

LAND USE CONVERSION: EVALUATION AND STRATEGIC ACTIONS (CASE OF SUMEDANG REGENCY)

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Abstract

The conversion of agricultural land in Sumedang of the year 2005-2014 reached 317 hectares. The land generally converted into housing, office buildings and public facilities. This study aims to conduct a comprehensive evaluation of the factors affecting changes in land use, analyze the impact of the changes and develop management strategies. This research was conducted with a qualitative approach located in Sumedang Regency, West Java Province. Sampling was done by multistage random sampling. The first step is selection of the sample districts purposively with consideration of districts that convert of land use at most, they are: Sumedang Selatan district, Jatinangor district and Jatigede district. The second step sample selection by simple random to residents who do changes their agricultural land use. The data obtained from questionnaires, interviews, observations, study of documents and mass media. Working method is based on a modification of the stages of strategic planning for the company. Formulation of the strategy carried out through three phases: phase determination of the key internal and external factors, phase matching using the SWOT matrix, as well as the decision phase using QSPM matrix. The resulting strategy is implemented in a more technical work steps. The results showed the factors that affect farmers convert agricultural land is decreasing productivity of the land, accretion of family members, high land prices, construction of public facilities and government policy. The most dominant factor affecting is different in each district. The impact of changes in land use in general is the opening of new agricultural land by cutting down forests, decline in rice productivity and the emergence of new unemployment and alteration or loss of livelihood. From the SWOT analysis matrix, obtained three possible strategic options. First, a policy review of spatial and territories; second, to encourage farmers to maintain agricultural land by providing agricultural inputs and extension the use of organic materials to restore soil fertility and the third private land use change should be governed by strict licensing mechanism.

Keywords: *land conversion, policy strategy*

INTRODUCTION

The conversion of agricultural land is a serious problem for agricultural development in Indonesia. The Ministry of Agriculture reports that the area of wetland

farmland in Indonesia in 2013 is only 8.1 million hectares left. Indonesia which is an agrarian country currently has difficulty in controlling land conversion due to increasing population and development project.

Novira et al (2012) stated that during the period 2007-2010 conversion of agricultural land to non-agriculture in Java reached 600,000 hectares. The land is used for non-agricultural purposes such as the construction of buildings, highway project, industries, housing and other public facilities. Agricultural land that has been converted to other uses outside the agricultural sector will have very little chance of changing back into agricultural land.

In order to control the conversion of agricultural land, the Government has issued Law No. 41 of 2009 on Sustainable Land Farming Protection, which is expected to encourage the availability of agricultural land to maintain food security.

The regional government have pioneered some efforts to save the fields. Until November 2013, the document of Spatial planning and territory has been reached in 310 districts /cities (63.14%). and 107 districts / cities have set Sustainable Land Farming Protection area in Spatial planning and territory law. Sustainable Land Farming Protection area that has been settled in the law is about 3,089,872 ha, and based on audit results of the Ministry of Agriculture the wetland area covering 8,132,642 ha (Ministry of Agriculture, 2014).

Sumedang Regency is an area that has the potential of agricultural resources. Regional Planning and Development Agency of Sumedang Regency, reported that the conversion of agricultural land in Sumedang Regency from 2005-2014 have reached 317 Hectares and remaining 30,000 hectares of raw land or productive land. The tendency to convert the land function still continue, so this problem needs a very special attention and

solutions. Otherwise, it will increase the high number of land conversion that can cause various socio-economic problems.

Research Objectives

This study aims to conduct a comprehensive evaluation of the factors affecting changes in land use, analyze the impact of the changes and develop management strategies.

Significance of the Study

This study is expected can contribute for the development of science, especially concerning to land conversion. In addition, this study is expected to provide a clear picture of land conversion factors in Sumedang Regency and the impacts.

