



**International Journal of Humanities & Social Science Studies (IJHSSS)**

A Peer-Reviewed Bi-monthly Bi-lingual Research Journal

ISSN: 2349-6959 (Online), ISSN: 2349-6711 (Print)

Impact Factor: 6.8

Volume-XII, Issue-III, May 2026, Page No. 174-187

Published by Scholar Publications, Sribhumi, Assam, India, 788711

Website: <http://www.ijhsss.com>

DOI: [10.29032/ijhsss.vol.12.issue.03W.333](https://doi.org/10.29032/ijhsss.vol.12.issue.03W.333)



---

## **Spatial Variability of Human Development Index (HDI) At Village Level, Across Coastal Blocks of West Bengal, India**

**Biswajit Baidya**

*Research Scholar, Coastal Environmental Studies Research Centre, Egra S.S.B. College, Vidyasagar University, Midnapore, West Bengal, India*

**Dr. Dipak Bisai**

*Associate Professor, Dept. of Geography, Coastal Environmental Studies Research Centre, Egra S.S.B. College, Vidyasagar University, Midnapore, West Bengal, India*

**Sourav Singh**

*Research Scholar, Coastal Environmental Studies Research Centre, Egra S.S.B. College, Vidyasagar University, Midnapore, West Bengal, India*

---

Received: 25.05.2026; Accepted: 29.05.2026; Available online: 31.05.2026

©2026 The Author(s). Published by Scholar Publication. This is an open access article under the CC BY license (<https://creativecommons.org/licenses/by/4.0/>)

---

### **Abstract**

*The combination of livelihood diversification, infrastructure access, and ecological sensitivity shapes human development in coastal area. Four coastal blocks in the Purba Medinipur district of West Bengal, India, Khejuri-I, II, Nandigram-I, II are evaluated for spatial variation at village level Human Development Index (HDI). The findings show significant disparities in human well-being despite comparable coastal environments. With 12.37 percent of its villages obtaining very high HDI (>0.800) and 40.21 percent scoring in the high category (0.700-0.799), Khejuri-II has the most advanced development status. While just 4.12 percent of villages fall into the low HDI category (>0.550), the highest-ranked hamlet, Jafar Chak (HDI, 0.959), has strong governance, varied livelihoods and substantial infrastructure. With 7.32 percent of villages falling into the very high HDI category and 36.59 percent falling into the high HDI category, Nandigram-II is ranked second and has a generally balanced HDI pattern. Prominent communities like Jayanpur (0.803) and Khodambari (0.802) have improved access to transportation and social services, but 19.50 percent of villages still have poor HDI because of frequent flooding and reliance on livelihoods. Conversely, Khejuri-I indicates a preponderance of medium to low human development, with 38.10 percent of villages falling under low HDI and 47.62 percent in the medium group (0.550-0.699). The block's, ranked Shyamchak (0.834) and lowest ranked Katari (0.189) differ significantly, indicating profound intra-regional inequality impacted by erosion, saline intrusion, and insufficient networks for healthcare and education. With 52.53 percent of villages having low HDI and just 6.06 percent having extremely high HDI, Nandigram -I has the lowest performance as per study.*

**Keywords:** Human Development Index; Spatial inequality; Coastal vulnerability; Livelihood resilience; Rural development; Purba Medinipur; West Bengal.

---

## **1. Introduction:**

Human development has become an important analytical framework that prioritizes social progress, human well-being and capacity building when assessing development. Therefore, economic growth alone is no longer seen as an adequate measure of success. To implement this concept, the Human Development Index (HDI) developed by the United Nations Development Programme (UNDP) combines three important factors: life expectancy, educational attainment and income measured by gross national income per capita (UNDP, 2023). A multi-scale analysis of the distribution and applicability of the HDI in national, international and regional contexts is presented in this section.

### **1.1 Global scale:**

Since its introduction in 1990, the HDI has become a widely used metric for comparing improvements in human well-being across nations. To facilitate comparative assessment and the discovery of regional disparities, it divides countries into categories ranging from very high to very low human development (UNDP, 2023). The index highlights that there are significant gaps between developed economies and developing regions, highlighting unequal access to healthcare, quality education and economic opportunities. Although it is an influential indicator, the HDI has been criticized for its inability to incorporate international disparities, political climate, environmental resilience and the quality of education (Ravallion, 2012). For this reason, the HDI is most useful when complemented by refined socio-economic and environmental indicators.

### **1.2 Indian context**

India's HDI performance places the country in the medium human development category globally. Despite national index scores showing significant progress in life expectancy and schooling outcomes, India lags behind higher human development countries (UNDP, 2023). Moreover, internal inequality remains a defining feature of India's development profile. Sub-national data indicate that states differ significantly in their performance in the social sector, reflecting unequal access to knowledge, health infrastructure and livelihood security (Global Data Lab, 2022). These variations reaffirm the need to examine human development at a micro-spatial scale to support evidence-based policy interventions.

