

# Temporal-spatial analysis in accordance with gender development index on the improvement of the quality of women in Central Kalimantan Province

Ari Yulianto<sup>1,\*</sup>, Prameswari Budi Kusumaningrum<sup>1</sup>, Alviyah Daniati<sup>1</sup>, Shinta Nurvitasari<sup>1</sup>, and Ratih Fitria Putri<sup>1</sup>

<sup>1</sup>Department of Environmental Geography, Faculty of Geography, Universitas Gadjah Mada, Indonesia

**Abstract.** Gender Development Index (GDI) is the index introduced by UNDP to measure the quality of human resources with respect of gender aspect. The objective of this research is to identify the influence of health, education, and economy to the women as well its distribution to map the areas prioritized for gender inequality alleviation. The methodology of this research employs quantitative descriptive analysis, spatial comparative analysis, and temporal comparative analysis. The result shows that the gender equality achieved by Central Kalimantan was GDI far below the national average, hence there needs to be efforts to push gender equality in main priority districts, such as Katingan, Murung Raya, and Barito Utara. The influence of health factor, represented by Life Expectancy Rate is more significant compared to other factors such as education and economy. The raise of total health facilities impact to the decreased of women mortality rate as the key for good women contribute into Gender Development Index.

## 1 Introduction

Gender Development Index plays a vital role as the benchmark to determine the quality of human resources in a particular area by differentiating each of its parameters gender-wise. Besides, Gender Development Index is also used to measure the inequality between men and women in terms of human resources' quality development. The closer GDI is to 100, then the more successful an area is in terms of human development [1].

Gender Development Index is fundamentally similar to the Human Development Index (HDI). Both indices involved identical variables, except GDI specifically differentiates them on gender basis, since GDI is intended to ascertain the inequality between genders in respect of human development. HDI itself is different to the GDI as it does not take gender into account [2].

Gender equality and sustainable development are two inseparable matters. Gender equality, human rights enforcement, women's dignity and capability empowerment are the main requirements of a just and sustainable life. Sustainable development itself is a development of economy, social, and environment that guarantees the welfare, unity, ecology, equality, and social justice for today and the generations to come [3]. Therefore, it is clear that gender equality is a key factor in sustainable development

In September 2015, the United Nations released a set of goals further called Sustainable Development Goals (SDGs) to replace the previously expired program, Millenium Development Goals. SDGs laid out 17 programs to be executed by developed and developing countries, including Indonesia. SDGs were scheduled for

the upcoming 15 years, which is also known as the Agenda 2030.

The value of GDI differs across provinces of Indonesia, and even so across districts and cities within a particular province. Central Kalimantan is an example of this case. Central Kalimantan is the province where Palangka Raya is, the city rumored to be the new capital of Indonesia, replacing Jakarta. Special Capital Region of Jakarta is one of the lowest in gender disparity, scoring a GDI of 94.72 [4]. Between 2010–2015, Central Kalimantan only scored a 89.25 in GDI, far below the Special Capital Region of Jakarta. So far, Palangka Raya has sufficed to be the national capital in terms of its physical properties. Its peat land can be easily engineered to support the infrastructures of a capital city. If Palangka Raya were to be named the national capital, it would be expected to maintain at least the same GDI score as that of Special Capital Region of Jakarta. Moreover, it also would be expected to encourage women participation in the parliament.

## 2 Materials and methods

The data used in this research are secondary data obtained from several government institutions. Gender Development Index (GDI) is acquired from the publication of Pembangunan Manusia Berbasis Gender (Gender-Based Human Development) published by Statistics Indonesia in cooperation with Ministry of Women Empowerment and Child Protection. Then, they were analyzed using three techniques, firstly the quantitative descriptive analysis, spatial comparative analysis, and temporal comparative analysis. Additional

\* Corresponding author: [ariyulianto1989@gmail.com](mailto:ariyulianto1989@gmail.com)

data is acquired from publication by Department of Health Central Kalimantan Province 2015.

Quantitative descriptive analysis is the primary analysis of this research. It employs numerical data such as the value of GDI of Indonesia, the Central Kalimantan Province, as well as all the districts and cities in Central Kalimantan. The data were presented in form of tables and charts, listed according both to the corresponding districts or cities (multi-spatial) and the corresponding year (multi-temporal). This analysis process is also supported by a literature review. Spatial comparative analysis compares the achievement of GDI on the district/city level of Central Kalimantan Province. The analysis then is used to determine the distribution of GDI of those districts and cities using thematic mapping.

