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Organizational resilience and social-economic sustainability: COVID-19 perspective

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Abstract

COVID-19 has affected the global economy like no other crisis in the history of mankind. It forced worldwide lockdown and economic shutdown to the point from where the recovery process has been very difficult. It has affected demand, supply, production and consumption in such a way that the entire economic development cycle has gone to its lowest levels. COVID-19 has also affected the social and economic sustainability structure which has led from one crisis to another and the developing countries have been the worst hit. Economic crisis resulted in unemployment leading to labour migrations, inevitable casualties and rising poverty etc. However, at a certain level, a few industries and organizations have shown resilience with better anticipation and survivability which may lead them to a quicker recovery. The current study aims at presenting a holistic view of organizational resilience which leads to the overall sustainable development. The study considers three aspects of organizational resilience as crisis anticipation, organizational robustness and recoverability. It assesses the impact of the aspects of resilience on social sustainability and economic sustainability. The study uses empirical analysis of primary data which is analysed to verify the hypothesized relationships by using a structural equation modelling approach. The study finds out that predicting the crisis and disruptions, building robustness and recoverability have a positive effect on both the social and economic aspects of sustainability. Findings of the study have their practical implications for industry, researchers and society.

Keywords Resilience · Sustainability · Crisis anticipation · Organizational robustness · Social sustainability · Economic sustainability

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1 Introduction

The world has seen one of the worst crises known to the history of mankind in the form of COVID-19 pandemic which has caused global unrest and devastation to the worldwide economy (Arora et al. 2020; Rajput et al. 2020). Having its contagious nature and health risks, the disease has forced worldwide disturbance such as lockdowns; closure of ports and airports; strict manpower norms; limiting imports and exports and so on (Bherwani et al. 2020; Sharma et al. 2020; Rajput et al. 2020; Gautam 2020). The economic shutdown has downgraded manufacturing, increased layoffs, high unemployment, slowed down demand and reduced industrial profits (Sharma et al. 2020; Gautam and Hens 2020; Rajput et al. 2020). Plenty of industries such as aviation, hospitality, tourism, entertainment and transportation etc. are struggling for survival and many organizations are at the verge of being shut down. However, there have been plenty of organizations which have been resilient enough to be less affected by the pandemic so far and many organizations are recovering faster than others even after being affected. For example, Nestle in India was very much resilient and unaffected during the complete lockdown in India, while other companies suffered losses during the same period (Gupta 2020). Resilience plays a crucial role in the survival of organizations. It is the ability to anticipate, survive in and recover from a turbulent environment with the ability to return to original or an improved state (Chowdhury and Quaddus 2017; Brusset and Teller 2017; Pettit et al. 2013; Christopher and Peck 2004). Resilience has three main aspects—anticipation, avoidance and adjustment which, respectively, focus one predictability, immunity and recovery. Many authors categorise the resilience in two parts as proactive resilience and reactive resilience where proactive refers to the preparedness and reactive refers to the recovery from turbulence (Chowdhury and Quaddus 2017; Sheffi 2005). In the current study, we have adopted a holistic view of resilience which focuses on all three dimensions.

One of the worst hits by the crisis is the sustainability structure of the organizations, especially in emerging countries like Brazil and India (Gautam and Hens 2020). Sustainability focuses on conservation for the future generations and it includes three aspects—environment, society and economy which is also called a triple bottom line (TBL) approach. Plenty of research has been done in the context of environmental sustainability worldwide. Social sustainability (which is referred as corporate social responsibility (CSR) by the majority of researchers) and economic sustainability (which focuses on organizational cost reduction through adoption of sustainable practises) have not been very much included by researchers especially in the emerging economies (Tang 2018a, b). However, these two aspects have witnessed worse crisis as society and economy both have been hit and both are trying to recover. A handful of research covering these aspects mainly represents the contexts of developed nations. Even among those studies, the social and economic aspects generally combine with environment either individually or with collective TBL approach. For instance: Barbosa-Póvoa et al. (2018) have observed that sustainability studies still lack in terms of holistic economic assessment and the assessment of environmental and social aspects. It lacks focusing on the measurement of implementing sustainable practises leading to cost minimization or profit maximization. For example, Zhang et al. (2018) have focused on green supply chain management (GSCM) as an indicator of environmental practises and corporate social responsibility (CSR) in their empirical model of sustainable supply chain management (SSCM). They have argued about multidimensional consideration of SSCM; however, their model does not very much explain the economic consideration. Esfahbodi et al. (2016) have considered the environmental performance and cost

performance in their empirical model. Although the model mainly focuses on the environmental aspects and misses out the social agenda. King and Lenox (2001) have emphasized the environmental performance within the production environment, however, leaving the social and economic issues.

