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A Study on the Adaptation Strategies Followed by the Dryland Farmers during Covid-19 Pandemic

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Abstract: ***The inadequate planning and preparation by governments before the sudden imposition of lockdowns to tackle the COVID-19 pandemic have inflicted a severe blow to India's economy, causing immense hardships, particularly to the working people and the informal rural economy. The peak of the Rabi crop harvesting season in March 2020 coincided with the nationwide lockdown, leading to significant losses for farmers in the north-western regions. The rural areas, heavily reliant on agriculture and allied sectors, faced disruptions in input availability, labor movement, and supply chains, impacting the livelihoods of nearly 50% of the workforce. This study focuses on the adaptation strategies employed by dryland farmers in Andhra Pradesh and Karnataka during the pandemic. The research explores various dimensions, including health and psychological adaptations, farming practices, financial adjustments, and marketing strategies. The findings reveal that farmers, facing dual challenges of health and economic crises, resorted to diverse adaptation measures to mitigate the impact. At the individual level, farmers prioritized precautionary measures, government regulations, and engaging in productive work to cope with anxiety. Families emphasized maintaining hygiene, avoiding discussions about the pandemic at home, and sharing financial difficulties equally. At the village level, preventive measures, social distancing in markets and agricultural operations, and making masks compulsory were widely adopted. In terms of farming adaptations, farmers faced disruptions in the availability of quality seeds, fertilizers, and pesticides, leading to increased expenditures. Financial adaptations included increased borrowing from financial institutions and private money lenders, utilization of long-term savings, and involving family members in agricultural activities to reduce costs. Marketing strategies saw a shift towards selling to retailers and exploring mobile agricultural marketing, while some farmers faced challenges due to low prices and transportation issues. Despite the immense challenges, farmers exhibited resilience by implementing various adaptation strategies to protect themselves and their farming activities. The study underscores the need for a comprehensive understanding of the impact of the pandemic on Indian farmers, addressing research questions related to adaptation strategies at different levels.***
Key words: Covid-19, Dryland farmers, impact, Adaptations.

I. INTRODUCTION

Inadequate planning and preparation by the governments before the sudden imposition of lockdown for tackling the COVID-19 pandemic has dealt a massive blow to India’s economy and had caused enormous hardships to working people of the country. The informal rural economy has been hit the hardest by this which was reported many times in media. The lockdown imposed in March, 2020 which coincided with the peak of harvesting season of Rabi crops in India mainly in the north-west posed significant losses to the farmers[2,9]. In the rural areas, where agriculture and allied sectors are often the dominant source of employment, income and food for local communities which contribute to nearly one-sixth to the Indian national income and provides employment to nearly 50% of the workforce. Of the total agricultural land nearly 68% of total net sown area comes under dryland spread over 177 districts. Dryland crops account for 48% area under food crops and 68% under non-food crops. Hence dryland agriculture plays an important role in the progress of agriculture in Indian economy. It is fundamental for ensuring food security of the nation and also influences the growth of secondary and tertiary sector of the economy through its forward and backward linkages.

Besides their important role in society, majority of dryland farming community confront yearly hazards such as low rainfall, price volatility, inflation, poor infrastructure, non availability of loans, and so on. The Covid-19 epidemic is a further difficulty for them due to its widespread impact in agrarian sector.

