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The Relationship Of The Construction Cost Index To Human Development Index In West Nusa Tenggara

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ABSTRACT

The Construction Cost Index (CCI) is an index that describes how expensive it is to build a building, the higher the index, the greater the cost. Meanwhile, the Human Development Index (HDI) is an index used to measure the quality of life of the people in a region, the higher the value, the better the quality of life. It is important to know how the pattern and dynamics of the relationship between CCI and HDI. Therefore, this paper aims to determine the relationship between CCI and HDI in West Nusa Tenggara Province. The data taken is secondary data derived from Central Bureau of Statistics. First, define the hypothesis between CCI and HDI, where CCI and HDI are assumed to have a negative relationship, which means that the higher HDI, the lower CCI, and vice versa, the lower HDI, the higher CCI.The average CCI in West Nusa Tenggara falls into the high category, as does the HDI. After that, compare the CCI and HDI values in each region with the previous region, where Makassar City is used as the initial comparison for the CCI category, as it is the region closest to or equal to the national average index. As a result, most regions show the hypothesized negative relationship. out of 10 regions, only Sumbawa District, West Sumbawa District, and Bima District show a negative relationship.

Keywords: Central Bureau of Statistics; The Construction Cost Index; Human Development Index.

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1. Introduction

Golden Indonesia 2045 is one of the visions and missions that has long been echoed in Indonesia. This idea is a form of ideal that describes Indonesia's desire to experience rapid progress in 2045, which is the 100th anniversary of the nation's age (Anjani et al., 2023). Golden Indonesia 2045 consists of four pillars, namely human development and mastery of science and technology, sustainable economic development, equitable development, and strengthening national resilience and governance (Jamilah et al., 2024). If Golden Indonesia 2045 fails to be achieved, the Indonesian nation has the potential to experience a multidimensional crisis covering social, political and economic fields (Hutagalung et al., 2024). This idea is one of the substantial things that needs to be given special attention in order to achieve the expected ideal conditions.

The idea of Golden Indonesia 2045 is also in line with the SDGs agenda, where sustainable development is another important thing that is also prioritized. Sustainable Development Goals or SDGs is a global program to maximize the potential and resources of a country, be it in the form of Human Resources or Natural Resources (Irhamsyah, 2020). The SDGs have 17 important goals, namely:

- No Poverty
- No Hunger
- Healthy and Prosperous Life
- Quality Education
- Gender Equality
- Clean Water and Sanitation

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- Clean and Affordable Energy
- Decent Work and Economic Growth
- Industry, Innovation and Infrastructure
- Reduced Inequalities;
- Sustainable Cities and Settlements
- Responsible Consumption and Production
- Addressing Climate Change
- Ocean Ecosystems
- Land Ecosystems
- Peace, Justice and Resilient Institutions
- Partnerships for the Goals. Basically.

Its agenda is aimed at addressing global problems such as poverty, inequality, and so on (Aji and Kartono, 2022).

There are two similarities between the two ideas above, namely infrastructure development and human development. This shows that these two things are crucial and inseparable from the ideals of the Indonesian nation. Therefore, it is important to observe the dynamics of infrastructure development and human development. In essence, development is an effort towards a change in order to achieve people's welfare (Simbolon et al., 2021). Infrastructure development is one of the important factors in encouraging economic growth and improving people's welfare. One of the indicators used to measure the cost of infrastructure development in a region is the Construction Cost Index (CCI). According to Central Bureau of Statistics (2023), the Construction Cost Index (CCI) is a price index that informs the level of construction cost of a city/district compared to the reference city. CCI is used as a proxy to measure the level of construction cost of a region, the calculation of the Construction Cost Index (CCI) is carried out by referring to certain approaches or assumptions. CCI illustrates the amount of construction costs required to build infrastructure in a particular region compared to other regions in Indonesia. The index is influenced by various factors, such as the cost of labor, raw materials and transportation, which in turn can affect a region's ability to develop its infrastructure.

