

Social dynamics, economic vulnerability, and community welfare in the Buffer Zone of Indonesia's New Capital (IKN), East Kalimantan

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Abstract. The North Penajam Paser Regency in East Kalimantan Province has been selected as the new capital city of Indonesia, known as the Capital City of the Archipelago (IKN). This development significantly impacts the local community, particularly those residing in the buffer zone of the new capital. This study aims to assess the Human Development Index (HDI) and the welfare of coastal and non-coastal communities within the IKN buffer zone. Using census sampling, the study involved 5,353 families from eight villages in the buffer zone, comprised of coastal and non-coastal areas. Findings revealed that the HDI was generally low across the study areas, with only two regions displaying modest HDI scores, indicating that the population remains underprivileged. This research contributes to the social humanities field by providing insights into the welfare of communities affected by the establishment of the new capital. This area has been relatively underexplored in existing literature.

1 Introduction

Welfare is the main goal of a country's development. Welfare, encompassing mental, physical, and spiritual health influenced by social interactions and environmental factors, is

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vital for community development [1]. Welfare indicators often reflect the level of health, education, and income possessed by a population [2]. Therefore, measuring people's welfare is important in determining the effectiveness of development policies implemented by the government [3].

One of the indicators used to measure welfare is the Human Development Index (HDI) [4]. The Human Development Index (HDI) is a crucial composite measurement tool developed by the United Nations Development Programme (UNDP) in 1990. It is designed to assess human development levels across different countries by integrating indicators from three key dimensions: health, education, and standard of living. The HDI is computed using the geometric mean of normalized indices, which include life expectancy at birth (health), mean years of schooling and expected years of schooling (education), and gross national income per capita (standard of living) [5]. It is an evaluation measure used globally to gauge the extent to which human development has been achieved by a country or region. The high HDI of a region indicates that its people have better access to health, education and economic services, ultimately improving their quality of life.

Indonesia's Human Development Index (HDI) performance places it fifth among ASEAN countries, behind Singapore, Brunei, Malaysia, and Thailand [6]. This regional ranking aligns with its global position, where it stands at 113th out of 188 countries according to the UNDP's Human Development Report. Despite notable economic progress, Indonesia still faces developmental challenges that hinder improvements in its HDI. Furthermore, research highlights a strong link between poverty reduction and HDI growth, indicating that a one percent decrease in poverty corresponds to a 0.4117 increase in HDI [7] reinforcing the importance of inclusive economic development in advancing human well-being both regionally and globally.

In the context of Indonesia, sustainable development is the main focus in improving people's welfare. One of the strategic steps taken by the government is the relocation of the national capital to the Capital City of the Archipelago (IKN) in East Kalimantan. This move aims to create a more equitable center of government, reduce the burden on Jakarta, and encourage more inclusive and sustainable economic development [8]. IKN is expected to not only be the center of government administration, but also encourage economic growth based on the concept of smart and environmentally friendly cities [9].

The development of the IKN in East Kalimantan is a strategic step by the government to create a new center of economic growth and maximize regional potential in a sustainable manner. East Kalimantan Province itself has a fairly high Human Development Index (HDI). With the location of IKN in Penajam Paser Utara Regency, accurate development planning at the village level is crucial to ensure the positive impact of development can also be felt by the people in the buffer zone. Research by Silwal et al. [10] indicates that buffer zone programs can have mixed impacts on local livelihoods and biodiversity conservation. Effective governance of buffer zones is integral to addressing multifaceted environmental and socio-economic issues. Ensuring that community welfare is prioritized in these governance strategies is vital for the overall success of IKN.

This study aims to analyze the HDI and social welfare of people living in the buffer zone of Indonesia's new capital city, IKN, and assess the effect of the development of the new capital on the welfare of surrounding villages. It also examines differences in HDI and community welfare between coastal and non-coastal communities. This study contributes to understanding these dynamics within the context of Indonesia's new capital.

2 Research method

This mixed-method study combines quantitative research using the Precision Village Data (Desa Presisi or DDP) method and qualitative research through Focus Group Discussions

(FGDs). The DDP method integrates a digital census methodology with a geographic approach by designating village youth as data collection agents or enumerators. Household head were appointed as respondents in the data collection process.

