

Artik1435\_JWEM\_Journal\_Vol\_3  
\_2\_\_\_72-78,\_Oct2015  
*by* Dr Elisa Wildayana

---

**Submission date:** 16-May-2019 09:55AM (UTC+0700)

**Submission ID:** 1131224990

**File name:** Artik1435\_JWEM\_Journal\_Vol\_3\_2\_\_\_72-78,\_Oct2015.pdf (365.63K)

**Word count:** 3730

**Character count:** 20189

## Formulating Rice Fields Conversion Control to Oil Palm Plantations in Tidal Wetlands of South Sumatra, Indonesia

ELISA WILDAYANA

Faculty of Agriculture, Sriwijaya University, South Sumatra, Indonesia,

### ABSTRACT

The research aimed to gain reasons of farmers to convert their rice fields, and to formulate rice fields conversion control to oil palm plantations in tidal wetlands of South Sumatra. The research was carried out in a drainage and irrigation area of Pulau Rimau, Banyuasin District South Sumatra. Collected data consists of primary and secondary data. Primary data are taken from farmers who have already converted their rice fields into oil palm plantations. Secondary data were collected from the village, the District Agriculture Office and Statistic Agency. Data was collected through the Focus Group Discussion (FGD). Data analysis was performed using Analysis Hierarchy Process (AHP) to determine the factors that influence the decision of farmers to convert their land to oil palm plantation. The research resulted that if rice yields was estimated an average 3.00 tons Milled Dry Grain (MDG)/ha, then in 2006 with the existing land could produce rice as much as 127,719 tons MDG/year, but in 2013 the productivity of agricultural land decreased to 60,138 tons MDG/year. If the predicted needs of rice in year 2006 were 50,000 tons MDG/year and increased by 75,000 tons MDG/year in 2013, then if the land use is not immediately controlled, that Pulau Rimau will deficit rice. Factors contributing to land conversion are divided into three factors, namely technical aspects, economical aspects and environment aspects. The control concept can be divided in macro concept and micro concept. The macro concept generally be only done by the government or a strong industry who pays a lot of attention to the local community. The micro concept programs can be done either by the government, private or local communities.

**Key words:** Formulating, land conversion, control, tidal wetlands, South Sumatra

### INTRODUCTION

Land conversion in the tidal wetlands belongs to a serious problem and almost never got the full attention of the Government which becomes the main problems affecting the availability of rice yields. By 2015, Indonesia's population is expected to reach 250 million people with food requirement of about 35,123 million tons of rice. In year of 2020, Indonesia needs 9.3 million ha of rice fields to fulfill the needs of the nation. Now, rice fields are available just 8.11 million ha. From year to year rather than an expansion takes place, but extensive rice fields shrunk (Suswono, 2013).

This rice field shrinkage also occurs in Pulau Rimau which is being productive rice fields converted into oil palm plantations (Armanto *et al.*, 2011). It can be evaluated from the results in Pulau Rimau rice yields that can be used to fulfill the needs of local people for 2-3 months only.

After four decades some places in Pulau Rimau are not able to be cultivated for rice because drainage and irrigation equipment do not function properly. Besides that there are a lot of constraints for rice growth found, such as water-saturated rooting zone (anaerobic layers), the presence of pyrite (FeS<sub>2</sub>), low to very low soil fertility, the presence of deep peat, excessive waterlogging and impacts of sea water intrusion (salinity). Management of pyrite soils and peat soils are difficult and if wetlands are mismanaged, then they cannot be planted again because of high soil acidity (Armanto, 2014).