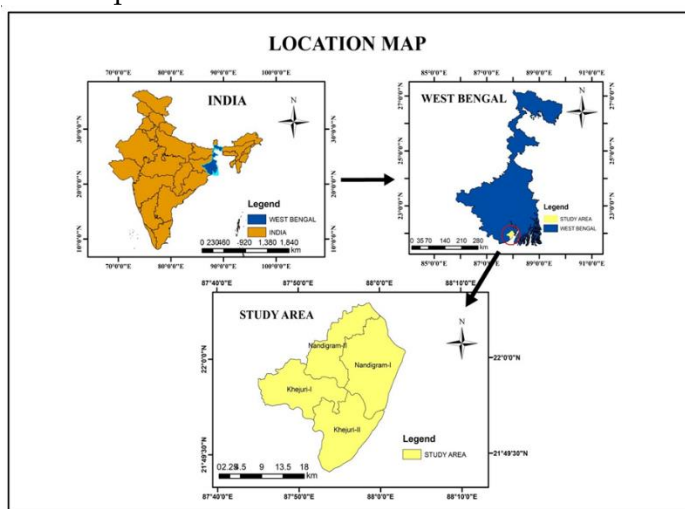
### **1.3 West Bengal Context**

Regional analysis of India has shown that West Bengal experiences multidimensional heterogeneity in human development outcomes. Scholarly findings have shown that district-level disparities persist in health, education and income indicators, leading to different levels of well-being within communities (Das, 2017). In addition, environmental vulnerability and coastal livelihood risks exacerbate developmental challenges in districts such as Purba Medinipur. The results of the sub-state human development assessment highlight that progress is uneven, which emphasizes the strategic importance of district and block-level assessments to capture local socio-economic dynamics (Hanagodimath, 2013). Coastal administrative units, including Khejuri-1 block, require special analytical attention due to their high sensitivity to livelihood pressures and exposure to climate-induced risks.

## **1. About the Study Area:**

The present study focuses on four coastal community development blocks – Nandigram-1, Nandigram-2, Khejuri-1 and Khejuri-2 – located within the Purba Medinipur district of the

Indian state of West Bengal. These blocks fall under the Haldia subdivision and are located close to the Bay of Bengal, which is part of the lower Gangetic delta region. Geographically, the region extends between 21°45'N to 22°10'N latitude and 87°45'E to 88°10'E longitude, characterized by low-lying plains, bordered by numerous tidal rivers and canals such as the Haldi, Rasulpur and Hooghly. The strategic, environmental and socio-economic importance of the region is significant. It is densely populated, predominantly rural and highly dependent on climate-sensitive livelihoods such as agriculture, aquaculture and small-scale fisheries. The land use pattern is dominated by multi-crop paddy fields, homestead gardens and fallow lands, interspersed with water bodies used for fish farming. The majority of the population are small and marginal farmers, sharecroppers, daily wage labourers and fishermen. The region is highly vulnerable to various natural disasters, including tropical cyclones (e.g., Aila in 2009, Amphan in 2020 and Yas in 2021), coastal erosion, tidal flooding and salinity intrusion, which pose a recurring threat to life, property and livelihoods. Deterioration of embankments, land degradation and fluctuations in monsoon rainfall have further exacerbated the socio-environmental risks. These blocks are part of the disaster-prone coastal zone identified by the West Bengal State Disaster Management Authority (WBSDMA). From a development perspective, the region reflects significant disparities in human development indicators such as literacy, access to healthcare and quality of life, with significant inter-block variations. According to the District Statistical Handbook (2022), some gram panchayats have shown moderate progress in terms of electrification and educational opportunities, while some lag significantly behind, especially in remote coastal and riverine areas. Given the environmental fragility and livelihood sensitivity, this study area provides an important perspective to examine the intersection of coastal vulnerability, human development and livelihood security. It serves as a model case study for evaluating the effectiveness of current policy frameworks, disaster resilience measures and grassroots level developmental interventions.

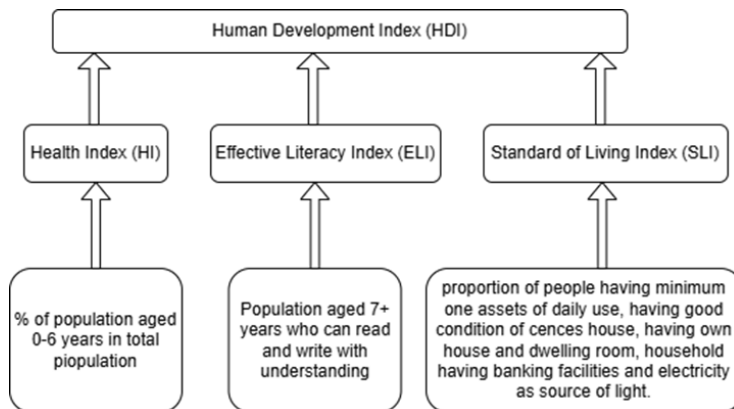


## 2. Data Sources:

Village-level data on health, education and quality of life were collected and analysed to calculate the Human Development Index (HDI) of Khejuri-1, Khejuri-2, Nandigram-1 and

Nandigram-2 blocks of Purba Medinipur district of West Bengal. Secondary data were obtained from District Human Development Report: Purba Medinipur (2011), Census of India (2011) and relevant publications of the Planning Department, Government of West Bengal. The integration of both qualitative and quantitative sources ensures a comprehensive understanding of regional livelihood risks.

