Working Paper 496

Livelihood and Social Capital in Vulnerable Ecosystems: A Case Study from Indian Sundarbans

Sneha Biswas
Sunil Nautiyal

October 2020

Institute for Social and Economic Change (ISEC) is engaged in interdisciplinary research in analytical and applied areas of the social sciences, encompassing diverse aspects of development. ISEC works with central, state and local governments as well as international agencies by undertaking systematic studies of resource potential, identifying factors influencing growth and examining measures for reducing poverty. The thrust areas of research include state and local economic policies, issues relating to sociological and demographic transition, environmental issues and fiscal, administrative and political decentralization and governance. It pursues fruitful contacts with other institutions and scholars devoted to social science research through collaborative research programmes, seminars, etc.

The Working Paper Series provides an opportunity for ISEC faculty, visiting fellows and PhD scholars to discuss their ideas and research work before publication and to get feedback from their peer group. Papers selected for publication in the series present empirical analyses and generally deal with wider issues of public policy at a sectoral, regional or national level. These working papers undergo review but typically do not present final research results, and constitute works in progress.

Working Paper Series Editor: **M Balasubramanian**

LIVELIHOOD AND SOCIAL CAPITAL IN VULNERABLE ECOSYSTEMS: A CASE STUDY FROM INDIAN SUNDARBANS

Sneha Biswas and Sunil Nautiyal*

Abstract

Indian Sundarbans, situated on the eastern coast of India, is exposed to threats like floods, cyclones and sea level rise. People living in this environmentally vulnerable area have to depend upon various response and adaptive strategies against these perils. Social capital and seasonal migration are two such measures. Social capital plays a crucial role in everyday life, particularly in crisis situations. This paper attempts to understand the role of social capital (relationship with neighbours, civil organisations and the local government in particular) in adapting to environmental and livelihood vulnerabilities in the study area. A survey was conducted in 200 households through geographical clustering from four villages of Indian Sundarbans (Madhya Gurguria, Debipur, Satjelia and Rangabelia) through a structured questionnaire and two Focus Group Discussions with farmers and the fishing community. Analysis of secondary data reveals historical evidence of the prevalence of cyclonic and flood events in the area. It was also found that the physical damage caused by these events is exacerbated by the area's bleak socio-economic conditions. The results indicated that at the advent of any natural calamity, it is the neighbours and community people who provide shelter, food and financial support to each other before the arrival of any external support. Seasonal migration became an adaptation strategy for many households (78%) but the opposite picture exists too. Even after threats to their lives and livelihood and despite the government showing a willingness to relocate millions of inhabitants, a majority of the people (61%) of the area are reluctant to leave the place which they refer to as 'bhite[1]'.

Introduction

Social capital in general terms can be referred to as the societal ties and networks, or as the group belongingness, which can have an effect on different aspects of one's life. The presence of social capital is inevitable in every sphere of social life, be it personal or professional. It also helps people in the adaptation of their day to day life. Social capital is considered as "resources" which can be used to fulfil certain actions (Coleman, 1994; Hadenius, 2004; Lin, 2017). These are the intangible resources which are expressed through the medium of human communication such as trust, belongingness, reciprocity etc. The main pillars of social capital such as embeddedness and trustworthiness act as good source of support during disaster situations. The role of social capital is becoming more and more relevant in disaster studies. As connection and communication among people constitute the major part of social capital, the flow of information becomes very relevant in particular during times of crisis. Hence, the flow of information (Coleman, 1994; Mukherjee, 2002; Lin, 2017) and local knowledge

* PhD Scholar and Professor, Centre for Ecological Economics and Natural Resources (CEENR), Institute for Social and Economic Change (ISEC), Bangalore - 560 072, India. Email: bsneha992@gmail.com; nautiyal_sunil@rediffmail.com.

We are thankful to the University Grant Commission (UGC), Govt. of India for fellowship to Ms. Sneha Biswas (UGC-JRF) and to Indian Council of Social Science Research (ICSSR), Govt. of India for financial support. We are thankful to the Director, Institute for Social and Economic Change (ISEC), Bangalore for the facilities. We are happy to extend our sincere thanks to the people of the Sundarbans for their kind cooperation, support and knowledge sharing during the field study. We thank the Editor, ISEC working paper series Dr M Balasubramanian for conducting the review and editorial processing, Dr S Manasi, Associate Editor, ISEC Publications for kind support during entire publication process and Ms Arathi for formatting of the manuscript.

[1] Bhite refers to ancestral home

(Petzold and Ratter, 2015) are given due importance for the successful working of social capital. In the case of developed countries, disaster management has been always a state responsibility (Zurita *et al*, 2018) while in the case of developing countries, it has been observed that they are more familiar with informal sources of social capital than formal ones (Jordan, 2015). Empirical studies show how social position, financial and political power influence the generation of social capital. In one of the empirical studies done in South-West Bangladesh by Jordan (2015), it was found that the poor, due to their lack of asset endowment, fail to build the trust to repay and thus are deprived of informal money support during times of disasters. The study also found that the dominance of sections with more financial and social capital creates an environment of injustice. Bordieu's concept says that social capital further creates marginalisation in society. Other studies also show how a strong social capital for one group may result in low social capital for another (Prakash and Selle, 2004). Petzold and Ratter (2015) opine that social capital is relevant for all sections of society, both for the poor and the rich. Thus, considering the universal presence and significance of social capital across the globe, the present paper tries to analyse the role of social capital in the lives of people living in Indian Sundarbans during times of disaster. The paper also tries to understand the difference in access to social capital based on the social, political and financial position of individual households.

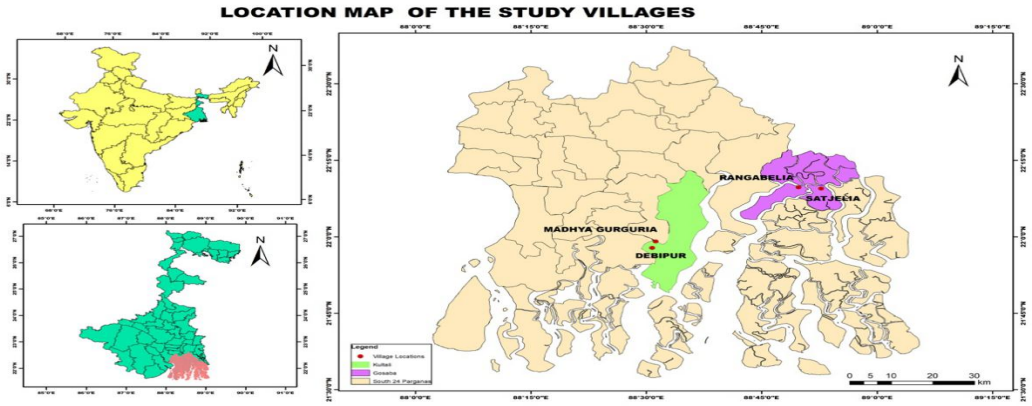
The Indian Sundarbans, lying on the largest delta of the world, is home to millions of people and also provides a habitat for several endangered species. The area, which takes the shape of a large archipelago, is the result of the meeting of several river mouths, rivulets and other channels. It is highly prone to disasters like floods and cyclones, as it is surrounded by several rivers and also due to its location on the coast of the Bay of Bengal. People who choose to live in a disaster-prone area put their life and livelihood consciously in a vulnerable condition, but they also try to cope with such a condition by adapting several strategies. The adaptation strategies can vary widely, starting from personal level initiatives to state and international level action plans, from relying on the traditional knowledge system to the use of modern technology. Social capital in the form of relationships with neighbours, local government and NGOs are the most essential and immediate response to disasters in the present study area i.e. Indian Sundarbans. The present paper attempts to understand the existing threats and vulnerability of the people living in the selected area and how they are able to utilise one of the major adaptation strategies, i.e., social capital.

