



# Planning Counseling Methods in Supporting Sustainable Forestry Development in Simalungun Regency

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**Abstract:** Simalungun Regency is an agricultural area and the main occupation of the community is agriculture. To support development in agriculture, especially in the field of community forestry, it is very necessary to be accompanied by extension workers. Forestry extension workers provide guidance and assist farmers either in the form of demonstrations or examples of work in farming to solve all the problems faced. The existence of community forestry extension workers in Simalungun Regency, the socio-economic life and knowledge of the community have changed for the better. Seeing the difficult challenges that will be faced by extension workers, it is necessary to have an accurate method in delivering the material so that farmers are willing to adopt the material from the extension worker. The data analysis technique using Process Hierarchy Analysis (AHP) is to solve problems by breaking down into groups then arranged into a form of hierarchy with a decision support system for selecting a health counseling method by determining the top priority of several criteria and existing alternatives to make decisions in the selection of counseling method planning. The weight of the value of each alternative based on the evaluation of the weighting that has been carried out with a higher weight indicates its level of importance. So the alternative development of the independence of farmer groups selected as a sustainable forestry development strategy is in accordance with the planning of forestry extension methods.

**Keywords:** Agriculture; Planning counseling; Sustainable forestry development

## Introduction

Forest is a renewable natural resource, it is capital development which if properly managed will provide economic benefits, through job creation while maintaining environmental benefits (Diniyati et al., 2010). The condition of the world's forests over the last 35 years has reached a critical point, degrading the main functions of forests, namely the function of conservation, production and protection. This is the cause of various natural disasters that have occurred in the world such as floods, landslides, smog, reduced sources of clean water, drought, to global climate change which in turn has resulted in material losses and even fatalities (Tanjung et al., 2017). After more than 70 years of Indonesia's independence, Indonesia's forestry development has experienced various complexities where forests that were once considered important for the Indonesian

economy are now facing challenges (Widiaryanto, 2019). Forestry development has undergone a shift from forest management oriented towards timber forest products and conglomeration systems that do not provide a role to the community, to being oriented towards the management of all sources and based on community empowerment (Sezgin & Karadas, 2011). In connection with this paradigm shift, the existence of forests and forest areas is not only a producer of wood, but also can produce commodities and other services for the benefit of the community. In addition, communities that were initially positioned as objects and partners in forestry development activities were directed as the main actors (Agbogidi & Ofuoku, 2009; Efratani Damanik, 2020). Therefore, the change in the paradigm of forestry development has also implications for forestry development, it has also implications for the reorientation of the forestry extension paradigm from the beginning

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which is participatory and is a process of community empowerment to realize sustainable forest management and equitable and sustainable community welfare (Efratani Damanik, 2017; Efratani Damanik et al., 2021; Kandzior & Rivas, 2015).

Simalungun Regency is a district in North Sumatra, Indonesia. The population of Simalungun district based on the Ministry of Home Affairs in 2021 is 1,038,120 people, with a density of 237 people/km<sup>2</sup>. The majority of the population's occupations were farmers (BPS, 2021). The area has many fields decorated with lush crops, Commodities that are widely cultivated by people in this area are by producing agricultural commodities such as rice, palm oil, rubber, and the most popular are duku fruit, tea plantations, rubber and vegetable commodities (BPS, 2021; Efratani Damanik, 2020; Efratani Damanik et al., 2021). With the condition of the agricultural area, the community really needs to be accompanied by forestry extension workers. The forestry extension officer acts as an advisor, who can serve, provide guidance and assist farmers either in the form of demonstrations or examples of work in farming to solve all problems encountered (Efratani Damanik et al., 2019; Lukkainen, 2012).

