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ASSESSING THE ECONOMIC IMPACT OF TOURISM AND VERDICT ECOTOURISM POTENTIAL OF THE COASTAL BELT OF PURBA MEDINIPUR DISTRICT, WEST BENGAL

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Abstract

The study focused on the economic impact of tourism and ecotourism potential. The present submission attempts to record community perspectives and to analyze the nature of impact, status of tourism and potentiality of ecotourism of the coastal belts of Purba Medinipur district, West Bengal, by employing primary survey and secondary database along with the application of various statistical methods and geoinformatics technique. An investigation of CRZ (Coastal Regulation Zone) norms provides maximum violation along the coastline of Mandermoni beach in the 'No Development Zone', because of establishments of beach resorts and hotels of above 58.40%. Furthermore, the SWOC (Strength-Weakness-Opportunity-Challenges) analysis of the beaches of the Dakshin Purushottampur village coastal belts revealed that Soula and Changasuli have vivid and varied natural strengths for ecotourism. To assess the economic impact of tourism, the exploratory factor analysis (EFA) of the variables using principal component analysis (PCA) provided four factors from 18 variables representing 78.76%, 68.02%, 38.18% and 2.78% dissent. The critical analysis employed in the current endeavor revealed that the potentiality of ecotourism of the coastal belts of Purba Medinipur district and it will helps in the formulation of the future plans, strategic improvement and prospective road map heading towards the development of sustainable tourism.

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Key words
Tourism development, exploratory factor analysis, PCA, SWOC, CRZ.

INTRODUCTION

Globally, tourism has immense significance in improving the economic sector. Thus, this sector is growing very fast and new forms of tourism are approaching in a more attractive way. Among the various tourism, ecotourism is known for its sustainability and it came in reaction of traditional mass tourism. Mass tourism, which is a part of a historical construction and the most significant travel trend now a day, involves a huge group of people going to the same place often at the same time (Theng et al., 2014). It has been observed that due to massive concentration of visitors, the mass tourism affects economic, social, cultural and ecological factors in the host country. Undoubtedly, from mass tourism, an enormous amount of positivity comes and revenue is incurred, but in many cases, the impact of mass tourism has often negative. Though the mass tourism generates the interesting volume of tourism revenues in terms of jobs and economic growth, it leverages other problems locally like, revenue leakage and distribution. Not to mention that, the overcrowding caused by mass tourism affects the environmental balance too. Because of these reasons, alternative tourism approaches are being developed and the more emphasis is given to sustainable tourism development. Ecotourism involves the responsible travel to the natural areas, conserving the environment, and improving the well-being of the neighbouring people. Ecotourism is a form of tourism involving visiting of the fragile, pristine, and relatively uninterrupted natural areas often intended as a low impact and petite scale. Thus, the present study is intended to the economic impact of tourism as well as ecotourism potential in the coastal regions of India. Worldwide, many studies have been done in the past to evaluate the economic impact of tourism in the host countries. In many cases, studies were finished using the economic models of input-output analysis (Fletcher, 1989) and more recently investigating the resident's perceptions of the economic effects on their lives and communities. Ecotourism has been perceived widely as a nature based form of tourism embodying the virtuous traits that standard commercial mass tourism lacks. Earlier, much attention was paid to what constitutes the ecotourism and to substantiate numerous concepts and definitions exist (Ballantine and Eagles, 1994, Blamey, 1995; Bottrill and Pearce, 1995; Buckley, 1994; Koščová and Koščová, 2017; Sumarmi et al., 2021). In totality, ecotourism is a form of nature based tourism that strives to be ecologically, socio-culturally and economically sustainable while providing opportunities for appreciating and learning about the natural environment or specific elements thereof. Since the ancient times, tourism is one of the important industries for economic development, especially in the developing countries, significantly having a large contribution towards earning of for-

eign exchange, gross domestic products and employment opportunities (De Kadt, 1992). The tourism industry of India is one of the most significant contributors to the world's GDP, ranking 7th as reported by the World Travel and Tourism Council. The state West Bengal of India has a great platform and portfolio of diverse tourism, and ecotourism has come up in terms of sustainable and alternative tourism deviating from mass tourism as it has enormous potential to cultivate and produce revenue, as they come up in recent years (Abed et al, 2011; Bunruamkaew, 2011; Reihanian et al, 2012; Dowling, 2013; Darabkhani, et al, 2014; Mihret and Yohannes, 2015). The present study area, i.e. coastal belts of Purba Medinipur district is a popular tourist destination and often considered as one of the most notable place for mass tourism over the couple of years. Still, most of the tourists of these areas are unsatisfied with the existing tourism infrastructure and often look for some alternative tourism in new as well as better forms. This development of fresh initiatives should be the integration of local populace and natural environment, both**,** for sustaining tourism in this area that provides the opportunity for ecotourism.

There are some works related to the impact analysis and ecotourism on the other places (Kumari et al., 2010; Mitra et al., 2013; Dandapath and Mondal, 2013; Banerjee, 2014; Bhaya and Chakrabarty, 2016; Ghosh and Ghosh, 2019), but no previous works have been done in this area before. Thus, the present study is designed for developing future tourism based on the ecosystem sustainability by focusing on conservation of the nature and local traditional culture and providing opportunities to the local inhabited community by implementing geoinformatics and statistical processes. Therefore, to assess ecotourism potential and economic impact of tourism in Dakshin Purushottampur village of Purba Medinipur, Strength-Weakness-Opportunity-Challenges (SWOC) analysis was carried out for all the available tourist spots and stratified random sampling technique was adopted for the household survey to collect the data in the current effort. Moreover, based on the local resident perceptions, an effort was completed to assess positive as well as negative economic impacts of tourism development in this region. Furthermore, an investigation was done to assess the level of violation of the Coastal Resource Zone (CRZ) norms in the beaches. The prime aim of the current effort is to evaluate the economic impact of tourism and the verdict of the ecotourism potential of the coastal belts of Purba Medinipur district. The significance of the current study lies in the fact that Purba Medinipur district, especially the Dakshin Purushottampur village is facing a tremendous dilemma of being one of the most notable place for mass tourism, which is experiencing rapid tourism development since past 20 years and hoping for an alternative tourism aspect. The statistical analysis attempted in the present submission will definitely be able to nailed out the nature of impact, status of tourism and find out the potentiality of ecotourism of the coastal belts of Purba Medinipur district and it will lead the region to the future of sustainable tourism.

OBJECTIVES

To assess the nature of impact of tourism by recording community perspectives and to portray the potentiality of ecotourism in the coastal belts of Purba Medinipur district, West Bengal.

