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**OPTIMIZING THE ROLE OF CHARACTER EDUCATION
THROUGH SCIENCE AND TECHNOLOGY TOWARDS
EXCELLENT AND INTELLIGENT GENERATION**

MAKASSAR STATE UNIVERSITY

Thursday, 20 August, 2015



**International Conference
on Education and Technology**



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International Conference on Education and Technology



FOREWORD

Main theme of the 54th anniversary of Makassar State University is Education as an intelligent movement towards superior generations who have good character. The event series started from 29 June until 22 August 2015.

This conference is an annual academic event that holds as a part of events series to celebrate the anniversary of Makassar State University. This year, it is conducted and arranged by engineering of faculty as the main committee for the 54th Dies Natalis. This conference comes with theme “Optimizing the role of character education through science and technology towards excellent and intelligent generation”. The main theme is expected to give birth on new thinking and recommendation on aspects such as the following : Science and Technology, Art and Humanities, Education, Vocational Education and training and other interests that related to the main theme.

This proceeding consists of all accepted and supplementary paper. They are also presented in the conference. All papers are contributed by researchers who are not only academic member of Makassar State University but also those who come from many area disciplines such as teachers, practitioners, and students. It is hoped that this proceeding will be used well as academic references in the field of education and vocational education especially in term of building and integrating character education as one of very important factors to produce generation which are not only smart but also have good character.

Makassar, August 15th 2015

Editor



**International Conference
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THE SCHEDULE OF INTERNATIONAL CONFERENCE

"Optimizing the Role of Character Education through Science and Technology
Towards Excellent and Intelligent Generation"

Makassar State University, August 20th 2015

TIME	ACTIVITY	PRESENTER	PIC
07.30 – 09.00	Registration		Committee
09.00 – 09.05	Opening ceremony	<i>Master of Ceremony</i> (MC)	Masni & Hasrul
09.05 – 09.10	Lagu Indonesia Raya	Dirigen	
09.10 – 09.20	Pembacaan Doa	Dr. Faisal Amir, M.Pd.	
09.20 – 09.30	Report and welcome address	Prof. Dr. Husain Syam, M.TP. (Chairman of Dies Natalis Committee)	MC
09.30 – 09.40	Welcome address	Rector UNM	MC
09.40 – 10.00	Opening Ceremony and Speech as Keynote Speaker	Prof. Mohamad Nasir, Ph.D. Ak. (Ministry of Research, Technology and Higher Education)	MC
10.00 – 10.10	Cultural Action	Traditional Dance (maks 10 menit)	MC
10.10 – 10.20	Souvenir Gift	Given by Rector UNM & Chairman	Committee
10.20 – 10.30	Coffee Break		Committee
10.30 – 12.00	Speech of Invited Speaker (Panel Session)	1. Prof. Dr. Muklas Samani (UNESA) 2. Ir. Simon Tandibua, M.Eng. (BPPT)	<u>Moderator:</u> Hasanah Nur <u>Notulen:</u> Yasdin
12.00 – 12.20	Discussion	Participant	
12.20 – 12.30	Souvenir Gift	Given by Coordinator of Seminar	Committee
12.30 – 13.30	Lunch Break		Committee
13.30 – 14.40	Speech of Invited Speaker (Panel Session)	1. Prof. Baharuddin Aris (Malaysia) (<i>Character Building in Academia via NALI & NA- RIPENS</i>) 2. Prof. Graeme Johansen (Australia) (the links between Information and Communications Technologies (ICTs), entrepreneurship, and excellence in education) 3. Larry Lai (Singapore) (<i>Character Education in the Cyber Age</i>) 4. Mahyuddin Bin Arsat, Ph.D. (Malaysia) Empowering Character Education through Sustainability Thinking In Engineering	<u>Moderator:</u> Yasser A. Djawad <u>Notulen:</u> Dyah D. Andyani
14.40 – 15.20	Discussion	Participant	
15.20 – 15.30	Souvenir Gift	Given by Coordinator of Seminar	Acara
15.30 – 15.45	Coffee Break		Committee
15.45 – 16.45	Parallel session	National & International presenter	Moderator: Fiskia Rera; Samnur; Ahsan; Amiruddin; Prof. Yunus; Prof. Lahming
16.45 – 17.00	Closing Ceremony	Gift for the best presenter; Most active participant, the best moderator	Committee (Prof. Saptu)