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Compared to the farmers with irrigation facilities the dryland farmers suffered a lot where they made more borrowings and decreased their extra expenditures more due to their low income and weaker financial stability than the irrigated farmers. The extensive Covid-19 mitigation actions nationally had resulted in slowing down of the agrarian activities like input availability, restricted labour movement, delay in timely field operations, disruptions in normal supply chains creating hardship environment for the farming community along with other sectors. [1,3,14]. Covid-19 pandemic apart from its major impact on physical health, also created great distress regarding the mental health and well being of the individuals and the dryland farming community is no such exception to it. The pandemic had been a double shock to the farmers in terms of health and economic challenges. Despite all these enormous threats they tried to balance their health and economic activities by safely combating the pandemic to some extent. Dryland farmers had faced difficulties because of the climate change and several other reasons for centuries, but they never gave up their hope and fought back since they were famed for their optimism and different adaptation strategies according to the need. Similarly, though the consequences of the crisis for farmers and their families were immediate, many farmers tried their best to overcome the hurdles. As reported by the media and the other relevant studies, farmers resorted to psychological, marketing adaptations, changes in cropping patterns along with the changes in expenditure patterns to stabilize their economic situation. The extensive Covid-19 mitigating actions and halting of the transportation, created difficulties for movement of agricultural labourers, and input supplies, thereby reducing yields and compromising food security. In addition to all these aspects, there were brief reporting's regarding the resilience shown by the farmers by implementing various adaptation strategies with regard to their health, farming activities. All these aspects need to be further probed to better understand the impact of the pandemic on Indian farmers. Hence, there arised a number of research questions which need to be answered, among which the major issue regarding what are all the adaptation strategies followed by the farmers at various levels to protect themselves and their farming activities from Covid-19 impact has been taken up for research purpose [4,5,6,7,16].

II. METHODOLOGY

The study was conducted in two different states i.e., Andhra Pradesh and Karnataka respectively. From each state one district i.e., Y.S.R. Kadapa and Raichur were selected respectively. Based on the presence of dryland farming practices available within the districts three villages each from three taluks of Raichur and two mandals of Y.S.R Kadapa were selected purposively. From each of the selected village, 15 farmers were selected. Thus the total sample size was 90. For studying this particular area a semi-structured schedule was prepared by the researcher. The adaptations made were categorized into different categories i.e., adaptation strategies followed regarding health and psychological disturbance management, farming adaptations, financial adaptations and marketing adaptations made by the dry land farmers. From each respondent, information was collected and a score of 3 for mostly followed, 2 for partially followed and 1 for not followed was assigned.

III. RESULTS AND DISCUSSION

A. Health and Psychological Adaptations

Sl.No	Adaptations	Most followed		Partially followed		Not followed	
		F	%	F	%	F	%
A. Individual level							
1.	All the precautionary measures to avoid virus contact	62	68.89	28	31.11	0	0.00
2.	Government regulations	60	66.67	30	33.33	0	0.00
3.	Removal of the anxiety level	30	33.33	39	43.33	21	23.33
4.	Self engaged into productive work	30	33.00	45	50.00	15	16.67
5.	Performed wellness and yoga activities	6	6.67	15	16.67	69	76.67
6.	Stopped watching TV and following news to avoid unnecessary fear	12	13.33	63	70.00	15	16.67
7.	Indulging more into religious activities	12	13.33	39	43..33	39	43.33
8.	Taken moral support from the family members	10	11.11	18	20.00	62	68.89
9.	Taken counselling from local health workers and other government agents	9	10.00	18	20.00	63	70.00

B. Family level							
1.	Encouraged all the members to maintain high level of hygiene	47	52.22	42	26.67	19	21.11
2.	Avoiding discussions about the pandemic at home	48	53.33	36	40.00	6	6.67
3.	Practising Yoga, Meditation and prayers daily	6	6.67	15	16.67	69	76.67
4.	Helping the family members to come out of stress and fear	31	34.44	41	45.56	18	20.00
5.	Shared financial difficulties equally by all the family members.	15	16.67	27	30.00	48	53.33
6.	Restricting the movement of family members out of their village	75	83.33	9	10.00	6	6.67
7.	Postponing Marriages and other religious ceremonies	62	68.89	20	22.22	8	8.89
8.	Spending happy time with the family members to keep fresh mind	45	50.00	33	36.67	12	13.33
C. Village level							
1.	Preventing external persons from entering village without proper health checkup	48	53.33	27	30.00	15	16.67
2.	Isolating themselves from moving in the village if get infected with the virus	60	66.67	30	33.33	0	0.00
3.	Avoided liquor, tobacco in the village to maintain personal health of every person	6	6.67	32	35.55	52	57.78
4.	Sanitary measures were implemented in the entire village	33	36.67	42	46.67	15	16.67
5.	Maintaining social distancing in local markets and during agricultural operations	57	67.33	33	36.67	0	0.00
6.	Masks were made compulsory while doing village tasks.	58	64.40	32	35.56	0	0.00
7.	The medicines are made available within the village for easy access	15	16.67	30	33.33	45	50.00
8.	Avoiding social conflicts within village to avoid mental stress	0	0.00	21	23.33	69	76.67