**3. Selection of indicators:**



**4. Methodological framework for assessing the village-level human development index:**

Human development refers to the increase in the basic freedoms and capabilities of individuals that enable them to live secure, dignified and fulfilling lives. Measuring the human development index (HDI) at the micro-spatial scale provides a clear representation of intra-regional disparities that are often hidden in aggregate statistics (Drege and Khera, 2012). The theoretical basis of human development emphasizes three normative goals, which include maintaining a healthy and long life, enhancing self-esteem and achieving freedom from economic and social deprivation (UNDP, 2010).

Originally developed by the United Nations Development Programme, the HDI includes three core dimensions: health, education and standard of living. The methodology has evolved since its initial formulation. Previously, life expectancy at birth, literacy rate and per capita income were used as core indicators, while the 2010 methodological revision replaced literacy rate with average years of schooling to better capture educational attainment (UNDP, 2010). However, data on life expectancy at the village level are not available in India due to the lack of reliable health and mortality records.

To overcome this data limitation, alternative indicators derived from the Census of India have been introduced in the micro-level HDI assessment. Chaurasia (2017) established an inverse relationship between the proportion of the population aged 0-6 years and life expectancy in 146 countries and used this demographic variable as a proxy for health status. A high proportion of young children generally indicates limited access to healthcare and a high mortality risk; hence, it is considered a negative proxy for health. The health index (HI) is calculated by negative standardization:

$$HI = \frac{\text{Maximum value} - \text{Observed value}}{\text{Maximum value} - \text{Minimum value}}$$

Educational attainment or effective literacy index (ELI) is measured using the effective literacy rate, which is calculated by excluding children aged 0-6 to capture literacy among

the population eligible for schooling. Standardization follows the positive index normalization method:

$$ELI = \frac{\text{Observed value} - \text{Minimum value}}{\text{Maximum value} - \text{Minimum value}}$$

Standard of living reflects a wide range of socio-economic benefits, including housing conditions, access to electricity, safe drinking water, banking services, and ownership of essential assets. Each indicator is standardized using a Z-score and then combined to calculate the Standard of Living Index (SLI) (Chaurasi, 2017):

$$SLI = \frac{\text{Observed value} - \text{Minimum value}}{\text{Maximum value} - \text{Minimum value}}$$

All indicators are standardized on a 0-1 scale to ensure comparability (UNDP, 2010). The final HDI is obtained using an arithmetic mean that assigns equal weight to the three dimensions:

$$HDI = \frac{HI + ELI + SLI}{3}$$

The HDI classification scheme, based on ArcGis software, classifies development status as low (<0.550), medium (0.550–0.699), high (0.700–0.799), and very high (>0.800), which facilitates the identification of development disparities and priority areas for targeted interventions.

## 5. Results and Discussion:

### 6.1 Summary of Human Development in Coastal Blocks

The Human Development Index (HDI) assessment across the four coastal blocks of Purba Medinipur district – Khejuri-1, Khejuri-2, Nandigram-1 and Nandigram-2 – revealed clear spatial disparities in human well-being and livelihood opportunities. Despite their proximity and shared coastal ecosystem, the pattern of human development varies sharply due to differences in infrastructure, livelihood diversity, environmental vulnerability and administrative capacity (Sen, 1999; Planning Commission, 2013).

The results show that Khejuri-2 and Nandigram-2 perform relatively well on the overall HDI, indicating strong socio-economic resilience and diversity, while Khejuri-1 and Nandigram-1 lag behind, mainly due to environmental fragility, agricultural dependence and infrastructural backwardness (Dasgupta et al., 2017).

### 6.2 Human Development in Khejuri-I Block

The level of human development in Khejuri-1 block is mainly at medium to low levels. Out of 42 villages, only one village (2.38%) falls in the very high human development category (HDI > 0.800), while five villages (11.90%) exhibit high human development values between 0.700–0.799. The majority – twenty villages (47.62%) – fall in the medium human development category (0.550–0.699), and sixteen villages (38.10%) remain in the low human development category (<0.550).

The highest-ranking village, Shyam Chowk (HDI = 0.834), exhibits significant human development, mainly due to improved access to secondary education, healthcare facilities and transport networks. In contrast, the lowest ranking village, Katari (HDI = 0.189), represents extreme deprivation, highlighting spatially embedded inequalities in access to social and economic opportunities.

