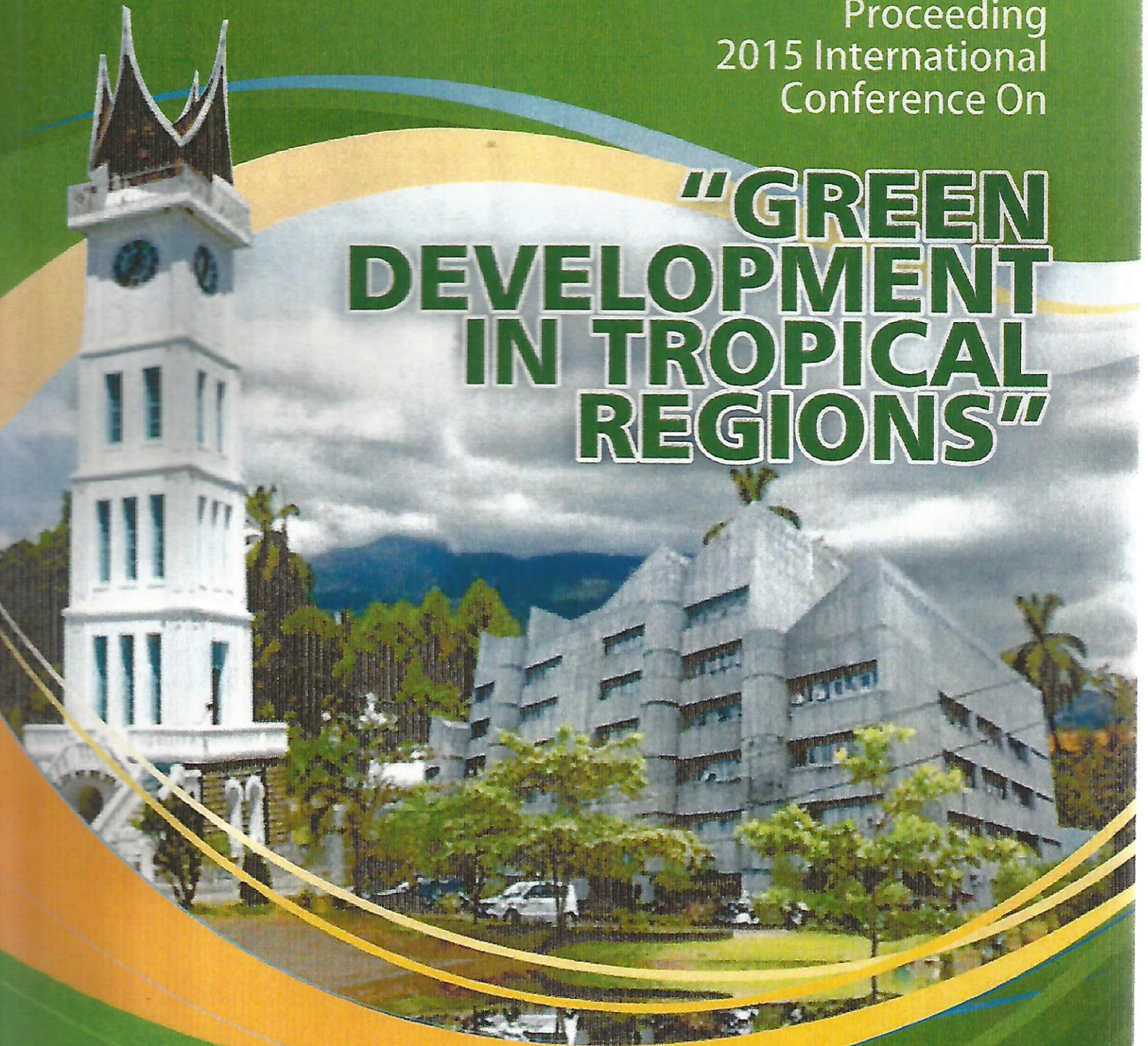


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Proceeding  
2015 International  
Conference On

# "GREEN DEVELOPMENT IN TROPICAL REGIONS"



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## FOREWORD

The papers contained in this proceeding originate from the "2015 International Conference on Green Development in Tropical Regions". Keynote speakers and authors of selected oral and poster presentations were invited to submit a manuscript for publication. Manuscripts were reviewed by the editors, and members of the editorial boards, and papers of a suitable scientific standard feature in this publication. The Steering Committee appreciates the contributions of all editors and reviewers in improving the quality of this proceeding.

