Population Distribution in the Drought Area in Grobogan Regency Central Java Province Indonesia

by Ananto Aji

Submission date: 11-Oct-2021 09:06PM (UTC+0700)
Submission ID: 1671084610
File name: Artikel_Hibah_Thesis_Q3.pdf (295.56K)
Word count: 5434
Character count: 30256

International Journal of Advanced Science and Technology
Vol. 29, No. 8s, (2020), pp. 1695-1706

Population Distribution in the Drought Area in Grobogan Regency Central Java Province Indonesia

Puji Hardati[1], Ananto Aji[2], and Diyah Ayu Saputri Sartiaksari[3]
[1,2]*Departmen of Georaphy Universitas Negeri Semarang*
[3]*Post graduate Student Program S2-Geography Education UNNES*

Abstract

Increasing the population with complex activities, triggering global climate change, the impact varies greatly in each region. The study population is a drought-prone area in Grobogan Regency, the unit of analysis is the subdistrict, the number is 19. The research variable is the number of villages and populations in each sub-district affected by drought. Data analysis has been carried out using descriptive statistics, percentages, indexes and presented in tables and figures. The results showed that drought-prone areas are spread in 18 districts and 43.9 percent of the number of villages. The number of villages affected by drought in each sub-district varies, there are sub-districts where only one village is affected by drought and there are sub-districts where all villages are affected by drought. The areas most severely affected by drought are in two sub-districts. The distribution of population in areas affected by drought is uneven, the largest population is in areas of moderate drought, the smallest population in areas with high drought. The densest population density is in areas with moderate drought, the lowest population density in areas with high drought. Areas with high drought have a little population and low population density.

Keywords: *Population Distribution, Population Density, Distribution of Drought-prone Areas.*

1. Introduction

The population is increasing and spreading throughout the region. Global pollution continues to grow. The world population reaches 7.7 billion people worldwide in 2019. The world population is estimated to reach around 8.5 billion in 2030, and become 9.7 billion in 2030, and in 2100 to 10.9 billion [1]. Spatial distribution is not balanced, in some regions of the world, large countries with fewer population, and vice versa in narrow areas, more population. Although there are no definite rules related to the population in an area. Increasing world population spread across several continents and countries. Asia is one of the most populous countries in the world. In 2015, Asia's population reached 3.684 billion and it is estimated that in 2025 the population will be 4.723 billion, and in 2050 to 5.267 billion [2] [3].

Indonesia is one of the countries in Asia, with the number four population in the world, after China, India, the United States [2]. Over a period of 55 years, from 1960 to 2015, the population increased. In 1961, the population was 97.10 million, in 1971, the population was 119.20 million, in 1980 the population was 147.49 million, in 1990 the population was 179.32 million, in 2000 the population was 205.13 million, in 2010 the population was 237.64 million, and in 2015 the population was 255.18 million [4] [5] [6]. The distribution of the population in Indonesia is almost the same as in other countries, which are very lame in spatial terms. Java is one of the most populous islands, with 56.83 percent of Indonesia's population in 2015. In terms of population, Central Java Province, one of the six provinces in Java, ranks third after West Java and East Java Provinces [6].

Residents have increasingly complex needs, causing an imbalance between the natural resources used to meet the needs of the population and their availability. Various phenomena of environmental mismatches, such as global climate shifts, drought, occur in several regions. Residents must be met with basic needs, and the most important basic needs are clean water needs. Water is a major factor in supporting the lives of living things, humans, animals, and plants. Access to clean water sources is one indicator that must be met in all aspects of development. The goal of sustainable development which has become a global collective

ISSN: 2005-4238 IJAST

agreement, has 17 pillars, in the sixth goal, which is to achieve universal and equitable access to safe and affordable drinking water for all [7]

Earth's planet in providing water for human needs is largely determined by natural conditions and various components. In the dry season, rainfall tends to decrease and the availability of water is very limited so that some areas occur drought, and very varied cause and effect. Drought is a problem that has a negative impact on an area and is a natural phenomenon that continues to the socio-economic conditions of a region [8] [9].Drought can cause disruption of various economic sectors, natural habitats, and people's lives, and seriously affect the majority of the population in many ways such as economically, socially, and environmentally [9] [10] [11] [12] [13]. Drought is increasingly widespread and often occurs routinely every year in the dry season period. Several studies of drought have been carried out, and most have analyzed physical and natural conditions. As has been done in several countries [11[[12] [13], that in Turkey, about the characteristics of watersheds, in South Africa about agrometeorology, and Zambia about drought spatial patterns. Drought has also occurred in Indonesia, and in Grobogan District.