The success of counseling in forestry development is largely determined by the quality of human resources (HR), especially forestry extension workers (Efratani Damanik, 2017). As the spearhead of forestry development, the competence of forestry extension workers must always be improved. The existence of community forestry extension workers in Simalungun Regency, the socio-economic life and knowledge of the community have changed for the better. Counseling activities are an activity that is quite difficult to do. This is because this activity involves the main actors, namely, a combination of farmer groups, farmer groups, farmers, which are sometimes very dynamic (Efratani Damanik, 2020; Efratani Damanik et al., 2019). This is a challenge that is often encountered by forestry extension workers in the field. Seeing the difficult challenges that will be faced by extension workers, it is necessary to have precise methods to convey agricultural technologies so that farmers are willing to adopt material from these extension workers (Lukkainen, 2012). The agricultural extension method is also one of the ways or techniques for delivering counseling materials by agricultural extension workers to the main actors and business actors so that they know, are willing and able to help and organize themselves in accessing market information, technology, capital, other resources as an effort to increase productivity, business efficiency, income and welfare, as well as increase awareness in preserving environmental functions (Efratani Damanik, 2017; Muneer, 2014). In applying the agricultural extension method, there are rules that must be followed by agricultural extension workers, so that the method

becomes effective. In this regard, competence is required to apply agricultural extension methods (Efratani Damanik et al., 2019).

The role of forestry extension workers in forestry development programs is basically to build community motivation, develop community independence through assistance with forestry-based community productive business activities, and support the physical development of the forestry sector. A forestry extension program is a written plan systematically prepared by a functional group of forestry extension workers at each level to provide direction and guidance in implementing extension services, and serves as a controlling tool for achieving extension objectives. The purpose of planning an effective extension method in supporting sustainable forestry development in Simalungun Regency is the selection of the right method according to the needs and conditions of the target. Thus, agricultural extension activities are carried out for the empowerment of the community, the business world, central and local government officials, as well as other parties related to sustainable forestry development (Muneer, 2014).

#### *Literature*

##### *Forest Planning*

In Indonesia, forests and forest land cover 2.8 million of hectares or 54% of the total area 81 % of forests are owned by the state, and the remaining are privately owned (Efratani Damanik, 2017). According to the Ministry of Environment and Forestry, Indonesia has a forest area of around 94.1 million ha which consists of various spatial functions, including those used as Production Forest (Adi et al., 2021). At present, the map of forestry problems has shifted from technical problems to economic, social problems as well as the impact of forestry sector policies which are increasingly complex and must be handled immediately including in the management plan (Akhadi et al., 2013). Forestry planning is a process of setting goals, determining activities and tools needed in sustainable forest management to provide guidelines and directions to ensure the expected achievement of forestry implementation. The long journey of forest management in Indonesia since the colonial era until now experiencing various dynamics and challenges (Supriyanto et al., 2021).

The availability of forest stand data as a result of the implementation of forest inventory is the condition of forest stands that exist at a certain time and is expressed in type composition, distribution of diameter and size of the height of trees, arrangement of stands, area, volume of forest stands, conditions of plant or natural youth and landforms in one area (Sawitri et al., 2020). One of the concrete steps in improving forest quality is the availability of data on growth and yield by modeling the dynamics of stand structures compiled

from growth data sets in permanent plots (Efratani Damanik, 2019).

In accordance with Government Regulation Number 44 of 2014, forest inventory at the management unit level is carried out by permit holders and is intended as a basis for the preparation of forest management plans in the management unit concerned (Efratani Damanik et al., 2022). The forest planning is intended to be able to provide a working and legal basis in order to realize order and also legal certainty in the use of forests, so as to ensure the greatest benefit of the forest and function in a versatile and sustainable use (Agbogidi & Ofuoku, 2009). Based on the principles of forest planning, especially in sustainable forest management and based on the identification of the area and land quality of a work area and forest exploitation so that it can be carried out properly as well as sustainable, efficient and environmentally sound forest management activities. Based on activities in forest management, a work plan is prepared including forest planting activities, forest maintenance activities, forest product collection activities and forest product marketing activities (Kandzior & Rivas, 2015; Lukkainen, 2012).