Selection of the Study Area and Sampling

The Indian part of Sundarbans falls under two districts of West Bengal, namely North and South 24 Parganas. There are 19 blocks in the two districts. To achieve the research objectives of the present study, two blocks i.e. Kultali and Gosaba (in South 24 Parganas district) were purposively selected based on their locations. However, further selection of four villages (Madhya Gurguria, Debipur, Rangabelia and Satjelia) were done again following purposive sampling (based on their accessibility). If we consider Matla river divides Indian Sundarbans into three different parts (east, west and central), Kultali block is situated in the central part of the region while Gosaba is situated in the east. According to the administrative boundary, Kultali falls under Baruipur subdivision while Gosaba falls under Canning subdivision. Both the blocks are surrounded by a protected area on their south. On the south of Kultali

are the South 24 Parganas South Forest Division and West Sundarbans Wildlife Sanctuary. While Gosaba constitutes several islands (50 inhabited), it is bordering Bangladesh on its east and Sundarbans National Park and Sajnekhali Wildlife Sanctuary on its south. According to the 2011 Census, the population density of Kultali and Gosaba are 748 persons/ km^2 and 831 persons/ km^2 respectively.

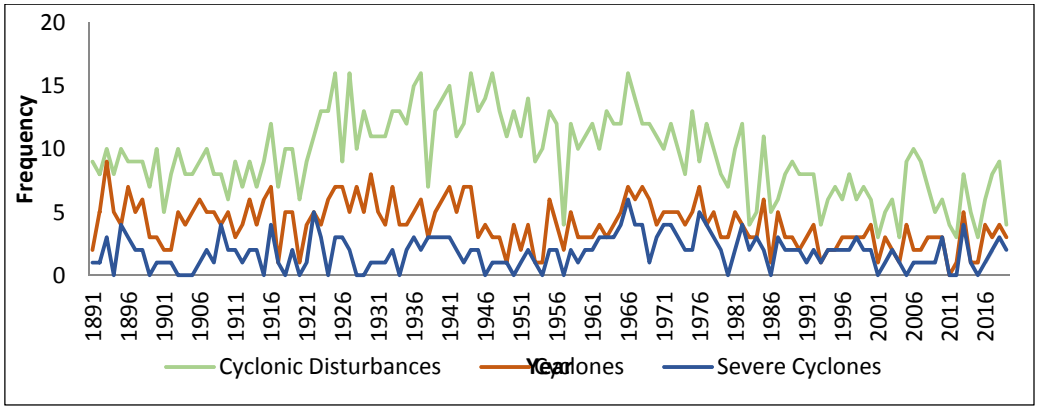
Figure 1: Location map of the study area in Indian Sunderbans (*Source: some of the shape files are obtained from Jadavpur University*)



Climate and Hazards

Sundarbans has a hot and humid climate throughout the year, with a temperature ranging from 36.3°C (Maximum) to 13.6°C (Minimum) and an average annual rainfall of 1750 mm to 1770 mm. About three-fourth of the total rainfall occurs during the south-west monsoon, between the months of June and September (Mandal, 2003). May is the hottest month, while January is the coldest one. The area remains very high in relative humidity throughout the year. This is due to the nearness of the coast and the presence of innumerable water bodies in the area. The area is affected by both floods and cyclones. Major floods in West Bengal occurred during 1978, 1984, 1991 and 2000, affecting an area of more than 20,000 sq. km. Most of the cyclonic activities occur during pre-monsoon or post-monsoon time.

Figure 2: Annual frequency of cyclonic disturbances over Bay of Bengal (*Source: India Meteorological Department)*



The above figure shows the historical trend of cyclonic events over the Bay of Bengal. The image shows there was an increase in events of cyclonic activities between 1926 and 1976. There was a relative decrease in the frequency of cyclonic activities after 1981 buta slight increase in the occurrence of severe cycloneshaving more destructive power was observed in the years between 2011 and 2015. Again a spike was observed from 2015 to 2019. Related to a cyclonic storm events, another major incident in the area is storm surges. It is the rise in sea level due to passing of cyclonic winds over the shallow seawater near the coast. This causes immense damage to different structures like housing, boats, etc.

Table 1: Major Hazards in the District of South 24 Parganas

Type of hazard	Year of Occurrence	Blocks affected	Impact on life
Flood	1978	All blocks	Severe
Flood	1986	Budge-Budge II	Mild
		Joynagar II, Canning I, Mathurapur II	Moderate
		Kultali, Gosaba, Basanti, Kulpi,	Severe
Cyclone	2006	Budge-Budge II	Mild
		Joynagar II, Canning I, Mathurapur II	Moderate
		Kultali, Gosaba, Basanti, Kulpi, Kakdwip, Namkhana, Sagar, Patharpratima	Severe
Cyclone	2009	All blocks	Severe
Boat capsize	2010	Kakdwip	Severe
Flood-like situation	2015	All blocks	Severe

Source: District Disaster Management Plan 2017, South 24 Parganas

The above table (table 1) shows the major hazards (1978 - 2017) and the severity of the impact of these hazards in the district of South 24 Parganas. It shows that there have been six major disasters in the area including man-made disasters like boat capsize. People mostly remember the devastating impacts of the 1986 floods and the 2009 super cyclone. All these hazards lead to loss of human lives, livestock and damage to crops, which is difficult to recover. The area's economy is largely dependent on agriculture, which is greatly affected due to the recurrence of these extreme events.

The area is environmentally threatened and also lacks in proper physical infrastructure and basic amenities. Census of India 2011 data shows only 20.27% of the households in Indian Sundarbans had electricity connection, 73.61% depended on kerosene and around 5.7% depended on solar energy. Moreover, the data shows that only 66.33% of all mouzas[2] had a proper drinking water source and the percentage of households having toilet facility was below 1%. The census also divided the housing conditions as good, livable and dilapidated conditions and it showed that only 28.14% lived in good housing structures while 49.87 % lived in livable and 21.97 % lived in dilapidated houses. It was found from the primary survey that the situation had improved much. In both the study blocks, almost all houses were electrified by the time of the survey. Stronger houses were built under state welfare

[2] Mouzas are the smallest type of village level administrative units for revenue collection

schemes and toilet facilities were also made available either by a state welfare scheme or by NGO initiatives. However, recent studies (World Bank, 2014; Danda *et al*, 2019) suggest there has been a ceasing of further developmental activities. Thus, the predominant environmental threats coupled with poor socio-economic conditions have led the inhabitants towards 'vulnerability'.

Research Objectives

- To assess the role of social capital as an adaptation strategy in the study area.