In particular for the government of Sumedang Regency, this study can be as a consideration in the determination of policy on the conversion of agricultural land with all its aspects and is expected to provide important information about the most appropriate strategy to be implemented

CONCEPTUAL FRAMEWORK

Definition of Land Function and Causal Factors

Lestari (2009) defines land use conversion is a change in the function of part or all of the land area from its original function (as planned) to other functions that have negative impacts (problems) on the environment and the potential of the land itself. Land use conversion can also be interpreted as a change for other uses because of factors that largely include the need to meet the increasing population demands and the increased demand for better quality of life.

According to Agus and widianto (2004) conversion of agricultural fields is a deliberate process by humans (anthropogenic), not a natural process. Land use conversion is a logical consequence of increased activity and population and other development processes.

Iqbal and Sumaryanto (2007) define land use conversion means the transfer of function or mutation of land in general concerning the transformation in the allocation of land resources from one use to another. The process of conversion of agricultural land to non-agricultural use is caused by several factors.

Supriyadi (2004) stated that there are at least three important factors causing the conversion of wet land as follows:

1. External factors; Is a factor caused by the dynamics of urban growth (physical and spatial), demographic and economic.
2. Internal factors; This factor is more to see the side caused by the socio-economic conditions of farm household users.
3. Policy factors; Namely the aspect of regulation issued.

Murniningtyas (2007) stated that land use change in the implementation of development can not be avoided. The change occurs because of two things, first the need to meet the increasing needs of the population and secondly related to the increasing demand for better quality of life.

Land use conversion that occurred in Indonesia not only because of ineffective laws and regulations, both in terms of substance. The provisions are not clear and not firm, or enforcer that is not supported by the government itself as an official authorized to grant a land use permit. (Fauziah, 2005)

Based on statements from several sources, land conversion can be defined as an intentional process by humans (anthropogenic) causing changes in function of part or all of the land area from its original function (as planned) to other functions.

METHODOLOGY

Research was conducted in Sumedang Regency, West Java Province in 2016. Picture 1. shows the location of *Sumedang Regency*, West Java, Indonesia on a detailed road map.

Sampling was done by multistage random sampling. The first step is selection of the sample districts purposively with consideration of districts that convert of land use at most, they are: Sumedang Selatan district, Jatinangor district and Jatigede district. The second step sample selection by simple random to 150 residents who do changes their agricultural land use. The data obtained from questionnaires, interviews, observations, study of documents and mass media.

Questionnaire was designed with both closed-ended and open question type. Closed-ended questions involved the most common responses as answer choices. In this way, the questions may better reflect what the respondents are thinking or how they view a particular issue. Open questions offer a number of benefits when piloting a questionnaire. Responses to them can reassure the researcher that all relevant issues have been covered. Responses may also be used to corroborate answers to closed questions, offering reassurance to the researcher that the questionnaire is valid, or highlighting problems with particular questions.



Picture 1. Adminstrative Map of Sumedang Regency

(Source: Regional Planning and Development Agency of Sumedang Regency, 2016)

Working method is based on a modification of the stages of strategic planning for the company. Formulation of the strategy carried out through three phases: phase determination of the key internal and external factors, phase matching using the SWOT matrix, as well as the decision phase using QSPM matrix. The resulting strategy is implemented in a more technical work steps.

The formulation of strategy in this research is a modification of strategic planning of David (2006), by establishing the Government of Sumedang Regency as the manager of land conversion. The formulation of this strategy is done in three stages: the determination stage of external and key internal factors, matching stage, and decision phase.

The determination of key internal and external factors is derived from evaluated aspect information that is general condition land use conversion, impact of land use conversion, and government policy. The matching stage uses SWOT matrix

analysis to formulate various possible strategy options (David, 2006).

Decision stage is done by using QSPM matrix. In the QSPM matrix analysis, each key factor is weighted and appealed. The weights given to each of these factors indicate the relative importance level of factors to the success of the firm. The weights range from 0.0 (not important) to 1.0 (very important), with the sum of all weights equal to 1.0.

