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## Impact of COVID 19 pandemic on agriculture and allied sectors in Goa: A stakeholders perception

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### Abstract

The outbreak of the Covid-19 pandemic is an unprecedented shock to the Indian economy. The present study was conducted in the Goa state. The questionnaire was developed to collect the data from different stakeholders involved in the agriculture sector. Data is collected online through a google form. The study revealed that COVID 19 pandemic made an adverse impact across the agriculture and allied sectors such as horticulture, livestock, dairy and fishery sector. It made an extremely severe impact on the livelihood of wage labours and psychological wellbeing of people. The major impact was found on the demand-supply chain of perishable commodities viz., fruits and vegetables and fish. In order to protect and safeguard the livelihoods of millions of people associated with the agricultural system, the state should increase spending on social safety nets immediately and take up other short- and medium-term strategies. Raising revenue by offloading excess buffer stock and increased credit to the agriculture sector should be the top priority for post-pandemic economy restoration.

**Keywords:** COVID 19, stakeholders, impact

### 1. Introduction

Coronaviruses are a group of viruses that can cause disease in both animals and humans. The new strain of coronavirus is called severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2). The virus causes coronavirus disease 19 (COVID-19). The new coronavirus has spread rapidly in many parts of the world. On March 11, 2020, the World Health Organization (WHO) declared COVID-19 a pandemic. To combat COVID 19, Government of India has declared a lockdown from 25<sup>th</sup> March to 3<sup>rd</sup> May 2020. Still, the government is carrying out lockdown in different phases with certain relaxations. The outbreak of the Covid-19 pandemic is an unprecedented shock to the Indian economy. The economy was already in a parlous state before Covid-19 struck. With the prolonged country-wide lockdown, global economic downturn and associated disruption of demand and supply chains, the economy is likely to face a protracted period of slowdown. The magnitude of the economic impact will depend upon the duration and severity of the health crisis, the duration of the lockdown and how the situation unfolds once the lockdown is lifted. The agriculture sector in India is likely to suffer the most. As the world battles this pandemic and, as economies and livelihoods are disrupted, the poor and vulnerable are suffering the most. Addition to this, distress reverse migration of labour force to their natives again raised another challenge before policymakers. Considering these challenges, the present study was conducted with an objective to study the impact of COVID 19 pandemic lockdown on agriculture and allied sectors in Goa.

### 2. Research Methods

The present study was conducted in South and North Goa District of the Goa state. The questionnaire was developed to collect the data from different stakeholders involved in the agriculture sector. Data is collected online through a google form. The responses from the respondents were rated on a five-point Likert scale and certain multiple-choice questions were included in the instrument. To avoid the missing data/ information, all questions in the instruments made compulsory to get accurate and reliable data from the respondents. After designing an online Google Survey Form, the link of the questionnaire was sent in the public domain through various social media platform such as WhatsApp. The researcher has taken efforts to make it viral as far as possible to cover a wide number of farmers, entrepreneurs, scientists, rural youths and farm women. The link was opened from 17/04/2020 to 20/05/2020 so that an individual can fill their responses. Total of 92 respondents have given a reply to the google survey form and collected data was extracted by the researchers.

Data were analysed in SPSS software (V20.0) and frequency, percentage, the mean and standard deviation was worked out.

### 3. Results and Discussion

The findings of the study under different head such as the impact of COVID 19 lockdown on agriculture, livestock, fisheries, tourism and psychological wellbeing are presented

hereunder.

#### 3.1 Impact on Agriculture

The data presented in Table 1 indicates that Covid-19 lockdown was impacted across the agriculture sector but the major impact was found on demand and supply chain of agricultural especially horticultural commodities.