In particular, I wish to express my warmest appreciation to the following people:

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Padang, July 2016

Chairman,

**Prof. Rudi Febriamansyah, PhD**

Director of Graduate Program

Andalas University

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## ANALYSIS EMPOWERMENT OF INDEPENDENT SMALLHOLDER FARMERS OF RUBBER IN THE RIAU PROVINCE

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### ABSTRACT

*Rubber farming of independent smallholder farmer in general are still in progress naturally without any intervention of a third party, so that the productivity of smallholder rubber farming is still low. This will certainly have an impact on the empowerment of the rubber farmers. This study aimed to analyze the level of empowerment of independent smallholder farmers of rubber in farming activities in Riau Province. This study was used explanation research that it is intended to discover and develop the theory. Respondents were chosen by dispropotional stratified random sampling. A total of 575 farmers from three districts potential rubber commodity in Riau Province. To answer the purpose of using the Likert Scale's Summated Rating (SLR). The results showed that the level of empowerment of smallholder farmers of rubber in the province of Riau included in the categorized quite well from the institutional aspect and productive economy, but is still not good than the aspect of human resources.*

**Keywords:** *empowerment, smallholder farmers, rubber*

### INTRODUCTION

Typology of smallholder plantations can be divided into two types, namely plantation farmers who became a partner for public and private companies and smallholder owned by non- government community. However, production of rubber smallholders better than independent smallholders due agribusiness management of input, process and output runs fine on smallholders. Unlike the independent smallholders who have not been able to meet the optimum production of oil palm plantations. Statistics plantation in Riau Province in 2012 showed that the area of land and production community rubber plantation with state and private companies are not directly proportional, where community plantation is wider but its results are not as big as private estates and country. In 2011 the productivity of the new Community's Garden Rubber reach 926 kg/ha/year when compared to plantation country has reached 1,327 kg/ha/year and Big Private Plantation reached 1,565 kg/ha/year. (Ministry of Agriculture, 2012). Smallholders with garden conditions is largely the old rubber trees that are less well maintained (not fertilized), using seed instead of clones, rubber materials low quality so that productivity is far below the normal potential. The ability of rubber farmers in achieving productivity rubber farming as expected very dependent on the empowerment of farmers.

Community empowerment are the elements that allow people to survive and able to develop themselves in order to achieve its objectives. However, community empowerment is an attempt to constantly improving the dignity of the bottom layers of society who are not able to escape the trap of poverty and underdevelopment. In other words, empowerment can be interpreted as an effort to increase the ability of poor society to participate, negotiate, influence and control of community institutions are accountable for the betterment of life. It can be concluded that, empowerment is an effort to improve the ability of the public, encourage the courage to be able and have the independence in choosing alternative and improvement for a better life.

Therefore, this study aims to determine the level of non-pattern rubber farmer empowerment, which in terms of the concept of "three powers" namely empowerment of aspects of human resources (HR), empowerment of productive economic aspects and institutional aspects of the empowerment of farmers.

### MATERIALS AND METHODS

Patterns of self-empowerment rubber farmer were assessed using explanation research intended to find and develop the theory, so that the result or product research may explain why or why the occurrence of a particular phenomenon or social reality. The approach used is a survey approach, this approach is used to describe the specific character of a population with respect to the attitudes and behavior (Faisal. 2005). The choice of location is done purposively with consideration of the location of non-rubber based on the number of farmers most in the order of 1, 2 and 3 is in the third district in a row. In determining the respondents used key informants and samples. To answer the purpose of using a Likert Scale's Summated Rating (SLR).

### RESULT AND DISCUSSION

#### *Farmer empowerment level*

Mardikanto (2012) explains that empowerment is an effort to build the power itself, by encouraging, motivating and raise awareness of their potential and strive to develop it. Furthermore, such efforts followed by strengthening potential or power possessed by the community itself. Next, Mardikanto (2012) explains that the empowerment aimed both directions. First, let go of the shackles of poverty and underdevelopment. Second, strengthen the position in the economic structure of society and power.