Population in an area becomes the main factor in determining development, the population becomes the goal of development, the population becomes the object and subject in the development process. Population-oriented development requires human development goals and outcomes [14], with regard to the concept of sustainable development with ecological, economic and social balance [15]. Assessing populations in each region is very important and relevant at all times. How is the distribution of population in areas exposed to drought. The purpose of this study is to analyze the distribution of populations in areas affected by drought and the distribution of areas affected by drought. The results of the study can be used to determine the condition of populations in areas affected by drought and make plans for water needs, especially in times of drought. In addition, housing studies in areas affected by drought can be used to inform irrigation supply planning information and develop drought assistance policies [16].

2. Lierature Review

Drought is one form of global climate change. Drought is a condition of water availability that is far below the water needs for the needs of life, agriculture, economic activities and environmental [17. Drought is included in natural disasters that are slow (slow on-set) with a duration of up to the rainy season, wide-ranging and multi-sectoral in nature [18].. Drought is not easy to avoid, the arrival of land lasts long until the rainy season arrives, the characteristics are different in each region.

Drought can be divided into four, namely meteorological drought, hydrological drought, agronomist drought, and socioeconomic drought [19]. Meteorological drought is a state of drought characterized by the level of rainfall under normal conditions in one season in an area. Hydrological drought is a condition of lack of surface water supply than groundwater and is characterized by reduced elevation of reservoir water, lakes, rivers, and groundwater levels. Agronomic drought is a condition of reduced soil moisture (water content in the soil), so it is not able to meet the water needs for certain plants at certain season periods. Socio-economic drought is a condition of the supply of economic commodities less than normal needs, and is characterized by crop failure and reduced food supply due to meteorological, hydrological, and agronomic drought [20] [21] [22].

The distribution of drought-affected regions is not the same, but the occurrence is slow and certain [11] [12] [13] [16]. The distribution of drought-affected areas follows the cause of drought in each region. Distribution of the population in drought areas is the sum of each unit area that occurs in areas affected by drought. Population distribution in drought areas can be used for development planning materials, especially water needs in the dry season. The population is used to assess water needs during a drought and to anticipate drought in the next period.

ISSN: 2005-4238 IJAST

Research that studies drought has been carried out by various fields of expertise, it's just that, not many have studied the distribution of population in drought areas, even though there are still very limited numbers, so this study can be used to complement, add to studies that have been done, especially studies on population distribution in drought areas.

Population density is the ratio between the population and the area of inhabited [23]. Population density is an indicator of population pressure in an area. Crude population density (crude density of population) or often also called arithmetic population density. "Population growth rate" is the rate at which the number of individuals in a population increases over a certain period of time, expressed as a fraction of the initial population. Population growth rate is the rate at which the number of individuals in a population increases over a period of time, which is expressed as a fraction of the initial population. As human populations grow, human demands for resources like water, land, trees, and energy also grow. Population growth has relatively easy and inexpensive solutions and because the population impacts every environmental challenge.

Distribution is the presence of a phenomenon on the surface of the earth. The intended distribution is spatial distribution, namely the spread of a phenomenon on the surface of the earth. Spatial distribution based on administrative and geographical boundaries. The administrative spread is the phenomenon being spread in each region horizontally based on administrative boundaries set by a region. Population distribution is the pattern of residence of people. Residents are people in their personal matrix, community members, residents and assemblies of the number living in an area [23]. Citizens are people who are in an area that is bound by applicable rules and interact with each other continuously. Indonesian citizens are Indonesian citizens and foreigners residing in Indonesia [24].

Population distribution is a form of population distribution in an area. Population distribution is whether the population that inhabits an area is based on the total available area based on the number of inhabitants who occupy the area. Population distribution can be divided into two, namely geographical population distribution, and administrative population distribution. Geographical distribution of the population is the location of the residence of the population which is limited by natural boundaries, such as mountains, beaches, rivers, lakes, and other natural phenomena. Whereas population distribution administratively is the existence of residents whose location of residence is limited by administrative boundaries set by a country [25]. This research refers to the distribution of the population administratively.

Population distribution in an area can be assessed from population density. Population density is a number that states the average number of inhabitants in each unit area of an area. Regional units can take the form of various regional units, ranging from global and highly local, such as the world, continents, countries, islands, provinces, districts/cities, sub-districts, and the smallest villages. Population distribution and density are highly determined by various geographical (natural), and non-natural (human: administrative, cultural) factors. Geographical factors that determine population distribution and density are physiographic conditions. While non-geographical factors, such as administrative in determining the area and boundaries. Dense regions often exploit natural resources, have high population interaction with the environment, and cause natural imbalances, and are most severe contributing to climate change.

