Revised Research Article

A Tool to Measure the Resilience Espoused by Agripreneurs on COVID-19 Pandemic

ABSTRACT

The unpredicted COVID-19 pandemic devastatingly challenged the business life of agripreneurs. Agripreneurs are the entrepreneurs holding their main business in agriculture or agriculture allied. The pandemic affected millions of businesses economically and shut down their production chains. It is the era of advocating resilience to make a transition and to sustain the post-COVID. The purpose of the research is to construct a composite pandemic resilience index to measure the resilience followed by agripreneurs during the COVID-19 pandemic. The index was developed by reviewing the available literature and judge's relevancy ratings. A relevancy score of more than 0.75 was selected and the Pandemic Resilience Index (PRI) was finalized yielding six indicators viz., pandemic response, support and assistance, agripreneurial skills, pandemic risk prevention and mitigation, business reconstruction, and pandemic preparedness. The PRI also had high reliability (α=0.838). The content validity of the index was 3.37, which is higher than 2.50, indicating the index is valid. The Pandemic Resilience index will act as a valid instrument to identify different resilient strategies adopted by agripreneurs to regulate and rebuild the business at the toughest times of the pandemic. PRI will also help us to understand how an agripreneur has to be resilient in order to cope with the unforeseeable occurrences of upcoming pandemics.

***Keywords**: COVID-19, Impact, Agripreneurs, Business, Pandemic Resilience Index*

1. INTRODUCTION

The word 'PANDEMIC' shook the minds of the whole world. The World Health Organisation (WHO) declared Coronavirus a global pandemic on March 11, 2020 [1]. The virus disturbed the agricultural food systems and industries endangering the livelihood of workers [2]. The government's implications to prevent the spread of COVID-19 include locking down national borders, quarantining regions or cities, imposing curfews, restriction in people's movement, physical distancing, social distancing, banning events and gatherings, and also restricting the ways in which businesses could operate [3]. This COVID-19 pandemic affected millions of business people and entrepreneurs around the world [4] and led to the closure of smaller and financially vulnerable business institutions [5]. The lower level of preparedness, higher vulnerability, reliance on government and institutions, and

increased psychological and financial impact on business owners might be the reasons for start-ups to be hit hard by any crisis [6].

The survival of entrepreneurs has always been at stake with various confrontations [7]. The emergence of crises provokes the need to identify alternate solutions to mitigate and cope with the damages and thus the entrepreneur has to build resilience to overcome the crisis. Advocating Protection Motivation Theory and building resilience is the immediate coping strategy to sustain life in the new normal. Resilience is the ability to deal with the unknown and unimaginable shocks and stresses [8]. Resilience is a key trait of an entrepreneur [9]. The entrepreneurial skills structure them to be better risk takers [10] and an entrepreneur must learn from their experiences to adapt to diverse changes [11]. The entrepreneur during a crisis must act more dynamically and innovatively by adopting the defined skills like proactivity, identification of opportunities, innovation, risk management, and resilience [12].

Entrepreneurial resilience begins with building the mentality to accept change and avoid seeing crises as insurmountable [13]. The effective business response to exogenous shocks creates resilience [14]. Some businesses responded to the pandemic with business renewal and by introducing new products and processes [15]. Certain business companies shifted their business model to online selling platforms [16]. In the post-COVID world, agile and resilient businesses will only be able to find opportunities in the upheaval that the pandemic has caused globally [17].

In this study, a tool is developed to measure the resilience espoused by individual agripreneur in upholding their business and enterprise from the consequences of the unforeseen pandemic of COVID-19. The Pandemic Resilience Index (PRI) implies answers to the questions like how an agripreneur responded to the sudden surge of the pandemic and which support systems helped him to restore the business. It will help us to identify the agripreneurial skills which favoured them in building resilience and what were the coping strategies adopted by them to leverage the effects of a pandemic. PRI will also indicate how the resilient measures have shifted or reconstructed their business to the new normal and how well the agripreneurs are prepared to meet the upcoming pandemics or exogenous shocks.