Correspondence: Elisa Wildayana, Faculty of Agriculture, Sriwijaya University, South Sumatra, Indonesia.  
 Phone/Fax +62711820933 HP. +628127338950  
 email: wildayana.elisa@yahoo.com

Land conversion is generally caused by population growth, economic activity and development which increase the demands and the need for land to carry out the development activities both the agriculture and non-agricultural sectors (Wildayana *et al.*, 2012). Such incidents are relevant with the economic principles that the land user always maximize their profits and land use (Armanto *et al.*, 2008 and 2013). Development sectors that are considered as non-productive and less profitable will be quickly replaced by more productive and profitable activity (Wildayana, 2013). Thus the competition took place for the most profitable land use which is to promote land conversion (Wildayana *et al.*, 2008a, 2008b and 2011).

Such problems can be seen the effect of changes on the balance of self-sufficiency (Wildayana, 2015), food security and the disruption of the spatial allocation structure that has been designated as rice regional centers and agricultural development of tidal wetlands in the Banyuasin Spatial Planning (Euroconsult, 1994, Kabupaten Banyuasin, 2014).

Land conversion caused permanent or fixed problems in the long term despite the land conversion is no longer exist. To prevent and to control land conversion, policy makers should have adequate data and information relating to the factors that influence farmers to convert their lands (Wildayana, 2014). Therefore, it is necessary to do research to gain reasons of farmers to convert their rice fields, and to formulate rice fields conversion control to oil palm plantations in tidal wetlands of South Sumatra.

## METHODS

The research was carried out in Pulau Rimau, Banyuasin District South Sumatra with Latitude  $-2^{\circ} 26' 20''$  South and Longitude  $104^{\circ} 29' 15''$  East (Figure 1).

After the drainage and irrigation network of Pulau Rimau was built, most of the research areas were cultivated as rice fields for transmigration program. Government built

the technical drainage and irrigation networks to fulfill the water needs of rice fields.

### Research site

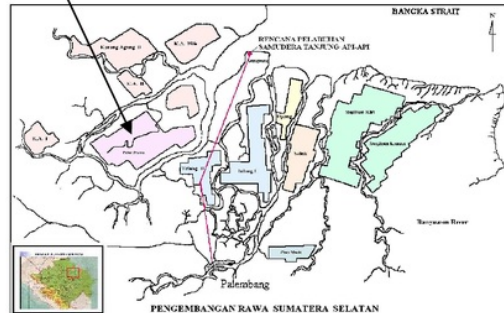


Figure 1. Research site in Pulau Rimau (Direktorat Rawa dan Pantai, 2009)

The materials and tools used in this research are some thematic maps, namely administrative map of Banyuasin (1:250,000 scale), Banyuasin land use map (scale 1: 250,000), irrigation and drainage network map (scale 1: 100,000).

Collected data consists of primary data and secondary data. Primary data are directly taken from farmers who have already converted their rice fields into oil palm plantations. Secondary data were collected from the villages, District Agriculture Office and Statistic Agency. Data was collected through the Focus Group Discussion (FGD) involving village cooperatives managements (KUD), farmers and women farmers. Data analysis was performed using Analysis Hierarchy Process (AHP) to determine the factors that influence the decision of farmers to convert their rice land to oil palm plantation. All data are analyzed and performed in forms of tables and narrative descriptions.

## RESULTS AND DISCUSSION

The less attention and improvement of the management system by the related institutions make farmers who are tempted to plant oil palm. This condition making most of the rice farmers choose to switch into oil palm

planters. However some farmers used non-excellent seed of oil palm, and some oil palm is not productive. In addition, the occurrence of rice fields conversion to oil palm plantations was caused by many factors, namely oil palm plantation income is higher with lower risk, selling value of plantation is higher, oil farm production costs are lower, and the limited availability of water.

In Governmental Regulation (Act) Number 41 of 2009 on the Protection of Agricultural Land, Government has made arrangements on land conversion. The function changes of sustainable agricultural land will be not sustainable agricultural land either permanently or temporarily, this will be subject to criminal penalties. However this

regulation is not yet properly implemented in the field, especially in Pulau Rimau.