DATA AND METHODS

Study Area

The present study includes the coastal blocks of Purba Medinipur district, West Bengal, covering parts of Ramnagar-I and II and Contai-I and Deshopran blocks, extending from 21˚36′40″N to 21˚53′37″N latitude and 87˚28′57″E to 87˚53′15″E longitude. Purba Medinipur district lies to the south of the Tropic of Cancer and the Bay of Bengal forms the southern boundary (Fig. 1). Physiographically, this is a coastal tract of Bay of Bengal. The Medinipur coastal belt belongs to the western part of Hugli River historically and geographically forms a contiguous part of deltic Sundarbans and is of immense global importance (Chakraborty, 2010). According to the Department of Tourism, Govt. of West Bengal, significant tourist spot on this coastal belts are New Digha, Old Digha, Mandarmoni, Sankarpur and Tajpur, which are manifest as imperative commercial areas.

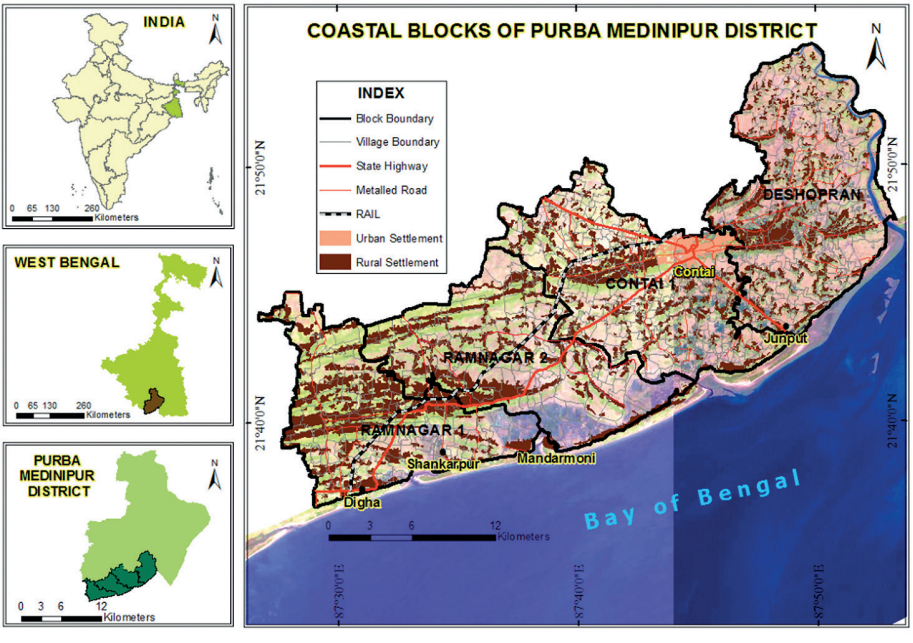

Fig. 1
Location of the study area with the transport infrastructure and settlement focus

The coastal stretch of this district constitutes part of the meso-tidal Balaso-re-Contai coastal plain. This region is geographically characterized by the presence of successive rows of dunes and beach ridge with intervening clayey tidal flats due to fluctuations in the sea level during the Holocene time. The ancient dune belt running from west to east stretches over Paniparul to Contai and indicates the position of the ancient strand line (about 6000 Y.B.P.) in the coastal tract of West Bengal (Chakrabarti, 2010). There are several discrete tidal creeks in the coastal tract of this district, viz. Ramnagar Khal, Jhalda creek and Pichaboni Khal. These tidal creeks physically divide the Purba Medinipur coastal plain (Digha-Junput) into four sectors; Digha, Shankarpur-Chandpur, Dadanpatrabar and Junput from west to east. Out of these, only new and old Digha area has few facilities to afford the tourist influx. It is mentioned as the 'Brighton of the East' in one of Warren Hastings' letters (1780 AD) to his wife. His writings about Digha slowly started giving exposure to this place. Afterwards, the Digha beach resort was developed after independence by the initiation of West Bengal's Chief Minister Dr. Bidhan Chandra Roy. The main attraction of Digha is the flat, hard beach, which stretches for miles and it is considered as one of the widest beaches in the world.

Methodology

The current study followed suitable methodological steps for the collection of primary data and employment of secondary data, which was illustrated by the graph (Fig. 2):

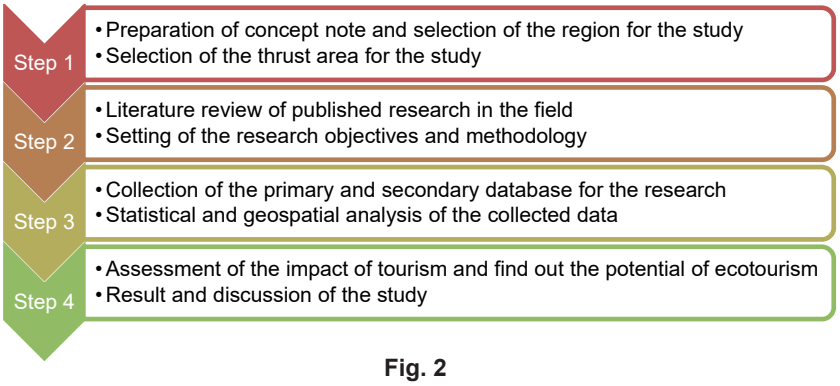

Fig. 2
Structural framework of the study

Data collection

A structured questionnaire-based survey form was designed to collect the data and explore the local resident's perceptions on the economic impacts of tourism development in Dakshin Purushottampur village. The collected data were analyzed

in three sections; concept, respondent's background and statement about tourism impact. The respondents were given 18 questions on economic impacts of tourism based on a 5 point Likert scale where 1 represented "strongly disagree" and 5 represented "strongly agree". The sample size was selected using the methodology proposed by Yamane (1967), which is explained below:

$$n = N / [1+N (e^2)]$$

(Where n = Sample size, N = Population size, e = Level of precision)

By assuming 95% confidence level and ±5% precision level, the number of population in the Dakshin Purushottampur village (N=2,394) was used in the calculation and sample size of 150 respondents was obtained. During the data collection, the stratified random sampling approach was used to select the respondents that represented the whole group of the population living in three different types of age group within the Dakshin Purushottampur village. The sampling structure was designed to obtain a better degree of representatives from the local residents and achieve a broad range of representatives from the whole population of that village. The actual population in every district is based on the 2011 census data published by the Government of India. Therefore, based on the 150 sample size (one sample from one household), data collected from January to April 2018 was done through face-to-face interviews with the selected respondents (Tab. 1). A spot check was done at the survey locations to confirm the validity of the survey. In totality, after four months, 145 questionnaire forms from 150 respondents were collected, one respondent representing one household and selected for further analysis, as the five questionnaire forms were eliminated due to improper reply by the respondents in the given questionnaires.