The overall HDI profile suggests that although some areas have diversified livelihoods and improved service accessibility, most settlements are experiencing structural

development deficits. Field-based secondary data from local governance reports and previous human development assessments (Planning Commission, 2011; Bhattacharya, 2019) confirm that coastal erosion, saltwater intrusion, and recurrent cyclones (notably Aila in 2009 and Yas in 2021) have reduced agricultural productivity in this block and limited alternative income opportunities.

Furthermore, education and health sub-indicators remain weak relative to income levels, implying that development progress has not been evenly distributed across all human capabilities (Sen, 1999; UNDP, 2020). This pattern reveals a dual development structure - where coastal core villages benefit from economic activities such as fishing and trade, while inland settlements face livelihood instability, inadequate education and infrastructural neglect.

**Table: Village Wise HDI distribution of Khejuri-I Block**

Category	HDI Value	Number of Villages	Percentage of Villages (%)
Very High Human Development	>0.800	1	2.38
High Human Development	0.700-0.799	5	11.90
Medium Human Development	0.550- 0.699	20	47.62
Low human Development	<0.550	16	38.10

**Table: HDI Rank of the Villages of Khejuri-I Block.**

Villages	HDI Value	Rank	Villages	HDI Value	Rank
Shyam Chak	0.834	1	Dakshin Kalamdan	0.583	22
Dakshin Gobinda Chak	0.754	2	Jarar Nagar	0.580	23
Mitra Chak	0.712	3	Dihierench	0.579	24
Kala Gachhia	0.710	4	Krishna Nagar	0.574	25
Golabari	0.704	5	Deulpota	0.574	26
Uttar Kalamdan	0.703	6	Herya Atmarampur	0.535	27
Kharar (Urf)Kharan	0.688	7	Kulia Jagannath Chak	0.507	28
Chhatna Bari	0.667	8	Jahanabad	0.459	29
Kalya Chak	0.663	9	Lakhi	0.453	30
Chingur Dania	0.649	10	Kulta	0.443	31
Bikram Nagar	0.645	11	Ali Chak	0.437	32
Tikashi	0.626	12	Kamdeb Nagar	0.421	33
Mukutsila	0.619	13	Keuchia	0.408	34
Thakur Nagar	0.618	14	Bahar Ganja	0.406	35
Thakur Chak	0.616	15	Patna	0.402	36
Kankuria	0.611	16	Aliamjad Chak	0.397	37
Baj Bajia	0.610	17	Debi Chak	0.390	38
Mohati	0.600	18	Kamarda	0.383	39
Ajaya	0.595	19	Srulia Chak	0.343	40
Amjad Nagar Golak	0.589	20	Kanthi Bari	0.258	41

Patra					
Bali Chak	0.588	21	Katari	0.189	42

### 6.3 Human Development in Khejuri-II Block

In contrast, Khejuri-2 Block shows a relatively advanced state of human development and is the most developed of the four blocks. Out of its 97 villages, 12 (12.37%) exhibits very high HDI values (>0.800), 39 villages (40.21%) are under high HDI, 42 (43.30%) are under record medium HDI and only 4 (4.12%) are in the low HDI category.

Top performing villages such as Zafar Chowk (HDI = 0.959), Kunjpur (0.892), and Manohar Chowk (0.878) reflect a strong social infrastructure, high literacy levels, and a diverse mix of livelihoods including fishing, trade, and migrant remittances (Chakraborty and Das 2014). Furthermore, the presence of a well-developed road network and proximity to the urban centers of Kantai and Digha enable improved market access and service delivery.

The spatial concentration of high HDI villages along the coastal and sub-coastal fringes indicates that maritime and related activities contribute significantly to human development outcomes. At the same time, only a few low HDI villages (such as Osmanpur, HDI = 0.416) exist in low-lying areas that are environmentally stressed or vulnerable to tidal flooding.

The relative success of Khejuri-II also highlights the role of decentralised local governance and participatory planning, which have enabled greater efficiency in the utilization of state and central welfare schemes (Mukherjee and Ghosh, 2018). The block benefits from targeted government investments under schemes such as Pradhan Mantri Awas Yojana, MGNREGAS and Rashtriya Krishi Vikas Yojana, all of which have improved living standards and reduced rural poverty. Thus, Khejuri-II serves as a benchmark model for human development-led coastal sustainability in East Midnapore, demonstrating how economic diversification, infrastructure investment and adaptive governance can enhance rural human development (UNDP, 2020; Banerjee et al., 2020).

