



Strategic development of nature tourism based on plant species at the mahawu mountainous region, North Sulawesi, Indonesia

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Abstract

This study aims to formulate the development strategy of the Mahawu mountain nature tourism based on the plants species in the Tomohon district, North Sulawesi, Indonesia. Field survey and observations involved the incidental purposive sampling. Number of tourist respondent was 100 people. Data and informations were collected through the questionnaire-based interviews. Data analysis used the Likert scale scoring and it is interpreted descriptively. The SWOT analysis was conducted to obtain the priority development strategy. Results show that total score of internal factors in the IFAS matrix is 2,532 and total score of external factors in the EFAS matrix is 2,626. The recommended development strategy is the SO (Strength-Opportunity) strategy with the total score is 3.132. This development strategy is classified as the Progressive Growth Strategy, i.e. conserving and improving the plant biodiversity that has a high ecotourism value, optimizing the plant biodiversity as a learning materials for students, visitors and researchers, optimizing the attractiveness values of the natural crater at the top of Mahawu Mountain and diversifying field activities in tree planting for tourists.

Introduction

Indonesia is a country rich in natural resources, traditional-culture and diverse natural landscape that serves as the nature-tourism destinations. The principal components that support the tourism destinations are the tourism attractions (nature-based attraction, cultural attraction and special interest attractions), natural property (nature amenities), accessibility and transportation, public facilities, tourism facilities and traditional communities support as the host of a destination (Gunn, 1994; Honey, 1999; Dwyer and Kim, 2003; Enright and Newton, 2005; Ardika, 2007; Sunaryo, 2013). Biodiversity of flora, fauna and nature landscapes are the valuable natural attractions for the visitors (Wearing and Neil, 1999; Gunn and Var 2001; Mowforth and Munt, 2003; Judge, 2004; Johnston and Tyrrell, 2005; Monoarfa, 2007).

Conceptually, the nature tourism is a form of tourism and recreation that utilize the potential of natural resources and ecosystems both in the natural forms or developed forms supported by any tourism facilities (Pendit, 1999; Timothy, 1999; Zhang *et al.*, 1999; Ritchie and Crouch, 2003; Cole, 2008; Nugroho, 2011; Damanik 2013). According to Hakim (2004), the natural attractions are classified into two groups: natural attractions within the forest ecosystems and other attractions outside the forest ecosystems. The ecotourism destinations and ecotourism attractions can be located within the protected zone, in the conservation zone, in the buffer zone, and in the development zone (Boo, 1991; Spillane, 1994; Swarbrooke, 1999; Holden, 2004; Damanik and Weber, 2006; Uriely *et al.*, 2007; Judge and Nakagoshi, 2010).

The North Sulawesi regions have become the valuable tourism destination for local tourists, national and foreign tourists, due to the diverse interesting attractions in these regions. One of them, the nature-tourism of Mahawu mountain in Tomohon, it has been visited by tourists due to the biodiversity of beautiful species of plant and the natural landscape beauties

(Butarbutar and Soemarno, 2012). The number of foreign visitor tourist during period of 2008 - 2012 have grown by 23.22% to 30.53% (Tomohon Statistics Office, 2013; North Sulawesi Statistics Office, 2013; Tourism Office of Tomohon City, 2013).

Increase the visiting tourists from year to year provides an opportunity and benefits for any ecotourism destinations. Therefore, it is required the appropriate development strategy toward the sustainable ecotourism management (Hardy and Beeton, 2001; Hardy, Beeton and Pearson, 2002). This appropriate development strategy is the way to achieve goals effectively and efficiently in accordance with the internal and external factors of development (Keane, 1992; Fry *et al.*, 1998; Krishnaiah, 2012). The SWOT analysis is a tool usually used in formulating the development strategy of the business organization (Bryson, 1998; Klein, 1998; Suharso, 2008). Strengthening the development strategy and performance improvement of the tourism business organization can be carried out by the SWOT analysis (Klein, 1998; Pesonen, *et al.*, 2001; Rangkuti, 2006; Jozi and Rezaian, 2010; Sarijik, Turkay and Akova, 2011; Nourbakhsh *et al.*, 2013; Zakeri and Habib, 2013).