Administrative regions in Indonesia are distinguished by regional levels, namely from the highest of the country, divided into several provinces, in each province divided into several districts/cities. In each district/city divided into several sub-districts, and in each sub-district is divided into several villages. This study uses a district analysis unit in Grobogan Regency. Research at the district level is included in the mezo or intermediate analysis phase.

ISSN: 2005-4238 IJAST

3. Research Methode

3.1. Material

The material of this research is data, the type of data used is secondary. Secondary data comes from the regional disaster management agency (BPBD) and the Statistical Loading Agency (BPS). The regional disaster management agency (BPBD) is a body established by the government and has the task of managing disasters at the provincial and district/city, sub-district and village levels. Secondary data from the regional disaster management agency (BPBD) in the form of data reports on drought in 2017, 2018, and 2019 [26] [27] [28]. Drought disaster data in 2019 is the main data used to analyze the distribution of areas exposed to drought, to support the first research objective. Drought event data for 2017 and 2018 are used to support the analysis of the extent of change in areas exposed to drought.

The central statistical body is one body that manages all population data. The central statistical body is national, starting from the center (in Jakarta), in each province, and district/city. This study uses secondary data from the Central Statistics Agency Grobogan. Secondary data obtained from the central statistical body are data on population, area, occupation, and rainfall data in each sub-district in Grobogan district. Data on the number of inhabitants in each district is used to study population distribution. Regional area data is used to calculate population density. Population density is the ratio between the population and the area of inhabited. Population density is an indicator of population pressure in an area. Crude population density (crude density of population) or often also called population density arithmetic. Rainfall data is used to support the distribution analysis of areas exposed to drought. Population type data used to analyze dominant occupations in the agricultural or non-agricultural sectors.

3.2. Methods

The study was conducted in Grobogan Regency, Central Java Province. During the last few years, Groboban Regency has often experienced drought events. The research uses a quantitative approach. The study population is the number of districts that have drought-prone. All districts that are prone to drought are analyzed, so the research conducted is population research, the unit of analysis is the district. The research variables are 1) the distribution of areas exposed to drought, with an indicator of the number of villages exposed to drought in each district; 2) the distribution of population exposed to drought, with indicators of the number of population and population density in districts exposed to drought. Analysis of the data used is descriptive, percentage, index, and classification. The distribution of areas exposed to drought is calculated using the percentage formula.

Percentage of areas exposed to drought (PDK) = (number of villages exposed to drought in each sub-district: number of villages in each sub-district.) X 100%.

Percentage of villages exposed to drought in each subdistrict, spatial distribution analyzed, with spatial unit boundaries being sub-districts.

Population density is analyzed by the arithmetic population density formula, the population density formula (KPA) = (total population: area) people / km2.

Population density figures in each subdistrict are known, spatial distribution analyzed, with the sub-district boundary analysis unit. The location of the grobogan district can be known from the following pictures.

