PROCEEDINGS
International Seminar on Climate Change & Food Security
October 24th-25th, 2013
Palembang, South Sumatra

FACULTY OF AGRICULTURE
SRIWIJAYA UNIVERSITY
# TABLE OF CONTENTS

## KEYNOTE SPEECH

Food Security and Climate Change in Developing Economies: Evidences and Policy Responses  
Mad Nasir Shamsudin (Universiti Putra Malaysia)  

Economic Impact of Climate Change on Rice Production  
Negin Vaghefi (Faculty of Agriculture Mazandaran University Iran)  

Innovation to address the Potential Impacts of Climate Change on Agriculture in Indonesia: Research Needs  
Perdinan (CCROM-SEAP/PERHIMPI)  

## SUPPORTING PAPERS

### Session 1

Pro-Poor Technology in Small Scale Farming for Adaptation to Climate Anomalies  
Maman Rahmansyah, Arwan Sugiharto and I Made Sudiana  

Farming System in The Region as a Dry Climate Impacts of Climate Change Adaptation in Southeast East Nusa  
Harmi Andrianyta and Titim Rachmawati  

Rice Supply on Climate Anomaly Condition in Central Java Province  
Nandika Pratiwi  

Potency and Intitutional Performance on Integration System of Beef Cattle and Oil Palm (SISKA) For Increasing the Beff Cattle Population  
Sriati, Armina Fariani, Gatot Muslim, Imron Zahri, and Elly Rosana
Dynamic Supply Response of Rice in Jambi Province
Edison

Anticipation and Adaptation of Climate Change for Food Crops in Indonesia
Supli Effendi Rahim

Impact of Climate Change on Soybean Production: a Nutrition and Food Security Perspective in Indonesia
Lazarus Dawa

Rice Production Enhancement Through Spatial Utilization "Land for Plant Life" in Industrial Crop Forest (ICF ) Zone for Avoiding of Peat Fire
Najib Asmani, Armaizal, and Iwan Setiawan

Diversification of Staple Foods as a Solution to Overcome Food Vulnerability Caused by Global Climate Change
Yunita

Are There Any Relationship Between Rice Barns Development and Welfare of Farmers in South Sumatra, Indonesia?
Dessy Adriani and Andy Mulyana

Diversification of Food Consumption in South Sumatera: an Analysis Based-on Desirable Dietary Pattern
Faharuddin and Andy Mulyana

Food Insecurity and Global Food System: Political Decision?
Nina Lisanty

Rice Consumption Analysis for Different Income Groups in Palembang, Indonesia
Maryati Mustofa Hakim
Communication Analysis of Edamame (Glycin max (L.) Meriil) Supply Chain Management: Case of Farmer Group in West Bandung Region, West Java, Indonesia 
Sri Fatimah and Amelia N. Hayati

Factors Influence Farmers’ Decision to Convert Rainfed Lowland in South Sumatera, Indonesia 
Erni Purbiyanti, Maryanah Hamzah and Eka Mulyana

The Farmer Choices in Utilizing Organic Fertilizers: Tidal Swamp Rice Farmers Case 
Siti Komariah Hildayanti, Andy Mulyana, Sriati, and Nuni Gofar

Efficiency Technical and Economic Analysis of Tall Variety Farming at Different Tidal Land Typologies in South Sumatra Province 
Yudhi Zuriah WP and M.Yamin

Labor Allocation and Leisure Time of Oil Palm Farmers on Indonesia’s Wet and Dry Lands 
Lifianthi, Selly Oktarina and Desi Aryani

The Economic Behavior of Rubber Farm Household in term of Achieving of Their Family Food Security in Musi Banyuasin Regency, South Sumatra Province, Indonesia 
Laila Husin

The Comparative Analysis of Production and Consumption Behavior of Rice Farmer Households Based on Land Typology and Capital Resources 
Andy Mulyana, Yunita, Riswani, and Maryati Mustofa Hakim

Session 2

Coastal Sand Soils and Their Assessment for Upland Rice Cultivation In Terengganu, Malaysia 
H.M. Edi Armanto, Adzemi Bin Mat Arshad, Elisa Wildayana and Usman M. Ishaq
The System of Biological-Environment Adaptive Control as Alternative Technology to Address Climate Change
Tamrin

