1 Session-4**

**12.00 P. M. to  
2.00 P.M**

**Theme : Market Led Extension Management – Policy Reforms**

1. Chairman : Dr. Yogendra Kumar Karki, Joint Secretary, Planning, Govt. of Nepal, Kathmandu, Nepal
  2. Co-Chairman : Dr. Lalith Achyut, Professor (Retd.), UAS, Bengalure, Karnataka
- Rapporteur : Dr. Mahesh Kadam, CCS NIAM

<b>Sr. No.</b>	<b>Title of the paper</b>	<b>Author</b>
1.	Collective farming for market empowerment of small and marginal farmers	Dr Shridevi Valamannavar
2.	The Doubling Farmers Income through Agriculture Market Intelligence	Hemant Sharma
3.	Value chain Development in Perishable Commodities in India: A Review	Shailza
4.	Comparative Analysis of Price Support Scheme Under Different Agencies in Karnataka- A Case of Pulses	Amrutha T Joshi
5.	Progress, Perception and Utilisation by Beneficiaries of PMKISAN Scheme of Karnataka	Kavitha, H.N.
6.	Reformation of Indian Agricultural Markets through e-NAM	Anil Sharma
7.	Livelihood diversification: Sustainable approach for climate change	Lakshman Reddy, B. S.
8.	Farmer to Farmer Extension Model: Experiences and Future Perspective	Dr. M.S Meena
9.	Hortipreneurship-Challenges and Opportunities- The Way Forward to Doubling Farmers' Income	Bakhtaver Hassan

**Day-2 Session-1**

10.00 A.M. to

12.00 P.M

**Theme : Emerging Agricultural Marketing Strategies**

1. Chairman : Dr. Sudhir Kumar Goel, IAS (Retd.), Agriculture Policy Expert
  2. Co- Chairman : Dr. T.N. Prakash, Former Chairman, Agriculture Price Commission, Govt. of Karnataka
- Rapporteur : Dr. Satish C. Pant, CCS NIAM

Sr. No.	Title of the paper	Author
1.	Present Scenario of Agricultural Marketing in the State of Nagaland, India- Prospect and Challenges.	Nchumthung Murry
2.	An Analysis of Value Chain of Selected Horticultural Commodities in Karnataka	Sandeep K T
3.	Marketing Strategies for Doubling Farmers' Income	Priyanka Maity
4.	Marketing Analysis of Sugar Cane in Kano Metropolis, Kano State, Nigeria.	I. Suleiman
5.	Growth and Instability analysis of Grapes Production in Karnataka	Prof. M. Devaraj
6.	Contract Farming and Its Consequence on the Farmers of Karnataka	Bhuvana.C.R
7.	Consumer preference towards fresh cut fruits and vegetables in modern retail formats of Bengaluru city	Nirosha, S
8.	Performance of Unified Market Platform (UMP) For Major Agriculture Commodities: A Case Study of Raichur Market	Bharatha Vinaykumar
9.	Post Harvesting Practices Adopted and Perception of Farmers towards Grapes Export in Nashik District of Maharashtra State	P. B. Pawar
10.	Analysis of marketing behaviour of papaya growers	Veena Bushetti
11.	Preservation of soft bulb type jackfruit pulp for enhanced income generation and livelihood security	Chandan K.
12.	Strategies and Components of Agricultural Marketing for Management of Market and Price Risk in India	Rakesh Rathore

	13.	Value chain analysis of Cumin Seed in Barmer district	Hema Yadav
	14.	Value Chain study of Medicinal Plant in Barmer District of Rajasthan	Dr. Pradeep Pagaria
	15.	Role of ICT in enhancing agriculture production	PUSHPA.P,
	16.	Market led extension models in dairying for income enhancement of farm women	K.Ponnusamy,

**Day-2 Session-2**

**10.00 A.M to  
12.00 P.M.**

**Theme : Agricultural Marketing in COVID period.**

1. Chairman : Dr. J.P. Sharma, Vice-Chancellor, SKUST, Jammu
  2. Co- Chairman : Capt. Laxmikant Kalantri, Ex- Director of Sericulture, Govt. of Maharastra
  3. Dr. Ravi Reddy, REEDS, Hyderabad
- Rapporteur- Mr. Sathyendra Kumar, CCS NIAM

Sr. No.	Title of the paper	Author
1.	Impact of Covid- 19 on Agriculture	Waghmare M.N.
2.	Need of Agricultural Market Reforms at the Time of COVID-19 Pandemic	Anju Yadav
3.	Pillars of Aatmanirbhar Bharat Abhiyan for Agriculture- A vision for market led extension approach for the farmers	Mahesh Kadam
4.	Impact of COVID-19 on the Supply-Chain of Major Horticultural Crops in Jammu and Kashmir, India	Bakhtaver Hassan
5.	Constraints Faced by the Trained Mushroom Growers	Rajgolkar Priya J.
6.	A Market Structure Analysis of Fish Markets in Mormugao, Goa	Shweta Chavan
7.	Value chain analysis of tea (Camellia sinensis) and constraints faced by the small tea growers in India with special reference to state Assam	Abhijit Das
8.	Perception of Paddy Farmers About Minimum Support Price In Karnataka	Sahana
9.	Analysis of dairy contract farming system in Tamil Nadu, India	N. Narmatha
10.	Supply chain and Agri infrastructure for pineapple farmers of Tripura	Lalit Singh

**Day-2 Session-3****10.00 A.M.****12.00 P.M.****Theme : Innovations in Agricultural Marketing Management**

1. Chairman : Dr.K.P. Vishwanath, Vice-Chancellor, MPKV, Rahuri, Maharashtra
  2. Co- Chairman 1 : Dr. R. R. Sinha, Founder, INSEE, Ex- Director of Extension Education, Dr. PDKV, Akola, Maharashtra
  3. Co- Chairman 2 : Dr. N. Balasubramani, Director, MANAGE, Hyderabad.
- Rapporteur : Sri. Manoj Agrawal, COO, CCS NIAM

<b>Sr. No.</b>	<b>Title of the paper</b>	<b>Author</b>
1.	Use of E-tools in Agriculture by Farmers of northern Karnataka	Smitha B R
2.	Constraints Encountered by Oats Growers in Adoption of Improved Production Technology	S S Kubrevi
3.	Preparation of thirst-quenching dehydrated line slices enhanced income generation and livelihood security	Chandan K.
4.	Institutional Innovations in Mango Marketing During Lockdown	T. N. Srinatha
5.	Attitude of Agri Student towards Agri Entrepreneurship	Inayathaidar A. Momin
6.	Entrepreneurial Readiness Among Youth: A Conceptual Framework	Divyata Joshi
7.	Consumer Preference for Value Added Products of Avocado in Bengaluru Metropolitan City	Shivani Dechamma
8.	Fresh Water Pearl Cultivation: A Prospective Venture towards Doubling Farmers' Income	Sarvjeet Kaur
9.	Innovations, Prospects and challenges of the Market Led Extension in view of 21 <sup>ST</sup> -Century Scenario	Kawita Bhatt
10.	PERCEIVED BENEFITS AND BARRIERS OF DIGITAL MARKETING BY B2B AGRIBUSINESSES IN INDIA	Avantika Bakshi
11.	Comparative Evaluation of different Rice establishment technologies	M. Venkataramulu

**Day-2 Session-4**  
**12.30 P.M to**  
**1.30 P.M.**

**Valedictory Address by Dr. Ashok Dalwai, CEO, NRAA, Govt. of India**

1. Chief Guest : Dr. A.K. Singh, DDG (Extn.), ICAR
  2. Guest of Honour : Dr.S. Rajendra Prasad, Vice-Chancellor, UAS, Bangalore
  3. Guest of Honour : Sri. G. Rajkiran Rai, M.D. & CEO, Union Bank of India
  4. Special Guest: Dr. G. Trivedi, Ex-Vice Chancellor, BAU, Samastipur, Bihar, India
  5. Special Guest: Dr. G. Rajguru, Ex-Director of Extension Education, OUAT, Bhubaneswar, Odisha, India
- Rapporteur : Dr. N. S. Shivalinge Gowda, Ex. D.E., UAS, Bangalore

The abstracts selected for presentation are given in the subsequent chapters. Hope this publication will benefit academicians and practitioners to provide the knowledge for the benefit of farmers.

Dr Hema Yadav  
Organising Secretary



## **Theme 1 : Market Led Extension Management - Approaches**

**Chairman** : Dr. K. Narayana Gowda, Ex-Vice-Chancellor, UAS, Bangalore

**Co-Chair** : Shri Yogesh Thorat,, Maha FPO, Pune

**Rapporteur** : Dr. S .R. Singh, Deputy Director, CCS NIAM



## **Communication Behaviour of Fruit Retailers in Kano State, Nigeria.**

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The study on communication behaviour of fruit retailers was carried out in Kano metropolitan, Kano state, Nigeria. Eighty respondents were randomly selected which represent 5% of the total sampling frame. The collected data were classified, tabulated, analyzed with the application of suitable statistical tests, interpreted and logical conclusions were drawn in the light of objectives set forth. The results revealed that most (46.25%) of the respondents fall within 27-36 years of age and majority (61.25%) have 1-5 household size, (100%) were male, (82.5%) were married, (50%) attended secondary school and (51.25%) earning NGN24,500-34,500 as their monthly income. It also inferred that majority of the respondents were always seeking information from the suppliers, evaluate the received information by discussing with suppliers and customers, preserved the received information by written document, and always sharing information at market/home with others. Their communication behaviour could be described to fall in the medium level. The findings also revealed that socio-economic variables like educational status, monthly income, and years of experience were positively correlated with the communication behaviour of the respondents. Based on their level of communication behaviour the respondents can easily adopt new innovations when they are available. There is a need for the broadcasting stations within the state to create a programme that will report the availability and price of the commodity, as up to now in a total number of ten radio stations only one station is reporting in its daily news. Also, the cooperative society in the market should create either a weekly or monthly market bulletin for effective and reliable information flow within the market.

**Keywords:** Communication Behaviour, Information, Fruit retailers

## **Constraints faced by the farmers at different marketing Channels in Madhya Pradesh**

Kinjulck C Singh, Sanjay Singh, Chandrajit Singh, Ajay Kumar Pandey and M. K. Mishra  
JNKVV, Krishi Vigyan Kendra, Rewa

Market is a facilitation centre for sellers as well as buyers. Agriculture is considered to be unorganized sector so the markets of agriculture. Government is continuously giving emphasis on fair deal of the agricultural produce in the benefit of farmers. Still there is a lot to be done according to farmers need and interest. Since market varies so the problems also differ from commodity to commodity and region to region. The present study was undertaken in the Madhya Pradesh to study the problems of farmers in the marketing of cereals and pulses at different levels of market. A total sample of 120 farmers from 4 villages of Rewa districts was selected for the study. The sample farmers were categorized on the basis of their operational holding, as marginal, small, medium and large farmers. The result shows that the most important problem identified by the farmers in the marketing of cereals was the delay in procurement. However, the major problem during marketing of pulses was lack of public procurement of the good quality produce.

**Key Words:** Marketing, Marketing channels, MSP, Moisture percent

# **Price Forecasting of Tomato in Kolar Market of Karnataka using ARIMA and GARCH model**

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Tomato is among India's most consumed vegetables which shares 7.77% and 10.28% of the total area and production under vegetable as per the 1<sup>st</sup> advanced estimate of 2019-20. Price of this crop is of high importance both economically and politically. However, tomato price is often found to be highly volatile and major fluctuations in price are observed. Since, price behaviour of a commodity plays crucial role in farm level production planning (Harini B *et al.*, 2018), there is need to understand the complexity of commodity price dynamics. To catch those unexpected fluctuations in prices, precise forecast models are immensely essential for effectual planning and monitoring. So, the study attempted to forecast tomato price in country's one of the biggest tomato market i.e. Kolar. Daily wholesale price data was sourced from Directorate of Marketing and Inspection for the period 2009-2019. Weekly wholesale price data used in the study was calculated from daily price data. ARIMA (2,1,2) was found to be the best fitted model based on lowest AIC value. Because of the presence of serial correlation and ARCH effect, GARCH model was also fitted. To compare the performance of these two models RMSE and MAPE values were calculated. Lower values of these two parameters revealed that GARCH (1,1) model is better than ARIMA (2,1,2) model in forecasting the price. So, GARCH model can be used by policy makers to forecast price for guiding the farmers to take decision regarding area allocated under the crop and also in deciding the time of harvesting to fetch better price.

**Key words:** Tomato, Forecasting, ARIMA, GARCH

## **Marketing Constraints Encountered by Progressive Rabbit Farmers of Tamil Nadu**

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The study was conducted to assess the constraints encountered by progressive rabbit farmers in Tiruvallur and Kancheepuram districts of Tamil Nadu. The data was collected from 30 rabbit farmers through a structured questionnaire along with focus group discussion during rabbit farmers meet at Chennai. Garrett's ranking technique was followed to analyse the constraints perceived by the rabbit farmers in backyard rabbit farming. Majority of the rabbit farmers were middle aged, educated up to graduate level, practised rabbit farming as their secondary occupation with an average of 2-5 years of experience and generated an income of Rs.20,000 through marketing of rabbits. Limited availability of pelleted feed (59.40), and mortality of young ones were the foremost production constraints faced, while high cost of feed (64.29), and theft/predators (51.48) were the serious socio economic constraints. With regard to Infrastructural constraints, lack of extension personnel (57.29) and difficulty in getting the

critical inputs were the serious constraints. Limited training programmes on rabbit rearing (58.07) and lack of technical support at doorsteps were the foremost infrastructural constraints. With regard to marketing, long distance to market (52.74) and lack of organized livestock markets with infrastructure (50.44) were the most serious constraints faced followed by unscientific price fixation, inadequate transport facility and season in that order.