2.1 Data collection

Village youth (enumerators) representing each RW (neighborhood unit) conducted the census to collect social data, recording every household in their respective areas. The parameters measured were Family Identity, Education, Social Life and Employment, Health, and Social Security. To ensure the collected data's accuracy and completeness, the supervisor cleared and monitored census data. In addition, Focus Group Discussions (FGDs) were conducted to collect qualitative data to gain in-depth insights into the impact of the new capital city development on community welfare.

2.2 Study population and sampling

Study involved heads of households in eight villages around the new capital city, IKN. A total of 5,353 respondents were included, comprising 3,108 from coastal areas and 2,245 from non-coastal areas. All populations become respondents who are selected by the census. The unit of analysis for this study is the head of the family, but all family members are recorded to measure the Human Development Index (HDI). The number of family members, including the head of family for coastal areas, is 10,591, and there are 7,715 for non-coastal areas.

2.3 Variables, data processing, and analysis

The research variables included 1) Socio-demographic characteristics, 2) Human Development Index (HDI) (Health, Education, Purchasing power), and 3) Welfare variables. Spatial and numeric data were analyzed using MERDESA Artificial Intelligence (AI). The Merdesa application is a tool designed to collect population data and social information directly in the field. It plays an important role in the Data Desa Presisi (DDP) initiative, which aims to build an accurate social database as the basis for village development planning. The process involved (1) a Digital-based Participatory Census conducted by enumerators using the MERDESA application and (2) Drone-based Mapping, which involves surveys and spatial data processing and analysis. The spatial results can be seen in the Study Population and Sampling section. The present descriptive analysis used the MERDESA application to identify respondent characteristics and calculate the Human Development Index (HDI). This study comprehensively analyzed the human development index, and welfare impacts on communities living in the buffer zone of Indonesia's new capital city by integrating quantitative and qualitative approaches. Table 1 presents the Human Development Index (HDI) calculation formula based on the Precision Village Data (Data Desa Presisi or DDP).

Table 1. The formula for Human Development Index (HDI) calculation based on the Precision Village Data (Desa Presisi or DDP)

Dimensions	Formulas	Precision Village Data Elements
Health	$Life\ Expectancy = \left(\sum_{i=25}^n \frac{A_n}{n} + \sum_{i=30}^n \frac{A_n}{n} + \dots + \sum_{i=100}^n \frac{A_n}{n} + \right) - 10 \sum_i^n \frac{B_n}{n} + 5 \sum_t^n \frac{C_n}{n}$ $I_{Health} = \frac{Life\ Expectancy - 20}{85 - 20}$ <p>A = Age of Village Residents B = Number of Major Illnesses of Villagers C = BPJS Health Participation</p>	<ul style="list-style-type: none"> • Age • Number of severe illnesses • BPJS Health Participation
Education	$EYS = \sum_{i=7}^{25} \frac{School\ Age\ Population_n}{Age\ Population_n}$ $AYS = \sum_{i=25}^n \frac{School\ Age\ Population_n}{n}$ $I_{education} = \frac{EYS + AYS}{2}$ <p>EYS= Expected Years of Schooling AYS= Average Years of Schooling</p>	<ul style="list-style-type: none"> • Age • Education Participation • Last diploma
Purchasing power	$I_{expense} = \frac{\ln(\text{expense of village popupation}) - \ln(P_{min})}{\ln \ln(P_{max}) - \ln(P_{min})}$ <p>P = Adjusted Expenditure per Capita</p>	<ul style="list-style-type: none"> • Education expenses • Cost of Clothing, Board, and Entertainment • Shopping expenses • Electricity costs • Monthly savings • Vehicle expenses • Social expenses

3 Results

3.1 Socio-demographic characteristics

Respondents were categorized based on their residence: coastal areas (3,108 respondents) and inland areas (2,245 respondents). Among all respondents, 82.7% were male, and 25.6% were aged between 40 and 50. The majority were Muslim (89.6%), married (78.1%), had fewer than four family members (76.1%), and belonged to the Bugis tribe (30.2%). Additionally, 47.3% of respondents had lived in their respective villages for over 30 years. Table 2 displays the sociodemographic characteristics.