The Effect of Eco-Microbe Application for Water Quality Bioremediation, Pilot Test at FRIM Kepong, Malaysia

Quality Assessment of Delayed-Drying Rice
Filli Pratama

The Point of Zero Charge of Coal Fly Ash due to Chicken Manures Addition and Incubation Time
Agus Hermawan, Sabaruddin, Marsi, and Renih Hayati

The Decrease of Pempek Lenjer Quality During Storage at Room Temperature
Railia Karneta, Amin Rejo, Gatot Priyanto, and Rindit Pambayun

Effect of Foaming Agents On Pandan Leaf Powder Characteristics Processed by Foam Mat Drying Method
Prima Septika Dewi, Agus Wijaya and Gatot Priyanto

The Effects of Climate Change on Plant Diseases and Possible Means for Their Mitigation
Nurhayati

Monensin Clearance Trait and Its Effect on Methanogenesis in The Rumen
Arfan Abrar, Takamitsu Tsukahara, Noriko Matsukawa, Tomomi Ban-Tokuda, Makoto Kondo, Wang Chau, and Hiroki Matsui

Climate Change Impacts on The Walang Rice Pest (Leptocoris oratorius F.) in Tidal Field on CI 200
Zaid Subrata, Kurniawan Subatra, and Imelda Marpaung
Estimates on Carbon Stored of Standing Trees as a Climate Change Mitigation Efforts
Yuanita Windusari, Zulkifli Dahlan, and Yuniar Pratiwi

Minimal Cooking Time Determination of Pepes Nile Tilapia Processed by Microwave Oven
Riya Liuhartana, Gatot Priyanto, and Basuni Hamzah

Toxicity Characteristics of Bacillus Thuringiensis Strain MSP-02 Agricultural Insect Pests
Yulia Pujiastuti, A. Muslim, Hisanori Bando, and Shin-Ichiro Asano

Improvement of Rice Growth and Productivity Through Balance Application of Inorganic Fertilizer and Biofertilizer in Inceptisol Soil of Lowland Swamp Area
Neni Marlina, Nuni Gofar, A.Halim, PKS, and A.Madjid

Water Management of Swampland as Adaptation Toward The Climate Change in South Sumatra
Puspitahati, Edward Saleh, and Purnomo RH

Tactics of Equitable Livelihood for Food Producers Towards Hedonistic Society’s Life
Marwan Sufri

Effect of Micro Climatic Condition of Oil Palm on Growth and Yield of Rice Plant in Tidal Swamp
M. Umar Harun

Climate Change Influences The Distribution Of Parasitic Plants On Duku Tree (Lansium Domesticum Coor.)
Chandra Irsan

APPENDIX
Rice Production Enhancement through Spatial Utilization "Land for Plant Life" in Industrial Crop Forest (ICF) Zone for Avoiding of Peat Fire

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Abstract. Approximately 588,841 hectares of the 645,249 hectares of degraded peat land in Ogan Komering Ilir (OKI), South Sumatra Province are being rehabilitated through ICF. Under government regulations that the layout of the plantation land use intended by 70 percent for staple crops with of Acacia crassicarpa species, and 5 percent is allocated to the plant life that aim for cultivating by people around ICF as a source of income. Land to plant life can be used for food crops, horticulture, and plants that have woody tree. Around the plantation, is still there, the local people who do farming activities by burning peat (the local term is “Sonor System”). Farmers Rice conducting Sonor System not fully willing to work the land because prohibited to burn the peat. Former transmigran farmers who live around of ICF has begun starting clearance through the cultivation of land life or Tillage System. Research conducted in Simpang Tiga Sakti Village, Tulung Selapan Sub district and in Simpang Heran Air Sugihara Sub district in OKI Regency, using Disproportionate Stratified Random Sampling Method. Results of research showed that farming Sonor System only produced rice was 0.47 tons and revenues was 1,507.00 million rupiah per hectare, while farmers Tillage System got rice yield by 3.30 tons and revenues was 6,960.50 million rupiah per hectare. Excess production that was produced by farmers using Tillage System without burning peat reached by 7.0 times compared with the farmers of Sonor System.