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- PARALLEL SESSION -

Makassar State University, August 20th 2015

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15.45 – 15.55	Muhammad Danial ¹ & Nurlaela ²	Development of basic chemistry learning tools forbiology-based group investigation for improving metacognition skills and concepts mastery
	Dahyar Daraba	Character education as the basis formation of praja (students of institute of domestic governance) to become a pioneer in mental revolution
15.55 – 16.05	Agustan S.	The process of student's thinking having learning style of auditory-sequential in understanding quadrilateral
	Andi Asmawati Aziz ¹ , Nurhayati B ² , Andi Irma Mutmainnahtul Adawiyah ³	The influence of using instructional media lectora inspire to students learning outcomes of class x in material of invertebrate at SMA Negeri 9 Bulukumba
16.05 – 16.15	Firman, Nurhayati B., Yusminah Hala, A. AsmawatiAzis, & Oslan Jumadi.	Correlation between peer assesment, readiness to learn with maternity care course's learning outcome of the students of Bina Bangsa Majene institute of health science
	Muhammad Akil Musi ¹ & Azizah Amal ²	Implementation of cultural value in character education for early childhood (case study at bugis family in Makassar city)
16.15 – 16.25	Mustari S. Lamada	Needs analysis project based learning in programming webcourses at informatics and computer engineering education UNM
	Muhammad Yahya	Ananalysis of vocational competency on eastern Indonesia
16.25 – 16.35	Sugiarti and Reni Appang Allo	The effect of using media animation through guided inquiry learning model toward motivation and student's achievement at class vii smpn 30 makassar (study on characteristic substances)
	Usman ¹⁾ , Nasrullah ²⁾	The difference of mathematical disposition based on learning models cps and dt in mathematics learning for secondary graders
16.35 – 16.45	Erma Suryani Sahabuddin ¹⁾ , Filha Mori Duhuria ²⁾	Cooperative learning model "student teams achievement divisions" effect toward learning outcomes of science program and interpersonal interaction
	Nuri Emmiyati	Students' Motivation Profiles Of Junior Secondary School In Indonesia In Learning English
16.45 – 16.55	Sapto Haryoko ¹⁾ , Hendra Jaya ²⁾	Attitude assessment students of vocational school toward using android based simulation laboratory
	Nurhikmah Hasyim	Character building as efforts to prevent crime and demoralization children in elementary school
16.55 – 17.05	Rusyadi ¹⁾ , Ahmad ²⁾	Analysis of supervisor performance of vocational high school (case study in district Pinrang in South Sulawesi)
	Rais Misi	Disaster mitigation education model based on social learning theory

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15.45 – 15.55	Frederik Palallo ¹ , Nixon Wibisono Suma ²	Resistance mechanical properties of material katinting boats effect on environment
	Soetyono Iskandar	Alternative electric power plant that environmental friendliness at Indonesia
15.55 – 16.05	Mithen	Impact of environmental conditions settlement watershed of Mamasa
	Nurlita Pertiwi	Ecobehaviour in the management of riverbanks at Soppeng regency
16.05 – 16.15	Nasrullah	Teachers' creativity in posing problems of mathematics using traditional games as learning context
	Ita Hasmila ¹ , Amaliah Z.J. ² , Netti Herawati ³ , Muhammad Danial ⁴	Isolation and identification of secondary metabolite compound etil acetate in the bark extract of pedada mangrove (<i>sonneratia caseolaris</i>)
16.15 – 16.25	Rosmini Maru	Rainfall seasonality index for south sulawesi province, indonesia, 1982-2012
	Wahidah Sanusi ¹ , Syafruddin Side ² & Muhammad Kasim Aidid ³	Intensity-duration-frequency (idf) curves for rainfall data in Makassar city
16.25 – 16.35	Moh. Ahsan S. Mandra	Analysis of emission control strategy of vehicles in makassar city using interpretative structural modeling
	Muhammad Ichsan Ali	Contingency plan for flash flood in Enrekang regency
16.35 – 16.45	Mushawwir Taiyeb and Irma Suryani Idris	Analysis of dietary habit and nutrition status biology student mathematic and sciences faculty makassar state university
	Pince Salempa	Phytochemical compound of stem bark soursop plant (<i>annona muricata linn</i>)
16.45 – 16.55	Mantasia ¹ , Tasri Ponta ²	The role of technology augmented reality in strengthening a scientific learning process