Conceptual Framework

The political economy of resource use or access to resources plays a major role in assessing people's vulnerability (Cutter *et al*, 2003; Adger *et al*, 2005). Hence, the present study attempts to analyse the differential access to social capital and how it influences people's vulnerability with the help of an access model developed by Blaikie *et al* (2004). The model, in a discussion of vulnerability to disasters, puts emphasis on differential access to resources and how it influences people's resilience. In the present paper, the resources imply the availability of social capital and government policies. The access model provides a holistic approach to disaster studies, which considers the 'normal life' before the disaster (the predispositions and socio-economic conditions) and the post disaster recovery stage. However, this particular study only enquires about the post-disaster life of a particular disaster event, namely the cyclone of 2009. The model assumes that each decision, be it individual or collective, is influenced by the political, economic and social environment. People's conditions are influenced by the political and economic processes through which 'assets, income and other resources' are allocated. One major concept in the model is social protection, which "symbolises the presence (or absence) of hazard precautions and preparedness that is provided by the state and the local collective action". Social protection can be of three different categories i.e. 1. 'individually generated safety', 2. 'non-monetary social relations' (such as mutual aid in community) and 3. 'the structure of domination'. Following this categorisation, our analysis of the functioning of social capital is also divided into three different levels i.e. individual level, community level and institution level. Bonding, bridging and linking are the most common terms used by most of the social capital researchers for the type of relations shared in social capital. These can be referred to as intra-community, inter-community and the hierarchical relation between the individual and institutions. With these limited types of relations and different levels of involvement of social capital, the present study attempts to explore the extent to which social capital plays a role in the sustainability of the complex socio-ecological system of Indian Sundarbans. The access model is used merely as a conceptual framework for understanding the functioning of social capital. However, there is a priori assumption that differential access is the cause of differential disaster impacts helped to analyse the field data. Moreover, the model's flexibility for implementation at different scales and linkage with the theory of social capital has enabled it to be applied to the present study.

Methodology

An emic perspective was necessary to understand the role of social capital and accessibility to government schemes and the adaptive capacity overall. An interview schedule including mostly close-ended questions was designed to conduct a household survey. The interview schedule was revised after conducting of a pilot survey. Information related to several aspects such as basic demographic characteristics, livelihood sources, educational attainment, income, social network, etc. were included in the schedule. A total of 200 households were selected from the four purposively selected villages namely Madhya Gurguria, Debipur, Rangabelia and Satjelia. Fifty households from each village were selected through geographical clustering, thus contributing to two hundred samples in total (N=200). Household heads were selected as respondents. Apart from household survey, focus group discussion, participant observation and discussion with subject experts were used as tools and methods to achieve the research objectives. Studies on social capital have mostly relied on the usage of the qualitative method. Petzold and Ratter (2015) specifically find the inclusion of local knowledge useful in the study of social capital. Likewise, in the present study, focus group discussion was done with the fishermen and farmers in order to include local knowledge in the study and with the aim to identify major livelihood threats and the immediate adaptation strategies after major disasters. Overall, a mixed-method approach has been followed to analyse the whole set of data. Descriptive statistics (percentage, average) and inferential statistics (chi-square) along with a narrative technique have been used to analyse the collected data. Comparative analysis has been done with the help of quantitative information to analyse differential access to social capital while qualitative information has helped to understand the patterns of access or use of it.

Results

Social and family structure of the study area

The household survey for the present study was done through cluster sampling. In our sample population, Hindus constituted a high proportion (87%) of the religious category while in the case of social categorization, General constituted the highest proportion (47.5%) followed by SC (29.5%), OBC (17%) and ST (6%). There was clear separation in the habitats of different communities, although there was a presence of mixed habitats too. Scheduled Castes (SC) were found higher in number in Gosaba block (39%) while Scheduled Tribes (ST) were more visible in Kultali block (13%). The average monthly income of the two blocks (Kultali and Gosaba) were Rs. 10,228.5 and Rs. 12,062.5 respectively and many belonged to the Below Poverty Line (BPL) category (42% and 55% respectively).

The average size of each household is 4.5 and 5 respectively and families are nuclear in structure. A son, after getting married, lives with his spouse, separate from his parents, although they might live in the same courtyard. There are exceptions to this phenomena, and particularly families live jointly when the house they live in is big enough to support the increasing members of the family. The highest educational attainments were post-graduation in both the blocks, but the percentages were very low (10% and 3%, respectively). In most cases, the highest level of education was secondary and upper primary level (constituting around 58% and 59% combined). The reasons for poor performance

in education are partly due to high dropouts due to personal issues and partly due to difficult access to higher education institutes. Accessibility is a major setback for island areas like Gosaba.

Livelihood diversity and related vulnerability

Sundarbans provide an array of livelihood options because of its richness in biodiversity as well as its geological condition. The livelihood ranges from agriculture in the alluvium of the delta to fishing and aquaculture in the rich zone of the mouth of rivers. Although there are several options for livelihood, most of these are nature dependent and hence come with threats and uncertainty. The primary occupation in the study area constitute agriculture, fishing and crab collection, daily wage labour and others. Other occupational categories include shopkeeper, van rickshaw puller, school teacher, bidi maker, carpenter, potter, doctor etc.

Figure 3: Occupational Category in Kultali block

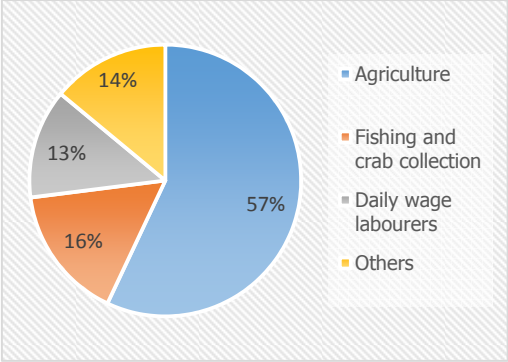
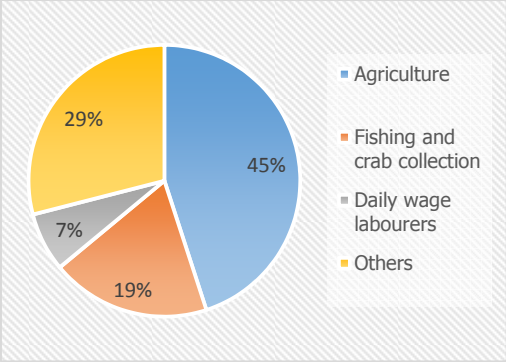


Figure 3: Occupational Category in Gosaba block



Livelihood related vulnerabilities in Sundarbans are manifold. The area's bio-geographical composition is such that almost all the professions come with their own set of threats. For example, although the largest proportion depends upon agriculture, it is highly prone to an increase in the salinity of the soil. In the aftermath of each disaster, the condition is reported to be worsened. Fishing and crab collection in the buffer zone of the Sundarbans Biosphere Reserve come with their own threats of tiger attacks and conflict with the state forest department. Animal husbandry on the other hand suffers from various diseases and they cause lack of mobility during any hazard like situation. The daily wage earners report not being paid their wages fully or regularly. With all these livelihood issues, there is a recent trend of seasonal migration of labourers to work at different places such as Chennai, Bangalore and Andamans for a particular of the time of the year.