**Keywords:** Marketing Constraints, livestock market, rabbit farming

## **Role of Extension Services in Disseminating the IPM technology in Rajasthan**

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Integrated Pest Management (IPM) is a sustainable approach to pest management by the combination of biological, mechanical, physical and chemical methods. Though use of chemicals cannot be avoided because of its importance, its management as a last line of defence is acceptable. Government of India has adopted IPM as a key solution to plant protection since 1985. So many extension services from the government of India are working in dissemination of IPM technology in India. In 2014-15, the Government of India introduced The National Mission on Agriculture Extension and Technology (NMAET) in order to take a holistic view of extension under four sub missions. Currently, the agriculture R&E system in India is dominated by the public sector and is led by the Indian Council of Agriculture Research (ICAR). In 2018-19, the revised budget for agricultural extension services by Government of India, was 205.53 crores for the country. Rajasthan is a land of diverse agro climatic zones. Agricultural extension plays a key role in boosting agricultural productivity, enhancing food security, improving rural livelihoods and changing farmers' preferences and farming practices positively. Extension agents work days and nights for the dissemination of agricultural innovations for the betterment of the farmers of Rajasthan. Extension services to a pluralistic extension system include extension services by government organisations like Agriculture Technology Management Agency ATMA, Department of Agriculture, Central Integrated Pest Management Centre (CIPMC), State Agricultural University (SAU), National Research Centre for Integrated Pest Management (NCIPM), and other government and non-government organisations, those contribute for the state towards the dissemination of IPM technology. Often agricultural development problems cannot be solved by one of these institutions, but only by a partnership of several of them. This study examines all the relevant data related to extension and training for agriculture, especially for IPM technology for India as a whole and also the state of Rajasthan.

**Keywords:** Extension Services, IPM, Rajasthan

## **Attitude Towards Mahatma Gandhi National Rural Employment Guarantee Act of Wardha Districts Beneficiaries**

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The study entitled “Attitude of beneficiaries towards Mahatma Gandhi National Rural Employment Guarantee Act (MGNREGA)” was conducted in Wardha district of Vidarbha region. The study was conducted in Wardha and Hinganghat tahsils. The lists of MGNREGA beneficiaries was obtained from respective gram panchayat and from rojgar sanyojak who is main in the village and the villages having maximum number of MGNREGA beneficiaries drawn were selected. Thus, 10 villages from two tehsil, each of five villages were selected for study. The 120 beneficiaries drawn from 10 villages, each of 12 beneficiaries from villages. The ex-post facto research design of social research was used.

The finding of study revealed that more than half i.e.58.34 per cent of the beneficiaries belonged to middle age group; majority of the respondent i.e. 41.67 per cent were educated up to high school level, the great majority 65.00 per cent of beneficiaries were either from Schedule Cast/Schedule Tribe or from backward, majority of (55.84%) beneficiaries belonged to medium sized family, more than three fourth 72.50 per cent of beneficiaries belonged to nuclear type of family, 47.50 per cent of them were dependent on MGNREGA + labour, half (50.83%) of the beneficiaries were small and semi medium land holders, Majority (50.83%) of the beneficiaries had annual income ranging from `50,001 to 1,00,000, the 43.34 per cent of the beneficiaries had membership in informal organization, two third (66.66%) of the beneficiaries had medium level of extension contact, more than two third (70.00%) of the beneficiaries were using medium level of sources of information, more than two third (68.33%) of the beneficiaries had medium economic motivation.

The study about attitude of beneficiaries illustrate that majority 59.16 per cent of the beneficiaries had moderate attitude towards MGNREGA, while 40.00 per cent them favorable attitude towards MGNREGA, respectively. None of the beneficiaries was found in the category of unfavorable attitude.

The result of relational analysis clearly indicates that selected characteristics of MGNREGA beneficiaries, it is observed that out of twelve independent variables, ten variables viz, Education, Caste, Land Holding, Social Participation, Annual Income, Occupation, Source of Information were positively and significantly correlated with attitude towards MGNREGA at 0.05 per cent level of probability, other variables like Family Size, extension contact and Economic Motivation were positively and significantly correlated with attitude towards MGNREGA at 0.01 per cent level of probability. whereas age had positive and non-significant correlation with attitude towards MGNREGA. Rest trait, type of family had failed to establish significant relationship with attitude of beneficiaries towards MGNREGA.

**Keyword:** Rural Development, Social participation, Social justice, Sustainable development, Rural Development, Attitude, employment, , National Food for Work Programme (NFFWP).

## **Market-led Extension: Prospects and Challenges**

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India's agricultural extension system is the largest in the world. It caters to the technology and information needs of about 100 million farm families. Focus of extension agencies on production technologies yielded very good results and hence India become self reliant in food production. Significantly, the extension system had played its role untiringly in transfer of production technologies from lab to land, besides the agricultural scientists, farmers and marketing network. But the farmers at individual level are not realizing remunerative prices for their produce. Therefore, extension functionaries need to play a major role to build the capacity of the farmers to meet the emerging challenges and make the farmers to realize better prices to their farm produce. But, market-led extension so far is a peripheral issue in the extension scenario. Agricultural sustainability can only be achieved when the ends are target from the means. This does not include only safe production in terms of consciousness of future generation needs but building up the capacity of the agricultural system towards increase in productivity cum profit maximization through the new trend of extension services. Under WTO, the globalization/liberalization of market demands farmers at all levels to transform themselves from production and selling in the domestic market to producer cum seller in the wider market scene to realize the optimum returns on their investments. The need for market led is of necessity by the paradigm shift of present agriculture scenario which calls for conversion of the sector into profit oriented business. FAO estimates that 32 percent of all food produced in the world were lost in 2009 due to lack of post-harvest operation similarly, 13% of GDP was reported loss yearly in India due to loss of food grains. However this loss can be minimized by the Market Led extension approach through adequate supply of information by SWOT analysis of the market, establishing market and agro processing linkages, direct marketing, and capacity building in terms of improved production and post-harvest operation and transport system. Hence, there is need to discuss about the prospects and challenges of market led extension for capacity building of farmers, extension functionaries' stakeholders, and also for policy recommendation towards holistic sustainable agricultural development.

## **Value Addition of Underutilized Arid Fruits and Vegetables for Enhancing Farm Income**

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India is recognized as a rich heritage of neglected and underutilized fruit and vegetable. Many underutilized fruit and vegetable species are found in Thar desert part of Rajasthan. These fruit species have great potential to provide nutritional and livelihood security. Among them, Ker (*Capparis decidua*), Sangari (*Prosopis cineraria*), Lasoda (*Cordia myxa*), Cluster bean (*Cyamopsis tetragonoloba*), Ber (*Ziziphus nummularia* and Kachari (*Cucumis species*) are pre-dominant. These fruits are nutritionally very rich and are helpful in fulfilling nutritional requirement of people dwelling in arid areas of Rajasthan. Presence of extreme climatic conditions also effect the shelf life of these fruits, and thus it is important to adopt appropriate strategies for proper harvest, handling, grading, processing or value addition to make them

available for longer duration of time and it is additional source of income also. Further, lack of technical knowledge, appropriate post harvest management and processing methodologies are major constraints for farmers to enhance their income. In majority of fruits technical standards are negligible along with important commercial cultivars. So, there is an urgent need to promote site specific post harvest technology and methodologies, which can reduce the post harvest losses and maximize the profit of farmers.

**Keywords:** value addition, arid fruits and vegetable, processing



## **Theme 2: Market Led Extension Models and Experiences**

- Chairman** : Dr. V.V. Sadamate, Former Advisor (Agri.) Planning Commission, GoI
- Co-Chair** : Sri. G.R. Soni, DGM, Punjab National Bank, Jaipur
- Co-Chair** : Dr. Sant Kumar Choundary, Chairman, SGI, New Delhi
- Rapporteur** : Dr. Shuchi Mathur, Asst. Director, CCS NIAM



## **Fish Marketing Extension Service Model for Supply Chain Actors – A Market Led Extension Approach**

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Marketing plays a significant function in raising the income of value chain partners in fisheries. However, its importance is seldom acknowledged or taken care of for improving the prevailing status of the fisheries sector. Market-led extension approach is the perfect blend for helping the farmers to realize high returns for the produce. In this regard, the present study was conducted to develop a “Fish marketing extension service” model using the participatory market chain mapping method. Thereafter, the binary logistic regression method was also used to elicit the responses of the supply chain actors with regard to their ‘Willingness to pay’ for implementing such marketing extension service model. The results of the study indicated that the majority of the respondents were willing to pay for such services and the results were in favour of the development of such models in the fish marketing system. The study further depicted that the WTP was found to be higher (log odds ratio 1.004) among the fish farmers who could sell more fish, the wholesaler who had more (log odds ratio 1.051) total area holding (area for wholesaling), and experience (log odds ratio 0.696) of the retailer. Implementation of such market led extension system model may foster a better marketing system with more price realization by the chain partners.

**Keywords:** Fish marketing, Market led extension, Participatory market chain mapping, Willingness to Pay.

## **Linking Rural Farmers to Markets by Using ICTs**

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The agricultural sector accounts for the overwhelming majority of rural employment in many developing countries like India. Poor access to markets and marketing information has left rural farmers exploited by other players in the chain. Farmers often don't know the prices of their produces at distant markets. Traders and middlemen cheat farmers by taking advantage of their lack of knowledge of market prices, poverty and weak bargaining power arising from illiteracy and poor social status. The timely availability of right information and its proper utilization is indispensable for agriculture. Information and Communication Technology (ICT) based initiatives like short messages, whatsapp groups, mobile calls and kisan call centers can be taken for propagation of information, transfer of technology, procurement of inputs and selling of outputs in a way so that farmers can be benefitted. ICT-enabled services helps in disseminating timely information on agricultural advisories, financial services and agricultural marketing to the farmer to improve their capacity and mitigate risks. It plays a crucial role in disseminating information to

farmers enabling them to decide on the cropping pattern, use of high-yielding seeds, fertilizer application, pest management, proper storage, marketing, etc. It has also proved to be extremely beneficial for farmers including small land holders, marginalized and poor farmers, and helped them in marketing and improved their profits. The introduction of computer education from the primary level is a revolutionary step for the next generation. Besides this, the government and private entrepreneurs have to come together and join hands for the creating and use of such ICT facilities which can match the aspirations of new generations farmers.

**Keywords:** Information, ICT, marketing, farmers

## **Dry Flowers: Way Towards Marketability Perspective Extension of Flowers**

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Fresh flowers play an important role in life of human being, but if flowers before fading are subjected to proper drying techniques, provide extra source of income throughout the year. The act of drying flowers for preservation and other uses are dates back to ancient times and used by Egyptians, Japanese and Victorian women for different purposes like to add design jewelry and cloths. Dry flowers are also economically important because fresh flowers are short lived retain for few days only while dry flower stay long lasting up to months or year. In India, commercially dry flowers business started in the year 1953 by National Botanic Gardens, which is renamed as National Botanical Research Institute in 1978. Dry flower products have good demand both in domestic and foreign markets. India stands first in dry flower export owing to the availability of variety of plants due to its diverse climate and vast range of vegetation may play a keen role in foreign exchange earnings. Japan, Europe and Unites Arab Emts have huge demand for dry flower products, which are prepared at low cost but are purchased at higher prices due to handicrafts and novel designs. Export of dry flowers is increasing continuously from Rs. 5933.26 lacs in year 2009-10 to Rs. 34252.83 lacs in year 2018-19. Dry flowers are more helpful in entrepreneurship development in unemployed youths, homemakers and rural women for earning money through this creative occupation and can easily generate 1.75 to 6.23 times profit.

**Key words:** Dry flowers, dehydration, value addition, economical

## **An Assessment of Marketing Channels of Poultry Products in Udaipur and Ajmer Districts of Rajasthan**

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Agriculture sector is the most crucial sector of the Indian economy because the main objectives of economic policy of output growth, price stability and poverty alleviation are best sub-served in this sector. Livestock is emerging as a driving force in the growth of agricultural sector of India. Animal Products plays an important role in the socio- economic life of the country. It is a rich source of high quality of animal products such as milk, meat and eggs. India has emerged as the largest producer of milk with 18.48 percent share in total milk production in the world and accounts for about 5.25 percent of the global egg production. Poultry in agriculture segment is one of the fastest growing sectors in India with an average growth rate of 6 per cent in egg production and 12 per cent for broiler production per annum. Eggs and poultry meat has emerged next to milk as a contributor to the output from livestock sector in recent years. The study was carried out to assess the important marketing channels in Udaipur and Ajmer district of Rajasthan. The most popular marketing channel in Udaipur district was identified as channel-III (Producer-Wholesaler-Retailer-Consumer) for both broilers as well as eggs marketing, while in case of Ajmer district channel-V (Producer-Super market-Consumer) and channel-III (Producer-Wholesaler-Retailer-Consumer) has been found as best for broilers and eggs, respectively.