The thematic map presents the areas prioritized for gender mainstreaming that are classified using the Sturgess approach. The analytical process also measures the contribution of each indicators in achieving GDI in respective districts and cities of Central Kalimantan. The indicators are Life Expectancy Rate, Mean Years of Schooling Index, Expected Years of Schooling Index, and Adjusted Per Capita Expenditure.

Temporal comparative analysis, as the name suggests, compares the value of GDI from 2010 to 2015 to inspect the trend over time. GDI is measured using the recent methodology referring to UNDP method published in 2010, using the following formula:

$$GDI = \frac{HDI\ Female}{HDI\ Male} \quad (1)$$

Hence, GDI might be interpreted as follow:

- The closer it is to 100, then the lower is the disparity between men and women.
- $IPG < 100$  means that the HDI of female is lower than HDI of male.
- $IPG = 100$  means that the HDI of female is equal to the HDI of male.
- $IPG > 100$  means that the HDI of female is higher than the HDI of male.

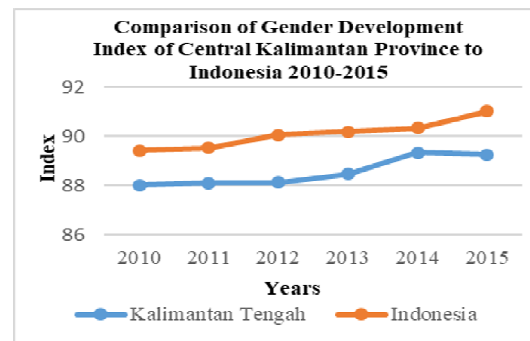
The method is employed because it better represents the situation of a particular area. This new method uses the more appropriate variable, which is Expected Year of Schooling. Therefore, the data analyzed are gathered from 2010 to 2015, which are the most recent ones from Central Kalimantan.

### 3 Results and discussions

#### 3.1 Comparison of gender development index of Central Kalimantan Province to Indonesia 2010-2015

The analysis of Gender Development Index achieved can be done through a comparison of GDI scores between Central Kalimantan and Indonesia. Hence, the analysis of how far the effort has done to alleviate gender discrepancy in Kalimantan Tengah can be obtained. According to a joint publication between Statistics Indonesia and Ministry of Women Empowerment and Child Protection titled *Pembangunan Manusia Berbasis Gender* (Gender-Based Human Development) in 2015,

the national index scored 91.03 while Central Kalimantan scored 89.25 in terms of GDI. The data comparison test shows that Central Kalimantan still fared lower than the national average.



**Fig. 1.** Comparison of gender development index of Central Kalimantan Province to Indonesia 2010-2015.

By using multi-temporal analysis, GDI can be reviewed using secondary data as shown in Figure 1, incorporating data from 2010 to 2015. The result shows that on general, the trend of national GDI average continues to rise. To look at the data quantitatively, in 2010, Indonesia scored 89.42 in GDI, and then 89.52, 90.07, 90.19, and 90.34 respectively in the following years.

The contrasting situation took place in Central Kalimantan. The rate of GDI growth was relatively slower, and even took a decline in 2015. Respectively, Central Kalimantan achieved 88.02, 88.11, 88.13, 88.47, 89.33, and 89.25 respectively from 2010 to 2015. A slight decrease of 0.08 point occur in 2015; while minute, it still indicated a widening in gender discrepancy in Central Kalimantan

Statistics Indonesia (2016) recorded the trend of GDI decline not only in Central Kalimantan, but also in four other provinces: Maluku (0.01), Papua (0.05), Central Sulawesi (0.44), and Bali (0.61). This phenomenon was caused due to slower growth of female HDI compared to male HDI. More specifically, there were indicators of HDI that may help to analyze the factors of the decline, to list: Life Expectancy Rate (derived from health dimension), Mean Years of Schooling Index and Expected Years of Schooling Index (derived from education dimension), and Adjusted Per Capita Expenditure (derived from economic dimension).

