

Lockdown-Slowdown Risk Assessment for the COVID-19 Pandemic Waves impacted on the Life Way of Digha Coastal Tourism Townscape in West Bengal

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Abstract - COVID has become a famed catchphrase in the recent globe for last two years. In fact, most of the socio-economic facets have been featured by a bitter crisis flaunt of massive constraints and confronts. Digha, a well-liked tourist destination over Bengal coast is reflected as a typical example of the finest coastal beaches in India and have been featured by twin developmental processes like tourism and rurbanization for last two decades having its dignity as Khadalgebra Census Town in 2011. Eventually, this tourism townscape has been shocked by the COVID waves distressing the bases of regional livelihood and development alongwith its own. The aimless and wayless tourism industry has been shifted towards a *status of fiscal stun* due to lockdown-slowdown progress for about 2-years. Tourist tone with its infrastructure, services and setting mirrors a desert glance as COVID consequence. Accordingly, the local cum regional economy and livelihood have been faced on the *massive economic defeat* estimating 2300 crore rupees slashing its bliss of drive and progress. The study reflects the risk of *occupational uncertainty* and *life insecurity* shaking the living of the depended populace connected with this economic dream ground. Thus, this industry and facts frankly require sustaining the life, livelihood and development for breathing from *pandemic challenges*. The essence of the research draws the feels and reality of the human costs assessing the *vulnerability and risk* of the tourism townscape and shows the efforts to find out the *optimistic pathway* to save it from the *frame of trouble*.

Keywords: COVID-19 waves, fiscal stun, lockdown-slowdown, occupational uncertainty, life insecurity, pandemic challenges, vulnerability and risk, optimistic pathway and frame of trouble.

I. INTRODUCTION

COVID-19 pandemic and its journey on the runway of two years have brought the massive declines in both economic and social sectors of the impacted nations. The whole of the anthropogenic globe has been fallen into the decay and darkness of economic loss and livelihood crisis on the way of development and advancement of life and nation which being never-experienced-before. This pandemic has kept its signature at all, from kitchen to corporate sectors, from manufacturing to service sectors and individual's household to global fiscal ground. The strain-slowdown effects has been affecting the productivity and demands with markets as the lockdown and social distancing are the lone cost-effective gears essential to stop the swell of COVID-19 [3].

Tourism is emerged as the spine of many nations' economy in the latest globe. It has become a giant basis which is supportive to breed large income in terms of a way of internal revenue and overseas exchange [10] [18]. In fact, tourism industry inherently interlinks many more profitable downstream like transport and travel, hotel sector, catering services, recreation and amusement amenities, local

markets of customer and art craft goods and services, etc. Different tourism enterprises encourage its advancement stimulating the intensification of income and generating the earning platform throughout multiplier effect.

Having the stamina of regional and national economies for India, tourism is flourishing as the trigger of economic escalation gifting the scope of life earning and providing the multi-facet opportunities of socio-economic development. In case of our country, tourism draws 10-12% GDP of the total having a great contribution to national economy. COVID-19 has been diffusing hastily throughout the world and has been scaled as the worst ever health risk disaster threatening life and livelihood. Globally, tourism economy is the nastiest exaggerated by COVID catastrophe. The World Tourism Organization [29] assessment predicts a collapse of 20-30% in worldwide tourist influx. Millions populace allied to tourism are at their job loss and uncertainty [28]. The report by FICCI-Yes Bank, 'India Inbound Tourism: Unlocking the Opportunities' designated India as the tourism powerhouse and the South Asian biggest market whereas 9.2% GDP regarding the industry has facilitated US\$247.3 billion with

26.7 million jobs in 2018. Now India has become the 8th largest GDP contributor from tourism in the globe [16]. The report opined also, the tourism is anticipated to afford earnings of about 53 million people by 2029. Unfortunately, the COVID has constrained the global transportability. Consequently, the breakdown income from the tourism has shown the drastically down falling in the GDP growth curve which predicts 0.45% collapse in GDP growth rate [3]. Federation of Associations in Indian Tourism & Hospitality (FAITH) has already expected the double loss for Indian tourism predicting about Rs. 10 lakh crore hammering from COVID pandemic. The PTI (March, 2020) has also primarily forecasted to the government estimating the loss as Rs 5 lakh crore from the industry. [23]

Historically, Digha, is complemented as the 'Beerkul', i.e., 'Brighton of the East' (National Informatics Centre Archived, 17th Feb, 2006, Retrived 2nd April, 2006) mentioned in one letter of Warren Hasting to his wife (1780). Later on, an English tourist John Frank Smith visited (1923) and captivated by its loveliness. In fact, he settled here and wished-for to Dr. Bidhan Chandra Roy, first ever Chief Minister of West Bengal in Independent India for crafting it as a tourist destination [9]. Eventually, during the ninety's decade of 20th Century it was appeared as a significant tourist end of South Bengal. Today, Digha is signified as the platform, functional operative and regulator of earnings, livelihood and development to not only the region, but also the state.

The study area, Digha alongwith its satellite destinations like Sankarpur, Tajpur, Mandermoni, Junput, Dariapur and Hijli on and along the coastal edge of Rasulpur-Pichhabani Basin over Midnapore seaside in South Bengal offers one of the most popular stay grounds from the intention of recreation and resorting relating travel-tourism and also research. Recently, it has been more dignifying by the annual average of about half crore tourists showing its promising growth with time. Digha, the Brighton of the East [Baitalik, Anirban, 2016] has reflects a low graded superficial sand beach having more than 12 km lifeline [15]. The pleasant loveliness of Digha having the moisture sand carpet, gentle waves and mild sunshine to the tourists has been rhythmic with coastline greenery of casuarinas. This tourism hotspot of Bengal with an added attraction, sea fishing shows the superfluity of life earning panorama locally, regionally and abroad [DSDA, 1997]. In Digha, fishing is the very significant supplementary font of employment cohort like tourism. About a lakh of local and regional demographic mass-figure is influenced directly and indirectly by its tourism and other related economic sectors suited with enriched coastal background. Undoubtedly, there will be a strapping intensification of employment prospect due to the amazing development of tourism in the study area. [4] Unfortunately, prosperity of

the study area has been infected by COVID-19 outburst under national as well as global pandemic umbrella for last two years.

This manuscript has been afforded to emphasize the human costs of COVID issue in this budding tourism townscape hampering regional livelihood and development. This research paper may be the decisive tool to the policy makers and thinkers for assessing the COVID crisis at any tourism landscape. Unquestionably, enlightening the economic shock to the industry and job uncertainty to earners is the germane task from the side of authors. Through this research attempt, we are trying to outline the life sustaining way for both livelihood and development of the tourism townscape against not only the COVID crisis, but also the likelihood disasters in near or far future.

II. SPECIFIC OBJECTIVES:

- a) To estimate the life earning and livelihood figure of the developing Digha coastal tourism townscape;
- b) To assess the lockdown-slowdown effects of COVID-19 waves in the study area;
- c) To enumerate the vulnerability and risk of the pandemic in the study area;
- d) To make the life sustaining blueprint against likely pandemic for the new normal journey of of this potential landscape in self of both livelihood and development.

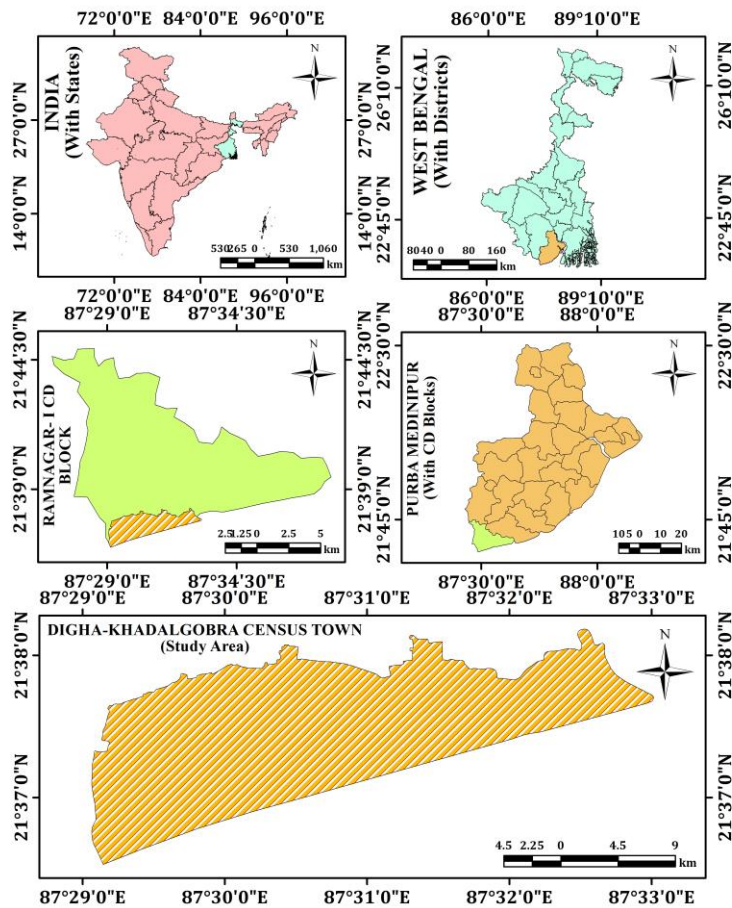
III. ABOUT THE STUDY AREA:

Geo-environmentally, Digha tourism townscape is situated at the most western coastal flank of West Bengal having the geo-referencing as 21°36'40" N - 21°38'20" N and 87°29'10" N - 87°32'40" N on the on the latitudinal and longitudinal scales respectively. The study area is a recent coastal sedimentary and alluvium formation of Quarternary (6000-8000 BP) alongwith its finest sedimentological set up and beach reflection [6]. Geomorphologically, it is the unique signature on the Pichhabani-Subarnarekha Interflaves having the western edge of Rasulpur-Pichhabani Sub-basin on South Bengal Basin. Although Digha has been dignified as the Khadalgobra Census Town in 2011, administratively it is composed of about 20 populated and depopulated mouzas having rurban behavior under Padima -I and II GP of Ramnagar-I CD Block of Contai Sub-division in Purba Medinipur District, West Bengal. Functionally, the study area has been mirrored as one of the important tourist destinations in Bengal enveloped by the trio as fishing, tourism and urbanization and facilitated by resourceful potential coastal habitats and ecosystem.

Table 1: Locational Details of the Study Area							
Name of Coastal Stretch	Name of Tourism Sectors/ Pockets	Location of the Study Area					
		Geographical Location		Geographical Area (sq. km)	Administrative Location		
		Latitude	Longitude		GP	CD Block	Others
Digha Coastal Stretch on Pichhabani-Subarnarekha Interfluves	Digha Tourism Sector (Udaypur-New Digha-Old Digha-Mohana)	21°36'40" N - 21°38'20" N	87°29'10" N - 87°32'40" N	9.6342	Padima-I & II	Ramnagar-I	Ramnagar P.S., Contai Sub-division, Purba Medinipur District, West Bengal

Source: GIS Software Analysis and Administrative and Institutional Report

LOCATION MAP OF THE STUDY AREA



Source: ISGPP, IGISMAP, Thy Maps Guide & Google Earth Imagery, 2021

Figure 1: Location Map of the Study Area

IV. MATERIALS AND METHODS:

The study on the costs and management of the outbreak of COVID-19, this deadly virus in Digha coastal tourism townscape has been conducted maintaining a systematic tentative route chart as given in figure 2.

4.1 Selection of the Study Area: The selection of the study area has been emphasized because of its most popular and overcrowding tourism dignity in South Bengal during last one and half decade. Not only that, huge cash flow, a large number of employments, influencing the regional livelihood, stimulating local to state economy and prosperous growth and development by tourism cum urbanization alongwith other allied sectors have been tremendously affected by COVID-19 pandemic for last two years. Here is the essence to select the study area.