Table 2. Distribution of socio-demographic characteristics of respondents

Variables	Non-coastal (n=2245)		Coastal (n=3108)		Total (n=5353)	
	n	%	n	%	n	%
Gender						
Male	1889	84.1	2537	81.6	4426	82.7
Female	356	15.9	571	18.4	927	17.3
Age						
<25 Years	113	5.0	136	4.4	249	4.7
25 - 30 Years	178	7.9	217	7.0	395	7.4
30 - 40 Years	522	23.3	686	22.1	1208	22.6
41 - 50 Years	623	27.8	750	24.1	1373	25.6
51 - 60 Years	465	20.7	799	25.7	1264	23.6
> 60 Years	344	15.3	520	16.7	864	16.1
Marital Status						
Unmarried	140	6.2	140	4.5	280	5.2
Divorced Alive	108	4.8	173	5.6	281	5.2
Divorced	261	11.6	350	11.3	611	11.4
Married	1736	77.3	2445	78.7	4181	78.1
Number of Family Members						
≤ 4 People	1685	75.1	2388	76.8	4073	76.1
5-6 People	490	21.8	653	21.0	1143	21.4
≥ 7 People	70	3.1	67	2.2	137	2.6
Religion						
Islam	2059	91.7	2735	88.0	4794	89.6
Catholic	92	4.1	62	2.0	154	2.9
Christian	94	4.2	310	10.0	404	7.5
Hinduism	0	0.0	1	0.0	1	0.0
Ethnicity / Tribe						
Bugis	533	23.7	1083	34.8	1616	30.2
Paser	659	29.4	410	13.2	1069	20.0
Java	326	14.5	495	15.9	821	15.3
Banjar	200	8.9	153	4.9	353	6.6
Toraja	83	3.7	245	7.9	328	6.1
Bajo	2	0.1	192	6.2	194	3.6
Bajau	0	0.0	160	5.1	160	3.0
Mandar	84	3.7	47	1.5	131	2.4
Buton	59	2.6	3	0.1	62	1.2
Timor	48	2.1	2	0.1	50	0.9
Others*						
Length of Stay in Village						
≤ 5 Years	259	11.5	260	8.4	519	9.7
> 5 Years - 10 Years	211	9.4	252	8.1	463	8.6
> 10 -15 Years	412	18.4	464	14.9	876	16.4
> 15 - 20 Years	201	27.3	179	20.7	380	23.5
> 20 - 25 Years	252	38.5	258	29.0	510	33.0
> 25-30 Years	206	9.2	329	10.6	535	10.0
> 30 Years	915	40.8	1618	52.1	2533	47.3

*Manado, Sunda, Muna Batak, NTT, Palopo, Flores, Madura, Makassar, Bajau, Bima, Dayak, Pasir, Manggarai, Mamuju, Lombok Timur, Maumere, Minahasa, Kaili, Kutai, Duri, Gorontalo, Ambon, Banjarmasin, Bone, Flores, NTB, Mandar, Melayu, Padang, Sinjai, Aceh, Betawi, Melayu Menado, Muna, Palembang, Poso, Sanger, Asak, Siau, Tionghoa, Wajo, Bulukumba, Bali, Banggai Kepulauan, Buton Utara, Cina, Ende, Ende Lio Enrekang, Garut, Jenepono, Kutai Paser, Luhu, Luwuk, inggai, Makasaar, Bone, Mandar, Bugis, Medan, Melayu Eli, Mentawir, Minang, Mongondow, Najau, Nakau, Nias, Nusa Tenggara Barat, Palu, Papua, Pare-Pare, Paser Bajau, Paser, Banjarpaser/Dayakpolopo, Sakra, Sangihe, Sangir, Sijungkgang, Sumatera Selatan, Sumatra Utara, Timor, Timur Manggarai, Tiur, Toli Toli, Toraja Paser

3.2 Descriptive analysis of Human Development Index (HDI) indicators

Table 3 shows the distribution of respondents' characteristics based on health indicators. Most respondents (84.1%) reported no severe illnesses in their families. Only 30.3% of respondents participated in family planning programs, while 54.7% were recipients of social security contributions through JKN-KIS/BPJS (National Health Insurance-Healthy Indonesia Card /Social Security Organizing Agency). Regarding drinking water sources, refilled water was preferred by most respondents (74.1%). The most common type of flooring was wood with low-quality boards (48.4%), and 81.5% of respondents had their toilets at home.

