

1. Judul Artikel: A modification of land suitability requirements for maize in the humid tropics of South Sulawesi, Penulis: Neswati R., Nama Seminar/Konferensi/Simposium: The 3rd International Conference on Global Issue for Infrastructure, Environment, and Socio-Economic Development, Penyelenggara Seminar/Konferensi/Simposium: IOP Conference Series: Earth and Environmental Science, Waktu Pelaksanaan Seminar/Konferensi/Simposium: 24 November 2020, ISBN/ISSN: 17551307

**Komentar dari Reviewer :**

*Karil dimuat di prosiding internasional namun tidak ada bukti karil dipresentasikan oral/poster. Pengusul sebagai penulis pertama. Dokumen bukti karil dipresentasikan tidak ada.*

**Jawaban:**

Artikel ini dipresentasikan secara online via ZOOM di The 3<sup>rd</sup> GIESED pada tanggal 24 November 2020. Berikut kami lampirkan:

1. LoA
2. Conference Agenda
3. GIESED schedule presentation room
4. Power point of our presentation
5. Dokumentasi saat presentasi
6. Sertifikat sebagai presenter

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# GIESED 2020

The 3rd International Conference on Global Issue for Infrastructure, Environment, and Socio-Economic Development

Hotel Claro Makassar, 24-25 November 2020

Website: <http://giesed2020.starconf.org>

Email: [giesed20@gmail.com](mailto:giesed20@gmail.com)

Date: 4 November 2020

## Letter of Acceptance for Abstract

Dear Authors: Risma Neswati, (a\*) Sumbangan Baja (a), Christianto Lopulisa (a)

We are pleased to inform you that your abstract (ABS-38, Oral Presentation), entitled:

**"A Modification of Land Suitability Requirements for Maize in The Humid Tropics of South Sulawesi"**

has been reviewed and accepted to be presented at GIESED 2020 conference to be held on 24-25 November 2020 in Makassar, Indonesia.

Please submit your full paper and make the payment for registration fee before the deadlines, visit our website for more information.

Thank You.

Best regards,

Please Insert  
Signature Image



Dr. phil. nat. Sri Widodo, ST. MT.  
GIESED 2020 Chairperson

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# Conference Agenda

Waktu	Agenda	
08.00-08.50	Registration and Opening Ceremony The 3 <sup>rd</sup> IC GIESED 2020	
08.50-08.55	National Anthem	
08.55-09.00	Opening Praying	Prof. Dr. Ir. Ahmad Munir, M.Eng.
09.00-09.05	Chairman Report	Dr.phil.nat. Sri Widodo, S.T., M.T.
09.05-09.15	Welcome Speech Dean of Graduate School Hasanuddin university	Prof. Dr. Ir. Jamaluddin Jompa, M.Sc.
09.15-09.30	Welcome Reception and opening by Rector of Hasanuddin University	Prof. Dr. Dwia Aries Tina Pulubuhu, M.A.
09.30-10.00	Keynote Speech by Ministry of National Development Planning	Dr (HC). Ir. H. Sudarso Monoarfa
10.00-10.20	Invited Speaker 1	Prof. Hideaki Yasuhara
10.20-10.40	Invited Speaker 2	Prof. Ir. Sumbangan Baja, M.Phil, Ph.D.
10.40-11.00	Invited Speaker 3	Dr. Peter Davey
11.00-11.20	Invited Speaker 4	Prof. Dr.Eng. Adi Maulana, ST., M. Phil
11.20-11.40	Invited Speaker 5	Dr. Zulfahmi Din Mohammed Jafar
11.40-12.00	Invited Speaker 6	Dr.rer.nat. Arifuddin Idrus, S.T., M.T.
12.00-13.00	Break and Profile of Hasanuddin University	