In the current study, we focus on a bi-dimensional approach of social and economic sustainability which is a major concern during the COVID-19 pandemic. To cover the context of an emerging economy, the study has been carried out in India which is among the countries having the fastest virus spread. The major research gaps that emphasize the importance of this study are: first, there is the need for such studies that focus on the holistic assessment of organizational resilience with the inclusion of tri-dimensional assessment in the turbulent situations. Second, there are very few studies that focus on social sustainability and economic sustainability in emerging economies. Third, there is a lack of such studies that combine resilience and sustainability and emphasize on maintaining sustainable values, while recovering from a crisis. Based on the aforementioned gaps the study presents its key objectives as: first, to find out how a resilient structure of the organizations may affect their social and economic sustainability during a global crisis like COVID-19 outbreak. Second, to evaluate the impact of individual dimensions of organizational resilience on social sustainability and economic sustainability. The study, therefore, poses the following research questions: RQ1: What are the parameters to evaluate the different aspects of resilience in the context of the current crisis? RQ2: What are the social and economic aspects of sustainability which is affected in the crisis? RQ3: How can we measure the impact of organizational resilience on social sustainability and economic sustainability?

The study focuses on contributing to both the practitioners and academia in several ways. First, it provides a holistic assessment of organizational resilience which is helpful for the firms in their survivability and recovery process during a crisis. Second, it offers a detailed assessment of social and economic sustainability which are at very risk during a crisis as the organizations tend to overlook them over their survival. Third, the study provides a cause and effect relationship between organizational resilience and its sustainability structure which tries to answer the question that how we can survive and become responsible at the same time. Fourth, the study explores how sustainability and resilience can be beneficial for organizations in the longer run.

2 Theory and hypothesis

2.1 Social: economic sustainability

Sustainability has emerged as one of the most researched areas in the management which can be confirmed from the day by day increasing research studies as well as corporate practises which also have started integrating the sustainability principles into their operations, while trying the same compliance to sustainable operations across their supply chains worldwide (Qorri et al. 2018). Sustainability is a phenomenon that stresses about the responsible acts of the human being towards the encompassing environment, the society and the future generations (Kates et al. 2001; Clark and Dickson 2003; Clark 2007). Derived from the idea, the researchers, as well as policymakers, strive for a development that caters to the needs of the present society, while it does not hamper the capability of the future generations to meet their requirements (Zhang et al. 2018). Social sustainability also termed as corporate social responsibility (CSR) is a responsible practise voluntarily where

social concerns are integrated with the organizational operations as well as in the shareholder interactions (Tang 2018a, b). Hence the social sustainability refers to the management of social issues throughout the value chain while ensuring the survival of the organization in the long run (Mani et al. 2016). It addresses social issues and how they are dealt which includes labour conditions, well-being, quality of life, equality, diversity and connectedness within and outside the community among the major concerns (Mani et al. 2018, 2016; Jia et al. 2018). To preserve the social sustainability structure, the organizations need to respect the labour rights which is extended to their job security, fair wages and social security (Mani et al. 2016). During a crisis when organizations are more concerned about their survival which is more in monetary terms, their self-interests conflict with the social interests and their investment in CSR activities reduces (Sajko et al. 2020). The current crisis has forced organizations to reduce their CSR initiatives hence, we consider lay-offs, wage reductions, health and safety issues, hygiene and social distancing, compliance with the government norms and employment generation for local society among our major constructs (Mani et al. 2018, 2016; Zhang et al. 2018; Tang 2018a, b; Qorri et al. 2018; Jia et al. 2018) (see Fig. 1).

There are various aspects of sustainability including the popular social and environmental concerns, however, they are all traced backed to the economic aspect which sustain and stabilizes the other aspects (Manca 2015). Economic sustainability refers to the generation of income for the members of society without exploiting the capital and resources which in turn generated circular effect and stabilizes the economy (Chelan et al. 2018; Spangenberg 2005; Pires et al. 2017). To have this circular effect which stabilizes both economy and society, the organizations must transform their practises towards renewability, reusability, recycling and life cycle costing as well as integrate the cost of wastes, emissions and pollutions etc. in the costing system (Kibert 2016; Zhong and Wu 2015). Cairns and Martinet (2014) have used sustainability accounting to assess the environmental-economic indicators and their role in sustainable growth and overall sustainable improvement. The dimensions of economic sustainability range from sales, market share, operational efficiency, and
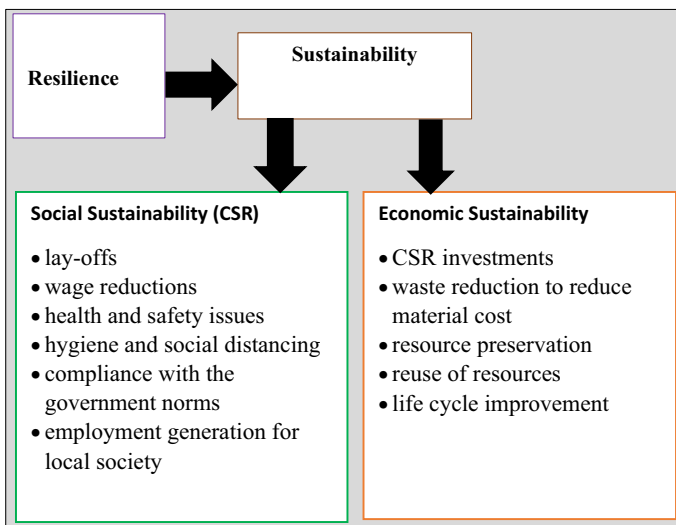

