

RINGKASAN

Irwan Mado, NIM 107040100111053. Program Pascasarjana Universitas Brawijaya, Analisis potensi produktivitas lahan untuk pengembangan tanaman jagung di Kabupaten Gowa Sulawesi Selatan. **Promotor: M.Luthfi Rayes, Ko-Promotor Syekhfani, dan Sudarto.**

Pengembangan lahan untuk tanaman jagung dapat dilakukan dengan mengetahui potensi produktivitas dari suatu lahan. Analisis potensi produktivitas dapat dilakukan dengan merumuskan suatu model, yang nantinya dapat digunakan untuk pengembangan tanaman jagung.

Penelitian bertujuan untuk merumuskan model produktivitas lahan secara spesifik lokasi, menentukan tingkat potensi pengembangan lahan, dan menyusun kriteria persyaratan tumbuh tanaman jagung. Penelitian dilaksanakan di Kecamatan Bontomarannu dan Pattallassang Kabupaten Gowa Sulawesi Selatan. Berlangsung dari bulan Maret sampai September 2014.

Penelitian ini diawali dengan survei awal untuk mengetahui besarnya produksi yang terdapat pada setiap desa/kecamatan di Kabupaten Gowa, selanjutnya dibuat kriteria tingkat produksi, tinggi ($> 80\%$) potensi produksi atau $> 7.2 \text{ t ha}^{-1}$), sedang ($60 - 80\%$ atau $5.4 - 7.2 \text{ t ha}^{-1}$), dan rendah ($< 60\%$ atau $< 5.4 \text{ t ha}^{-1}$) potensi produksi jagung varietas Bisi 2 adalah 9 t ha^{-1} . Kemudian dilakukan penentuan titik pengamatan dengan menggunakan sistem Grid. Pengamatan dan pengambilan sampel tanah dilakukan dengan membuat lubang pengamatan atau minipit pada setiap satuan lahan. Satuan lahan didasarkan atas formasi geologi, kelas lereng, kedalaman efektif dan penggunaan lahan. Analisa laboratorium dilakukan untuk mengetahui tekstur tanah, air tersedia, kapasitas menahan air, bobot isi, KTK, pH, N, K, dan C-organik. Perumusan model produktivitas, dan penentuan tingkat potensi lahan, penetapan produksi jagung di lapangan dilakukan dengan menggunakan metode ubinan ($2.0 \times 2.0 \text{ m}$). Analisis data dilakukan dengan menggunakan korelasi dan regresi untuk mengetahui pengaruh dari variabel-variabel tersebut terhadap produksi jagung, dan menggunakan metode kriging untuk memetakan penyebaran karakteristik lahan di lokasi penelitian.

Hasil penelitian menunjukkan bahwa berdasarkan analisis korelasi dan regresi (*Step wise*) variabel kedalaman (x_1), bahan organik (x_{10}), dan K (x_9) memberikan korelasi sangat nyata ($\text{sig} < 0.01$) dan N (x_8) memberikan korelasi yang nyata ($\text{sig} < 0.05$), hal ini mengindikasikan bahwa ke empat variabel tersebut memberikan pengaruh yang nyata dan sangat nyata. Gabungan dari ke empat variabel tersebut, memberikan pengaruh sebesar 69.5% dengan tingkat keeratan atau hubungan yang sangat kuat (0.834). Model produktivitas lahan yang diperoleh di lokasi penelitian adalah $Y = 0.654x_1 + 0.021x_8 + 0.012x_9 + 0.008x_{10}$. Tingkat potensi pengembangan lahan untuk tanaman jagung sedang sampai baik. Kisaran karakteristik lahan yang optimal untuk produksi jagung adalah kedalaman yang $> 61 \text{ cm}$ (S1), $> 25 - 61 \text{ cm}$ (S2), $16 - 25 \text{ cm}$ (S3), dan $< 16 \text{ cm}$ (N), untuk bahan organik $> 2.92\%$ (S1), $0.7 - 2.92\%$ (S2), $0.46 - 0.70\%$ (S3) dan lebih kecil dari 0.46% (N). Kemudian untuk N total $> 0.32\%$ (S1), $0.11 - 0.32\%$ (S2), $0.07 - 0.11\%$ (S3), dan $< 0.07\%$ (N), untuk K $> 0.75 \text{ me kg}^{-1}$ (S1), $> 0.27 - 0.75 \text{ me kg}^{-1}$ (S2), $0.17 - 0.27 \text{ me kg}^{-1}$ (S3), dan $< 0.17 \text{ me kg}^{-1}$ (N).