On the other hand, the Human Development Index (HDI) is used as a key indicator to measure the quality of life and well-being of people in a region. The HDI is a composite index formed from various indicators that are calculated using certain methods to produce the figure. Indonesia adopts the human development measurement method used by UNDP by calculating the same index. HDI is closely related to the Human Resources available in a particular region. HDI covers three important aspects, namely education, health, and living standards. Adequate infrastructure can play an important role in improving access to health services, education, and economic opportunities, which in turn will increase the HDI. The development of HDI provides an indication of the increase or decrease of human development in a region. Indonesia adopts the human development measurement method used by UNDP by calculating the same index. The HDI calculated independently by Indonesia also includes three dimensions, as formulated by UNDP, namely (1) The dimension of longevity and healthy living; (2) Dimension of knowledge; (3) Dimension of decent standard of living. Of the three existing HDI dimensions, there are four constituent indicators. However, there is a difference in one of the indicators in the decent standard of living dimension, due to the absence of the same indicator as used by UNDP at the subnational level in Indonesia, both at the provincial and district/city levels. For the dimension of longevity and healthy living, the indicator used is Life Expectancy at Birth. In the knowledge dimension, namely: i) Expected Years of Schooling; and ii) Average Years of Schooling. For the last dimension, a decent standard of living, the adjusted real expenditure per capita indicator was chosen to represent this dimension (Alfian et al., 2023).

West Nusa Tenggara, as one of the growing provinces in Indonesia, faces challenges in infrastructure development that is influenced by the HDI. High construction costs in some areas in West Nusa Tenggara may hinder the pace of infrastructure development and in turn affect the decline of HDI. Therefore, it is important to analyze the relationship between CCI and HDI in West Nusa Tenggara to find out the extent to which construction costs affect human development in the region. In its analysis, observations are made through the statistical perspective to enable interpretation. Statistics plays a crucial role in decision-making based on data, scientific research, quality control, forecasting, public policy formulation, and business analysis (Siboro et al., 2023).

2. Methods

The data processed is secondary data originating from the Central Bureau of Statistics. Each data from CCI and HDI consists of 10 data, namely 8 district data and 2 city data in West Nusa Tenggara Province. The working steps of this research are as follows.

- Open the official website of the Central Bureau of Statistics.
- Open the publication section on the website.
- Downloading the CCI and HDI files from 2010 to 2023.
- Based on the downloaded files, summarize the CCI and HDI data specifically for West Nusa Tenggara Province.
- Make a hypothesis about the relationship between CCI and HDI.
- Categorize CCI and HDI into defined categories.
- Comparing the CCI and HDI values in each region against the CCI and HDI values of the previous region.
- Draw conclusions based on the hypothesis used.

3. Results and Discussion

A city/district can be categorized as having a high or low CCI based on its comparison with the CCI of the reference city. The reference city used in the calculation of CCI in 2023 is Makassar City. The CCI of Makassar City is 100, which is the CCI of this city that is closest or equal to the national average index (Central Bureau of Statistics, 2023). Therefore, if the CCI of a region is below 100, the CCI of that region is said to be lower than the national average index, and if it is above 100, it is said to be higher than the national average.

The following CCI data consists of various districts and cities in West Nusa Tenggara Province, with 8 districts and 2 cities. Bima District has the highest CCI, at 109.79, followed by Bima City at 108.12, and Dompu District at 104.70. These high CCI figures indicate that development in these three regions is also becoming more difficult, due to the high cost of building a building in these areas. Meanwhile, West Sumbawa District has the lowest CCI figure, which is 97.19. It means that among all regencies and cities in West Nusa Tenggara, West Sumbawa District ranks first for the cheapest development costs. The following is the complete data on CCI in West Nusa Tenggara Province on Table 1.

Table 1. CCI of West Nusa Tenggara Province in 2023

Kode	District/City	CCI
5201	West Lombok District	102,32
5202	Central Lombok District	100,11
5203	East Lombok District	101,71
5204	Sumbawa District	98,34
5205	Dompu District	104,70
5206	Bima District	109,79
5207	West Sumbawa District	97,19
5208	North Lombok District	98,04
5271	Mataram City	100,59
5272	Bima City	108,12

Source: Central Bureau of Statistics of West Nusa Tenggara Province

Meanwhile, HDI can be classified into 4 categories, namely low, medium, high, and very high. HDI can be said to be low when the value is <60, medium when 60≤HDI<70, high when 70≤HDI<80, and very high when HDI>80 (Pamungkas & Widiyanto in Central Bureau of Statistics, 2022). The HDI data itself is also similar to the CCI data, consisting of 8 districts and 2 cities. In West Nusa Tenggara Province, Mataram City is ranked first for the highest HDI, which is 81.15, followed by Bima City, then West Sumbawa District, and West Lombok District. This indicates that Mataram City has the highest quality of life. Meanwhile, North Lombok District has the lowest HDI figure, which is only 68.02. This means that North Lombok District has the lowest quality of life when measured from the dimensions of longevity and healthy living, the knowledge

dimension, and the decent standard of living dimension. The following is the complete HDI data in West Nusa Tenggara Province on Table 2.

