

# Population Pressure on Land Availability

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**Abstract :** Population pressure is an important factor that triggers people, especially farmers who live in villages to expand their farmlands or leave their profession. This phenomenon is a result of the super-exponential increase in the population, whilst on the other hand, the availability and quality of farmland has not improved. The Population Pressure Index (ITP) is determined by the proportion of farmers' income from non-farming activities, average land availability possessed by farmers in order to live adequately, proportion of people who are farmers, the total land availability, and population growth rate. Data was sourced from secondary data. The calculation results show that the Population Pressure Index (ITP) for Kecamatan Sukaraja, Kabupaten Sukabumi in 2013 was 13.34. This means that from the population pressure view point, Kecamatan Sukaraja has been categorized as an area that is unable to support any new residents.

**Keywords :** Land, land availability, and population pressure.

## 1. INTRODUCTION

The population size continues to increase absolutely, despite the fact that the rate of growth has slowed, as a direct or indirect effect of population policy. This fact is accompanied by population density, which has also increased. Daldjoeni (1987) stated that population density can be categorized into three types: arithmetic density, physiological density, and agricultural density. Arithmetic density is density that refers to the number of people in every farmland unit, while agricultural density means, density that refers to the number of people who farm in every unit of farmland. Data gained from every area generally refers to the approximate population density, which is the ratio of the total number of people and the total amount of land.

Population density does not always correlate to over population. Conceptually, they are different. Population density refers to the quantitative aspect, while over population refers to the qualitative aspect. The usual concept of population density as the ratio between population and land area has less significance for industrial and urban populations than for those which are largely agricultural and rural (Clarke, 1981). The fact that the number of people is still acceptable and the land availability is adequate can possibly result in low population welfare and purchasing power if the land quality is poor and human resources quality is relatively low. That is when the overpopulation phenomenon is noticeable. High population density that is supported through the region's ability to support and fulfil its people's needs, will not cause overpopulation. If a region fails to do so, pressure will be evident resulting in people moving out to different regions, or getting a job apart from farming. The above explanation is what Daldjoeni (1987) recognizes as population pressure.

Population pressure can trigger people to open the land areas and/or move to the cities. (Soemarwoto, 1989). Daldjoeni (1987) states that population pressure is a variety of difficulties faced by people in fighting for their lives, which is caused by overpopulation in an area that does not go along with the region's ability to support and supply its people. Rusli (2009) elaborated that people pressure is a symptom

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of overpopulation in a region. Related to a region's ability to support its people, population pressure can occur because the number of people exceeds the land's power to support. The people pressure phenomenon is undeniably related to the population growth process. There are three ways in which a population can grow; when natural increase exceeds net migration, when net immigration exceeds natural decrease, and when there is both natural increase and net immigration (Woods, 1982)

People pressure results in a force that pushes the people, especially farmers, to expand their lands or leave their profession, to get a better life due to overpopulation, while the environment's ability to support remains the same. Basically, population pressure is triggered by continuing population growth. Farmers do not utilize their land only as a place to live, but also as a place for them to carry out their commercial activity of farming. When the number of people keeps increasing significantly, while land areas and their productivity remain the same, the existence of people in general will be disrupted, especially those people who have high dependence on land areas.

(ITP) indicates population dependency on land, particularly regarding decreased function. The basic assumption employed is that every individual conducts land expansion when the lands productivity is unable to fulfil people's needs. Population pressure can occur because population growth is higher than the ability to increase human resources, which can lead to people leaving their villages. The continual growth in the number of people, while land areas and land productivity remain the same, can cause failure to fulfil life aspirations. If land expansion is not feasible to solve this problem, it is likely that migration will be the farmers' final choice. The increasing limitation of farmland because of land conversion to build industrial areas to employ local people, makes the situation a lot more difficult

Areas with high agricultural density in every square meter normally have population pressure. Meanwhile, areas with low agricultural density rarely experience population pressure. This fact indicates that farmland availability continues to drop, while the number of farmers continues to increase. If this continues, it is very likely that farmers will not own any land areas, but instead work for other people. Conversion of farmers to different sectors is not simple, as this might cause new problems because of the specialised knowledge and skills needed to enter non-agricultural life.

Soemarwoto (1989) explained that population pressure, caused by population growth in a village, can result in the fall of the man to land ratio. This encourages farmers to expand their farmland or move to a different sector. If farmland is still available, there will not be a problem. However, structural unemployment can happen when land is no longer available. Structural unemployment occurs when people move job from one sector to another, when they are not ready to do so. Structural unemployment occurs when people are not ready to find a new job.