The value of attractiveness is seen from its interest with the available strategic options (David, 2006). If certain factors influence the choice of existing strategies, then the value of attractiveness is done. The attractiveness value includes: 1 (unattractive), 2 (somewhat interesting), 3 (quite interesting), and 4 (very interesting).

As for certain factors do not affect the choice of strategy, then the value of attractiveness is not given. Total interest value is the product of the weight of each factor and its appeal value to the strategy choice. The largest total value of interest

among each strategy will determine which strategy is selected in dairy farms.

RESULT AND DISCUSSION

Evaluation on Factors Affecting Land Conversion

Information from 150 respondents, there are some factors that affect land use conversion in sumedang, among others, reduced production of paddy produced land, rising land prices, population growth and government policy as shown in Figure 1.

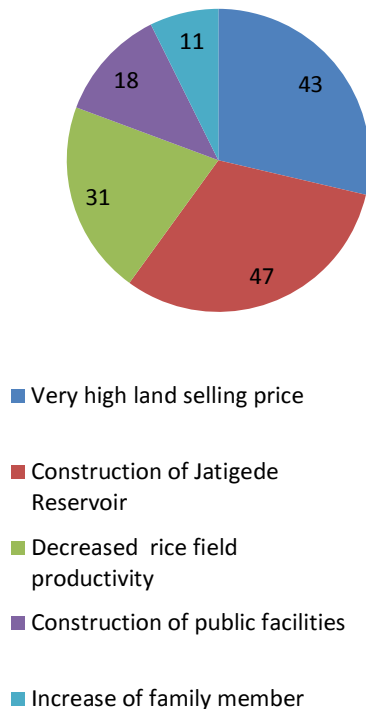


Fig. 1: Factors that Cause Land Conversion

Source: Research Result, 2015

Very High Land Selling Price

Mostly respondents who stated that they converted their land use function due to very high land selling price are respondents who live in Jatinangor

district. The establishment of Institut Koperasi Indonesia, Bandung Institute of Technology, Institute of Home Affairs and Padjajaran University become factors that greatly affect the development of Jatinangor become very rapid.

With the establishment of the college, there was a migration of the population as a student, so the need for land increased dramatically. The land is used for settlements, shops and other public facilities. This causes the price of land in the area of Jatinangor to be very high. The price of land in Jatinangor District in 2002 was Rp 125,000-180.000 / m² and in 2015 it increased to Rp 2,500,000-5,000,000 / m².

This condition strongly encourages the owners of agricultural land to sell their land. Besides other factors of the other thickeners is reduced productivity of rice fields encourage farmers to divert their land functions.

Construction of Jatigede Reservoir

Forty-seven respondents stated they converted their land use function because of Jatigede reservoir construction. They converted about 29 hectares of agricultural land for the construction of the Jatigede dam. The range of land that is converted by each respondent is shown in table 1.

Table 1. Number of Agricultural Land Conversion

Area of Agricultural Land	Number of People
0,1 – 0,5 Ha	23
0,6 – 1 Ha	17
1,1 – 1,5 Ha	5
1,6 – 2 Ha	2

Source: Research Result, 2015

Decreased Productivity of Rice Fields

Respondents informed that rice field production decreased significantly because of various factors such as the occurrence of pest attacks, drought and floods. Due to climate change and unpredictable weather causes rice production in quality and quantity is reduced very drastically. In addition, farmers usually can harvest twice in a year become once in a year. This factors discourage farmers to use their land as rice fields.

Agriculture, Livestock and Fishery Service of Sumedang Regency in 2016 reported that the productivity of rice per hectare decreased as shown in Table 2.

Tabel 2. Land Productivity

Year	Planted Area (Ha)	Grain Production (Ton)	Land productivity per Ha (Ton)
2012	75.365	446.949	5,93
2013	77.728	485.674	6,25
2014	74.804	472.220	6,31
2015	68.387	443.340	6,94
2016	40.845	112.126	2,75

Source: Pocket Book Profile of Regional Sumedang Regency in Budget 2016, processed.