**Table 1:** Impact of COVID 19 Pandemic Lockdown on Agriculture

Sr. No	Item	Responses (N=92)					Mean Score	SD
		Not at all	To a marginal extent	Can't tell	To a large extent	To an extreme extent		
1.	Mango operations affected by lockdown;							
	Harvesting	7 (7.6)	18 (19.6)	17 (18.5)	46 (50.0)	4 (4.3)	3.23	1.06
	Processing	7 (7.6)	31 (33.7)	45 (48.9)	9 (9.8)	00 (0.00)	2.60	0.76
	Marketing	7 (7.9)	10 (10.9)	31 (33.7)	44 (47.8)	00 (0.00)	3.21	0.92
	Increased pricing	15 (16.3)	10 (10.9)	16 (17.4)	45 (48.9)	6 (6.5)	3.18	1.22
2.	Cashew operations affected by lockdown;							
	Harvesting	7 (7.6)	19 (20.7)	9 (9.8)	47 (51.1)	10 (10.9)	3.36	1.08
	Processing	3 (3.3)	26 (28.3)	21 (22.8)	36 (39.1)	6 (6.5)	3.17	1.02
	Marketing	4 (4.3)	21 (22.8)	15 (16.3)	42 (45.7)	10 (10.9)	3.35	1.08
	Increased pricing	15 (16.3)	11 (12.0)	9 (9.8)	47 (51.1)	10 (10.9)	3.28	1.2
3.	Coconut operations affected by lockdown;							
	Harvesting	7 (7.6)	33 (35.9)	10 (10.9)	36 (39.1)	6 (6.5)	3.01	1.15
	Processing	18 (19.6)	20 (21.7)	44 (47.8)	10 (10.9)	00 (0.00)	2.50	0.93
	Marketing	8 (8.7)	35 (38.0)	15 (16.3)	32 (34.8)	2 (2.2)	2.83	1.07
	Increased pricing	8 (8.7)	26 (28.3)	6 (6.5)	46 (50.0)	6 (6.5)	3.17	1.17
4.	Banana operations affected by lockdown;							
	Planting material	8 (8.7)	38 (41.3)	30 (32.6)	16 (17.4)	00 (0.00)	2.58	0.87
	Intercultural Operations	7 (7.6)	41 (44.6)	26 (28.3)	18 (19.6)	00 (0.00)	2.59	0.89
	Harvesting	7 (7.6)	43 (46.7)	33 (35.9)	9 (9.8)	00 (0.00)	2.47	0.77
	Marketing	4 (4.3)	43 (46.7)	26 (28.3)	19 (20.7)	00 (0.00)	2.65	0.85
	Increased pricing	6 (6.5)	44 (47.8)	26 (28.3)	16 (17.4)	00 (0.00)	2.56	0.85
5.	Vegetable operations affected by lockdown;							
	Seed/Seedlings	00 (0.00)	21 (22.8)	11 (12.0)	29 (31.5)	31 (33.7)	3.76	1.15
	Intercultural Operations	00 (0.00)	28 (30.4)	14 (15.2)	38 (41.3)	12 (13.0)	3.36	1.05
	Harvesting	00 (0.00)	21 (22.8)	14 (15.2)	44 (47.8)	13 (14.1)	3.53	0.99
	Marketing	00 (0.00)	18 (19.6)	14 (15.2)	45 (48.9)	15 (16.3)	3.6	0.98
	Increased pricing	4 (4.3)	14 (15.2)	14 (15.2)	47 (51.1)	13 (14.1)	3.55	1.05