Data presented on Figure 1 below are the result of the HDI indicators achieved by Central Kalimantan, based on gender in 2015. One can draw an interpretation of this data and state that women's development growth still lagged behind men's. That situation is identified with score differences as much as 0.01 in Life Expectancy Rate, 2.38 in Expected Years of Schooling, 0.16 in Mean Years of Schooling. All the three indicators recorded positive tend while Adjusted Per Capita Expenditure showed negative growth, which is -2.46 %, differing as much as 2.68 points from men. These indicators factored in the result of GDI achievements. Further analysis can be conducted to trace each of the indicator with the assumption that women in Central Kalimantan tend to

fall behind from men firstly in education, then economy, and finally in health dimension.

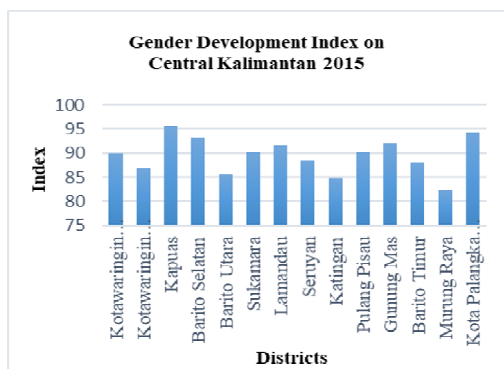
**Table 1.** The growth rate of HDI indicators based on gender in Central Kalimantan, 2015.

Indicators	Gender	Rate of growth 2015 (%)
Life expectancy rate	Male	0.22
	Female	0.21
Expected years of schooling	Male	2.67
	Female	0.29
Mean years of schooling	Male	2.74
	Female	2.58
Adjustment expenditure per capita	Male	0.22
	Female	-2.46
Human development index	Male	1.02
	Female	0.93

### 3.2 Comparative trend of gender development index among regencies in Central Kalimantan

A thorough analysis on the district/city level of Central Kalimantan is required to investigate the gender inequality phenomenon. The province's index score is lower than the national average is influenced by the situation of gender development in the corresponding district or city. The transition of Indonesia's administrative system post-reformation has adopted decentralization [5]. Decentralization implies authority restrictions among central and local governments. Therefore, in other words, the central government only issues the policy, while the local government acts as the operational executives.

Gender mainstreaming on the district/city level of Central Kalimantan can be described with the area coverage of 13 districts and 1 city. The GDI of each area varies, ranging from 80 to 95. The number shows that gender inequality is still prevalent in those areas and is still lower than the ideal score of 100. Besides, efforts in gender mainstreaming still face a problem, which is the uneven distribution of GDI in 2015 (displayed in Figure 2).



**Fig. 2.** GDI trend sorted according to district or city in Central Kalimantan, 2015.

The occurring trend shows that each district or city experiences different rate of growth. GDI can only be stated as ideal when it reaches 100, where by men and women experience equality. According to the result, Central Kalimantan Province's low index achievement

was caused by low indices on the district/city level, far from the ideal.

The distribution of Gender Development Index (GDI) in the districts and cities of Central Kalimantan can be analyzed spatially. The analysis is necessary to classify the areas with high gender inequality, so they can be prioritized for gender balancing program. Using Sturges approach, this classification can be conducted and resulted in three classes of areas: primarily prioritized areas, potentially prioritized areas and non-prioritized areas. The thematic mapping of the gender balancing efforts on districts/city level is hoped to be a consideration tool in the local government's formulation of future policies and follow-up actions, e.g. the effort in developing gender-aware indicators

Aliansi Jurnalis Independen (Independent Journalist Alliance) Indonesia (2012) laid out the objectives of gender-wise indicators [6]. They were there to help establish a balanced proportion of men and women in the decision making, in terms of equal treatment and acknowledgment, equal salary, equal attendance and participation in making policies, and to establish gender-aware society through media content interventions. Therefore, media contributions are also essential in gender main streaming in form of public communication, including the display of thematic map as in Figure 3. The thematic map was constructed from the data input of Figure 2. below. The data were classified using Sturges approach with values displayed as in Figure 3.

