The strategy of sustainable soybean development to increase soybean needs in North Sumatera

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The strategy of sustainable soybean development to increase soybean needs in North Sumatera

L Handayani[1], A Rauf[2], Rahmawaty[3] and T Supriana[4]

[1]AGraduate Student of Agricultural Science, Universitas Sumatera Utara, Indonesia
[2]Department of Agriculture Agroecotechnology, Universitas Sumatera Utara, Indonesia
[3]Departemen Agriculture Forestry, Universitas Sumatera Utara, Indonesia
[4]Department of Agriculture Agribusiness, Universitas Sumatera Utara, Indonesian
E-mail: tavihutasuhut@yahoo.co.id

Abstract: The objective of the research was to analyze both internal and external factors influencing the strategy of sustainable soybean development to increase soybean needs in North Sumatera. SWOT analysis was used as the method of the research through identifying internal factors in the development of sustainable soybean the strategy to increase soybean production in research area is aggressive strategy or strategy of SO (Strengths - Oppurtunities) that is using force to exploit existing opportunity with activities as follows: (1). Use certified seeds in accordance with government regulations and policies. (2). Utilizing the level of soil fertility and cropping patterns to be able to meet the demand for soybeans. (3). Utilizing human resources by becoming a member of farmer groups.

1. Introduction

Soybeans are the most important food crops after rice and maize. In addition, soy is also a commodity palawija rich in protein. Fresh soybeans are much needed in the food industry and soybean meal is needed for the feed industry. Soybean plays a role as an important vegetable source in order to increase the nutrition of the community because in addition to safe for health is also relatively cheap compared to the source of animal protein [1]

National soybean production has not been able to meet the needs, because the actual harvested area is still inadequate and the productivity is still low. Productivity at the farm level averaged 1.3 tons / ha, while the production potential reached 2.0 to 2.5 tons /ha. The large gap is partly due to the application of technology at the farmer level is still low, the use of limited seed and human resources still weak. Every year the industry knows tempe requires at least 1.85 million tons of soybeans, as well as the soy and tauco industry of around 325.220 tons. In addition, the seed industry also needs 25.843 tons of soybean, as well as for feeding about 8.319 tons of soybeans. To meet the shortage of needs each year, soybean imports reached 1.3 million tons. In fact, Indonesia is one of the countries that depend on imports of soybeans from the United States (US).

Availability of food is essential for the stability of a country. The ability to be self-sufficient can save foreign exchange that can be utilized for other strategic purposes. In fact, to date in Indonesia import needs especially in the sectors of food needs are always increasing because the demand exceeds the supply of available food. healthy lifestyle changes and progress in the field of agro-industry and farming sectors. Conditions such as these that ultimately trigger a shortcut to import soybeans to meet

the needs of the public soy consumption. in addition, an increase in the volume of i mports was also caused by increased demand for import soybean because it has cheaper prices than local soybean [2]

Currently, soybean cultivation in paddy fields only reaches 65% of the total harvest area. The opportunity to increase soybean production is wide open due to the availability of potential area of about 800 thousand ha spread over 10 provinces. But the problem faced is to instill trust and interest of farmers to want to plant soybeans aback. Altemeier, K and T. Bottema[3] Argue that price protection is an effective way of encouraging increased production, adoption of fertilizer technology and labor absorption compared to fertilizer price subsidies. Acid Soils amelioration technology with high Al content is generally well known, that is by liming, giving organic matter and P fertilization from natural phosphate[4]. The soybean cultivation that reaches over 20 million ha in Brazil is almost entirely done on acid soils with high productivity after land amelioration is applied [5].

Conditions in the field also show that the application of soybean production technology components by farmers is not complete. Implementation of drainage channels, such as the width and depth of the channel, the number and location of the channel) is not in accordance with the recommendations. The soybean production technology package in NTB area shows the diversity of production level achieved by farmers between planting time, location and season. Application of true and exact technology package able to obtain result > 2.0 ton/ha [6]

There are some environmental factors related to the lower productivity of soybean. Drought and floodingas results of climatic anomaly and climate change are the main causal factors. Many sectors are affected by climate changes, and agriculture is the most susceptible sector related to extreme climate change. Ecosystem of rice and other food crops such as soybean are the common examples that impacted by the extreme climate changes [7].