**GIESED 2020 SCHEDULE**  
**(Tuesday, 24th November 2020)**

Time (GMT+8)	Agenda						
08.00-08.50	Registration and Preparation						
08.50-08.55	National Anthem						
08.55-09.00	Prayer	Prof. Dr. Ir. Ahmad Munir, M.Eng.					
09.00-09.05	Chairman's Report	Dr.phil.nat. Sri Widodo, S.T., M.T.					
09.05-09.15	Dean's Welcome Speech	Prof. Dr. Ir. Jamaluddin Jompa, M.Sc.					
09.15-09.30	Rector's Welcome Speech	Prof. Dr. Dwia Aries Tina Pulubuhu, M.A.					
09.30-10.00	Keynote Speaker	Dr. Ir. H. Suharso Monoarfa				Moderator: Drs. Muhammad Yusri Zamhuri, M.A., Ph.D.	
10.00-10.20	Invited Speaker 1	Prof. Hideaki Yasuhara				Moderator: Ilham Alimuddin, S.T., M.GIS., Ph.D.	
10.20-10.40	Invited Speaker 2	Prof. Ir. Sumbangan Baja, M.Phil, Ph.D.					
10.40-11.00	Invited Speaker 3	Dr. Peter Davey					
11.00-11.20	Invited Speaker 4	Prof. Dr.Eng. Adi Maulana, ST., M. Phil				Moderator: Dr. Abigail Mary Moore	
11.20-11.40	Invited Speaker 5	Dr. Zulfahmi Din Mohammed Jafar					
11.40-12.00	Invited Speaker 6	Dr.rer.nat. Arifuddin Idrus, S.T., M.T.					
12.00-13.00	Break						
<b>Parallel Session</b>	<b>Room 1</b>	<b>Room 2</b>	<b>Room 3</b>	<b>Room 4</b>	<b>Room 5</b>	<b>Room 6</b>	<b>Room 7</b>
<b>Moderator</b>	<i>Dr. Paulina Taba, M. Phil.</i>	<i>Ilham Alimuddin, S.T., M.GIS, Ph.D.</i>	<i>Dr. Abdul Razak Munir, S.E., M.Si, Mktg</i>	<i>Amanda Pricella, S.Pi, M.Sc.</i>	<i>Muh. Ulil Ahsan, S.TP, M.Sc.</i>	<i>A. Ahmad Yani, M.Si, MPA, M.Sc.</i>	<i>Dr. Sufriadin, S.T., M.T.</i>
13.00-13.15	MH-001	RE-001	SE-001	SD-001	SD-018	IF-001	LF-001
13.15-13.30	MH-002	RE-002	SE-002	SD-002	SD-019	IF-002	LF-002
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13.45-14.00	MH-004	RE-004	SE-004	SD-004	SD-021	IF-004	IF-018
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14.15-14.30	MH-006	RE-006	SE-006	SD-006	SD-023	IF-006	IF-020
14.30-14.45	MH-007	RE-007	SE-007	SD-007	SD-024	IF-007	IF-021
14.45-15.00	MH-008	RE-008	SE-008	SD-008	SD-025	IF-008	IF-022
15.00-15.30	Break						
<b>Moderator</b>	<i>Dr. Paulina Taba, M. Phil.</i>	<i>Ilham Alimuddin, S.T., M.GIS, Ph.D.</i>	<i>Dr. Abdul Razak Munir, S.E., M.Si, Mktg</i>	<i>Ravika Ramli, S.H., L. LM.</i>	<i>Muh. Ulil Ahsan, S.TP, M.Sc.</i>	<i>A. Ahmad Yani, M.Si, MPA, M.Sc.</i>	
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15.45-16.00	MH-010	RE-010	SE-010	SD-010	SD-027	IF-010	
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5	IF-004	Infrastructure	Influence of Number of Collisions Towards Asphalt Emulsion Mixture Stability Using Marshall Method (SNI 06-2489-1991)	Irianto, M. Tumpu, D. S. Mabui, Mansyur
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88	SD-015	Sustainable Development	Biomarker Characterization of Oil Seepages in Tomori Basin, Center of Sulawesi, Indonesia	M. S. Burhanuddin, A. Jaya, A. Maulana
89	SD-016	Sustainable Development	The Effect of Climate Characteristics for the Land Suitability and Cacao Productivity ( <i>Theobroma cacao</i> L.) in West Sulawesi	L. Asrul, Harli, S. Baja, R. Padjung, A. C. Trisnaputri
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No.	Paper ID	Topic	Title	Authors
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98	SD-025	Sustainable Development	The Correlation Between Soil Chemistry Characteristics with Cocoa Yield (A Case from West Sulawesi, Indonesia)	S. Baja, Harli, L. Asrul, R. Padjung, R. Neswati
99	SD-026	Sustainable Development	Weather Forecasting Uses Backpropagation Algorithm Artificial Neural Network Model for Agricultural Planning in Three Villages at Three Sub-Districts of Gowa Regency	A. A. Lestari, A. Munir, Suhardi
100	SD-027	Sustainable Development	The Development Strategies of Cocoa Cultivation ( <i>Theobroma cacao</i> L.). in Soppeng District	L. Asrul, A. Yulianti, Y. Musa, A. C. Trisnaputri
101	SD-028	Sustainable Development	The Adoption of Cultivation Technology and The Quality of Cocoa Seeds in Bantaeng, Pinrang, and Luwu Timur District	L. Asrul, Darmawansa, A. Sahur, A. C. Trisnaputri
102	SD-029	Sustainable Development	Estimation of carbon stock on palm oil ( <i>Elaeis guinensis</i> Jacq) in PT. Unggul Widya Teknologi Lestari Kabupaten Pasangkayu, Sulawesi Barat	L. Asrul, Rafiuddin, G. Randa
103	SD-030	Sustainable Development	Resilience Level of Highland Smallholder Farmers in Developing Various Coping-Based Agroforestry in the Upstream Minraleng Sub-Watershed Maros District	M. Dassir, A. P. Samuel, A. Usman, S. Nadirah
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105	SD-032	Sustainable Development	Natural Disasters Management and the Challenge of Governability in Indonesia	D. Effendi, Agustiyara, H. Amriyanto
106	SD-033	Sustainable Development	Flood resilience and sustainable development challenges in Indonesia: A case of the Lake Tempe fisheries community in Pallimae village, Wajo regency	M. U. Ahsan, A. Maulana
107	SD-034	Sustainable Development	Volumetric of Porous Asphalt Mixture Containing Modified Asbuton with and Without Plastic Waste	E. Aprianti, D. Runtulalo, A. M. H. Zaifullah