**Keywords:** Livestock, poultry, eggs, meat etc.

### **Perception of Scientist of Navsari Agricultural University towards Organizational Climate**

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The Organizational Climate (OC) is the powerful tool that has tremendous influence to enhance the morale, performance and job satisfaction of the employees in any organization. The OC plays a pivotal role in an organization when employees have clearly perceived. Organizational climate is defined as a set of characteristics that describes an organization, distinguishes it from other organizations, is relatively enduring over time and can influence the behavior of people in it. A sound OC encourages the employees and develops cooperative attitude towards their works. This is the most essential for an organization in achieving their goal which ultimately benefits to

the employees. Organizational climate serves as a measure of individual perceptions or feelings about an organization. I have studied with 120 scientist of Navsari Agricultural University based on primary data and it was clearly indicates that majority of the respondents were in high level of perception towards Organizational climate, followed by medium and low level of perception towards Organizational climate respectively.

**Key words:** Organizational Climate, Perception, Job satisfaction, Attitude

## **An Exploratory Study on Agricultural Marketing Information Needs and Usage among Farmers of Madhya Pradesh**

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Agricultural marketing information system remains a relatively lesser explored area, especially in the case of developing countries like India, where the existing system has immense potential towards stimulating higher productivity, providing a robust information source for farmers thereby enabling right decision making on significant aspects of marketing and post-harvest management of their produce and ultimately fetching them better prices. Unquestionably, marketing decisions backed by reliable information and due diligence can have a significant impact on enhancing farmers' income and overall socio-economic status. Given that the state has been in the limelight for both good and bad reasons for the past few years, this study explores the existing agricultural information systems and the information needs of the farmers of Madhya Pradesh. On one hand when the astounding growth rate of its agriculture was hitting the national headlines, the protests and agitations by farmers were the subject of national debate. The study investigates the access and pattern of usage of information networks amongst the farming community and objectively evaluates the role and impact of the sources of information on their overall production and marketing practices. This study was undertaken to analyse marketing information usage among farmers in the Ujjain district of Madhya Pradesh. 120 randomly selected farming households, using a structured questionnaire were interviewed and data was collected on selected variables. Responses on various levels of awareness, type of information in demand, sources of information, access and usage of ICT tools in gathering market related information and associated constraints were studied. The findings have significant potential policy implications as it will help in reducing the existing information asymmetry and bring in more robustness, resilience, efficiency and inclusive growth in the agriculture sector.

**Key Words:** Agricultural Marketing Information, Marketing, ICT, Inclusive Growth

## **Farmer Producer Organizations: A Route to Strengthen Indian Rural Livelihood**

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India is an agrarian economy with 70% rural households still dependent on agriculture directly or indirectly for their livelihood. But the Indian agriculture sector at present is facing many challenges. So, to overcome the existing challenges of Indian agriculture sector, the need was felt to have an independent farmers' organization which enables incorporation of primary farm producers into such an institution which would be controlled by farmers themselves. That creates the great milieu for the genesis of Farmers' Producer Organization (FPO) in India. The Farmer Producer Organization is one type of producer, organization (legal entity formed by primary producers viz. farmers, fishermen, weavers etc.) where the members are farmers. In India, FPOs can be registered under Cooperative Society Act or Indian Companies Act or Indian Trust Act. The Farmer Producer Organizations are fundamentally farmer-owned and farmer-governed micro-enterprises which can be considered as hybrid formation between cooperative societies and private companies. Therefore, the present paper throws light on the structure, functioning, present status and its future prospects to strengthen the small and marginal farmer's livelihood in India. The paper also discusses the problems faced in implementation and functioning of Farmer Producer Organizations and discusses some examples of successful Famer Producer Organizations. So, Farmer Producer Organizations could be an effective model for mitigating the risk of Indian agriculture sector.

**Keywords:** FPOs, functioning, challenges, rural livelihood

## **Internet of Things Application to State Agricultural Universities in India – A Review**

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The Internet of Things (IoT) is a novel paradigm shift in information technology (IT) sector. The sensor data visualization for agriculture has a great opportunity for mobile technology. Cloud computing offers several applications in the field of agriculture with limited infrastructure and costs. This review paper discusses IoT application in agriculture in developing countries and suggests a conceptual framework for IoT applications in State Agricultural Universities of India. By 2020, the world will be having around five billion mobile subscribers and most of these will reside in China and India and 50 billion IoT users in the world by 2050. Hence, there is a wide ranging scope for IoT applications in Indian agriculture. Any initiative that could move a part of the agriculture into the IoT platform/cloud at a cost-effective price would help the Indian agriculture sector.

**Key words:** Internet of Things (IoT), Smart Agriculture, Sustainable Development Goals (SDGs), Sensors, Cloud Computing, Smart Library

## **Perceived Effectiveness of Agricultural Certificate courses through Distance Learning medium**

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2. Dr. A. Pratap Kumar Reddy , Dean of Agriculture , ANGRAU , A.P.
3. Dr. A. Lalitha, Scientist (Extension), AI&CC, ANGRAU, A.P.

The center for Open and Distance learning established in Acharya N.G.Ranga Agricultural University in the year 2018 is emerging as a cost effective and learner oriented medium for imparting Knowledge, skills and attitude to large number of aspirants throughout the globe. Recently, many institutions and Universities have adopted this medium of education and along with extensive use of technical media (ICTs)for developing high quality instructional material, institutions are making it possible to extend education to large number of people across the globe. The study aimed to learn the potential of Certificate Courses through distance mode in extending Agricultural education in needful areas. 200 participants of certificate courses - Organic Farming and Terrace Gardening in telugu offered by ANGRAU in 2018 , each of 3 months duration were randomly selected and the effectiveness of the courses was measured based on 8 parameters such as Course content , Contact sessions , Resource person expertise , Duration of course , Communication pattern, Exposure visits / Practicals, New learnings gained and Course objectives achieved. Profile of the respondents who have undergone the certificate course programme was studied. The data was collected from respondents using structured Interview schedules and check lists. Effectiveness index was computed by summing the scores on all parameters of the course in distance mode. The results revealed that 67.50 percent of officers scored the courses to be highly effective followed by 23.50 percent of them as Effective and a meagre 9.00 percent expressed the courses to be less effective. A simple correlation analysis of the respondents' profile with their perceived effectiveness revealed that Education, Innovativeness and higher aspirations showed high positive significant relationship with the effectiveness.

**Key words:** Distance learning, contact sessions, certificate courses.

## **Dairy Farmers' Organization in view of its' Supply Chain Management and Sustainability**

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**India's mission** of agricultural self-sufficiency with due support from its' allied sector has been established as the largest source of livelihoods .In spite of India being self sufficient in food production, plight of small and marginal farmers is not good. Keeping this in view , mobilization of these farmers through Farmers' Organization is needed in order to pursue the economic and socio-cultural needs of its' members and surrounding entity. Sharing of agriculture & allied sector and livestock sector in terms of percent GVA to total GVA is 17.2 % and 4.9% respectively.

Hence, presence of Farmers' or Producers' Organization in a populous country like India is quite significant. Considering existing challenges and opportunities of dairy farmers, this review article has outlined overarching viewpoints and explored how the Dairy Farmers' Organization needs to adapt. Responsibility of Farmers' Organization starts from knowledge inputs, financial credit, technical training i.e. to facilitate start up and ends at arrival of final product in the hands of consumers. In practice, adequate infrastructure like milk collection units, chilling centers, refrigerated transporting vans etc. are of paramount importance. Meeting increasing consumer demands through innovation, development of value added products, quality assurance and market research are pertinent aspects to improve both quality and availability. Productivity and by products' utilization are a few major challenging areas to enhance overall business margin to help farming occupation economically sustainable. Besides, it's also essential to respond to business regulation, environmental norms, engagement with policy processes and improved co-ordination within business sector from management perspective. Under globalization era, Farmers' Organization needs to explore export opportunities in line with WTO regulation, free trade opportunities and protectionism to minimize risk of business in long run. Managing Farmers' Organization through Triple Bottom Approach shall further place the business in the framework of sustainability.

**Key words:** Dairy Farmers' Organization, Supply Chain Management, Marketing Mix

## **Socio Economic Characteristics of Consumers and Retailers of Value- Added Products of Avocado and Documentation of Different Products**

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Avocado (*Persia americana*) fruit is a native of tropical America. In India Avocado was bought during first decade of nineteenth century. Avocados are grown scattered in southern tropical states like Tamil Nadu, Kerala, Karnataka, and Maharashtra. Also popular in the northeaster Himalayan state of Sikkim. Avocado is useful and beneficial in many different ways to the Indians because of its high nutritional density, good source of protein, fiber, antioxidant properties, stroke prevention, and is used as a baby food. The study reveals the socio-economic characters of consumers, in that majority of (51.67%) consumers belong to the middle age group of 35-50 years, while 41.66 per cent of them had education up to graduation, more than half i.e., 55 per cent of the consumers were male while 45 per cent of the consumers were female, private employees are the major population(46.67 %) who prefer avocado, more than half (53.33 %) of the consumers belonged to medium income category, 53.33 per cent of consumers monthly expenditure on avocado products is up to Rs. 500 for the purchase. With regard to socio-economic character of the retailers the study indicates that 62.50 per cent of the respondents belongs to the age group up to 40 years, with respect to the education level it was found that 75 per cent of them

studied graduation, marketing experience of 37.50 per cent of the retailers had up to 10 years of experience.

Consumers were aware of multiple brands and types of value-added products of Avocado. In present day market different types of value-added products are available. Among all the value-added products of avocado Evam body lotion product reveals significantly higher quantity and price (240 g and Rs. 491 respectively) followed by cake (250g and Rs. 299 respectively) and the least quantity and price was found in milkshake product of avocado (150 g and Rs. 40 respectively).

**Key words:** Avocado, Consumers, Retailers, Brands, Socio-economic characters.

### **Women SHGs in Chhattisgarh: A Case of Business Performance**

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The formation of Self-Help Groups has enabled the rural women to become economically independent, come out of the vicious cycle of poverty and live with dignity and confidence. The Self Help Groups are said to have a great potential in accelerating the pace of rural development. That said it becomes necessary to assess their perform to further help develop a profitable path. The study includes interview schedule and designed questionnaire. In Chhattisgarh Plain five SHGs were selected purposively for the present study. From each SHGs ten respondents were selected so in total fifty respondents were selected from SHGs for present study. Literacy rate of selected member was 88 per cent and the majority of the respondents in the study area belonged to the age between 18 to 30 years. In selected SHGs, the various types of forest products were found to be Candy, Murabba, Jam, Pickle, Powder, Chips, Plate, Dona, Juice and Sharbat, The majority of produce of forest product were powder (63 percent) and rest of the products like candy, juice, murabba, pickle, plates & dona were 15, 9, 4, 3, and 3 percent respectively. It was found that Jai Shree Om Women SHG was the best performer over all of the other SHGs because it produced maximum number of products (37), the average Input-Output ratio was 1:1.32 and average VC ratio was 76.70 percent.

**Keywords:** Self Help Groups (SHGs), Women, Demographic, Age, literacy, Performance, Marketing, Marketing Strategy.

## **ICTs Supported Extension Services in Agricultural Technologies Information Access for Farmers in Barnala District of Punjab, India**

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A total of one hundred farmers were interviewed, with a purposively selected sample of 60 farmers, interviewed using pre-formulated questionnaire from all three blocks of Barnala district. The purpose of the study was to analyse the use of different ICTs in agricultural knowledge pathways, the dissemination pathways, line departments and socio economic factors. Data was analysed manually and using R software (version 3.6.1). Our finding indicate that various knowledge pathways exists through which farmers can access farming knowledge. Four major ICT types *viz.*, mobile apps, television, internet browsing and facebook were identified, however, the study noted a lack of harmonization and weak linkages between line departments in the utilization of the existing ICT tools, utilization of the ICTs ownership and access at the household level and harmonization of the farming information messages. Furthermore, even though there was 95% mobile phones, 96.67% television, 65% internet, 33.33% computer (desktop) or laptop ownership and access among the respondent farmers and a large number of the extension staff lacked the skills to fully exploit the use of ICTs to access agricultural knowledge from various sources. ICTs have huge potentials to improve quality of e-extension advisory services if taken advantage of by the 'extension agents' in the diffusion process of new innovations. ICTs can play a crucial role in strengthening the capacity of not only farmers but also for the field level extension functionaries and intermediaries, wherein one can hold a discussion, get immediate feedback and use the written media to convey messages. An ICT intervention that can improve the livelihood of farmers will likely have significant direct and indirect impacts on enhancing agricultural production, post-harvest activities and marketing. The higher percentage of ownership and accessibility of ICTs among the survey farmers also offers the potential to fully exploit ICTs in the improvement of the agricultural knowledge pathways and information provision.