Fig. 1 Sustainability framework for resilience

upgrading (Jia et al. 2018; Marchi et al. 2013) to value addition, GDP contribution, environmental protection, ethical investments, resource conservation, resource reuse, resource recycling and waste reduction (Zhong and Wu 2015; Manca 2015). A group of researchers also emphasizes on taking economic sustainability as economic feasibility assessment of the sustainability initiatives in any of the environmental or social dimensions which create a balance between organizational interests and sustainable responsibilities (Lovarelli et al. 2020). For instance, Tusso-Pinzón et al. (2020) have added the metrics of economic assessment as utility costs, purchase costs and profits etc. with the indicators of sustainability assessment. In the light of the current crisis, the major constructs of economic sustainability in this study are CSR investments, waste reduction to reduce material cost, resource preservation, reuse of resources and life cycle improvement (Zhong and Wu 2015; Manca 2015; Kibert 2016; Jia et al. 2018; Yazan et al. 2017; Azapagic and Perdan 2000) (see Fig. 1).

2.2 Organizational resilience

Resilience refers to a firm's capability to survive, adapt and grow in a dynamic and uncertain environment (Fiksel 2006; Sawik 2013). The concept of resilience refers to its capability of returning to a stable state after facing a disruptive situation. Disruptions are inevitable and there are several factors of the internal and external environment which cause disruptions in the organizations. When discussed resilience, the major concern is given to the organizational vulnerability, disruptions, and the complexities as these are the key issues dealing with the resilience of the system. Sheffi (2007), describes vulnerability to a disruptive event as a combination of the likelihood of disruption and its potential severity. The vulnerability is assessed by the probability of what can go wrong, the likelihood of that happening and the consequences of the happening. There are various dimensions of vulnerability. Low disruption probability with light consequences will cause low vulnerability while high disruption probability with severe consequences will result in high vulnerability. Christopher and Peck (2004), describe the risks which make a value chain vulnerable. The major risks are divided into five kinds of disruptions into three broad categories. The first category is related to the internal disruptions in the firm which include disruptive events during the process and control. The second group is external to the firm but internal to the supply chain consisting of disruptions in demand and supply. The third category refers to the external environment. The external environment may directly have its impact upon the players involved in the supply chain as well as the market conditions. Disruptions contain the potential to cause damages both in the short term and long term to sales, shareholders' values and status including the damage to relationships between the customers and suppliers (Bode and Wagner 2015; Hendricks 2003; Sheffi 2007). Disruptions can be defined as unplanned and unanticipated discreet events involving minimum two levels of the supply chain, but heterogeneous in characteristics which disrupt the usual courses of actions, material and goods' flows, make the firms vulnerable to the operational and financial risks and results in losses to the affected firms (Bode and Wagner 2015; Bode et al. 2011; Craighead 2007; Rao and Goldsby 2009). Bode and Wagner (2015), conclude that disruptions will increase with increasing organizational complexities as a result of interactions among more elements in the chain.

Sajko et al. (2020) describe resilience as the ability to anticipate, avoid, and adjust to shocks occurred from a crisis or a disruption. Sheffi (2007) stresses that a resilient enterprise is prepared enough to absorb the shocks of disruption and it is capable enough to

recover from a crisis. The first ability of a resilient organization to anticipate the risks which can strike the organization in future. Anticipation starts with the collection of details of the smallest of disruptions at the organizational level and it strengthens with sharing the details among the organizations to predict the upcoming larger disruptions (Sheffi 2005). Information gathering and sharing is a key element to predict risks and build preparedness for unforeseen events and stabilize the sustainability structure (Sheffi 2005). Therefore, we hypothesize the following (see Fig. 2):

H1a Crisis anticipation will have a positive impact on social sustainability.

H1b Crisis anticipation will have a positive impact on economic sustainability.

After anticipation, the next aspect of resilience is organizational robustness which we can term as its immunity towards the disruption. Robustness has been described by the authors as a capability to be proactive to build the risk management infrastructure and become adaptive to the changes to minimize the impacts of the disruptive crisis (Chowdhury and Quaddus 2017; Soni et al. 2014; Ambulkar et al. 2015; Brusset and Teller 2017). Sheffi (2005) have emphasized on building capabilities and being prepared to mitigate the crisis and to sustain for longer. Hence, the hypothesis follows (see Fig. 2):

H2a Organizational robustness will have a positive impact on social sustainability.