The health dimension analysis indicates that most families are relatively healthy, with low incidences of serious illness. However, the low participation in family planning programs and moderate social security coverage suggest areas for potential improvement. The prevalent use of refilled water and substandard flooring materials highlight gaps in primary living conditions that need addressing to improve overall well-being.

Table 3. Distribution of respondent characteristics based on health dimensions

Variables	Non-coastal (n=2245)		Coastal (n=3108)		Total (n=5353)	
	n	%	N	%	n	%
Number of severe illnesses in the family						
0	1916	85.3	2584	83.1	4500	84.1
1	258	11.5	399	12.8	657	12.3
2	56	2.5	93	3.0	149	2.8
3	13	0.6	23	0.7	36	0.7
>3	2	0.0	9	0.2	11	0.1
Family planning program						
Yes	741	33.0	883	28.4	1624	30.3
No	1504	67.0	2225	71.6	3729	69.7
JKN-KIS/BPJS (National Health Insurance-Healthy Indonesia Card /Social Security Organizing Agency)						
Contribution Assistance Recipients	1354	60.3	1574	50.6	2928	54.7
Independent Participants	175	7.8	380	12.2	555	12.2
State Puik	297	13.2	298	9.6	595	9.6
Private Puik	53	2.4	209	6.7	262	6.7
Source of clean water						
PAM (Regional Drinking Water Company)	789	35.1	1338	43.1	2127	39.7
Well	854	38.0	1471	47.3	2325	43.4
Rainfed	554	24.7	65	2.1	619	11.6
Spring	525	23.4	2580	83.0	3105	58.0
Drinking water source						
Refill water	1999	89.0	1966	63.3	3965	74.1
Protected spring	88	3.9	161	5.2	249	4.7
Rainwater	66	2.9	13	0.4	79	1.5
Protected well	52	2.3	151	4.9	203	3.8
Branded bottled water	7	0.3	20	0.6	27	0.5
River/lake/reservoir water	4	0.2	86	2.8	90	1.7
Retail tap	0	0.0	12	0.4	12	0.2
Metered tap	13	0.6	207	6.7	220	4.1
Unprotected spring	5	0.2	3	0.1	8	0.1
Drilled/pumped wells	11	0.5	483	15.5	494	9.2
Unprotected well	0	0.0	6	0.2	6	0.1

Table 3. Distribution of respondent characteristics based on health dimensions (*continue*)

Variables	Non-coastal (n=2245)		Coastal (n=3108)		Total (n=5353)	
	n	%	N	%	n	%
Broadest floor type						
Low-quality wood/board	1116	49.7	1473	47.4	2589	48.4
High-quality wood/board	355	15.8	422	13.6	777	14.5
Ceramic	379	16.9	605	19.5	984	18.4
Cement/red brick	257	11.4	399	12.8	656	12.3
Tile/seal/terrazzo	107	4.8	180	5.8	287	5.4
Earth	24	1.1	9	0.3	33	0.6
Bamboo	5	0.2	12	0.4	17	0.3
Marble/granite	2	0.1	4	0.1	6	0.1
Parquet/vinyl/rug	0	0.0	4	0.1	4	0.1
Latrine						
Available	1968	87.7	2396	77.1	4364	81.5
Not available	277	12.3	712	22.9	989	18.5

Table 4 illustrates that 20.1% of respondents had dropped out of school. Regarding the highest level of education completed, 32.2% had graduated from elementary school or its equivalent, and 30.5% had graduated from high school or its equivalent. The educational attainment data shows a substantial dropout rate and a significant portion of the population having only completed elementary or high school. This limited educational background may hinder the community's ability to fully engage in and benefit from the socio-economic opportunities presented by the new capital's development.

Table 4. Distribution of respondent characteristics based on education dimension

Variables	Non-coastal (n=2245)		Coastal (n=3108)		Total (n=5353)	
	n	%	n	%	n	%
School Participation						
Dropped out of school	452	20.1	623	20.0	1075	20.1
In school	13	0.6	12	0.4	25	0.5
Not in school	1780	79.3	2473	79.6	4253	79.5
Education/Last Diploma						
No diploma	381	17.0	606	19.5	987	18.4
Elementary school/equivalent	799	35.6	922	29.7	1721	32.2
High school/equivalent	592	26.4	1039	33.4	1631	30.5
Junior high school/equivalent	355	15.8	417	13.4	772	14.4
D1/D2/D3	35	1.6	32	1.0	67	1.3
D4/S1/S2/S3	83	3.6	92	3.0	175	3.2