In each program's empowerment, community empowerment is output to be achieved as a final destination. Mardikanto (2009) explained that empowerment are the elements that allow people to survive and (in the dynamic sense) are able to develop themselves in order to achieve its objectives. Because it is an attempt to empower communities (continuous) increases the dignity of the bottom layers of society who are not able to escape the trap of poverty and underdevelopment. In other words, the empowerment of society is increase capacity and improve the independence of the public.

Patterns of self-empowerment rubber farmers in the province of Riau studied with variable human resources, productive economy, and institutional (three power).

### *Human Resources (HR)*

Human resources (HR) has a very important role in building the nation. With superior human resources and competitive will be able to increase agricultural productivity and able to manage the market through the supply of agricultural products. Empowerment of Human Resources is closely related to the ability of a person in the knowledge, attitudes, skills and reasoning power and creativity to develop their potential and social environment in this case is a farming community environment.

Tabel 1. Human Resources (HR)

No.	Human Resources (Y1)	Average	Category
1	Knowledge of farmers on better farming of the process extension	2.96	Enough
2	Improving the competence and quality of farmers in farm businessplanning	2.54	Less
3	Engaged in the manufacturing group PDNG	2.11	Less
4	Farmers have rubber farming plan	2.51	Less
Human Resources (Y1)		2.53	Less Helpless

Based on Table, it can be explained that the empowerment of self-pattern rubber farmers in the province of Riau categorized as "defenseless" which with a score of 2.53. The human resource variable in the value of the four indicators that increase farmers' knowledge, improvement of competence and quality of farmers, farmer involvement in the manufacture PDNG (Plan Definitive Needs Group), planning of rubber farmers.

Counseling can contribute to increase the knowledge of farmers, because one of the roles of counseling is the role of education. The results of the field study indicate that outreach activities that have been done can improve farmers' knowledge on rubber farming better, so the empowerment of rubber farmers in quite defense condition (score 2.96).

Indicators of farmers' knowledge increased and indicators of competence and quality of farmers in business planning to get a score of 2.54 with the category of "Less". Judging from the indicators increased knowledge of farmers, extension workers has been carrying out its role in the process of counseling. However, the material presented extension only discuss the problems faced by farmers even in one sample farmer groups, extension has never specifies the *extension materials but counselors receive complaints from farmers to farm rubber*. So not much knowledge gained from the farmer extension process

that led to the farmer must take the initiative to acquire knowledge in rubber to farm themselves.

From the indicators of competence and quality of farmers in business planning, there is no special materials are given extension of rubber farming business planning. Extension only occasionally gives a view of how well the rubber farming in the future so that the farmers do not understand what a business plan and how good business planning. Farmers are only able to make small plannings are not written to run farming as determining maintenance schedules, but all the planning that has made farmers can not be run in accordance with the plans that have been made.

On the involvement of farmers in the manufacturing indicator PDNG got a score of 2.11 with less category. In making PDNG group, the agent role is to assist the group in making PDNG, but in making a group PDNG not all members of the group who participated made it only the leader and secretary of the group, and some farmers who make PDNG aided by the extension. Not all farmers want to get involved in the manufacture PDNG only some farmers only. In this case the unity and loyalty of farmers in the group still has not woken up so it needs more intensive coaching by the instructor. Factors limited time farmers is also one less obstacle farmers to follow the group's activities.

On Indicator farmers have farming plans to get a score of 2.51, less categorize. Lack of knowledge of farmers on business planning makes the farmers have not been able to make their business plan in writing. However, farmers have a plan that is not written in running their farm *as plant maintenance schedules and sales plans*.

### *Productive Economy*

Agricultural development to be achieved through agricultural counseling activities, basically have economic objectives that seek to improve the income of farmers for the welfare of their families and communities. More productive economic approach emphasizes the active participation of the community to solve , formulate , plan and carry out activities in accordance with the needs in order to create the economic conditions of society's productive. Productive economy in this case more emphasis on rubber farming activities are managed to be able to achieve optimal production , so as to the welfare of farmers. Farmer empowerment is seen from productive economic aspects of this research can be seen in Table 2.