Good and appropriate planning makes forest management more targeted and controlled, both at the beginning of forest management and in monitoring and evaluating activities. Such forest planning is carried out or made to provide an appropriate foundation and more rational direction for activities and for their subsequent implementation [4]. Therefore, in every achievement of management goals inseparable from the principle of sustainability, all activities in the field of forest exploitation are still carried out with the principle of sustainability and sustainability (Efratani Damanik et al., 2022; Kandzior & Rivas, 2015).

### *Forestry Counseling*

Extension workers are experts and are the spearhead of forestry, agricultural extension workers ideally need to play a mentoring role to communities and farmer groups that carry out forestry activities (Efratani Damanik, 2017). UUD No. 16 Th 2016 explains that Counseling is defined as a learning process for key actors and business actors so that they are willing and able to help and organize themselves in accessing market information, technology, capital and other resources, as an effort to increase productivity, business effectiveness, income and welfare, as well as increasing awareness in the preservation of environmental functions (Euriga et al., 2018). Civil servant forestry extension officers are civil servants who are given full duties, responsibilities, authorities and rights by authorized officials in forestry scope organization units to carry out forestry counseling (Muneer, 2014). In this case, the extension play an important role in making it

happen better forest management because the community needs extension agents know how to communicate properly and without coercion so as to convince society will use these new things (Hardianto et al., 2020).

Forestry Counseling is a process of community empowerment in developing knowledge and attitudes of community behavior so that they become aware, willing and able to carry out forestry business to increase their income and welfare and have concern and actively participate in forest conservation (Muneer, 2014). In this regard, community empowerment in forestry development is the key answer to optimizing access to forest resource management in order to improve people's welfare (Suyadi et al., 2019). The empowerment of communities around forests, which is one of the priority policies for forestry development, requires extension efforts. Directed and planned forestry counseling will encourage the acceleration of the strength and ability of communities around the forest to participate in forestry development, so that an independent, resilient, and sustainable people's economy can grow and develop, which is characterized by increasing community incomes, developing community capacities and capabilities, and increasing community institutions (Efratani Damanik, 2020; Sezgin & Karadas, 2011). Forestry counseling is a system or service carried out by the government or non-governmental organizations that are deliberately directed to help farming communities to add information through non-formal education processes to improve their knowledge, income so that their lives are more prosperous and able to improve education and social standards of life in rural areas (Efratani Damanik et al., 2022).

Taking into account the current condition of forest resource destruction which is already very worrying, it is necessary to change the paradigm of forestry development which relies on a forest resource ecosystem approach based on community empowerment. Future forestry development programs will be directed to actively participate or participate in the community and also proportionally (Efratani Damanik, 2016). Thus, the role of a forestry counselor is very strategic, especially in order to increase community capacity, community independence, as well as in efforts to conserve forest resources so that they can run for a very long time and remain sustainable in a sustainable manner. In connection with the current problems, general guidelines for forestry counseling are needed which are a reference for parties in the implementation of forestry counseling (Kassem, 2014; Sezgin & Karadas, 2011).

The purpose of implementing forestry extension activities in accordance with Article 56 of Law No. 41 of 1999 concerning Forestry, is to improve information and knowledge of the community and can improve skills

and be willing to change the attitudes and behaviors of the community itself, who do not want to become willing and who are unable to become capable and support forestry development and are aware of the importance of forest resources in human life (Efratani Damanik, 2017). The target of the results of forestry counseling is the realization of an independent community based on forestry development (Muneer, 2014).

#### *Forestry Extension Methods*

According to the Regulation of the Minister of Agriculture number 52 of 2009 concerning agricultural extension methods, the agricultural extension method is a way or technique for delivering counseling materials by agricultural extension workers to the main actors and business actors so that they know, are willing and able to help (Efratani Damanik et al., 2022; Muneer, 2014) and organize themselves in accessing market information, technology, capital, other resources as an effort to increase productivity, business efficiency, its income and well-being, as well as raising awareness in the preservation of environmental functions (Lukkainen, 2012; Sezgin & Karadas, 2011).