Table 5 presents data on the economic and expenditure dimensions. Based on the 2023 poverty line of East Kalimantan Province (Rp790,186), 22.7% of respondents were categorized as poor. While 78.3% of respondents were employed, 21.7% were not. Most respondents reported monthly expenditures between Rp1,000,000 and Rp2,000,000. Additionally, 84.6% of respondents ate three meals a day. The economic dimension reveals a considerable percentage of the population living below the poverty line despite a high employment rate. The disparity between employment and economic well-being underscores the issue of underemployment or low-paying jobs. The regular meal frequency suggests that, despite economic challenges, basic nutritional needs are being met.

Table 5. Distribution of respondent characteristics based on expenditure dimensions

Variables	Non-coastal (n=2245)		Coastal (n=3108)		Total (n=5353)	
	N	%	N	%	n	%
Poverty line						
Poor	574	25.6	643	20.7	1217	22.7
Not poor	1671	74.4	2465	79.3	4136	77.3
Employment						
Working	1829	81.5	2364	76.1	4193	78.3
Not working	416	18.5	744	23.9	1160	21.7
Monthly expenditure (Rp)						
< Rp100,000	62	2.8	123	4.0	185	3.5
Rp100,000-500,000	391	17.4	426	13.7	817	15.3
Rp 500.000-1.000.000	611	27.2	629	20.2	1240	23.2
Rp 1,000,000- 2,000,000	804	35.8	1009	32.5	1813	33.9
Rp 2,000,000- 3,000,000	293	13.1	638	20.5	931	17.4
> Rp 3,000,000	84	3.7	283	9.1	367	6.9
Frequency of meals per day						
1x meal	1	0.0	14	0.5	15	0.3
2x meals	137	6.1	354	11.4	491	9.2
3x meal	2035	90.6	2495	80.3	4530	84.6
> 3x meal	72	3.2	245	7.9	317	5.9

3.3 Analysis of Human Development Index (HDI) in IKN Buffer Areas

The HDI in this study was calculated using three key indices: health, education, and expenditure. The health index was determined by measuring life expectancy (AHH). Table 6 shows that the AHH in coastal areas (61.90) is higher than in non-coastal areas. Sepan and Sotek had the highest and lowest AHH values, respectively.

The education index was assessed using Expected Years of Schooling (HLS) and Average Years of Schooling (RLS). HLS reflects the expected duration a child will spend in school, indicating the development level of the education system. RLS measures the average years of formal education completed by individuals aged 25 and above. The study found that non-coastal areas have a higher average HLS (12.15) than coastal areas, whereas coastal areas have a higher average RLS (7.65) than non-coastal areas.

Average expenditure was used to calculate the expenditure index. The findings in Table 6 indicate that residents in coastal areas have higher average expenditures (Rp5,881,857.65) than those in non-coastal areas. Maridan had the highest average expenditure, while Gersik had the lowest.

Table 6. AHH, HLS, RLS, and Community Expenditure in IKN Buffer Areas

Villages	Life Expectancy (AHH)	Expected Years of Schooling (HLS)	Average Years of Schooling (RLS)	Average Expenditure
Buluminung	57.76	10.94	6.88	5.600.579,76
Gersik	60.80	12.03	8.87	4.222.560,75
Jenebora	70.91	11.17	7.54	6.753.950,02
Maridan	63.52	12.90	10.06	8.043.542,49
Pantai Lango	56.52	10.49	4.91	4.788.655,25
Average Coast	61.90	11.50	7.65	5.881.857,65

Table 6. AHH, HLS, RLS, and Community Expenditure in IKN Buffer Areas (*continue*)

Villages	Life Expectancy (AHH)	Expected Years of Schooling (HLS)	Average Years of Schooling (RLS)	Average Expenditure
Riko	57.72	11.95	7.02	4.929.764,87
Sepan	64.56	12.08	6.72	5.163.770,87
Sotek	55.45	12.42	8.19	5.630.599,13
Average Non-coast	59.24	12.15	7.31	5.241.378,29

Table 7 presents the HDI scores for each IKN buffer zone. The coastal areas had a higher average HDI (57.93) than non-coastal areas (56.23), suggesting better welfare in coastal communities. Despite higher HDI values in coastal areas, both regions' HDIs fall into the low category. Only Jenebora and Maridan were classified as having moderate HDI scores, with Maridan having the highest HDI (66.41) and Buluminung the lowest (54.37).