## **Theme 3: Market Led Extension Management – Policy Reforms**

**Chairman** : Dr. Yogendra Kumar Karki, Secretary, Agriculture, Govt. of  
Nepal, Kathmandu, Nepal

**Co-Chair** : Dr. Lalith Achyut, Professor (Retd.), UAS, Bengalure,  
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**Rapporteur** : Dr. Mahesh Kadam, CCS NIAM



## **Collective Farming for Market Empowerment of Small and Marginal Farmers**

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In India, fragmented farm holdings become a substantial challenge in improving the productivity of farm commodities as well as farmers' income. In the country, decreased farm holdings significantly increased over the decades. In the name of the production, farmers are wasting a considerable amount of their resources unknowingly. These holdings become a bigger problem in the application of cost-intensive technologies which can improve farm productivity to a significant extent. The small amount of farm produce prevents farmers from controlling market prices. Directly and indirectly, the impact is widening the gap between the haves and have-nots. The collective farming under agriculture cooperatives is the best answer to solve the problem of fragmented farm holdings. The pooled land and resources enable farmers not only for mass production but also for mass marketing of their produce. In other words, collective farming provides the market empowerment to the small and marginal farmers. It also can provide a better livelihood for farmers. This collective farming could effectively narrow down the gap of financial, technological disparities that exist in the society and also build harmony among the farming communities.

**Key words:** India, Fragmented farm holding, Collective farming, Agriculture co-operatives.

## **The Doubling Farmers Income through Agriculture Market Intelligence**

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Agriculture is the largest private sector enterprise in India. It contributes more than 17.2 per cent to the national GDP, sustain livelihood of about two-thirds of the population, accounts for 54.6 per cent of the national work force and forms the back bone of the agro-based industries. Trustworthy and well-timed market information and intelligence in terms of price to the farmers will definitely increase their income and standard of living. Market Intelligence is an essential function for the formulation of a sound price and trade policy. New market trends, consumer preferences, new suppliers or new markets can alter the nature and pattern of transaction. A farmer while giving his entire time for planning of production related activities cannot keep track of the changing market or price signals. Though farm related information is provided through the radio, TV and newspapers, there is no mechanism to analyze, interpret and convert this huge volume of information passing through the information highway into simple and comprehensible for trade intelligence. Market intelligence is required by the government organization, traders and their organization, farmers, consumers and researchers as well. Farmers need market intelligence for

proper adjustments in cropping pattern and to decide when, where and how much to sell. Farmers need advise on the price that could be realised during harvest well in advance of sowing the crop and before harvesting the crop. As per review With the price forecasting made by the Market Intelligence project, some farmers realized an incremental income to the extent of rupees twenty four thousand per hectare from coriander price intelligence in Kota district of Rajasthan and In case of Chickpea grower the incremental benefit of Rs.17001.6 per ha in Bikaner district of Rajasthan .

**Key word:** Market Intelligence, farmers' income, Price forecast, Agriculture

## **Value chain Development in Perishable Commodities in India: A Review**

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Marketing of perishable commodities is laden with various issues and challenges. To find the various challenges and suggest a way forward there is need to develop value chain for perishables like fruits and vegetables. So the purpose of the present study is to understand value chain concept, various structural challenges and development of model value chain for fruits and vegetables. The present study undertook a thorough review of basic and contemporary literature available. Value chain is sequence of value adding activities which will reduce the pre and post harvest losses, generate employment and improve the quality of produce marketed. India is second largest producer of perishable commodities viz. fruits and vegetables. In India only 4 percent of the fruits are processed compared to China (23 percent) followed by Indonesia (50 percent) and Brazil (70 percent) (Shivakumar, 2016). Apart from these, another issue is post harvest losses among these high value commodities (25-30 percent of total production) (Joshi *et al.*, 2007). The value chain concept in marketing of perishables is still having challenges like access to finance, market access, capacity building and non tariff barriers. By reviewing various research articles, it was concluded that the government must take some initiative in collaboration with the firms involved in processing activities to promote the value addition activities and value chain management for improvement of the quality of produce.

**Keywords:** Perishables, Fruits and vegetables, Post harvest losses, Value chain, Government.

## **Comparative Analysis of Price Support Scheme Under Different Agencies in Karnataka- A Case of Pulses**

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Assurance of a remunerative and stable price environment for growers/farmers is very important for increasing agricultural production and productivity. The market price for agricultural produce many times tends to be unstable and volatile which may result into undue losses to the growers and discourage adoption of the modern technology and required inputs. Due to delay in

procurement, most of the benefit goes to traders under the guise of farmers. Keeping this in view, a study was undertaken to evaluate the performance of the process of procurement of pulses under different procurement agencies through PSS (Price Support Scheme) in Karnataka. The present study was conducted in two districts of Karnataka *i.e.*, Kalaburagi and Raichur districts. To fulfil the objective of study, primary data were collected from the sample farmers and different procurement agencies through personal interview method using pretested schedules. The data collected pertained to the year 2017-18. Multistage stratified random sampling procedure was adopted for required sample selection. At the first stage redgram and greengram were selected for the study as these crops were under MSP was also considered under Kharif procurement of 2018-19. After selecting the crops, two districts were chosen based on the highest area under these crops in the study area. Different procurement agencies/centres were selected for the study. In order to have a comparative picture 10 PACS and 5 FPO's were selected for both the crops. Total 60 beneficiary farmers (who sold their produce to PACS and FPOs), of which 20 farmers from FPOs of redgram, 40 farmers from PACS which includes 20 redgram and 20 green gram growers. The estimated benefits of PSS indicated that the procurement price of both redgram and greengram for the year 2018-19 was more (Rs.6000 per qtl for redgram and Rs.6975 per qtl for green gram) than MSP (Rs.5675 /qtl for redgram and Rs. 6975 per qtl of greengram) and open market price(Rs.4262 /qtl for redgram and Rs.4564/qtl for green gram). It could be seen from that the farmers who sold their produce PSS procurement centres realized higher benefits than selling it in open market and minimum support price. Thus the operation of procurement centres during the period of fall in the market price below MSP level was justified. It was observed that PSS procurement have price advantage of 1738 (40.77 %) in redgram and 2411 (52.82 %) in greengram compared to open market price, an average permissible quantity procured by different agencies in redgram 15.25 quintal per farmer and 4 quintal per farmer in greengram. The study has concluded that procurement through FPOs is more efficient and PACS due to availability and accessibility of infrastructures, manpower, efficient management due to limited members and professional management. It was clear from the above finding that farmers have positive perception about the PSS procurement scheme.

## **Hortipreneurship- Challenges and Opportunities- The Way Forward to Doubling Farmers' Income**

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The study intends to find out the opportunities as well as the challenges in the hortipreneurship to seek to achieve doubling farmers' income by 2022. Entrepreneurship is significantly important for economic development of a region or the country as a whole. It brings out accelerated growth, better remuneration for the producers, enhances market efficiency as well as leads to increased quality of life. In India, the horticultural growth has shown tremendous promise post 1991 reforms, particularly. Annual Horticultural crop produce has consistently surpassed food crops since 2012-13. India has varied agro-climatic conditions making it very favorable for growing any kind of horticultural crop. Besides, India is one of the leading producers

of fruits and vegetables in the country. On the Economic Front, Horticulture contributes nearly 30% of the agricultural GDP. With still half of the workforce depending on agriculture in India and consistent stagnancy in the productivity as well as unsustainable farming practices exhibited in the food crops, horticulture provides a significant opportunity to the development of entrepreneurial avenue of the sector. However, challenges in Horticulture persist out of which, on the supply side poor market information amongst the farmers, high input cost and low quality of inputs are common. In addition, poor connectivity, low logistic efficiency throughout the country, poor infrastructure, inadequate cold-storage, poor market linkage creating high price-wedges often leading to high perishability and wastage of the horticultural produce. The Government having recognized has already started schemes like Pradhan Mantri Kisan SAMPADA Yojana, MIDH and NHM to boost the sector. Through Horticulture, the agricultural-industrial linkage looks imminent, which would reduce the over-dependence or the disguised unemployment plaguing the sector. Rural Industries in Horticulture, therefore appears to be the best alternative to find employment avenues for the rural population. Thus, Hortipreneurship is the way forward to ensure that the farmers' income is doubled via market led development.

**Keywords:** Hortipreneurship, Marketing efficiency, logistic efficiency, productivity, horticulture, rural market, marketing infrastructure.

## **Progress, Perception and Utilisation by Beneficiaries of PMKISAN Scheme of Karnataka**

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The Prime Minister Kisan Samman Nidhi (PMKISAN) scheme was launched in India on 1<sup>st</sup> December 2018 as a means to overcome the distress farm economy is faced with. It intends to provide Rs 6000/- per annum in three installments to the farm families comprising of husband, wife and minor children. The programme despite being novel is faced with a number of implementation issues resulting in only 63.2 per cent of the potential beneficiaries having been able to enroll in the programme. Regional variation in participation of beneficiaries in the PMKISAN scheme is observed across different districts of Karnataka. Belagavi (82.3%), Haveri (78.5%), Uttarkannada (77.5%), Bagalkot (73.8%), Dharwad (75.0%), Udupi (74.4%) and Gadag (70.8%) districts accounts for the proportion of beneficiaries to potential beneficiaries to be more than 70 per cent. Bengaluru urban (27.7%) and Kolar (33.2 %) districts record the lowest proportion of beneficiaries to potential beneficiaries. On an average beneficiary in the Karnataka state accounts for about 57.5 per cent of the projected operational holdings, 2018-19, revealing poor performance of the state in participation in PM-KISAN scheme. The PMKISAN scheme leads to transfer of income towards poor section of the society. The PM-KISAN amount forms the largest percentage share to the annual income for marginal households (7.2%) followed by 6.2 percent for small farmers, 3.6 per cent for semi-medium, 2.1 per cent for medium households and only 0.7 percent of the annual income of large farmers. The cash transfer on an average increases the income of the households by 5.1 percent. The analysis of data of 120 farmers from Tumkur district of Karnataka revealed that 64.6 per cent of beneficiaries spent it on agriculture, 35.4 percent on

other than agricultural purposes. The expenditure on agriculture was mainly for purchase of inputs (46.3%) followed by payment of wages (40.9 %), feed and fodder for cattle (11.8%) and other expenditure (1.1%). The non-agriculture expenditure was on consumption (43.1%) followed by education (33.3%), health expenses (19.6 %) and other expenditure (3.9%). Getting all required documents like Record of Rights of land or pahani, identity proof (Aadhar card) and bank passbook, etc., and limited time period for registration were the major problem faced by the beneficiary farmers. Large proportion of farmers (42.6%) expressed that lack of land ownership land titles in their names as the main reason for farmers not registering under the scheme. Other problems like limited period for registration (25.4%), lack of awareness (15.6%), lack of clarity about the eligibility (10.2%) were also the reasons for not registering in the scheme by farmers. It is suggested that the districts with poor performance should motivate and facilitate the farmers to participate in the scheme. The digitization of land records should be hazened up. The infrastructural facility need to be improved and created nearer to the villages so that it is easy for the farmers to register and reap the benefit of the scheme.

## **Reformation of Indian Agricultural Markets through e-NAM**

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Agricultural sector is critical for growth and development of the country as 58% of the population is directly or indirectly dependent on it for their livelihood. This sector faces vulnerabilities in entire supply chain from sowing to marketing. Also, the increased trend in production of agriculture produce has brought in its wake new issues to handle in terms of huge marketable surplus. In this regard there is an urgent need for a strong and efficient marketing system in India to overcome these issues. Realizing the need to address the issues of existing agricultural marketing system the Indian government has launched National Agriculture Market portal (e-NAM) on April 14, 2016, in order to connect e-mandies in several States. E-NAM is an online inter-connectivity of e-mandies, which is aimed at organizing the agriculture marketing reforms to enable the Indian farmers to fetch better prices of their agricultural produce. According to reports (DAC & FW, 2019) 585 regulated wholesale mandies have been integrated with e-NAM across 16 states and 2 union territory in India. In this regard the paper discusses the issues faced by farmers in agricultural marketing at present and the role of e-NAM as an important instrument in mitigating farmers risk regarding marketing of agri-produce. The paper also discusses the present status of e-NAM and its benefits to different stakeholders of agriculture sector in India.