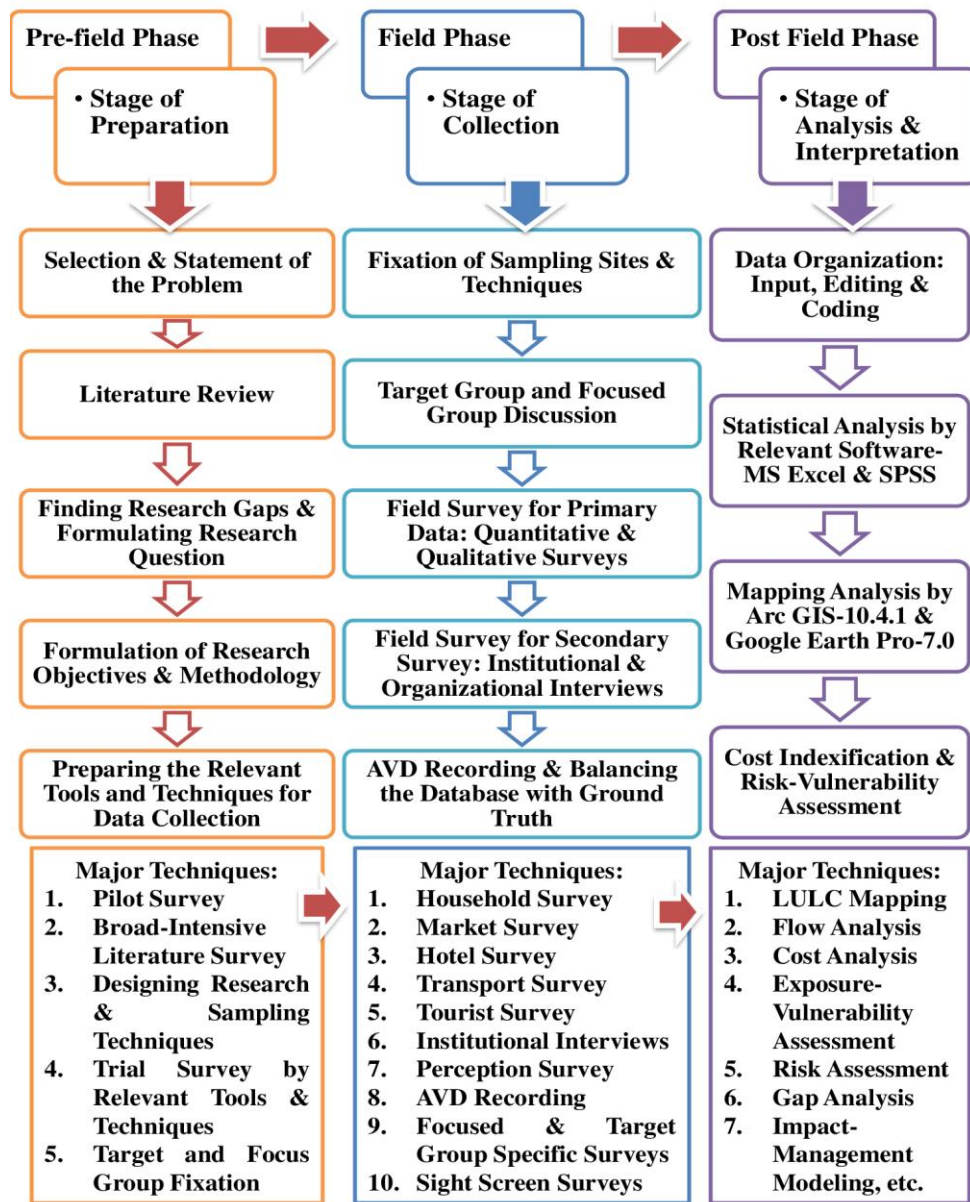


Figure 2: Methodological Flow Chart showing the comprehensive methods and techniques for the study

4.2 Nature and Scale of Literature Survey and Review: The study intensively finds out and follows the contemporary literatures relating COVID-19 and likelihood pandemics. Pandemic related various publications in reputed and non-reputed global, regional and local journals, magazines and news papers have been the literature tools for this research. Regular informative telecasting and web-forecasting in different channels and websites are emphasized also in this study. A large number of govt. and non-govt. database and report have been used for this study also. Lockdown and economical collapse regarding different institutional and organizational reports and press columns have been used for estimating the costs and vulnerability of COVID in the study area. Pandemic parallel published research papers and articles are also the helpful tools in this study. Overall, the extensive, but intensive literature finding and cultivation have signified this research from the view point of background knowledge, core thinking of the research and searching the methodological and functional route for the study.

4.3 Sampling, Sample Sites and Sample Size: To assess the vulnerability and risk of COVID estimating its costs to the region, different sampling techniques are considered as per necessity of smooth data collection. Probability sampling techniques like restricted stratified and cluster random samplings and non-probability techniques like purposive, chunk and snowball samplings have been used in broad way to collect the target data. Figure 3 indicates the ways and purpose of various sampling techniques used for the study. 360, this sample figure has been justified from household, hotel, market, transport, tourists, fishing, tourism and other institutions, etc. for assessing the costs of the pandemic here. But extra-samples (another 360 units) outside this sample size is chosen for perception and quantitative survey for vulnerability cum risk assessment from tourism and allied sectors.

4.4 Major Survey Methods and Techniques for Data Collection: Different quantitative and qualitative surveys and interviews are considered extensively to fulfill the target of research. Various sectoral surveys, individual specific and institutional interviews and perception study have been conducted using personal, official, organizational and institutional interactions by open, closed, structured, semi-structured and non-structured questionnaires and both participant and non-participant observations in the study area.

4.5 Emphasized Methods and Techniques for Data Analysis: Table 3 shows major extracts from data analysis mentioning relevant databases with source, used tools and techniques and applied methods during post field stage.

Table 2: Extracts, Used Database and Applied Tools, Techniques and Methods for the Study

Extract	Database	Source of Database	Tools & Techniques	Applied Method
Location Map (On the Basis of District & CD Blocks)	ISGPP & Google Earth Imagery-2021	ISGPP- II (Panchayats & Rural Development Department, Govt. of West Bengal) & SIO, NOAA, U.S. Navy, NGA, GEBCO Image Landsat/ Copernicus	Arc GIS (v.10.4.1), Google Earth Pro (v. 7.0) & Mapping Analysis	GIS Software Analysis
Magnitude/ Flow/ Influence Maps	IGISMAP, ISGPP, GPS Survey & Google Earth Imagery-2021	IGISMAP, ISGPP- II (Panchayats & Rural Development Department, Govt. of West Bengal) & SIO, NOAA, U.S. Navy, NGA, GEBCO Image Landsat/ Copernicus	GPS (GARMIN Montana- 680 & Garmin Oregon- 650), TCX Converter (v. 2.0.30), Google Earth Pro (v. 7.0), SPSS (v. 18.1) & Statistical and Mapping Analysis	Statistical Analysis & GIS Software Analysis
Land Use Land Cover (LULC) Map	IGISMAP, ISGPP & Google Earth Imagery-2021	IGISMAP, ISGPP- II (Panchayats & Rural Development Department, Govt. of West Bengal) and SIO, NOAA, U.S. Navy, NGA, GEBCO Image Landsat/ Copernicus	GPS (GARMIN Montana- 680 & Garmin Oregon- 650), TCX Converter (v. 2.0.30) and Google Earth Pro (v. 7.0) & Mapping Analysis	GIS Software Analysis
Vulnerability and Risk Index Assessment	Primary and Secondary Databases	Purposive Field Survey, 2018-'20 for Quantitative and Qualitative Data Collection & Institutional and Literature Survey	Target based Questionnaire, Survey Schedule, Field and Issue based Literatures, etc. & Systematic, Stratified and Purposive Sampling, Target and Focused Group Survey, Database Experiment, Theoretical Analysis, Data Compilation, Data Synthesization and Analysis	Qualitative and Quantitative Data Analysis, Dimension Specific and Comprehensive Index Computation

Source: Author's Own Compilation

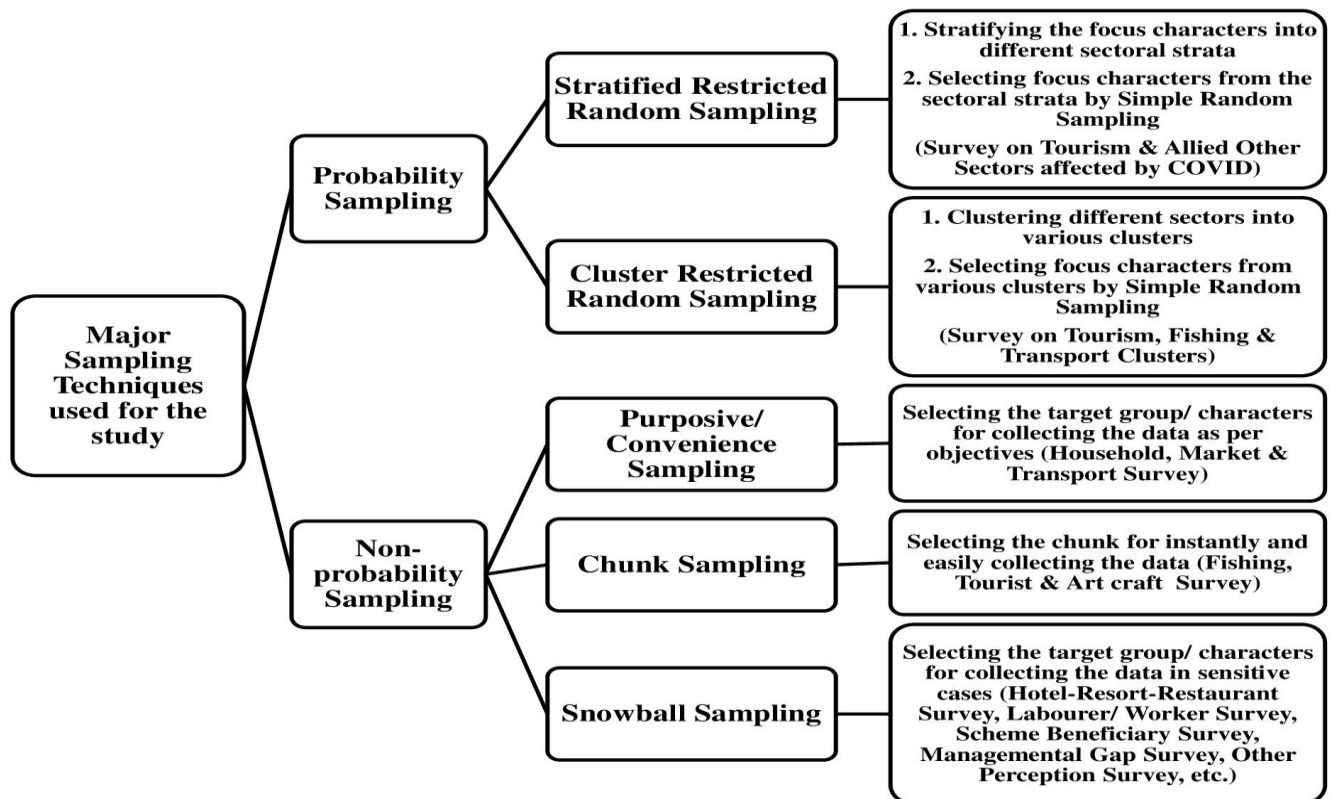


Figure 3: Major Sampling Techniques used for the study

V. ANALYSIS AND INTERPRETATION:

1.1 General Statement about the Study Area:

5.1.1 General Demography and Economy of the Study Area:

Influenced Total Population (2011)	Influenced Total Population (2011)	Influenced Total Population (2021)*	Decadal Population Growth (%)	Geographic Area (sq. km)	Population Density/ sq. km (Recent)	Number of CT & Mouza	Major Economies	Dominated Process
18345	22285	33670	51.09	9.6342	3495	1-Census Town & 18-populated mozas	Travel and Tourism, Fishing, Fish Manufacturing & Marketing, Hotel Business, Service Sector, Cashew nut processing, local handicrafts, etc.	Tourism, Fishing and Urbanization
*indicates projected population based on the compilation of provisional data from concerned authorities and institution								
Source: Census of India-2011, GPs and Block Level Census and Provisional Data-2011 and 2020, Report of DSDA, 2012, 2014, 2018 and 2020-2021 (Project Final, Draft and Provisional Report)								

The table-4 shows the basic scenario of demography and economy of the study area under DSDA. This scenario indicates the blooming scenario of the tourism cum rurban journey and its potentiality over time. The population has been increased over time as the tourism development is the prime initiative to accelerate this population growth. Immigration of interior rural people for drawing the opportunity of residence and employment and invasion of outsiders in terms of business and commercial activities, both are reflected as the driving causes for this population growth over time. Interestingly, after 2011, the population of this tourist cum rurban hotspot over Bengal coast has been increased drastically due to the initiatives and opportunities from the newly formed Government mainly. The database reflects the more population concentration and economic accumulation in Digha tourism sector than that of neighbourhood others.