Tab. 1 Stratified sampling frame of the study area

Location	No. of Household	Population	Stratified Random sampling	Sample size
Dakshin Purushottampur	476	2394	2394 x 150	150

Source: Authors

SWOC analysis

Purba Medinipur coastal belt has many places of tourist interest and therefore it often encourages mass tourism by providing attractive and friendly environment. To assess the satisfaction level of the tourists on the available facilities provided to them, a factor-wise satisfaction index was intended and areas requiring special attention were identified. This was done by identifying all the available spots and then analyzing the characteristics of the spots by SWOC analysis. Taking a good

number of factors listed (Tab. 2), the SWOC analysis was carried out based on the weighted score. The analysis includes scope for improvement by including more options of strategic management to provide sustainable ecotourism.

Tab. 2 Factors of SWOC analysis

Strengths (S)
S1-Existing Transport facility (mainly major pucca road to beach distance); S2- Scenic Beauty; S3- Beach length (max.); S4- Beach to village distance; S5- Cyclone rescue centre from natural disaster, distance form beach; S6- Existing infrastructure facility (like electricity, toilet, drinking water) S7- Cultural perspective (local cultural occasion); S8- Tourist interest for ecotourism (mainly people visiting Digha, Shankarpue, Mondarmoni, Tajpur); S9- Nearest town/railway station distance; S10- By road nearest Town distance
Weaknesses (W)
W1-People's interest in other occupation (like seasonal tourism/other); W2- People perspective, mainly willingness for tourism; W3- Local people' interest (mass/ eco-tourism); W4- Local people educational structure; W5- Local people occupational structure; W6- Local people's satisfaction for their income; W7- Local people's interest for skill upgradation and capacity building (tourism perspective)
Opportunities (O)
O1- Seasonal tourism (December to march); O2- Temporary accommodation facility (tent); O3- Biotoilet; O4- Filtered drinking water; O5- Beach beautification (lighting and seating, temporary); O6- Solid waste and sewage treatment plant; O7- Open the canteen and tent delivery for food; O8- Water sports (boating, ski); O9- Sun bath facility; O10- Sea food; O11- Local handicraft workshop / documentary film on fisherman/ photography
Challenges (C)
C1- Medical and other facility; C2- Sanitation and cleanness; C3- Police and administrative help; C4- Online weather forecasting monitor; C5- Security alert

Principal Component Analysis and Exploratory Factor Analysis

The mass resident's perception for assessing impacts of tourism development has been examined in several studies in the recent years. In this regard, principal component analysis (PCA), which is a dimension / variance reduction technique, shares many similarities with exploratory factor analysis (EFA). Here, the variables of PCA have been chosen based on the importance and their liability for ecotourism potentiality as found from some literature (Abed et al, 2011; Kumari et al., 2010; Bhaya and Chakrabarty, 2016; Mirhat and Yohannes, 2015; Reihanian et al., 2012).As the considered variables are going to analyze the economic impact and scope of ecotourism, thus all these are grouped into four factors, like economic benefits, higher cost of living, support to local economy and economic barriers. For economic impact analysis (EIA) of tourism development, EFA of event variables was completed using the PCA method to examine the effect of different events on the economy of the tourist spot beaches in Dakshin Purushottampur village. In the analysis, the local

tourism industries from the perspective of both, direct and indirect impacts were considered. It includes employment, value added and revenue generated by the tourism industry or a supplier to the industry as well as the market segments of the tourism industry (hotels, vacation homes and timeshare properties). This method was used in the present study to assess the economic impact. For ordinal variables used in PCA include a wide range of Likert scales, like- 5=Strongly Agree, 4=Agree, 3=Neutral, 2=Disagree, 1=Strongly Disagree. There are a few methods to detect sampling adequacy: the Kaiser-Meyer-Olkin (KMO) Measure of Sampling Adequacy for the overall data set; and the KMO measure for each variable. For PCA analysis, Statistical Package for Social Sciences (SPSS) software (Version 20) was used.

RESULTS

Demographic attributes

Before going into the detail analysis of economic impacts of tourism in the study area by SWOC analysis or factor analysis, it is imperative to know the demographic attributes to better understand the nature of inhabiting community and their perceptions. Therefore, the variation of population growth and population increasing