There are two types of population pressure, absolute population pressure and relative population pressure. Absolute population pressure relates to food and housing. This type of population pressure can be measured by the amount of consumption; the lower it is, the higher the population density will be. Relative population pressure is defined as the level of insufficiency amongst people, compared to other nationalities in other countries, or other groups within the country. (Daldjoeni 1987). Population pressure needs to be measured, and the results can be used as a foundation to determine development programme priorities, in order to ensure realisation of national development targets. This information regarding population pressure can be utilized by local and national policy makers.

## **2. RESEARCH METHOD**

The research was conducted in Kecamatan Sukaraja, Kabupaten Sukabumi. Kecamatan Sukaraja borders Sukabumi municipality. According to Kabupaten Sukabumi Regional Family Planning and Population Board (BKKBD), in 2013 Kecamatan Sukaraja was considered to be one of the areas with the highest numbers of population heads in Kabupaten Sukabumi, following Cisaat, Cibadak dan Palabuanratu. Based on the population data gained from the *Badan Kependudukan dan Keluarga Berencana Daerah* Kabupaten Sukabumi (Regional Family Planning and Population Board), Sukaraja is also one of the most

densely populated cities, apart from 6 other kecamatan, namely, Palabuanratu, Nagrak, Cibadak, Cisaat, Parungkuda and Kebonpedes. The technique used to collect data is documented study, which means it only uses the available secondary data. Hence, this research does not obtain primary data directly from the people. Documented study uses the data contained in existing documents. These documents are from BPS, in Kabupaten Sukabumi in the forms of numbers and maps. In addition, 2013 data from the Regional Family Planning and Population Board (BKKBD), Kabupaten Sukabumi, was processed. This secondary data was the main source of material to calculate population pressure, before it is processed in the Population Pressure calculation. To calculate *Indeks Tekanan Penduduk* (ITP), the Population Pressure Index, research is formulated into this equation:

$$TP_t = z(1 - \alpha) \frac{f P_0(1 + r)^t}{L_{tot}}$$

Which means  $TP_t$  = ITP at time- $t$  be careful with the risk  $t$

$\alpha$  = Proportion of farmers' income from non-farming activities

$z$  = Average land size needed by every farmer to live sufficiently

$f$  = Proportion of population who are farmers

$P_0$  = The number of population at the beginning of the period

$r$  = The average annual population growth

$L_{tot}$  = Total amount of farmland

$T$  = Time span in a year

**To calculate the Z value, the following formula is used :**

$$Z = \frac{(0.25 LSI_2) + (0.5 LSI_1) + (0.5 LST) + (0.7 LLK)}{(LSI_2 + LSI_1 + LST + LLK)}$$

Which means  $Z$  = Average size of farmland needed by each farmer to live sufficiently

$LSI_2$  = Irrigated farmland area size from two harvest times a year (ha)

$LSI_1$  = Irrigated farmland area size from one harvest time a year (ha)

$LST$  = Non-irrigated farmland size (ha)

$LLK$  = Dry farmland size (ha)

### 3. RESULTS

Population pressure in a region can be determined by the growth of its population, agricultural density, and the region' ability to support its population. The higher the population growth, the higher the population pressure will be. Various factors influence the population pressure, however, the most dominant factors are population growth, non-agricultural income, and relatively stagnant land area size development. After the population pressure and land availability index calculation is conducted using the above formulas, the results are then analyzed using the following criteria:

**Table 2**  
**Index Classification Table of Population Pressure (ITP)**

<i>No.</i>	<i>ITP Value</i>	<i>Criteria</i>
1.	> 1	Population pressure exceeds land ability
2.	= 1	Optimum land management against land ability
3.	< 1	There is no overpopulation