Tabel 2. HDI of West Nusa Tenggara Province in 2023

Kode	District/City	HDI
5201	West Lombok District	72,18
5202	Central Lombok District	70,41
5203	East Lombok District	70,65
5204	Sumbawa District	71,68
5205	Dompu District	71,77
5206	Bima District	70,33
5207	West Sumbawa District	74,84
5208	North Lombok District	68,02
5271	Mataram City	81,15
5272	Bima City	78,24

Sourcer: Central Bureau of Statistics West Nusa Tenggara Province

Based on Rahmadhani's research (2019), it is known that with the increase in the construction cost index of an area, the human development process in that area will decrease. This shows that there is a negative relationship that occurs between HDI and CCI. To analyze the relationship between the Construction Cost Index (CCI) and the Human Development Index (HDI), data consisting of 10 samples covering CCI and HDI values from various regions in West Nusa Tenggara are used. This data can be seen in the following graph:

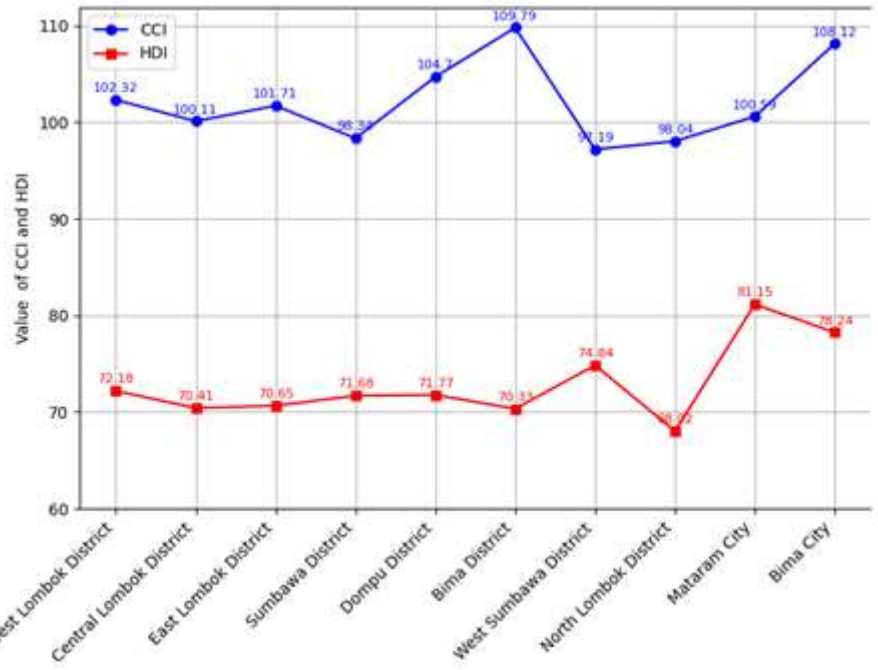

Figure 1. Comparison of CCI and HDI

The Figure 1 illustrates the comparison between CCI and HDI for districts and cities in West Nusa Tenggara in 2023. The CCI values consistently surpass the HDI across all districts and cities. The highest CCI value is observed in Bima District (109.79), while the lowest is in West Sumbawa District (97.19). Then, the HDI values are lower and show relatively less fluctuation compared to the CCI. Mataram City has the highest HDI value (81.15), while Bima District records the lowest (70.33). The HDI values are generally close to each other, ranging mostly between 70 and 75, except for Mataram City and Bima City (78.24).

Statistically, the assumed negative relationship between CCI and HDI across regions suggests that infrastructure development (CCI) is not directly correlated with human development (HDI). Mataram City shows a higher HDI value, which most likely reflects better human development indicators such as education, health and living standards. High HDI values in other regions that are not followed by lower CCI values, or low HDI values that are not followed by increasing CCI values may indicate gaps in human development that are not fully captured by the infrastructure index. The regional insight that North Lombok District stands out with a low CCI but only a moderate HDI value (68.02), indicates a potential imbalance between community welfare and human development. Mataram City achieves balance with a CCI closest to Makassar City or the national average index (100.55) and the highest HDI, indicating that the city is leading the way in terms of welfare and development.