### Distributions of Land Conversions

According to the dominant livelihoods of farmers, in year of 2006 most of land was utilized for rice fields, rainfed rice, shifting cultivations which leads in shaping economic sector of farmers, followed by oil palm and rubber plantations. There were still enough non-productive land in the form of wetlands with Gelam forest, belidang grass, shrubs and herbs as well as tidal wetlands grass. The exploited land in Pulau Rimau is presented in Table 1.

Table 1. Land use in Pulau Rimau in 2006 and 2013 \*/

Nr	Land use	Acreages (ha)		Difference	
		2006	2013	ha	%
1	Rice fields				
	Technical irrigation	37,378	17,367	-20,011	-53.54
	Rainfed rice	5,195	2,679	-2,616	-48.43
2	Other land uses				
	Building/emplacement	985	2,788	+1,803	+183.05
	Garden farming	105	47	-58	-55.24
	Shifting cultivation	211	105	-106	-50.24
	Pasture and livestock	525	389	-136	-25.90
3	Wetlands				
	Tidal wetlands	1,606	987	-619	-38.54
	Peat soils	28,800	15,675	-13,125	-45.57
4	Plantations	21,500	50,899	+29,399	+136.74
5	Infrastructure	3,603	8,972	+5,369	+149.02
	Total	99,908	99,908	0	--

Note : \*/ It was calculated and interpreted on the basis of Banyuasin land use map (1: 250,000 scale) and landsat 2006 and 2013 as well as Google map 2013

In 2006 the acreage of rice fields was around 37,378 ha and the rice fields could play an important role in the income formation of farmers. In 2013 their role is diminishing due to shrinking rice fields which amounted to 17,367 ha (-53.54 %) and converted into oil palm plantations increased by 50,899 ha (+136.74 %) whereas plantation area in 2006 was only around 21,500 ha. It means that plantations increased more than doubled in 7 years. During the 7-year increase is not only in plantation acreages (+136.74 %), but also building (+183.05 %) and infrastructure (+149.02 %), whereas other sectors decreased in accordance with the

needs of farmers and the economic development of the farmers.

Most of the changes of agricultural land was converted into oil palm plantations, this is because farmers consider that activities of oil palm plantations is more promising when compared to rice fields. Thus gradually if it is not anticipated, it could lead to a potential loss of rice fields in Pulau Rimau and replaced with oil palm plantations. High rates of agricultural land conversion resulted in a decrease in rice yields, this affects the food supply imbalance.

If rice yields was estimated an average 3.00 tons Milled Dry Grain (MDG)/ha, then

in 2006 with the existing land could produce rice as much as 127,719 tons MDG, but in 2013 the productivity of agricultural land decreased to 60,138 tons MDG. If the predicted needs of rice in year 2006 were 50,000 tons MDG/year and increased by 75,000 tons MDG/year in 2013, then if the land use is not immediately controlled, that Pulau Rimau will deficit rice. Their effect is that rice should be imported from other regions although Pulau Rimau is determined as one of rice centers in Banyuasin.

Rice cultivations are also vulnerable to production failure caused by pests and natural digesters. Farmers need a considerable cost, which will need inputs (fertilizers, pesticides etc.) and labor costs are very high, however rice price is so low. Oil palm plantations are more attractive due to higher productivity than rice. The average income of rice farmers is only Rp 3.00-4.00 millions/ha per year with a high management costs while income of oil palm farmers is 8-12 millions/ha per year with low management costs. Besides that the risk of plantation failure and prices are relatively stable, thus the risk faced by the farmers is relatively small compared to rice farmers. Other reasons why farmers converted their rice fields are mostly induced to lack of

information and having low bargaining positions.