**Table 2.** Classification of priority area of equality gender in Central Kalimantan.

Districts	HDI	
	2015	Classification
Kotawaringin Barat	90.04	Potential Priority
Kotawaringin Timur	86.79	Potential Priority
Kapuas	95.65	Non-Priority
Barito Selatan	93.34	Non-Priority
Barito Utara	85.62	Main Priority
Sukamara	90.09	Potential Priority
Lamandau	91.55	Non-Priority
Seruyan	88.42	Potential Priority
Katingan	84.78	Main Priority
Pulang Pisau	90.25	Potential Priority
Gunung Mas	92.00	Non-Priority
Barito Timur	88.16	Potential Priority
Murung Raya	82.31	Main Priority
Kota Palangka Raya	94.30	Non-Priority

**Table 3.** Classification of priority area calculated from Sturges method [4].

Classification	
Main Priority	82.31–86.76
Potential Priority	86.77–91.22
Non-Priority	>91.22

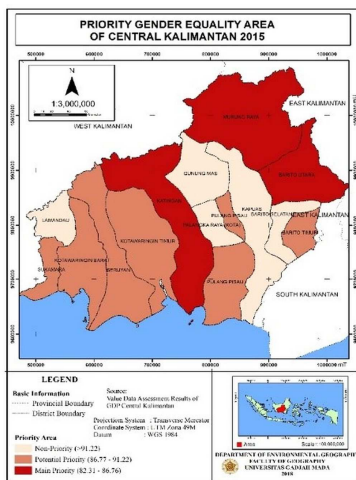
The areas identified for prioritization of gender balancing includes three districts: Katingan, Murung Raya, and Barito Utara. In 2015, Murung Raya scored 82.31 in GDI, which is the lowest, followed by Katingan and Barito Utara with 84.78 and 85.62 respectively.

Historically speaking, there might be a common factor to explain the districts' low GDI achievement. All three of them were newly established areas in 2002 [1]. Katingan was developed from Kotawaringin Timur, while Murung Raya was developed from Barito Utara.

The slackness in developing GDI on newly founded areas might be caused by the planning of development priority. The assumption taken is that some areas still do not give enough priority for gender equality issues, but rather different aspect of developments, such as economy, education, or healthcare investment. Newly-founded districts cannot give instant results because the new administrations usually take a long time to adjust work performances.

The identification of areas potential for gender equality promotion includes six districts: Kotawaringin Barat, Kotawaringin Timur, Sukamara, Seruyan, Pulang Pisau, and Barito Timur. The impact of this gender mainstreaming goes into two-way direction. First, GDI trend can rise if the condition is satisfied, which is the comprehensive and continuous gender balancing. Secondly, GDI trend can also decline if the condition is not fulfilled.

Non-prioritized areas are considered to have considerably better GDI scores. There are five areas: Kapuas, Barito Selatan, Lamandau, Gunung Mas, and Palangka Raya. Kapuas District even surpassed Palangka Raya, the capital, with a score of 95.65 whilst the latter only recorded a 94.30 GDI score.



**Fig. 3.** Mapping of priority gender equality area in Central Kalimantan 2016.

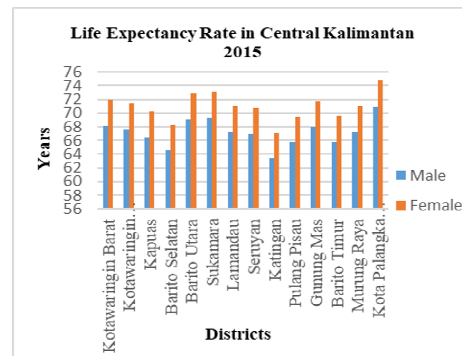
The urgency of gender balancing in non-prioritized areas tend to be lower than that of potential and prioritized areas. However, gender inequality still exists as long as the index is below 100. Therefore, there needs to be an intervention to maintain or raise GDI trend in prioritized areas. In the case of Palangka Raya, it is assumed that the level of equality between genders is higher due to workforce expansion, therefore men and women share about equal portion of jobs. Educational intervention indirectly influences the individual mindset, which then implicates on gender-aware understanding.

### 3.3 Factors affecting gender inequality in Central Kalimantan Province in 2015

The gender in equality in Central Kalimantan in 2015 can be broken down into several factors. They are Life Expectancy Index, Expected Years of Schooling, Mean Years of Schooling, and Adjusted Per Capita Expenditure. Furthermore, the analyses of these factors are presented in the following subsections, each from the dimension of health, education, and economy.