Spices operations affected by lockdown;								
6.	Intercultural Operations	20 (21.7)	38 (41.3)	27 (29.3)	3 (3.3)	4 (4.3)	2.27	0.98
	Harvesting	23 (25.0)	35 (38.0)	27 (29.3)	3 (3.3)	4 (4.3)	2.23	1.00
	Marketing	18 (19.6)	33 (35.9)	34 (37.0)	3 (3.3)	4 (4.3)	2.36	0.98
	Increased pricing	22 (23.9)	32 (34.8)	31 (33.7)	3 (3.3)	4 (4.3)	2.29	1.01
Cowpea operations affected by lockdown;								
7.	Harvesting	20 (21.7)	39 (42.4)	30 (32.6)	3 (3.3)	00 (0.00)	2.17	0.80
	Marketing	15 (16.3)	38 (41.3)	35 (38.0)	4 (4.3)	00 (0.00)	2.30	0.79
	Increased pricing	20 (21.7)	35 (38.0)	30 (32.6)	7 (7.6)	00 (0.00)	2.26	0.88
8.	An adverse effect of COVID 19 lockdown was seen on the marketing of watermelon	8 (8.7)	37 (40.2)	23 (25.0)	20 (21.7)	4 (4.3)	2.72	1.03
9.	Prices of locally available vegetable are increased suddenly	8 (8.7)	7 (7.6)	10 (10.9)	39 (42.4)	28 (30.4)	3.78	1.21
10.	There was a huge shortage of agricultural inputs in the market	4 (4.3)	14 (15.2)	3 (3.3)	34 (37.7)	37 (40.2)	3.93	1.20
11.	Transportation of farm produce is affected during a lockdown	00 (0.00)	31 (33.7)	4 (4.3)	42 (45.7)	15 (16.3)	3.44	1.12
12.	Locking of district border has led to a rise in prices of agricultural commodity	00 (0.00)	7 (7.6)	7 (7.6)	63 (68.5)	15 (16.3)	3.93	0.73
13.	There was a shortage of hiring of agricultural machinery	15 (16.3)	7 (7.6)	49 (53.3)	7 (7.6)	14 (15.2)	2.97	1.19
14.	A problem in the repair of agricultural tools and implement is faced by farmers	16 (17.4)	11 (12.0)	44 (47.8)	11 (12.0)	10 (10.9)	2.86	1.16

Majority of the respondents (68.5%) reported there was a rise in prices of agricultural commodities (MS=3.93) and a huge shortage of agricultural inputs in the market (MS=3.93) due to locking of district border. Similarly, there was a large impact on the availability of vegetables in the market. A sudden increase in the prices of locally available vegetable (42.4%) and lockdown affected transportation of farm produce was reported by 45.7 percent of the sample. The mean score for both the item was 3.78 and 3.44, respectively. The mango, cashew and coconut are principal crops grown in the Goa. However, these crops were affected the most as different critical operations of these crops were synchronized with the lockdown period. More than half of the respondents were reported that great impact of Covid-19 lockdown on the harvesting (50.0%) and marketing (47.8%) of 'high value-high perishable' mango during 'March to May'. Mango is climate-sensitive which requires timely harvesting, grading, packaging, and marketing. Interrupted rail connectivity was affected the transportation mango from other regions. This resulted increased the prices of mango (48.9%) to a large extent was observed in Goa. Similarly, the large impact was observed on harvesting (51.1%), marketing (45.7%) and processing (39.1%) of cashew during the lockdown. The prices of cashew in the market were also increased to a large extent was said by more than half (51.1%) of the respondents. The highest mean score of 3.36 and 3.35 was found in case of harvesting and marketing of cashew, respectively. Coconut was another important horticultural crop

in Goa. The COVID 19 lockdown affected coconut to a large extent. The major impact was found on harvesting and pricing 51.1 percent each, and marketing (45.7%) during the lockdown. Addition to this, 39.1 percent of the sampled respondents reported the processing of coconut was affected to a great extent. The highest mean score of more than >3 was found across all operations of the coconut such as harvesting, processing, marketing, and increased pricing during the lockdown. The large impact was found on availability of seeds and seedlings of vegetables (31.5%), intercultural operations (41.3%), harvesting (47.8%) and marketing of vegetables was reported by 48.9 percent of the respondents. This resulted increased the prices of vegetables in the local market was said by the 51.1 percent of the sample respondents. However, the present study reported a little impact of COVID 19 lockdown on various operations of the spices and cowpea in Goa. The restrictions on movement disrupted the supply chains, hampering the uninterrupted flow of inputs for and outputs of agricultural activities (Barrett, 2020; Carberry and Padhee, 2020). Supply of perishable commodities were affected more, challenging the food and nutritional security of the vulnerable sections of the society (Harris et al., 2020).