Soybean (*Glycine max* L) is a highly nutritious food commodities as a source of vegetable protein an d low cholesterol at an affordable price. Soybeans also an important food commodity after rice and maize. Soy consumption in the form of fresh or in processed form can improve nutrition. Soybean plants can grow well in areas with rainfall around 100-400 mm / month with temperatures bet ween 21-34 degrees C and at a height of not more than 500 m above sea. In Indonesia, many proces sed soybeans for various foodstuffs, such as tempeh, soy milk, tofu, bean curd, soy sauce, oncom, tauco, soybean cake, ice cream, edible oil, and soy flour. In addition, it is also widely used as an animal feed ingredient [8].

From the above problems, it needs to be studied further about The Strategy of Sustainable Soybean Development to Increase Soybean Needs in Nort Sumatera.

2. Research Method

The data collected in this research consist of primary data and secondary data. Primary data is in the form of questionnaires obtained from the results of interviews as many as 120 soybean farmers consisting of 4 districts in North Sumatra namely Langkat, Deli Serdang, Serdang Bedagai and Simalungun using a list of questions that have been prepared previously. Secondary data are supporting data obtained from related institutions such as Central Bureau of Statistics (BPS) of North Sumatra and other related institutions. The method used in this research is SWOT analysis and position matrix to determine strategy in soybean development. This matrix produces four sets of alternative strategic possibilities, as illustrated in the Table 1.

Prior to the data analysis as above then first performed data collection using the matrix model internal strategy factor, external factor matrix as as illustrated in the Table 1.

Table 1. Category Assessment of Internal and External Factors

Rating	Category	Internal Factors	External Factors
4	Very Good	Strength	Oppurtunity
3	Good	Strength	Oppurtunity
2	Pretty Good	Strength	Oppurtunity
1	Not Good	Strength	Oppurtunity
-4	Very Good	Weakness	Threats
-3	Good	Weakness	Threats
-2	Pretty Good	Weakness	Threats
-1	Not Good	Weakness	Threats
Total Score			

Each internal factor of strength and external factors of opportunity is given very good category until it is not good and given a 4 start rating for category very good up to 1 for not good category. whereas any internal factors of weakness and external threat factors are categorized as excellent until not good and given a rating ranging from - 4 very good category up to - 1 for not good category.

3. Results And Discussions

3.1. Sustainable Soy Development Strategy

Every farming certainly faces problems in the production process. But the problems in dealing with these goals must be able to determine the right development strategy of production in order to be able to position them selves in a favorable position. Based on the of data processing obtained from soybean farmers in the study area, the result is as follow.

Table 2. Merging of Internal and External Strategy Factor Factoring Matrix for Sustainable Soybean Development

Strategic Factors	Rating	Weight	Score
Internal Strategy Factor			
Strength			
1. Human Resources in Producing Soybean	3	10	30
2. The capital used by farmers			
3. Use of Certified Seeds	2	6.67	13.34
4. Improving Cropping Patterns and Utilizing	4	13.33	53.32
Potential Land	4	13.33	53.32
5. The Level of Land Fertility	2	6.67	13.34
Total Strength Score	15	50	163.32
Weakness			
1. Utilization of Natural Potential	-3	11.54	34.62
2. Technology used Farmers	-3	11.54	34.62
3. Management System in farming	-3	11.54	34.62
4. The area of land cultivated	-2	7.69	15.38
5. Use of production facilities	-2	7.69	15.38
Total Weakness Score	13	50	134.62
Difference (Strength - Weakness)			28.70
External Strategic Factors			
Oppurtunity			
1. Selling Price of Soybean	2	5.89	11.78
2. The existence of Soybean Processing Industry	4	11.76	47.04
3. Organization of Farmer Groups	3	8.83	26.49
4. Demand for Soybeans	4	11.76	47.04

5. Regulations and government policies	4	11.76	47.04
Total Opportunity Score	17	50	152.90
Threats			
1. Entry of imported soybeans	-3	10.71	32.13
2. Lack of Counseling	-2	7.14	14.28
3. Climate Change and Weather	-2	7.14	14.28
4. Development of Information and Communication	-3	10.71	32.13
Technology	-3	10.71	32.13
5. Availability kiosks Means of Production	-1	3.57	3.57
Threats Total Score	14	50	128.52
Range (Opportunity – Threats)			24.38

Source: Primary Data Analysis

The data above shows that the difference of internal strategy factor (strength-weakness) is equal to 28.70 which means the influence of strength is greater than the influence of weakness in soybean development in research area. While the difference of external strategy factor (opportunity-threat) is 24.38 which means the influence of opportunity is greater than influence of the threat on soybean development in the research area.