Keywords: Plant Life, Land Cultivation, Rice Production

1. Background

Indonesian's forest area until the year 2009 was 88.17 million hectares. Deforestation that occurred in the 2000-2009 Period covering 15.16 million hectares (Sumargo et.al., 2011). Until the Year 2008, in Indonesia there were 84.70 million hectares of degraded land, that there was 69.86 percent in forest zone. Shrinkage forests in Indonesia could not be separated from land and forest fires events resulting from El Nino phenomenon of 1997. Rehabilitation of degraded land in Indonesia of which is done through the development of plantation forests or industrial crop forest (ICF). Its target reach until 9.2 million hectares or 16 percent of production forest area. Minister of Forestry Decree No. 70/Kpts-II/1995, Minister of Forestry Decree No. 246/Kpts-II/1996 and Minister of Forestry Regulation No. P.21/Menhut-II/2006 have set layout of ICF space. Space of ICF allocated by 70 percent for staple crop, 5 percent for area of the plant life, 10 percent for area of local species plant, 10 percent for conservation area, and 5 percent for infrastructure (General Directorate of Forestry Production Development of The Forestry Ministry Republic of Indonesia, 2010).

In Ogan Komering Ilir Regency of South Sumatra, in its production forest area, there were 645,249 hectares degraded peat land. Amounting to 90.73 percent or 585,405 hectares of it allocated for ICF. Realization of planting acacia as staple crop until year 2012 reached approximately 250,000 hectares. Area for plant life allocated was 32,777.87 hectares or 6.0 percent. Activities in the area of plant life effort to create jobs for the people live around ICF through agribusiness activities in agriculture and forestry. Other plants are cultivated in this area were food crops, forest trees or woody species and types of fruits. ICF activities not only for the company's interests in the timber business, but also simultaneously increase economic activities based on agriculture and social welfare (Armaizal, 2012).

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ICF company has implemented a variety of plant life activities such as paddy rice and corn, and other crops such as citrus. ICF companies do guidance for communities to undertake land clearing without burning (Armaizal, 2012). Habits of local people who live around or in area of ICF were used to plant rice with clearing land by burning, which known as “Sonor System”. "Sonor" means the traditional rice planting in peat swamps in the long dry season, with no attempt to control the fire. Planting is done by way of sowing rice seeds, left without maintenance such as fertilizing, pest control and weeding grass until harvest (Suyanto and Khususiyah, 2004). Ashes resulted by burning of peat as a medium as plant nutrients (Abidin, 2011). In the other hand, former transmigran farmers have been done plant rice without burning. Their land preparation were done chemically by using herbicides (Asmani et al., 2011).

Based on the above description, the purpose of the study was to assess the potential for development of food crops in the area of plant life through rice cultivation by way of land clearing without burning to change the traditional way "Sonor System".

2. Method

Research method used in this study was Case Study, and the sampling was done by using a Disproportionate Stratified Random Sampling Method. Strata in this study consisted of local farmers who did rice cultivation by land fire or Sonor System (1st Stratum), and farmers who did rice cultivation by land management or Tillage System (2nd Stratum). Total of samples of each stratum was 30 people. The study was conducted at Simpang Tiga Sakti Village Tulung Selapan Sub district for 1st Stratum, and for 2nd Stratum performed at Simpang Heran Air Sugihan Sub district, which all the location are in the OKI Regency South Sumatra Province. Primary data collected through interviews using a questionnaire, carried out in June 2013. To find out the losses peat fires was obtained from one of the employees of the company as an example of the in-depth study. Secondary data drew from variety of sources such as the District Head Office in Simpang Tiga Sakti, Cooperatives of Bina Andalas in Simpang Heran, and Main Office PT.SBA Wood Industries in Palembang. Data was processed in tabulation and presented using quantitatively description.

3. Result and Discussion

32,777.87 hectares of plant life in the areal of ICF is a potential to be developed as rice fields, swampy or tidal rice fields. This area if used for planting rice one time per year potentially can support rice supplies. In addition, there are many spaces, around 5 thousand hectares, are delimiter between embankment blocks which can be used to plant rice or other food crops. The total of these two areas are 5 percent of the 758,732 hectares of rice fields in South Sumatra Province (Central Bureau of Statistics of South Sumatra Province, 2012). If both types of these areas were utilized, the potential rice can be obtained around 100 thousand tons per year.