5.1.2 Comprehensive LULC Scenario influenced by Tourism in the Study Area:

LAND USE LAND COVER (LULC) MAP OF THE STUDY AREA
 [Digha-Khadalgobra Census Town, Purba Medinipur, West Bengal, India]

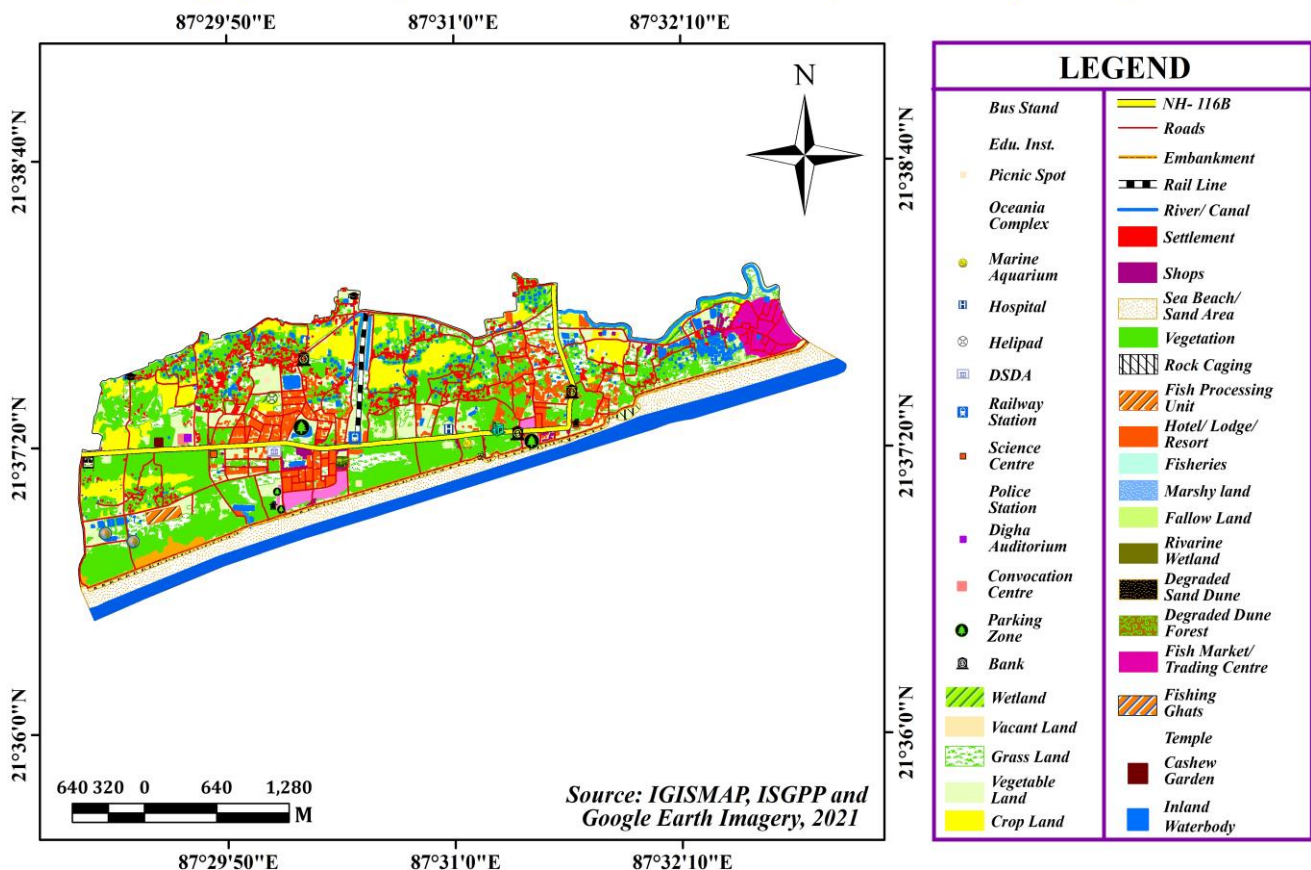


Figure 4: LULC Map of the Study Area, 2021

The figure 4 shows the LULC scenario of study area in 2021. The mapping database reflects the different anthropogenic features and land uses have been dominated over physical features breaking the monotony of natural set up. Consequently, the vegetation cover including forest, dune tract, wetland and inward agricultural and vegetable lands have been dramatically squeezed over time whereas hotels and resorts, market, transport and institutional entities have been increased in fabulous way. This scenario indicates the development of tourism and urbanization in the study area throughout the time.

5.1.3 Tourist Flow and Magnitude at the Different Tourism Sectors in the Study Area:

Years	2007		2008		2009		2010		2011		2012		2013		2014		2015		2016		2017		2018		2019		2020*		2021*																																													
	Daily	Tourist	Daily	Tourist	Daily	Tourist	Daily	Tourist	Daily	Tourist	Daily	Tourist	Daily	Tourist	Daily	Tourist	Daily	Tourist	Daily	Tourist	Daily	Tourist	Daily	Tourist	Daily	Tourist	Daily	Tourist	Daily	Tourist																																												
2007	3641	Total	13.29	Total	2008	3808	Total	13.87	Total	2009	4189	Total	15.24	Total	2010	6978	Total	25.47	Total	2011	6751	Total	24.04	Total	2012	7252	Total	26.38	Total	2013	7449	Total	27.19	Total	2014	7652	Total	27.95	Total	2015	7551	Total	27.56	Total	2016	7849	Total	28.05	Total	2017	8052	Total	29.39	Total	2018	8559	Total	31.24	Total	2019	8890	Total	32.45	Total	2020*	3455	Total	12.55	Total	2021*	4447	Total	16.25	Total

* indicates the estimated figures in the draft reports from the authorized ends

Source: Final and Draft Reports of DSDA, 2013, 2014, 2018, 2019 & 2021

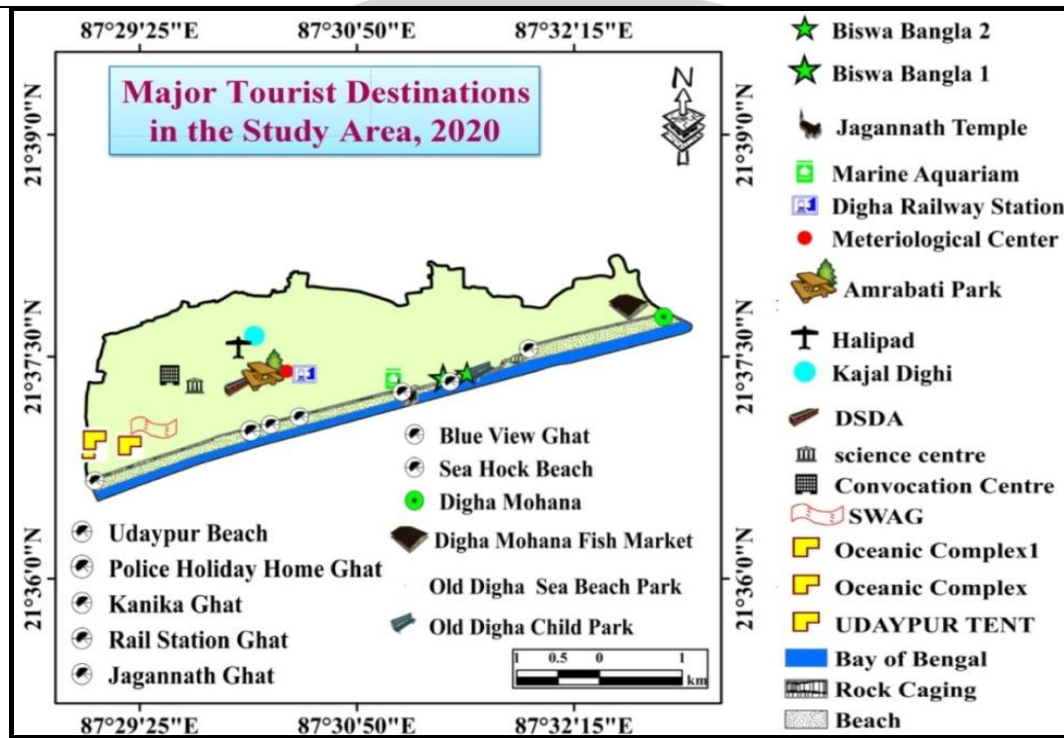


Figure 5: Major Tourist Destinations in the Study Area

Name of Tourism Sector/ Pocket	Average Number of Tourists (Yearly, Monthly, Daily and During Peak Season)				
	Yearly	Peak Season (April-June)	Monthly	Daily	Daily in Peak Season
Digha Tourism Sector (Udaypur-New Digha-Old Digha-Mohana)	3245000	1974600	270417	8890	21940

Source: DSDA Report, 2017-18, 2018-19 & 2019-20 and Field Survey, 2018, 2019, 2020 & 2021

Table 5 and 6 show the temporal figure and flow of tourists in the study area. The data reveals the average magnitude of tourist flow here based on last 4-years database which significantly reflects the upgrowing importance of this tourism cum rurban landscape over time. The tourist flow shows that the increasing higher magnitude and flow of tourists are usually higher in

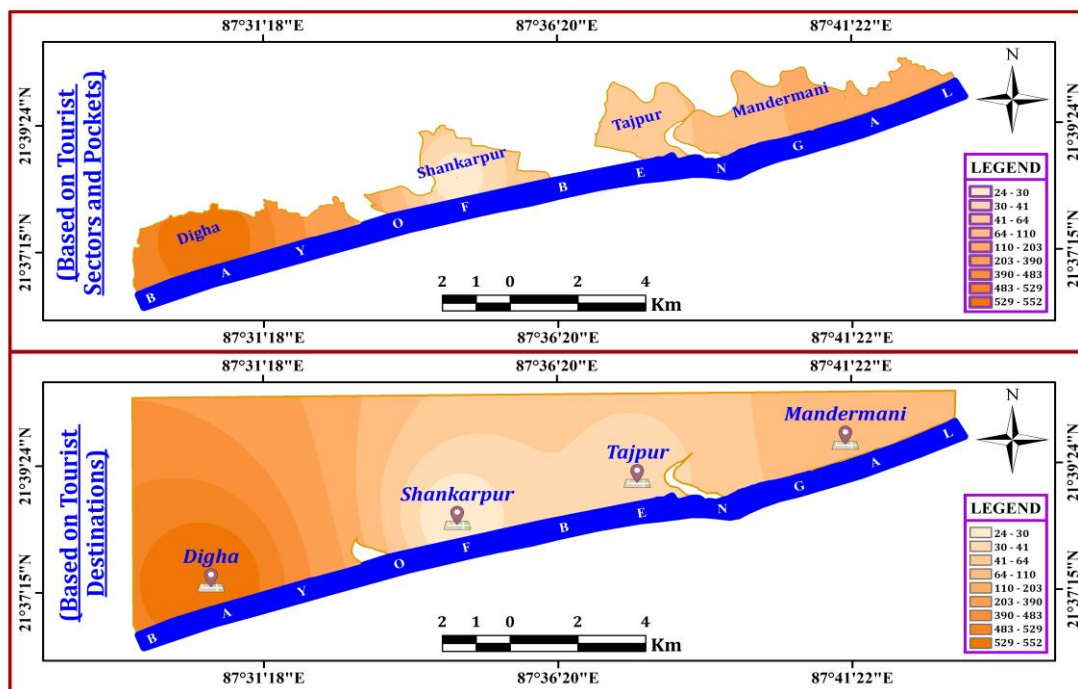
Digha. At least 21 tourist destinations have been selected for assessing the tourist flow at those sectors and pockets. All of the bathing ghats along with marine aquarium, science city, Amravati Park, Biswa Bangla Udyan, Kaju Garden, etc. have been considered to estimate the magnitude of tourist flow in the study area [4]. Table 5 significantly exhibits the drastically decline in tourist flow during 2020 and 2021 due to the hard hitting of COVID-19 and its race on that time.

1.2 Economy and Employment Opportunities created by Tourism and Allied Industry in the Study Area:

Digha is the coastal tourism townscape having the tourism cum rural experience providing the mammoth extent for life earnings. A large number of people earn their livelihood in different segments associated with tourism and hospitality [5]. Not only local or regional people are engaged in different dimensions of employment background, but also a remarkable figure of outsiders is visible here. Employment in hotels/ guest houses/ holiday homes, transport sectors, street/ opened informal sectors including vendors, hawkers, etc., licensed shops, fishing industry, etc. creates the ample scope to stimulate the tourism journey in the study area. Table 6 shows the gigantic number of hotels and resort in Digha townscape which indicates the intensity and increasing concentration of hotel infrastructure and livelihood dependency of the region over time.

MAGNITUDE OF HOTEL INFRASTRUCTURE

[Digha, Shankarpur - Tajpur and Mandermani Tourism Sectors, Purba Medinipur, W.B.]