Table 7. Average HDI scores in IKN buffer areas

Typology	Villages	Health index	Education Index	Expenditure Index	HDI Score	HDI Category
Coastal	Buluminung	0.58	0.53	0.52	54.37	Low
	Gersik	0.63	0.63	0.44	55.90	Low
	Jenebora	0.78	0.56	0.58	63.31	Moderate
	Maridan	0.67	0.69	0.63	66.41	Moderate
	Pantai Lango	0.56	0.46	0.48	49.64	Low
	Average	0.64	0.57	0.53	57.93	Low
Non-Coastal	Riko	0.58	0.57	0.49	54.39	Low
	Sepan	0.69	0.56	0.50	57.81	Low
	Sotek	0.55	0.62	0.53	56.48	Low
	Average	0.61	0.58	0.51	56.23	Low

The non-coastal areas had an average health index of 0.61, slightly lower than the coastal areas' 0.64. Sepan had the highest health index (0.69), while Sotek had the lowest (0.55), aligning with Hooyberg et al. [11], who noted that living near the coast positively impacts health. Research indicates that living near "blue spaces," such as oceans and lakes, is associated with improved health outcomes, including lower rates of chronic diseases and better mental health [12]. This is particularly relevant in coastal urban areas where health services are often more developed compared to their non-coastal counterparts. The availability of recreational opportunities and the aesthetic benefits of coastal living also contribute to improved well-being [12].

The education index was marginally higher in non-coastal areas (0.58) than in coastal areas (0.57). Maridan had the highest education index (0.69), while Buluminung had the lowest (0.53). One significant factor contributing to the higher education index in non-coastal areas is the availability and quality of educational infrastructure. Non-coastal regions often have a more stable population and may benefit from targeted educational policies that prioritize the establishment of schools and educational programs.

The expenditure index was higher in coastal areas (0.53) than in non-coastal areas (0.51). Maridan had the highest expenditure index (0.63), while Gersik had the lowest (0.44). Coastal regions often attract significant tourist traffic due to their natural beauty, recreational opportunities, and cultural attractions. This influx of tourists stimulates local economies,

leading to increased spending in various sectors, including hospitality, retail, and services [13, 14]. For instance, the inbound tourism economy in coastal areas has been shown to create substantial revenue, which can be reinvested into local infrastructure and services, thereby raising the expenditure index [13]. The tourism sector not only provides direct employment but also generates ancillary economic activities that contribute to overall expenditure levels in these regions [14].

The differences in HDI between coastal and non-coastal regions highlight a complex interplay of geographic, economic, and social factors. Coastal regions, despite having better economic opportunities and health outcomes, face significant vulnerabilities due to environmental risks and fluctuating incomes. Non-coastal regions, while having stronger educational outcomes and more stable social structures, suffer from limited economic opportunities and poorer health infrastructure. Addressing these disparities requires tailored policy interventions that account for the unique needs and challenges of each region to ensure balanced human development across the buffer zones of Indonesia's new capital city.

3.4 Relationship between Sociodemographic and Objective Welfare

Table 8 presents the correlation analysis between community welfare and respondents' sociodemographic characteristics. Average expenditure was used to measure objective welfare. A significant correlation ($r = 0.332$) was found between family expenditure and the number of family members, indicating that larger families spend more. There was also a correlation ($r = 0.144$) between education and expenditures, suggesting that higher education levels lead to higher expenditures, as more educated individuals typically earn and spend more. Financial assistance for education was also correlated with higher expenditure ($r = 0.060$).

Employment status ($r = 0.185$) and permanent residence status ($r = 0.045$) were positively correlated with expenditure. Participation in training ($r = 0.064$), meal frequency ($r = 0.088$), electricity usage ($r = 0.181$), and community activity participation ($r = 0.106$) were also positively correlated with expenditure, indicating that higher involvement in these activities leads to higher costs. Next, there was a negative correlation ($r = -0.067$) between age and expenditure, showing that older respondents tend to spend less.