- West Lombok District
  CCI: 102.32
  HDI: 72.18
  In West Lombok District, the CCI value is quite high (102.32), while the HDI is at 72.18. In this analysis, the West Lombok district will be used as a starting point to see whether or not the negative relationship hypothesized at the beginning exists.
- Central Lombok District
  CCI: 100.11
  HDI: 70.41
  Central Lombok District shows a slightly lower CCI than West Lombok (100.11), and a slightly lower HDI at 70.41. A decrease in CCI did not lead to an increase in HDI in this region. On the contrary, there was a decrease in HDI, which caused the expected negative relationship not to be achieved or not applicable.
- East Lombok District
  CCI: 101.71
  HDI: 70.65
  In East Lombok District, the CCI increased slightly compared to Central Lombok District, but the HDI remained in the same range (70.65). This indicates that an increase in CCI did not cause a substantial decrease in HDI.
- Sumbawa District
  CCI: 98.34
  HDI: 71.68
  In Sumbawa District, the CCI fell to 98.34, and the HDI increased slightly to 71.68. This shows a pattern that supports the hypothesis, where a decrease in CCI correlates with an increase in HDI, although the difference is not very large.
- Dompu District
  CCI: 104.70
  HDI: 71.77
  Dompu District has a relatively high CCI (104.70), but the HDI remained stable at 71.77. In this region, an increase in CCI does not lead to a significant decrease in HDI, thus not supporting the hypothesis.
- Bima District
  CCI: 109.79
  HDI: 70.33
  In Bima District, the CCI reached the highest value (109.79), while the HDI was at 70.33. This supports the hypothesis, because the increase in CCI was accompanied by a significant decrease in HDI compared to other regions.
- West Sumbawa District
  CCI: 97.19
  HDI: 74.84
  In West Sumbawa District the CCI is low at 97.19, while the HDI is quite high, reaching 74.84. This is an example that clearly supports the hypothesis, where a decrease in CCI correlates with an increase in HDI.
- North Lombok District
  CCI: 98.04
  HDI: 68.02

In North Lombok District, the CCI stood at 98.04, while the HDI dropped to 68.02, which is the lowest value among all regions. This does not support the hypothesis because although the CCI is low, the HDI is also low.

- Mataram City
  CCI: 100.59
  HDI: 81.15
  In Mataram City, the CCI is relatively stable (100.59), but the HDI is very high, reaching 81.15. Although this city achieves the most ideal equilibrium, it shows a relationship between CCI and HDI that is contrary to the hypothesis, because although the CCI is stable, the HDI is much higher than other regions.
- Bima City
  CCI: 108.12
  HDI: 78.24
  Bima City has a fairly high CCI (108.12), but the HDI remains high at 78.24. This contradicts the hypothesis, because an increase in CCI is not accompanied by a decrease in HDI.

Based on the data provided, the hypothesis that an increase in CCI causes a decrease in HDI is not fully proven in all regions in West Nusa Tenggara. Some areas, such as Bima District and West Sumbawa District, did show a pattern in accordance with the hypothesis, where Bima District showed an increase in CCI followed by a significant decrease in HDI. Meanwhile, West Sumbawa District showed a decrease in CCI followed by a significant increase in HDI. However, in other regions such as Bima City, the relationship is not evident, even contradicting the hypothesis, where even though the CCI is high, the HDI also remains high.

Therefore, the relationship between CCI and HDI seems to be contextual and may be influenced by other factors, such as the quality of education, health services, and infrastructure access that vary by region. Further research using more in-depth statistical methods, such as regression or correlation analysis, may be needed to gain a more complete understanding of the relationship between these two indices. The findings and their implications should be discussed in the broadest possible context. Future research directions may also be highlighted.

4. Conclutions

Based on the analysis of the relationship between the Construction Cost Index (CCI) and the Human Development Index (HDI) in the West Nusa Tenggara region, It is known that the average of each CCI and HDI falls into the high category. CCI is said to be relatively high when its value exceeds Makassar City or the average national index (100), while HDI is said to be high when its value is within the range of 70 and 80. The high category of CCI indicates a bad thing, as this means that the cost of constructing a building in the area will be higher. Meanwhile, the high category for HDI indicates the opposite. A high HDI indicates that the quality of life of the people in an area is good. Then after the two indices are compared, it is concluded that the hypothesis that an increase in CCI leads to a decrease in HDI is not fully proven in all regions. While there are some regions that support the hypothesis, many regions show patterns that are not consistent with the expected relationship. Most likely, the effect of CCI on HDI is influenced by the local context of each region, such as the access to health service or the quality of education. This could be the subject of further research to determine the specific types of factors that influence the relationship.

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