Very drastic decline in productivity occurred, from 6.74 Ton/Ha in 2015 become 2.75 Tons/Ha in 2016 as shown in Figure 2.

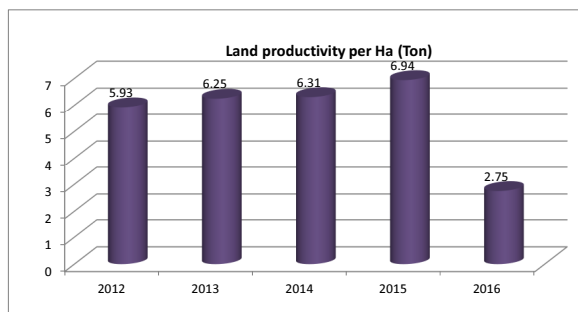


Fig 2. Change of Land Productivity in Sumedang Regency of the year 2012- 2016 (Source: Pocket Book Profile of Regional Sumedang Regency in Budget 2016, processed).

Construction of Public Facilities

Eighteen respondents informed that they sell their agricultural land because of the construction of Cisumdawu toll road. Sumedang Regency Agricultural Agency reported the Cisumdawu toll project spent 4,000 hectares of rice fields in Sumedang district.

Increase of Family Member

Eleven respondents claimed the conversion of land functions due to the increase of family members. Generally, family members who are married and do not leave their homes will build houses on land previously used as agricultural land. In addition, some family members who have been migrated back to their hometown also set up houses on agricultural land.

Central Agency of Statistics of Sumedang Regency reported that in 2016 the rate of population growth for 4 years (2011-2015) decreased as shown in table 3.

Table 3. Population Grown Rate 2011-2015

Year	Population (People)	Population Growth Rate (%)
2011	1.110.083	0,77
2012	1.117.919	0,71
2013	1.125.125	0,64
2014	1.131.516	0,57
2015	1.137.273	0,51

Source: Pocket Book Profile of Regency Sumedang Regency Budget in 2016, processed.

Rate of population growth declined to 0.51% in 2015 from 0.77% in 2011, but the population grew by 27,190 for five years. This is likely to cause some agricultural land to be settled for new residents. Change of population growth is shown in Figure 3.

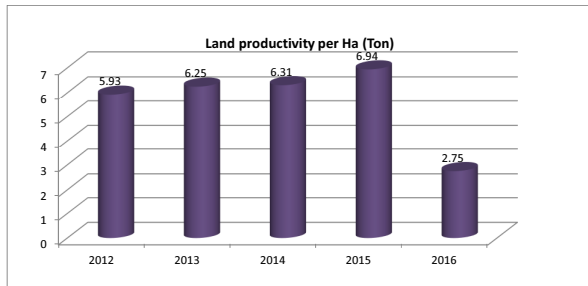


Fig. 3. Change of population growth in Sumedang Regency in 2011-2015 (Source: Pocket Book Profile of Regency Sumedang Regency Budget in 2016, processed)

Impacts of Land Conversion

Land conversion generally has a profound impact on social and economic fields. Social impacts that arise in the form of positive impacts, negative impacts and social problems.

Positive impact can be found in Jatinangor district, such as the opening of employment opportunities for the community. Negative impacts are the decreasing interest of young people to work in agriculture. Impact of land conversion to livelihood is shown in table 4.

Table 4. Impact of Land Conversion to the Livelihood

Livelihood	Number of people
• Keep farming	25
• Do not have a definite livelihood, generally a farm laborer, construction worker, factory worker	27
• Working in malls, shops, cafes and Restaurants	31
• Opening stalls, traveling traders and market traders	34
• Penetrate forest illegally as farmland	23

Source: Research Result, 2015

Table 4 shows that twenty-five respondents still survive as farmers. Generally they are native farmers due to lack of experience or access to outside information about other work, aged 45-55 years, with a land area of 1,500-3,500 M2. They work in their own remaining land and also work on other people's land with a "maro" system or a profit sharing according to an agreed agreement.