The findings suggest that larger families, higher education levels, stable employment, and active community participation are associated with increased expenditures, while older age appears to correlate with reduced spending. These insights can inform policymakers and community planners in developing targeted interventions to enhance welfare in the community.

Table 8. Relationship between sociodemographics and expenditure

Variables	Expenditure		Conclusions
	Correlation Coefficient	Sig. (2-tailed)	
Number of Family Members	0.332**	0.000	Significant
Employment Status	0.185**	0.000	Significant
Electricity Power	0.181**	0.000	Significant
Education	0.144**	0.000	Significant
Community Activity Participation	0.106**	0.000	Significant

Table 8. Relationship between sociodemographics and expenditure (*continue*)

Variables	Expenditure		Conclusions
	Correlation Coefficient	Sig. (2-tailed)	
Frequency of Meals per Day	0.088**	0.000	Significant
Age	-0.067**	0.000	Significant
Participation in Training	0.064**	0.000	Significant
Received Education Assistance	0.060**	0.000	Significant
Status of Residence	0.045**	0.000	Significant
Length of Stay in the Village	-0.010	0.260	Insignificant

3.5 The impact of the Development of the IKN on community welfare

To analyze the impact of the Capital City of the Archipelago (IKN) on social life, economic vulnerability, and community welfare in the IKN buffer zone, a Focus Group Discussion (FGD) was conducted at Penajam Paser Utara District Hall on December 30, 2023. The FGD involved 15 participants representing eight villages, including the Head of the Village, Village Representatives, and Community Leaders. The participants were divided into two groups: Group 1, which included representatives from Gresik, Jenebora, Buluminung, and Pantai Lango villages, and Group 2, which included representatives from Riko, Maridan, Lawe-Lawe, and Sotek villages.

The word cloud generated from the NVivo analysis of the focus group discussion (FGD) reveals several key themes discussed by the participants. Important keywords such as *IKN* (Indonesia’s New Capital City), *no*, *work*, *information*, *community*, and *local* appear prominently.



Fig. 1. Word clouds in NVivo

The discussion revealed that the primary livelihoods in the IKN buffer zone are fishing and employment. However, youth unemployment remains an issue, particularly among those with lower education levels and those unwilling to enter the fishing sector. Young people exposed to technology and information tend to avoid fishing.

Labor recruitment increased with the onset of IKN development, particularly for infrastructure projects like airports and toll roads. However, many jobs were filled by workers from Java and Sulawesi, with local workers primarily employed as manual laborers. The lack of open labor recruitment and accessible job information has left local residents at a disadvantage, often relying on word-of-mouth for job vacancies.

The influx of migrant workers has also impacted local communities. Although migrants rent houses from local residents, there is minimal interaction, creating a gap between residents, migrants, and companies. Issues of educational level, work ethic, and respect for local governance have further strained relations. Additionally, construction projects have obstructed residents' access to their areas, with no alternative routes provided.

The presence of migrants has led to increased crime rates, including theft of motorcycles and livestock. In Sotek, the disturbance of crocodile habitats due to development has increased crocodile attacks on residents.

The demand for fish has increased due to the influx of labor. However, local fishermen have not benefited significantly because the fish are sold to collectors who supply larger markets like Balikpapan. However, some positive impacts have been observed, such as increased house rentals in Pantai Lango and Gresik Villages due to workers involved in the Pulau Balang bridge project.

Residents in Ring 1, including Riko, Maridan, Lawe-Lawe, and Sotek Villages, have experienced some positive impacts. Training programs for youth in sewing and laundry and assistance for Micro, Small, and Medium Enterprises or MSMEs have been introduced. Economic development has increased, with new businesses such as catering, boarding houses, and rental properties emerging. Land values have also increased, benefiting residents who sell their land at higher prices.

Several health facilities have been built, including Puskesmas (Community Health Center) in Sotek and hospitals like RSUD (Regional General Hospital) Sepaku, Hermina Hospital, and Mayapada Hospital. Educational facilities have also improved with the establishment of Gunadarma University.

While the physical development of IKN has brought some benefits, non-physical aspects such as security and public facilities need more attention. Relocating the country's capital to IKN is expected to enhance ASEAN unity and integration and promote economic growth in the East ASEAN Growth Area (EAGA).