Source: IGISMAP, ISGPP, GPS Survey and Google Earth Imagery, 2021

Figure 6: Magnitude of Hotel Infrastructure in the Study Area w.r.t. neighbourhood tourist destinations

Table 6: Account of Hotels, Shops and Vendors throughout the Study Area							
Hotel in the Study Area							
Sl. No.	Name of Coastal Stretch	Name of Tourism Sectors	Name of Tourism Pockets	Number of Hotels and Resorts			Total
				Government Sector	Private Sector	Unauthorized Uses	
1.	Digha Coastal Stretch	Digha Tourism Sector		39	307	206	552
Total (%)				7.06	55.62	37.32	100
Vendors throughout the Study Area							
Name of Zones		Number of Vendors		% of Vendors			
Old Digha Sector		1018		34.7			
New Digha Sector		1855		63.2			
Udaypur Sector		64		2.1			
Total		2937		100.0			
Licensed Shops							
Old Digha		810		24.3			
New Digha		1447		43.6			
Udaypur		27		0.8			
Other Different Markets		1043		31.3			
Total		3327		100.0			

Source: DSDA and Hotel Owner's Association Report & Field Survey, 2018, 2019, 2020 & 2021



Figure 7: Importance of Tourism Development in the Study Area

Source: Field Survey and Perception Study, 2018-2020

Name of Tourism Sector/ Pockets	Number of Employees & Workers in Tourism & Allied Sectors								Total
	Hotel, Resort, Lodge, Restaurant, etc.	Vendor, Hawker, Street & Market Shop, Mall, etc.	Transport including Rickshaw, Auto, TOTO, Tracker, Private Car, Bus, etc.	Tourist Institution/ Organization & Related Service Sectors	Fishing, Fish Processing, Manufacturing, Marketing, Transporting, Exporting, etc.	Govt. and Non-govt. Formal/ Service Sectors including Administration, Health & Education	Forestry, Livestock, Agriculture, Small Scale Manufacturer, Handicraft, Work Man, Mechanics & Others	Labour Force in Carious including construction, renovation, repairing, transporting & others	
Digha Tourism Sector (Udaypur-New Digha-Old Digha-Mohana)	15500	8715	5155	1119	47794	646	668	2574	82171

Source: DSDA Report & Field Survey, 2018, 2019, 2020 & 2021

Name of Tourism Sector/ Pockets	Number of Employees & Workers as per Residence					Total
	Local (Within Ramnagar-I & II CD Blocks)	Regional (Outside Ramanagar-I & II CD Blocks, but within Purba Medinipur District)	State Level	National Level		
Digha Tourism and Allied Sectors (Udaypur-New Digha-Old Digha-Mohana)	48.3	19.3	30.8	1.6		82171

Source: DSDA Report & Field Survey, 2018, 2019, 2020 & 2021

Table 7 and 8 detect the employee and employment scenario of tourism and allied sectors in the study area. The generated database shows the higher concentration of employees and workers engaged in tourism and related economies in Digha. Due to higher scope and opportunity in tourism and different formal and informal sectors here, the employment graph and magnitude are higher there. Table 8 reflects the residential scenario of employees and workers in the study area. In all of the designated sectors of tourism industry, on an average, 54.3% of the employees is local in nature where outside the blocks, regional workers are 22.2% and remarkably, 23.5 belongs to outside working force involved in the study area. This figure indicates, not only local or regional livelihood, but also the outsiders is influenced by the tourism and allied economies of the study area. Interestingly, due to higher opportunity of employment and socio-economic convergence, Digha is featured by a remarkable outside working force than others.

5.3 Wave Lockdown Schedule for COVID Outbreak in the Study Area:

The corona virus infection or COVID-19 outbreak is one of the biggest medical challenges to humankind in recent times. “Lockdown” is an emergency protocol, which basically means preventing public from moving from one area to the other. In this scenario, all educational institutions, shopping arcades, factories, offices, local markets, transport vehicles, airports, railways, metros, buses, etc., are completely shut down, except hospitals, police stations, emergency services such as fire station and petrol pumps, and groceries [26]. Lockdown can be a significant and effective strategy of social distancing to tackle the increasing spread of the highly infectious COVID-19 virus. At the same time, it must have elevated degree of socio-economic impact on the life and livelihood throughout a nation [2].

Table 9: Lockdown Specific Schedule for Wave Oriented COVID Outbreak in West Bengal

Phases of Lockdown		Duration	State of Lockdown in the Study Area
1 st Wave	1 st Phase	23 rd March-14 th April, 2020	Completely lockdown along with the state
	2 nd Phase	15 th April – 30 th April, 2020	
	3 rd Phase	1 st May – 31 st May, 2020	The zones is categorically under ‘A’ affected zones and fallen into sensitive lockdown region.
	4 th Phase	1 st June – 30 th June, 2020	
	5 th Phase	1 st July – 31 st July, 2020	Conditional lockdown to avoid the pandemic outbreak due to huge gathering and interaction in tourist place.
	6 th Phase: Extended Phase having selected days	2, 5, 8, 9, 20, 21, 27, 28 & 31 August, 2020	West Bengal government announced the extension of the weekend lockdown in the state wherein only essential services would be allowed to operate. All public and private transport is banned.
	7 th Phase	Lockdown is extended in containment zones in West Bengal till September 30 and 7 th , 11 th and 12 th complete lockdown in the state	Indirectly lockdown due to shutdown of source regions, feeding zone and hinterland of the region.
	8 th Phase	1 st November – 30 th November, 2020	Partial Lockdown for several places and situations
2 nd Wave		24 th April, 2021	Mandatory of mask facial wearing and maintaining social distance in all the public place
		30 th April & 1 st – 15 th May, 2021	Mandatory of mask facial wearing and maintaining social distance in all the public place & several prohibition in case of Hat/ Bazar/ Shopping Mall and others.
		15 th -30 th May, 2021	Restrictions/prohibitions in the State till 30th May, 2021
		29 th May, 2021	Notification regarding extension of restrictions/prohibitions in the State till 15th June, 2021
		14 th May, 2021	Notification regarding extension of restrictions/prohibitions in the State till 30th June, 2021.
		28 th June, 2021	Notification regarding extension of restrictions/prohibitions in the State till 15th July, 2021.
		14 th July, 2021	Notification regarding extension of restrictions/prohibitions in the State till 30th July, 2021.
		29 th July, 2021	Notification regarding extension of restrictions/prohibitions in the State till 15th Aug, 2021.
		13 th August, 2021	Notification regarding extension of restrictions/prohibitions in the State till 31st Aug, 2021.
		28 th August, 2021	Notification regarding extension of restrictions/prohibitions in the State till 15th Sept, 2021.
		15 th September, 2021	Notification regarding extension of restrictions/prohibitions in the State till 30th Sept, 2021.
		29 th September, 2021	Notification regarding extension of restrictions/prohibitions in the State till 30th Oct, 2021.
		30 th October, 2021	Notification regarding extension of restrictions/prohibitions in the State till 30th Nov, 2021.
3 rd Wave		15 th January, 2022	Notification regarding additional restriction and relaxation measures in the State till 31st Jan 2022.
		17 th January, 2022	Notification regarding additional restrictions and relaxation measures of Order dated 15/01/2022.
		31 st January, 2022	Notification regarding additional restriction and relaxation measures in the State till 15th Feb 2022.

	14 th February, 2022	Notification regarding additional restriction and relaxation measures in the State till 28th Feb 2022.
	28 th February, 2022	Notification regarding additional restriction and relaxation measures in the State till 15th Mar 2022.
	31 st March, 2022	Restriction and relaxation measures related to COVID-19 revoked in the State
	30 th June, 2022	COVID Advisory for new wave/ situation

Source: Govt. Officials, Daily News Papers, Media Sites & Regional Notification, West Bengal State Portal/ Bengal Surges Ahead/ <https://wb.gov.in/COVID-19.aspx>

Once the seaside villages along the Bay of Bengal coast are now becoming as one of the most important tourism hotspots with all the major urban facilities in the state of West Bengal. The rural scenario has been changed dramatically. All tourism centric developmental activities have been done to make this place into an economic giant also. But, now the COVID-19 outbreak is now just shutting down the economy of this region. It looks like a desert [Steni, Simon, 2020]. It is one of the worst crises ever to hit the tourism industry of this region impacting all its geographical segments - inbound, outbound and domestic, almost all tourism verticals - leisure, adventure, heritage [Das R. and Mondal M., 2021]. Table 10 depicts the wave based COVID pandemic lockdown scenario in the study area along with the state and central lockdown schedule.

5.4 Socio-economic Impact of COVID-19 Outbreak on the Study Area:

The above discussion clearly depicts the number of people dependent on tourism industry at Digha. This pandemic actually brings the curse in the present and future lives of that number of huge population. The most vulnerable groups are those who are engaged in unorganized sectors and daily bread earnings. One thing should always keep in mind that the economic crises are visible but the social and psychological crises are not always visible. These invisible crises are actually destroying the life of mankind. In the following sections the authors are trying to estimate these immitigable losses as much as possible because of the limitation of short survey period and prevailing lockdown situation which is going on even now in West Bengal.

5.4.1 Perceptions from Different Sectors of Region regarding the Socio-economic Cost of COVID-19 Outbreak and Its Lockdown Situation:

Table 10: Perception on Sector wise Socio-economic Costs due to COVID-19 Pandemic and Its Lockdown Situation

Major Socio-economic Costs	Perceptions/ Responses from Different Parts in the Study Area												Average	Average (%)
	Hotel & Resort Sector	Travel & Transport Sector	Vendor/ Hawker Sector	Tourist Worker Sector	Market Sector	Handicrafts & Manufacturing Sector	Fish Farming & Agriculture Sector	Trade, Commerce & Service Sector	Fishing Sector	Household Sector	Construction & Labour Force Sector	Tourists & Others		
Job Loss & Uncertainty	46	42	50	50	43	44	41	44	45	42	45	42	44.5	89.0
Economic Uncertainty & Insecurity	47	47	48	48	46	46	44	45	47	46	45	44	46.1	92.2
Increasing Poverty & Marginalization	39	48	49	46	41	45	41	39	43	44	46	39	43.3	86.6
Collapsing Market, Economy & Tourism Systems	49	44	48	47	50	45	43	50	47	41	41	42	45.6	91.2
Turndown Growth & Development	50	48	47	46	50	47	46	50	49	45	44	45	47.3	94.6
Healthcare Crisis & Insecurity	39	47	48	43	40	41	42	41	42	43	45	40	42.6	85.2
Socio-Psychological Stress	42	48	48	47	43	45	45	45	46	46	45	43	45.3	90.6
Socio-cultural Disruption & Stress	39	42	46	42	37	41	40	39	42	43	44	42	41.4	82.8
Social Inequalities & Segregation	36	35	40	41	36	34	36	38	43	39	45	38	38.4	76.8
Change in Lifestyle	44	45	45	44	46	47	46	45	45	46	45	44	45.2	90.4
Socio-economic Insecurity & Unsafe Livelihood	43	41	43	42	42	45	43	43	45	44	46	42	43.3	86.6
Diluting Tourist	48	48	46	47	46	45	42	44	43	43	41	47	45.0	90.0

Flow & Potentiality														
Average	43.5	44.6	46.5	45.3	43.3	43.8	42.4	43.6	44.8	43.5	44.3	42.3	44.0	88.0
Average (%)	87.0	89.2	93.0	90.6	86.6	87.6	84.8	87.2	89.6	87.0	88.6	84.6	88.0	
N=360	N _{HR} = 30	N _{TR} = 30	N _{TH} = 30	N _{TRW} = 30	N _M = 30	N _{HMV} = 30	N _{FA} = 30	N _{RS} = 30	N _F = 30	N _H = 30	N _{CR} = 30	N _{RO} = 30	N = 360	N% = 100

Source: Telephonic Interview during Lockdown and Field Survey after Lockdown, 2020-2021

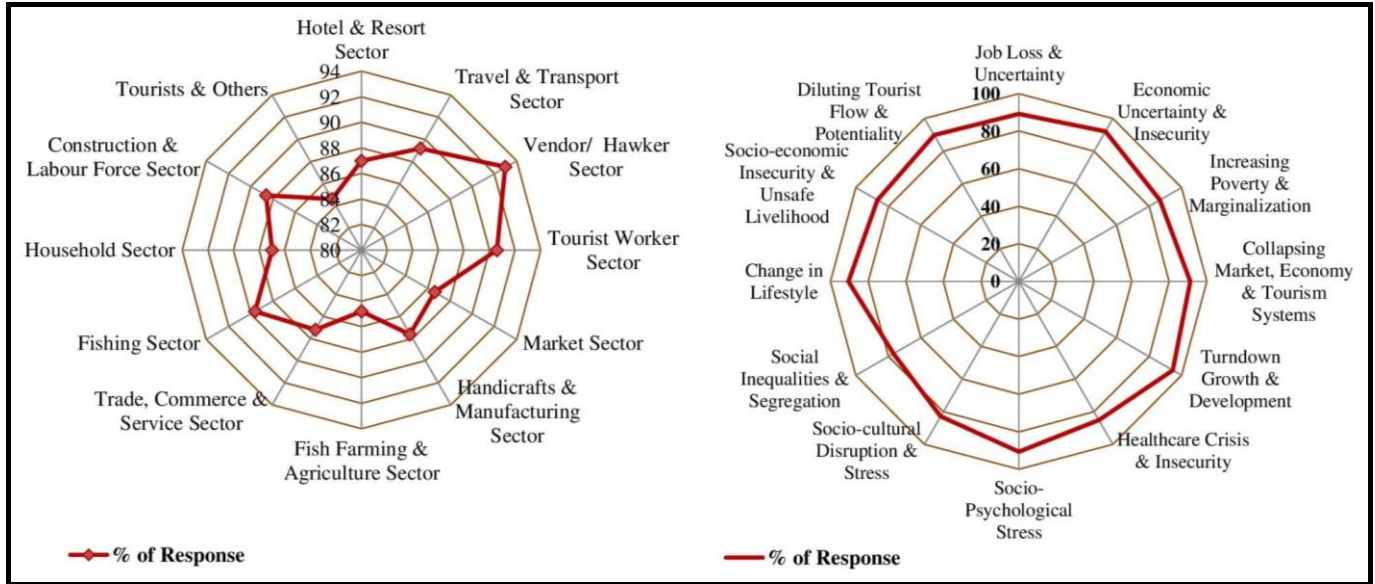


Figure 8: Perceptions from the Region regarding the Socio-economic Cost of COVID-19 Outbreak and Its Lockdown Situation

Table 10 and Figure 8 show the perception on different socioeconomic costs as per various sectors relating tourism in the study area. In most of the cases of sectors and socio-economic costs, the magnitude of perception is at higher scale (> 80%) whereas total 600-respondents taking 50 from each sector have put their suffering perceptions in the field.