### 3.2 Impact on Animal Husbandry and Dairy

There was also a great impact of Covid-19 pandemic on animal husbandry and dairy sector. The data were collected, analysed and presented in Table 2.

**Table 2:** Impact of COVID 19 Pandemic Lockdown on Animal Husbandry and Dairy

Sr. No	Item	Responses (N=92)					Mean Score	SD
		Not at all	To a marginal extent	Can't tell	To a large extent	To an extreme extent		
1.	Wastage of milk increased during COVID 19 lockdown	46 (50.0)	27 (29.3)	11 (12.0)	8 (8.7)	00 (0.0)	1.79	0.96
2.	The demand for milk has gone down during lockdown	65 (70.7)	12 (13.0)	00 (0.00)	11 (12.0)	4 (4.3)	1.66	1.21
3.	The prices of milk have fallen in the villages	69 (75.0)	16 (17.4)	3 (3.3)	4 (4.3)	00 (0.00)	1.36	0.75
4.	<b>Supply of the following feed and concentrate for animals is disrupted</b>							
	Green Fodder	3 (3.3)	43 (46.7)	11 (12.0)	31 (33.7)	4 (4.3)	2.89	1.05
	Silage	00 (0.00)	46 (50.0)	17 (18.5)	25 (27.2)	4 (4.3)	2.65	0.96
	Concentrate feed	3 (3.3)	37 (40.2)	17 (18.5)	31 (33.7)	4 (4.3)	2.95	1.02
	Dry fodder	3 (3.3)	43 (46.7)	17 (18.5)	25 (27.2)	4 (4.3)	2.82	1.01
5.	Milk supply shutdown due to locking of interstate border	12 (13.0)	26 (28.3)	28 (30.4)	22 (23.9)	4 (4.3)	2.78	1.08
6.	The collapse in the sale of poultry products due to rumours spread	4 (4.3)	13 (14.1)	17 (18.5)	43 (46.7)	15 (16.3)	3.56	1.06
7.	Shortage of poultry feed is seen during the lockdown	00 (0.00)	22 (23.9)	16 (17.4)	40 (43.5)	14 (15.2)	3.50	1.02
8.	Demand for egg decreased during the lockdown	12 (13.0)	26 (28.3)	21 (22.8)	22 (23.9)	11 (12.0)	2.93	1.23
9.	Distress sale of poultry birds is seen during the lockdown	12 (13.0)	21 (22.8)	34 (37.0)	15 (16.3)	10 (10.9)	2.89	1.62
10.	Farmers are facing problem in getting chick	7 (7.6)	32 (34.8)	12 (13.0)	30 (32.6)	11 (12.0)	3.06	1.21
11.	The demand for mutton increased during the lockdown	12 (13.0)	40 (43.5)	12 (13.0)	22 (23.9)	6 (6.5)	2.67	1.16
12.	Demand for pig meat increased	17 (18.5)	39 (42.4)	15 (16.3)	17 (18.5)	4 (4.3)	2.47	1.12
13.	Supply of veterinary medicine disrupted	5 (5.4)	52 (56.5)	15 (16.3)	6 (6.5)	14 (15.2)	2.69	1.17
14.	Farmers are facing problems in getting AI services	10 (10.9)	23 (25.0)	38 (41.3)	10 (10.9)	11 (12.0)	2.88	1.12
15.	Farmers are facing problem in repair and maintenance of dairy equipment	9 (9.8)	37 (40.2)	31 (33.7)	7 (7.6)	8 (8.7)	2.65	1.05
16.	Veterinary services are available to the farmers	6 (6.5)	54 (58.7)	21 (22.8)	4 (4.3)	7 (7.6)	2.47	0.96