ISSN: 2005-4238 IJAST

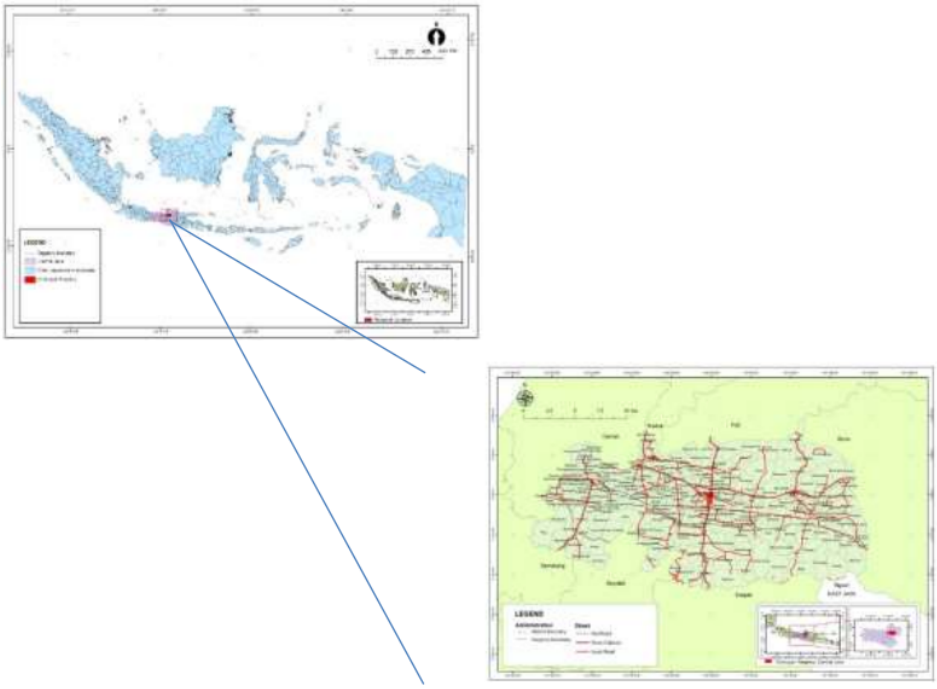

Figure 1. Research Location

4. 4.1. General Description of Grobogan Regency

Grobogan Regency is one of 35 regencies/cities in Central Java Province. The location is between 1100 32 '- 1110 15' East Longitude and 60 55 '70 16' South Latitude. The location coincides with the location of Kendeng Utrara Mountain and the South Kendeng Mountains, which stretch from West to East, the area is about 37 kilometers wide and 83 kilometers long.

Grobogan Regency is bordered by several surrounding areas, in the west, it is bordered by Semarang and Demak Regencies. In the north, bordering the Kudus and Pati regencies. In the east, it is bordered by Blora Regency, and in the south, it is bordered by Sragen, Boyolali, Semarang and Ngawi Regencies. The capital of the district is in Purwodadi District, with an average distance to each sub-district around 22.km, the closest distance is Purwodadi District, 0 kilometers, and the longest distance to Kedungjati District, 43 kilometers.

The topography of the region is rough, namely low-lying areas and hilly areas. Lowlands with an altitude of fewer than 50 meters above sea level and slope of less than 80 percent are in 6 districts. Hilly areas, with an altitude of between 50-500 meters above sea level, with a slope of 80-150 percent, are in 13 districts.

It covers an area of about 197,586 hectares, with land use for paddy agriculture 41.24 percent, non-paddy agriculture 43.93 percent, and not agriculture 14.83 percent. The need for water for agriculture is supported by the Kedung Omombo reservoir water, and 312 rivers. However, there is still 36.98 percent of the land area used for paddy farming, water requirements depend on rainwater or rainfed.

The population in Grobogan Regency is 1365207 people and it is increasing every year. the population increased during the 5-year period, from 2015 - 2019, 0.51 percent. The number of

ISSN: 2005-4238 IJAST

female and male residents is not the same, with a sex ratio of 101.99; meaning that every 100 female residents there are 101 male residents. Low population density, in 2019, the population is 684 people / square kilometer. Its population, spread in 19 districts whose numbers are very diverse.

4.2. Distribution of Areas Exposed to Drought

Grobogan Regency is one of the regions in Central Java which is included in the high drought-prone class. Drought is spread in 18 sub-districts or 94.73 percent of the 19 sub-districts in Grobogan Regency, and there is only one district that is not exposed to drought. Villages that are exposed to drought are 123 villages or 43.93 percent of all villages with 280 villages.

Table 1. Distribution of Villages Exposed to Drought in Grobogan Dsitrict

Sub-district	Number of Villages	Number of Villages Exposed to Drought (percent)
Kedungjati	12	75,00
Karangrayung	19	42,11
Penawangan	20	10,00
Toroh	16	56,25
Geyer	13	76,92
Pulokulon	13	100
Kradenan	14	100
Gabus	14	92,86
Ngaringan	12	33,33
Wirosari	14	57,14
Tawangharjo	10	40,00
Grobogan	12	75,00
Purwodadi	17	52,94
Brati	9	44,44
Klambu	9	0
Godong	28	3,57
Gubug	21	4,76
Tegowanu	8	12,50
Tanggungharjo	9	44,44
Total	280	43,93

The distribution of villages exposed to drought in each district varies in number. The highest number of villages exposed to drought are in Pulokulon and Kradenan districts. Because all villages in the two sub-districts are exposed to drought. Whereas the smallest number of villages affected by drought are in Godong Subdistrict, out of 28 villages, only one (3.57 percent) villages are exposed to drought.

ISSN: 2005-4238 IJAST

Table 2. Clasification of Area Exposed to Drought in Grobogan District

Clasification (persent)	Velue	Number sub-disctric	Number of Village Exposed to Drought	Total Villages	class
3,57 -35,71	1	6	9	97	low
> 35,71-67,85	2	7	46	94	medium
>67,85-100	3	6	68	78	hight

Areas affected by drought, including low, are spread in 5 districts, there are in 7 districts and high in 6 districts. The distribution of areas exposed to low drought, namely Godong, Gubug, Penawangan, Tegowanu, Ngaringan Districts. Distribution of areas affected by moderate drought, in this Regency. Wirosari, Toroh, Purwodadi, Brati, Tanggungharjo, and Karangrayung. Distribution of areas affected by high drought spread across the Regency. Kradenan, Pulokulon, Cork, Geyer, Kedungjati, and Grobogan. The distribution of spatial areas exposed to drought in more detail can be observed from the following figure.