Role of social capital in adaptation

The availability of social capital during disasters are taken as an indicator of the amount of adaptive capacity since "…the abilities of societies to adapt is determined in part by the ability to act collectively" (Adger, 2001). In the literature, it is found that embeddedness, associationalism, obligation, trustworthiness and closure are some of the traits which determine social capital (Coleman, 1994; Lin, 2017). Hadenius (2004) defines social capital as connectedness or the relational attribute being part of

the larger group. The type of connectedness varies among bonding, bridging and linking. Bonding, bridging and linking are the different types of connectedness which can define any kind of social capital. When it comes to the source of social capital, there are two types of institutions in general viz. formal and informal (Jordan, 2015; Blomkvist, 2003). There are studies which have focussed on social capital at the community level (Adger, 2001; Mukherjee, 2002; Rudolph, 2004; Jordan, 2015) while others have emphasised the role of a local institution in the form of social capital (Blomkvist, 2003; Hadenius, 2004; Prakash and Selle, 2004; Zurita *et al*, 2018). With the help of an access model, the present study looks into the different levels of involvement of social capital as a form of social protection. In the case of Indian Sundarbans, the working of social capital is categorised into three different levels or tiers which can be explained through the following diagram:

Figure 4: Framework to Study the Role of Social Capital in Adaptation

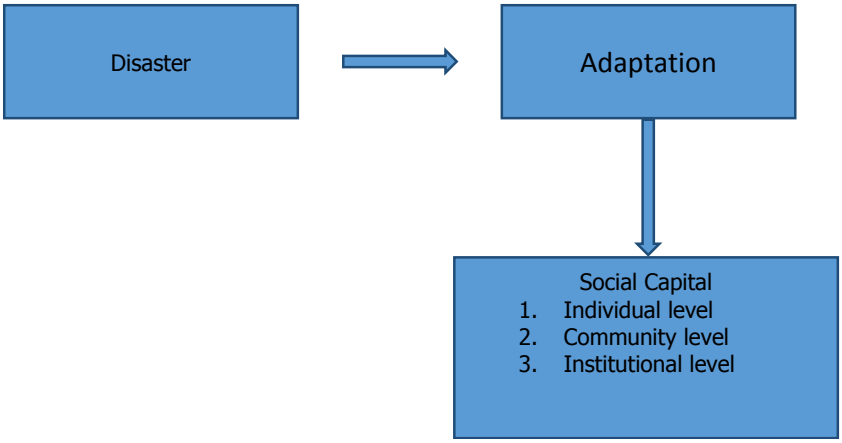


Table 2: Relation between types and levels of social capital

Level of social capital	Type (formal/ informal)	Type of linking system
Individual	Informal	Bonding
Community	Informal	Bonding and Bridging
Institution	Formal	Bridging and Linking

Here, social capital is recognised as one of the adaptation strategies. Except for adaptation on a personal level, (for e.g. education, age, physical wellness) all other strategies largely depend upon social capital; starting from relief distribution to finding alternative livelihood options. Indian rural communities are generally closed communities with strong social ties and norms acting on the population that lives within the society. Our study area which has seen a slightly different land reclamation and settlement history, also developed into a particular rural Indian society. Although human settlements can be traced back to the 15th and 16th centuries, the population growth in Indian Sundarbans has been exponential in the last century. Given the geographical isolation of the area, the limited livelihood options and environmental threats present in the area, it is crucial to build a strong base for the development of social capital.

The present study aims to understand how the presence of social capital helps in daily life, livelihood generation and specifically in the aftermath of a disaster taking place. The above table (table no. 2) shows the type of linkages observed at the three different levels of social capital. Zurita *et al* (2018) have defined the three linking systems of social capital: "*Bonding* social capital refers to trust and the relation within a network of people who see themselves as similar in terms of identity, whereas *bridging* social capital is composed of relations of respect and reciprocity between people from different socio-demographic groups. *Linking* social capital is articulated as social networks operating across formal or institutionalised power or authority gradients in society." At the individual level, it has been observed that bonding is the only linking system and it is an informal type of social capital. Bridging works at the community level and linking works at only the institution level. Institutions such as the state and NGOs work formally and hence the social capital formed at this level is also termed as a formal type of social capital. While analysing the data, it has been categorised into three levels i.e. individual level, community level and institution level.

Individual level

Lin (2017) considers social capital as an 'individual asset'. Petzold and Ratter (2015) also identify individual social capital as a very important aspect of adaptation. Social capital at the individual level are identified as the individual household's connection with family, relatives, neighbours, NGOs and local governments. The magnitude or the sensitivity towards disaster differs from household to household due to various sets of factors including basic infrastructure, geographical location, resource endowments etc. Table 3 tries to simplify the complex situation from the village level unit to understand the post-disaster support system in minimising the losses and damages.

Table 3: Post-disaster Recovery Help

	Relatives staying outside the village boundary	Neighbours	Friends	Local government	NGO	No help
Kultali	18	22	2	24	14	28
Gosaba	3	32	0	51	36	0

*all figures are in percentage (%)

Respondents were asked from whom they got support and help in the aftermath of the most recent devastating cyclone of 2009. It is reported in the study (table no. 3) that local government, neighbours and NGOs are found to be more supportive during the time of need, although statistically the help provided does not differ much ($F= 0.056$, $df = 1, 10$). In some other cases, relatives from surrounding or distant villages provided support after the disaster. Help provided by the relatives in such cases differed significantly between the two blocks ($X^2= 10.71$, $df =1$, $p < 0.01$). The reason why people in Kultali got more help from their distant relatives was due to their easy accessibility through lands. However, neighbours proved to be a good source of social capital in both the blocks ($X^2= 1.85$, $df =1$, $p < 0.05$) and the help provided by them was not significantly different. It has been acknowledged that neighbours are the immediate actors and helpers in these crucial times. Most of the time, better off neighbours (having two or three-storied buildings) provide shelter to others during an

emergency. This reflects the presence of social cohesion in the area and how it works during the time of need. Some households reported staying at neighbours' houses for several months. As one of the respondents says,

> *"Around two hundred people stayed in our house during Aila. Two families stayed for three months. We started using the food stock (rice) we had. After a few weeks, local government started to supply food (puffed rice) and tarpaulin."*

After neighbours, it is the local government and NGOs who turn out to be more helpful. People recounted staying on the road for several days with just a tent overhead and supply from government and non-government sources. These formal type of institutions took care of the food supply, tent material, clothes and medicines. There were exceptions in the case of getting help at the individual level. It was found that each and every household got help in Gosaba block, while in the case of Kultali, around 28 per cent households reported getting no help immediately after disaster. The percentage of households getting help from local government (X^2= 9.72, df =1, $p < 0.01$), NGOs (X^2= 9.68, df =1, $p < 0.01$) and those who did not get any kind of help (X^2= 28, df =1, $p < 0.01$) differed significantly between both the blocks. It can be said that because of Gosaba block's historical and ecological importance, the block's population had advantages over the other block in getting individual help. Additionally, Gosaba block is the hub for activities by different civil organisations. Rangabelia hosts the centre for one of Indian Sundarbans' influencial NGOs i.e. Tagore Society for Rural Development (TSRD). Gosaba has also been able to attract different international NGOs' attention. Thus one block seems to get prioritisation in the distribution of relief and help in times of distress over the other block due to its higher linkages. In general, families who lacked good linkages at the personal level seemed to be left out of the help. However, individual households take immediate action to overcome losses and to adapt. In the case of a severe disaster, the community organisational structure comes to the rescue, which has created a close bonding among the people living there.