Thirty-one respondents work in malls, shops and restaurants cafe. Generally they reside in Jatinangor District which is about 20-40 years old. And 34 respondents become entrepreneurs, by opening small stalls, street vendors and traders in the market. There is another opportunity than to farm from money capital land compensation because it can not take care of the same job the average age 35-45 years.

Twenty-seven respondents chose to be farm laborers, factory-laid laborers, construction workers, in the absence of other jobs. The results of further interviews, some of the respondents had planned to move shelter and open new land.

In Jatigede district, twenty-three respondents stated that they opened forest land to open agricultural land as a source of livelihood.

Another impact of land conversion is the diminished global production of rice that will affect food security. Based on Regional Planning and Development Agency of Sumedang Regency's report of 2015, the Economic Growth Rate of agricultural sector in Sumedang Regency from 2013 to 2014, declined drastically.

Agricultural sector Economic Growth Rate in 2013 reached 2.86%, fell drastically by 2014 to 0.74%. The decline reached 2.12%. The contribution of the agricultural sector to the rate of economic growth in general in Sumedang District, ranked first at 21.71%.

Evaluation on Government Policy and Related Institution

The protection of agricultural land and the determination of agricultural areas shall be regulated in the Regional Regulation of Sumedang Regency No. 2 of 2012 on the Spatial Planning of Sumedang Regency Year 2011-2031. The regulation affirms the general rules of the zoning regulation of wetland farming areas prepared by taking into account:

1. Restrictions on the development of other cultivation activities, namely only for rural settlements, facilities and infrastructure that support the livelihood of farming communities;
2. Restrictions on the transfer of land functions only to activities, facilities and infrastructure that support community life;
3. Provisions on prohibiting conversion of irrigated rice field land that has been designated as sustainable rice field;
4. Strictly controlling the conversion of non-technical irrigated rice fields, for the purposes of strategic infrastructure; and
5. Provisions for banning the growth of urban activities along transportation lines using converted rice fields.

Based on field observations and interview results, although the provision for the transfer of agricultural land has been determined, but in fact the implementation in the field has not been firmed. The permit to grant land fungsi and the establishment of buildings and housing on agricultural land still continues.

Directly related institutions to handle agriculture problems in Sumedang Regency is the Department of Agriculture of Food Crops and Horticulture. Based on the Regent Regulation Sumedang Number 6 Year 2009 About Job Description Structural Position At the Department of Agriculture Food Crops and Horticulture, the Institute is responsible for Agricultural Resources, Food Crops; Horticultural Crops; Post-Harvest Management and Business Development; Rice Seeds and Palawija; and Horticultural Seeds.

Strategy Formulation

The results of the evaluation of land conversion conditions in Sumedang a are used to determine external and internal factors. The next stage after the determination of external and internal factors, the matching stage using SWOT analysis, and decision phase by using Quantitative Strategic Planning Matrix (QSPM) analysis