**Source :** Ariani (2012)

The research method used is documentary study, using a number of documents or available secondary data sources, mainly from BKKBD Kabupaten Sukabumi in 2013. Additionally, BKKBD Kabupaten Sukabumi, data is also sourced from Sukabumi Dalam Angka, which contains information/data regarding Kabupaten Sukabumi. Secondary data available in local institutions or related institutions is in great quantity, nevertheless, for the benefit of the calculation of population pressure, data is selected initially according to the requirements of the calculation process. Several components have been calculated prior to the ITP value calculation, as follows:  $z$  value = 0.73,  $@$  = 0.50,  $f$  = 0.60,  $P_0(1+r)^t$ , 41 988,  $L_{tot}$  = 1420. After the value calculations of certain components have been carried out, the results are inserted into the ITP formulas, which then leads to the final ITP value of Kecamatan Sukaraja, Kabupaten Sukabumi of 13.4, based on 2013 data. These results are clearly above 1. This is caused by the population pressure, which exceeds available land ability. This index indicates that the population in the region is continuing to grow. Kecamatan Sukaraja is not the district capital, and is far from the district capital, but geographically it has good access. It is strategically located, adjacent to Sukabumi Municipality, and has high traffic mobility caused by people passing through from Bandung, Sukabumi and Jakarta. In addition, Sukaraja also possesses natural resources in the form of mineral C, which is popularly used for building material, such as sand, rocks, and lime stones. This mineral resource can fulfil local needs and even other areas' needs, such as Sukaraja, Sukabumi Municipality and District, Cianjur, Bogor, and Jakarta. Cimangkok, is the mining area of this mineral. Other popular economic activity is fisheries, as the water supply in this region is relatively stable. Several industrial activities have forced the beginning of land conversion in Sukaraja. Geographic position, accessibility, and resource availability are the factors that attract people from outside the region to start commercial activities here. Everyone has the right to run commercial activities, including newcomers, but clear control and accountable policy are needed to regulate and guarantee the environment' ability to support people's future existence. A fall in the environment' ability to support can be detected in advance and can affect people's welfare. High population pressure is guaranteed to cause competition among people to gain scarce resources, while environmental ability is very limited. The decline in environmental ability should not happen, and should instead be higher to maintain people's welfare and existence. Population growth will have to be controlled appropriately. Land availability is limited, but its quality can continue to grow to maintain land productivity. In addition, non-agricultural potential commercial activities need to be identified and utilized well. When land productivity is stagnant and population growth is out of control, these non-agricultural activities can take over without destroying natural resources and conservation. Starved people tend to consider forest area for their farming area, and if deforestation takes place, future conditions could worsen. Villages like Sukaraja are highly dependent on land, especially those who work as farmers and farm workers. It is not surprising that ITP value peaks when the number of population and farmers grow while land availability and quality are stagnant and the non-agricultural sectors are not operational. Indonesian farmers generally have very limited land areas. According to Soemarwoto (1989), average land ownership is less than 0.5 acres per farmer. If the population continues to grow and land availability tends to shrink, it is likely that more farmers will not have land in the future. This condition will lead to higher population pressure. The need for farmland is high, but land availability is limited, hence the land's ability to support living will be restricted. Population growth creates the needs for more land, and this results in the decrease of other resources, such as forest conservation. This phenomenon is an impact of the high population number and uncontrolled population growth. To begin with, pollution only came from household waste. Nevertheless, industrial and transportation activities are leading to pollution problems. Without proper preventive action and control, this population problem can lead to low environment quality, and low health quality. People's health should be prioritized as it is important for them to carry out their routines. Low health will lead to low productivity.

#### 4. CONCLUSION

Sukaraja is one of the areas with the highest population amongst the 47 kecamatan in Kabupaten Sukabumi, apart from Cibadak, Palabuanratu and Cisaat. The number of the farmer population and the farmer population growth continue to grow, but on the other hand, land availability and quality remain the same. This leads to population pressure against the land. Population pressure can force people to open or even leave the area. High population pressure can result in a threat to forest conservation areas. According to the secondary data that has been calculated and influenced the ITP results, the ITP value of Kecamatan Sukaraja is 13.34. This signifies that the value is borderline, as when the value exceeds 1 it means the situation has exceeded the ability. The signs that ITP value exceeds the limit are agricultural population density, over population, high daily population mobility, and high competition to fulfil daily needs which can affect people's welfare. Population pressure, which should have been anticipated through appropriate policy, requires serious and cross-sectoral actions. This calculation, with a very solid academic background, is expected to form guidance for decision makers when making the most appropriate policy, considering population number, rate of population growth, and the multi-dimensional pressure against land. People's welfare can be affected. People are the object and also the subject of development programmes. Population number, growth and distribution, as well as other direct and indirect variables are important and should be integrated into the development planning process. Therefore, controlling population growth, mainly in Kecamatan Sukaraja should continue to be prioritized to guarantee the increase in productivity in non-agricultural sectors.

#### 5. REFERENCES

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