**Key Words:** Agriculture, Agricultural marketing, e-NAM, e-mandies, issues.

## **Livelihood diversification: Sustainable approach for climate change**

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Climatic condition in Kolar district of Karnataka is not stable. This change has created negative impacts on agricultural production and likely to continue, unless adaptation measures are taken up. The changing climate is a global challenge to sustainable livelihoods and economic development. The farmers mainly depend on rain-fed agriculture, a situation that makes agriculture and rural livelihoods vulnerable to climate change. Diversification of activities has been perceived as adaptive strategies for sustainable livelihood in a changing climate. With this background, the present investigation was carried out in Kolar district of Karnataka state in order to know the nature and extent of livelihood diversification among farmers with a total sample of 150 farmers who have adopted two and more livelihood diversified activities. Out of 150 farmers, 28 per cent adopted four activities for their livelihood followed by five (24%), three (21.33%), six and more (18.67%) and two (8.0%) activities. The livelihood activities practiced by them are agriculture (98.66%), animal husbandry (82.66%), horticulture (64.00%), agriculture labour (52.00%), formally employed (48.00%), poultry (33.33%), sericulture (27.33%), service (26.66%), wage labour (22.66%), transportation (22.66%), trade (20.66%), sand mining and quarrying (17.33%), manufacturing (16.66%), driver (6.66%), construction (6.00%), handicraft & artisan (4.00%), commission agent (broker) (1.33%), marketing of vegetable and fruits (0.66%) and migration (30.00%). The data depicted that about 46.7 per cent of the farmers are moderately diversified followed by highly diversified (30.6%) and less diversified (22.7%) farmers. There is a significant variation in the attitude of marginal, small and big farmers towards livelihood diversification with mean scores of 47.38, 58.41 and 52.49 respectively. All the farmers faced the constraint of climatic change followed by lack of adequate natural resources for livelihood diversification (96.00%), risk and uncertainty (66.00%), less production and productivity (49.33%) and seasonal pest and disease incidence (32.00%).

## **Farmer to Farmer Extension Model: Experiences and Future Perspective**

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ICAR-Agricultural Technology Application Research Institute, Zone-II, Jodhpur, India has developed and tested an innovative model for promoting farmer to farmer extension. Krishi Vigyan Kendra (KVK) is the major district level knowledge centre in mentoring the LEAD (Learning and Experience based Advisor) farmers and imparted trainings to improve LEAD farmers' knowledge and skills as a major role. Investigation reveals that one LEAD farmer adopted 5 agricultural technologies from KVKs and trained 232 fellow farmers, expanded 14 ha area under crops through intervention of KVKs. One LEAD farmer reduced cultivation costs by Rs.14975/ha/year while enhanced income of Rs.39000/ha/year through KVK intervention. Further, fellow farmers adopted 2 proven technologies from LEAD farmers and reduced cost by Rs.5800/ha/year while enhanced income by Rs.21000/ha/year. The major determinants of effectiveness of F2F extension were enhanced technology adoption followed by enhanced production and improved productivity. This

model can play a significant role in complementing Indian public extension system through reducing cost and coverage of more farm families. Moreover, for sustainability and scalability, it needs community as well as government support. However, sustainability implications of this model are; identification of LEAD farmers, technological backup, involvement of local institutions, motivational & compensation issues, and participation of women LEAD farmers.



## **Theme 4: Emerging Agricultural Marketing Strategies**

**Chairman** : Dr. Sudhir Kumar Goel, IAS (Retd.), Agriculture Policy Expert

**Co-Chair** : Dr. T.N. Prakash, Former Chairman, Agriculture Price  
Commission, Govt. of Karnataka Karnataka

**Rapporteur** : Dr. Satish C. Pant, CCS NIAM



## **Present Scenario of Agricultural Marketing in the State of Nagaland, India- Prospect and Challenges**

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Agricultural sector plays a pivotal role in the socio economic progress of a nation. In Nagaland, about 68 per cent of the population is directly or indirectly dependent on agricultural and allied activities. Nagaland is topographically a hilly terrain state with fertile land and varied agro climatic condition suitable for cultivation of many crops. Over the years, there has been an appreciable increase in production and productivity of major food grains, pulses, oilseeds, spices, fruits and vegetables and other commercial and plantation crops in the state. The state has huge potential in production and export of many high value organic agricultural and horticultural produce within and outside the country. Agricultural marketing plays a crucial role in ensuring robust growth in agriculture sector combating poverty and socio economic injustice of the farmer. Agricultural produce are perishable and seasonal in nature and requires appropriate intervention and policy support in the process of marketing. Nevertheless, in Nagaland farmers are often faced with multiple marketing challenges mainly to the geographical isolation of the region from the mainland of the country, remoteness of the scattered villages in the state, small and scattered production, inadequate marketing infrastructure, presence of middleman, inaccessibility of the villages etc. Thus, agricultural activities are mainly practiced subsistence scale at household level. Agricultural marketing mechanisms operating at various levels are faced with many deficiencies at institutional, structural and functional level. The present paper examines the prospect and challenges of agricultural marketing in Nagaland and also to suggest suitable measures for the development of agricultural marketing in Nagaland.

**Keywords:** Agricultural Marketing, Challenges, Nagaland, Middleman, Subsistence.

## **An Analysis of Value Chain of Selected Horticultural Commodities in Karnataka**

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Karnataka State is one of the major producers of a variety of horticulture crops in India. Karnataka's horticulture production area accounts for about 16% of the total cultivable area in the state. It includes plantation crops (45%), vegetables (23%), fruits (20%), spices (10%) and other commercial crops like flowers, medicinal and aromatic plants (2%). During the year 2017-18, the state produced 97.35 million tons of Fruits up 4.8% more than that in 2016-17, Vegetables in 2017-18 the state produced 187.5 million tons of, about 3.5% more than the previous year. Hardly about 1% of the total production of fruits and vegetables In Karnataka is currently being processed for

value addition. About 25–30% of postharvest loss is estimated due to inadequate cold storage, dearth of rural transport, poor handling of produce, in appropriate processing and other value addition facilities.

The value chain analysis for Horticultural Commodities offers an opportunity to expand financing for horticultural production, improve efficiency and repayments of loans, and strengthen or consolidate linkages among participants in value chains. Each chain of activities gives the product more added value than the sum of added values of all activities put together. This paper attempts to analyse the value chain system of selected horticultural commodities in Karnataka. The study is limited to Karnataka State and 2 commodities, namely, Mango (under fruits category), and Tomato (under vegetables category). The present study attempts to fill the gap of value chain analysis for horticultural commodities in Karnataka. The study also attempts to assess the percentage of value added in each stage of value chain, so that's it helps identify stages crucial in the value addition process.

**Key Words:** Value addition, value chain analysis.

## **Marketing Strategies for Doubling Farmers's Income**

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Today, around 138 million Indian farmers' main concern is about declining farm income on the one hand and the increasing cost of inputs on the other. Around 48% of the population is currently dependent on agriculture and allied fields and the agriculture sector contributes around 17% to national gross domestic product (GDP). Moreover, the public sector capital investment in agriculture and rural development has declined from almost 20% during Green Revolution period to currently less than 10%. In the process, many States have remained deprived of growth and development. As a result, most farmers are not benefitted especially since majority of them are smallholders and find agriculture not profitable any more. Due to the never ending problems faced by the Indian farmers the Ministry of Agriculture and farmer Welfare formerly known as Ministry of Agriculture has taken some effective steps. Also Honorable Prime Minister Shri Narendra Modi has set a goal of doubling farmer's income by reducing agrarian distress and bring parity between income of farmers and those working in non agricultural professions. The ICT based agricultural extension has lots of opportunities to bridge the gap between the income of Farmers and non Agricultural sector. The paper focuses on discussing the development initiatives made by the government bodies, policy reforms and other technological advances to double the farmers income.

**Keywords:** Farmer's income, Marketing strategies, policies, technological advances

## **Growth and Instability analysis of Grapes Production in Karnataka**

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Grape is one of the major fruits in Karnataka. Despite the fact that Mango and Banana are the important conventional fruit crops produced in Karnataka, in recent years the grapes production has been increased significantly because of the government's horticultural crops production policies and more importantly the Wine Policy of 2007. In this backdrop, the study has examined the growth performance of grapes in the state of Karnataka for a period of fifteen years from 2004-05 to 2018-19. The study has revealed that the annual growth performance of grapes in area under crop (7.45 %), production (8.31 %) and productivity (0.83 %). The state performance is little better than the all India level performance. The instability indices for area (4.26), production (11.91) and productivity (7.94) are relatively lower than the all India level. On the whole, the study reveals that there is a further scope for the enhancement in production of grapes in the State by adopting appropriate production technology.

**Keywords:** Area, Production, Productivity, Compound Growth Rate, Instability Analysis, Performance.

## **Marketing Analysis of Sugarcane in Kano Metropolis, Kano State, Nigeria**

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Science and Technology, Wudil, Kano, Nigeria.

The study focused on the marketing analysis Sugarcane in Kano Metropolis of Kano State, Nigeria. Purposive and random sampling methods were used to select sixty five respondents who market sugarcane in the study area. The data were collected using well structured questionnaire and analyzed using descriptive statistics, marketing margin and marketing efficiency. The results showed that all the sugarcane marketers were males with one form of education or the other, 64.6% of the sugar cane marketers were adult belonging to the age group of 25 – 48 years, 48.1% of them had household size of 1-5 members, 32.3% of them had 1-9 years of marketing experience, 83.1% married. The results revealed that sugar cane marketing was profitable in the study area, with gross marketing margin and net marketing margin of ₦500 and ₦330 per bunch. The result further revealed gross ratio of 0.84 while return per capital invested was found to be 1.20. Marketing efficiency (20%) of sugar cane indicating that marketing of this commodity was profitable and efficient in the study area. The major constraints faced by marketers were inadequate marketing infrastructure, inadequate credit facilities, inadequate storage facilities and fluctuating in demand and supply. The study recommended that since sugar cane marketing was a profitable enterprise

more youth should be encouraged to venture into the enterprise this will go a long way in reducing unemployment in the study area.

**Key words:** marketing margin, marketing efficiency, gross ratio, operation ratio, return investment, Sugarcane

## **Contract Farming and Its Consequence on the Farmers of Karnataka**

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Risk and uncertainty are very prominent factors of agriculture and more so in Indian agriculture. These risks and uncertainties can be due to the weather conditions, market conditions, production risks etc. The people most affected by it are the farmers. One of the most efficient and modern method of mitigating these risks is through contract farming. The paper includes review of 30 cases of contract farming of horticultural crops. It includes contract farming in hybrid seed production, gherkin, medicinal plants and spices, green chilli, fruits and flowers and baby corn. The paper analyses impact and consequence of contract farming on farmers in Karnataka and on the contracting firm as well.

Keywords: Contract farming, Horticultural crops, Karnataka, Constraints, Comparative review

## **Consumer Preference Towards Fresh Cut Fruits and Vegetables in Modern Retail Formats of Bengaluru City**

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Fresh cut fruits and vegetables are relatively new and rapid developing segment of the fresh produce industry. The present study was conducted to know the consumer preference towards fresh cut fruits and vegetables in modern retail formats of Bengaluru City. The data was collected through pre-tested schedule from 90 consumers and analysed using Measures of central tendency and factor analysis. The study revealed that among all the fresh cut fruits and vegetables the most preferred were pomegranate and baby corn by the consumers. The important factors that influencing the consumers to consume fresh cut fruits and vegetables are convenience, appearance, packaging, quality, price and supply. The results indicated that among the fresh cut fruits 54.44 per cent of consumers consume once in a fortnight and among the fresh cut vegetables 61.11 per cent of consumers consume once in a week. Visiting retail formats (57.78 %) was the major source of information to consumers for purchase of fresh cut fruits and vegetables. The constraints during

marketing by retailers included lack of cold shelf, influence of raw fruits and vegetables price on Fresh cut fruits and vegetables, consumer were not clear about quality issues of the Fresh cut fruits and vegetables and mismatch between demand and supply of fruits and vegetables. It can be suggested that the fresh cut fruits and vegetables are gaining popularity in the cities due to health conscious, instant use and reduction in wastage. The retailers should provide the reliable information on nutritional value of these kinds of products in order to promote consumption by all kinds of consumers.

## **Performance of Unified Market Platform (Ump) For Major Agriculture Commodities: A Case Study of Raichur Market**

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Agriculture is dependent on monsoons and markets, inefficient market lead to ineffective price discovery mechanism making farming profession unattractive. Market integration over time and space to create efficient marketing system to farmers, this study analysed the performance of one such marketing initiative namely Unified Market Platform (UMP) by comparing pre and post UMP periods in APMC, Raichur. Overall, the performance of Raichur market under UMP in terms of total arrivals of paddy was increased by 48.27 percent, redgram was increased by 13.73 percent and groundnut was increased by 26.28 percent in APMC, Raichur. Average price of paddy was increased by 46.07 percent, redgram was increased by 32.39 percent and groundnut was increased by 25.50 percent in APMC, Raichur. In pricing mechanism under UMP in case of paddy shows if 1 bid increases for lot there was 13.8 per cent, in redgram 8.3 per cent and groundnut 11.48 percent increase in price. Market performance index value has improved to 0.26 from 0.33. The percent difference has improved to 31.4 from 32.3 per cent in paddy. The average index value has improved to 0.26 from 0.36; the percent difference has improved to 41.3 from 65.7 per cent in redgram. The average index value has improved to 0.19 from 0.28; the percent difference has improved to 39.2 from 58.2 per cent in groundnut. Marketing efficiency in paddy increased to 1.64 from 1.08, in redgram 2.5 from 1.97 and in groundnut 1.56 from 1.19. Thus to make UMP more effective it is suggested to concentrate on number of bids per lot, lot size and number of lots and quality parameters at trader level. Hence market performance has improved so scope for expansion of e-trading in other markets in Karnataka as well as India.