Table 1: Health and Psychological adaptations followed by the farmers under dry land conditions

The most frequent health adaptations they make at an individual level are, to put on a mask when they walk outside, maintaining social distance and washing their hands frequently. However, if they don't travel too far, they choose not to wear it in their own community. The majority of respondents might have adapted them to protect themselves because of their increased concern as a result of news reports about the severity of the virus, high infection rate and increased mortality, and the stern actions put in place by the government in case of noncompliance with the pandemic restrictions. The hoaxes and conspiracy, the repetitive news about the pandemic on TV and the mass media made the farmers to stop following the news and engage in some productive work to divert their minds from the Covid-19 thoughts. [8,9,10]. Most farmers have not taken counselling from health workers or government agents. This might be due to their cosmopoliteness during the pandemic, and farmers felt afraid to contact them directly, or farmers do not have hope of getting a positive response from them. Another reason may be that farmers already had knowledge of precautionary measures and were not interested in receiving any assistance in the form of counselling from outsiders or from the family members [13,15].

B. Farm Expenditure Adaptations

Sl.No	Particulars	Dryland (n=90)					
		Increased		Decreased		No Change	
		F	%	F	%	F	%
1.	Total area of cultivation	0	0.00	6	6.67	84	93.33
2.	Quality seeds	0	0.00	9	10.00	81	90.00
3.	Fertilizers and pesticides	30	33.33	0	0.00	60	66.67
4.	Labour cost	34	37.78	10	11.11	46	51.11
5.	Machinery cost	34	37.78	14	15.56	42	46.67

TABLE 2: Changes In Farm Expenditure Made By The Farmers Under Dryland Conditions

Increased expenditure on fertilizers may be owing to their price increase as a result of supply chain disruptions and restricted access to required inputs. Similar to how wages of labour increased due to their shortage and limits on transportation, along with increased machinery cost due to their timely unavailability, farmers' expenditure increased as a result. [11,12]

C. Financial Adaptations

Sl.No	Adaptations	Dryland (n=90)			
		Followed		Not Followed	
		F	%	F	%
1.	More borrowings from the financial institutions	39	43.33	51	56.67
2.	Borrowed money from the private Money lenders	54	60.00	36	40.00
3.	Savings from the long term are put to use	71	78.89	19	21.11
4.	Financial help from the family members	30	33.33	60	66.67
5.	Involving family members in agriculture activities to reduce farm expenditure	44	48.89	46	51.11
6.	Shifting to more profitable enterprises	0	0.00	90	100.00
7.	Reduction in investments in the farming and other activities	10	11.11	80	88.89
8.	Reducing the income spend on the education of children	28	31.11	62	68.89
9.	Reduced borrowings from the public and private institutions to avoid more indebtedness	17	18.89	73	81.11
10.	Reduction in the income spend on the food and recreational activities	46	51.11	44	48.89

Table 3: Financial Adaptations Made By The Farmers Under Dryland Conditions

Relatively more farmers utilized their long-term savings, which might be explained by the fact that they already had more loans from either public institutions or private lenders and, if they get more, will remain more indebted. Another factor might be that lenders refuse to give loans since they have previously given out many loans to farmers and don't trust them. While with no option left, poor farmers with no savings borrowed money even at higher interest rates from money lenders to continue farming in the next season and some from financial institutions with greater difficulties. Family members were made involved in some farming activities to reduce higher labour costs and overcome labour scarcity.