**Table: Village Wise HDI distribution of Khejuri-II Block.**

Category	HDI Value	Number of Villages	Percentage of Villages
Very High Human Development	>0.800	12	12.37
High Human Development	0.700-0.799	39	40.21
Medium Human Development	0.550- 0.699	42	43.30
Low human Development	<0.550	4	4.12

**Table: HDI Rank of the Villages of Khejuri-II Block.**

Villages	HDI Value	Rank	Villages	HDI Value	Rank
Jafar Chak	0.959	1	Shyampur Katka	0.709	50
Kunjapur	0.892	2	Shilla Berya	0.700	51
Monohar Chak	0.878	3	Ser Chak	0.699	52

Bhupati Chak	0.863	4	Kalagachhia	0.698	53
Gorahar	0.861	5	Mundamari	0.698	54
Chhota Kasha Phalia	0.859	6	Shyampur	0.696	55
Dhobaghata Baman Chak	0.844	7	Oashil Chak	0.696	56
Chatur Bhuj Chak	0.843	8	Chhota Garania	0.695	57
Padar Bheri	0.831	9	Dekhali	0.693	58
Alipur	0.815	10	Thana Berya	0.693	59
Chhota Garania	0.812	11	Abdulla Chak	0.693	60
Khari Pukhuria	0.811	12	Alichak	0.692	61
Battalya	0.805	13	Meidi Nagar	0.691	62
Hemanta Chak	0.804	14	Nijkashba	0.691	63
Phulbari	0.801	15	Ram Chak	0.690	64
Satkumari	0.794	16	Saheb Nagar	0.683	65
Adampur	0.794	17	Purbba Bhangamari	0.682	66
Dakshin Pankhai	0.790	18	Talpati	0.681	67
Sahapur	0.790	19	Baratala	0.679	68
Matilal Chak	0.788	20	Khajuri	0.679	69
Radha Nagar	0.786	21	Satsimali	0.675	70
Pacharya	0.783	22	Pankhai	0.674	71
Koyal Chak	0.780	23	Serkhan Chak	0.672	72
Raypur	0.778	24	Chalta Talya	0.672	73
Kastala	0.769	25	Dakshin Ali Chak	0.669	74
Janka	0.768	26	Gopi Chak	0.668	75
Jagannath Chak	0.767	27	Garang	0.667	76
Bara Garania	0.767	28	Purbba Panikhya	0.665	77
Halud Bari	0.763	29	Kartik Khali	0.661	78
Sundarpur	0.762	30	Karmi Chak	0.659	79
Katkadebi Chak	0.760	31	Barka Saria	0.658	80
Kasaria	0.759	32	Arak Bari	0.654	81
Mansinghabar	0.755	33	Kadirpur	0.654	82
Chak Arak Bari	0.751	34	Nankar Gobindapur	0.651	83
Bara Kasha Phalia	0.750	35	Jhati Hari	0.636	84
Boga	0.749	36	Ban Basarya	0.635	85
Damodar Chak	0.746	37	Sat Khanda Saheb Nagar	0.633	86
Lakshan Chak	0.741	38	Murali Chak	0.624	87
Keshab Chak	0.739	39	Paschim Bhangamari	0.620	88
Tengra Mari	0.737	40	Gorahar Jalpai	0.613	89

Ajan Bari	0.731	41	Mada Khali	0.593	90
Pakhuria	0.728	42	Kadirabad Char	0.580	91
Shyampur Jalpai	0.725	43	Nona Pata	0.577	92
Chauddha Chuli	0.724	44	Baman Chak	0.561	93
Pirijpur	0.720	45	Andiram Chak	0.495	94
Maldaha	0.717	46	Safar Chata	0.468	95
Narsulya Chak	0.717	47	Joshua	0.463	96
Gorahar Gonsai Chak	0.713	48	Oshmanpur	0.416	97
Paschim Panikhya	0.711	49			

#### 6.4 Human Development in Nandigram-I Block

The Nandigram-1 block, historically known for its socio-political dynamics, exhibits a highly polarized HDI profile. Of the villages studied, 6.06% fall under the very high HDI category ( $>0.800$ ), 9.09% high HDI (0.700–0.799), 32.32% medium HDI (0.550–0.699) and a significant 52.53% low HDI ( $<0.550$ ).

The top performing villages like Nandan Ayek Bar (HDI = 0.928) and Kanango Chak (HDI = 0.857) perform well in terms of literacy, income and life expectancy. However, most villages – particularly Saudikhali Jalpai (HDI = 0.097), Chhayghari (0.117), and Nakchira Char (0.162) – reflect extremely low HDI scores, indicating widespread deprivation and livelihood distress.

This pattern of severe inequality can be attributed to historical land-use change, low industrialization, and inadequate educational infrastructure (Bhattacharya 2019). After 2007, political conflict in Nandigram led to socio-economic disruption, displacement, and loss of livelihood opportunities, further slowing human development (Dashgupta et al., 2017).

Environmental factors also play an important role. Frequent floods and waterlogging in low-lying areas limit agricultural productivity and contribute to the migration of the population, especially the young, to nearby cities or other states for employment (Planning Commission, 2013). As a result, despite the locally high HDI cluster, the overall human development situation of Nandigram-1 remains low and uneven, reflecting the continuing challenges of social instability, environmental pressures and wealth inequality.