## **Post Harvesting Practices Adopted and Perception of Farmers towards Grapes Export in Nashik District of Maharashtra State**

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The major findings of the study were that farmers are using bubble sheet and foam Sheet in plastic crate to avoid post harvest handling loss during transportation from field to pack house. A layer of double pad or protective liner is placed at the bottom of the carton to protect the grapes from bruising and a polyethylene lining is placed over it for packaging, in the pack houses, the grapes are harvested and sorted according to physical attributes such as berry size and colour. The study also found that good quality produce is exported to the Netherland, Russia and UK market while poorer quality may be sold by farmers in the domestic market or may be exported to other countries. The precautions are taken during harvesting and post harvest handling leads for better market and shelf life. The study reveals that farmers had positive attitudes towards post-harvest management practices. Also, it was found that the farmer perceive export process is tedious and grapes export requires high quality standards which can be maintained with technical support. Also the findings revealed that Trade and tariff barriers in export process followed by High Quality standards, Export is risk, Requires government support, Grapes export requires advanced technology, Registration process of grapes export is tedious Grapes export is profitable task and High cost of investment etc.

**Short running title:** Post Harvesting Practices Adopted and Perception of Farmers towards Grapes Export

**Keywords:** - Grapes, Post Harvest, Perception, Export

## **Analysis of the Marketing Behavior of Papaya Growers**

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The present study was conducted during 2018-19 in Nagaral, Hirenasabi and Cholachagudda villages of Bagalkote district. The prime objective of this research is to analyze the marketing behavior of papaya growers. In this study, source of information for marketing of papaya, mode of packing, mode of transport, grading behavior, time of sale, reasons for selling at particular time, agency chosen by the farmers to sell their produce and reasons for sale, place chosen by the farmers for marketing of papaya, middlemen involvement, price determination, market decision and mode of payment are considered to analyze the marketing behavior of the papaya growers calculated by using frequency and percentages. This study was conducted by

following *ex-post facto* research design and the total sample size is 45. Among these papaya growers, more than three fifth (62.22 %) of the respondents have approached others who visited market as a source of information, nearly three fourth (71.11 %) of the respondents have sold their produce after grading, 86.67 per cent of the respondents sold their produce after harvest at whatever the price available in the market, nearly cent (95.56 %) per cent of the respondents sold their produce to commission agents and farm gate served as the major venue for marketing of papaya by 97.77 per cent of respondents.

**Key words:** Advanced payment, open auction, grading, perishable nature, price determination

### **Preservation of soft bulb type jackfruit pulp for enhanced income generation and livelihood security**

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Soft bulb jack pulp treated by addition of 0.2 per cent potassium meta bisulphite followed by pasteurization at 91°C for 15 minutes showed maximum shelf life of 150 days. The preserved jack pulp was found to contain 5.57 mg/100g ascorbic acid, 0.29 mg/100g and 8.37 per cent total sugars.

### **Strategies and Components of Agricultural Marketing for Management of Market and Price Risk in India**

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Agricultural marketing play an important role in economy of the country. It stimulates growths of the production and consumption of the agricultural produce. However various risk involve with agricultural marketing in the country includes market and price risks. To minimize these risk helps in better economic development and better return for the producers or farmers in the country. This paper is review and conceptual based with the objectives to highlight the components and strategies to manage the market and price risk of for agricultural products. The secondary information was collected from various published sources annual reports, review papers and government official websites etc. Pricing risk and market risk associated with the

agricultural produce. New initiative and reform from government side in agricultural marketing taking place with the goal of better return for their produce. Market risk refers to the uncertainties associated with getting price less than expected price and possibilities of losing market opportunities. Market risk may also arise if a product fails to meet the standards as per the requirement of market. Some are the components of agricultural marketing like e-NAM, direct marketing and contract farming helpful to the farmers to get timely market and better price of their produce. Sound strategies and extension system may help farmers reduce variability in production and profitability through effective management of associated risk.

**Key Words:** Agricultural Marketing, Risk, Price, Management

### **Value chain analysis of Cumin Seed in Barmer district**

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2. Principal Scientist, CAZRI, Jodhpur and PI of the DST project “Enhancing food and water security in the Barmer district, Rajasthan, India, through improved understanding of Quantity, Quality and Management of Blue, Green and Grey water among stakeholders”
3. Junior Research Fellow, CCS National Institute of Agricultural Marketing, Rajasthan

Cumin (*Cuminum cyminum*) is an aromatic spice with pleasant fragrance. It is member of parsley family. It is grown in the arid region area around the world. The major cumin growing countries around the world are India(77%), Turkey(9%), Syria(5%),Egypt, Pakistan and others. It has distinct flavour and aroma, which make it a multipurpose commodity for domestic and industrial application. As per the FAO estimate, cumin has average annual production around 3,00,000 tones. India is the leading producer of the Cumin in the world and hold around 77% of total world production, whereas it has share around 60% in the total world export of cumin.

Rajasthan and Gujarat are major cumin producing state in India and contributes around 99% of India's total production (APEDA, and National Horticulture Board). Barmer is one of the one of the major cumin producing district in the Rajasthan. Around 85-90% of the farmers in this district are involved in the cumin cultivation. Although, this district is producing large amount of cumin, but due to lack of several factors as processing facilities, organized cumin market, lack of pledge finance, storage facility, lack of market related information and other is forcing farmers to get very little share in the price paid by consumer. As per the primary survey, it was found that, farmer's share in the consumer's rupee is around 30-35%. Aggregation of the cumin produce, formation of FPO/FPC, availability of processing units in the nearby area, availability of organized market to support better market linkage are some of the measures to improve the farmers share in the consumers' money.

**Keyword:** Cumin, Arid region, agriculture marketing, FPO (Farmer Producers Organisation)/FPC(Farmer Producer Company), Value Chain, Value Addition, Competitive advantage

## **Value Chain study of Medicinal Plant in Barmer District of Rajasthan**

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Barmer District is situated in western part of Rajasthan state. Barmer is the second largest district of Rajasthan. Medicinal plants offer alternative livelihood with tremendous opportunities to generate income, Employment and foreign exchange. Many traditional healing herbs and their parts have been shown to have medicinal value and can be used to prevent, alleviate or cure several human diseases. Near about 120 medicinal plants of the Barmer district are known to be important for its medicinal and pharmaceutical values. Many farmers sell these naturally growing medicinal herbs/ plants to local traders and hence earn some income. Medicinal plants like Shankhpuspi, Neem, Akara, Dhatura, Tumba, Arni etc. there is good demand of medicinal plants which grows in wild in the region. The domestic trade of the AYUSH industry is of the order of Rs. 80 to 90 billion. The Indian medicinal plants and their products also account of exports in the range of Rs. 10 billion. Thus there is an immense scope for livelihood enhancement through medicinal plant cultivation and marketing in Barmer district.

**Key word:** Medicinal Plant, Value chain, livelihood, Sankhpuspi etc

### **Role of ICT in enhancing Agriculture Production**

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Agriculture is the backbone of our country. majority of the Indian farmers depending on agriculture for their livelihood security. In the modern age there is need to inform millions of people quickly and accurately about scientific technical and recent developments. the farmers are information hungry and present public extension system is not able to meet the demand of the farmers for information. The farmers and extension worker ratio is widening. On the other side communication tools development is enormous. One good example is , Information Communication Technology (ICT), Ict is the basket of technologies, which assist in storage, processing and dissemination of information.

ICT plays a very important role in agriculture development as it helps in enhancing agriculture development by providing up to date information about pest and disease control, early warning systems, new varieties, new ways to optimise production and regulations for quality control, market price of commodities, inputs and consumer trends, ICT can be used to strengthen communities and farmers organizations, strengthen their own capacities and better represent their constituencies when negotiating inputs and output prices, land claims, resource rights and infrastructure projects. major ICT initiatives of Karnataka are, Bhoomi (Computerisation of Land records), Nemmadi (800 Village Telecentre project) ,Bangalore One ,Khajane (Computerisation of Treasury offices),Kaveri (Computerisation of the registration process)etc. ICT tools like village knowledge centres, different mobile Apps, Agri portals, websites, SMS through mobile phones, expert system, e-sagu, Agmarknet, kisan call centres, Rural e seva etc are assisting farmers by

giving information like, providing technical information related to agricultural inputs, processing quality seeds, daily market price and advice farmers on rotation of crops as well as about the use of fertilizers and pesticides.

Looking to the advantage of ICT, it clearly indicates that ICT plays a vital role in disseminating agriculture technologies to farmer's doorsteps and enhance Agriculture production.

## **Market Led Extension Models in Dairying for Income Enhancement of Farm Women**

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Rural women are significant contributors to animal husbandry development. They carry out three-fourth of activities in dairy farming in addition to their household chores. Their limited access to training and marketing opportunities often deprive them of income generation from dairying. It is possible to enhance the income earning capacity of resource poor farm women by exposing them to value addition in milk and milk products along with market facilitation for these products. ICAR-NDRI initiated a DST-sponsored project namely "Improving Livelihood of Rural Women through Dairy based Secondary Agriculture" since 2017 and promoted ten women groups in three districts of Haryana. The approach included interventions like sensitization meetings followed by training and demonstration on value added milk products to motivate farm women to take up dairy based enterprise. Forty trainings have been conducted during which more than 450 farm women have been benefited. Women received technical guidance and were further facilitated for market-tie ups with potential buyers of milk products with specific focus on *paneer*, coconut *burfi*, curd, *ghee* and *gulab jamun*. This helped them to earn an additional income of Rs. 3000 to 5000 per month depending on the local demand, nature and volume of market. The various extension approaches followed under this project include direct tie-up with school/college canteens, restaurants, *dhabas*; networking with government functions; putting up stalls in national and international events; harnessing all important religious functions; doorstep delivery to consumer using refrigerated van; and direct sale to consumer especially in their neighbourhood. NABARD, State Rural Livelihood Mission, ATMA and local NGOs played a pivotal role in strengthening project activities. The specific gender barriers were overcome by organizing sensitization meetings for both men and women in the village and organizing exposure visit to successful dairy units operated by farm women. The upscaling of these ten different market led extension models is likely to enhance the income of women and their better livelihoods across Haryana and other states.

**Keywords:** Farm women, Livelihood, Women groups, Training, Market linkage



## **Theme 5: Agricultural Marketing in COVID Period**

- Chairman** : Dr. J.P. Sharma, Vice-Chancellor, SKUST, Jammu  
**Co-Chair** : Capt. Laxmikant Kalantri, Ex- Director of Sericulture, GoM  
**Co-Chair** : Dr. Ravi Reddy, REEDS, Hyderabad  
**Rapporteur** : Dr. Sathyendra Kumar, CCS NIAM



## Impact of Covid- 19 on Agriculture

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As the Covid-19 goes widespread on human civilization changing every aspect of our life; many are looking for the opportunity even in these difficult situations. Although this pandemic is the biggest challenge the human civilization has ever faced, it is giving the opportunity to work on our issues which we always neglected. In India, agriculture is the most important aspect of our lives. However, our agriculture market system incrustated with middlemen has always denied that fair share of the profit to our farmers. *The agricultural value chain in India has been adversely affected by the Covid-19 crisis and the resultant lockdown* Thus, Indian farmers who enabled us to break records of production every year never really got many benefits from their achievements.

**Keywords:** Covid-19, pandemic, Global health and Lockdown

### Need of Agricultural Market Reforms at the Time of COVID-19 Pandemic

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At the time when the whole world is facing the misfortune of COVID-19 pandemic, all the sectors hit hard. The economy of India, which was already in slowdown phase, suffered a lot. Agriculture and allied sector also not left behind the consequences of COVID-19 pandemic. The lockdown measures taken as a preventive measures resulted in hardship of farmers. The harvesting and post harvesting activities hampered due to non availability of market, restricted transport, migration of laborers, etc. Although government has taken various measures for the upliftment of farmers but the situation of small and marginal farmers is vulnerable. A huge loss borne by farmers especially in marketing of perishable commodities. Countries have closed national borders bringing international trade and commerce to an abrupt halt. All these are severely disrupting supply mechanisms and distribution chains in almost all sectors. For long, the central and the state governments have a mechanism of minimum support price (MSP) or a floor procurement price for agricultural commodities to provide income security to the farmers. However, it has been empirically observed that farmers often do not get a fair price for their produce and particularly, when the production is higher, they are forced to sell it at lower than MSP to traders given the procurement constraints of government agencies. e-NAM provides a good avenue for social distancing in the current scenario while undertaking trade in agriculture produce seamlessly. Therefore, it can be concluded that reformation of marketing functions is highly required to increase the returns per rupee investment as well as net returns.