H2b Organizational robustness will have a positive impact on economic sustainability.

The final stage of resilience is a recovery which represents the organizational capabilities to be able to restore the system to either the previous state or to an improved state (Chowdhury and Quaddus 2017; Brusset and Teller 2017; Pettit et al. 2013; Christopher and Peck 2004). Brusset and Teller (2017) have described the capabilities as a set of physical, financial, human, technological, and organizational resources which can respond to the disruptions and accelerate the recovery process. Ambulkar et al. (2015) have pointed
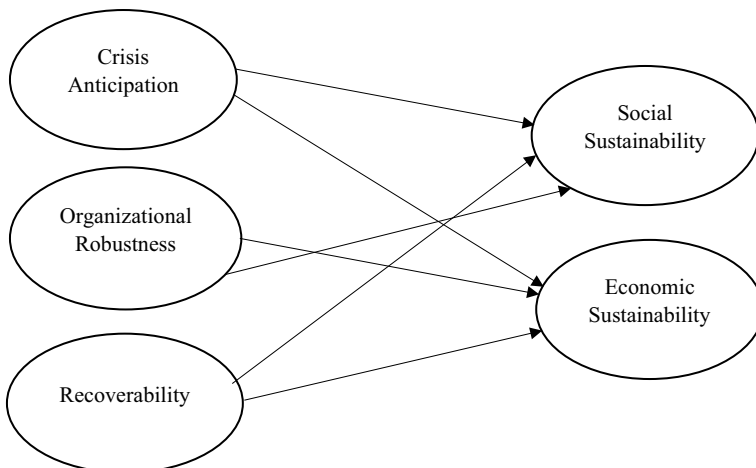

Fig. 2 Hypothesized framework

out the ability to resource reconfiguration as a major ability of supply chains for resilience which is considered as a combination of flexibility and responsiveness to meet the changing requirement of the resources. Brusset and Teller (2017) have also backed the theory with their classification of flexibility as one of the major capabilities to mitigate risk and build resilience. Chowdhury and Quaddus (2017) along with other researchers in the area have emphasized on responsiveness and agility as major aspects of reactive organizational resilience (Hosseini et al. 2019; Soni et al. 2014; Christopher and Peck 2004). Therefore, we propose the following hypothesis (see Fig. 2):

H3a Recoverability will have a positive impact on social sustainability.

H3b Recoverability will have a positive impact on economic sustainability.

3 Methodology

3.1 Research design

The research has been conducted in India to ensure the emerging economy perspective. Current research follows an empirical analysis of primary quantitative data which is collected based on an extensive survey technique via a structured questionnaire which was sent to the companies from multiple industries doing their operations in India (see Table 1). Having taken into consideration of the current situation where direct contact is not safe, the entire data were collected online through a well-designed questionnaire. The questionnaire was designed based on the existing literature complying with current requirement during the crisis and duly verified by a set of experts for its relevance in the current situation. The questionnaires were sent electronically through emails to over 700 people and after rigorous follow-ups; we received a total number of 261 complete responses which we have considered appropriate to be used in our study. The sample consists of 146 male and 115 females. Further, the data were classified into 3 categories according to the managerial

Table 1 Respondents characteristics	Industry	Male	Female
	Textile industry	45	35
	Electronics industry	34	26
	Hospitality industry	23	28
	FMCG industry	44	26
		(146)	(115)
	Total	261	
	Managerial level		
	Top management	55	
	Middle management	135	
	Lower management	71	
	Total	261	
	Company profile (percentage-wise)		
	(Firms less than 100 employees)	60%	
	(Firms more than 100 employees)	40%	

position of the employees 55 belonged to top management, 135 middle management and 71 belonged to lower management. 60% of the firms that participated in the study belonged to a small-scale firm category and the rest 40% belonged to medium and large firm category. A complete profile of respondents in terms of industry and the hierarchy of management is available in Table 1.

3.2 Questionnaire and measurement scale

While preparing the questionnaire, we have focused on making it clear, easy and well written. We have chosen easy sentences and simple words to make the questionnaire more understandable. The survey questionnaire consists of five essential constructs including three constructs of resilience—crisis anticipation, organizational robustness, and recoverability; and two constructs of sustainability—social sustainability and economic sustainability. The five constructs included their defining variables that explained and formed the constructs. The construct items in the questionnaire are developed on a 7-point Likert scale. Respondents were asked to measure their responses for every construct and rate them on the given scale where 1 pertains to strongly disagree and 7 pertains to strongly agree. Once the questionnaire was finalized, we consulted the experts and sought their reviews before sending it to the respondents (refer to Table 2).