5.4.2 Estimation and Assessment of the Employment and Job Crisis due to the Impacts of COVID-19 Outbreak in the Study Area:

Table 11: Estimation of Employees experienced with Job Crisis in the Study Area

Sl. No.	Name of Different Sectors Related to Tourism and Allied Industries	Estimated Number of Employees faced on Job Crisis	
		Number	%
1.	Hotel Sector	12744	18.29
2.	Travel, Tourism & Hospitality (Agency & Organization)	105	0.15
3.	Vendors, Hawkers and Market Shops	5644	8.10
4.	Transport: Trackers, Auto, Toto, Rickshaw, Motor Van, Small Car, Local Bus, Long drive Bus, etc.	4383	6.29
5.	Coast Guards, Nulia, Photographers, Tourist Guiders, etc. (employed as per casual basis through organization, institution and agency)	425	0.61
6.	Small Scale Manufacturing, Art Crafts and so on	258	0.37
7.	Cashew Nut Processing and Food Processing	167	0.24
8.	Fishing and Selling, Fish Processing and Manufacturing, Fish Marketing, Transporting and Trading	42532	61.04
9.	Distributers/ Suppliers, Service Man, Manufacturer, etc.	1296	1.86
10.	Others	2125	3.05
Total		69679	100

54780 (54.2%) employees (within the Ramnagar-I and II CD Block) are local and residual is regional (23450 within the Purba Medinipur District showing 23.2%) and outsiders (22850 outside the District showing 22.6%)

Source: Compilation of Secondary Data (DSDA, Digha Hotel Owners' Association, Fish Owners' Association, Fisheries Development Corporation, Various Labour's and Workers' Union, Market Unions, Different Tourism and Institutions, BDO, GPs, etc.) and Primary Data (Field Survey, 2018-2021)

Table 12: Suffered Employees from Occupational or Life Earning Background engaged in Tourism and Allied Sectors

Regional Existence of the Employees/ People engaged in Tourism and Allied Sectors	Estimated Employees faced on Job Crisis (%)	Estimated Number of Employees faced on Job Loss (%)	Estimated Number of Employees faced on Job Uncertainty (%)	Estimated Number of Employees faced on Less Job Loss/ Uncertainty due to Formal Base or Other Economic Support (%)	% of Employees with respect to Grand Total	% of Employees faced on Job Crisis with respect to Its Total	% of Employees faced on Job Crisis with respect to Grand Total
Local Employees (within the Ramnagar-I and II CD Block)	43.58	14.89	28.69	2.69	46.28	94.18	51.99
Regional Employees (within the Purba Medinipur District)	15.08	5.50	9.58	4.26	19.33	77.98	17.99
Outsider Employees (outside the district and state)	25.16	9.85	15.31	9.23	34.39	73.17	30.02
Total	83.82	30.24	53.58	16.18	100	81.78 (Average)	100

Source: Compilation of Secondary Data (DSDA, Digha Hotel Owners' Association, Fish Owners' Association, Fisheries Development Corporation, Various Labour's and Workers' Union, Market Unions, Different Tourism and Institutions, BDO, GPs, etc.) and Primary Data (Field Survey, 2018-2021)

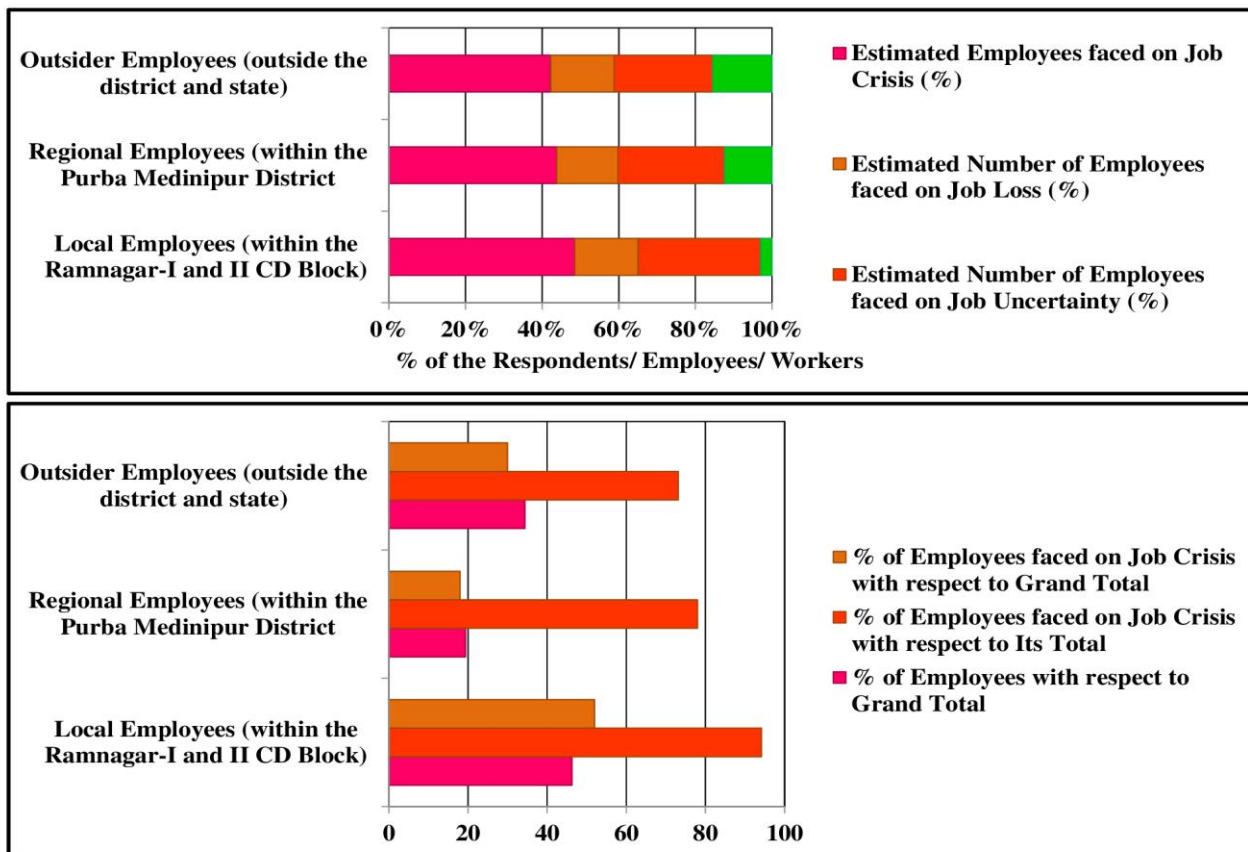


Figure 10: Estimated Employees faced on Various Job Crisis in Tourism and Allied Industries at Study Area

The above data and prepared diagrams based on survey and institutional report reveals that more than 30,000 employees in tourism industry and about 40,000 of allied industry have faced the acute crisis of employment and life earning. The designated authorities also don't know when this situation will become normal.

5.4.3 Estimation and Assessment of the Economic Shock due to the COVID-19 Outbreak in Study Area:

Table 13: Estimation of the Economic Loss of Tourism and Allied Sectors due to COVID-19 in Study Area

Sl. No.	Name of Different Sectors related to Tourism and Allied Industries	Income Loss (Rs./- in lakh) for different wave wise lock downs and unopened situation of Digha Sector				
		1 st Wave (More than 8-Months)	2 nd Wave (About 8-Months)	3 rd Wave (3-4 Months)	Total	%
1.	Hotel Sector	53365.43	31618.76	9802.91	94787.1	40.42
2.	Travel, Tourism & Hospitality (Agency & Organization)	7909.12	4666.65	1557.08	14132.85	6.03
3.	Vendors, Hawkers and Market Shops	3552.78	2451.46	637.14	6641.38	2.83
4.	Transport: Trackers, Auto, Toto, Rickshaw, Motor Van, Small Car, Local Bus, Long drive Bus, etc.	1118	592.54	171.19	1881.73	0.80
5.	Coast Guards, Nulia, Photographers, Tourist Guiders, etc. (employed as per casual basis through organization and agency)	288.82	167.04	61.92	517.78	0.22
6.	Small Scale Manufacturing, Art Crafts and so on	101.86	53.99	17.38	173.23	0.07
7.	Cashew Nut Processing and Food Processing	62.54	24.39	8.76	95.69	0.04
8.	Fishing, Selling, Processing, Manufacturing, Transporting and Trading	64500.78	20735.34	8747.81	93983.93	40.08
9.	Others (Distributers/ Suppliers, Service Man, etc.)	178.62	74.76	24.14	277.52	0.12
10.	Govt. Loss from Different Tourism & Allied Industry related Sectors	14500.18	5655.39	1839.69	21995.26	9.38
	Total	145578.13	66040.32	22868.02	234486.47	100
	Grand Total	= 234486.47 Lakh = 2344.86 Crore				

54780 (54.2%) employees (within the Ramnagar-I and II CD Block) are local and residual is regional (23450 within the Purba Medinipur District showing 23.2%) and outsiders (22850 outside the District showing 22.6%)

Source: Compilation of Secondary Data (DSDA, Digha Hotel Owners' Association, Fish Owners' Association, Fisheries Development Corporation, Various Labour's and Workers' Union, Market Unions, Different Tourism and Institutions, BDO, GPs, etc.) and Primary Data (Field Survey, 2018-2021)

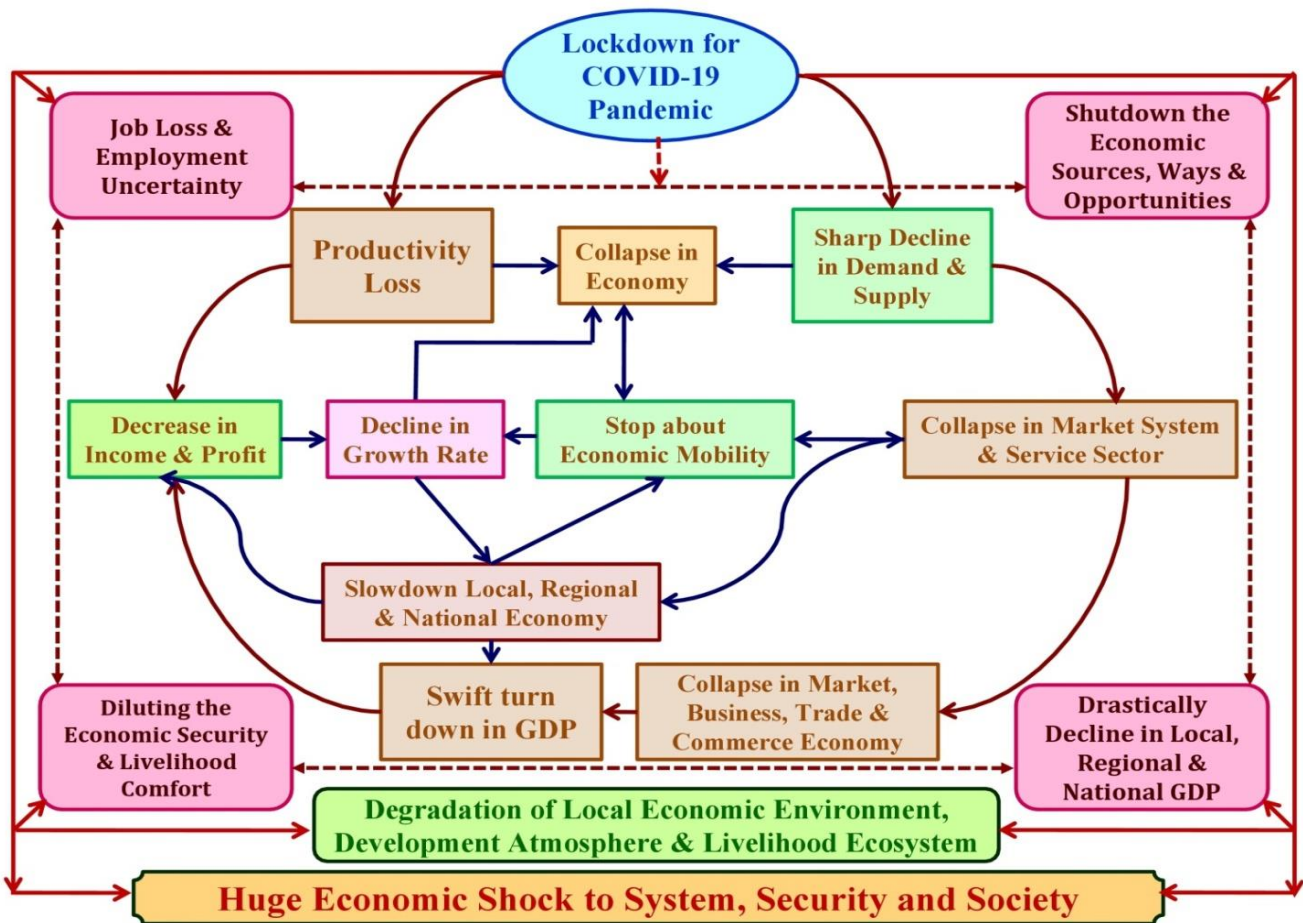


Figure 12: State of Economic Shock to the System, Security and Society in the COVID Environment of Digha

The above Table No.-9 has been prepared from field survey, telephonic interview, face to face interview maintaining the social distance and institutional report reflects the state of economic shock in different sectors like hotel, market, transport,

hospitality, manufacturing, art and crafts, tourism services, etc. of tourism industry and also in allied industry like fishing and fish food manufacturing. Estimation and assessment of income loss indicates stern drowning state of concerned sectors. But, hotel, transport, fishing and market are the mostly affected segment of this industry in the study area. Not only that about 6000 of local households and 2200 households of surrounding regions have been suffered from their livelihood due to this heightened scenario of COVID-19 outbreak. The economy of this region has totally been shuttered during the first wave phase whereas the 2nd and 3rd waves dilute the severity of the pandemic and its socio-economic impacts here.