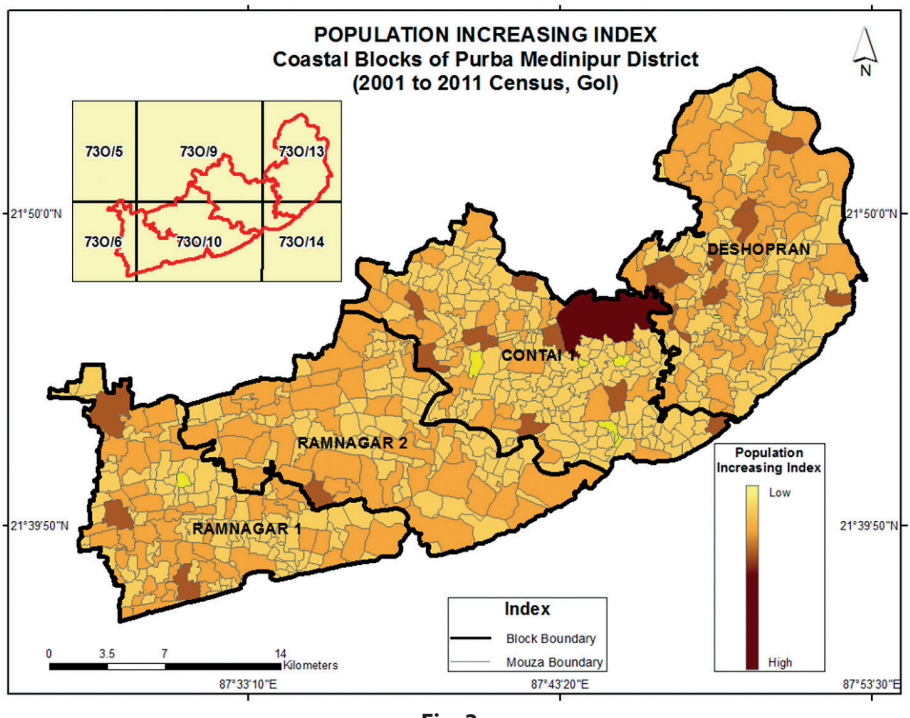

Fig. 3a
Population Increasing Index

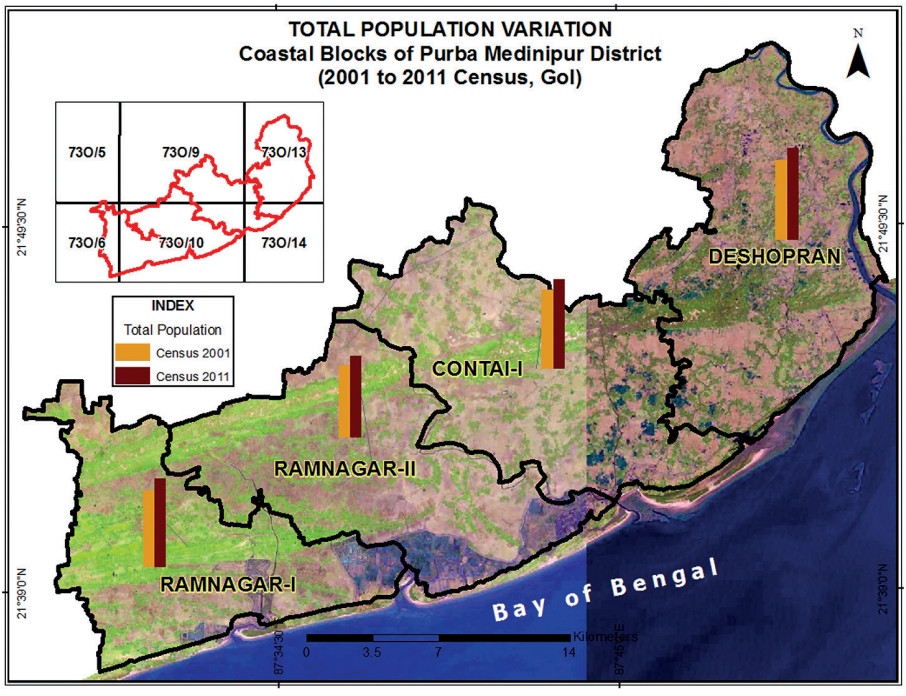

Fig. 3b
Total Population Variation

index from 2001 to 2011 census of the study area at nose level (lowest administrative unit) was spatially mapped and analyzed. From the figures (Fig. 3a and 3b), it could easily be understood that the population increasing trend is continuing in the mouzas close to beach area to facilitate the tourism by the inhabited community and through which they can earn good revenue. According to census 2001 to 2011 report, level of urbanization increased to 3.35% due to the natural growth as well as migration of rural population to the nearest urban places for better income opportunity, mostly related to tourism. The illustrated map reveals that the changes observed in the population increasing pattern is closely related to tourism because near about 1 lakh of foreign and about 25 lakh of domestic tourists visit this coastal tourist spot every year.

Characteristics of respondents

A total of 145 respondents were involved in this study, of which 66.9% were male and 30.1% were female (Tab. 3). The age of the respondents ranged from 20 to 60 years and above also. The highest number of respondents age group varies between 20 and 40 years (49.66%). About 42.07% respondents were of the ages

between 41 and 60 years; and 8.28% respondents were 60 years and above. An analysis on profession of the respondents was also conducted and it revealed that 6.21% as student; 33.79% as fisherman; 30.34% as fisherman and per day worker; 8.28% as farmer; 16.55% as per day worker and 4.83% in other professions. In respect of academic attainments of respondents, the highest academic attainment was bachelor degree viz. Bachelor in Arts and Bachelor in Technology. Some respondents have academic attainment of primary level and below. A factor analysis of the respondents (n=145) is presented in a table (Tab. 2) and this table provides the educational, professional and monthly income details on different types of respondents. A large number of respondents (83.4%) have monthly income ranges from Indian Rupee (Rs.) 4000 to 8000. The respondents having income more than Rs. 8000 are meager.

Tab. 3 Respondents' profile

Variables	n (145)	%	Variables	n (145)	%
Gender			Profession		
Male	97	66.90	Student	9	6.21
Female	48	33.10	Fisherman	49	33.79
Age			Fisherman and Per Day worker	44	30.34
20-40	72	49.66	Farmer	12	8.28
41-60	61	42.07	Per Day worker	24	16.55
60 above	12	8.28	Other	7	4.83
Education			Monthly income		
Primary school or lower	15	10.34	Under 4,000 Rs.	13	8.97
Secondary school	59	40.69	Rs.4,000 to 6,000	63	43.45
High school	57	39.31	Rs.6,000 to 8,000	58	40.00
Higher Education (B.A. and B.Tech)	14	9.66	More than Rs.8,000	11	7.59

Source: Authors

Perception of respondents on impact of tourism

The perception of respondents about positive economic impacts of tourism development was evaluated and it provides a mean value of 4.36 (Tab. 4). The analysis also revealed that most respondents agree that 'tourism improves local economy' (mean= 4.17) and 'local residents earn greater income' (mean= 4.83). The lowest mean value (3.33) was found for 'gain of the local people from rent'.

Tab. 4 Respondents' perception of the positive economic impact

Positive impacts to economy	Mean	S.D.	Rank	Variability
Local residents intension for greater income	4.83	0.67000	1	13.87
Improvement of local economy	4.17	0.84984	2	20.38
Open up new business opportunities	4.33	0.62361	3	14.40
Local peoples' income from selling local products	4.25	0.73598	4	17.32
Bringing more investment in local areas	3.83	0.47140	5	12.31
Increase in tax revenues	3.75	0.54006	6	14.40
Local employment opportunity	3.75	0.35355	7	9.43
Improvement in public utilities infrastructure	3.67	0.42492	8	11.58
Local peoples' income through rent	3.33	0.71686	9	21.53
Scale: 5=Strongly Agree, 4=Agree, 3=Neutral, 2=Disagree, 1=Strongly Disagree				

Source: Authors

Onwards, the perception of respondents about negative economic impacts from tourism development was also carried out and it provides aggregate mean value of 2.45 (Tab. 5), which is almost 50% of the aggregate mean value of positive economic impacts from tourism. The respondents agree that 'tourism increases price of land' (mean= 3.25), and 'increases local residents' cost of living' (mean= 3.08). The lowest mean value is found for 'jobs may pay low wages' (mean= 1.42).