Community level

A community is identified through commonality in daily life, cohesion and connectedness among a group of people. Rudolph (2004) states that communities can be natural or acquired. In the field, it was observed that there was no community which got its identity by birth or which could be referred to as a natural community. Instead, the community feeling was acquired, determined largely by neighbourhood, social status etc. The particular communities formed to safeguard the environment were found to be dominated by women. One Self Help Group (SHG) named Swarnajayanti which makes school uniforms remembers helping its members by providing its stock of rice. Another women workers group based in Sundarbans takes regular initiatives in planting saplings to protect the vulnerable embankments. Most of the SHGs present in the area aim to provide loans to their members in times of need at a very low rate of interest. Hence the members of SHGs gain benefit from the social capital they acquire from being connected with the organisation.

It is noticed that a basic difference in income level and political power played a crucial role in determining the social capital among the people living there. People recount the irregularities in the distribution of relief materials. Most of the relief which came in the form of food, clothes and other

necessities was cornered by the powerful and influential families. Families with no influential abilities remained deprived of their share of the relief materials. As a result, the distribution of relief materials was highly unequal. As one of the respondents in Satjelia village of Gosaba block recounts,

> *"Sanitary napkins were provided by NGOs. But only two-three families confiscated all the materials and we were deprived of this basic health necessity."*

The other two important sectors of community initiative are embankment repairment and plantation. People recalling the aftermath of cyclone Aila in 2009 remember the immediate involvement of local people in the repair work. The data shows that a high proportion of people (76% and 82%) actively participate in repairing the embankment by the side of which they live. Earthen embankments are very important aspects of the entire Indian Sundarbans region. They prevent the houses and the land which are built on the lower elevation from being submerged by the river and channel waters. During monsoon season, people start to repair the banks either being recruited by the local government as a part of the daily wage scheme or driven by community need. As one of the respondents remembers the aftermath of the cyclone of 2009,

> *"We, the local people ourselves repaired the embankment after the event (Aila). Members from each family in the neighbourhood came forward to rebuild it. It took days for the government to take action."*

Another respondent describing the present situation says,

> *"Earlier, local people used to participate collectively in the management of the embankments. Nowadays, embankments are not looked after properly. The responsibility is with the local government in the form of 100 days' work at present."*

Thus a shift took place in the responsibility. When people had to protect their own land, they were more likely to actively participate.

Table 4: People's participation and willingness to protect nature (%)

	Participation in embankment repairment	Participation in afforestation
Kultali	76	64
Gosaba	82	58

Afforestation is another process which is promoted by local government and NGOs. Planting mangroves along the earthen embankment promotes protection against breaching or breaking. Local government and NGOs provide saplings which are planted along the sides of the earthen roads and earthen embankments. The study shows that most of the people (64% and 58% at Kultali and Gosaba respectively) willingly participated in afforestation process by the obligation of protection of nature. A strict forest policy and the continuous degradation of the surrounding environment has largely contributed to this growing concern.

Institution level

The role of social capital at the institution level can be best understood at the grass-root level i.e. local government and NGOs. Prakash and Selle (2004) recognise that the 'performance of political institution' in particular of the local government, is an important factor ensuring social capital in a society. The grass-root level government in rural West Bengal is a Gram Panchayat (a body consisting of several villages or *mouzas*) who are given the responsibility of disbursing the different types of funds coming from both the centre and the state government. For the present study, six major welfare schemes have been selected for the household survey. Mahatma Gandhi National Rural Employment Guarantee Scheme (MGNREGS) which ensures 100 working days in a year for a job card holder shows 67% and 51% participation in Kultali and Gosaba blocks respectively and the participation rates do not differ significantly (X^2= 2.17, df =1, $p < 0.05$). 100 days' work in the study area involves soil cutting, road construction, construction of houses under government scheme and the plantation of mangrove saplings to repair the earthen embankments. People became interested in taking advantage of the scheme which came into existence through an act in 2005, but with the passage of time, they started to lose interest in the job because of various reasons such as irregular payment, hard labour jobs for women etc. Thus, a scheme like MGNREGS which aimed at securing livelihoods is losing its significance in both the blocks irrespective of the fact that the annual government budget for MGNREGS is increasing over the years.

Table 5: Percentage of households under different government welfare schemes

	MGNREGS	ICDS	NMBS	PMGAY	Pension	MDM
Kultali	67	72	31	7	12	85
Gosaba	51	79	50	24	9	77

*all figures are in percentage (%)

Integrated Child Development Scheme (ICDS) and National Maternity Benefit Scheme (NMBS), two policies which aim at ensuring nutrition and health of the child (0 to 5 years of age) and mother, show a stark difference in the participation rate. It is observed that ICDS being an older scheme has penetrated both the study blocks well (72% and 79% participation respectively). The mid-day meal scheme which aims to provide meals for the school children between the ages of 5 to 14 has also proved to be a well-implemented scheme and the implementation of the scheme does not differ significantly between the two blocks (X^2= 0.395, df =1, $p < 0.05$). The National Maternity Benefit Scheme is aimed at providing financial assistance to pregnant women. The scheme provides a gross amount of 500 rupees each to the pregnant women belonging to poor families, but with the implementation of the Maternity Benefit Programme (MBP) and Conditional Maternity Benefit Programme (CMB) in 2017, the financial assistance rose to Rs. 6,000. It disburses the gross amount to the beneficiary in instalments during pregnancy and after child birth. In Kultali block, it was found that a proportion as low as 31% of the households' young mothers got the benefit of the scheme although the situation is a little better for the Gosaba block where at least 50% of the people are getting the benefit (X^2= 4.46, df =1, $p < 0.05$). Still, the percentage of beneficiaries should be higher, given the

socio-economic needs of the people living in the Indian Sundarbans. Due to the difference in the amount provided for the scheme, the amount received varies from Rs. 500 to Rs. 6000.

PMGAY or Pradhan Mantri Gramin Awas Yojana is a housing scheme which provides for the building of *pucca* houses for families. This scheme has proved to be very helpful as the infrastructure plays a major role in people's lives. Data collected from the field shows a very low percentage of people got the benefit of the scheme (7% and 24% in Kultali and Gosaba respectively). Respondents said that there is corruption in the selection procedure of the beneficiaries of the housing schemes. According to their consensus, the name of the poor, less influential families and families with no political connections are kept in the waiting list for years. It was also observed that families supporting the opposition party at the Panchayat level were less likely to get access to the housing scheme. Apart from that, the people of Gosaba are not satisfied with the amount provided to build a house. The transport cost of the raw materials for the construction of houses is very high due to the remoteness of the island block (i.e. Gosaba). Other than these six major schemes, it was found that there is an Individual Household Latrine scheme which showed a higher implementation in Kultali block than Gosaba (around 58% households had proper toilet facility in contrast to 41% households in Gosaba block). A higher transaction cost attributed to the Gosaba block reduced the implementation rate. However, a better collaboration between the NGO (TSRD) and the local government was observed in the case of Gosaba block. Apart from the above-mentioned schemes, the post disaster relief included a one-time financial compensation and public distribution of rice at a subsidised rate. The state government provided Rs. 10,000 to each affected family as compensation and started the provision of monthly rations of 16 kg rice per family (known as 'Aila rice') at the rate Rs 2 per kg. The provision of 'Aila rice' continues till date. However, personal links, ties, economic or social status did not seem to affect the access to this monetary compensation and subsidised rice. Apart from this, states are taking initiatives to build cyclone shelters in some disaster-prone areas. One such cyclone shelter can be observed in Madhya Gurguria village which can provide support to hundreds of people.