#### 3.3.1 Health dimension

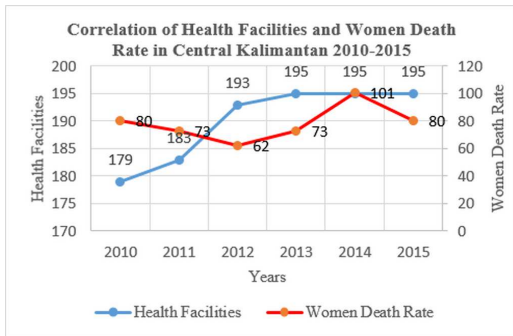
The indicator used in the health dimension of gender development program is Life Expectancy Rate. In general, the data shown concluded that women have longer life expectancy than men. Figure 4 shows a processed data from Statistics Indonesia (2016), illustrating a significant multi-spatial gap between the two gender groups in 2015. The multi-spatial aspect shown was the comparison among districts and cities in the province of Central Kalimantan.



**Fig. 4.** Trend of life expectancy rate among districts and cities in Central Kalimantan RLS 2015

Multi-spatial analysis shows that women scored Life Expectancy Rate better than men in all of the districts and cities. The difference between these two groups were considerably large. So, there needs to be an assessment of the factors contributing to the women's high life expectancy.

The high life expectancy of women in Central Kalimantan Province influenced by health facilities. Health profile data shows that the increased of health facilities much as 195 in 2015. Figure 5 concluded the correlation between health facilities and women mortality rates. The raise number of health facilities impacted to the lower performance of women mortality rate. The findings below, women mortality rate has decreased from 101 in 2014 to 80 in 2015.



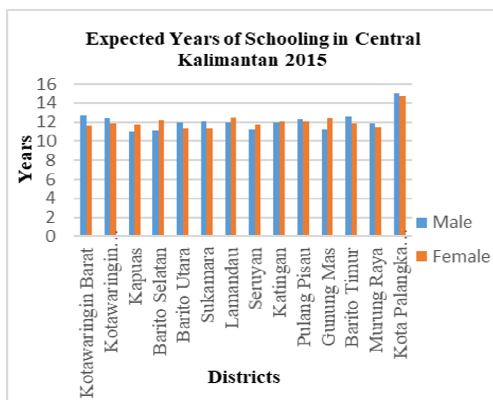
**Fig. 5.** Correlation of health facilities and women death rate in Central Kalimantan, 2010–2015 [7].

Identify factors that cause women to live longer than men as follow [8]:

1. Two X chromosomes cause women to have stronger immunity system.
2. Low Oxidative Stress prevents women’s cells from being damaged easily.
3. Estrogen hormone prevents women from heart attacks, especially at the times approaching menstruation.
4. Women’s lifestyle are usually less intensive than men’s, since they consume less cigarettes and alcohols.

### 3.3.2. Education dimension

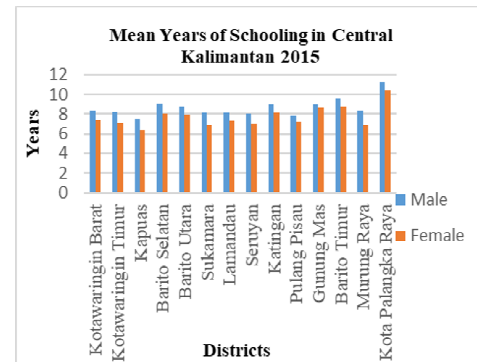
The indicators used in the gender development in this dimension are Expected Years of Schooling and Mean Years of Schooling. Figure 6 points out that there is a discrepancy of expected years of education between Palangka Raya and the rest of Central Kalimantan. Quantitatively, male students of Palangka Raya City, on average, are expected to be in school for 15.04 years while female students are expected for 14.71 years. This indicates that women in Palangka Raya City are expected to finish high school and even continue to colleges. This potential is supported by the higher education institutions, such as Universitas Palangka Raya, Institut Agama Islam Negeri Palangka Raya, Sekolah Tinggi Ilmu Ekonomi Palangka Raya, Politeknik Kesehatan, and Akademi Kebidanan.