No.	Paper ID	Topic	Title	Authors
108	SD-035	Sustainable Development	Integrated ecological rehabilitation concept for the Coral Triangle	A. M. Moore, R. A. Rappe, S. Yusuf, M. E. Fachry, A. P. Putri, W. Umar, J. Jompa
109	SD-036	Sustainable Development	Powering and linking islands sustainably – perspectives on adapting the “Ellen” approach to an Indonesian context	A. M. Moore, S. A. Farhum, A. P. Putri, J. Jompa
110	UH-001	Urban Heat Island	Potential Impact of Climate Change on Water Resources Availability in Bantaeng District, South Sulawesi Province	M. Chaerul, S. Gusty, I. Marzuki, N. K. Nur, M. Rusli



# **A Modification of Land Suitability Requirements for Maize in The Humid Tropic of Indonesia**



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**Presented at The 3<sup>rd</sup> International Conference on Global Issue for Infrastructure, Environment, and  
Socio Economic Development (GIESED), 24<sup>th</sup> November 2020**



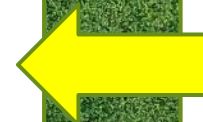
Competition of using land use resources might happen due to conflict of interests between development sector due to increasing population

Land use conflicts

The invasion on agricultural land

Land degradation

Land Evaluation



# LAND EVALUATION



Land suitability is the fitness of a given type of land for a defined use. The land may be considered in its present condition or after improvements.



Various methods:

1. Simple limitation methods
2. Parametric



Crop requirements : various sources (FAO, Sys et al, Pusat Penelitian Tanah Indonesia), but sometimes give different result for the same unit analysis



Criteria of land suitability still general, considered to be wide that supposed due to varied data assessed because of various region both tropic and sub-tropic or hasn't specific yet



Generally, criteria of land suitability arranged based on empirical crop growth requirement nor the data of actual yield.....no validation yet




- ▶ Recently, maize yield in South Sulawesi 4.42 tons/ha
- ▶ According to Sys et al. (1993) optimal yield of maize 9 tons/ha
- ▶ Maize productivity depends on (Van Ranst et al (2003):
  1. Soil and climate (biophysics)
  2. Genetic potential
  3. Land management



Need to land assess or evaluation about land potency for specific purposes in the specific area for **sustainability, equity, efficiency**



## The Objectives



**The main objective of this study was to modify the land suitability requirements for maize in the specific humid tropic of Indonesia.**

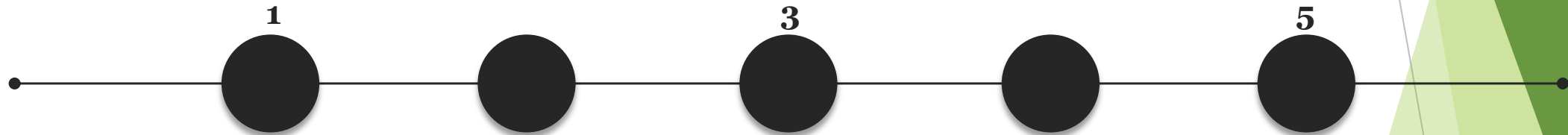


# Methodology

The study employed Integrated technique of data analysis & interviews

Primary data obtained from field surveys (60 sites) and interviews (purposive sampling)  
Secondary data: maps (topography, land use, RTRW, climate, administrative) and satellite imagery Landsat 8

The range of each land characteristics was determined by **quadratic regression analysis** from correlation between land characteristics and maize yield with optimal yield range of each land suitability class. **Analysis of correlation** between land index and land characteristics with observed maize yield using **Pearson correlation analysis** which has value 0-1 and quadratic regression analysis to know impact on each land characteristics to maize yield.