Tab. 5 Respondents' perception of the negative economic impact

Negative impact to economy	Mean	S.D.	Rank	Variability
Increase in price of land	3.25	0.20412	1	6.28
Increase in local residential cost of living	3.08	0.11785	2	3.83
Competition for land with other economic uses	3.00	0.35355	3	11.79
Increase in price of goods and services	3.00	0.40825	4	13.61
Increase in road maintenance and transportation system costs	2.58	0.31180	5	12.09
Requirement of specialized labour for tourism related services	2.33	0.23570	6	10.12
Profit goes to foreign investors	1.92	0.65617	7	34.18
Cost for additional infrastructure (water, power, etc.)	1.50	0.70711	8	47.14
Jobs may pay low wages	1.42	0.58926	9	41.50
Scale: 5=Strongly Agree, 4=Agree, 3=Neutral, 2=Disagree, 1=Strongly Disagree				

Source: Authors

Outcomes of Principal Component Analysis (PCA) and Exploratory Factor Analysis (EFA)

Furthermore, 18 items describing the economic impact of tourism development were subjected to the EFA using PCA. The Barlett's Test of Sphericity showed a statistical significance with the Kaiser-Mayer-Olkin value of 0.731, exceeding the recommended value of 0.6 to conduct a factor analysis (Hair et al., 1995).

1st Factor - Economic benefits: The factor analysis was prepared to investigate the perceptions of respondents on the economic impacts of tourism development in Dakshin Purushottampur village. As shown in table (Tab. 6), the first factors of "economic benefits" loaded with six sub-factors were analyzed. The analysis suggested that factors in the 1st phase 'local people incomes from selling local products', 'improvement of local economy' and 'local residents' intention for greater income' are in the similar trend in the 2nd phase also.

Tab. 6 Factor analysis of 'Economic benefits'

Major Factor	Sub Factors	Rotated Component Matrix		Initial Eigen values		
		1st Phase (Barrier 0.90)	2nd Phase (Barrier 0.80)	Total	% of Variance	Cumulative %
Economic benefits	Local residents intension for greater income	0.118	0.967	4.081	68.019	68.019
	Local people income from selling local products	0.949	-0.155	1.021	17.022	85.04
	Bringing more investment in local areas	0.825	0.283	0.477	7.952	92.992
	Improvement of local economy	0.954	0.146	0.225	3.755	96.747
	Local employment opportunity	0.788	0.411	0.168	2.794	99.541
	Open up new business opportunities	0.837	0.22	0.028	0.459	100

Source: Authors

Plotting the variables/sub-factors of 1st phase and 2nd phase into 'x' and 'y' axis respectively as component 1 and 2, a graph was prepared using PCA as the extraction method on rotation basis (Varimax with Kaiser Normalization) preparing the component matrix (Fig. 4a). Here both positive and negative ranges of each variable were taken into consideration and it was found that all the variables are

positive, except the variable 2, i.e. the income of local people from selling local products, which is negative. It means that tourism generates numerous economic benefits to the local residents of beaches. However, there is a threat, if no variation comes in the local product in the 2nd phase, because of its decreasing trend. The 2nd phase has considerable impact by 'local resident's intention for greater income' and those people who are promoted by the tourism will be deteriorated day by day, if the local level skill labors are not created.

2nd Factor - Higher cost of living: The second factor of "higher costs of living" includes four sub-factors; 'increase in price of land', 'increase in the price of goods and services', 'increase in the local residential cost of living' and 'Competition for land with other economic uses' (Tab. 7). In the 1st phase, 'increase in the price of land' and 'increase in the price of goods and services' and the 'competition for land with other economic uses' are in the increasing trend, which continues in the 2nd phase. Plotting the variables/sub-factors of 1st phase and 2nd phase into a graph using PCA as the extraction method (Fig. 4b), it reveals that here all the variables are positive. It means that tourism increases costs of living for the local residents of the beach and makes it higher. In the 1st phase, the 'increase in the price of land' and 'increase in the price of goods and services' are the reasonable factors for 'competition for land with other economic uses' in the 2nd phase and thereby create the land diversity.

Tab. 7 Factor analysis of 'Higher cost of living'

Major Factor	Sub Factors	Rotated Component Matrix		Initial Eigen values		
		1st Phase (Barrier 0.90)	2nd Phase (Barrier 0.90)	Total	% of Variance	Cumulative %
Higher costs of living	Increase in price of land	0.711	0.419	2.697	67.424	67.424
	Increase in price of goods and services	0.911	0.197	0.752	18.807	86.231
	Increase in local residential cost of living	0.955	0.132	0.44	10.991	97.222
	Competition for land with other economic uses	0.197	0.965	0.111	2.778	100

Source: Authors

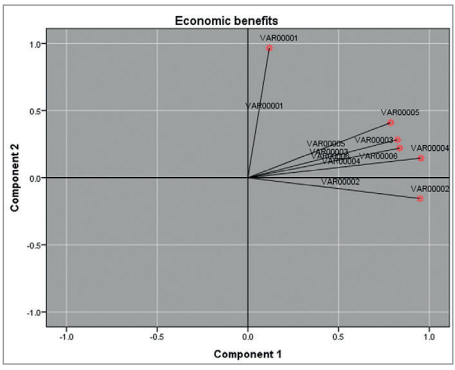

Fig. 4a
Factor analysis of economic benefits

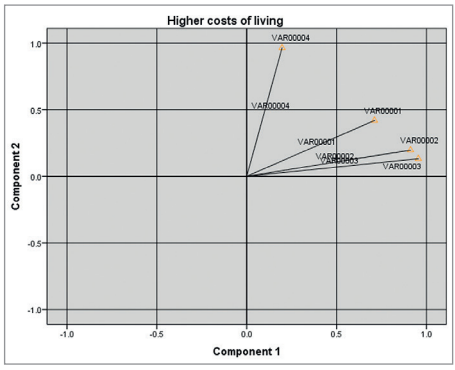

Fig. 4b
Factor analysis of higher costs of living

3rd Factor - Support to local economy: The final factor "supports local economy" was analyzed (Tab. 8) with three sub-factors; 'local peoples' income through rent', 'improvement in public utilities' infrastructure' and 'increase in tax revenues'. It reveals that most of the variables are positive in both the phases and the trend of factors 'increase in tax revenues' and 'local people income through rent' is same in 1st and 2nd phase both. Further, the factor 'tax revenues' is seen getting incised in the 1st phase, therefore 'local people income through rent' increased in the 2nd phase. It signifies that the tourism support the local economy to a great extent and development of ecotourism will able to enhance this support as the local community involved largely and this will also improve their household infrastructure and allied incentives.