**Fig. 6.** Trend of expected years of schooling among districts and cities in Central Kalimantan RLS 2015.

Mean Years of Schooling as shown on Figure 7 indicates that there is a significant disparity between Palangka Raya and the rest of the Central Kalimantan. By reviewing the gender disparity on the province as a whole, it is clearly shown that on average, women spends less time in school than men.

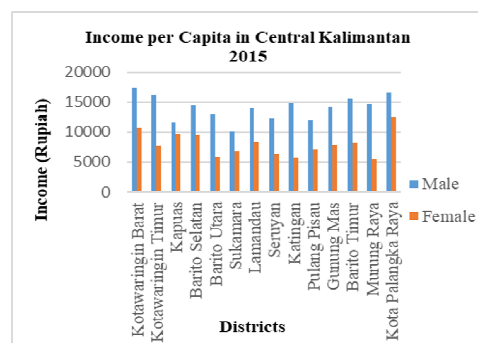
By identifying the data quantitatively, one can obtain the lowest value of Mean Years of Schooling of each gender. Kapuas District holds the lowest average score for both women and men, with 6.41 years and 7.46 years respectively. Thus, the gender equality in terms of education is still far from expectation.



**Fig. 7.** Trend of mean years schooling among districts/cities in Central Kalimantan RLS 2015.

### 3.3.3 Economic dimension

The indicator of economic dimension might be derived from per capita expenditure. Figure 8 shows that there is a significant discrepancy between women’s economic contribution and men’s. Using quantitative and multi-spatial analysis, women fared lowest in Murung Raya District, with only IDR5,512,000 per person per year while men fared lowest in Sukamara District with IDR10,094,000 per person per year.



**Fig. 8.** Per capita expenditure among districts and cities of Central Kalimantan, 2015.

There was a stigma surrounding entrepreneur circles, perceiving women labors as cheaper factors of production compared to men labors. However, added that women are considered to be more thorough than men in manufacturing process. Therefore, women have high potentials in entering the workforce [9].

The women’s ease in entering the labor market is often counterbalanced with their potential in leaving it.

That is due to the women's tendency to transition from jobs to other jobs. For example, a woman may take up a job and keep it until one day, she decides to get married and goes through a domestic life. Both of her domestic workload and pressure from workplace might put her into a dilemma. She could resign from her professional position and live a housewife life, but some economic hardship or family income imbalance might very well force her back into the workforce. This kind of cycle affects women's economic contribution to the society as a whole, as opposing to men whose high stability and longevity in the workforce.

### 3 Conclusion

The Gender Development Index of Central Kalimantan showed to be relatively unequal, with the value of 89.25 in 2015. Spatial distribution exhibits that Palangka Raya scored better than any other area, such as main priority districts in Katingan, Murung Raya, and Barito Utara. In conclusion, the health dimension (represented by Life Expectancy Rate) is the only sector where women scored better than men. The more of health facilities, the less possibilities to the women mortality rate. In the other two dimensions, women still scored poorly. Expected years of schooling and mean years of schooling indices of women are still lower than that of men, signifying backwardness in education dimension. On the other side, in respect of economic dimension, economic contributions of women is still far behind those of men due to some factors, including low-cost labor stigma and worker-housewife transitional cycles.

### References

1. BPS. *Pembangunan Manusia Berbasis Gender*. Jakarta (2016)
2. BPS. *Gender Development Index Provinces in Indonesia* (2016)
3. Munashinghe, et al. *Integrating Sustainable Development and Climate Change in the IPCC Fourth Assessment Report* (1992)
4. BPS. *Kalimantan Tengah dalam Angka 2016*. (2016)
5. M. Bhisma. *Perencanaan dan Penganggaran untuk Investasi Kesehatan di Tingkat Kabupaten dan Kota* (2006)
6. Aliansi Jurnalis Independen (AJI). *Indikator Sensitif Gender untuk Media* (2012)
7. Dinas Kesehatan Kalimantan Tengah. *Profil Kesehatan 2015 Provinsi Kalimantan Tengah* (2015)
8. S. Ehiemua. 2014. *Gender Longevity: Male/Female Disparity*. *International Journal of Academic Research and Reflection*. **2**, 3 (2014)
9. P. Ratna. *Wanita Bekerja dan Implikasi Sosial*, *Journal of Population*, **5**, 20 (2000)