D. Marketing Strategies

Due to constraints on mobility and the difficulties associated with selling the produce outside or transporting it to mandis, farmers might have sold their goods to retailers or private agencies, though they quoted a lower price for it despite its good quality. Another likely explanation is that farmers have been selling their goods directly to private agencies for many years, as they will come and pick them up from their own villages. Farmers in certain places who are closer to large marketing yards combined their produce and brought it to the mandis and yards by taking special permission from the concerned authorities. Due to extremely low prices and a lack of transportation, some farmers even claimed that they had not even picked the crop and had instead left it in the field, while others simply distributed it to their neighbours without even trying to market it.

Sl.No	strategies	Dry land (n=90)					
		Mostly followed		Partially followed		Not followed	
		F	%	F	%	F	%
1.	Sales to retailers	52	57.78	22	24.44	16	17.78
2.	Mobile agricultural marketing in rural and semi rural areas	0	0.00	33	36.67	57	63.33
3.	Sales in weekly markets	29	32.22	28	31.11	33	36.67
4.	Roadside stands	0	0.00	0	0.00	90	100.00
5.	Sales in mandis	31	34.44	32	35.56	27	30.00

Table 4: Marketing Strategies Adapted By Farmers Under Dryland Conditions

E. Categorization of the Dryland Farmers Based on their Overall Adaptations Made

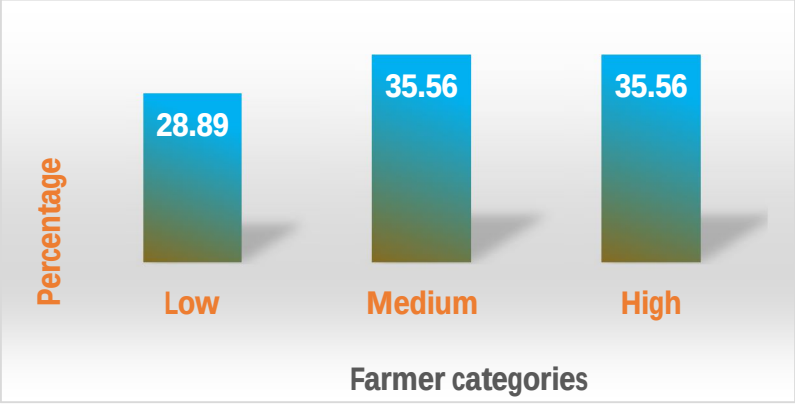


Fig. 1. Graphical representation of the farmers categorization

In particular, psychological factors play a key role in the way people make adaptations in the case of epidemics. The majority of farmers had moderate psychological impact, which probably contributed to their medium levels of adaptation strategies. Despite the fact that the majority of respondents had high extension personnel contact, there were those who had just a moderate degree of risk orientation and inventiveness, which may have discouraged farmers from making greater financial, marketing adaptations, as well as making changes in farming activities. Also low educational levels, limited health access, reluctance to seek health care and communal culture are alleged to be the causes of medium compliance in implementing health protocols in their daily life.