Tab. 8 Factor analysis of 'Support to local economy'

Major Factor	Sub Factors	Rotated Component Matrix		Initial Eigen values		
		1st Phase (Barrier 0.90)	2ndPhase (Barrier 0.80)	Total	% of Variance	Cumulative %
Support the local economy	Local peoples' income through rent	0.311	0.944	2.363	78.762	78.762
	Improvement public utilities infrastructure	0.806	0.5	0.469	15.635	94.397
	Increase in tax revenues	0.942		0.168	5.603	100

Source: Authors

4th Factor - Economic barriers: The third factor of "economic barrier" was analyzed (Tab. 9) using five sub-factors; 'cost for additional infrastructure (water, power, etc.)', 'jobs may pay low wages', 'requirement of specialized labour for tourism-related services', 'profit goes to foreign investors' and 'increase in road maintenance and transportation system costs'.

Tab. 9 Factor analysis of 'Economic barriers'

Major Factor	Sub Factors	Rotated Component Matrix			Initial Eigen values		
		1st Phase (Barrier 0.80)	2nd Phase Barrier 0.80)	3rd Phase (Barrier 0.90)	Total	% of Variance	Cumulative %
Economic barriers	Cost for additional infrastructure (water, power)			.987	1.909	38.18	38.18
	Jobs may pay low wages	.848	-.125	.290	1.372	27.43	65.61
	Requirement of specialized labour for tourism related services	.920	.125		0.951	19.019	84.629
	Profit goes to foreign investors	.309	.834		0.504	10.077	94.706
	Increase in road maintenance and transportation system costs	-.352	.796		0.265	5.294	100

Source: Authors

The 'profit goes to foreign investors' factor has an increasing trend in the 2nd phase also. The other factor 'increase in road maintenance' and transportation systems costs' shows the negative trend in the 1st phase and positive trend in the 2nd phase. Thus, in this context, the planning should consider development and barriers. The 2nd phase is promoting local investors and this phase includes threat, which is 'profit goes to foreign investors'. That is why 'cost for additional infrastructure (water, power, etc.)' is increasing in the 3rd phase.

The principal component analysis of all the four components as described in the tables (Tab. 6, 7, 8 and 9) provides the eigenvalues exceeding to vary between the factors respectively (Tab. 10). This table highlights the factors responsible for creating economic impact by tourism development in different phases from

economic benefit leading to higher living cost, next to economic cost and finally supporting the local economy.

Tab. 10 Exploratory factor analysis of four factors using principal component analysis

Factor of participation problem	Factor loading			
	1	2	3	4
Economic benefits				
Local residents intension for greater income	0.967			
Improvement of local economy	0.954			
Local people income from selling local products	0.949			
Open up new business opportunities	0.837			
Bringing more investment in local areas	0.825			
Local employment opportunity	0.788			
Higher costs of living				
Competition for land with other economic uses		0.965		
Increase in local residential cost of living		0.955		
Increase in price of goods and services		0.911		
Increase in price of land		0.711		
Support to local economy				
Local peoples' income through rent			0.944	
Increase in tax revenues			0.942	
Improvement in public utilities infrastructure			0.806	
Economic barriers				
Cost for additional infrastructure (water, power, etc.)				0.987
Requirement of specialized labour for tourism related services				0.920
Jobs may pay low wages				0.848
Profit goes to foreign investors				0.834
Increase in road maintenance and transportation system costs				0.796

Source: Authors

Analysis of violation of Coastal Regulation Zone norms in beaches

The violation of Coastal Regulation Zone (CRZ) norms was reintroduced in 2011 and it was found more in Old Digha than New Digha. The beach resorts and hotels are found in the NDZ of Old Digha. The violation of CRZ was also observed in the Sankarpur coast, where coastal erosion is already a problem (Fig. 5a). The violation is apparently less in Tajpur, but the construction is still going on by diminishing

the sand dunes beyond NDZ. The maximum violation of CRZ regulation was found along the coastline of Mandermoni as most of the beach resorts and hotels (above 80%) are developed in the NDZ area. The study area has massive influxes of tourists, often in a relatively small area, evade a huge impact. As a consequence, beach resorts and hotels are established and cover about 20.51% of the total CRZ area, which has tremendous detrimental effects in the long turn. Most of such beach resorts and hotels are situated in the Mandermoni coastal belt, which covers about 58.54% area of NDZ (Fig. 5b). Currently, these tourist spots are gradually developing, consequencing rapid and incessant sea beach erosion, which gradually causing the retreat of shoreline, as a result of which the people and place are in jeopardy. In this area, the tourism developmental activities, like building and road construction, concretizing embankment, vehicular movement, waste disposal, water usage, land use conversion incorporating the development of beach recreational facility and urbanization impose a negative impact on the target environment that includes land, aquatic life, air, noise etc. All these brunt on the land setting are changing the land use and land cover type, habitat loss, loss of species, deforestation, land degradation, change in groundwater level and beach erosion, which in totality increases the overall vulnerability of these beaches by violating the CRZ norms.

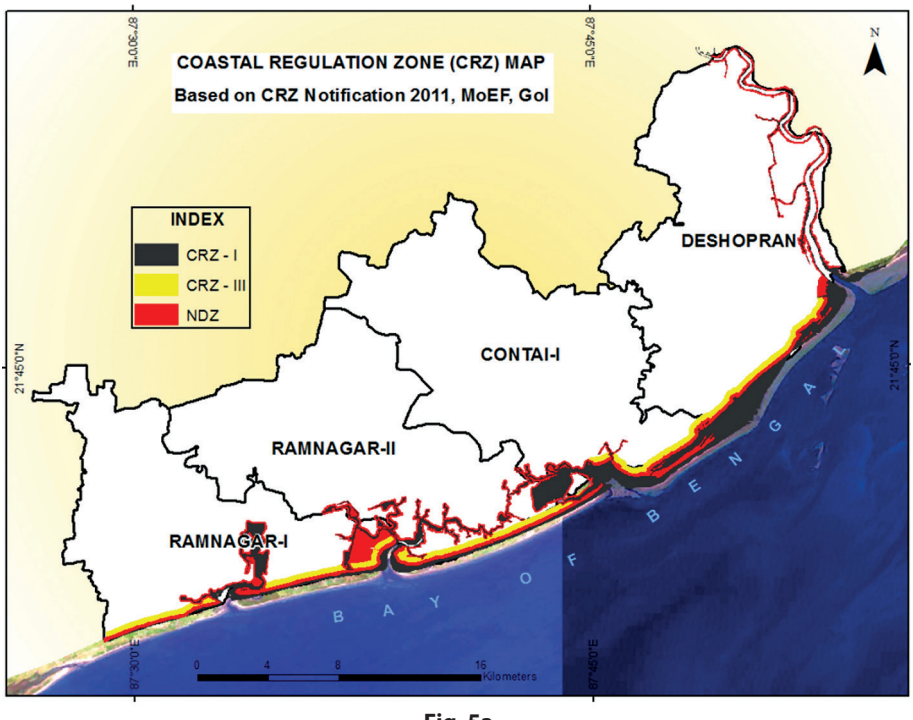

Fig. 5a
Coastal Regulation Zones (CRZ);