**Table: Village Wise HDI distribution of Nandigram-I Block.**

Category	HDI Value	Number of Villages	Percentage of Villages
Very High Human Development	$>0.800$	6	6.06
High Human Development	0.700-0.799	9	9.09
Medium Human Development	0.550- 0.699	32	32.32
Low human Development	$<0.550$	52	52.53

**Table: HDI Rank of the Villages of Nandigram-I Block.**

Villages	HDI Value	Rank	Villages	HDI Value	Rank
Nandan Ayek Bar	0.928	1	Sona Chura	0.537	51

Kanango Chak	0.857	2	Tara Chand Bar	0.528	52
Gobindapur	0.856	3	Bartalya	0.523	53
Ratanpur	0.841	4	Raja Ram Chak	0.522	54
Bar Kanda Pashara	0.839	5	Brindaban Chak	0.499	55
Khariberia	0.814	6	Dhanya Khola	0.499	56
Manu Chak	0.788	7	Mansakata Bharat Chak	0.495	57
Chak Chilinga	0.783	8	Mahammadpur	0.494	58
Tajpur	0.769	9	Mann Chak Jalpai	0.494	59
Rampur	0.760	10	Jambari	0.494	60
Manikpur	0.740	11	Gadai Balbar	0.493	61
Keshabpur	0.737	12	Daudpur	0.490	62
Mirichdana	0.722	13	Gagra Char	0.481	63
Jelyamara	0.715	14	Gokul Nagar	0.475	64
Maheshpur	0.700	15	Champai Nagar	0.473	65
Nandigram (CT)	0.683	16	Jadu Bari Chak	0.472	66
Haripur	0.682	17	Gangra	0.472	67
Bahadurpur	0.675	18	Habibpur	0.470	68
Kandapa Shara	0.657	19	Babukhanbar Part-II	0.469	69
Akanda Bari	0.647	20	Samsabad Barsar Beria	0.467	70
Purushottampur	0.644	21	Kanchan Nagar	0.462	71
Jalpai Part V	0.642	22	Binandapur	0.445	72
Sonachura Jalpai	0.627	23	Shyam Sundari Chak	0.435	73
Anantapur Part-I	0.623	24	Usman Chak	0.431	74
Basuli Chak	0.623	25	Charkende Mari	0.429	75
Balibrindabanpur	0.621	26	Saudkhali Char	0.429	76
Taluk Brindabanpur	0.620	27	Bhekutya	0.419	77
Dijamtalya	0.610	28	Bara Nagar	0.415	78
Kalicharanpur	0.599	29	Chandan Nagar	0.407	79
Char Galya	0.597	30	Kenda Mari Jalpai	0.400	80
Bhasur Kata	0.593	31	Naya Chak	0.399	81
Gopimohanpur	0.584	32	Parbatipur	0.396	82
Durgapur	0.581	33	Sri Gauri	0.388	83
Parul Bari	0.580	34	Dinabandhupur	0.384	84
Dhaneshwarpur	0.580	35	Samsabad	0.361	85
Debipur	0.578	36	Baincha Bari	0.342	86
Jhatibani	0.578	37	Gar Chakra Berya	0.335	87

Hazra Kata	0.577	38	Jalpai Part-VII	0.331	88
Subhanichak	0.577	39	Bhimkata	0.321	89
Amgechhya	0.577	40	Banasri Gauri	0.307	90
Simul Kundu	0.571	41	Naynan	0.302	91
Chilinga	0.571	42	Nilpur	0.254	92
Priya Nagar	0.569	43	Sultanpur	0.253	93
Mirza Chak	0.567	44	Saifulya Chak	0.250	94
Amtalya	0.564	45	Babukhanbar	0.242	95
Bar Jamtalya	0.560	46	Hosenpur	0.222	96
Narasinghapur Tajpur	0.555	47	Nakchira Char	0.162	97
Raynagar	0.546	48	Chhayghari	0.117	98
Moujbrindabanpur	0.546	49	Saudikhali Jalpai	0.097	99
Madhabpur	0.541	50			

### 6.5 Human Development in Nandigram-II Block

The Nandigram-2 block exhibits a moderately balanced human development situation, ranking second only to Khejuri-2 in terms of overall human development index. Out of the 41 villages studied, 3 villages (7.32%) fall under the very high human development index (>0.800), 15 villages (36.59%) fall under the high human development index (0.700-0.799), 15 (36.59%) fall under the medium human development index, and 8 villages (19.50%) remain in the low human development index category.

Top performing villages such as Joyanpur (HDI = 0.803), Khodambari (0.802), and Pathuria (0.800) demonstrate improved access to education, healthcare, and economic diversification, supported by proximity to Nandigram town and regional markets. Clusters of high HDI values with internal road networks indicate a relationship between transport connectivity and human development performance (Chakraborty and Das, 2014).