**Keywords:** Covid- 19, agriculture sector, slowdown, marketing, e-NAM and returns per rupee investment.

## **Pillars of Aatmanirbhar Bharat Abhiyan for Agriculture- A vision for market led extension approach for the farmers**

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India is home to about 120 million smallholder farmers who contribute over 40% of the country's grain production, and over half of its fruits, vegetables, oilseeds and other crops. Much of the global share of food staples such as rice and wheat come from India, and almost half of the population in India depends on agriculture for their livelihood. The upcoming Agriculture oriented bills and schemes such as, The Essential Commodities (Amendment) Ordinance, 2020, The Farmers' Produce Trade and Commerce (Promotion & Facilitation) Ordinance 2020, The Farmers (Empowerment and Protection) Agreement on Price Assurance and Farm Services Ordinance 2020, Agriculture Infrastructure Fund and Promotion of Farmer Producer Organizations (FPO) Scheme have created a versatile outreach opportunities to the farmers in various dogmas of production, finance and marketing as concern. The secondary base study with the literature inputs from various research bodies and published outputs was carried out to know the opinion benchmark about the Farm bills and various schemes. The study concluded that, the reforms through amendments in these agriculture core areas if carried out earnestly could go a long way in helping the farmers get out of the misery and help achieve the goal of doubling of farmer's income in the set time frame and overcome the glitches in agriculture and its allied sectors.

**Key words:** production, income, bills, schemes, reforms

## **Impact of Covid-19 on the Supply-Chain of Major Horticultural Crops in Jammu And Kashmir, India**

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This paper aims to highlight the disruption caused by COVID-19 in the supply-chain of major horticultural crops in Jammu and Kashmir, India which is the most important economic activity in the Union Territory. The paper studies the impact of COVID-19 on the pre-harvesting, harvesting and post-harvesting stages of horticultural supply-chain. Primary Data was collected through the telephonic survey whereby the farmers acknowledged delay in spraying the chemicals and fertilizers which has resulted in increase of pests and weeds in their farmers, this is likely going to impact the quantity as well as quality of the horticultural crops in Jammu and Kashmir. Another

group of the respondents, who had stored last year's produce in Controlled-Atmosphere-Storages (CAS), have failed to find any buyer due to closure of the markets and the consequent fall in demand. The transportation and the storage cost of their stored produce is increasing with each passing day, therefore gradually eroding their profitability. Moreover, the cherry farmers who had reaped a good harvest couldn't find the buyers and therefore had to dump their produce hitting the economy badly. Longevity of COVID-19 and the subsequent lockdown is severely denting the efficiency of the supply-chain of the horticultural crops in Jammu and Kashmir. The profitability of horticultural sector as a whole is taking a severe hit which will impact the coming years too. With the pandemic yet to peak in India, the government should ramp up the infrastructure, provide timely input to the farmers, bring clarity in the opening of mandis and provide a financial stimulus to restore some normalcy in the sector.

**Keywords:** COVID-19, supply-chain, horticulture, apple, agriculture, storage-facilities, production.

### **Constraints Faced by the Trained Mushroom Growers**

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The present study was conducted in Western Maharashtra. Data were collected personally from 60 farmers from 7 districts viz., Pune, Kolhapur, Satara, Sangli, Solapur, Ahemadnagar and Nashik to study the entrepreneurial behaviour of trained mushroom growers. Findings of the association analysis revealed that variables viz. age, education, land holding, size of family, annual income, knowledge, training received and experience in mushroom enterprise were significantly associated with entrepreneurial behaviour. However, family occupation, sources of information and social participation were non-significantly associated with entrepreneurial behaviour of trained mushroom growers. Major constraints faced by trained mushroom growers viz., non-availability of proper market channels (96.67 per cent) followed by temperature maintenance problem (91.67 per cent), no supply of loans from banks (88.33 per cent), lack of availability of writing materials (83.33 per cent), short day training and lack of availability of good spawn at nearest place (75.00 per cent). Suggestions obtained from trained mushroom growers like large majority (91.67 per cent) of respondents wanted fixed market, followed by majority (86.67 per cent) of respondents wanted loan facilities through banks, 85.00 per cent respondents wanted proper training programmes, fixed market rate (83.33 per cent), availability of popular literature (80.00 per cent), availability of straw (75.00 per cent), availability of quality spawn (71.67 per cent) and experts guidance (66.67 per cent).

**Keyword:** Constraints, Suggestions

## **A Market Structure Analysis of Fish Markets in Mormugao, Goa**

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The coastline of Goa is 104 km and contributes about 1.85% of the total marine fish landings of our country. Goa coast consists of 10,545 of total fishermen population. The marine production of Khariwada jetty which is the major landing center in Mormugao taluka is 17,913 tons. Present study was conducted at fish markets of Mormugao taluka, South Goa to access the present market structure, infrastructure and hygiene facilities as well as constraints. Information was collected from 74 retailers in all the different markets in which 71 were female and 3 male retailers. The fish markets under study were namely Vasco fish market, Baina market, Mundvel fish market, Vaddem fish market, Dabolim fish market and Birla fish market. The Vasco fish market was nearest to the Vasco jetty whereas Birla fish market was the farthest. The Vasco city market is the major fish retail market of Mormugao taluka. Vasco city market and Baina retail market were well constructed fish market provided with electricity and water facility. Both the Mundvel retail market and Vaddem retail market had no basic infrastructural facility and were in an open area along roadside. In general, all the markets were lacking sanitation, proper facility for disposal of waste and proper drainage system. In addition retailers also faced problems like spoilage during storage, price fluctuation, high transportation cost, and insufficient availability of potable water. The study has shown insufficient infrastructure and poor hygienic conditions of fish markets. Markets highlighted indicate the need for governmental interventions in providing infrastructure and transportation facilities within the study area to encourage the retailers. The study recommended that the development of the basic infrastructural facilities like platform, proper flooring, good drainage system, lavatory and preservation facilities.

**Keywords:** Market structure, fish markets, infrastructure, Mormugao and Goa

## **Value chain analysis of tea (*Camellia sinensis*) and constraints faced by the small tea growers in India with special reference to state Assam**

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The present study aims at estimating the cost involved in value addition of green tea leaves in Sonitpur district of Assam. The primary data were collected from 100 small tea growers, 50 tea leaf collectors, 20 processing industries, 50 wholesalers, and 50 retailers drawn from fifteen randomly selected villages of two randomly selected blocks of Sonitpur district of Assam by conducting interview of individual respondents. The secondary data were collected from various

published and unpublished sources. It was found that the highest value addition took place at Industry level, where the cost of value addition was Rs. 129.18 per kilogram, followed by wholesalers (Rs.35.92 per kilogram), retailers (Rs. 17.80 per kilogram) and green leaf collector (Rs. 3.20 per kilogram). The analysis also revealed that the net incomes of small tea growers and green leaf collectors were Rs. 2.63 and Rs. 1.86 per kilogram of green tea leaves respectively; and for processors, wholesalers and retailers these were Rs. 20.00, Rs. 2.50 and Rs. 4.00 per kilogram of made tea, respectively.

It was observed that non-availability of workers in the peak plucking season, lower price of green tea leaves, non-settlement of land records of the small tea growers in the government offices and high price fluctuation of green tea leaves were the common problems faced by the small tea growers in the study area during production and marketing of green tea leaves.

**Keywords:** Value chain, small tea grower, constraints, actors

## **Perception of Paddy Farmers About Minimum Support Price in Karnataka**

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Paddy is an important staple food crop of southern India. In the recent past, farmers exhibited transition in cropping pattern from Paddy to commercial crops, a cause of concern from the view point of food and fodder security. The transition is because of non-remunerative and labour intensive nature of the crop. The market price of paddy is not keeping the pace with that of rising cost of cultivation leading to non recuperativeness. Majority of the farmers involved in paddy cultivation possesses marginal to small land holding wherein mechanization though available is not possible. In such situations, farmers invariably have to rely on labour folk for performing various agricultural operations timely. Labour force in the recent past has not only become physically scarce but also exhibited economic scarcity and emerged as the greatest predicament to farmers. Hence, retention of farmer's interest in continuing paddy cultivation is indispensable from the view point of food and fodder security. In order to retain their interest, both the central and state government intervenes in the form of announcement of minimum support price. Minimum Support Price (MSP) safeguards encourages and instills confidence among paddy growers. In this context, the present study was undertaken to assess the perception of paddy growers about MSP. For the study, two taluks having highest area under paddy cultivation in Shivamogga district of Karnataka were selected and from each taluks 21 respondents were selected randomly totaling to 42. The result indicated that majority of the respondents had medium (69.02%) level of perception followed by high (16.66%) and low (14.28%). More than half of the respondents strongly agreed that different agencies owned by government were held responsible for the procurement of farm produce at MSP (68.42%). Nearly equal number of respondents (44.71%) strongly agreed that MSP is announced prior to the sowing season, MSP varies every year on account of cost of production and announced for pre-defined varieties not benefiting all the farmers. Nearly one third of the respondents perceived that MSP rates are usually announced

at the time when farmers have already initiated the necessary preparation for sowing (36.84). Farmers though had knowledge about the MSP but they could not able to utilize in deciding cropping pattern due to several shortcomings. If we could able to resolve these shortcomings of the system, it might help farmers in deciding profitable cropping pattern to sustain their livelihood.

### **Analysis of dairy contract farming system in Tamil Nadu, India**

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In the context of increasing demand for milk, participation of private sector through policy changes and critical role of dairying among the vulnerable sections of the rural society necessitates to analyse the dairy contract farming system. The study was conducted in Namakkal district of Tamil Nadu with the sample size of 120 dairy contract farmers. Majority (98.33%) of the dairy farmers sold milk to private dairies only and 60.00 % of them had up to 3 years of experience in contract farming. Before entering into contract firm, 50.80% of the dairy farmers supplied milk to milk vendors and 45.00 % shifted their marketing option from vendor to contract firm. Majority of the dairy farmers had direct contract with the contract firm and none of the dairy farmers had written agreement with the contract firm. All the dairy farmers reported that there were no conditions such as amount of milk, minimum fat and SNF content to enter into contract system except selling of milk. The farmers received payment in assured time frame and had no dispute with the contract firm. Nearly three-fourth (72.72%) of the collection centres had lay inseminators for artificial insemination service. An overwhelming majority (98.33%) of the dairy farmers reported that higher price for milk was the major factor influencing farmers to enter into contract farming. Lack of credit for animal purchase, under reporting of fat and SNF and lack of input constraint faced by the contract dairy farmers.

**Keywords:** Contract farming, dairying, Tamil Nadu

### **Supply chain and Agri infrastructure for pineapple farmers of Tripura**

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Pineapple is a traditional fruit crop of Tripura. The agro-climatic conditions of Tripura make it suitable for large-scale pineapple cultivation. Tripura pineapple is particularly famous for its quality and aroma. The crop accounts for 16% of the total area under fruit crop cultivation and 23% of the total fruit production in the State. The State is 4<sup>th</sup> largest producer of pineapple in India after Kerala, West Bengal and Assam, accounting for approximately 9% of the total production in the country. However, the percentage of Tripura pineapple in the India market share is limited due absence of post-harvest infrastructure coupled with weak logistic and geographic connectivity with rest of India

In the Paper, the supply chain and commodity flow of Pineapple has been analyzed based on primary data. The assessment of infrastructure gaps with the point view of enhancing export potential has also been worked out. The objective of the paper is to give suggestions for

development of collection centre, integrated packhouse, processing facilities, deployment of IoT so that pineapple marketing can be strengthened.

The Paper is based on the primary data collected for developing Action Plan for Pineapple value chain under MIDH for Pineapple in the State of Tripura by CCS NIAM

**Key words:** Pineapple Supply Chain, Commodity flow, market channels, FPO



## **Theme 6: Innovations in Agricultural Marketing Management**

- Chairman** : Dr.K.P. Vishwanath, Vice-Chancellor, MPKV, Rahuri,  
Maharashtra
- Co-Chair** : Dr. R. R. Sinha, Founder, INSEE, Ex- Director of Extension  
Education, Dr. PDKV, Akola, Maharashtra
- Co-Chair** : Dr. N. Balasubramani, Director, MANAGE, Hyderabad.
- Rapporteur** : Sri. Manoj Agrawal, COO, CCS NIAM
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## **Use of E-Tools in Agriculture by Farmers of Northern Karnataka**

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The study was conducted during 2017-18 on use of e-tools in agriculture by farmers of northern Karnataka. Vijayapur and Bagalkot taluks were selected from Vijayapur and Bagalkot districts purposively because these taluks were nearer to respective KVKs, Universities and research stations. Eight e-tools were selected for the study namely; Krishi Marata Vahini, Raitamitra, Kisan Call Centre, Whats App groups, Information Kiosk, Kisan Mobile Advisory Services, Kisan Suvidha and Agromet Advisory Services. A sample of 120 respondents was selected randomly and was personally interviewed using pretested schedule. Majority of farmers (60.00 %) were under middle age category and 26.66 per cent farmers had education up to high school level. 44.16 per cent of the farmers were belonged to semi medium farmers, 52.50 per cent of the farmers belonged to medium level of annual income category, low extension contact (51.66 %), high mass media utilization (40.00 %), medium decision making ability (44.16 %), medium economic motivation (36.66 %), medium innovative proneness (55.00 %), medium cosmopolitaness (48.33 %), medium organizational participation (44.16 %) and medium scientific orientation (38.33 %). The results revealed that 40.83 per cent most of the farmers belonged to low utilisation category of e-tools, followed by high (34.16 %) and medium (25.00 %) utilisation category. A positive and significant relationship was observed between utilisation pattern and socio economic characteristics such as education, farm size, annual income, extension contacts, innovative proneness, cosmopolitaness and training on e-tools. Whereas, the variable age was found to be negatively and significantly correlated with utilisation pattern. Lack of awareness about e-tools, poor internet connection, overload of information on the internet and lack of proper training facility were the major constraints in effective utilisation of e-tools by farmers.