5.4.4 Social impact:

The poor and marginalized sections of this regional society are the major fatalities of this deadly virus attack. The fright of unemployment, poverty, incapability to uphold the social distancing, fear of disease, no such hope from administrative levels etc. make their lives ruinous.

The various visible social impacts resulted from the survey cum investigation are listed below:

- a) **Massive Psycho-social Impacts on Poor and Marginalized Sectors:** The crisis in terms of economic costs leads to massive psycho-social impacts on marginalized sections, women and children has been huge in this area.
- b) **Higher Physical and Mental Health Risk of Women Community:** Women are at greater risk from both the physical and mental health perspectives due to loosening of job and uncertainty of family income and declining expenditure in household health purpose. Lacking resource for women reflects the negligence in own requirements trending the issues towards menstrual hygiene, mental health and nutrition in the list of livelihood priority.
- c) **Social Inequalities and Unsafe Livelihood:** Poor and substandard families of unsafe scenario draws the social inequities including gender based violence, child abuse, lack of security and money with poor health.
- d) **Social Stress in Communal Life and Livelihood:** Travelling restriction, socio-cultural disruption, healthcare limitation, interruption in regular immunization, shutting down occupational sources, etc. results the anxiety and fear in terms of social stress among the people by lock down.
- e) **Incapacitated hospitals and distressed primary healthcare:** There are significant reasons behind so much distress among the people for a disease which could be prevented with a little care and precaution.
- f) **The stigma of religious hatred, caste based discrimination affecting humanity:** In appearance of this situation, the less informed and biased media as well as people with vested interests tried to damage the social fabric of the area and left a big social impact in the fight against corona virus.
- g) **Multi-dimensional Socio-economic Issues trapping single to society and Bottlenecked Livelihood:** The issues of health, the rapid decline of economy, shortage of medicines, sanitizers, masks, and other essentials, poverty, unemployment has undoubtedly taken centre stage and each has left a mark on the lives of people.
- h) **Daily Wage Earners, Social Distancing and Reality of Socio-economic Security in Livelihood:** While upper class and upper caste people are able to create a safety net around them, the daily wage earners are victimized by the harsh social distancing provisions in the absence of adequate social safeguards. Social locations of the marginalized classes results in more oppression and exploitation without intersecting endeavours and understanding of the nature of continuous process of social segregation. Therefore, the deep seated apathy towards the marginal sections hit hard by the widespread Covid-19 outbreak and will reproduce otherness among haves and have not.
- i) **Inadequate Investment, Poor Infrastructure and Insufficient care lacking to Socio-economic Reconstruction and Rejuvenation:** Large investment, vigorous infrastructure and sufficient care towards local livelihood, tourism and allied sectors and development stability are not enforced from govt. and policy makers for the strengthening turndown livelihood, economy and development.

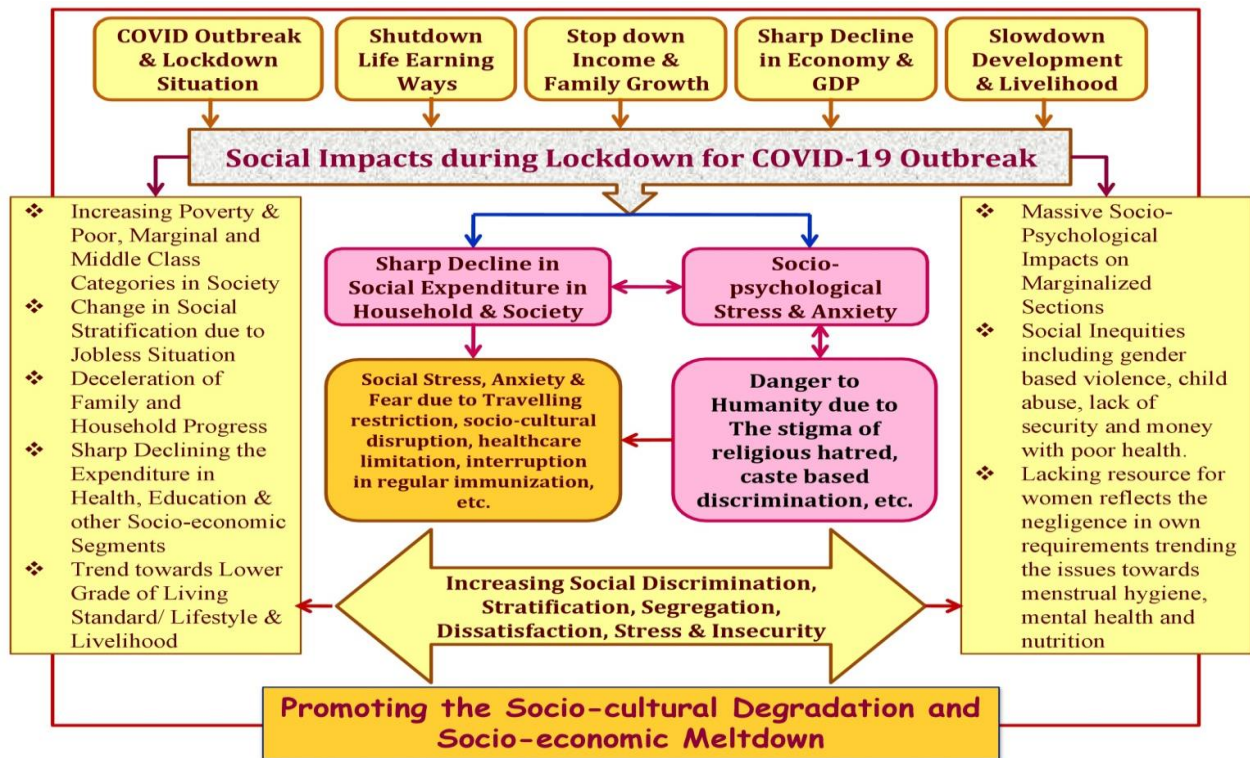


Figure 13: Socio-cultural Degradation and Socio-economic Meltdown in terms of Social Impacts of COVID-19 Pandemic in the Study Area [4] & [5]

Table 14: Magnitude of different social impacts due to COVID-19 outburst in study area

Major Social Impacts as per Observation and Perception	Rating Scale for the assessment impact magnitude						Total
	Very High	High	Moderate	Low	Very Low	No Comment	
Massive psycho-social impacts on poor and marginalized sectors	16.6	37.3	28.5	12.1	3.9	1.6	100
Higher physical and mental health risk of women community	14.9	38.1	29.4	13.7	3.4	0.5	100
Social inequalities and unsafe livelihood	13.4	33.6	34.2	15.6	2.1	1.1	100
Social stress in communal life and livelihood	19.3	39.8	25.2	11.7	2.9	1.1	100
Incapacitated hospitals and distressed primary healthcare	21.3	36.4	26.9	12.2	2.4	0.8	100
Stigma of religious hatred, caste based discrimination affecting humanity	10.8	30.7	35.2	17.1	4.3	1.9	100
Multi-dimensional socio-economic issues reflecting bottlenecked livelihood	17.3	34.5	30.1	14.3	3.1	0.7	100
COVID obstacles to daily earners and hardness to socio-economic security	27.2	35.9	23.8	10.7	2.1	0.3	100
Inadequate investment for basic needs including infrastructure and services	25.9	34.2	25.6	11.6	1.9	0.8	100
Insufficient care for socio-economic reconstruction and rejuvenation	24.8	35.8	24.1	11.9	2.2	1.2	100
N=360	19.15	35.63	28.3	13.09	2.83	1	100

Source: Post-COVID Lockdown Survey and Interview, 2020

5.4.5 Institutional roles and responsibility for recovering the socio-economic shock to Digha tourism industry:

Table 15: Magnitude of Human Costs by the Special Effects of COVID-19 Outbreak

Respondents from Different Sites and Sectors	Various Aspects of Human Costs						Average Impacts (Loss, Stress & Crisis)
	Economic Loss and Suffering	Socio-cultural Stress, Crisis and Degradation	Socio-psychological Stress and Crisis	Decaying Lifestyle and Livelihood Status	Retrograding Industrial and Allied Sectoral Development	Retrograding Local and Regional Development	
Hoteliers (Owners of Hotels, Lodge & Restaurants)	VH	M-H	H	M-H	VH	M	H
Hotel Employee and Workers	VH	H	VH	VH	H	H	H-VH
Market Employee and	VH	M-H	H-VH	H	H	H	H

Workers							
Vendors and Hawkers	VH	VH	VH	VH	H-VH	H	VH
Transport Employee and Workers	VH	M-H	H-VH	H-VH	H	H	H-VH
Manufacturer and Manufacturing Workers	VH	H	H-VH	H-VH	H	H	H-VH
Coast Guards, Nulia, Photographers, Tourist Guiders, etc.	VH	H-VH	VH	VH	H	H	VH
Agents & Organizers relating Travel, Tourism & Hospitality	VH	H	H-VH	H	H	M	H
Various Distributers, Suppliers, Service Man, etc.	VH	H	H-VH	H-VH	H	H	H-VH
Local/ Regional Inhabitants depended on the industry	H	H	H	H	H	H	H
Fishing related employee, worker and inhabitants depended on the industry	VH	M-H	H	H	M-H	M-H	H
Govt. and Non-govt. Employee and Workers	M-H	M-H	M-H	M-H	M-H	M	M-H
Daily Labourers	VH	VH	VH	VH	H	H	VH
Others	M	M	M	M-H	M-H	M	M
Average	VH	H	H-VH	H	H	M-H	H
VH = Very High	H-VH = High to Very High	H = High	M-H = Moderate to High	M = Moderate	M-L = Moderate to Low	L = Low	VL = Very Low

Source: Post Lockdown Perception Survey and Analysis, 2020-2021

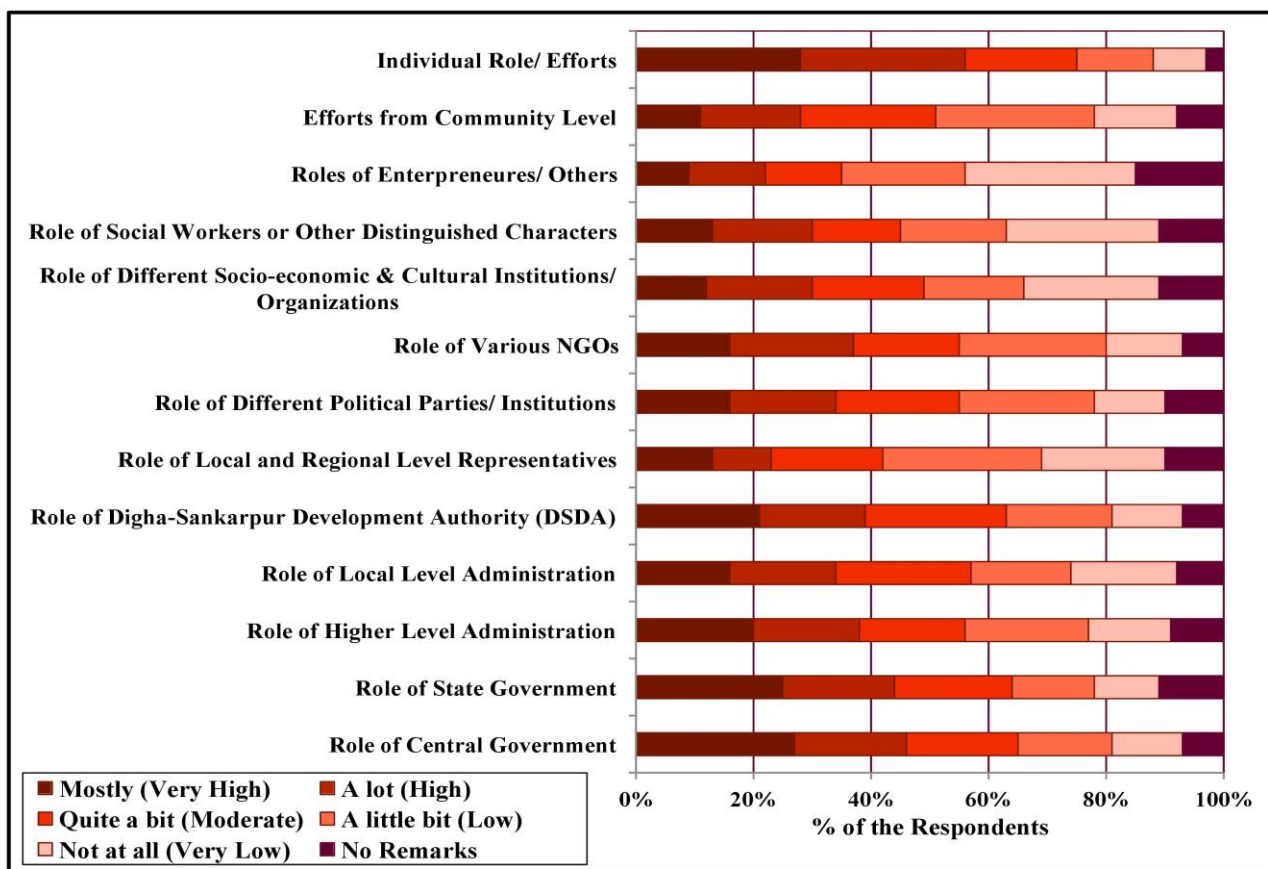


Figure 14: Role of Different Sites for Management of the Problems in the Study Area

Table 15 shows the magnitude of different human costs on various sites of the tourism and allied industries in the study area. On an average, magnitude of COVID impacts as loss, stress and crisis in different sectors are high to very high throughout the regional economy. Figure 14 reflects the roles and responsibilities from the relevant institutions, authorities, departments and organizations for managing the deadly impacts of the issue. The perception study indicates the poor to traditional management scenario rather than its required attempts.