IV. CONCLUSION

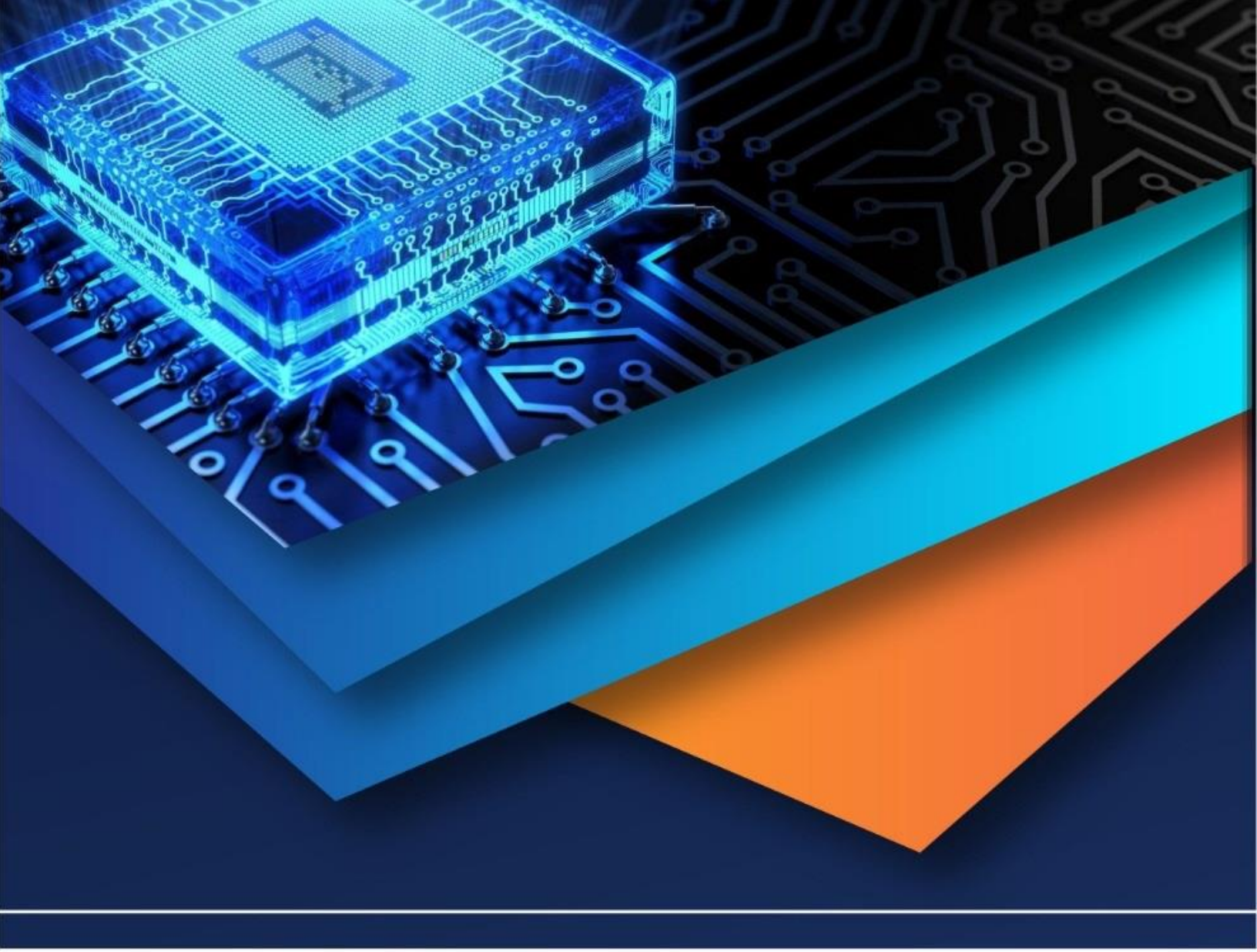
This research showed that throughout the -19 pandemic, almost all farmers continued to carry out their agricultural activities but only some farmers had implemented the health protocols. According to farmers' opinion about agricultural activities, they mostly stated that doing the agricultural activities will make them healthier. Accordingly various adaptation strategies made by the farmers had brought certain kind of relief to them. In conclusion, the Covid-19 pandemic presented unprecedented challenges for dryland farmers, necessitating swift and innovative adaptation strategies. These resilient individuals exhibited a remarkable ability to navigate the uncertainties imposed by the global crisis. Through a combination of technological adoption, community collaboration, and resource optimization, dryland farmers not only sustained their agricultural practices but also emerged as examples of adaptability in the face of adversity. Furthermore, the strong sense of community among dryland farmers became a cornerstone of their adaptation efforts. Collaborative initiatives, including shared resources, knowledge exchange, and collective problem-solving, became integral in mitigating the impact of the pandemic. As the agricultural landscape continues to evolve, the lessons learned from this period of unprecedented change will likely serve as a blueprint for future resilience and sustainable development in dryland farming communities worldwide. The findings provide valuable insights for policymakers, researchers, and practitioners working towards enhancing the resilience of agricultural communities in the face of unprecedented challenges.

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