## **Constraints Encountered by Oats Growers in Adoption of Improved Production Technology**

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Study was conducted in Nyoma block of Leh district to know the constraints faced by the growers in adoption of Oats production technology. 130 respondents were selected from 10 randomly selected villages of Nyoma block and data were collected through interview schedule. Results indicates that, lack of knowledge in the practices namely recommended dose of fertilizers, control measures of pests and diseases, identification of pests and diseases , recommendation of chemical weed control measures in oats, high cost of fertilizers and pesticides and harvesting, labour shortage at the time of harvesting and poor contacts of extension workers with growers

were major constraints faced by oats growers. Facility of crop insurance scheme in case of failure of season, minimum support price of oats should be declared well in advance were important suggestion to overcome/minimize the constraints in adoption of new technology in oats cultivation

**Keywords:** constraints, oats production technology, Suggestions

## **Preparation of thirst-quenching dehydrated lime slices for enhancement of nutrition and livelihood security**

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Lime (*Citrus aurantiifolia*) is a one of the commercial crops of India. It is a rich source of vitamin C, antioxidants and other nutrients. Regular consumption of this fruit increases body immunity against various diseases. Lime is commonly used for preparation of beverages and pickles. Beverages prepared from lime are highly refreshing and thirst quenching in nature. Information on preparation and utilization of dehydrated lime slices is very meagre. In view of this, a study was conducted for preparation of thirst quenching dehydrated lime slices using cost effective technology. Organoleptically acceptable good quality thirst quenching dehydrated lime slices can be obtained by blanching of fruits for five minutes and mixing of fruit slices with roasted common salt (75g /kg) for 10 days followed by steeping in 50<sup>0</sup>B sugar syrup for one day and added with spice mixture (25 g / kg fruit slices) containing dry ginger 6g, black pepper 4g, ajwain 6g, cumin 10g followed drying in poly solar dryer. These slices obtained significantly highest organoleptic scores for color and appearance (4.06), texture (4.08), mouth feel (4.17) and overall acceptability (4.11) and retained highest ascorbic acid content (9.58 mg/100g) as compared to control. The cost: benefit ratio of dehydrated lime slices was found 1: 2.1.

## **Institutional Innovations in Mango Marketing During Lockdown**

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Mango (*Mangifera indica* L.) is also called as King of fruits because of its unique taste, delicacy and nutritive values. India is the leading producer of mango with production of 21.82 million tonnes constituting around 50 % of the total world production. Changing life style due to increase in the disposable income of the consumers led to the increased demand which in turn led to increased production of mango over the years. The coincidence of sudden lockdown and the

mango harvesting season has left the mango growers as well as the consumers in shock as mango mandis were virtually shut. Karnataka is one of the major mangoes producing states in India with a production of 1760.60 thousand tonnes from an area of 183.23 thousand hectares sharing around 8 per cent of the total area and production. There exists a large number of institutions promoting quality mango production and efficient marketing of mango in Karnataka. The predominant traditional marketing channels for mango are Producer-Preharvest contractor-wholesaler-retailer-consumer where 70-80 % of the produce moves and Producer-commission agent-wholesaler -retailer-consumer. Producer share in consumer rupee in these channels is only 50-60 %. As mango mandis were shut and consumers were in fear of stepping out from homes which has led to the emergence of many innovative marketing channels viz. Producer-Karnataka State Mango Development and Marketing Corporation (KSMD & MC)- Consumers involving post office has deliver agent, Producer-Flipkart (KSMD & MC)- Consumer. These channels helped mango farmers to realize higher share in consumer rupee (80-90 %). KSMD & MC also signed a MoU with flipkart to ensure the mango growers about the availability of marketing facilities and facilitating consumers to place orders for different mango varieties like Alphonso, Badami, Banganpalli, Kesar, Neelam, Sendur and Mallika etc. with a minimum quantity of 3 kgs on flipkart platform. These innovative marketing channels not only led to higher producer share in consumer rupee but also led to the higher consumer satisfaction by making available quality mangoes at reasonable price. These marketing channels were innovations to overcome covid 19 crisis, however these should be promoted as an important marketing channels in future with complementary government policy support in terms of marketing reforms for farmers to sell their produce outside APMC market and farmers should also be trained to practice good agricultural practices, ripen mangoes without ripening agents, etc.

## **Attitude of Agri Student Towards Agri Entrepreneurship**

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Entrepreneurship refers to the overall course of action undertaken by an owner in starting and managing enterprise for profit. Entrepreneurship contributes the economic growth and thereby plays a vital role in the development process. In developing country like India entrepreneurship plays a great role in the economic growth and development of the country. Entrepreneurs are the seed of industrial development and its fruits are greater employment opportunities, increase in per capital income, higher standard of living and balanced regional development.

India is an agriculture based economy having 329 million hectares of land area of which 143 million hectares is under cultivation. India being the second most populous country in the world after China, millions of farm families spread over 127 agro-climatic zones of the country with a variety of crops and animal production systems. On the other hand there is a vast pool of agriculture student in the country who can support and boost agriculture production process if viable business opportunities are provided to them. Therefore, the country has a great strength to promote Agripreneurship. Development of Agripreneurship can bring a paradigm shift in the agricultural scenario of the country thereby developing a sustainable farming system, which is

technologically feasible, economically viable, socially acceptable, and ecologically stable which determines the growth and development of the country.

Considering the growing unemployment in rural areas and slow growth of the agricultural sector, it is necessary to tap the opportunities for promoting entrepreneurship in agriculture. Agri entrepreneurship can be used as best medicine as the solution of this problem. Rural youth are the very important section of the rural society and they play a vital role in development of rural areas and country as a whole. As rural youth participate enthusiastically and with interest in various self-employment activities of the village are selected as respondents in the present study.

The study found that most (30.67%) of the respondents had neutral attitude towards Agri entrepreneurship followed by favourable (22.00%), most unfavourable (17.33%), unfavourable (16.00%) and most favourable (14.00%) attitude towards Agri entrepreneurship. The findings suggest that proper/ congenial environment, regular trainings, low cost technologies, frequent product oriented training programmes and family support could influence the respondents to move from neutral attitude to most favourable attitude.

## **Entrepreneurial Readiness Among Youth: A Conceptual Framework**

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Youth constitute a critical part in economic development and demographic improvement of any country. Youth is defined as individuals within the age bracket of 15 to 24, which constitute more than one fifth of the population in India. This demographic dividend has greater opportunity to bring in freshly learned and updated skills that will help renew and improve the country's stock of human capital. But this phenomena also arises the problem of resource burden on the economy as employment becomes a limitation. In the developing countries like India, service sector is seen as prestigious source of employment and the mindset of people towards entrepreneurship is often negative. Though several skill development programmes are being organized by the Government of India and other institutions but young population which typically constitutes the entering cohort in the country's labour force, lack necessary skills to start their new venture. This paper conceptualizes the readiness of youth towards entrepreneurship. Entrepreneurial readiness is defined as the mindset of youth towards entrepreneurship, and the major factors affecting this are entrepreneurial abilities, available resources and achievement motivation. Social capital theory, achievement motivation are some of the theories governing the motivation for entrepreneurial activities. Some of the interventions such as sensitivity trainings, skill based trainings, financial support, incentives for startups can help in achieving entrepreneurial readiness among youth, ultimately leading to utilize the human resource effectively and generating sustainable livelihood.

**Key words:** Youth, Entrepreneurial readiness, demographic dividend, achievement motivation.

## **Consumer Preference for Value Added Products of Avocado in Bengaluru Metropolitan City**

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Avocado is the most nutritive among fruits. It is beneficial in many different ways to the Indians because of its high nutritional density, good source of protein, fiber, antioxidant properties. The avocado contains about twice of our daily needs for vitamins C, E, and beta-carotene as its calorie proportion. The study was carried out in Bengaluru Metropolitan city. The primary data was collected through personal interview method from 60 consumers in Bengaluru Metropolitan city. The study revealed the consumers awareness about Avocado value-added products, only 44.66 per cent were aware of the products indicating low level of awareness. About 57.78 per cent of consumers got information from friends, followed by family 45.56 per cent. The consumer preference for value added products of Avocado mainly depends on the quality followed by hygiene, price and flavor. The study also depicts that 86.66 per cent of consumers show a positive approach towards the value-added products of Avocado, where it helps to maintain healthy life style. However, 13.33 per cent had a negative approach. The important factors influencing the consumption of value-added products of Avocado were analyzed using factor analysis. The Kaiser-Meyer-Olkin (KMO) measure was found to be 0.621 which shows that the factors that are extracted will account for moderate variance. This KMO value of 0.621 is excellent since it exceeded the recommended value of 0.4. The major constraints faced by retailers in marketing of Avocado was lack of consumer awareness, high price and low margin. The brand awareness of consumers was high for few brands of value-added avocado products. Hence there is a need for more promotional activities by the companies to popularize Avocado value-added products in the city.

## **Fresh Water Pearl Cultivation: A Prospective Venture towards Doubling Farmers' Income.**

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Pearls from India are known and admired all over the world as the finest of oriental pearls and have been in high demand. However, India has been one of the major importers of pearls every year to meet the growing domestic need. More than 90 per cent pearls are cultured pearls and Asia-Pacific is the largest as well as the fastest growing market after China and Australia being the largest players. Fresh water pearl farming is the process of growing fresh water cultured pearls on a farm. Fresh water pearls are the pearls that are grown on pearl farms using fresh water mussels. Mussels are the organic hosts. Each mussel can produce multiple pearls with each production

cycle. The shells after mussels are dead can be used for various purposes. Large quantity of mussel shells can be used as a soil amendment. Pearl shells can also be used to produce decorative materials. Pearl farming is a very profitable business venture in which the value of final product is high. Except for the grafting process, pearl farming is the simple form of aquaculture business because pearl oysters do not require artificial feeds, complicated farm structures or constant attention. This enterprise can provide valuable opportunities for farmers to increase farmers' income in current scenario. Fresh water pearl cultivation is confined only to a few farmers of states of Maharashtra, Gujarat, Karnataka, Bihar, Madhya Pradesh, Uttar Pradesh and Chhattisgarh. Moreover, including pearl farming in integrated farming system shall enhance the productivity, profitability and sustainability of different component systems as suited to a specific region. Fish farming alongside pearl cultivation can increase the production of mussels. Thus, fresh water pearl cultivation can prove as a successful venture for doubling farmers' income.  
Key words – Pearl, Fresh water, farmers, cultivation

## **Innovations, Prospects and Challenges of the Market Led Extension in View of 21<sup>st</sup> -Century Scenario**

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Earlier the agricultural production was limited to the family or neighbour. With advancement and emergence of food industries, agribusiness and multinational companies in the food production has led to the emergence of the scientist in the chain of production processing and marketing. To empower the primary producers as these scientist working at ground level known as Extension scientist has changed their approach from production led extension to market led extension. In market led extension the primary producers are made capable to analyse the market need and invest their resources accordingly. Other activities involved in this approach includes formation of Farmers' Interest Groups (FIGs) supporting and enhancing the capacities of locally established groups under various schemes / programmers like watershed committees, users groups, SHGs, water users' associations, thrift and credit groups. The success of any initiative is dependent upon the close analysis of its working and its criticism. Here an attempt has been made to analyse the innovations, prospects and challenges of the market led extension in view of 21st-century scenario for capacity building of farmers, extension functionaries' stakeholders, and also for policy recommendation towards holistic sustainable agricultural development.

## Comparative Evaluation of Different Rice Establishment Technologies

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Cost of cultivation play an important role not only in reducing the costs but also in increasing the income level of farmers. The present study was carried out to compare the difference in rice production systems viz., Transplanting, Mechanized System of Rice Intensification (MSRI), Drum Seeder, Broadcasting and Aerobic. The study was carried out in Khammam district of Telangana State during 2014-15. A total of 120 farmers from 6 mandals were selected using multistage sampling method and they were personally interviewed with the help of a schedule. The findings of the study indicate that the per acre total cost of cultivation was least in Aerobic (Rs. 13684.8/-) production and highest in MSRI (Rs. 22245/-). Similarly, the grain yield (a bag of 75 kg) was least in Aerobic (25.7) and highest in MSRI (29.89). It was found that there was no much difference in the total cost of cultivation between transplanting (Rs. 222093/-) & MSRI. Whereas, Gross income was more in case of MSRI (Rs. 39269.69/-) compared to transplanting (Rs. 38229.22/-). The net income was highest in drum seeder (Rs.21428.6/-) method followed by broadcasting (Rs.20626.44/-). In terms of benefit cost ratio Aerobic method has a highest C:B ratio of 2.33 followed by drum seeder (2.26), broadcasting (2.12), MSRI (1.7) and transplanting (1.64). It is concluded that the Aerobic method of rice cultivation is more beneficial to the farmers as it fetches higher returns and less cost compared to other methods of rice cultivation.

**Keywords:** Cost of cultivation, Aerobic rice cultivation, Mechanized System of Rice Intensification.