However, low-performing villages (e.g., Naya Chowk Bayal, HDI = 0.279; Sanibari, 0.487) are characterized by agricultural dependence, limited schooling facilities, and recurrent flood vulnerability. Despite these limitations, Nandigram-II shows signs of improvement due to government interventions in education, public health, and livelihood training after 2010 (Mukherjee and Ghosh, 2018).

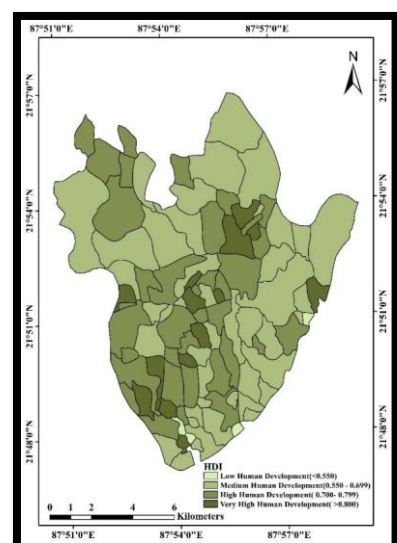
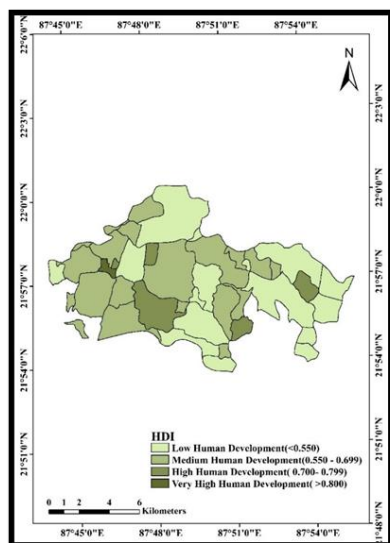
Overall, this block portrays a transitional development stage - where rural modernization and infrastructure expansion are gradually increasing human capacity, yet environmental risks and economic dependence still hinder sustainable development.

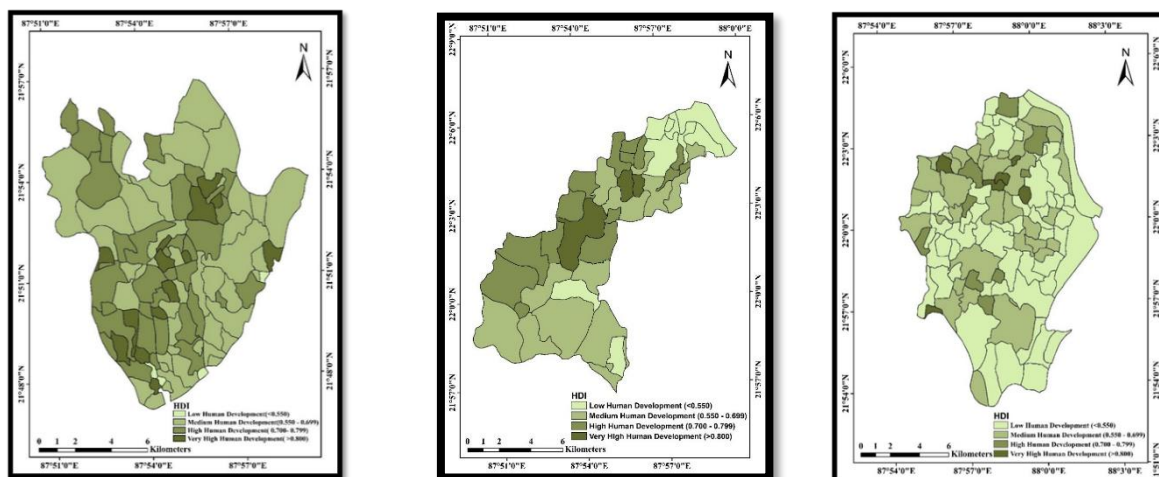
**Table: Village Wise HDI distribution of Nandigram-II Block.**

Category	HDI Value	Number of Villages	Percentage of Villages
Very High Human Development	>0.800	3	7.32
High Human Development	0.700-0.799	15	36.59
Medium Human Development	0.550- 0.699	15	36.59
Low human Development	<0.550	8	19.50