At the initial stage, Covid-19 pandemic made an extremely worst impact on the livestock sector especially the poultry and meat industry. In this study, 46.7 percent of the respondents reported a large and 16.3 percent reported an extreme downfall in the sale of poultry products such as broiler chicken due to rumours spread about Corona through social media (MS=3.56). Demand for an egg also decreased during lockdown (MS=2.93). Therefore, distress sale of poultry birds by most of the farmers was seen during lockdown (MS=2.89). There was very marginal demand for mutton and pig meat were reported by the 43.5 and 42.4 percent of the respondents. This means the poultry and meat industry was affected the most due to this pandemic. The livestock farmers in Goa were faced lots of problems viz. shortage of poultry feed due to locking of the inter-state border (MS=3.50), the problem in getting chicks (MS=3.06), problems in getting AI services (MS=2.88) and problem in repair and maintenance of dairy equipment (MS=2.65). Majority of the respondents were said that

marginal impact of lockdown on the supply of veterinary medicine (56.7) and veterinary services (58.7%) to the farmers. The supply of feed and concentrate for animals such as green fodder (MS=2.89), concentrate (MS=2.95), dry fodder (MS=2.82) and silage (MS=2.65) was disrupted during the lockdown period. Similarly, there was a little interruption in milk supply shutdown due to locking of the interstate border (MS=2.78) during the lockdown. The pandemic disrupts demand and supply of food impacting the global supply chain; while droughts tend to be localized affecting only the associated sector or stakeholders (Mishra et al., 2021) [3].

### 3.3 Impact on Fisheries

The fishery is one of the important sectors as Goa is well known for seafood. COVID 19 pandemic fish industry significantly. The data on the impact of COVID lockdown on the fishery sector was collected, analysed and presented hereunder in Table 3.

**Table 3:** Impact of COVID 19 Pandemic Lockdown on Fisheries

Sr. No	Item	Responses (N=92)					Mean Score	SD
		Not at all	To a marginal extent	Can't tell	To a large extent	To an extreme extent		
1.	Demand for fish is decreased due to rumour spreads	00 (0.00)	8 (8.7)	7 (7.6)	55 (59.8)	22 (23.9)	3.98	0.81
2.	Fish procurement is affected due to lockdown	4 (4.3)	00 (0.00)	7 (7.6)	60 (65.2)	21 (22.8)	4.02	0.83
3.	Fish prices have increased during the lockdown	00 (0.00)	2 (2.2)	11 (12.0)	54 (58.7)	25 (27.2)	4.10	0.68
4.	There is fish wastage due to shutdown of processing units and fish selling area	16 (17.4)	36 (39.1)	15 (16.3)	11 (12.0)	14 (15.2)	2.68	1.31
5.	Stopped Cross border transportation interrupted fish supply chain	8 (8.7)	16 (17.4)	37 (40.2)	17 (18.5)	14 (15.2)	3.14	1.14

The study reported that COVID 19 made the worst impact on increased fish prices was reported by the 58.7 percent of the respondents and majority (65.2%) of the sample said fish procurement (MS=4.02) was affected to a large extent. Covid-19 lockdown made an extreme impact on inter-state transportation of fish and, closing of a weekly market and restricted cross-border transportation has increased the cost of fishes. Uncertainty imposed by the crisis, restrictions on inter-state movements and absence of transportation disrupted the food supply chains and spiked food prices (Kalsi et al., 2020)<sup>[20]</sup>. Further, 59.8 percent of the respondent said that demand for fish was also decreased to a large extent due to rumour

spreads about Coronavirus (MS=3.98). Besides, fish processing was also affected to some extent in Goa. This resulted in there was fish wastage due to shutdown of processing units and fish selling area (MS=2.68). A shutdown of the weekly market threatens the livelihood of local fish vendors.