Several types of forestry extension methods that can be applied (1) Lecture Method. The lecture method is a way of explaining and explaining an idea, understanding or message orally to a group of targets so as to obtain the desired information. The implementation of the lecture is necessary so that the expectations to be achieved, systematically explaining the content of the lecture to be voiced loudly and up and down so that it is not boring, interspersed with fresh humor, the use of appropriate and correct props can clarify the material that is not clear, try to make the atmosphere of the lecture pleasant, every three minutes give time to ask questions for the target, use language that is easy to understand, answer questions convincingly (Efratani Damanik, 2020). (2) Group Discussion Method. The group discussion method is a planned and prepared talk on a topic of conversation between 5 to 20 participants (target) with a designated discussion leader (Muneer, 2014). This discussion method is carried out by giving each participant the opportunity to express their opinions, encourage participant participation, make participants more tolerant and insightful, listen actively and the opinions of group members to conclusions can be drawn (Kandzior & Rivas, 2015). (3) Brainstorming Method. The brainstorming method is a form of problem solving in which each member proposes all possible problem solving that each participant has thought of, and an evaluation of those opinions is carried out later (Agbogidi & Ofuoku, 2009). This method is indispensable because it gets a lot of ideas from a group of people in a short time, puts forward ideas that arise in

his mind, the power of imagination and the creativity of thinking become developed because of using various alternatives, discussing and evaluating ideas and finding certain ideas that are considered good (Sezgin & Karadas, 2011). (4) Panel Method. The Panel Method is a planned talk in front of visitors or participants on a topic, it takes 3 or more panelists with a leader (Efratani Damanik, 2017). Discussion participants express their ideas, discuss the subject matter, encourage the analysis of possibilities, differences of opinion that can still be concluded (Kassem, 2014). (5) Role-playing methods. The role-playing method is to act out a situation in human life without any exercise, performed by two or more people to be used as a material for thought by the group (Efratani Damanik, 2017). This is done by learning with the cognitive realm, actualizing with certain roles relevant to the objectives of counseling, designing and directing role-playing and guiding the process of role-playing (Efratani Damanik et al., 2022; Kandzior & Rivas, 2015). (6) Demonstration Method. The demonstration method is a way of showing understanding, ideas and procedures about something that has been carefully prepared to show how to carry out an action, a scene using props (Lukkainen, 2012). This method is used against not very large groups. This method is carried out by demonstrating a new way of working, accelerating the adoption process, obtaining real information and data, showing the results obtained and providing experience to the officer so as to increase confidence in his duties (Muneer, 2014; Sezgin & Karadas, 2011).

#### *Sustainable Forestry Development*

The development of the forestry sector that expects its programs to be planned and budgeted by the local government must refer to this Permendagri and must still refer to their respective authorities as stipulated in Law No. 23 of 2014. The central government, in this case the Ministry of Environment and Forestry/KLHK, cannot necessarily order the local government (in this case the Service that handles Forestry) to carry out a program or activity of the Ministry of Environment and Forestry without referring to the Permendagri. Unless the MoEF provides assistance tasks, deconcentration tasks, and facilitation, which means that activities are carried out by the regions, but financing from the Central Government (Efratani Damanik, 2017; Efratani Damanik et al., 2019; Muneer, 2014).

The forestry development program can basically be grouped into 3 groups of activities, namely (1) Building community motivation; carried out so that the community knows, is willing and able to participate in sustainable forestry development. This activity is carried out through various activities including: campaigns, socialization, group meetings (Efratani Damanik, 2019).