SPSS and IBM AMOS software were used to purify and analyse the data. Descriptive analysis, exploratory factor analysis (EFA), confirmatory factor analysis (CFA), structural equation modelling (SEM) tests were carried out to test the structure of the model and to check the hypotheses. After gathering the responses, the data were checked for any missing values and outliers. There were 9 missing values found and they were replaced by using missing data imputation technique in SPSS. Then, we checked the data for normality. Kurtosis and skewness tests were performed to check normality and the result of both the tests came within the permissible limit, i.e. between -1.96 and $+1.96$ (Malhotra and Dash 2016). Once the data normality achieved descriptive statistics and EFA were carried out by using SPSS. After EFA, the reliability and validity of the measurement model were checked using CFA. After that measurement invariance were computed using SEM (Hair et al. 2006).

3.3 Descriptive statistics

In this research, a descriptive statistics analysis was done to study crisis anticipation, organizational robustness, recoverability, social sustainability and economic sustainability dimensions. The minimum value was 1 and the maximum value was 7 for the items used in the study. The mean value of the items ranged from 3.39 to 5.17, and the standard deviation ranged from 0.789 to 1.758. The analysis shows that SS2, SS3, SS4, SS9, SS7 were the biggest contributor to social sustainability. The mean value of social sustainability was dominant over economic sustainability. Social sustainability may have more value to the respondents than economic sustainability (Table 3).

3.4 Exploratory factor analysis (EFA)

To measure the dimensionality of the constructs measured in this research, an EFA test was carried out using SPSS 20 statistics software. KMO test was carried out to check the adequacy of the samples and the value came as 0.854 which is well above the threshold limit

Table 2 Questionnaire items

Variables	Items
Social sustainability	
SS2	We pay fair wages to our manpower
SS1	We have not laid-off workers during the lockdown
SS4	We invest in our workers' health and safety even during the crisis
SS3	We have not reduced the salaries of our employees during the crisis
SS5	We ensure our employees for health issues
SS6	We focus on protecting our workers' rights
SS7	We comply with hygiene and social distancing norms
SS8	We educate and train our employees for new safety requirements
SS9	We focus on job creation for local and economically, affected society
Organizational robustness	
ROB1	We are prepared enough to manage the predictable challenges
ROB2	We have the preparedness to overcome the unknown challenges
ROB4	We prepared ourselves when news of pandemic came out
ROB3	The current has not affected our operations very much
ROB5	We have maintained a supply network during the crisis
ROB6	We can fulfil our customer requirements without disruption
Recoverability	
REC1	We are recovering from the losses that occurred during pandemic and lockdown
REC2	We are flexible enough to find out to cope with the changing market requirements
REC4	We can redesign our offerings according to changing requirements
REC3	We are able to arrange alternative sources to minimize supply disruptions
REC5	We are able to respond faster to the changes
REC6	We have flexible manpower that can cope up with changes
REC7	We collaborate with other organizations to speed up the recovery process
Crisis anticipation	
ANTI1	We are able to forecast the regular disruption to operations
ANTI2	We collect the data of even small disruptions
ANTI3	We share the disruption data with other organizations
ANTI4	We invest in an information system that can predict the upcoming turbulence
ANTI5	We were able to predict the crisis before it had hit our operations
ANTI6	We were able to anticipate the upcoming challenges when the pandemic was at a very early stage
Economic sustainability	
ECOS1	We invest in CSR without hurting our profits
ECOS2	We minimize waste to reduce our material cost
ECOS3	We sustainably procure and preserve the materials to increase their lifecycle
ECOS6	We reduce resource consumption for sustainability
ECOS5	We reuse resources to reduce our costs
ECOS4	We invest in quality for the increased life cycle of products

Table 3 Descriptive statistics

Descriptive statistics			
	N	Mean	Std. deviation
REC7	261	4.433	1.4197
REC1	261	4.299	1.3166
REC4	261	4.322	1.4610
REC5	261	4.475	1.4769
REC3	261	4.874	1.4529
REC2	261	4.709	1.3698
REC6	261	4.973	1.2812
ECOS6	261	3.43	.911
ECOS5	261	3.51	.853
ECOS3	261	3.53	.892
ECOS1	261	3.55	.946
ECOS4	261	3.43	.789
ECOS2	261	3.39	.869
ANTI5	261	3.93	1.088
ANTI2	261	3.93	1.004
ANTI3	261	3.82	.920
ANTI4	261	3.84	.958
ANTI1	261	3.76	.898
ANTI6	261	3.874	1.0576
ROB3	261	5.172	1.7312
ROB2	261	5.004	1.6443
ROB5	261	4.667	1.6361
ROB4	261	4.759	1.7583
ROB1	261	5.057	1.6573
ROB6	261	4.931	1.7015
SS1	261	4.969	1.3152
SS2	261	5.107	1.2481
SS3	261	5.069	1.3225
SS4	261	5.134	1.3277
SS8	261	4.372	1.4530
SS9	261	5.169	1.2809
SS5	261	4.782	1.3453
SS6	261	4.667	1.4223
SS7	261	5.008	1.3214
Valid N (list wise)	261		

of 0.5 prescribed by Hair et al. (2006). Bartlett test of sphericity was carried out to check whether the correlation exists among the variables and the values were found significant (p-value = 0.000) (Hair et al. 2006). EFA proposed 5 factors having eigenvalue greater than 1. These factors in total explained more than 68% variance in the study. To measure the reliability of each factor Cronbach's Alpha value was observed crisis anticipation (0.897), organizational robustness (0.958), recoverability (0.918), social sustainability (0.931) and economic sustainability (0.830). The Cronbach's Alpha values were found above the threshold limit of 0.6 as recommended by Hair et al. (2006) (Table 4).