Table 2. Productive Economy

No.	Productive Economy (Y2)	Average	Category
1	Scaling up effortswith their outreach activities	2.98	Enough
2	Improved rubber farm income	3.05	Enough
3	Increased household income of farmers	2.74	Enough
4	Household after the link extension	2.98	Enough
	Productive Economy (Y2)	2.94	Quality Helpless

Table 2 illustrates that the economic empowerment productive rubber farmers as farmers who receive counseling in Riau Province in the category "Enough" with a score value is 2.94. Economic assessment productive rubber farmers is assessed from the following five indicators increased business scale, increasing farm income, an increase in household income, an increase in non-food needs and rising household expenditure after the counseling.

Indicators of the increase business scale with the counseling activities get a score value of 2.98 which can be categorized "Enough". Such improvements can be seen from the increase in rubber plantation area they have, which is indicated by the number of farmers with land area of over 2 hectares of rubber reached 49.17% or almost 50%. There are also some members of farmers or farmer rubber acreage of land to grow from the results that they buy, although not yet cultivated or used for something useful, but there is a desire to use the vacant land at their disposal to land food agriculture and horticulture, and there is also even for livestock.

Similarly, the increase in farm income gum after the counseling also increased as indicated by the assessment of this indicator is obtained a score of 3.05 which can also be categorized "Enough". It means counseling already delivering the material of the production, quality, price and income of the farmers have been able to increase farmers' income through farming rubber rubber, although the impact is not entirely perceived by rubber farmers in the province of Riau.

Indicators of increasing household income and non-food needs with a score of 2.74 with "enough" category. It means, although farmers still largely dependent with rubber to farm, but they begin to develop other businesses can increase their income. Such as trade and develop other commodities such as oil crops, vegetables and fruit. This is where the role of the educator is needed in terms of increasing the productive economy of farmers through counseling. With increasing income of farmers made non-food needs of farmers has also increased, because basically both of these indicators are interrelated. The higher the income of a person/family, the fulfillment will be higher as well.

On the rising indicators of household spending after the extension obtained a score value of 2.98 by category: "Enough". The continued development of the times make demands owned by farmers growing to improve their standard of living. On this indicator based on the fulfillment of 14 basic household needs of farmers, namely (1) a floor area greater than 8m<sup>2</sup>; (2) type of residential buildings flooring is cement; (3) The wall type is the place to stay the walls; (4) The use of toilet or latrine is milliki itself; (5) household lighting source is electricity; (6) the source of drinking water is a water refill; (7) Fuel cook using gas; (8) The consumption of meat per week is greater than 1 times; (9) Purchase of clothes per year of household members greater than 1 sets; (10) Eating in the day to the household is more than 2 times; (11) The ability to go to the health center including a category capable; (12) Field household's main job is farmer owners; (13) Highest level of education is higher education; (14) Ownership of the asset or building is greater than Rp. 500.000, -. Most of the farmers have been able to meet the basic needs of the household 3-6 they are even some who have been able to meet all the basic needs of the household (14 indicators).

### Institutional

Syahyuti (2006) explains that, an institution is a social structure that serves for specific purposes within the community. Institutional empowerment in this case relates to how the institutional capabilities of the farmer groups can help to be able to work effectively, efficiently and was able to be sustainable.

Table 3 shows that the level of institutional empowerment of farmer groups in Riau province in the category sufficiently shown with a score of 2.99. Variable empowerment views of institutional assessed based on seven indicators that institutions have clear objectives, institutional objectives achieved, the institution has a clear structure, farmer groups have PDG (Plan Defenitive Group) and PDNG (Plan Definitive Needs Group), the implementation of the DRC and P, institutions can help farmers implement farming materials, farmer groups into rural economic enterprises.

Table 3. Institutional

No.	Institonal (Y3)	Average	Category
1	Institutional have a clear goal	3.18	Enough
2	Institutional group goal achieved	2.92	Enough
3	Have a clear institutional structure	3.60	Hight
4	Farmer groups have PDG and PDNG	2.71	Enough
5	PDG and PDNG be implemented	2.49	Less
6	Agencies are able assist farming	2.87	Enough
7	Farmer groups into rural economic enterprises	3.12	Enough
Institutionl (Y3)		2.99	Qualite helpless

Empowerment of farmers from institutional aspect got a score of 3.18 with categorize "Enough". Institutional farmer followed by farmers (farmer groups) are generally fairly powerful, but its weakness is institutional farmers are not able to help farmers in the capital or the sale of farm production.