### 3.4 Impact on Agricultural Labours

The wage labours were the most vulnerable segment of the Indian population to Covid-19 pandemic. Therefore, data on the impact of Covid-19 lockdown on agricultural labours were collected, analysed and presented in Table 4.

**Table 4:** Impact of COVID 19 Pandemic Lockdown on Agricultural Labours

Sr. No	Item	Responses (N=92)					Mean Score	SD
		Not at all	To a marginal extent	Can't tell	To a large extent	To an extreme extent		
1.	The intensive labour shortage is seen due lockdown	12 (13.0)	00 (0.00)	4 (4.3)	31 (33.7)	45 (48.9)	4.05	1.31
2.	Local labours are demanding high wages	8 (8.7)	15 (16.3)	00 (0.00)	36 (39.1)	33 (35.9)	3.77	1.32
3.	Lack of skilled labour affected specialized activities in fruit orchards, nursery and processing units	00 (0.00)	16 (17.4)	7 (7.6)	47 (51.1)	22 (23.9)	3.81	0.99
4.	Reverse migration of Agriculture wage labours to their native is seen during the lockdown	4 (4.3)	6 (6.5)	8 (8.7)	38 (41.3)	36 (39.1)	4.04	1.06
5.	Procurement operation has been affected in mandis	4 (4.3)	13 (14.1)	29 (31.5)	35 (38.0)	11 (12.0)	3.39	1.01
6.	The livelihood of seasonal migrant labours has been affected the most	8 (8.7)	00 (0.00)	8 (8.7)	13 (14.1)	63 (68.5)	4.33	1.20

The data of present study indicates that large majority (68.5%) of the respondents were reported livelihood of seasonal migrant labours has been affected extremely worst (MS=4.33) and 39.1 percent said that reverse migration of agriculture wage labours to their native was seen during lockdown (MS=4.04). The World Bank (2020) has estimated that Covid-19 crisis has impacted the livelihoods of nearly 40 million internal migrants in India. (MS=4.05). Intensive labour shortage (MS=4.05) and lack of skilled labour affected specialized activities in fruit orchards, nursery and processing units (MS=3.81) was seen due to lockdown. This leads to the suffering of certain

agricultural operations and interruption of demand and supply chain management. There was high wage demand by local labours to perform critical agricultural and allied activities was reported by 35.9 percent of the sampled respondents.

#### 3.4.1 Impact on Tourism

Goa is globally well known for the tourism sector, especially during winter and summer season. Goa attracts tourist from nationally as well as internationally. Therefore, tourism act as the main pillar of the Goan economy. March-May is a very critical period for tourism base-economic activities.



**Table 5:** Impact of COVID 19 Pandemic Lockdown on Tourism

Sr. No	Item	Responses (N=92)					Mean Score	SD
		Not at all	To a marginal extent	Can't tell	To a large extent	To an extreme extent		
1.	Restrictions on tourism affected the rural economy of Goa	00 (0.00)	11 (12.0)	6 (6.5)	37 (40.2)	38 (41.3)	4.10	0.97
2.	Restrictions on the selling of agriculture commodities on-road and beaches affected local vendors	00 (0.00)	8 (8.7)	8 (8.7)	57 (62.0)	19 (20.7)	3.94	0.80
3.	Ban on tourism affected livelihood of rural handicraft craftsman	00 (0.00)	12 (13.0)	4 (4.3)	43 (46.7)	33 (35.9)	4.05	0.96
4.	Ban on tourism affect the marketing of value-added agricultural products	00 (0.00)	12 (13.0)	00 (0.00)	49 (53.3)	31 (33.7)	4.07	0.92
5.	Spoilage of vegetables and fruits due to the shutdown of the hotel and food industry	13 (14.1)	10 (10.9)	11 (12.0)	38 (41.3)	20 (21.7)	3.45	1.32
6.	Closing of restaurant and hotel has led to unemployment of rural youth	4 (4.3)	4 (4.3)	00 (0.00)	46 (50.0)	38 (41.3)	4.19	0.97
7.	A decline in income was seen due to the closing of the food industry	00 (0.00)	9 (9.8)	7 (7.6)	51 (55.4)	25 (27.2)	4.00	0.97