5.5 Vulnerability and Risk Assessment for estimating the Impacts of COVID-19 Pandemic on Livelihood and Development of the Study Area:

5.5.1 Pandemic Exposure/ Cost Index to the Employees and Workers, People and Households and Livelihood in the Study Area:

Table 16: Estimation of Pandemic Socio-economic Exposure/ Cost Index (SeEI/ SeCI) to the Employees and Workers, People and Households and Livelihood in Study Area

Dimension	Indicators	Weightage on 5-Point Scale	Dimension Specific Exposure Indices	Pandemic Exposure Index (PSeEI/ PSeCI)
Economic Exposure/ Cost	Trends to Job Loss and Uncertainty	4.50	EEI = 0.83	PSeEI/ PSeCI = 0.803 (80.3%)
	Top to bottom reduction in income and Increase in Poverty	3.75		
	Disruption in monthly small scale deposits or running the life insurance policy	4.25		
	Loosening the pocket money for essential expenditure	4.50		
	Economic Dependency on Family/ others	4.00		
	Loosening the Economic Empowerment in the Site and Society	3.75		
Socio-cultural Exposure/ Cost	Reducing the Health and Education Expenditure in the Family	4.25	ScEI = 0.79	
	Decrease in Self-sufficiency and Reliability in Family	3.75		
	Decrease in Demands and Standard of Living	4.00		
	Decreasing Trend to consume Modern Amenities and Services	4.00		
	Decreasing Trend towards Child-Women-Older Care in Family	3.75		
	Domestic Violence and De-empowering the Women Employees and Workers in the Family and Outside	3.75		
Physico-Psychological Exposure/ Cost	Decrease in Socio-cultural Participation and Activities	4.25	PpEI = 0.86	
	Increasing stress, anxiety, depression and thinking disorder	4.75		
	Increasing headache, fatigue and physical disorder	4.25		
	Concentration breaking in domestic works/ others	4.25		
Family/ Relation based Exposure/ Cost	Feeling loneliness and boring at all	4.00	FEI = 0.73	
	Relational Conflict in Inside and Outside Circles	4.00		
	Ignorance in the Family/ Household and Frequent Family Conflict, Chaos and Quarrel	3.75		
	Trend towards Bad Habits/ Practices creating Unhealthy Atmosphere	3.25		

Source: Perception (Qualitative) Survey, 2020 - 2021

The table 16 based on data compilation and synthesization shows the average Socio-economic Exposure/ Cost Index as 0.803 which is higher in magnitude and indicates the intensive cost from the view point livelihood and development. The table 17 reflects the COVID vulnerability to the employees and workers, people and households and livelihood in the study area. This assessment shows also the higher value of index (PVAI=0.7714) indicating the higher livelihood vulnerability by COVID wave hitting.

Table 17: Estimation of Pandemic Vulnerability Assessment Index (PVAI) to the Employees and Workers, People and Households and Livelihood in the Study Area

Vulnerable Dimension	Vulnerable Indicators	Weightage on 5-Point Scale	Dimension Specific Vulnerability Indices	Pandemic Vulnerability Assessment Index (PVAI)
Demographic	Vulnerable Population in the Family	4.25	DVI = 0.70	PVI = 0.7714 (77.14%)
	Family Size & Population Density	3.50		
	Sex Ratio	3.75		
	Literacy Rate	3.25		
	Birth Control/ Family Planning	2.75		
Economic	Vulnerability to Assets including all the Infrastructure and Property	4.25	EVI = 0.81	
	Vulnerability to Savings	4.25		
	Vulnerability to Access to Credit	4.25		
	Vulnerability to Marketing Facility and Capability for Goods and Services	4.25		
	Vulnerability from Poverty Alleviation Schemes/ Programmes	3.25		

Livelihood	Assured Employment	4.25	LVI = 0.81
	Earning Loss during Pandemic	4.25	
	Insurance/ Deposits Facility/ Scope	4.25	
	Alternative Employment	4.50	
	Family Status (Rich/ Higher Middle Class/ Lower Middle Class/ Marginal/ Deprived)	4.25	
Social	Vulnerability to Social Overhead Capital	4.25	SVI = 0.81
	Vulnerability to Education and Awareness	4.25	
	Vulnerability to Health Infrastructure and Facility	4.25	
	Vulnerability to Land and Household Ownership	3.25	
	Vulnerability to Socio-cultural Participation and Empowerment	4.25	
Physical & Psychological	Domestic Violence, Stress, Depression and Anxiety	3.75	P _{HP} SVI = 0.75
	Relational Violence, Stress, Depression and Anxiety	3.75	
	Individual Stress, Depression and Anxiety	4.25	
	Psycho-physical/ Physico-psychological Illness	3.75	
	Existing Health Problems of Family Member (s)	3.25	
Safety & Infrastructure	Vulnerability from Communication Tools	3.75	SIVI = 0.79
	Vulnerability from Household Safety	4.00	
	Vulnerability from Rights to women in family	4.00	
	Vulnerability from Socio-economic Safety	4.00	
	Vulnerability from Empowerment in family and society	4.00	
Institutional	Lack of Disaster Management Plan and Efforts	3.25	IVI = 0.73
	Lack of Advance Warning, Education and Awareness System	3.25	
	Lack of Institutional Responsiveness	3.25	
	Lack of Research and NGO Activities	4.25	
	Lack of Prevention, Mitigation and Preparedness and Zoning	4.25	

Source: Perception (Qualitative) Survey, 2020 - 2021

Table 18: Estimation of Vulnerability Progression Causal Index to the Employees and Workers, People and Households & Livelihood in Study Area

Dimension	Indicators		Weightage on 5-Point Scale	Dimension Specific Causal Indices	Vulnerability Progression Causal Index (VPCI)
Root Causes	Limited Access:	Limited Access to Power	4	RCI = 0.80	VPCI = 0.8133 (81.33%)
		Limited Access to Resources and Rights	4		
		Limited Access to Structure and Services	4		
	Ideologies:	Backwardness from Socio-Political System	4		
		Backwardness from Economic System	4		
Dynamic Pressure	Lacking:	Role of Local Institution, Organization and Administration	4	DPI = 0.84	
		Appropriate Skills, Training, Education and Awareness	4		
		Local Market	3.5		
		Ethical Standards	4		
	Marco Forces:	Rapid Population Change	4.5		
		Rapid Lifestyle and Livelihood Changes	4.5		
		Arms Expenditure	4.5		
Unsafe Conditions	Physical:	Unprotected Infrastructure	4	UCI = 0.80	
		Low/ Marginal Income	4		
	Socio-economic:	Special Group at Risk (Risky Livelihood)	4		
		Vulnerable Input and Production	4		
	Institutional:	Lack of Public Preparedness	4		
	Physico-psychological:	Week and unsafe physiological and psychological conditions	4		
	Overall Safety and Security:	Lack of domestic and background safety and security	4		

Source: Perception (Qualitative) Survey, 2020 - 2021

The data table 18 reflects the Vulnerability Progression Causal Index to the employees and workers, people and households & livelihood in study area. The estimated value shows the higher value of index (VPCI = 0.8133) belonging to the very high vulnerability progression causal possibility here.

Risk	=	Hazard	x	Exposure	x	Vulnerability
Risk Assessment Index (RAI)	=	Hazard Index Value (HVI)*	x	Pandemic Exposure Index to Employees & Workers (PEI _{EW})	x	Pandemic Vulnerability Index to Employees & Workers (PVI _{EW})
RAI	=	1.00	x	0.803	x	0.7714
RAI	=	⇒ 0.6194 (62%)				
RAI	=	⇒ **Higher risk of the COVID-19 Pandemic to the employees and workers engaged in tourism and allied sectors in the study area				

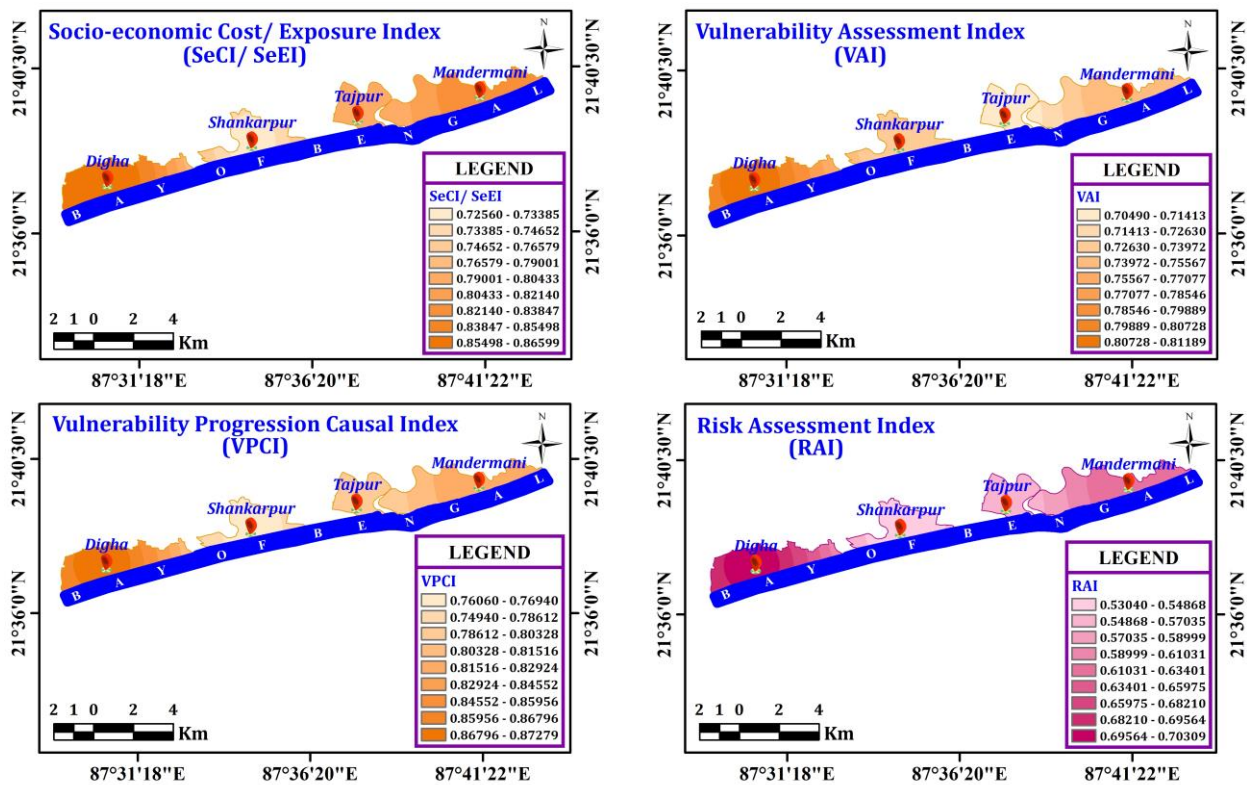
* indicates the absolute numerical figure for its pandemic nature and deadly impacts to whole of the anthroscape and its livelihood.
 ** indicates the remarks on risk assessment on the hazard, exposure and vulnerability whereas 0 – 20% ⇒ Lower Risk, 20-40% ⇒ Moderate Risk, 40-60% ⇒ Moderate to Higher Risk, 60-80% ⇒ High to Very High Risk and > 80% ⇒ Very High to Acute Risk

Source: Compilation of Exposure and Vulnerability Assessment Data Analysis, 2021

The table 19 reflects the Risk Assessment Index (RAI) to the employees and workers, people and households and livelihood in the study area. The enumerated value of RAI on an average scale is higher (RAI = 0.6194) which indicates the higher risk of the COVID-19 Pandemic to the employees and workers engaged in tourism and allied sectors in the study area.