Table 4 Exploratory factor analysis, KMO and Bartlett's Test, Cronbach's alpha

Rotated component matrix[a]

KMO (.854)	Component				
Sig. .000	Social sustainability	Organizational robustness	Recoverability	Crisis anticipation	Economic sustainability
SS2	.877				
SS1	.869				
SS4	.866				
SS3	.863				
SS5	.834				
SS6	.798				
SS7	.780				
SS8	.728				
SS9	.600				
ROB1		.941			
ROB2		.935			
ROB4		.911			
ROB3		.901			
ROB5		.873			
ROB6		.870			
REC1			.862		
REC2			.857		
REC4			.837		
REC3			.830		
REC5			.824		
REC6			.767		
REC7			.749		
ANTI1				.862	
ANTI2				.833	
ANTI3				.828	
ANTI4				.803	
ANTI5				.798	
ANTI6				.749	
ECOS1					.785
ECOS2					.748
ECOS3					.746
ECOS6					.707
ECOS5					.706
ECOS4					.694
Cronbach's alpha (α)	.931	.958	.918	.897	.830

Extraction Method: Principal Component Analysis. Rotation Method: Varimax with Kaiser Normalization. Rotation converged in 5 iterations

3.5 Confirmatory factor analysis

After EFA, CFA were carried out using AMOS graphics 20 software. The CFA results indicated a good model fit ($\chi^2 = 1016.681$, $p < 0.05$, df $= 517$), reporting adequate goodness (i.e. NFI $= 0.85$, CFI $= 0.92$) and badness of fit indexes (RMSEA $= 0.06$). Once the model fit was achieved, the reliability of the model was inspected by computing composite reliability. All the factors scored more than 0.70 which is the standard for the composite reliability (Hair et al. 2006). After that convergent validity was checked by using the average variance extracted method as suggested by Malhotra and Dash (2016). AVE value was greater than 0.50 for all the factors. AVE was, followed by discriminant validity analysis. It is computed by checking whether the square root of the average variance extracted was greater than the correlation coefficients as suggested by Malhotra and Dash (2016), and this condition was also fulfilled (Tables 5, 6, 7).

Table 5 Measurement model—goodness of fit measures

CMIN	DF	CMIN/DF	CFI	NFI	RMSEA
1016.681**	517	1.967	.921	.852	.061
846**	470	1.80	.918	.850	.053

**($p < 0.05$)

Table 6 Construct validity

	CR	AVE	MSV	Max R(H)	ANTI	SS	ROB	REC	ECOS
Crisis anticipation	0.901	0.603	0.051	0.908	0.777				
Social sustainability	0.933	0.611	0.007	0.946	0.045	0.781			
Organizational robustness	0.955	0.781	0.007	0.974	− 0.002	− 0.082	0.884		
Recoverability	0.919	0.620	0.006	0.924	− 0.046	0.028	0.078	0.787	
Economic sustainability	0.831	0.596	0.051	0.837	0.226	0.003	− 0.073	0.024	0.772

Table 7 Hypotheses testing

Effects		Estimate	t-value
H2a	Social sustainability < – Robustness	0.40***	7.69
H3a	Social sustainability < – Recoverability	0.39***	3.42
H1a	Social sustainability < – Crisis anticipation	0.52***	4.44
H2b	Economic sustainability < – Robustness	0.56***	5.89
H3b	Economic sustainability < – Recoverability	0.41***	4.22
H1b	Economic sustainability < – Crisis anticipation	0.45***	3.38

***$p < 0.001$

3.6 Structural equation modeling and hypotheses testing

After obtaining an acceptable model fit, a structural model was built based on the pro-
posed hypotheses. The model fit indices found that the hypothesis model fits the data well.
The regression weights confirm our hypotheses. Hypotheses used in this study were found
significant. The path coefficients (H2a-0.40, H3a- 0.39, H1a- 0.52, H2b- 0.56, H3b- 0.41,
H1b- 0.45), validate the applicability of the sustainability model.