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15.55 – 16.05	Abdul Azis ¹ & Hajrah ²	Folktale categories fable language learning materials as Indonesia and literature in primary school
16.05 – 16.15	Heru Winarno	The role of social capital, entrepreneurship education and interest among students at faculty of engineering Makassar State University
16.15 – 16.25	Mashur Razak ¹ & Bahrul Ulum Ilham ²	The effect of personal character, family, and governmental policy toward entrepreneurship competence of young entrepreneur (case study of gkn 2014 program South Sulawesi).
16.25 – 16.35	Andi Aminullah Alam	The impact of school counseling on student educational outcomes in high schools
	Ismail & Nurhikmah Tenri Pada	Analysis of student character development stages through the implementation of typical curriculum of sekolah alam (a case study in sekolah alam bogor junior high school level)
16.35 – 16.45	Jokebet Saludung	Prospects of kecombrang fruit development become home industry
16.45 – 16.55	A. Padalia	The effectiveness of motoric skill assesment using video in the subject of basic South Sulawesi dances

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**RAINFALL SEASONALITY INDEX FOR SOUTH SULAWESI PROVINCE,
INDONESIA, 1982-2012**

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ABSTRACT

Spatial and temporal variability of rainfall for any region in the world are very important with regards to planning for various sectors including water supply and agriculture demands. The aims of this paper are to study the spatial and temporal variability of seasonality of rainfall and its relation to rainfall regimes within the South Sulawesi Province, Indonesia. Data for the 64 rainfall stations for the 29 years (1983 – 2012) were used in order to calculate the SI for the whole of the South Sulawesi area. In general, the result showed that the dominance SI was the seasonal rainfall regime of 0.60 to 0.79 especially in the central region of the South Sulawesi. Furthermore, the rainfall regimes of rather seasonal with a short drier season (0.40 – 0.59) and markedly seasonal with a long drier season (0.80 – 0.99) were calculated for the northern part and Western part of the South Sulawesi Province, respectively. One significant finding was that the entire province did not experience a rainfall regime of very equable and equable but with a definite wetter season. However, a more extreme rainfall regime of ≥ 1.0 (3 months or less rainfall) was calculated for the southern part of the South Sulawesi Province. The rainfall data were divided into three periods with the 1983 – 1992 and 2003 – 2012 periods showed a more rather seasonal with a short drier season (0.40 – 0.59). For the period of 1993 – 2002 the dominance SI was seasonal rainfall regime. Based on these findings, it is clearly indicated that certain region of the South Sulawesi Province, especially for the southern part experienced a longer drier season in a single year, implying that the region could be experienced less water supply for domestic as well as for the agricultural sectors.

Keywords: *Seasonality Index (SI), rainfall regime, water supply, mapping*

A. Introduction

Indonesia is one country in the world which is traversed by the low latitudes that is one area that has a tropical climate. Therefore, this region has two seasons namely wet and dry seasons that turns naturally (Sellers and Robinson, 1988). In addition, local geographic conditions also influence in determining the type of climate, especially rainfall regime of the region. Due to limited rainfall regime was influenced by various factors such as: (1) the position of the sun relative to the path (location latitude); (2) the existence of the ocean or surface water; (3) the pattern of wind direction; (4) in

such a land surface; and (5) the density and type of vegetation (Lakitan, 2002) suggests that the seasonal rainfall to give effect to the characteristics of the soil and vegetation can even give effect to the distribution of vegetation and soil density for the entry into force of the erosion process. In addition, the amount of rainfall is very important to maintain the capacity of the soil and water storage in the soil (Sto) which will be used by plants. (Thornthwaite, 1957; Gomez, 2004 and Adejuwon, 2012)

According to Guhathakurta and Serve (2012) that the knowledge of the spatial variability of rainfall and the

smaller scale is important for planners in various sectors including water and agricultural planners. Especially in the area of Jharkhand, India which has rainfed areas more than 70% means dependence on rainfall is very large (Nandargi and Mulye, 2014).

The studies that have been ongoing for more than 100 years data in Maharashtra in India (Guhathakurta and Saji, 2012) and for the monthly precipitation series of the 24 districts in Jharkhand for the period 1901-2000 shows the variability of rainfall during the rainy season and the annual rainfall for the country Jharkhand (Nandargi and Noble, 2014). Guhathakurta and Serve (2012) also tried to look at the impact of climate change on the spatial and temporal patterns through the analysis of the trend of declining monthly rainfall. The results showed a decrease trend of the rainy season in the first five months of the year led to increased heating, as well as an impact on the lack of soil moisture, groundwater and surface water decreased.

Whereas, Nandargi and honorable (2014) tried to see trend index of seasonal rainfall for the year 1901-2000 in Jharkhand, India. Results from both studies show that there has been an increase in the index of seasonal rainfall over time and affect the condition of water and agriculture in two areas, namely, Maharashtra and Jharkhand, India.