#### Factors Contributing to Land Conversion

Data indicated that factors contributing to land conversion can be divided into three factors, namely (1) Technical Aspects which covering components of long-lived oil palm, difficulty for getting Saprotan (means of agricultural production), more easily oil palm cultivation techniques and more difficult rice post-harvest process, (2) Economical Aspects consist of the low selling price of rice, oil palm harvested every 2 weeks, the more secure or stable price of FFB (Fresh Fruit Bunches), higher profit for oil palm plantation and lower oil palm maintenance costs, and (3) Environment Aspects are that irrigation/drainage conditions do not support, the threat of pests and diseases of rice, land suitability for oil palm plantation, higher bargaining power of smallholders, and less labor for oil palm plantations. Dominant reasons and considerations of farmers in their land conversion were performed firstly by the economic aspects around 51.35 %, followed by technical aspects as much as 25.64 % and the environmental aspects around 23.01 % (Table 2).

Table 2. Factors Contributing to Land Conversion in Pulau Rimau

Nr	Contributing factors	Percentage (%)
A	Technical Aspects	25.64
	Long-lived oil palm (15.58 %)	
	Difficulty for getting Saprotan (5.46 %) */	
	More easily oil palm cultivation techniques (3.25 %)	
	More difficult rice post-harvest process (1.35 %)	
B	Economic Aspects	51.35
	Low selling price of rice (16.19 %)	
	Oil palm harvested each 2 weeks (11.45 %)	
	More secure/stable price of FFB (10.92 %) */	
	Higher profit for oil palm plantation (9.35 %)	
	Lower oil palm maintenance costs (3.44 %)	
C	Environmental Aspects	23.01
	Irrigation/drainage conditions do not support (8.94 %)	
	The threat of pests and diseases of rice (5.78 %)	
	Land suitability for oil palm plantation (4.89 %)	
	Bargaining power of smallholders higher (1.99 %)	
	Less labor for oil palm plantations (1.41 %)	
	Total	100
Explanation	: Saprotan (means of agricultural production), FFB (Fresh Fruit Bunches)	
Source	: Primary data evaluation (2015)	

The types of land conversion are divided into two types, namely the first type tends to show with high conversion. It occurred on agricultural land that has been equipped with adequate infrastructure and in general it has very good accessibility. The second type with a tendency to lower land conversion generally occurs in areas with poor accessibility, inadequate infrastructure and in the remote area. It is located away from the settlement and housings.

### **Formulating Rice Fields Conversion Control**

Some recommendations to control land conversion can be expressed in terms of the directions of the control formulation of agricultural land conversion to oil palm plantation. The control concepts can be divided in macro concept and micro concept. The macro concept generally be only done by the government or a strong industry who pays a lot of attention to the local community, among others:

- 1) Formulation of regulations regarding licensing and incentive or disincentive, especially for industrial and private sectors, among others tighten permits oil palm plantations and agricultural land extension importance of food to local food security;
- 2) Formulation of spatial regulation and the establishment of sustainable food agricultural land which is reinforced with local regulations. Determination of sustainable food agricultural land is based on land suitability;
- 3) Formulation of land conversion control policy that is comprehensive with the participation of all stakeholders;
- 4) Formulation of legislation regarding the enforcement of the law against the land use in farmland conservation. The sanctions assertion for violators of the land use regulations in accordance with the regulations of agricultural land protection for sustainable food;
- 5) Direction of the directives controlling for rent value of land in the form of low tax

incentives for food agricultural land to farmers who maintain the function of agricultural land for food, and retributions to oil palm plantations product. This retribution is then used as a source of food incentives to farmers;

- 6) Determination of the basic price of agro-food products, prioritization of local products to meet local food needs, and the purchase of agricultural food crops by local governments;
- 7) Dissemination related to the regulation, so that the community will also be involved.