(2). Development of community independence; carried out through the assistance of various productive community business activities based on forestry, with various models or pilots of forestry development (Kassem, 2014). (3). Support the physical development of the forestry sector. One of the efforts to address the problem of the shortage of forestry extension workers (PNS), is to empower independent extension workers (Efratani Damanik, 2016).

**Method**

The data collected in this study consists of two types, namely primary data and secondary data. Primary data is data obtained from the results of direct interviews with respondents. The technique of data collection carried out by observation is the collection of data carried out through direct observation of the assisted farmer groups obtained from documents and information in villages and sub-districts that are closely related to this study. Data analysis techniques using Process Hierarchy Analysis (AHP) are solving problems by breaking them into groups and then organized into a form of hierarchy (Brunelli, 2015). The process used in decision making with a systems approach, where decision makers try to understand a system condition and help make predictions in making decisions.

**Table 1.** Comparison Scale in Pairs

Intensity of Importance	Definition
1	Just as important as any other
3	A little more important than the others
5	Quite important compared to others
7	Very important compared to others
9	Extremes are important compared to others
2;4;6;8	If the element i has one of the above numbers compared to the element j then j has the value of i inversely when compared to j

Test the consistency of each paired matrix with the following steps:

Calculating the Consistency Index CI:  $\tau_{max} - n / n - 1$

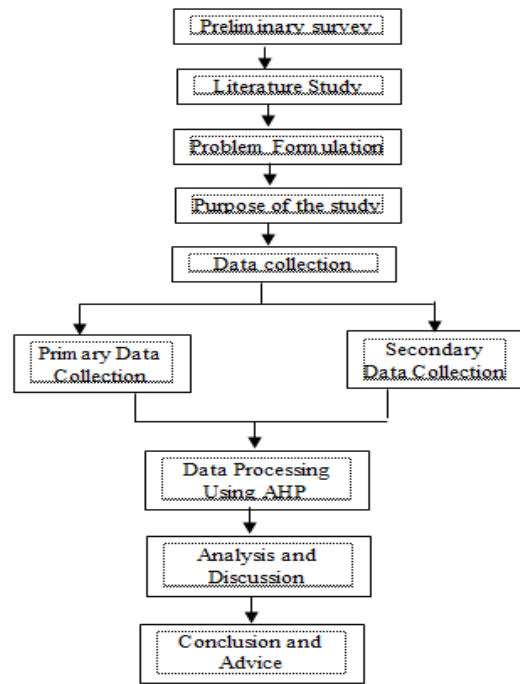
Calculating the Consistency Ratio CR:  $CI / RI$

The Random Index VALUE of the RI based on the Saaty calculation, can be seen in table 2.

**Table 2.** Random Generating Value (RI)

n	1	2	3	4	5	6	7	8	9	10
R	0:0	0:0	0:5	0:9	1:1	1:2	1:3	1:4	1:4	1:49
I	0	0	8	0	2	4	2	1	5	

The flow of research that will be carried out from beginning to end is broadly as follows:

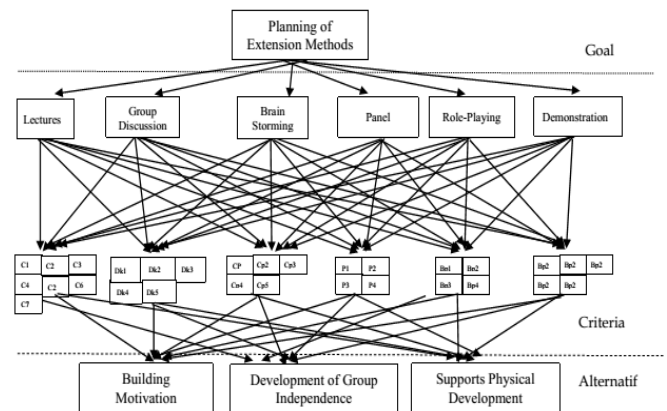


**Figure 1.** Research methodology flow chart

**Result and Discussion**

*AHP Structure Model*

Based on the goals, criteria, and alternatives that have been set, a hierarchical structure is then built for a clearer depiction. The AHP structure can be seen in Figure 2.