NGOs and other organisations also play an important role in the adaptation of the people living in Sundarbans. For example, the latrine facility in Gosaba was mostly done by the NGO Tagore Society for Rural Development (TSRD) who provided toilet slabs for people living in both Rangabelia and Satjelia villages. They also provided medical help during the time of disaster when the chances of an outbreak of diseases are high. Apart from that, different organisations help in promoting livelihood opportunities for the people by providing training workshops, a supply of livestock etc. Thus, NGOs and other third parties also play a crucial role in the sector of skill development and livelihood support as well as the post-disaster recovery phase.

Table 6: Political Participation and Social Engagement of People

	Participation in GP meetings	Voice heard in GP meeting	Association with NGOs
Kultali	66	48	55
Gosaba	67	44	66

*all figures are in percentage (%)

With the help of the above table (table 6), we tried to assess the linking of an individual (or individual household) with the institution. It can be seen clearly that even the participation rate in Gram Panchayat meetings is high in both the blocks (66% and 67% respectively), but in practical term,s people's participation in decision making is hardly present. In both the blocks, less than half of the respondents reported their voices being heard in the GP meetings. In the case of association with NGO, it was found that a good number of people in Gosaba (66%) were engaged with any of the organisations working in the area. The percentage in Kultali block was also above fifty (55%) which is not statistically different (X^2= 1, df =1, $p < 0.05$) from Gosaba block. Thus, a good linkage with the NGOs observed in both the blocks indicates better social capital formation. Respondents also opined that these NGOs are easily approachable and they mostly reach out to the NGOs while dealing with big livelihood issues and legal problems.

Thus, it can be observed from the above discussion that social capital works as an asset, especially if a person is living in a disaster-prone area. But the amount of social capital a person will get depends upon their bonding and linking capability. At the individual and institution level, discrimination in the form of prioritisation of households can be observed, while social capital can be seen at its purest form at the community level in the study area.

A shift in livelihood and adaptation strategies

Recurrent disasters result in a change in livelihood and adaptation strategies as they limit the livelihood options. Agriculture, which is the major occupation of the area, has seen a shift in the pattern and rotation of the crops. For example, paddy has become a monocrop which used to be cultivated twice in a year. Rabi crops like chilli and bitter gourd have seen a decline in production and many of the farmers have stopped producing them. The fishing profession has seen a lot of churn due to the change in regimes and internal migrations of the people. A larger number of people are opting for fishing which used to be confined within only one community i.e. the Scheduled Castes. NGOs and civil organisations are trying to reduce the livelihood vulnerability through different training programmes and by also providing subsidies, but it does not cover the overall population and cannot ensure proper income generation. The trend to seasonally migrate in search of jobs is a recent phenomenon which started just a decade ago. Reduction in agricultural productivity and the limited scope for income generation has made these shifts possible. The 2009 cyclone played an important role in this change in the livelihood pattern. At the time of the survey, a proportion as high as 78% of the households reported having at least one family member who had migrated in search for a job. Along with the above-mentioned trend, a shift in community feeling can also be observed. It is revealed from the FGD that residents of the area belonging to the younger generation are looking for ways of making a good living. As they are staying a couple of months outside, their concern is towards building their own *pucca* houses with the remittances that they are sending back home. Permanent migration is low in number and in most cases, it is the educated persons in the family who shift near Kolkata or other parts of the state in search of government or other service-related jobs.

A shift in any social phenomenon directly impacts the availability of social capital. Youths who are the source of strong social capital compose the bulk of the migrating population. Sanyal and

Routray (2016) identified that youth clubs and the young population play an important role in disaster management in the Indian Sundarbans. However, the older generation members are more willing to stay in the area. In our household survey, 66% of the respondents in Kultali and 56% in Gosaba stated that they do not want to move to other places in spite of the known vulnerability of the area. The reason they mention is adaptation to the environment that they are living in for years. They cannot adjust to a new environment, especially the urban environment. Above all, the attachment to their '*bhite*' is the main reason for their reluctance to leave the place. Other respondents who are willing to leave the place will only agree if they are assured of better opportunities and help from government at the destination.

Discussion

The paper focussed on the role and significance of social capital as an important adaptation strategy to counter vulnerability to disasters. The findings suggest that the most immediate and responsive social ties are with the neighbours. They are the immediate helpers in any emergency situation. They look after each other and provide help in the form of shelter etc. While comparing the two blocks, relatives are more likely to help in Kultali block than Gosaba due to its detached position from the main land. On the other hand, NGOs and local government are more favourable for the people living in Gosaba. Thus, a pattern of prioritization and polarization in help and relief distribution was observed in the study area. The state initiated recovery in terms of cash assistance and subsidised rice was more equitably distributed. Still, economic status and political agency proved crucial in the receipt of post-disaster recovery help in individual cases. Differences in these attributes also resulted in different post-disaster help block wise as well. Thus the development of social capital largely depends on the socio-economic characteristics and the political influence or association. Coming to the availability of social capital at the community level, it is the concern about environment that unites all. The community feeling is strongly observed in the case of the protection of the environment such as afforestation or the repair of broken earthen embankments. It is also observed that being a part of a social organisation (SHG) or a community helps in gaining social capital at the individual level. Other empirical studies from India also suggest that community initiatives are responsible for sustainable management of the environment (Mukherjee, 2002; Rudolph, 2004; Sanyal and Routray, 2016). Zurita, *et al* (2018) state that disaster management has been a state responsibility in the global south. In the present study, it can be observed that the state's response in the form of local level institutions plays a major role in the life of people in the global south as well. Although the formal institutions' (the state and NGOs) response is a little late than the community response, they serve for the long-term adaptation through different welfare schemes and different provisions. The implementation of government schemes aiming at social welfare seems to be weak except for the ones which ensure nutritional requirements. A livelihood guarantee scheme like MGNREGS is not able to satisfy people's demand for work and as a result is losing its significance gradually. Housing schemes are faulty with the allegation of being corrupted and governed by political agency. Hence, a transparent and inclusive approach should be followed to fruitfully implement the government schemes. Our study also found that the trend of seasonal migration is emerging as another adaptation strategy as natural disasters cause losses to the traditional livelihood

sources. Migration has been acknowledged as a new form of adaptation strategy against climate change and related livelihood vulnerabilities (Black *et al*, 2011; O'Donnell and Wodon, 2015; Gemenne and Blocher, 2017).

To summarise, the results show that when it comes to immediate action, a majority of the help comes from local government (37.5%), neighbours (27%) and NGOs (25%). Hence, individual social capital can be considered as a useful asset in the post-disaster situation of the developing world where social ties still define the essence of society, although the availability of social capital depends upon their socio-economic status and individual endowments. However, the difference in prioritising post-disaster relief distribution to the selection procedure of beneficiaries of government welfare schemes, the domination of power and influence is clearly present and visible. Thus the structure of domination can hinder an individual household's access to help, irrespective of the presence of a strong social capital in overall.