Determination unit of observation according to homogeneity of land characteristics (land unit)

**Determination of maize predicted yield: According to Sys et al. (1993):**  
**S1: >75%; S2: (50-75)%; S3: (25-50)%;**  
**N: <25% of optimal yield**



# RESULTS

The correlation between climate characteristics with maize yield



Characteristics of Climate	r
Rainfall of growing period	0.491*
Rainfall of first month	0.390*
Rainfall of second month	0.316
Rainfall of third month	0.409*
Rainfall of fourth month	0.044
Mean temperature of planting season	0.285
Minimum temperature of planting season	0.317
Relative humidity of vegetative stage	0.270
Relative humidity of generative stage	0.341
n/N vegetative stage	0.762**
n/N generative stage	0.735**

# The correlation between land characteristics with maize yield



Land Characteristics	r
Slope	0.022
Drainage	0.290*
Flooding	0.298*
Texture	0.213
Soil depth	0.174
Coarse fragment	0.098
Cations Exchange Capacity (CEC)	0.189
Base saturation	0.603**
Sum of basic cations	0.352*
pH H <sub>2</sub> O	0.584**
C-Organic	0.552**



# Effect of climate characteristics to maize yield (Regression analysis)

Land Characteristics	R <sup>2</sup>	Regression Equation
P_GC	0,241*	$Y = 0,008 - 0,0000514X + 0,408X^2$
P_1	0,152	$Y = 4,012 - 0,007X + 0,00000717X^2$
P_3	0,099	$Y = 1,176 + 0,021 X - 0,000475X^2$
n/N_2	0,580**	$Y = 8,974 - 18,004X + 12,773X^2$
n/N_4	0,540**	$Y = 24,924 - 77,639X + 67,67X^2$

Note: \*\*Correlation is significant at the 0.01 level (2-tailed) ; \* Correlation is significant at the 0.05 level (2-tailed) ; R<sup>2</sup> : Coefficient of determination; P: Precipitation; GC: growing cycle; n/N: duration of sunshine



# Effect of land characteristics to maize yield (Regression analysis)

Land Characteristics	R <sup>2</sup>	Regression Equation
P_GC	0,241*	$Y = 0,008 - 0,0000514X + 0,408X^2$
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n/N_2	0,580**	$Y = 8,974 - 18,004X + 12,773X^2$
n/N_4	0,540**	$Y = 24,924 - 77,639X + 67,67X^2$
pH H <sub>2</sub> O	0,341*	$Y = 21,77 - 7,67X + 0,754 X^2$
Drainage	0.088	$Y = 3,613 - 0,620 X$
Flooding	0.089	$Y = 3,666 - 0,678X$
Base saturation	0,363*	$Y = 1,838 + 0,039X$
Amount of exchangeable bases	0,123	$Y = 2,011 - 0,148X + 0,004X^2$
C-organic	0,305*	$Y = 1,493 + 0,132X + 0,506X^2$



# Criteria of land suitability for maize in the humid tropics of South Sulawesi

Characteristics	Land Suitability Class			
	S1	S2	S3	N
n/N vegetative stage (2 <sup>nd</sup> month)	0.50 - 0.55	0.45 - 0.50 0.55 - 0.80	>0.80 <0.45	- -
n/N generative stage (4 <sup>th</sup> month)	>0.64	0.46 - 0.64	<0.46	-
Base saturation (%)	>62	41-62	10-41	<10
pH H <sub>2</sub> O	6.8 - 7.0	6.3 -6.8 7.0 -8.0	5.47 -6.3	<5.47 >8.0
Organic Carbon (%)	>2.2	1.1 - 2.2	<1.1	-
Growing cycle rainfall (mm)	650-900	550-650 900-1.200	270-550 >1.200	<270 -

**Note: S1: highly suitable; S2: moderately suitable; S3: marginally suitable; N: unsuitable**



# Conclusions



The land characteristics which significantly correlated with maize yield were climate (precipitation during the growing season, length of radiation at the vegetative and generative phase), soil fertility (base saturation, soil pH and soil organic carbon).