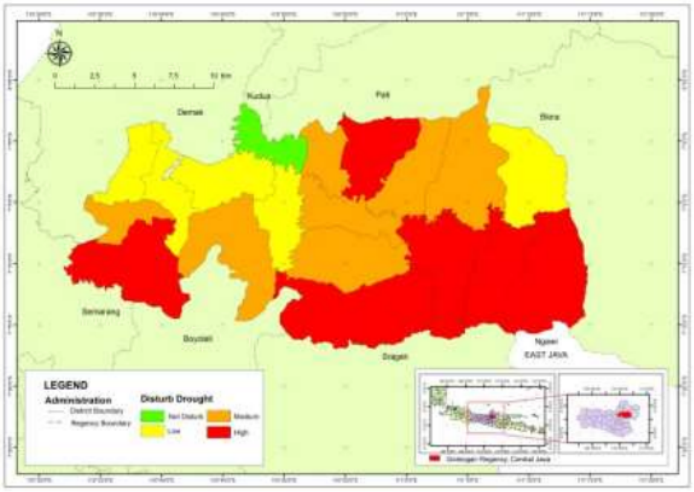

Figure 2. Spatial Distribution of Area Exposed to Drought

Areas exposed to drought have become increasingly widespread over the past 5 years. This situation is known from the number of districts exposed to drought more and more. In 2015, a drought occurred in 14 sub-districts and 73 villages (Muryani, et al; 2015: 350). In 2017, the number of sub-districts exposed to drought has decreased, to 8 sub-districts, but in 2018, it has increased to 17 sub-districts, and in 2019, there will be 18 sub-districts.

Expansion of areas exposed to drought also occurs at the village level. In 2015, the number of villages affected by drought was 73 villages / kelurahan, and in 2017, 23.75 percent of the number of villages, in 2018, became 37.50, and in 2019, there were 123 villages / kelurahan, or 43.93 percent. Areas exposed to drought are increasing faster, increasing numbers of areas exposed to drought are getting faster, meaning that the number of regions is increasing. The number of regions affected by the drought was 28.57 percent, from 14 districts to 17 districts. In addition to the number of sub-districts, the increase also occurred in the number of villages exposed to drought.

ISSN: 2005-4238 IJAST

Ftable 3. Region Exposed to Drought in Grobogan Dsitrict, 2017-2019

Year	Number and level of Regions			
	Villages	Sub-district	Villages of drougth (percent)	Sub-district Exposed to drought (percent)
2017	280	19	23,75	42,11
2018	280	19	37,50	89,47
2019	280	19	43,93	94,74

4.3. Population Distribution in Areas Drought Exposed

The population distribution is uneven in every area of the region. The uneven population has never happened, this is related to the natural and physical conditions of the region. Residents tend to choose a place to live in areas that have natural conditions that can provide better life opportunities, such as fertility, water availability. Residents tend to choose the location of the residence that has a physical condition with high accessibility.

The population distribution in Grobogan Regency is uneven, the districts with the most population are in Purwodadi District, and the least in Kedungjati District. Purwodadi District is the center of government, economic, social, cultural and political activities, because it is the capital of Grobogan district. Infrastructure facilities are more complete and have higher accessibility compared to other districts. In addition, the area is flat, with a height of between 50-100 meters above sea level (masl) and a slope of fewer than 80 degrees. The main occupation of the population is dominated by the non-agricultural sector. Kedungjati Subdistrict is one area that has a location a little far from the center of activity, its direction to Southwest from the center of district activities, bordering areas outside the district, namely Semarang and Boyolali districts. In general, the Grobogan Regency is dominated by geological conditions in the form of karst or limestone areas [29].

Table 4. Distribution of the Number and Population Dencity in Grobogan District

Sub-district	Number of population (percent)	Widh Area (percent)	Population Dencity (living/km2)	Number of Villages (Percent)
Kedungjati	2,91	6,59	306	75,00
Karangrayung	6,68	7,12	796	42,11
Penawangan	4,37	3,75	796	10,00
Toroh	7,93	6,03	307	56,25
Geyer	4,41	9,92	307	76,92
Pulokulon	7,47	6,76	757	100,00
Kradenan	5,60	5,45	705	100,00
Gabus	4,97	3,98	410	92,86
Ngaringan	4,95	5,90	572	33,33
Wirosari	6,39	7,81	560	57,14
Tawangharjo	4,07	4,23	658	40,00
Grobogan	5,63	5,29	721	75,00
Purwodadi	10,13	3,93	747	52,94
Brati	3,45	2,78	847	44,44
Klambu	2,56	2,35	747	0