At the institute indicator has clear goal, institutional goal achieved and institutions have a clear structure to get a score of 2.92 with "enough" category. Agricultural institutions such as farmer groups in Riau Province in general has had a clear goal of improving the economy of its members. However, in reality, these goals are still not able to be implemented and felt by most members of the group. This is due to lack of good quality management of farmer groups. In addition, each farmer group also has a management structure that is clearly illustrated from the structure that shows the group's leader, secretary, treasurer and member of the group. Although there were still groups whose structure only

shows the core committee and in the implementation still there are concurrent positions within its competence.

Although the ability of farmers to make PDG and PDNG still categorized enough, but farmer groups in Riau have generally been PDG and PDNG obtained a score of 3.60 with the High category. Making PDNG and PDG and aims to facilitate farmers' groups in planning and carrying out an activity. However, in the field found that the manufacture of PDG and PDNG just to get the assistance provided by the government.

This is evident from the implementation of the PDG and PDNG the category enough (score 2.71). This shows that the PDG and PDNG which have been made by the group have been carried out by the group, but the plan has not been implemented.

Furthermore, the institutional indicators can assist in carrying out farming by farmers or farming materials categorized "Enough" with a score of 2.87. In this case of course extension activities have been going pretty well. In addition to farmer groups is a means to obtain the extension, farmer groups are also medium farmers in terms of getting assistance from the government in the form factors of the production of rubber farming such as seed, fertilizer, tools harvesting tools and other assistance. But the group has not been fully able to help farmers provide sufficient information in to farm, including the diffusion of innovation among farmers that less goes well. Institutional technicians are also not able to fully assist farmers to farm rubber and facilitate farmers to partner with other parties. Entanglement farmers with toke is one factor that is strong enough to affect farmers can not completely decide its own conduct farming and in partnership with others. usually rubber farmers in Riau is still very tied to "toke" (owner of an enterprise) in terms of marketing, although in several districts in Riau has no auction market to help farmers get higher prices, but the dependence of farmers to owner of an enterprise primarily related to debt or meeting family needs causing difficult for farmers to be able to break away from dependence.

Indicators of farmer groups to become economic enterprises can also be categorized as "enough" with a score of 3.12. Other than as a group learning process container, can also serve as a forum for economic for farmers which can help farmers to increase revenue, such as joint marketing tool, a means of savings and loans, and so forth. Rubber marketing through auction markets managed by group of is one example of a business function into a group of village economy, as some group of farmer in Kuantan Singingi and Indragiri Hulu. Besides institutional groups were also used by farmers as a forum for savings and loans to assist farmers in terms of capital.

#### *Farmer empowerment recapitulation*

Empowerment rubber farmers in the Riau Province self pattern described in the variable human resource empowerment, economic empowerment productive and institutional empowerment can be summarized in Table 4.



Table 4. Empowerment

No.	Institonal (Y3)	Average	Category
1	Human Resources (Y1)	2.53	Less helpless
2	Productive Economy (Y2)	2.94	Quite helpless
3	Institutional (Y3)	2.99	Quite helpless
	Empowerment (Y)	2.82	Quite helpless

Patterns of self-empowerment rubber farmers in the Riau province categorized quite helpless with a score of 2.82. Empowerment of rubber farmers viewed from three aspects: the empowerment of Human Resources (HR), Productive Economic empowerment and Institutional empowerment.

Empowerment aspects of human resources (HR) is still considered "less powerful" with a score of 2.53 perception. It can be seen that there is still the need for self-coaching to rubber farmers in the province of Riau, the role of education should be improved so that farmers' knowledge of the process of education increases. In addition, the necessary guidance to the management capabilities of farmers ranging from labor to farmers' financial management. If the human resources aspect of empowerment is met, then increase production and and income will concomitant increase.