**Figure 2.** AHP model forestry extension model planning

*Comparison of Pairs and Priority Weights*

The paired comparison questionnaire that has been filled in by the correspondent then becomes data as material for calculating AHP. With the comparison data that has been obtained, then the calculation of priority weights between attributes of the same level in the hierarchy and alternative weights of solutions is carried out on each criterion and subcriteria.

**Table 3.** Priority Weights Between Criteria

Priority Weight Type	Priority Weight Value
Between criteria	Lecture 8:61
	Group discusion 8:77
	Brain storm 8:45
	Panel 8:36
	Role play 8:55
	Demonstration 8:92
Lecture sub criteria	Expectations to be achieved 5:11
	Systematic explanation 5:63
	Not boring 5:68
	Interspersed with fresh humor 5:48
	Use of props 5:59
	Easy-to-understand language 5:26
	Questions convincingly 5:66
Sub criteria for group discussions	Give every participant a chance 5:31
	Encourage participation 5:38
	Make participants more tolerant and insightful 5:52
	Active listening 5:47
	Opinions of group members become decisions taken 5:49
Brainstorming sub criteria	Get ideas 5:69
	Putting forward ideas 5:43
	Imagination and thinking creativity 5:46
	Using a variety of alternatives 5:37
	Found certain ideas that are considered good 5:29
Sub criteria panel	Bringing out ideas 5:67
	Talking about the subject 5:76
	Analyze the possibilities 5:69
	Differences of opinion that can still be concluded together 5:48
Role-playing sub criteria	Cognitive learning 5:88
	Actualizing with certain roles 5:89
	Design and direct role play 5:86
	Guiding the playing process 5:59
Demonstration sub criteria	Showing new work 5:98
	Speed up the adoption process 5:99
	Real captions and data 5:95
	Show the results obtained 5:94
	Providing experience 5:96

The table above shows the results of weighting between decision-making criteria. Each of these criteria is compared with one another to find out the level of importance of each criterion in decision making. A higher value indicates a more important level of importance. In this case the highest score is the demonstration sub-criteria with the priority weight value accelerating the adoption process of 5.99, followed by showing new work with a priority weight value of 5.98, and the third order gives experience with a priorotas weight value of 5.96.

**Table 4.** Weighting of Alternative Priorities Against Sub-Criteria

Priority Weight Type	Priority Weight Value
Lecture criteria and alternatives	Building motivation 3:01
	Development of self-reliance 3:12
	Supporting development 3:32
Group discussion and alternatives	Building motivation 3:26
	Development of self-reliance 3:18
	Supporting development 3:37
Brainstorming and alternatives	Building motivation 3:41
	Development of self-reliance 3:41
	Supporting development 3:28
Panels and alternatives	Building motivation 3:53
	Development of self-reliance 3:42
	Supporting development 3:42
Roole playing and alternatives	Building motivation 3:69
	Development of self-reliance 3:69
	Supporting development 3:57
Demonstrations and alternatives	Building motivation 4:29
	Development of self-reliance 4:12
	Supports physical development 4:04

Weighting of the criteria against the alternatives used. Weighting is carried out one by one criteria and sub-criteria against alternatives that are used to determine the level of importance of these criteria to an alternative. A higher weight value indicates that the criterion is more appropriate against a particular alternative. The highest type of demonstration and alternative priority weighting was at a motivational build weight value of 4.29 second order establishing independence with a priority weight value of 4.12 and supporting physical development of a priority weight value of 4.04.

*Consistency Test*

The weighting that has been carried out is then tested for consistency to prove that the weighting carried out is appropriate and can be used. The consistency level value of the weighted pmboan is said to be consistent when the value is smaller or equal to 0.1. The results of the calculation of the consistency level of each weighting can be seen in Table 5 to Table 7.