This study indicated an extremely worst impact of COVID 19 pandemic on tourism base activities in Goa. A huge majority of the respondents said that there was an extreme impact of lockdown on the restaurant and hotel industry (MS=4.19). This led to large unemployment of rural youth was reported that more than fifty percent of the sample. Most of the respondents (41.3%) reported restrictions on tourism affected the rural economy of Goa to an extreme extent (MS=4.10), a ban on tourism affected marketing of value-added agricultural products (MS=4.07) and livelihood of rural handicraft craftsman (MS=4.05). Further, 55.4 percent of the respondents said that there was a large decline in per capita income due to closing of the food industry (MS=4.0) and spoilage of vegetables and fruits due to shutdown of the hotel and food industry (MS=3.45). The economic activity of tourism centres, restaurants and hotel industry, fish industry, roadside fruit sellers as well as small vendors and water-sport activities on the seashore were completely shut down as there was not a

single tourist in the state. Never before, people have experienced such kind of extreme setback to this tourism base economic industry in the Goa.

**3.4.2 Impact on Psychological Wellbeing**

The COVID-19 pandemic has posed unprecedented challenges to the mental wellbeing of peoples in the society. The implementation of a nationwide lockdown disrupts the day-to-day lives of the public and social isolation measures of Covid-19 have had a profound impact on the psychological wellbeing of individuals across society. Therefore, data on the impact of Covid-19 pandemic on the psychological wellbeing of the different agricultural stakeholders were studied. The Likert summated rating techniques were used to develop instruments to measure the impact on psychological wellbeing and responses were rated on five continuums. The collected data was analysed and presented in Table 6.

**Table 6:** Impact of COVID 19 Pandemic Lockdown on Psychological Wellbeing

Sr. No	Item	Responses (N=92)					Mean Score	SD	Rank
		Strongly Disagree	Disagree	Undecided	Agree	Strongly Agree			
1.	I have a fear of losing agricultural production during the lockdown	11 (12.0)	12 (13.0)	7 (7.6)	51 (55.4)	11 (12.0)	3.42	1.21	
2.	I am frustrated due to stay at home	16 (17.4)	35 (38.0)	14 (15.2)	19 (20.7)	8 (8.7)	2.65	1.23	
3.	I have a fear of financial loss in agriculture during Covid-19 pandemic	00 (0.00)	6 (6.5)	14 (15.2)	53 (57.6)	19 (20.7)	3.92	0.78	
4.	I am worried regarding the availability of inputs for Kharif season	00 (0.00)	23 (25.0)	11 (12.0)	48 (52.2)	10 (10.9)	3.48	0.98	
5.	I am worried about meeting the financial demand of my family in future	00 (0.00)	10 (10.9)	9 (9.8)	53 (57.6)	20 (21.7)	3.90	0.86	
6.	Whenever I sneeze, cough or feel a little rise in body temperature I doubt myself for infection of coronavirus	4 (4.3)	63 (68.5)	11 (12.0)	11 (12.0)	3 (3.3)	2.41	0.87	
7.	I worry about marketing and selling of my agricultural produce	00 (0.00)	20 (21.7)	14 (15.2)	43 (46.7)	15 (16.3)	3.57	1.00	
8.	I am burden due to non-payment of loans	40 (43.5)	17 (18.5)	3 (3.3)	22 (23.9)	10 (10.9)	2.40	1.50	
9.	I am restless due to uncertainty of ending this pandemic	4 (4.3)	8 (8.7)	5 (5.4)	63 (68.5)	12 (13.0)	3.77	0.93	
10.	I am restless when I see masses of return migration	4 (4.3)	14 (15.2)	7 (7.6)	51 (55.4)	16 (17.4)	3.66	1.07	
11.	I doubt everyone around me is COVID suspected	26 (28.3)	42 (45.7)	8 (8.7)	11 (12.0)	5 (5.4)	2.20	1.14	
12.	I am restless when I see someone is wandering without taking COVID precautions	4 (4.3)	53 (57.6)	14 (15.2)	17 (18.5)	4 (4.3)	2.60	0.98	