Conclusion

Social capital is relevant for adaptive capacity towards climate change and also during crisis situations like disasters. The present paper attempted to analyse the functioning of social capital in a disaster-prone zone like the Indian Sundarbans at the three different levels i.e. individual, community and institution level. The micro-level study shows how people living in an isolated and vulnerable place try to utilise social capital as an important form of adaptive strategy. Our qualitative analysis of access to social capital reveals that better socio-economic status and a potential to build political influence results in improved chances of access to it at the individual level. The paper also identified the importance of the closest social networks or closest bonds i.e. with neighbours and close relatives who provide primary support. When it comes to the linking of social capital i.e. the institution's relation with its population, there is much room for development. The structure of domination working at this level needs to be brought down to break the barrier of inaccessibility for the deprived and marginalised section. Transparency and accountability should be strengthened to assure better access to the welfare schemes applied in the area. NGOs and other civil organisations may act as a bridging institution between the people and the government. Although many have chosen seasonal migration as an adaptation strategy, still most of them are reluctant to leave their '*bhite*' permanently. The livelihood vulnerability proposes the requisition for skill development, training programmes and more livelihood opportunities in the area. Mobilisation of community feeling towards risk reduction is also required. However, our study suffers from the problem of exclusion of pre-disaster societal conditions. As the study was a post-disaster enquiry about social capital, it failed to incorporate both 'normal life' and 'life after disaster'. Hence, there is scope to enquire about the historical analysis of social capital formation in our study area. There is also the limitation to the application of access model to its full potential. First of all, it is not a theory that can be testified at the ground. Second, we followed only a part of the access model framework mostly to analyse the functioning of the social capital at individual, community or institution levels. There is scope to analyse the data keeping in mind the functioning of the social structure and political agency. Future studies can enquire about the same research question using the socio-political structure working in the area. Lastly, it is concluded that although the theory of social

capital seems complex and there is still debate on the right methodology to assess it, its significance cannot be underestimated in the assessment of a crisis situation like the onslaught of a cyclone or a flood.

References

Adger, W N (2001). *Social Capital and Climate Change*. Tyndall Centre Working Paper (8).

Adger, W N, T P Hughes, C Folke, S R Carpenter and J Rockström (2005). Social-ecological Resilience to Coastal Disasters. *Science*, 309 (5737): 1036-39.

Black, R, S R Bennett, S M Thomas and J R Beddington (2011). Migration as Adaptation. *Nature*, 478 (7370): 447-49.

Blaikie, P, T Cannon, I Davis and B Wisner (2004). *At Risk: Natural Hazards, People's Vulnerability and Disasters*. Routledge.

Blomkvist, H (2003). *Social Capital, Civil Society, and Degrees of Democracy in India*.

Census of India (2011). *District Census Handbook North Twenty Four Parganas: Village and Town wise Primary Census Abstract (PCA).* New Delhi: Government of India.

———— (2011). *District Census Handbook SOUTH Twenty Four Parganas: Village and Town wise Primary Census Abstract (PCA).* New Delhi: Government of India.

Chambers, R and G Conway (1992). *Sustainable Rural Livelihoods: Practical Concepts for the 21st Century*. UK: Institute of Development Studies.

Coleman, J S (1994). *Foundations of Social Theory*. USA: Harvard University Press.

Cutter, S L, B J Boruff and W L Shirley (2003). Social Vulnerability to Environmental Hazards. *Social Science Quarterly*, 84 (2): 242-61.

Danda, A A, N Ghosh, J Bandyopadhyay and S Hazra (2019). Managed Retreat: Adaptation to Climate Change in the Sundarbans Ecoregion in the Bengal Delta. *Journal of the Indian Ocean Region*, 15 (3): 317-35.

Gemenne, F and J Blocher (2017). How can Migration Serve Adaptation to Climate Change? Challenges to Fleshing out a Policy Ideal. *The Geographical Journal*, 183 (4): 336-47.

Hadenius, A (2004). Social Capital and Democracy: Institutional and Social Preconditions. In Prakash, S and P Selle (eds), *Investigating Social Capital: Comparative Perspectives on Civil Society, Participation and Governance*. Sage. Pp 47-63.

India Meteorological Department (2018). *Regional Specialized Meteorological Centre for Tropical Cyclone Over North Indian Ocean.* Retrieved from http://www.rsmcnewdelhi.imd.gov.in/index.php?option=com_content&view=article&id=55&Itemid=203&lang=en

Jordan, J C (2015). Swimming Alone? The Role of Social Capital in Enhancing Local Resilience to Climate Stress: A Case Study from Bangladesh. *Climate and Development*, 7 (2): 110-23.

Lin, N (2017). Building a Network Theory of Social Capital. In *Social Capital*. Routledge. Pp 3-28.

Mandal, A K (2003). *The Sundarbans of India: A development analysis*. New Delhi: Indus Publishing.

Mukherjee, N (2002). Measuring Social Capital: Forest Protection Committees in West Bengal. *Economic and Political Weekly*, 37 (29): 2994-97.

O'Donnell, A and Q Wodon (eds) (2015). *Climate Change Adaptation and Social Resilience in the Sundarbans*. New York: Routledge.

Petzold, J and B M Ratter (2015). Climate Change Adaptation under a Social Capital Approach – An Analytical Framework for Small Islands. *Ocean & Coastal Management*, 112 (October, 2015): 36-43.

Prakash, S and P Selle (eds) (2004). *Investigating Social Capital: Comparative Perspectives on Civil Society, Participation and Governance*. Sage. Pp 1-46.

Putnam, R (2001). Social Capital: Measurement and Consequences. *Canadian Journal of Policy Research*, 2 (1): 41-51.

Rudolph, S H (2004). Is Civil Society the Answer?. In Prakash, S and P Selle (eds), *Investigating Social Capital: Comparative Perspectives on Civil Society, Participation and Governance*. Sage. Pp 64-87.

Sanyal, S and J K Routray (2016). Social Capital for Disaster Risk Reduction and Management with Empirical Evidences from Sundarbans of India. *International Journal of Disaster Risk Reduction*, 19: 101-11.

West Bengal Disaster Management and Civil Defence Department (2017). *District Disaster Management Plan - 2017, South 24 Parganas.* Retrieved from http://wbdmd.gov.in/pages/district_dm_plan.aspx

World Bank (2014). Building Resilience for Sustainable Development of the Sundarbans: Through Estuary Management, Poverty Reduction, and Biodiversity Conservation*. Strategy Report No. 88061 – IN*. www.imd.gov.in.

Zurita, M D L, B Cook, D C Thomsen, P G Munro, T F Smith and J Gallina (2018). Living with Disasters: Social Capital for Disaster Governance. *Disasters*, 42 (3): 571-89.