Godong	5,85	4,39	912	3,57
Gubug	5,67	3,59	1084	4,76
Tegowanu	4,03	2,61	1042	12,50
Tanggungharjo	2,93	3,06	653	44,44
Total	100	100	684	43,93

The distribution of population growth rates varies from -0.07 to 1.11 percent. The highest population growth rate is Tegowanu District, and the lowest is in Geyer District. Tegowanu Sub-district is located closer to Semarang City and Demak Regency than to the Capital District of Purwodadi Regency. In addition, it is crossed by the highway to the capital of Purwodadi Regency, which has high accessibility. Geyer Subdistrict, its location has low accessibility, far from the capital of Grobogan Regency, there is no public transportation, and most of the population is active in the agricultural sector, the population working in the agricultural sector is the most (75.18 percent) among other districts in the Grobogan Regency [30].

The population distribution is uneven and varied, not always followed by population density and population growth rates. The sub-district that has the most population does not have the highest population density and the highest population growth rate. Other factors outside the conditions of the population that are considered to contribute to population distribution still need further study. Population distribution and population density can be observed from the map image as follows.

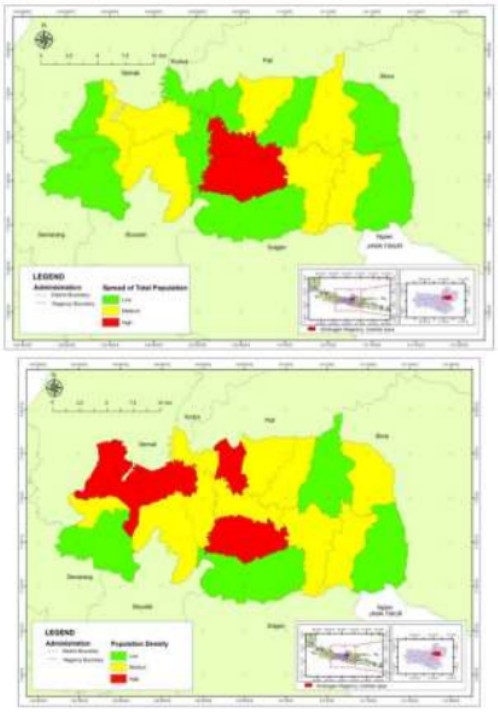

Figure 3. Spatial Distribution of Population Number and Population Dencity

Population distribution in areas exposed to drought, in districts that have the most population, high population growth rates, dominant population occupations in the non-agricultural sector, have the number of villages exposed to drought included in the medium class.

The sub-district which has the fewest population, the population growth rate is low, the occupation of the dominant population in the agricultural sector has the number of villages exposed to drought included in the high class.

The distribution of areas exposed to drought is highest, in sub-districts that have a population including moderate class, population growth rate including medium class, occupation of the dominant population in the agricultural sector. Subdistricts that have a number of villages are exposed to high drought, moderate numbers, densities, and population growth, and the majority of the population has main jobs in the agricultural sector.

The drought that occurred in Grobogan Regency has been overcome with various efforts carried out and integrated [9] [10], however, the threat of drought continues to occur and the area is increasingly widespread.

5. Conclusion

The distribution of drought-affected areas occurs in almost all regions in Grobogan Regency, out of 19 districts, 18 have villages that are exposed to drought. The number of villages exposed to drought in each district varies in number. Districts that have the most villages exposed to drought are Kradenan and Pulokulon Districts. The distribution of areas exposed to drought is increasingly widespread, at the sub-district and village levels.

Population distribution in areas exposed to drought is spatial in every district. The highest number of population is in Purwodadi Subdistrict, the least in Kedungjati Subdistrict. The densest area in Gubug Subdistrict, and most tenuous (not dense) in Kedungjati Subdistrict. The highest population density is in sub-districts that have villages that are affected by low-class drought, and the lowest population density is in districts that have villages exposed to high-class drought.

The population distribution is determined by the natural and physical conditions of the area. Subdistricts with low population density, more villages are exposed to drought. The natural and physical conditions of the area have the potential to become disaster-prone areas and provide opportunities for exposure to drought. Subdistricts with high population numbers, densities and growth and area exposed to high drought form the basis for a more in-depth study of mitigation, preparedness, vulnerability, capacity, and adaptation that must be carried out, and prioritized in areas where the majority of the population work in the agricultural sector. Local wisdom must be understood and implemented in order to anticipate meeting water needs in each dry season, anticipating global climate change.

6. Acknowledgments

Acknowledgments were conveyed to the Ministry of Technology and Higher Education Research which is now the Ministry of Education and Culture, and the Ministry of Technology Research and Higher Education, which has facilitated the research team to obtain post-graduate research grants in the Postgraduate Study Program of Geography Education in Post-Graduate State University of Semarang for the cooperation that has been built well.