It was found that huge majority (57.6%) of the respondents were agreed with 'I have a fear of financial loss in agriculture during Covid-19 pandemic' (MS=3.92) and same percent were also agreed to statement that 'I am worried about meeting financial demand of my family in future' (MS=3.90). Further, a majority (68.5%) of the respondents were strongly agreed that 'I am restless due to uncertainty of ending this pandemic' (MS=3.77) and a large percent (55.4%) of the sample expressed that 'I am restless when I see masses of return migration' (MS=3.66). It was found that 57.6 and 55.4 percent of the respondents have a strong fear of financial loss and fear of losing agricultural production is due to COVID 19 pandemic, respectively. More than half of the respondents agreed that they were worried regarding the availability of inputs for Kharif season (52.2%) and worried about meeting financial demand of their family in future (57.6%). Some respondents also have a burden due to non-payment of loans (MS=2.40); they became restless when they see someone is wandering without taking COVID precautions (MS=2.60) and have a doubt that everyone around them is COVID suspected (MS=2.20). In all, we can safely say that Covid-19 pandemic made an adverse effect on psychological wellbeing as many of the respondents reported fear, anxiety, frustration, loneliness, and irritation.

#### 4. Conclusions and future directions

The study revealed that COVID 19 pandemic made an adverse impact across the agriculture and allied sectors such as horticulture, livestock, dairy and fishery sector. It made an extremely severe impact on the livelihood of wage labours and psychological wellbeing of people. The major impact was found on the demand-supply chain of perishable commodities viz., fruits and vegetables and fish. Specifically, the study pointed out that COVID 19 pandemic made an adverse impact on mango, cashew, coconut, and banana during a lockdown and therefore, farmers have earned a very marginal profit. In Goa, COVID 19 pandemic has affected the tourism sector severely. This resulted in an economic breakdown in the state. The economic activity of tourism areas, restaurants and hotel industry, fish industry, roadside fruit sellers as well as small vendors and water-sport activities on the seashore were completely shut down as there was not a single tourist in the region. COVID 19 pandemic made an extremely worst impact on fish, poultry and meat industry. The study reported an extreme downfall in the sale of broiler chicken, eggs, pig meat and seafood due to rumours spread about Corona at the initial stage. The reason was a misconception that coronavirus will spread through chicken, mutton and seafood as its outbreak was begun from seafood and meat market of Wuhan- a city in the Hubei province of China. The wage labours were the most vulnerable segment to COVID 19 pandemic. This pandemic has not only threatened the economic conditions of labours but also enforced them for distress return migration. The study reported an adverse impact of pandemic lockdown on the livelihood of daily wage labours. Similarly, the World Bank (2020) also estimated that COVID 19 crisis has impacted the livelihoods of nearly 40 million internal migrants in India. A nationwide lockdown and social isolation measures of COVID 19 have had a profound adverse effect on the psychological and mental wellbeing of individuals across society. Many of the respondents reported loneliness, frustration, irritation, depression and anxiety and fear of financial loss. In order to protect and safeguard the livelihoods of millions of people associated with the agricultural system, the state should

increase spending on social safety nets immediately and take up other short- and medium-term strategies. Raising revenue by offloading excess buffer stock and increased credit to the agriculture sector should be the top priority for post-pandemic economy restoration.

#### 5. References

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