4 Findings and discussion

Results describe the positive impact of determinants of resilience on the social and eco-
nomic sustainability. It explains that in case if the organization is resilient the social val-
ues of the economy will more likely to sustain and there are high chances the economic
investments in the conservation of resources and sustainable production will increase.
The study finds out that capability to anticipate crisis has a positive effect on social and
economic sustainability. It stresses on a collaborative inter-organizational and intra-
organizational information sharing mechanism on a large scale where the smallest of
crises can be recorder and shared among each other to predict a bigger crisis (Sheffi
2005). The study suggests that prediction of a crisis on a collaboration basis provides a
more resilient organisational structure where organizations establish and maintain their
resources including material, money and human resources. There are high chances if the
organizations can anticipate the crisis in advance, and they will sustainably preserve the
resources as well they will display the stability in maintaining the social values which
include the rights of their employees.

Organizations which are more prepared and show more robustness are more immune
to the crisis. However, the robustness comes from the readiness to confront and survive
the crisis which depends on the resources the organization has preserved and the man-
power it has sustainably secured (Sheffi 2005; Ambulkar et al. 2015; Brusset and Teller
2017). The study finds out the positive impact of organizational robustness on the social
and economic sustainability. It can be because a resilient organization needs to maintain
its resources and keep its costs lower which is easier if it adopts a sustainable approach
of waste reduction, resource preservation, social development and human resource sus-
tainability. Recoverability is the final aspect of resilience which has its positive effect on
social and economic sustainability which is because the recovery requires the ability to
reconfigure the resources, agility to respond to the requirements and flexibility to adapt
to the changes (Chowdhury and Quaddus 2017; Ambulkar et al. 2015; Brusset and Teller
2017). A sustainable approach in all the aforementioned situations is required where both
the employer and employees can rely on each other as well as they can maintain sustain-
able values.

4.1 Combined approach of sustainable resilience

The study finds out the positive impact resilience on sustainability. It observes the cor-
responding nature of both the principles for each other when it concerns about the social
principles and recovery of the society from a crisis situation. A sustainable and resil-
ient organization brings in the diversity, connectivity, learning social participation and

Fig. 3 Sustainability—resilience matrix
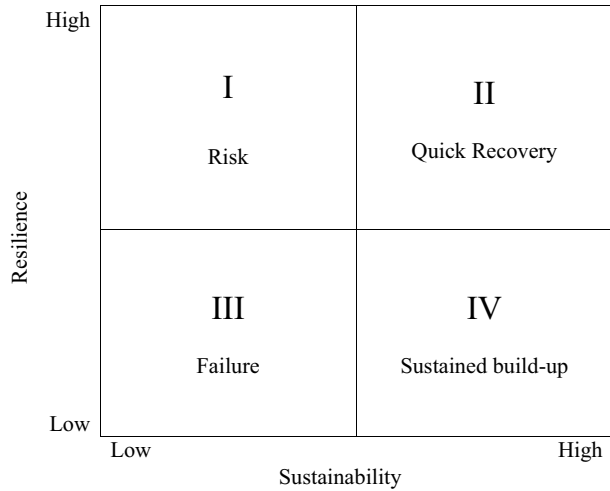
inclusive policy making which survives in and recovers from the crisis without compromising its sustainable value (Choi et al. 2021; Shamout et al. 2021). To make the discussion of the findings and observations more comprehensive, the study provides a sustainability- resilience matrix (see Fig. 3) where we compare the different levels of resilience and sustainability with each other. The first quadrant presents a situation where resilience is high, and sustainability is low. Although a resilient situation seems to be under control, but without the sustainable values it will be a risky situation when the robustness of the organization reaches its limits and the firm requires to recover. A contradiction with the social values and a negative social image may derail the desired speed of the entire recovery process. The second quadrant represents a high resilience and high sustainable situation which keeps the organization fundamentally correct on both the fronts which will speed up the recovery process. In the third quadrant, we find that the organization is neither sustainable nor resilient which make it destined to fail whenever a crisis occurs which cannot be either avoided or controlled. The fourth quadrant presents the combination of low resilience but high sustainability situation. The situation is more relevant to a large-scale crisis scenario where the reserved contingency plans of the organization's end, robustness fails and crisis overtakes. In this scenario, the organizations which are fundamentally correct with sustainable principles, seem to build up stronger and fight back more efficiently.