The micro concept programs can be done either by the government, private or local communities, among other things:

- 1) Providing incentives in the form of agricultural subsidies to improve quality and productivity in order to increase farm income by providing assistance unit of agricultural production such as seeds, fertilizers, pesticides, and the provision of drying floor for food crop farmers;
- 2) Empowerment of collective agriculture with farming systems in groups to suppress labor costs for food crop production especially harvest time;
- 3) Control of water availability among others normalization in infrastructure drainage and irrigation channels, development and maintenance of irrigation channels, development of irrigation facilities on land with high productivity and already has a semi technical irrigated, and the construction area of water reservoir (dam) to be used in food non-irrigated farmland;
- 4) Establishment of buffering zones between rice fields and oil palm plantations, it is to prevent the disruption of water supply and pests of oil palm plantations that can directly interfere with rice fields;
- 5) Impose restrictions on the agricultural land conversion and perform zoning (zoning) of the existing land as well as the possibility of land conversion;
- 6) The directives controlling collateral value that includes the establishment of microfinance institutions and ease of filing requirements of credit;

- 7) Control direction of postharvest process factors are the empowerment of farmer groups to manage post-harvest activities until the milling stage, so that no farmers sell directly their rice after harvesting;
- 8) Control of farming risk factors that includes the use of natural predators to kill the rat through Integrated Pest Rat Control;
- 9) Control of farming techniques factors, among others diversification of agricultural intercropping systems. Farming techniques can be applied to upland rice-maize-cassava. Multiple cropping system will provide better income for farmers.

### CONCLUSIONS

If rice yields was estimated an average 3.00 tons Milled Dry Grain (MDG)/ha, then in 2006 with the existing land could produce rice as much as 127,719 tons MDG/year, but in 2013 the productivity of agricultural land decreased to 60,138 tons MDG/year. If the predicted needs of rice in year 2006 were 50,000 tons MDG/year and increased by 75,000 tons MDG/year in 2013, then if the land use is not immediately controlled, that Pulau Rimau will deficit rice.

Factors contributing to land conversion are divided into three factors, namely technical aspects, economical aspects and environment aspects. The control concept can be divided in macro concept and micro concept. The macro concept generally be only done by the government or a strong industry who pays a lot of attention to the local community. The micro concept programs can be done either by the government, private or local communities.

### 4 ACKNOWLEDGEMENTS

The authors wish to acknowledge the financial supports provided through doctorate BPPS scholarship 2009-2013 by Directorate General for Higher Education, Ministry of National Education, Indonesia.

### REFERENCES

- Armanto, M.E. 2014. Spatial Mapping for Managing Oxidized Pyrite (FeS<sub>2</sub>) in South Sumatra Wetlands, Indonesia. *Journal of Wetlands Environmental Managements*. Vol 2(2); 6-12, October 2014. ISSN: 2354-5844. Indexed in DOAJ. Web-link: <http://ijwem.unlam.ac.id/index.php/ijwem>
- Armanto, M.E., E. Wildayana dan N. Rahmawati. 2008. Keterkaitan Kesesuaian Lahan dengan Keputusan Investasi Perkebunan Kelapa Sawit di Lahan Pasang Surut. *Journal of Habitat* Vol. XIX (3):193-206, December 2008. ISSN 0853-5167.
- Armanto, M.E., M.A. Adzemi, E. Wildayana and M.S. Imanudin. 2013. Land Evaluation for Rice Cultivation in the Reclaimed Tidal Lowland in Delta Saleh, South Sumatra, Indonesia. *Journal of Sustainability Science and Management*. Vol 8(1):32-42. June 2013. ISSN 1823-8556. (SCOPUS, Google Scholar and DOAJ indexes). Web-link: <http://jssm.umt.edu.my/files/2013/07/4w.pdf>
- Armanto, M.E., M.A. Adzemi, E. Wildayana, M.S. Imanudin, S.J. Priatna and Gianto. 2011. Land Suitability for *Elaeis Guineensis* Jacq Plantation in South Sumatra, Indonesia. *Proceedings of the 6<sup>th</sup> CRISU-CUPT Conference: International Seminar and Exhibition*. 20<sup>th</sup>-22<sup>nd</sup> October 2011, Sriwijaya University, Palembang. ISBN 978-979-98938-5-7. p. 10-18.
- Direktorat Rawa dan Pantai. 2009. *Potensi dan Tantangan Pengembangan Rawa Indonesia*. Makalah pada Seminar Lokakarya Pengelolaan Rawa dalam Mendukung Ketahanan Pangan Nasional. Departemen Pekerjaan Umum. Hotel Nikko Jakarta.
- Euroconsult, 1994. *Summary of Water Management Approach: IISP Telang-Saleh*. Paper for Coordination Meeting IISP-I, Jakarta.
- Kabupaten Banyuasin. 2014. *Kabupaten Banyuasin Dalam Angka 2014*. Pangkalan Balai, Sumatera Selatan.