**Table 5.** Results of Calculation of Consistency Ratio Weight Between Criteria

Weighting Type	Consistency Ratio
Between criteria	0:077
Lecture Sub Criteria	0:072
Sub Criteria for group discussion	0:026
Sub Criteria for brainstorming	0:022
Sub Criteria panel	0:038
Sub Criteria play	0:036
Sub Criteria demonstration	0:037

**Table 6.** Results of Calculation of Consistency Ratio of Alternative Weights Against Criteria

Weighting Type	Consistency Ratio
Lecture Sub Criteria	0:072
Sub Criteria for group discussion	0:026
Sub Criteria for brainstorming	0:022
Sub Criteria panel	0:038
Sub Criteria play	0:036
Sub Criteria demonstration	0:037

**Table 7.** Results of Calculation of Consistency Ratio of Alternative Weights against Sub Criteria

Weighting Type	Consistency Ratio
Expectations to be achieved	0:057
Systematic explanation	0:058
Not boring	0:062
Interspersed with fresh humor	0:055
Use of props	0:053
Easy-to-understand language	0:052
Questions convincingly	0:037
Give every participant a chance	0:045
Encourage participation	0:052
Make participants more tolerant and insightful	0:056
Active listening	0:047
The opinion of the members of the group becomes the decision taken	0:044
Get ideas	0:053
Putting forward ideas	0:052
Imagination and thinking creativity	0:029
Using a variety of alternatives	0:052
Bringing out ideas	0:025
Talk about the subject	0:027
Analysis of possibilities	0:032
Differences of opinion that can still be concluded together	0:037
Cognitive learning	0:036
Actualizing with certain roles	0:031
Design and direct role play	0:043
Guiding the playing process	0:047
Showing new work	0:088
Real captions and data	0:066
Show the results obtained	0:067
Giving experience	0:064

Based on the results that can be seen in Table 5 to Table 7, it can be seen that the consistency test values of the weighting that have been carried out are all worth less than 0.1. This means that the weighting that has been carried out is consistent and can be trusted to continue in the next process.

*Decision Making*

After calculating the level of consistency of each weighting, then the calculation of the weight evaluation obtained by each alternative to the priority weighting that has been carried out is carried out to find out which alternatives will be used as a decision.

**Table 8.** Evaluation of alternative weights of solutions

Strategy	Weight
Build motivation	0:30
Development of group independence	0:59
Supports physical development	0:38

Table 8 shows the weight of the values of each alternative based on the evaluation of the weighting that has been carried out. An alternative with a higher weight indicates its importance to choose from compared to the lower one. So the alternative development of group independence was chosen as a sustainable forestry development strategy in accordance with the weight of 0.59. Thus, the activities of agricultural extension workers for the independence of farmer groups in Simalungun Regency need to be implemented, this is also to accelerate the process of dissemination of technological innovations, it is recommended that the extension method using the method of developing group independence. The demonstration counseling method with the development of group independence is an agricultural extension method carried out by demonstration. Demonstration activities are carried out with the intention of showing a new innovation to farmers in a real or concrete manner. Through demonstration activities, the target in this case is that implementing farmers are taught about skills and given examples of how technology works with new innovations including its advantages to perfect the old ways that have been implemented by implementing farmers.

**Conclusion**

In the decision support system for the selection of the health counseling method by determining the top priority of several criteria and existing alternatives to make decisions in the selection of counseling method planning. Priority weight on the development of self-reliance as a strategy in forestry development to achieve the goals of the forestry extension model planning. The role of agricultural extension workers in escorting and mentoring as well as improving the function and role of the Agricultural Extension Center (BPP) as a learning center. Therefore, it is recommended that both central and regional governments can facilitate demonstration activities in the work areas of agricultural extension workers.

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