Recent Working Papers

439 Income and Vehicular Growth in India: A Time Series Econometric Analysis
Vijayalakshmi S and Krishna Raj

440 A Critical Review of Apprenticeship Policy of India
K Gayithri, Malini L Tantri and D Rajasekhar

441 Sustainability Concerns on Sugarcane Production in Maharashtra, India: A Decomposition and Instability Analysis
Abnave Vikas B

442 Economic, Occupational and Livelihood Changes of Scheduled Tribes of North East India
Reimeingam Marchang

443 Need for a Study of State Policies towards the Development of Religious Minorities in Karnataka
Azhar Khan C A

444 An Analysis of Bilateral Trade Between Canada and India
Malini L Tantri and Preet S Aulakh

445 Should they Avoid the Middlemen? An Analysis of Fish Processing Firms in India
Meenakshmi Rajeev and Pranav Nagendran

446 Growth and Consolidation of Kerala Non-Gazetted Officers' Union: From Its Formative Years to Union Militancy Phase
Jithin G

447 The Relationship Between Economic Growth and Carbon Emissions in India
Kaumudi Misra

448 Tax Revenue in India: Trends and Issues
Pratap Singh

449 Technical Efficienc of Unorganised Food Processing Industry in India: A Stochastic Frontier Analysis
Padmavathi N

450 Demonetisation 2016 and Its Impact on Indian Economy and Taxation
Pratap Singh

451 Impact of Perform-Achieve-Trade Policy on the Energy Intensity of Cement and Iron and Steel Industries in India
Kaumudi Misra

452 Impact of Non-Cognitive Skills on Cognitive Learning Outcomes: A Study of Elementary Education in India
Indrajit Bairagya and Rohit Mukerji

453 Assessment of Vulnerability to Floods in Coastal Odisha: A District-Level Analysis
Niranjan Pradhan and S Madheswaran

454 Who Benefits from Higher Education Expenditure? Evidence from Recent Household Survery of India
Ramanjini and Karnam Gayithri

455 How the Modern Food Retail Chains Emerging as Alternative Channels of Agricultural Marketing? Evidence from Karnataka
Kedar Vishnu, Parmod Kumar and A V Manjunatha

456 Educational Development, and Household and Public Expenditures on Education in Manipur
Reimeingam Marchang

457 Social Audit of MGNREGA - A Panacea or a Placebo? Issues and Ways Forward in Karnataka
Sanjiv Kumar and S Madheswaran

458 State, Religion and Society: Changing Roles of Faith-Based Organisations in Kerala
Abdul Raoof

459 Single Child Families in Tripura: Evidence from National Family Health Surveys
N Pautunthang and T S Syamala

460 MGNREGA Ombudsman a Forlorn Scarecrow: Issues and Ways Forward in Karnataka
Sanjiv Kumar and S Madheswaran

461 Dynamics of Procurement of Modern Food Retail Chains: Evidences from Karnataka
Kedar Vishnu and Parmod Kumar

462 Determinants of Micro-Level Decisions of Sugarcane Farmers
Lavanya B T and A V Manjunatha

463 Assessing Quality of Higher Education: An Empirical Study of Commerce Graduates, Kerala State
Indrajit Bairagya and Bino Joy

464 Farmers' Perception on Risk and Management Strategies in Mahanadi River Basin in Odisha: An Economic Analysis
Jayanti Mala Nayak and A V Manjunatha

465 An Analysis of Revenue Diversification Across Select Indian States
J S Darshini and K Gayithri

466 Urban Governance in the Context of Urban 'Primacy': A Comparison of Karnataka and Andhra Pradesh
Anil Kumar Vaddiraju

467 Urban Financing and Accountability Structures - Case Study of Bruhat Bengaluru Mahanagara Palike
Shankari Murali and S Manasi

468 Status of Unorganised Food Processing Industry in Inida - A Study on Key Performance Indicators
Padmavathi N

469 Sustainability of India's Current Account Deficit: Role of Remittance Inflows and Software Services Exports
Aneesha Chitgupi

470 BCIM Economic Corridor and North East India
Reimeingam Marchang

471 The Nation and Its Historical Mediations: Towards Typologies of Regions/States
Anil Kumar Vaddiraju

472 Structure and Functions of Social-Ecological Systems: A Case Study from Indian Sundarbans
Sneha Biswas

473 **Multiple Vulnerabilities in Utilising Maternal and Child Health Services Across Regions of Uttar Pradesh, India**
Prem Shankar Mishra and T S Syamala

474 **Fertility at the Crossroads of Ethnicity and Gender: Understanding Oraon Tribe in Jharkhand, India**
Ujjwala Gupta

475 **Complexities of Collaboration, Negotiation and Contestation: Agragamee and the State**
Ambuja Kumar Tripathy

476 **International Best Practices of pprenticeship System and Policy Options for India**
K Gayithri, Malini L Tantri and D Rajasekhar

477 **Public Healthcare Infrastructure in Tribal India: A Critical Review**
Mohamed Saalim P K

478 **Whether Caste Impedes Access to Formal Agricultural Credit in India? Evidence from NSSO Unit Level Data**
Karthick V and S Madheswaran

479 **Harmonization of Intellectual Property Rights Across the Globe: Impact on India's Pharmaceutical Exports**
Supriya Bhandarkar

480 **Decentralization and People's Participation in Educational Governance: A Review of Internatonal Experiences**
Mahima Upadhyay and D Rajasekhar

481 **Initiatives in Solid Waste Management: A Case Study of the City of Bengaluru**
Natasha Kalra and S Manasi

482 **Agrarian Change in Bihar: A Study of Two Villages**
Prashant Kumar Choudhary

483 **Information Asymmetry, Exclusion and Inclusion Errors and Elite Capture of MGNREGA: Critical Examination of IEC Strategies in Karnataka and Ways Forward**
Sanjiv Kumar, S Madheswaran and B P Vani

484 **Political Regimes and Religious Minorities in Karnataka: 2008-2018**
Azhar Khan Chikmagalur Akbar

485 **Economic Estimation of Health and Productivity Impacts of Traffic Congestion: A Case of Bengaluru City**
Vijayalakshmi S and Krishna Raj

486 **Economic Development in the Princely State of Jammu & Kashmir (1846-1947)**
Sardar Babur Hussain

487 **Local Government and Decentralized Natural Resource Management**
Mahima Upadhyay

488 **Agrarian Distress and Farmer Suicides in Kerala**
Ance Teresa Varghese

489 **Ownership of Firms and Their Implication for Productivity: An Empirical Investigation in to Indian Mining Industry**
Meenakshi Parida and S Madheswaran

490 **Determinants of Agricultural Credit in Rural India by Social Group**
Karthick V and S Madheswaran

491 **Knowledge and Practice of Ethno-Medicine by Jaunsaris in Jaunsar-Bawar Region of Uttarakhand**
Geeta Sahu

492 **MGNREGA Quality Monitoring and Multiplier 'Malai' for the Richer States and Regions: Evidence on Elite Capture of Assets in Karnataka and Ways Forward**
Sanjiv Kumar, S Madheswaran and B P Vani

493 **Interests and Participation of Elites in MGNREGA: Lessons from Elite Capture in Karnataka**
Sanjiv Kumar, S Madheswaran and B P Vani

494 **Values Concerning Children and Fertility Behaviour: Method, Respondents and Preliminary Insights from the Field in Jharkhand, India**
Ujjwala Gupta

495 **Preparedness to Monsoon Diseases in Kuttanad (Kerala)**
Bejo Jacob Raju and S Manasi

Price: ₹ 30.00

INSTITUTE FOR SOCIAL AND ECONOMIC CHANGE
(ISEC is an ICSSR Research Institute, Government of India
and the Grant-in-Aid Institute, Government of Karnataka)
Dr V K R V Rao Road, Nagarabhavi P.O., Bangalore - 560 072, India
Phone: 0091-80-23215468, 23215519, 23215592; Fax: 0091-80-23217008
E-mail: balasubramanian@isec.ac.in; Web: www.isec.ac.in