In Fig. 4, we provide a holistic view of sustainability and resilience where both aspects complement each other. The outer circle represents resilience and its different aspects, the innermost side of the circle represents the social and economic sustainability which has its determinants on the outer side. The resilience—sustainability circle represents a framework which explains that an organization requires to build up resilience to stabilize its sustainability structure. As shown in the outer circle, the resilience capabilities of an organization lead to the individual initiatives of sustainable development and when it is combined in a collective approach it leads to the overall social and economic sustainability development.
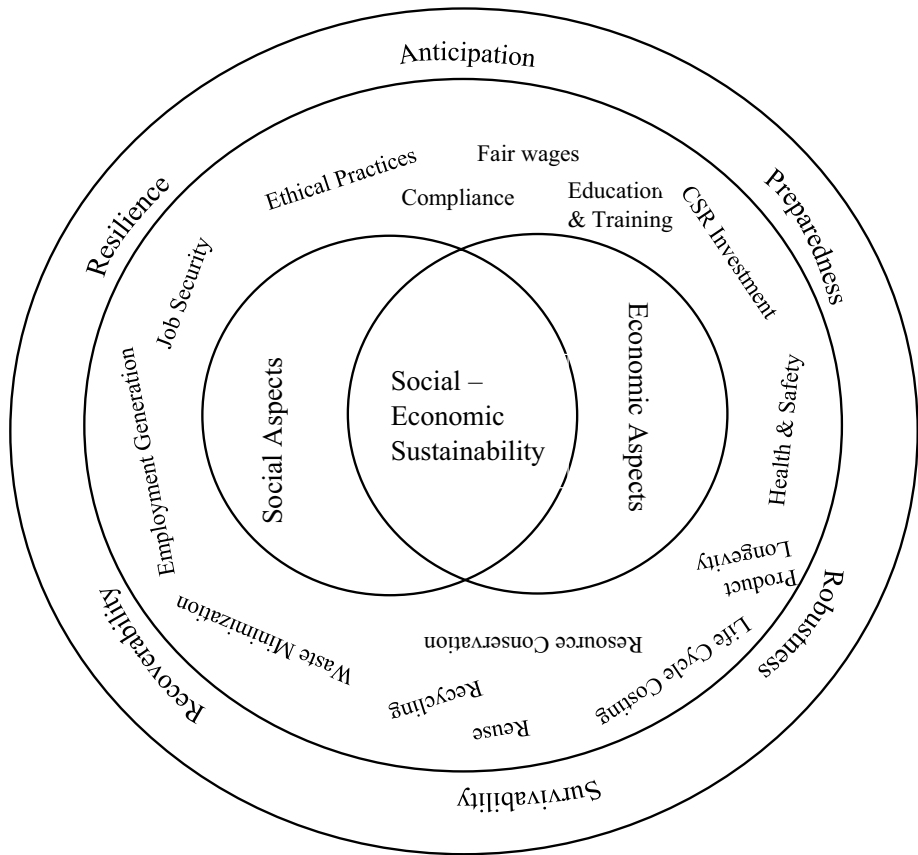
Fig. 4 Sustainability—resilience framework

5 Conclusion

The current study attempts to develop a conceptual framework for organization resilience which can sustain the social and economic values and contribute to the overall sustainable development. It argues that building organizational resilience is a way to maintain the social and economic sustainability structure in terms of the development of society, the welfare of the manpower social security, resource conservation and environmental protection, while maintaining the profitability and cost structure of the firm. The study has assessed the effectiveness of various aspects of resilience amid the impact of these aspects on the sustainable practises in the typically functioning organizational operations. The interaction between resilience and sustainability discloses the specific insights from relationships to the researchers and practitioners. The study contributes to both industry and academia in many ways. Firstly, it identifies the specific social and economic sustainability constructs from an organizational perspective considering the current COVID-19 crisis. Secondly, the study conceptually discovers the major constructs for organizational resilience which may affect its sustainability at any stage. The constructs are crucial considering the current crisis, if not defined properly they may provide vague results. Thirdly, the

study produces a comprehensive framework for the aspect wise investigation of resilience for sustainability within the impactful construct interactions. The study has clear managerial and theoretical implications for both practitioners and the research community. The framework for the aspect wise evaluation of resilience in the current research provides a theoretical foundation for researchers to establish a micro-level sustainability analysis approach. Focus on aspect specific resilience constructs provides detailed insights towards identifying and prioritizing the key determinants crucial to the individual stages of sustainability. The research has some social implications as well. It provides researchers and practitioners with a framework for better utilization of resources and maintaining social values which is important for social and sustainable development.

There are certain limitations associated with the current research which provide the research gap for future study. First, the study has focused only on the social and economic aspects of sustainability. However, a more comprehensive approach with a triple bottom line approach which includes environmental aspects also would provide a more holistic view of the resilience-sustainability relationship. Second, the study focuses on three-dimensional aspects of resilience which include crisis anticipation, organizational robustness and recoverability to assess a cause and effect relationship with sustainability. A mathematical modelling and analysis approach with the evaluation of trade-offs among resilience aspects and simultaneous trade-off analysis among sustainability dimensions may yield more comprehensive results. Third, the study was carried during COVID-19 outbreak resulting in country-wide lock-down with high restrictions, and reaching to more respondents was very difficult. Although we used an electronic medium for sending and receiving the questionnaires, it was not easy for the respondents as well. For the future, we suggest implementing the current methodology with the inclusion of additional constructs, once the COVID-19 situation comes under control to observe the current findings during the recovery period. Fourth, the study has considered only the quantitative aspects of sustainability-resilience assessment. For future studies, we suggest the inclusion of a more comprehensive qualitative analysis to cover the aspects which do not get covered in the quantitative analysis.

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