B. Method

This study used climate data for 64 rain stations for 29 years (1983-2012) in South Sulawesi, Indonesia. The data obtained from the Department of Meteorology and Climatology and the Department of Irrigation and Water Resources in Makassar City. Furthermore, the seasonal index (SI) is calculated using the formula developed by Walsh and Lawer (1981); Kanellopoulou (2002); Schoof and Pryor (2008) as shown in formula 1. The identification included in the classification regime seasonality index consisting of seven levels of seasonality index as set forth in Table 1,

$$SI_i = \frac{1}{R_i} \sum_{n=1}^{n=12} \left| X_{in} - \frac{R_i}{12} \right| \quad (1)$$

where:

R_i is the total annual rainfall for a given year under review

X_{in} is the actual monthly rainfall for the month n

Table 1. Regime Seasonality Index (SI)

Kriteria	Seasonality
< 0.19	rain scattered throughout the year
0,20-0,39	rain scattered throughout the year, but with a definite wet season
0,40-0,59	Somewhat seasonal with a short dry season
0,60-0,79	seasonal
0,80-0,99	Marked seasonal drought
1,00-1,19	Most of the rainfall in <3 months
> 1.20	Extreme seasonal, with most of the rainfall in 1-2 months

Source: Extracted from Walsh and Lawer (1981); Kanellopoulou (2002).

The index value less than or close to zero indicates the presence of rain throughout the year. On the contrary the index showed a larger highly significant seasonal rainfall was only 1-2 months. While the index 0.60 - 0.79 show where seasonal rainfall in the rainy season and the dry season is balanced (Walsh and Lawer, 1981; Kanellopoulou 2002; Pryor and Schoof, 2008). However, one disadvantage of this index is indescribable when applicable, wet and dry conditions. SI values obtained in spatial analysis using ArcView software. The resulting map is a map of the distribution of the SI in the study area.

C. Results

1. Seasonality index for South Sulawesi in 1983-2012

The results showed that rainfall patterns respectively north and south of Santa Cruz. One of the significant findings is the seasonal rainfall regime from 0.60 to 0.79 mainly in the central region of South Sulawesi. Moreover, quite seasonal rainfall regime with a short dry season (0.40 to 0.59) occurred in the northern region to spread in various districts in the central part of South Sulawesi such as in the southern part of the Regency, the central part of the regency, the central part Kabuapten Bone, the eastern and southern part of the regency Wajo. While in the western part of South Sulawesi is dominated by seasonal and long dry season (0.80 to 0.99). A fraction of the amount of rain has less than three months

(1.0-1.19) and extreme seasonal (> 1.2) which are each located in the south western part of the regency and Takalar. Meanwhile, rainfall amounts of less than three months, the central part Takalar and the western part of Jeneponto for extreme seasonal (Figure 1).

2. Seasonality index for South Sulawesi in three periods (1983-1992, 1993-2002, and 2003-2012)

In detail, rainfall data is divided into the three-year period 1983-1992 (first), 1993-2002 (second), and 2003-2012 (the third). The first period, SI dominance is seasonal with a short dry season (0:40 to 0:59) spread from East Luwu regency, which is located in the northern part of South Sulawesi until at Soppeng, which is located in the central part of South Sulawesi. Furthermore, seasonal (0.60-0.79) occurred in Bone regency south central part so as to continue to the east of Gowa district the western part of the district of Sinjai, Jeneponto and Bantaeng. The rest is the number of months with rainfall of less than three months and seasonal extremes. Furthermore, as shown in Figure 2.

The second period, SI domination is seasonal (0:40 to 0:59) covers the East Luwu regency. directly to the Central, South Sulawesi, as Pinrang, Sidrap Stead, Soppeng, and Bone. In addition, there are also dibahagain south as in Maros, Sinjai,

and the piece. Furthermore, seasonal and short dry season (0:40 to 0:59) are in the north up to the middle of South Sulawesi include Luwu Utara, Luwu, Tanah Toraja, Palopo, part Pinrang, Soppeng, Bone and Bulukumba. Whereas, with seasonal drought (0.80.0.99) occurs in Enrekang, the west coast of South Sulawesi include Pinrang, Sidrap, Pare-pare, Pangkep, Maros, Makassar, directly to the south include Gowa, Jeneponto, Bulukumba and Selayar. The rest is the amount of rain in less than three months (1.0-1.19) and extreme seasonal (> 1.2) were both found only on the southern coast of South Sulawesi as Takalar, Jene.ponto and Ba.ntaeng as set forth in Figure 3.