2. METHODOLOGY

An index is defined as a technique of totaling or reducing a single composite series of data on several distinct, but related variables expressed in different units of measurement [18]. The indicators of the pandemic resilience index were collected by reviewing the available literature on the pillars of resilience, disaster resilience index, entrepreneurship,

and resilience on COVID-19. With the literature review, the possible six indicators that could measure the resilience followed by the agripreneurs were identified. The measurement of pandemic resilience was measured through a composite index procedure followed by Hooda [19]. For the relevancy rating of the indicators 60 judges were selected and among them, 42 judges responded with their degree of relevancy.

2.1 Establishing Pandemic Resilience Index

2.1.1 Selection of indicators and sub-indicators

A list of six indicators pertaining to measuring the resilience espoused by agripreneurs during the pandemic times was identified. The six identified indicators were pandemic response, support and assistance provided during the pandemic, agripreneurial skills advocated to cope with the situation, pandemic risk prevention and mitigation, business reconstruction, and pandemic preparedness. For each indicator, a list of sub-indicators was identified through literature review and discussion with experts. The selected six indicators and their sub-indicators were subjected to judges' opinions.

2.2.2 Relevancy Rating of indicators

The judges were requested to indicate their response to the indicators on a four-point continuum namely, 'Most relevant', 'Relevant', 'Somewhat relevant,' and 'Not relevant'. The scores assigned to the continuums were 4, 3, 2, and 1. The judges' responses were collected and for each indicator, the Relevancy Weightage (RW) was calculated using the given formula.

$$\boldsymbol{Relevancy\ Weightage\ (RW)} = \frac{(\boldsymbol{MR} * \mathbf{4}) + (\boldsymbol{R} * \mathbf{3}) + (\boldsymbol{SR} * \mathbf{2}) + (\boldsymbol{NR} * \mathbf{1})}{\boldsymbol{Maximum\ Possible\ Score}}$$

Where,

MR- Most relevant, **R**- Relevant, **SR**- Somewhat relevant, and **N**- Not relevant

The indicators having a relevancy weightage score of more than 0.75 were selected for the pandemic resilience index and given in Table 1.

Table1. List of selected pandemic resilience indicators with their relevancy weightage

S. No.	Resilience Indicators	Relevancy Weightage
1.	Pandemic response	0.92
2.	Support and assistance	0.90
3.	Agripreneurial skills	0.89
4.	Pandemic risk prevention and mitigation	0.95

5.	Business reconstruction	0.93
6.	Pandemic preparedness	0.91

3. RESULTS AND DISCUSSION

3.1 Quantification of indicators

To evolve a composite Pandemic Resilience Index (PRI) and to derive meaningful conclusions, a separate index was developed for each indicator. The detailed procedure for quantification and operationalization of each indicator is furnished below.

3.2 Operationalisation and administration of indicators

1. Pandemic Response Index (PRESI)

It refers to the reaction to the onset of the COVID-19 pandemic with consideration to the immediate assistance taken by agripreneurs for business survival. For measuring the pandemic response of the agripreneurs, ten sub-indicators were selected. The pandemic response index was worked out by using the following formula.

$$PRESI = \frac{SPRESxi}{TPRESyi} * 100$$

Where,

SPRESxi = Secured score by an individual on pandemic response

TPRESyi = Total possible score for an individual on pandemic response

Table 2. List of sub indicators for pandemic response with their relevancy weightage

S. No.	Pandemic Response	Relevancy Weightage
1.	Reduced the production hours in enterprise	0.83
2.	Cut down the manpower	0.81
3.	Adapted to frugal resource management	0.82
4.	Secured with the alternate supply of raw materials	0.82
5.	Avoided face-to-face interaction among employees	0.81
6.	Made use of the lockdown period in identifying possible ways to improve	0.83
7.	Emotional support from family	0.83
8.	Provided prompt assistance to employees	0.80
9.	Created peer group support among agripreneurs to handle a crisis situation	0.80
10.	Looked upon alternative financial forms	0.78