Table. 3. SWOT Matrix

INTERNAL / EXTERNAL	STRENGTH (S)	WEAKNESS (W)
	1. Human Resources in Producing Soybean (S1) 2. The capital used by farmers (S2) 3. Use of Certified Seeds (S3) 4. Improving Cropping Patterns and Utilizing Potential Land (S4) 5. The Level of Land Fertility (S5)	1. Utilization of Natural Potential (W1) 2. Technology used Farmers (W2) 3. Management System in farming (W3) 4. The area of land cultivated (W4) 5. Use of production facilities (W5)
OPPURTUNITY (O)	STRATEGY SO	STRATEGY WO
1. Selling Price of Soybean (O1) 2. The existence of Soybean Processing Industry (O2) 3. Organization of Farmer Groups (O3) 4. Demand for Soybeans (O4) 5. Regulations and government policies (O5)	1. Utilizing human resources by being a member of farmer group (S1, O3) 2. Using certified seeds according to government regulations and policies (S4, O5) 3. Utilizing land fertility and cropping patterns to meet soybean demand (S5, S4, O1, O2, O4)	1. Utilizing demand and selling price of soybean by expanding farming land and managing natural potency (W1, W4, O1, O3) 2. Following training to improve skills in the use of technology (W2, O2, O3, O5) 3. Encourage the improvement of farmer group activities in the form of farm management training (W3, O3)
THREATS (T)	STRATEGY ST	STRATEGY WT
1. Entry of imported soybeans (T1) 2. Lack of Counseling (T2) 3. Climate Change and Weather (T3)	1. Using the land fertility level and improved cropping patterns to overcome the attacks of pests and diseases (S5, S4, T4) 2. Using capital to obtain the	1. Looking for information that can give hope for a better farming (W3, T5) 2. Utilizing existing counseling for soybean farming on

4. Development of Information and Communication Technology (T4) 5. Availability kiosks Means of Production (T5)	required production facilities (S2, T6)	available land (W4, T2, T3, T6)

From the above strategy results can be poured policies, programs and activities of soybean development as follows:
Strategy (S1,O3) :
Utilizing human resources by becoming a member of farmer groups
Effort :
Appropriate human resource upgrading so as to ensure the sustainability of a good so that the production can be maintained its quality, through the organization of farmer' groups, the farmers' experience will increase
Program :
Increased production, productivity and quality of sustainable soybean
Activities :
Agricultural institutions provide training to farmers
Strategy (S4,O5) :
Using seeds certified in accordance with government regulations and policies
Effort :
Increase the production of soybean with the use of certified seed to guarantee quality yields the good one
Program :
Prevention use of seeds that less quality
Activities :
Certified seeds obtained from agricultural services provided free of charge through farmer groups designated as seed breeders of F2 and F3 derivatives
Strategy (S5, S4, O1, O2, O4) :
Utilizing the land fertility and cropping patterns to meet the demand for soybeans
Effort :
Increasing production by planting soybeans on suitable land for soybean crops and the utilization of vacant land (fallow) post harvest rice can keep the soybean stock for industry.
Program :
The dependence of farmers on inorganic fertilizers (chemical) that make agricultural land damaged, the use of organic fertilizer can improve soil structure to be better
Activities :
Provision of subsidized fertilizer by the government to soybean farmers.

4. Conclusion

1. The strategy to increase soybean production in the research area is aggressive strategy or SO (Strengths - Oppurtunities) strategy that uses the power to exploit the existing opportunities
2. with uses the power to exploit the existing opportunities with the following activities : (1). Use certified seeds in accordance with government regulations and policies. (2). Utilizing the level of soil fertility and cropping patterns to be able to meet the demand for soybeans. (3). Utilizing human resources by becoming a member of a farmer group.

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