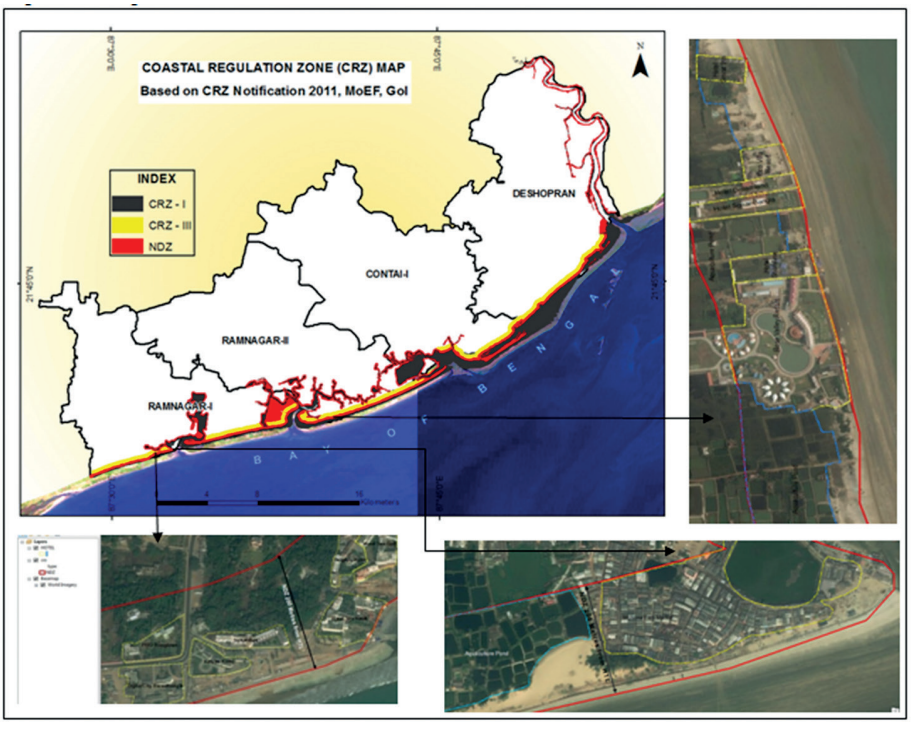

Fig. 5b
Encroachment in CRZ area

SWOC analysis of beaches

In the coastal belts of Purba Medinipur, the study of the satisfaction level of tourists on the available facilities reveals that tourists are satisfied with the existing facilities at New Digha, Old Digha, Shankarpur, Tajpur and Mondermoni. A general dissatisfaction with the drinking water facility, parking and conveniences facilities was observed.

Therefore, it is necessary to expand the scope of recreational facilities as these places get overcrowded during the peak seasons. Thus, to find out the alternate tourist spot, firstly it is necessary to identify all the available spots. As shown in the figure (Fig. 6), local names of the available beaches from the western side are Jaladha, Soula and Changasuli, Haripur, Junput, Bhogpur and Bankiput. Among these, Jaldha is presently suffering from the coastal erosion. Further, Haripur, Junput, Bhogpur, and Bankiput are fully covered with sandy clay and the beach communication from the nearest Contai town is poor. The well-established tourism destination with a variety of natural attractions and unique culture of local people having antique culture are the strengths of Soula and Changasuli beaches. The major drawbacks of these beaches are the lack of infrastructure and fundamental facilities.

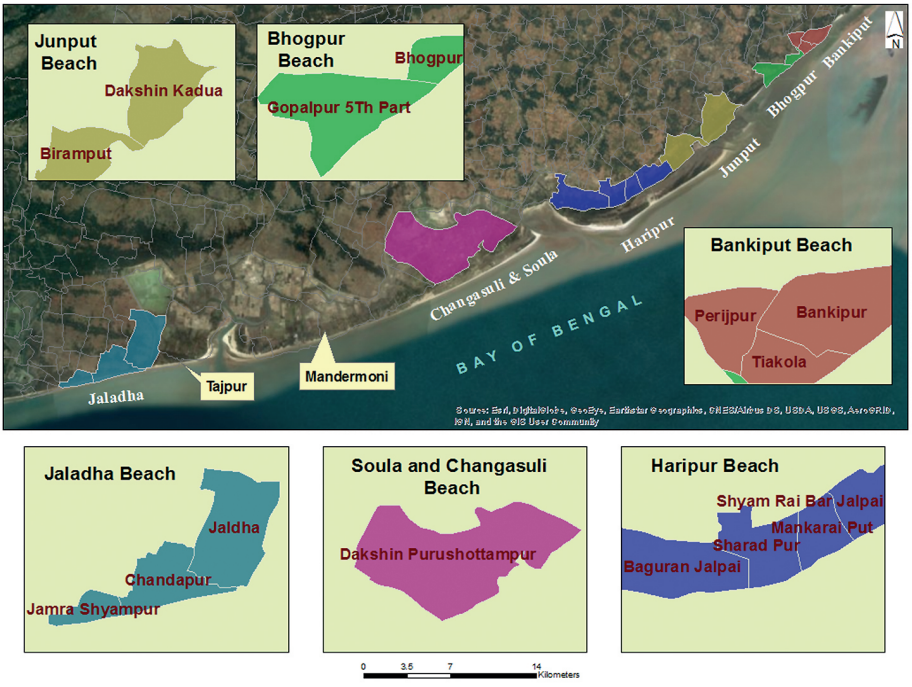

Fig. 6
Beaches of tourist interest

The Strength-Weakness-Opportunity-Challenges (SWOC) analysis was employed to depict the overall scenario of the economic impact of tourism and potentiality of ecotourism in the area. It reveals that these spots could be the first well-established tourism destination. The other most potential features of these beaches are their beach length, which is nearly 5 km, the distance from beach to village (Dakshin Purushottampur), which is about 150 m; the distance from the nearest town Contai, which is about 11 km (the road is under construction); a complete sandy beach suitable for water sports and Barunimela at Poush Sankrinti. These strengths are performing as the special attractions for tourists. The calculated values are plotted into a figure (Fig. 7), which displays the result of the SWOC analysis and highlights that Soula and Changasuli beaches have the greatest potential for sustainable ecotourism and strategic management. The other most significant places of potentials are Junput, Habibpur and Bankiput.