2. Support and Assistance Index (SAI)

It refers to both monetary and emotional support provided to withstand the pandemic situation. The support of family, peers, and government during tough pandemic times are significant in ensuring resilience. The identified indicators of support and assistance were: i) Personal assistance, ii) Family assistance, iii) Government support, and iv) Social support. The support and assistance index is worked out by using the following formula.

$$SAI = \frac{SSAxi}{TSAyi} * 100$$

Where,

SSAIxi = Secured score by an individual on support and assistance

TSAyi = Total possible score for an individual on support and assistance

Table 3. List of sub indicators for support and assistance with their relevancy weightage

S. No.	Support and Assistance	Relevancy Weightage
	I. Personal Assistance	
1.	Procured loans from banks or other sources	0.84
2.	Used the past savings	0.84
3.	Sustained with the multiple income sources	0.82
	II. Family Assistance	
1.	Monetary support from family members	0.88
2.	Family properties	0.84
	III. Government Support	
1.	Incentives	0.82
2.	Loan waiver	0.86
3.	New policy instruments	0.82
	IV. Social Support	
1.	Support from employees	0.82
2.	Local and international contacts	0.77

3. Agripreneurial Skill Index (ASI)

It refers to the important agripreneurial skills possessed by them, which helped them to cope up with the COVID-19 pandemic crisis. The survival skills essential for agripreneurs to survive in their business and personal life during the pandemic and like times could be identified using the ten selected skills. The agripreneurial skill index worked out by using the following formula.

$$ASI = \frac{SASxi}{TASyi} * 100$$

Where,

SASxi = Secured score by an individual on agripreneurial skill

TASyi = Total possible score for an individual on agripreneurial skill

Table 4. List of sub indicators for agripreneurial skills with their relevancy weightage

S. No.	Agripreneurial Skills	Relevancy Weightage
1.	Pro-activeness	0.85
2.	Perseverance	0.85
3.	Self-confident	0.89
4.	Innovative	0.83
5.	Self-efficacy	0.81
6.	Risk-taking	0.95
7.	Flexibility	0.85
8.	Motivation	0.93
9.	Adaptability	0.94
10.	Hard working	0.89

4. Pandemic Risk Prevention and Mitigation (PRPMI)

It was operationalised as the ability of agripreneurs to manage and reduce the threats posed by the COVID-19 pandemic. The pandemic risk prevention and mitigation index worked out by using the following formula.

$$PRPMI = \frac{SPRPMxi}{TPRPMyi} * 100$$

Where,

SPRPMxi = Secured score by an individual on pandemic risk prevention and mitigation

TPRPMyi = Total possible score for an individual on pandemic risk prevention and mitigation

Table 5. List of sub indicators for pandemic risk prevention and mitigation with their relevancy weightage

S. No.	Pandemic Risk Prevention and Mitigation	Relevancy Weightage
1.	Took immediate action to address challenges	0.88
2.	Prepared a strategic management plan	0.91
3.	Planned in a better way	0.87
4.	Took control over the resources	0.83
5.	Followed the COVID protocols in business	0.83
6.	Reduced the employee wages	0.81
7.	Maintained limited number of staffs	0.78
8.	Promoted a safe working environment	0.88

9.	Identified different alternatives in product delivery	0.81

5. Business Reconstruction Index (BRI)

It was operationalised as the new strategies followed by agripreneurs to reinstate their business in new normal situation. The business reconstruction index worked out by using the following formula.

$$BRI = \frac{SBRxi}{TBRyi} * 100$$

Where,

SBRxi = Secured score by an individual on business reconstruction

TBRyi = Total possible score for an individual on business reconstruction

Table 6. List of sub indicators for business reconstruction with their relevancy weightage

S. No.	Business Reconstruction	Relevancy Weightage
1.	Resumed the normal business routine	0.82
2.	Discovered new marketing and management strategies	0.93
3.	Established Tie ups with online marketing portal	0.92
4.	No contact deliveries were made	0.77
5.	Monitored daily health of staffs	0.81
6.	Assured with the quality of products and services	0.86
7.	Established new business collaborations	0.81
8.	Increased the product promotion and advertisements	0.82
9.	Conducted frequent research and survey on consumer expectations	0.83
10.	Launched new products to meet changing consumer demands	0.79