The third period, showing dominant SI is seasonal with a short dry season (0:40 to 0:59), spread starting from the northern part of South Sulawesi, North Luwu in South Sulawesi until the middle of the cover and Bone regency. Furthermore, SI seasonal (0.60-079) is available in a variety of central as in the district of Pinrang, Wajo, Soppeng, Bone up to southern part includes Pangkep, Sinjai, Bulukumba, and Bantaeng. What is interesting is that there SI with rainfall spread throughout the year, but the rainy season is limited (0:20 to 0:39), namely in the border area between North and East Luwu. Meanwhile, extreme seasonality is dominant in the southern part of the

Takalar and Jeneponto. This is shown in Figure 4.

D. Discussion

Based on the results of the study reveal that in the northern part of South Sulawesi has a rainfall higher than the central and southern parts of South Sulawesi, even more to the south is getting less rainfall are characterized by a long drought with rainfall amounts of less than three months.

This is according to a study conducted by Maru and Jaya (2009) using methods Thorenthwaite to see the drought index in South Sulawesi. The results of the study show that in the northern part of South Sulawesi is dominated by the drought index in leading little or no water scarcity (0 - 16.7%). Furthermore, in the central part is dominated by water scarcity is leading (16,7-33.3%). While in the southern part is dominated by water shortages leading to severe (> 33.3%).

Comparison of the three periods of 1983-1992, 1993-2002, and 2003-2012

show that in South Sulawesi rainfall regime shift occurred from time to time. The rainfall regime in the north are experiencing a marked increase in the presence of SI rainfall spread throughout the year with the rainy season which limited the third period. While, on the other hand experienced a reduction in the Division-south rainfall regime with the ever-expanding SI eksrem seasonal (> 1.2). Increased rainfall as observed in the northern region of South Sulawesi is rare, but a lot happens is a reduction in the amount of seasonal rainfall as well as studies conducted by Guhathakurta and Serve (2012) in Maharashtra. The results of the study found a significant downward trend in monthly rainfall was observed in many areas (districts) of January (seven districts) May (three districts) with a maximum reduction in February (15 districts).