Kata Kunci : Model Kriging, Sistem Parametrik, Kesesuaian Lahan, Produktivitas Jagung.

SUMMARY

Irwan Mado, NIM 107040100111053. Doctoral Program of Postgraduate Program, Brawijaya University, Analysis of Land Productivity Potential For Maize Development On Gowa Regency, South Sulawesi, under **Supervised/Promotor by: M.Luthfi Rayes, Co-Promotor Syekhfani, and Sudarto.** .

The objectives of this research are to formulated land productivity model in specific location, determined the level of land development potential, and produce a criteria of maize growth requirement. This research was conducted at Bontomarannu and Pattalassang Districts, Gowa Regency, South Sulawesi. It was done from March to September 2014.

Pre-survei was done in Gowa regency to collect maize production data in this area. The collected data was used to arrange production criteria in: high (production $>7.2 \text{ t ha}^{-1}$ or $>80\%$ of potential plant production), medium (5.4 to 7.2 t ha^{-1} or $60 - 80\%$ of potential plant productio), and low ($<5.4 \text{ t ha}^{-1}$ or $<60\%$ of potential plant production). Representing of soil profile and collecting soil sample was done based on grid sampling with stratified random sampling as selected from the field work map. Soil samples were collected from different dept in each profiles and analyzed for physical and chemical characteristics using the standard analytical methods. Soil physical and chemical properties analyzed method such as soil texture was determined using hydrometer, water holding capacity was determined by pressure plate apparatus, sample core method was used to bulk density, and soil reaction (pH) was determined in 1:2 suspension using standard pH meter, Cations Exchange Capacity (CEC) estimation using Am-Acetate saturated method. Total nitrogen (N-tot.) was estimated using Kjeldahl distillation method. Total potassium (K-tot.) was calculated using Am-Acetate saturated method. Soil organic carbon was estimated using the Walkley and Black wet oxidation method. In addition, environment conditions such as climate, land characteristics (soil depth, topography, slope, soil type, land use), maize production in each district, productivity index was used as compile data in developing analysis of the site.

Combining of soil sample data, bio-physical land characteristics, and maize production is analyzed in Stepwise as parametric system and Kriging Model to determine potential land and distribution area for development of maize production. The results showed based on step wise analysis that bio-physical land characteristics variables as depth of soil (X_1), organic matter (X_8), and total potassium (X_9) had very significant effect (sig <0.01) and total nitrogen (X_{10}) had significant effect (sig <0.05). Analysis combination of four variables is found 69.5% with coefficient regression $r = 0.834$ which means strong relationship between each variable in the study area. Land productivity models obtained in the study site was $Y = 0.0654X_1 + 0.021X_8 + 0.012X_9 + 0.008X_{10}$. Land suitability distribution based on Kriging Model is found that the range of land characteristics optimal for corn production is the depth of $> 61 \text{ cm}$ (S1), $25 - 61 \text{ cm}$ (S2), $16 - 25 \text{ cm}$ (S3), and $<16 \text{ cm}$ (N). For organic matter $> 2.92\%$ (S1), $0.7 - 2.92\%$ (S2), $0.46 - 0.70\%$ (S3), and $<0.46\%$ (S3). Nitrogen variable was $> 0.32\%$ (S1), $0.11 - 0.32\%$ (S2), $0.07 - 0.11\%$ (S3), and $<0.07\%$ (N). Potassium variable was $>0.75 \text{ cmol/kg}$ (S1), $0.75 - 0.27 \text{ cmol/kg}$ (S2), $0.27 - 0.17 \text{ cmol/kg}$ (S3), and $< 0.17 \text{ cmol/kg}$ (S3). The level of land potential development for maize production is moderate to good. This results confirmed that parametric system using step wise and Kriging Model could be applied in determine land suitability class to provide of maize development area.

Keywords: Step wise, Kriging Model, Parametric system, Land suitability, Maize production.