6. Pandemic Preparedness Index

It was operationalised as the degree to how well agripreneurs are prepared to meet out the upcoming pandemic. The pandemic preparedness index worked out by using the following formula.

$$PPI = \frac{SPPxi}{TPPyi} * 100$$

Where,

SPPxi = Secured score by an individual on pandemic preparedness

TPPyi = Total possible score for an individual on pandemic preparedness

Table 7. List of sub indicators for business reconstruction with their relevancy weightage

S. No.	Pandemic Preparedness	Relevancy Weightage
1.	Having a backup plan	0.90
2.	To seek help with intermediaries	0.80
3.	Relying on government support and policies	0.80
4.	Trying to save for future expenses	0.86
5.	Leveraging the experiences of pandemic and understanding its severity	0.83
6.	To keep a tab on the health of employees	0.82
7.	Ready to face future risks	0.79
8.	Continuously identifying the alternatives for survival	0.87
9.	To make an effort in accepting and adjusting to the upcoming new-normal situation	0.83

Each indicator of the pandemic resilience index is to be administered to the agripreneurs in a three-point continuum namely 'Extremely', 'Moderately', and 'Not at all' with the scores of 3, 2, and 1. The aggregate of all these indicators with the sub indicators forms the Pandemic Resilience Index (PRI).

3.3 Standardisation of Index

After calculating the relevancy weightage of the index, the next stage was calculating the reliability and validity of the index. For standardising the Pandemic Resilience Index (PRI) reliability and validity measures were calculated. The reliability of the index was tested with Cronbach's alpha and the validity was tested with the content validity of the items in the index.

3.3.1 Reliability of PRI

The 'Cronbach's alpha' method was used to determine the reliability of PRI [20] and it is the most common measure of internal consistency. Conceptually, α is the mean of all possible split-half correlations for a set of items. About 30 agripreneurs from the non-sample area were asked to rate the fifty eight items of the index under six resilience indicators on a three-point continuum ranging from Extremely', 'Moderately' and 'Not at all' with the scores of 3, 2, and 1. The collected data were tabulated and analysed for internal consistency by using SPSS software. The Cronbach's alpha value of 0.70 or higher is considered as an acceptable measure of internal consistency [21]. The reliability coefficient of PRI was 0.838.

Hence the index is considered reliable with the reliability coefficient of r=0.838, which is higher than 0.70.

3.3.2 Validity of PRI

The PRI was assessed in terms of content validity. Content validity provides evidence about the validity of an instrument by assessing the degree to which the instrument measures the targeted construct, it is designed to measure. Content validation was carried out by subjecting the selected fifty eight items to the judge's opinion. The judges were requested to indicate their presumed relevance to which the items covered the different indicators of resilience. Totally, forty two judges responded by sending their judgements. The content validity of the index was determined using a mean score of 2.50 and above as the criterion. The calculated overall mean score for the PRI was 3.37, which is higher than 2.50, indicating the index is valid.

4. CONCLUSION

The COVID-19 pandemic and its detrimental effects have altered society. It has pushed the world economy into a recession [22]. The business environment has become complex. Coping with adverse vulnerabilities by the business owners tends to psychological distress like increased anxiety, level of stress, burnout, and rumination, and may become one of the factors for diminishing the business survival [23]. Resilience is vital for an entrepreneur to uphold the business in such exogenous shocks. It helps to develop strong interpersonal propensities to look for alternatives under adverse conditions and promotes the ability to deal with complex situations and identify solutions [24].

There are numerous studies depicting the resilience of entrepreneurs in crises situation, but only a few studies are emerging on pandemic resilience and with consideration to the components of resilience, the Pandemic Resilience Index is constructed. The index measures the resilience of agripreneurs in six dimensions viz., pandemic response, support and assistance offered by family, government institutions, society and personally, the agripreneurial skills crucial during crises situations, pandemic risk prevention and mitigation, business reconstruction, and pandemic preparedness to survive with the future occurrences. The PRI will also contribute to indicate the different resilient strategies followed by them to regain their business to the state of normality.

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