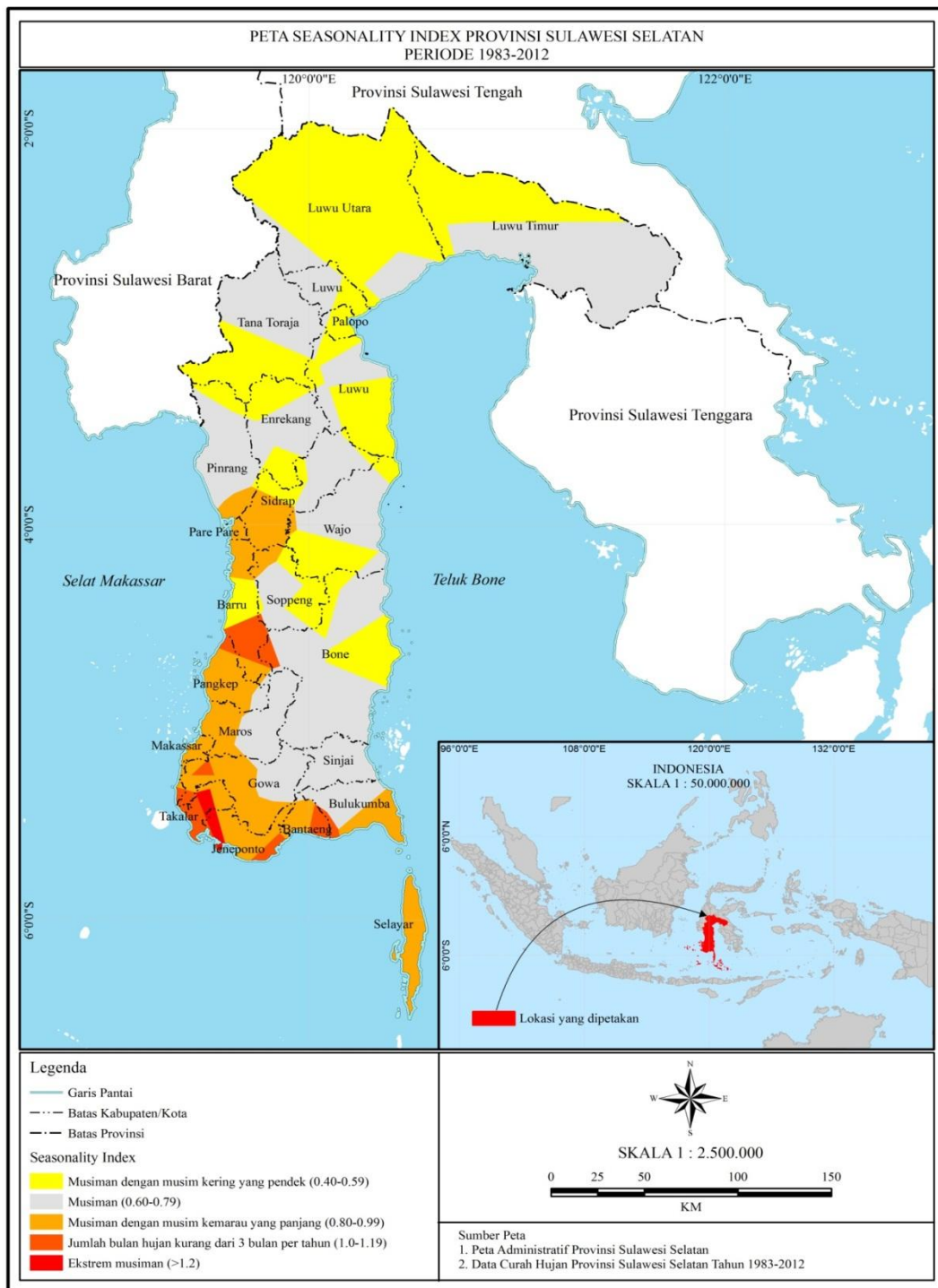


Figure 1. Map of seasonality index (SI) of South Sulawesi, Indonesia in 1983-2012

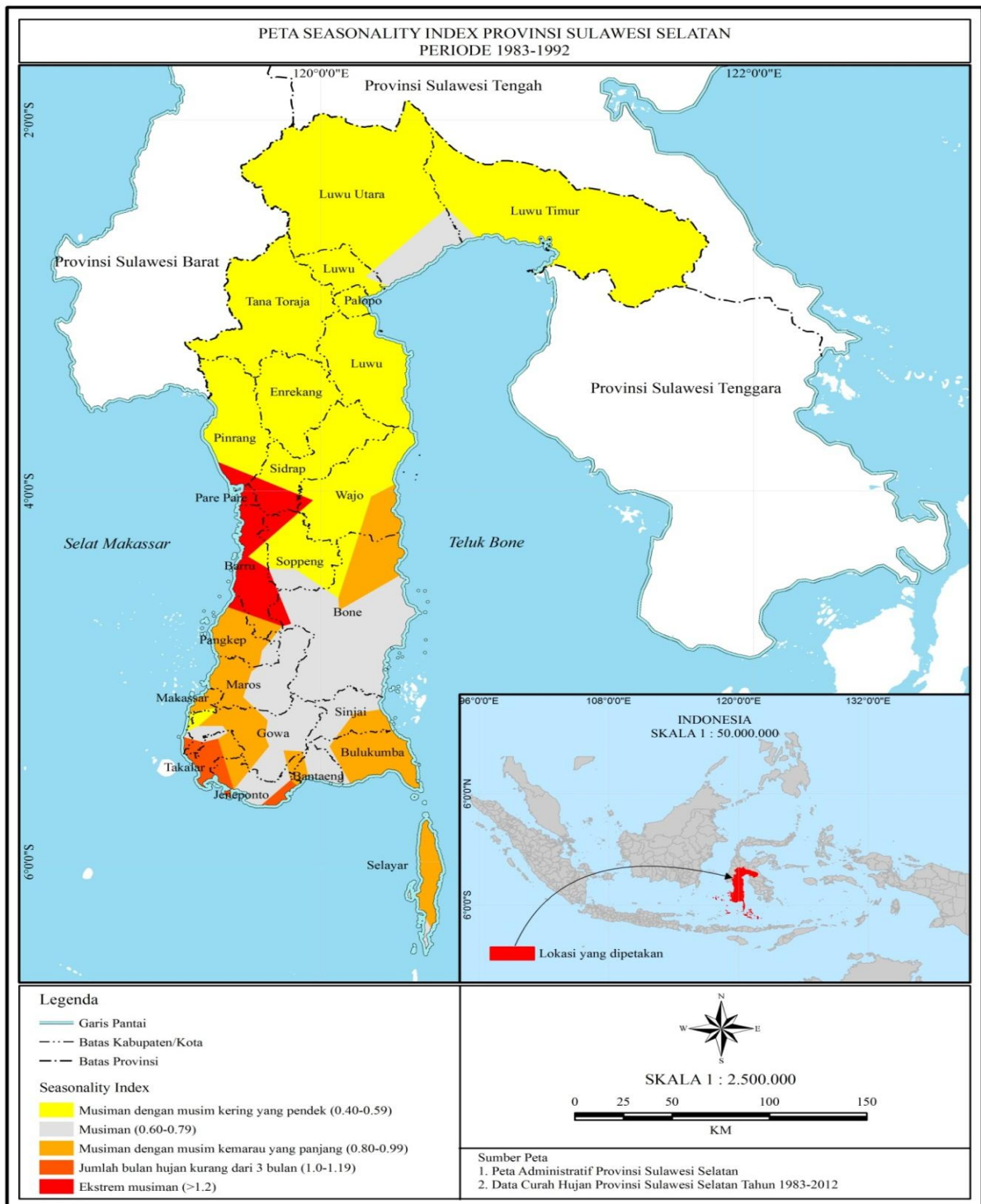


Figure 2. Map of seasonality index (SI) of South Sulawesi, Indonesia in 1983-1992