**Table: HDI Rank of the Villages of Nandigram-II Block.**

Villages	HDI Value	Rank	Villages	HDI Value	Rank
Jayanpur	0.803	1	Ramchak	0.682	22
Khodambari	0.802	2	Kiyakhali	0.678	23
Pathuria	0.800	3	Amratalya	0.674	24
Reye Para	0.785	4	Kamalpur	0.662	25
Hanu Bhunya	0.775	5	Kanakpur	0.660	26
Tentul Bari	0.774	6	Krishnagar	0.634	27
Ghol Pukurya	0.766	7	Ashadtalya (CT)	0.631	28
Balarampur Part-II	0.758	8	Rankinipur	0.622	29
Gopalpur	0.758	9	Rani Chak	0.605	30
Thakur Chak	0.750	10	Subdi	0.604	31
Narasinghapur Jalpai	0.739	11	Amda Bad	0.578	32
Baishnab Chak	0.737	12	Dakhin Kiyakhali	0.560	33
Shibrampur	0.735	13	Bayal	0.549	34
Dinbhuni Chak	0.723	14	Satgabari	0.537	35
Chironjibpur	0.715	15	Sanibari	0.487	36
Balarampur Part-I	0.712	16	Mangalchak	0.448	37
Bheturya	0.706	17	Gopal Chak	0.428	38
Narayanchak	0.703	18	Jalpai Part-III	0.385	39
Birulia	0.699	19	Jalpai Part-II	0.368	40
Bara Nara Singhapur Part-I	0.687	20	Naya Chak Bayal	0.279	41
Monoharpur	0.687	21			





### 6.6 Comparative Discussion and Policy Implications

A comparative HDI analysis of the four coastal blocks reveals a clear developmental hierarchy:

Khejuri-2 > Nandigram-2 > Khejuri-1 > Nandigram-1.

Spatial patterns indicate that development performance improves with proximity to urban centers and low risk of coastal hazards, while environmentally fragile and conflict-prone areas lag behind.

1. Khejuri-2 benefits from coastal trade, aquaculture, and remittance flows, strengthening local incomes and human capital formation.
2. Nandigram-2 reflects moderate growth through infrastructure expansion and educational access.
3. Khejuri-1 faces stagnation due to coastal salinity, lack of secondary schools and weak healthcare network.
4. Nandigram-1, though historically important, is socio-economically depressed, burdened by high population density, agricultural distress and flood risk.

Inter-block comparisons highlight the importance of inclusive coastal governance, which integrates livelihood resilience, gender equality and climate adaptation into regional planning. The need for block-specific interventions – such as promotion of salinity-tolerant crops in Khejuri-1, strengthening of fisheries value chains in Khejuri-2 and vocational education in both Nandigram blocks – is evident (Bandyopadhyay et al., 2020).

### 7. Conclusion:

Furthermore, these findings are consistent with larger studies indicating that human development in coastal West Bengal is deeply intertwined with environmental sustainability and institutional performance (Chakraborty and Das, 2014; UNDP, 2020). Therefore, enhancing human development requires not only economic investment but also community-based disaster management, participatory planning and ecosystem restoration to ensure long-term resilience.

**References:**

1. Das A (2017) Rethinking Human Development in West Bengal, India. *Journal of Social and Economic Development* 19(2):341-364. <https://doi.org/10.1007/s40847-018-0054-6>
2. Global Data Lab (2022) Subnational Human Development Database: India. Global Data Lab, Nijmegen
3. Hanagodimath SV (2013) Sub-state HDI in Karnataka and West Bengal: An analysis of regional disparities. *International Journal of Creative Research Thoughts* 1(2):1-10
4. Ravalion M (2012) Problematic tradeoffs in the Human Development Index. *Journal of Development Economics* 101:1-8
5. United Nations Development Programme (UNDP) (2023) Human Development Report. UNDP, New York
6. Chaurasia, Alok Ranjan. 2017. *Measuring Human Development: A Statistical Approach*. New Delhi: Academic Publishing.
7. Dredge, Jean, and Ritika Khera. 2012. "Regional Patterns of Human Development and Gender Equality in India." *Economic and Political Weekly* 47 (48): 61-73.
8. United Nations Development Programme (UNDP). 2010. *Human Development Report 2010: The Real Wealth of Nations: Pathways to Human Development*. New York: Palgrave Macmillan.
9. Banerjee, S., R. Das, and S. Hazra. 2020. *Coastal Risk and Adaptation in the Indian Sundarbans*. Springer, Singapore.
10. Bhattacharya, D. 2019. "Spatial Inequality and Rural Development in Eastern India." *Economic and Political Weekly* 54(27): 45-54.
11. Chakravarty, I., and K. Das. 2014. "Human Development and Livelihoods in Coastal West Bengal." *Indian Journal of Regional Science* 46(2): 23-35.
12. Dasgupta, S., M. Haque, Z. Khan, and D. Wheeler. 2017. "Climate Change and Human Development in Coastal Regions." *World Development* 98: 256-268.
13. Mukherjee, N., and P. Ghosh. 2018. *Decentralized Governance and Rural Transformation in West Bengal*. Routledge India.
14. Planning Commission. 2011. *Human Development Report: West Bengal 2010*. Government of India, New Delhi.
15. Planning Commission. 2013. *District Human Development Report: Purba Medinipur*. Government of West Bengal, Kolkata.
16. Sen, A. 1999. *Development as Independence*. Oxford University Press, New Delhi.
17. UNDP. 2020. *Human Development Report 2020: The Next Frontier—Human Development and Anthropology*. United Nations Development Programme, New York.