Table 1. Cost and Revenue Analysis of Rice Farm between Sonor System in Simpang Tiga Sakti Village and Tillage System Simpang Heran Village Ogan Komering Ilir Regency South Sumatra Province, in June 2013

<table>
<thead>
<tr>
<th>No.</th>
<th>Parameter</th>
<th>Unit</th>
<th>Sonor System</th>
<th>Tillage System</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Land size</td>
<td>ha²</td>
<td>2.20</td>
<td>1.60</td>
</tr>
<tr>
<td>2.</td>
<td>Production</td>
<td>kg ha⁻¹</td>
<td>470.00</td>
<td>3,300.00</td>
</tr>
<tr>
<td>3.</td>
<td>Cost production</td>
<td>Rp ha⁻¹</td>
<td>373,000.00</td>
<td>3,400,000.00</td>
</tr>
<tr>
<td>4.</td>
<td>Selling price of rice</td>
<td>Rp ha⁻¹</td>
<td>4,000.00</td>
<td>3,800.00</td>
</tr>
<tr>
<td>5.</td>
<td>Revenue</td>
<td>Rp ha⁻¹</td>
<td>1,880,000.00</td>
<td>12,540,000.00</td>
</tr>
<tr>
<td>6.</td>
<td>Net revenue</td>
<td>Rp ha⁻¹</td>
<td>1,507,000.00</td>
<td>6,060,500.00</td>
</tr>
<tr>
<td>7.</td>
<td>Net revenue total</td>
<td>Rp²</td>
<td>3,315,000.00</td>
<td>9,696,800.00</td>
</tr>
<tr>
<td>7.</td>
<td>R/C</td>
<td></td>
<td>5.04</td>
<td>1.93</td>
</tr>
</tbody>
</table>

The results of research in Table 1 has indicated that rice grown on degraded peat land by way of opening the land without burning, farm produced production of rice 7 tomes more than the way of the Sonor
System. The land area under cultivation using Tillage System by farmers of the former transmigran was capable only 1.60 hectares. Farmer who did the activities of Sonor System, open land for rice reached 2.20 hectares. After rice seed spreading, Sonor farmers were not doing plant maintenance activities such as fertilizing, pest control, and weeding. Its cost production was lower than Tillage System. Costs incurred only for the purchase of seed rice, whereas labor is derived from his own family. Sonor System income was lower around four times than the Tillage System. Its cost production only 10.97 percent compared to Tillage System. Comparison of revenue and costs of production (R/C) in Sonor System was 5.04 whereas Tillage System was 1.93.

Base on the description of the results of these studies that managing peat land by using inputs such as fertilizers and herbicides can increase rice production compared to the way of fires. Tillage Systems in addition to increase production and income as well as reduce the release of green house gas emission. The amount of emissions from the burning degraded peat land based on research results Asmani et.al. (2011) reached 49.90 tons of carbon dioxide per hectare per year. Preventing sonor can reduce green house gas emission. Firing peat cause reducing soil quality, biodiversity and hydrological cycle (Muhendar, 2012). The losses of socioeconomic activities of Sonor System can cause laziness nature for farmers because they want to achieve something easily and not productive. The productivity of rice was low. Farmers who continue to implement Sonor System has a reason that did it very simple, low input, low labor and low cost.

ICF companies are very interested in the prevention of peat fires. Peatland fires resulted in the destruction of investment in plant acacia and depletion of peat as media acacia. The company of ICF for fire prevention caused by sonor activity spent of money around 500 thousand per hecata. If one hectare of land has been planted with young acacia burning causes an average loss of about 5 million rupiah per hectare. Anticipating the peat fire, the company invites the public about HTI joined the group Concerned Citizens Fire (Armaizal, 2012).

4. Conclusion

From the results of the study concluded that:

1. The area of plant life on the plantation and embankment spatial divider block potentially planted for the development of rice field as big as 5 percent of total rice land of South Sumatra to support food stock.
2. Managing peat land with cultivating rice with tillage potentially to increase production of rice 7 times and net revenue 4 times compared with sonor by burning of peat.
3. People who seek sonor cultivation system still continues to strive to do such activities because of the relatively low cost of production that do not require a lot of inputs and labor employment.
4. The company of ICF very concerned to prevent peatland fires because it would destroy investment in plant and eliminate peat as a medium crop.

5. References