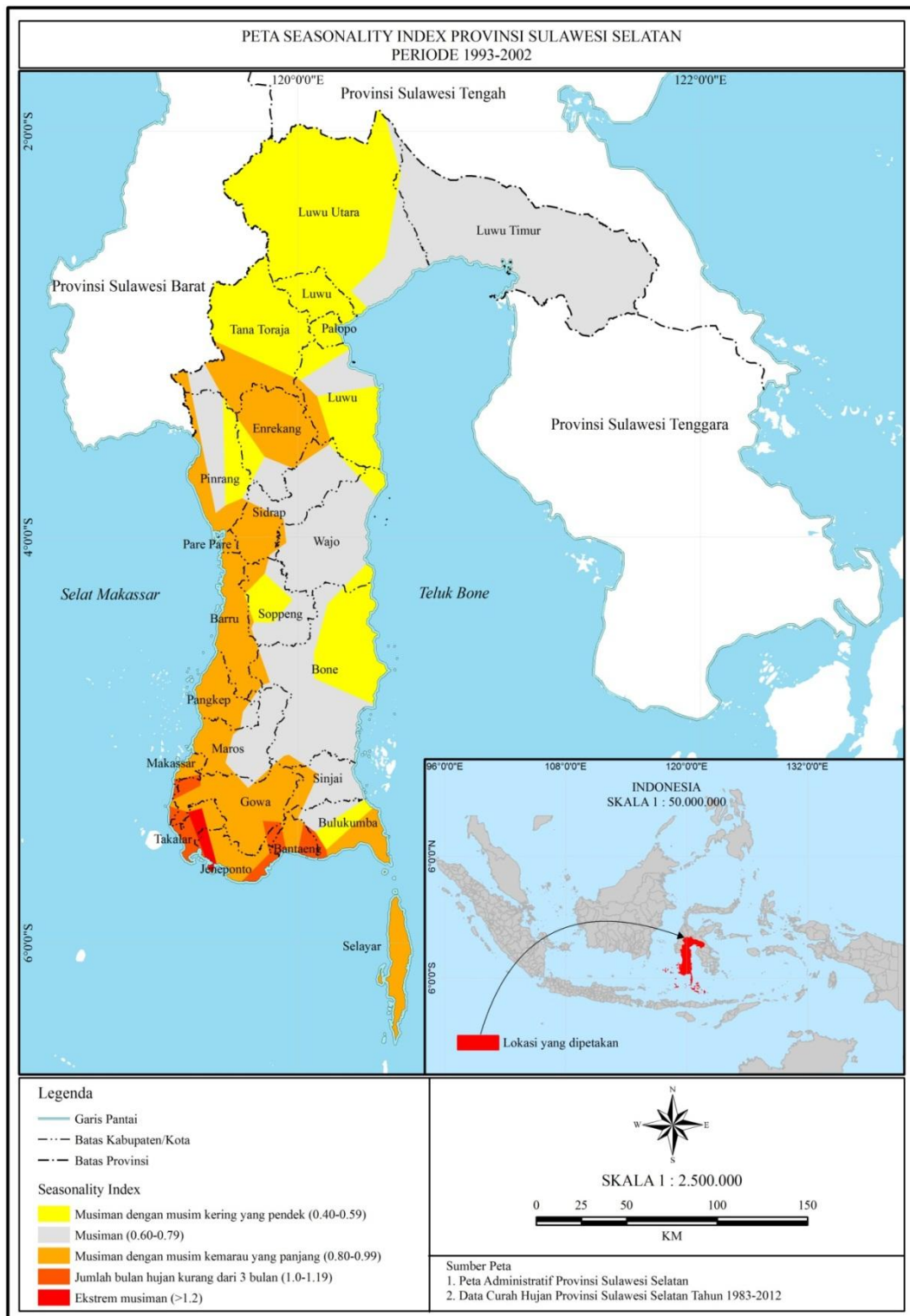


Figure 3. Map of seasonality index (SI) of South Sulawesi, Indonesia in 1992-2003