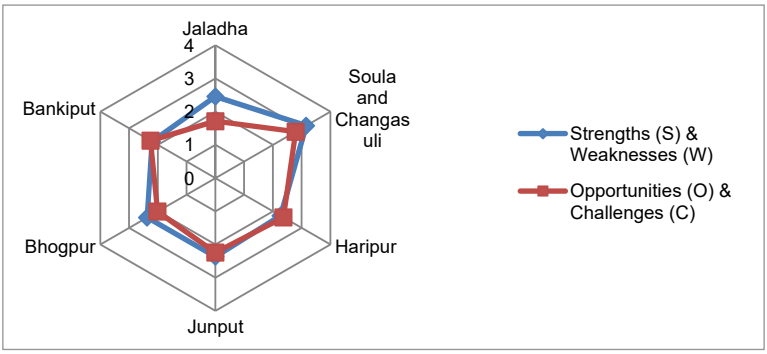

Fig. 7
SWOC analysis of different beaches

DISCUSSION

The SWOC analysis to find the ecotourism potential in the beaches of Dakshin Purushottampur village revealed that Soula and Changasuli, though lacks the infrastructure and fundamental facilities, they could be well-established as the tourism destinations with a variety of natural attractions and unique culture of local people having antique culture as major strengths. In other words, these beaches have utmost potential and resources for ecotourism development compared to the other beaches. By doing a factor analysis of the perceptions of the residents towards the impact of tourism on economic growth, it had been discovered that the respondents have a strong positive perception towards 'local residents earn greater income', 'improves local economy', 'increases price of land' and 'increases local residents cost of living'. This is because of the earlier fact that tourism was the most significant industry in the beaches of Dakshin Purushottampur village and local residents had more income from selling their products to tourists and their willingness of working in the tourism related jobs. The socio-cultural impact of tourism development on these coastal beaches have corroborated that local residents perceive tourism as a contributor for generating income; besides supporting them to upscale their education and skills.

The coastal tourism has already been identified by the government as a niche area with the potentiality to create employment opportunities for local communities and the other stakeholders and suggested that it should be viewed as a key growth sector. There are other studies, which highlight not only the environmental, socio-cultural, and economic impacts of tourism on societies and individuals (Ap and Crompton, 1998; Perdue et al., 1999; Spencer and Nsiah, 2013); but also the degree and nature of a local person's perception with tourism and tourists. These studies have found that that the tourism has a potent effect on their lives and the community both. In addition, the benefits and costs of tourism perceived

by members of host communities were examined in several case studies such as Uganda (Lepp, 2007), Greece (Haralambopoulos and Pizam, 1996; Trakolis, 2001), Spain (Burns and Sancho, 2003; Pérez and Nadal, 2005), Belize (Alexander, 2000), Fiji (King, et al., 1993), British Columbia in Canada (Cooke, 1982), Arizona in the USA (Madrigal, 1993), Turkey (Var et al., 1985), and the Bahamas (LaFlamme, 1979), the Tanzania (Zacharia and Andindilile, 2020) and Uttarakhand Himalaya in India (Sati, 2020). Recognizing the importance of tourism activity for economic growth, many regional, national and international organizations are promoting tourism, defending its role and observed it as an instrument of economic development (UNCTAD, 2011; UNWTO, 2015; WTTC, 2010). However, few studies suggest that the tourism activity is not only brings the improvement in socio-economic conditions, instead it leads to a decrease in the society's welfare level (Lee and Brahmasrene, 2013, Sahli and Nowak, 2007, UNDP, 2011).

Thus, it is to wrap up that tourism in the current study area was regarded as a significant revenue generating industry for local residents and the development of ecotourism industry was recommended. However, the study observed some negative impacts on the local community, due to the increase in the 'prices of land and housing' and 'local resident's cost of living such as food, water and electricity bills'. In addition, from the respondent's view, tourism contributes to mass tourism, generating overcrowding of people, traffic congestion and overloading of key infrastructure such as water and power supply networks. Still the ecotourism is suggested based on the ecosystem sustainability by focusing on conservation of the nature and local traditional culture and providing opportunities to the local community in the decision making process. Besides, Digha is the only major tourist resort of West Bengal and it receives about 43% of the tourist flow of West Bengal. About one lakh foreign and 25 lakh domestic tourists visit this coastal belt throughout the year. Mandarmoni beach is a spectacular beach, which is named after the thousand of red crabs that crawl on the sands resembling the 'Mandar' flow. Shankarpur is a virgin beach as yet is a recent discovery. On the basis of environment, considering the rate of beach erosion at Shankarpur, the New Digha center can be developed as 'all weather beach resorts while Shankarpur may be developed as 'Winter beach resort' (for November-March). With the prime attraction of pristine sea beach fringed with a dense forest of tamarisk trees, Tajpur became the latest addition to the tourist map of Bengal.

CONCLUSIONS

The present study illustrates that tourism in the beaches of the Purba Medinipur coastal belts provides benefits to the local communities, involved in the tourism directly or indirectly. The ecotourism potential in the beaches of Dakshin Purushottampur village revealed that though Soula and Changasuli though lacks the

infrastructure and fundamental facilities, they could be well-established tourism destinations with a variety of natural attractions and unique culture of local people having original and ancient culture as major strengths. In other words, these beaches have maximum potential and resources for ecotourism development compared to other beaches. The limitations of the study are limited sample size; selected variables of PCA and factors of SWOC analysis; thus it can be stated that the outcomes may be differ from other variables. Using of geoinformatics technique and factor analysis in the study, the positive economic impacts from the tourism were discovered, and they truly depicted by the perceptions of local communities. Furthermore, it revealed from the outlook of the residents towards economic impacts suggest that, respondents have a strong positive attitude towards the idea that 'local residents earn greater income', which 'improves local economy', 'increasing price of land' and henceforth increases the standard of living and 'increases local residents cost of living'. Finally, it is stated from the critical analysis employed in the current endeavour using statistical methods and geoinformatics that development in tourism proves beneficial for developing the local economy along with the increment in the local income. Moreover, the ecotourism has enormous potentiality heading towards sustainable tourism development, formulation and execution of apposite plans, strategic improvements leading to a prospective road map of the coastal belts of Purba Medinipur district.

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