Tabel 5. SWOT Analysis Matrix

<p style="text-align: center;">Internal</p>	<p>Strength</p> <ol style="list-style-type: none"> 1. People are still interested to farm even with narrow land, and with the system of “maro” 2. People have the capital to look for new agricultural land or switch businesses 	<p>Weakness</p> <ol style="list-style-type: none"> 1.Low productivity of rice field 2. Farmers who become a trader are not accompanied by knowledge about entrepreneur so tend to traditional business 3.Government regulations that restrict land conversion have not been firmly implemented
<p>Ekstenal</p> <p>Opportunity</p> <ol style="list-style-type: none"> 1. High land Selling price 2The availability of new jobs 3. The construction of public facilities makes access faster and mobility 4. The availability of agricultural service to handle aggricultural problem 	<p>S-O Strategy</p> <p><u>Product Development</u></p> <p>High land prices and smoother mobility access, the government can lead the community to start new businesses (S2; O1,2,3)</p>	<p>W-O Strategy</p> <p><u>Product Development:</u></p> <p>Intensification of agriculture, superior seeds resistant to climate change W1,3; O4</p> <p>Training for new entrepreneurs W2; O1,2,3</p> <p>Improve and revitalize agricultural extension work W1; O4</p>
<p>Threat</p> <ol style="list-style-type: none"> 1. Loss of livelihood 2. Illegal clearance of forest land can lead to more serious problems 3. Food security 	<p>S-TStrategy</p> <p><u>Policy Adjustment</u></p> <p>Providing new farmland, for people that have converted their agricultural land (S1,2; T1,2,3,)</p>	<p>W-T Strategy</p> <p><u>Policy Adjustment</u></p> <p>To strictly punishment for illegal land use conversion (W3; T2,3)</p>

Decision Stage

From the result of matching using SWOT matrix analysis resulted several strategy choices (Table IV.12). The strategies are then selected using Quantitative Strategic Planning Matrix

(QSPM) analysis. The stages of QSPM’s analysis are to determine the attractiveness scores of key external and internal factors. The results of QSPM analysis are expressed in matrix form, as can be seen in Table 7.

Table 6. QSPM Analysis Matrix

Key Factors		Weight AS	Product Development		Policy Adjustment	
			TAS	AS	TAS	
<i>Internal Strength</i>						
1.	People are still interested to farm even with narrow land, and with the system of “maro”	0,05			3	0,15
2.	People have the capital to look for new agricultural land or switch businesses	0,1	3	0,3	3	0,3
Internal Weakness						
1.	Low productivity of rice field	0,1	3	0,3		
2.	Farmers who turn into traders are not accompanied by knowledge about entrepreneur so tend to traditional business	0,05	2	0,1		
3.	Government regulations that restrict land conversion have not been firmly implemented	0,15			4	0,6
External Opportunities						
1.	High land Selling price	0,1	3	0,3		
2.	The availability of new jobs	0,05	2	0,1		
3.	The construction of public facilities makes access faster and mobility	0,05	2	0,1		
4.	The availability of agricultural service to handle agricultural problem	0,1	3	0,3		
External Threats						
1.	Loss of livelihood	0,10			4	0,4
2.	Illegal clearance of forest land can lead to more serious problems	0,10			3	0,3
3.	Food Security	0,05			2	0,1
Sum of Total Value of Attraction		1,0		1,5		1,85

Based on the analysis of QSPM matrix in the most appropriate strategy table implemented in the short term is the policy adjustment. This strategy has a high attachment (value 0.6) with key factors in government regulations that restrict land conversion from being firm yet.

Implementation of the policy adjustment strategy can be done by reviewing the Regional Regulation of Sumedang Regency No. 2 of 2012, and establishing new lands for agricultural areas to avoid illegal clearance of forest land.

For the long-term strategy that must be pursued is to encourage farmers to maintain agricultural land by providing assistance of agricultural facilities and counseling the use of organic materials to restore soil fertility.

CONCLUTIONS AND SUGGESTION

Conclutions

From the results of research that has been done, there are several points of conclusion as follows:

1. The conversion of agricultural land to

non-agricultural land in Sumedang Regency is attributed to the decreasing value of land yielding productivity, high land prices, increasing population, and construction of public facilities.

2. Land use change affects social and economic aspects such as changing livelihood structure and food security
3. Based on the result of QSPM matrix analysis, the most priority strategy applied in controlling the transfer of land function in Sumedang Regency is Policy Adjustment.

Suggestion

From the current conditions it is recommended that the government of Sumedang Regency:

1. Arrangement of policy adjustments to control land conversion through reviewing for regulation of Spatial Planning.
2. Arrangement of licensing mechanism for land use conversion
3. Solutions to problems arising from the conversion of agricultural land to social, economic and environmental issues.

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