References

[1] United Stated. World Population Peospect 2019 Highlight. Departement of Economic and Social Affair. *Population Division*. New York. United Nation (2019).
[2] Population Reference Bureau. *World Population Data Sheet*. USAID. Washington, DC. USA.www.prb.org (2015).
[3] Hardati, P. (2018). *Population Mobility*. *Sustainable Livelihood Strategy*. *Spatial Perspective*. Semarang. UNENS Press.

[4] Kasto and Henry Sembiring. *Indonesia Population Profile, during PJP I and beginning of PJP II*. Yogyakarta. Gadjah Mada University Population Research Center (1995).
[5] Dwiyanto, A. *Population and Development*. Yogyakarta. University of Gadjah Mada Population Research Center (1996).
[6] Central Bureau of Statistics (BPS).. *Profile of Indonesian Population Results of Inter-Census Population Survey (SUPAS) 2015*. Jakarta. Central Bureau of Statistics (2016).
[7] Ministry of National Development Planning (BAPPENAS). *Summary of Metadata Indicators for Indonesia's Sustainable Development Goals*. Jakarta. BAPPENAS. (2017)
[8] Hardati, The Livelihoods of Rural Households Affected by Drought in Facing Climate Change in Semarang Regency. *Research Report*. UNNES. Not published. (2016).
[9] Muryani, C. Sarwono, and Dewi Hastuti. Public Adaptation for Disasters in Grobogan Regency. *Proceedings*. UMS, Geography National Seminar, Efforts to Reduce Disaster Risks Related to Climate Change (2016).
[10] Hastuti, D., Sarwono, Chatarina Muryani. Mitigation, Preparedness, and Community Adaptation Against Danger of Grobogan Regency (Implementation as a Contextual Module for Geography Learning in Class X High School Disaster Mitigation Subjects). *GeoEco Journal*. Vol. 3, No. 1 (January 2017) Pg. 47-57.
[11] Libanda, B., Mie Zheng & Chilekana Ngonga. Spatial and Temporal Pattern of Drought in Zambia. *Journal of Arid Land*. Volume 11, Pages 180-191 (2019).
[12] Cavus, Y., and Hafzullah Aksoy.Spatial Drought Characterization for Seyhan River Basin in the Mediterranean Region of Turkey. *Journal Water*. (2019), Vol. 11, 1331; doi:10.3390/w11071331.
[13] Adisa, O.M., Joel O. Botal., Abiodun M. Adeola., Christina M. Bortai., Abubeker Hassen., Daniel Darkey., Eyob Tesfamariam, Abidemi T. Adisa., and Alex F. Adesa. (2019). Analysis of Drought Condition over Mayor Maize Producing Provinces of South Africa. *Journal of Agricultural Meteorology*. (2019) 75(4): 173-182.
[14] Tjiptoherijanto, Prijono. Towards Population-Based Development. *Population*. Vo 11, No. 1 (2000).
[15] Baiquni, M. *Livelihood Strategies in Crisis Times*. Yogyakarta. ideAs (2007).
[16] Rahmat, SN., Jayasuriya, N., Bhuiyan, M. Development of Drought Severity-duration-frequency Curves in Victoria, Australia. *Australian Journal of Water Resources*, Volume 19 Issue 1 (2015).
[17] National Disaster Management Agency (BNPB). Bencana . http://bnpb.go.id/pengknow-bencana- read-februari 2020.
[18] Indonesian Institute of Education (LIPI)-UNESCO-ISDR. *Study of Community Readiness in Anticipating Earthquake and Tsunami Disasters*. Jakarta. Deputy of Earth Sciences, Indonesian Institute of Sciences (2006).
[19] Wilhite, D.A & M.H. Glantz). Understanding the Drought Phenomenon: the Role of Definitions. *Water International*, 10, (1985), pp.111-120.
[20] National Disaster Management Agency, Regulation of the Head of the National Disaster Management Agency Number 4 of 2008 concerning General Guidelines for the Preparation of Disaster Management Plans. *Document*. Jakarta. BNPB. (2008).
[21] National Disaster Management Agency (BNPB). Regulation of the Head of the National Disaster Management Agency Number.2, 2010 concerning General Guidelines for Disaster Risk Assessment. *Document*. Jakarta. BNPB (2012).
[22] National Disaster Management Agency (Bakornas PB). *Introduction of Disaster Characteristics and Mitigation Efforts in Indonesia*. Jakarta. BNPB (2007).
[23] Mantra, IB.. *General Demographics*. Yogyakarta. Student Library (2003).
[24] Anonymous. (2019). Government Regulation of the Republic of Indonesia Number 40 of 2019 concerning the Implementation of Law Number 23 of 2006 concerning Population Administration. As amended by Law Number 24 of 2013 concerning Amendment to Law Number 23 of 2006 concerning Population Administration. *Document*. Jakarta. Not published. http://www.sipuu.setkab.go.id/PUUdoc/ 17859 / PP. Number 40 Year 2019.pdf. Read February 29, 2010.