VULNERABILITY & RISK ASSESSMENT INDEX ANALYSIS TO ESTIMATE THE COVID-19 IMPACT ON REGIONAL LIVELIHOOD & DEVELOPMENT

[Digha, Shankarpur - Tajpur and Mandermani Tourism Sectors, Purba Medinipur, W.B.]



Source: IGISMAP, ISGPP, GPS Survey and Google Earth Imagery, 2021

Figure 15: Vulnerability and Risk Assessment to estimate the COVID-19 Waves Based Lockdown Impacts on the Regional Livelihood and Development in the Study Area

VI. RECOMMENDATIONS:

Govt. of any country or state is acted in the role of safeguard against all types of calamities, hazards, disasters and catastrophe and afforded to make stronger the depressed in time. In the reality of giving aids or relief to the needy, Govt. must play the sincere role and honest responsibility to prevent the social-economic vulnerability. Where the tone of voice on the ground reality is as "If we don't die of the corona virus, we will die of hunger" sounded from the roadway of the deprived and unbalanced bonded workforce against secure distancing norms, the social distancing thought should be measured with tolerably recognizing the regional livelihood. Needy populace should be priorities than greedy several in the management system. Strategic improvement to tackle the situation is very important to reduce the socio-economic distress in the region. Govt. and planners should emphasize to the extensive input, sturdy infrastructure and prosperity believes towards all patients for the strengthening of public healthcare considering health issue [4]. Large scale and long term preparation, planning, set up

and development alongwith cooperative attempts of individuals, communities, governments, institutions and organizations to struggle against COVID-19 and likelihood pandemic are essential. In figure 16 and 17 the recommendations for the well-management of COVID issue in the study area have been considered in four ways. Firstly, recommendation for socio-economic turn back or recovery has been proposed in figure 16 and secondly, recommendation for proper institutional and organizational policies has been considered in the same figure. Thirdly, recommendation for social sustainability against COVID has been formulated in figure 17 whereas a road map to transform tourism needs to address five priority areas is sketched in figure 18.



Figure 16: Recommendation for socio-economic recovery and institutional-organizational roles and responsibilities against COVID-19 outbreak



Figure 17: Recommendation for social sustainability against pandemic

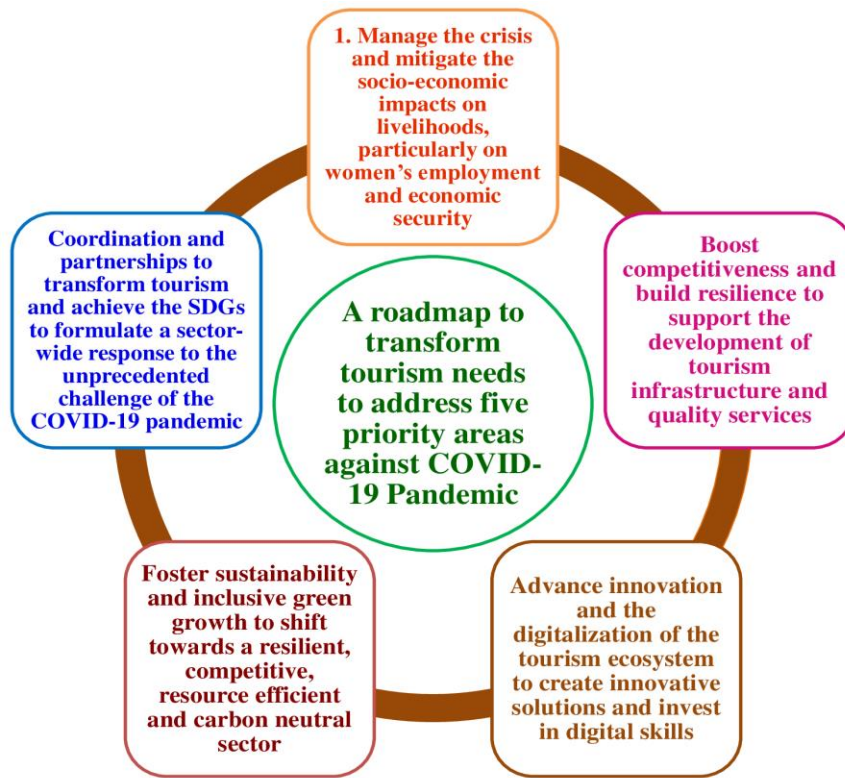


Figure 18: A roadmap to transform tourism needs to address five priority areas

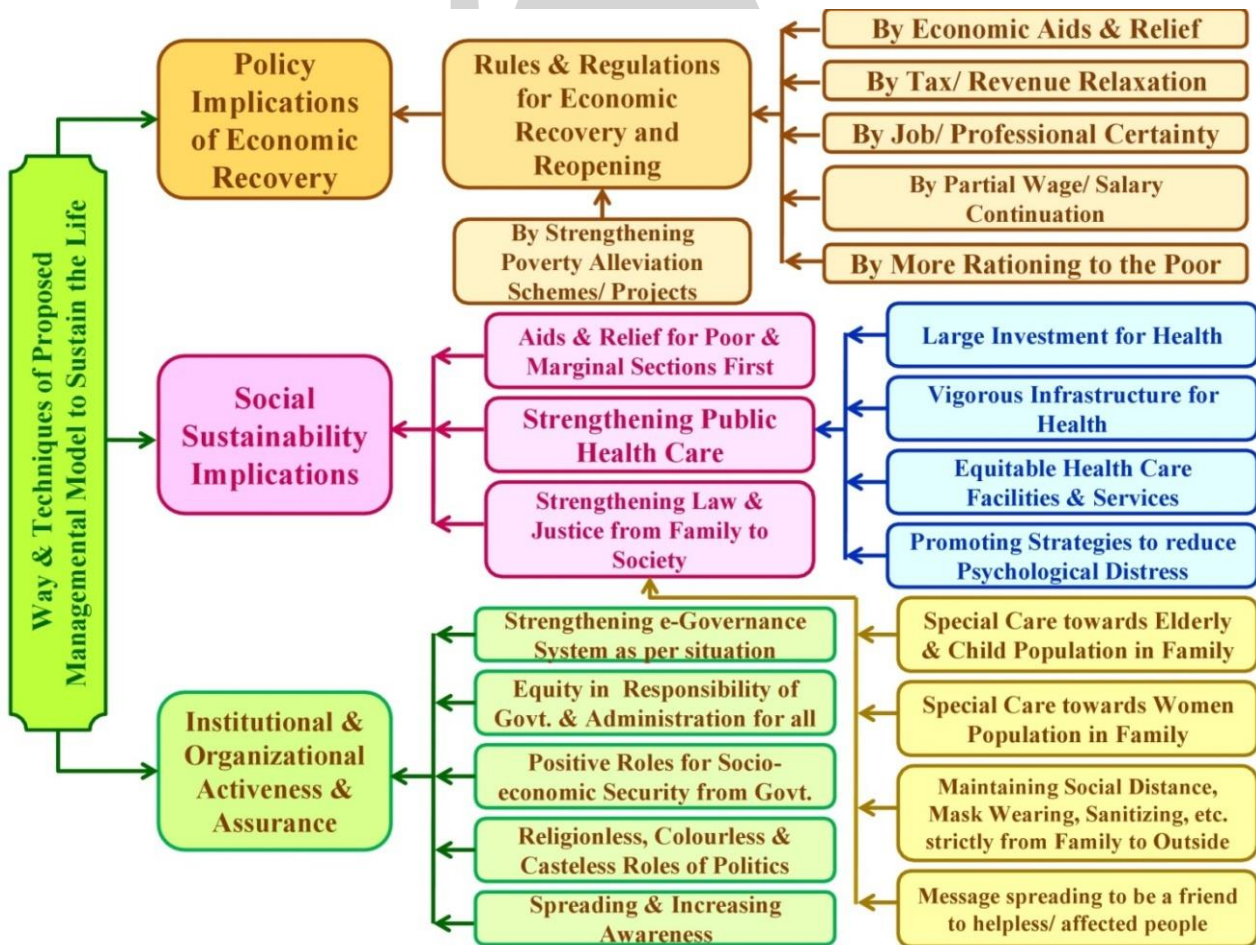


Figure-19: Planned Model for Sustaining the Life, Livelihood and Development against the Human Costs of COVID and Likelihood Pandemic in Study Area [4] & [5]

Table 20: Proposed Ways reflected from the Perception Survey for Management of the Issue

Proposed Ways reflected from the Perception Survey for Management of the Issue	Number of Responses	% of Responses
A. Essentials for Economic Recovery and Reopening:		
(1) Providing Economic Aids and Relief	85.56	308
(2) Tax/ Revenue Relaxation in Hotel & Commercial Sectors	76.67	276
(3) Confirming Job/ Employment Certainty in Different Sectors in the Industry	88.33	318
(4) Continuation of Worker's or Employee's Wage/ Salary from the Ends of Various Institutions	82.78	298
(5) Strengthening the Transparent and Liberal Rationing for the Poor & Marginal Sectors	89.17	321
(6) Introducing and strengthening more relevant poverty alleviation schemes/ projects	74.17	267
B. Attempts towards Social Sustainability against Pandemic:		
1. Ensuring Socio-economic Security for Sensitive Sectors:		
(a) Providing the Aids and Relief for Poor and Marginal Sectors first	86.39	311
(b) Special helps/ care to migrant and Job loss people	85.28	307
2. Strengthening Public Health Care through Rethinking, Reconstruction and Renovations:		
(a) Strengthening the public health care to all	86.94	313
(b) Large investment in public healthcare	85.28	307
(c) Vigorous infrastructure for health	86.67	312
(d) Equitable health care facilities and services	80.28	289
(e) Promoting strategies to reduce psychological distress	77.50	279
3. Strengthening Law and Justice from Family to Society:		
(a) Special cares towards child, women and elderly people in the family	86.11	310
(b) Strictly maintaining social distance, mask wearing, sanitizing, etc.	79.72	287
© Message spreading to be a friend to helpless, hopeless and affected people	75.83	273
C. Institutional and Organizational Responsibility, Activeness and Assurance:		
(1) Strengthening e-Governance system as per situation	86.94	313
(2) Equity in govt. responsibility and administration liability for all	82.50	297
(3) Constructive roles for socio-economic security from govt.	86.67	312
(4) Religionless, colourless and casteless roles from politics	88.89	320
(5) Spreading and increasing awareness from govt. and other institutions/ organizations	84.17	303
	N=360	

Source: Post Lockdown Perception Survey and Analysis, 2020 & 2021

The table 20 shows the proposed ways reflected from the perception survey for management of the issue in the study area. The survey reflects the loud voice from the ends of sampled 360 respondents selected from various socio-economic strata or cluster. The focus characters have sounded for well management on some proposed dimensions like considering some essentials for economic recovery and reopening, ensuring socio-economic security for sensitive sectors, strengthening public health care through rethinking, reconstruction and renovations, strengthening law and justice from family to society and escalation of institutional and organizational responsibility, activeness and assurance.

VII. CONCLUSION

Tourism industry is one of the key controllers of earnings, livelihood and development. Eventually, COVID pandemic has spectacularly distorted it. The shock to the industry and allied sectors in the study area makes it as paralysis reflecting a desert like look during the wave specific phase wise lockdowns. In this perspective, the consultant and coordinated policy for tackling the issue should be integratedly framed on the table of discussion by the government, administration, reliable authorities and organizations, associations and unions of employers and workers, regional public representatives, experts and technicians. This is the time to take urgent steps and make the far sighted decisions to triumph over slowdown curve movement of tourism economy by COVID command. The clear-cut message for not only retaining the fallen down GDP, but also sustaining the life and livelihood in the zone should be sounded from the relevant sites of characters, communities and chiefs. Since, the capability for serving the natives and helping the dependents is out of control and subsequently we are intending towards sequential COVID lip-locked struggles for survival; the tourism industry in this region requires the absolute life sustain and liquidity to

stay alive against non-stop Covid crisis [17]. Significantly, each hazard reflects a distinctive chance to turn back on the route for the advancement of society and its development. Although the escalation of COVID-19 deadly disease has deformed and decelerated the flourishing tourism and allied economy here in nervously; it may gift a new mass-momentum for new normal journey and development from the edge of this pandemic disruption and depression. Hence, tourism industry in Digha experienced with COVID terrible circumstances may tackle the superior challenges in turns of strong strategic encounters from government, policy makers and grounded people. In a final word, to overcome this paralyzed state of shocks and misbelieves of the tourism sector and associated livelihood in this coastal rural landscape, proper management and planning to restart and pick up the activities and the industry are needed from the integrated interference of all responsible corners.

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