3.6 Theoretical contribution

This study contributes to the existing body of knowledge on welfare state theory by highlighting the critical role of government intervention in ensuring social welfare and human development in rapidly evolving urban environments, such as the buffer zones of IKN. The findings indicate that while the state has implemented various development projects, structural issues such as disparities in educational access, healthcare, and employment opportunities persist. These challenges underscore the need for more comprehensive, context-specific policy interventions aligned with welfare state principles.

The study enriches the understanding of the welfare state theory in a developing nation context, particularly by demonstrating how large-scale infrastructure projects like IKN's development influence local welfare dynamics. It illustrates that government efforts, while crucial, need to be inclusive and consider the socio-economic and geographical diversity within the affected populations. By integrating social welfare programs into the planning and execution of such projects, governments can mitigate inequalities and improve the Human Development Index (HDI) across different regions, particularly in vulnerable communities such as coastal and non-coastal areas.

Furthermore, this research offers a nuanced view of the interplay between urban development and community welfare by emphasizing the importance of community participation and environmental sustainability. It extends the application of welfare state theory by showing that welfare is not merely the product of economic development but also of the state's ability to foster social cohesion, protect local livelihoods, and provide equitable access to resources and opportunities.

By focusing on the specific case of IKN, the study also highlights the limitations of a purely economic approach to development. It argues that human development is a multidimensional process that must consider health, education, and environmental factors alongside economic indicators. This comprehensive approach aligns with the human development paradigm, which positions individuals as active participants in their development, not passive recipients of state aid.

3.7 Policy implications

Based on the findings of the study on the Human Development Index (HDI) and community welfare in the buffer zones of Indonesia's new capital city (IKN), several specific and actionable policy recommendations can be made. First, it is crucial to enhance educational infrastructure, particularly in non-coastal areas where educational attainment levels are lower. This can be achieved by prioritizing the construction of new schools, upgrading existing facilities, and providing incentives like scholarships to reduce dropout rates. Improving access to education will ensure that the local population can benefit from the economic opportunities brought by IKN's development.

In addition, it is recommended to promote skills training and job creation programs for the local workforce. Establishing vocational training centers focused on skills relevant to the IKN development, such as construction and tourism, and enforcing local hiring policies can help bridge the employment gap, particularly for youth who are struggling to find jobs. Expanding social safety nets is another important policy, especially for vulnerable populations in coastal areas. This could include healthcare subsidies, food assistance, and income diversification programs for fishermen to help reduce economic vulnerability.

Moreover, improving healthcare access in coastal areas should be a priority. This can be done by increasing the number of healthcare facilities, particularly focusing on preventive healthcare and maternal services, and introducing mobile clinics for remote communities. Investments in sanitation infrastructure will also be critical in promoting long-term health outcomes.

Environmental protection is a crucial aspect of sustainable development [15]. Implementing sustainable development initiatives, such as promoting sustainable fishing practices and conserving marine biodiversity, will help mitigate the environmental impact of rapid development. In non-coastal areas, supporting sustainable farming practices can help prevent food insecurity and maintain ecological balance.

Strengthening local governance and promoting community engagement are also essential. By involving local leaders and residents in decision-making processes, the government can ensure more transparent and inclusive development, fostering a sense of ownership among the local population. Additionally, supporting micro, small, and medium enterprises (MSMEs) in both coastal and non-coastal regions through financial assistance and training will empower local entrepreneurs and help reduce economic inequality, allowing them to participate fully in the IKN-related economic growth.

These policy measures are designed to improve the HDI and overall welfare of communities in the IKN buffer zone while ensuring sustainable, inclusive development that benefits all residents.

4 Conclusions

This study surveyed 5,353 participants across eight villages in the IKN buffer zone, revealing consistently low Human Development Index (HDI) scores, with only two areas reaching moderate levels. Focus Group Discussions (FGDs) with 15 representatives confirmed that limited education access and job opportunities were key barriers to prosperity. Most residents

saw little benefit from IKN development, highlighting the need for inclusive policies to enhance community welfare.

Findings also showed coastal areas had higher HDI scores overall, while non-coastal areas excelled in education, and coastal regions ranked higher in health and expenditure indices. Sociodemographic analysis indicated positive correlations between expenditure and factors like family size, education, training, and community participation, while age showed a significant negative correlation. Given IKN's long-term development, further longitudinal research is needed to analyze these relationships in depth.

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