- Suswono. 2013. Oil Palm Land is Bigger than Rice Field. [www.mediaperkebunan.net](http://www.mediaperkebunan.net). Accessed on 11 November 2015
- Wildayana, E., I. Zahri, A. Mulyana and L. Husin. 2012. The Analyses Structure and Household Income Distribution of Oil Palm (*Elaeis guineensis* Jacq) Farmers NES-TRANS in South Sumatra, Indonesia. Proceedings of 11<sup>th</sup> UMTAS, 09-11<sup>th</sup> July 2012, p. 1480-1487, e-ISBN 978-967-5366-93-2. UMT Malaysia.
- Wildayana, E., M.E. Armanto and M.A. Adzemi. 2011. From Economic Valuation to Policy Making in Forest Conversion for *Elaeis guineensis* Jacq Plantation. Proceedings of the 6<sup>th</sup> CRISU-CUPT Conference: International Seminar and Exhibition. 20<sup>rd</sup>-22<sup>nd</sup> October 2011, Sriwijaya University, Palembang. ISBN 978-979-98938-5-7. p. 19-26.
- Wildayana, E., M.E. Armanto dan N. Rahmawati. 2008a. Dampak Pembangunan Perkebunan Kelapa Sawit terhadap Peningkatan Ekonomi Masyarakat Pedesaan di Lahan Pasang Surut (Pendekatan *Multiplier Effect*) Journal of Habitat Vol. XIX (2):159-168, August 2008. ISSN 0853-5167.
- Wildayana, E., M.E. Armanto dan N. Rahmawati. 2008b. Pengembangan Program Pola Usahatani Agribisnis Spesifik Lokasi di Lahan Pasang Surut. Journal of Habitat Vol. XIX (3): 223-236, December 2008. ISSN 0853-5167.
- Wildayana, E. 2013. Analisis Perilaku Petani Kelapa Sawit dalam Kaitannya dengan Prospek Keberlanjutan Kebun Plasma di Sumatera Selatan. Disertasi. Program Doktor Ilmu-Ilmu Pertanian, FP. Universitas Sriwijaya. Palembang.
- Wildayana, E. 2014. Formulating Oil Palm Investment Decision in Tidal Wetlands of South Sumatra, Indonesia. Indonesian Journal of Wetlands Environmental Managements (IJWEM). Vol 2(2); 30-36, October 2014, ISSN: 2354-5844 (indexed in DOAJ). Web-link: <http://ijwem.unlam.ac.id/index.php/ijwem>
- Wildayana, E. 2015. Dampak Krisis Global Terhadap Pengeluaran Konsumsi Rumah Tangga Petani Plasma PIR BUN Kelapa Sawit di Kabupaten Muara Enim. Prosiding Seminar Nasional dalam Rangka Dies Natalis ke-52 FP Universitas Sriwijaya, Palembang, 05 November 2015.



ORIGINALITY REPORT

---

7%

SIMILARITY INDEX

6%

INTERNET SOURCES

0%

PUBLICATIONS

4%

STUDENT PAPERS

---

PRIMARY SOURCES

---

1	Submitted to Lambung Mangkurat University Student Paper	4%
2	journal.trunojoyo.ac.id Internet Source	1%
3	www.scribd.com Internet Source	1%
4	id.123dok.com Internet Source	1%
5	unlam.ac.id Internet Source	1%

---

Exclude quotes On

Exclude matches < 1%

Exclude bibliography On