The optimal value of the land characteristics for maize yield that is rainfall during growing season is 650-900 mm, length of radiation at vegetative phase is 0.50-0.55 and the generative phase is  $> 0.64$ , then base saturation is  $> 62\%$ , soil pH is about 6.8-7.0, and organic carbon is  $> 2.2\%$ .

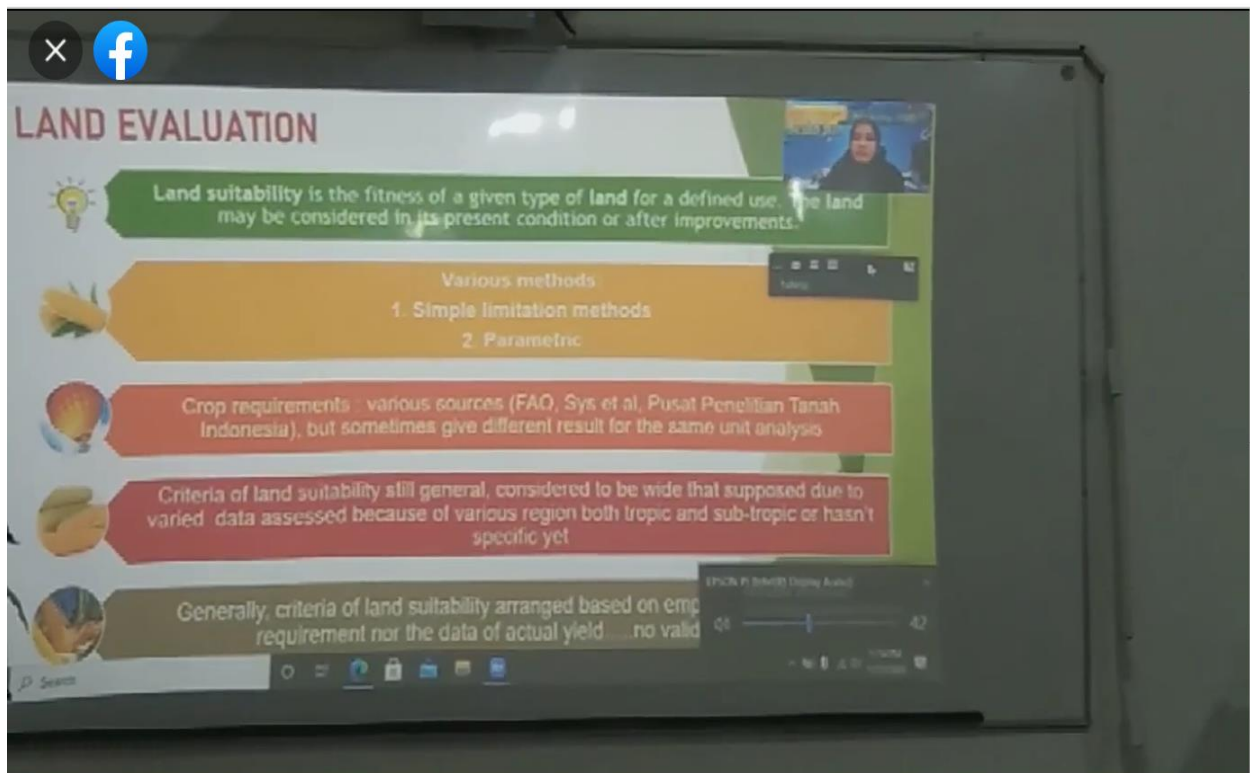


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**TERIMA KASIH**  
**Thank you**



Foto saat presentasi di Konferensi The 3<sup>rd</sup> GIESED 24 Nov 2020





# Certificate of Appreciation

This Award is Presented to

**Dr. Risma Neswati**

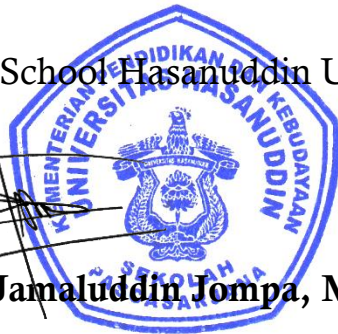
As Presenter

for Participating in the The 3<sup>rd</sup> international conference on Global Issue for Infrastructure, Environment, and Socio-Economic Development 2020 (GIESED - 2020) by theme “*SDGs Center Universitas Hasanuddin Enhancement of science and technology application to support the implementasion of SDGs*”

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