In terms of the economic aspects of Productive categorized quite helpless with a score of 2.94. In this aspect the extension has been able to foster the desire of farmers to have a better life. In addition, the economic pressure also makes the farmers have the desire to increase their income.

Institutional empowerment aspect also is quite helpless with a score of 2.99. Is expected to be more active groups to be able to help its members to farm rubber. In addition, the need for a work plan better and attainment targets are clear. Here's role as a companion extension is necessary so that farmer groups can work well as it should.

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# Weed growth dynamics in paddy field at methods SRI (*The System of Rice Intensification*) with provision mulching paddy straw



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## 1. INTRODUCTION

The main problems paddy field with SRI method is the high growth of weeds (Kasim, 2005). Rice yield reduction due to weeds ranged from 60-87% (FAO, 2004), a data drop in national rice yields due to weed interference 15-42% for paddy rice and 47-87% for upland rice (Pitoyo, 2006). Weed control is a must be done, both in conventional and SRI method paddy field. Weed control SRI method of paddy field in Indonesia is still using herbicides (DISIMP, 2005) that its potential environmental damage (Chung *et al.*, 2003). Food Agriculture Organization (FAO) in 2004 the concept of paddy rice weed control that is economical, efficient, effective and environmentally friendly is to use plant debris or organic material. Organic materials commonly used for weed control in the form of mulch forage crops, such as paddy straw, corn straw and other crop residues.

## 2. MATERIALS AND METHODS

This research was conducted on Mei-Agustus 2008 and Oktober 2008-Januari 2009 in paddy field farmers at Kuranji, Padang City West Sumatra-Indonesia. Located research at coordinate 0° 57' 2,76" LS (S) dan 100° 21' 41,64" BT (E). The research method in the form of field trials with a completely randomized design with 3 time of application at age (7 and 14 DAP, 15 and 22 DAP, and 23 and 30 DAP) and 6 replicates, with a dosage of 15 t.ha<sup>-1</sup> paddy straw mulch. The provision of an-organic fertilizer at half the recommended dosage. Analysis conducted on weeds and rice yields.

## 3. RESULTS AND DISCUSSION

Table 1. Number of species, number of individual, dry weight weed and weed dominance species

Time Application	No of Species and Individual	Dry weight and Species
7 and 14 DAP	7 and 588	171.67 <i>Commelina</i> sp.
15 and 22 DAP	7 and 801	230.00 <i>M vaginalis</i>
23 and 30 DAP	7 and 925	223.33 <i>Ludwigia</i> sp.
Total	21 and 2,134	625.00

Weeds that dominance different experiments for each treatment comes same group but that of broadleaf weeds, it is because of the time difference paddy straw as mulch application. However, the most important is the shift of control of weed species that commonly from family Cyperaceae and Poaceae. The end of the trial weeds come from families that dominance Onagraceae. Differences in the timing of paddy straw supplied with installments twice led to the appearance of weeds and weed grasses initially became a major weed in previous experiments became depressed.



Table 2. Yield of paddy dry milled grain (GKG)

Time Application	Yield (g)/plot	Yield (t)/ha
15 and 22 DAP	14.636,66 a	7,133a
23 and 30 DAP	14.638,83 a	7,185a
7 and 14 DAP	15.362,33 b	7,317b
KK (%)	10,87	

Paddy straw mulching to application for weed control in crops ages of 7 and 14 DAP in paddy SRI highest values obtained Summed Dominance Ratio (SDR) 38.4% by the species of *Commelina* sp. versus six other weed species: *M vaginalis*, *Ludwigia* sp., *Eclipta alba*, *Portulaca* sp., *Cyperus* sp., and *Echinochloa* sp. (Table 3). With the highest SDR in *Commelina* sp weed species, it is stated that the weed *Commelina* sp. is a type of weed that is not effectively controlled the SRI method of paddy straw.

## 4. CONCLUSION

Dynamics of the dominance commonly at paddy field of family Cyperaceae decreased with differences in timing (7 and 14 DAP) of paddy straw mulch. While weeds Onagraceae family and Poaceae a change of dominance in each treatment. Weed dominant by *Echinochloa* sp., and subsequently by *Commelina* sp., based SDR, the results show that the weed community varied dominance, both the type and intensity. Types of weeds that tend to dominate a broadleaf weeds.

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