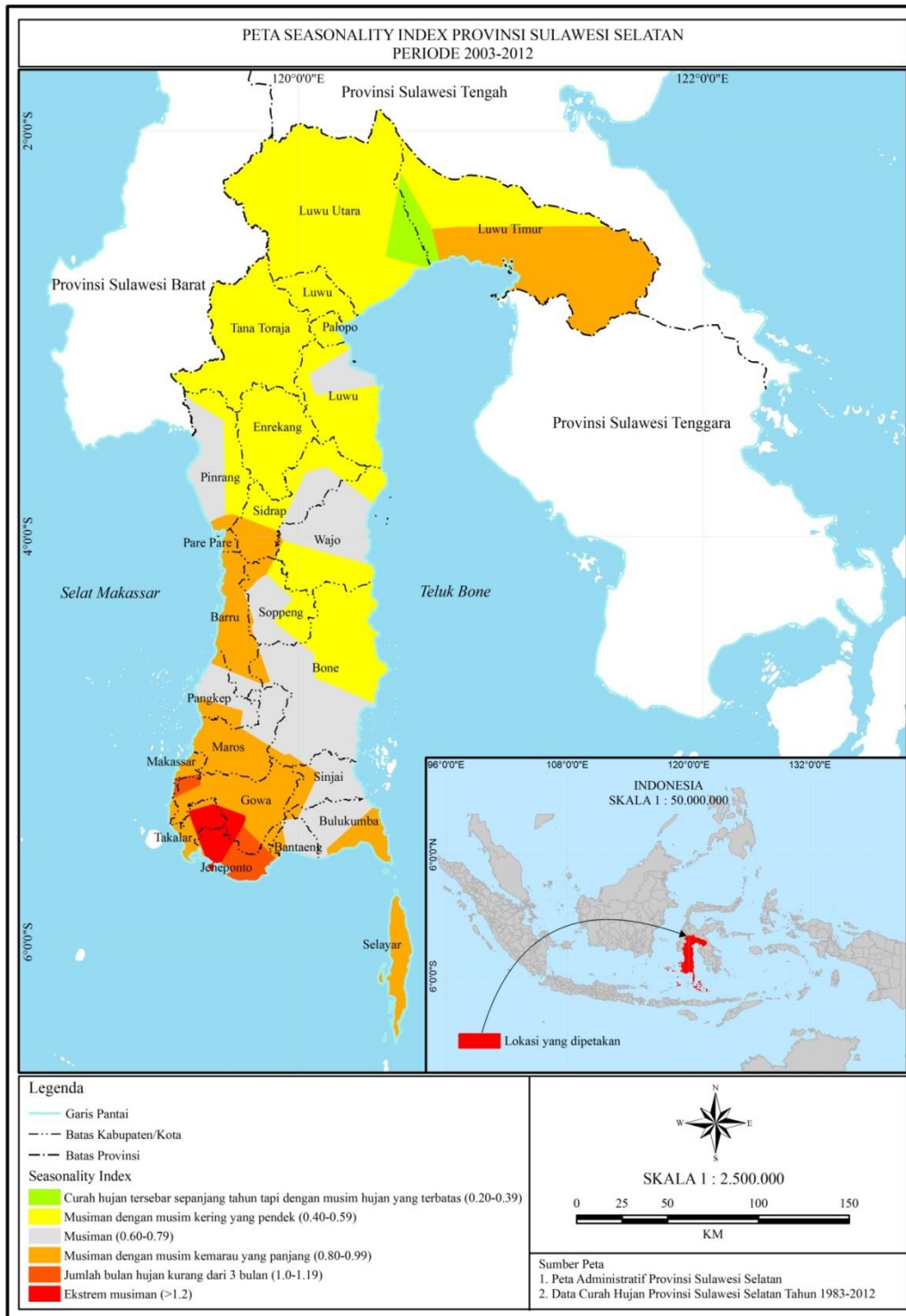


Figure 4. Map of seasonality index (SI) of South Sulawesi, Indonesia in 2003-2012

E. Conclusion

Based on the results of the study found that, in general, SI dominant in South Sulawesi is seasonal (0:40 to 0:49). especially in the central part of South Sulawesi. Furthermore, the northern part of South Sulawesi has a rainfall regime that is longer than the central and southern areas of South Sulawesi. In contrast, the southern region is seasonal, with long dry season (0.80-0.99) implying that these regions may experience less water supply for domestic and agricultural sectors. Rainfall regimes vary in each part of the region had an impact on the pattern of plants that should be developed in line with the regime of rainfall in the area.

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