[25] Gischa, S. (2020). Population Distribution and Types. *Kompas*., http://www.kompas.com/, read 29 February (2020).
[26] Regional Disaster Management Agency (BPBD). *Activity Report*. Semarang. Document. Not published (2017).
[27] Regional Disaster Management Agency (BPBD). *Activity Report*. Semarang. Document. Not published. (2018).
[28] Regional Disaster Management Agency (BPBD). *Activity Report*. Semarang. Document. Not published (2019).
[29] Tjahyono, G., and Agung Budi Supangat. Drought Characteristics in Grobogan Regency and Alternative Solutions. *Article*. National Seminar on Regional Independence in Disaster Mitigation towards Sustainable Development, Surakarta 19 September. (2015).
[30] Central Bureau of Statistics (BPS). *Grobogan District in Numbers*. Purwodadi. Central Bureau of Statistics (2008).

ISSN: 2005-4238 IJAST

Population Distribution in the Drought Area in Grobogan Regency Central Java Province Indonesia

ORIGINALITY REPORT

10%	%	7%	7%
SIMILARITY INDEX	INTERNET SOURCES	PUBLICATIONS	STUDENT PAPERS

PRIMARY SOURCES

1	Submitted to Universitas Hasanuddin Student Paper	4%
2	Submitted to University of Ghana Student Paper	1%
3	"Book of Abstracts International Conference on Agriculture, Environment, and Food Security 2017 (AEFS) 2017", IOP Conference Series: Earth and Environmental Science, 2018 Publication	1%
4	Submitted to Florida Virtual School Student Paper	1%
5	Iffa Faliha Dzakiyah, Ratna Saraswati. "Drought area of agricultural land using Tasseled Cap Transformation (TCT) method in Ciampel Subdistrict Karawang Regency", E3S Web of Conferences, 2020 Publication	<1%
6	Submitted to Burroughs High School Student Paper	<1%

7	"Water Resources in Arid Lands: Management and Sustainability", Springer Science and Business Media LLC, 2021 Publication	<1 %
8	Alua Omarova, Kamshat Tussupova, Ronny Berndtsson, Marat Kalishev, Kulyash Sharapatova. "Protozoan Parasites in Drinking Water: A System Approach for Improved Water, Sanitation and Hygiene in Developing Countries", International Journal of Environmental Research and Public Health, 2018 Publication	<1 %
9	Bhola Nath Dhakal. "Spatial Variation in the Level of Agricultural Development in Districts of Western Development Region, Nepal", The Third Pole: Journal of Geography Education, 2018 Publication	<1 %
10	"Disaster Risk Reduction in Indonesia", Springer Science and Business Media LLC, 2017 Publication	<1 %
11	R H Haryanti. "People with Disability in Vocational High Schools: between School and Work", IOP Conference Series: Materials Science and Engineering, 2018 Publication	<1 %

12	A Afrahamiryano, D Ariani. "Student Task Analysis for the Development of E-Learning Lectural System in Basic Chemistry Courses in FKIP UMMY Solok", IOP Conference Series: Materials Science and Engineering, 2018 Publication	<1 %
13	Submitted to Defense University Student Paper	<1 %
14	Ida Rahmawati, Vike Pebri Giena, Neni Triana, Buyung Keraman, Nur Haadiy. "THE INFLUENCE OF VIDEO MEDIA ON THE PREPARAEDNESS IN FACING FLOOD DISASTERS IN ELEMENTARY SCHOOL IN BENGKULU CITY", Nurse and Health: Jurnal Keperawatan, 2020 Publication	<1 %
15	Amrih Halil. "Sensitivity pattern of drought region in Bojonegoro", MATEC Web of Conferences, 2018 Publication	<1 %
16	S Hariyani, A Susilo, E B Kurniawan, F Shoimah. "Spatial Model of Coastal Community Vulnerability of Puger District to Tsunami Disaster Hazard", IOP Conference Series: Earth and Environmental Science, 2019 Publication	<1 %
17	Frédéric Ayant, Y. Pragathi Kumar, N. Srimannarayana, M. V. Chakradhara Rao, B.	<1 %

Satyanarayana. "On fractional integral operator with modified multivariable I-function", AIP Publishing, 2021

Publication

Exclude quotes	On	Exclude matches	Off
Exclude bibliography	On		