The purpose of this research is to design the appropriate development strategy for the Mahawu mountain natural tourism based on the biodiversity of plant species.

Materials and methods

This research was conducted during October 2012 until January 2013 in the Mahawu mountain region, Tomohon, North Sulawesi, Indonesia.

The research population is all tourists there are in the study site during the process of data collection (everyday Monday-Saturday). Tourist sample (respondents) in this study were selected by the incidental purposive method. The number of tourist respondents were 100 people. Data and informations were collected by means of questionnaire survey and

personal key person interview involving the tourist guide (Lankford, 1994; Walle, 1997; Hardy, 2005; Tribe, 2005).

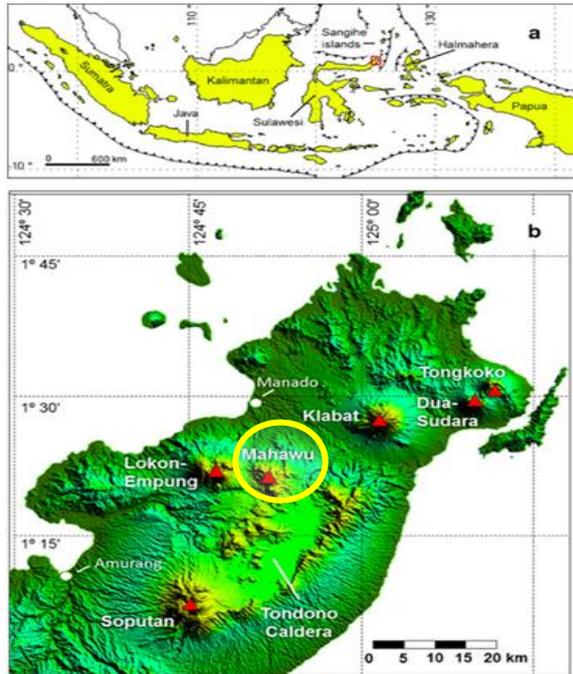


Fig. 1. Map of the Study Area (Source : Kushendratno *et al.*, 2014).

Data and informations were obtained from the primary and secondary sources. The primary data collection included the field observations, interviews with respondents (tourists, local and foreign) and questionnaire survey. Secondary data and informations include the report of previous studies, data from the government institutions, such as: Statistics Office, Tourism Office and Forestry Office, Tomohon city, North Sulawesi, Indonesia.

Data was obtained from interviews and questionnaires were analyzed quantitatively and qualitatively. Quantitative analysis was carried out based on the Likert scale, and subsequently incorporated into the IFAS matrix (Internal Factors Analysis Summary) and EFAS matrix (External Factors Analysis Summary). Results of the SWOT analysis are presented in the form of tables and fig.s (Green *et al.*, 1990; Dyson, 2004; Khaton and Ghadam, 2011).

The use of an internal factor analysis matrix (IFAS) in the process of determining the appropriate strategy is very helpful in determining the weight, rank or rate and score of each item contained in the Strength (S) and Weaknesses (W). Before being processed into IFAS and EFAS matrix, calculation are based on the Likert scale scoring, in which the highest value minus the lowest value is divided by the number of categories (Liliwari, 2013). Furthermore, the determination of weight and rate (priority) for each of internal and external factors. The total weight of internal and external factors ≤ 1 are calculated with this formula:

$$Bi = \frac{1}{(n+TR)} \times (Ri + 1)$$

Bi = weight of each rank; n = number of components; TR = Total ratings; Ri = rating of each component.

The score calculation is done by multiplying the weight and the rate of each component.

Results

Internal and external factors of mountainous Mahawu region

Tomohon city includes three mountain regions that became the tourism destinations, that are The Lokon mountain (1579.6 m asl), The Tampusu mountain (1,474 m asl), and The Mahawu mountain (1,331 m asl). The Mahawu mountains are located in 10 21' 30" North Latitude and 124 51'30" East Longitude, in the Tomohon subdistrict, East Rurukan village. The Mahawu mountain coverage about 550 ha of the state protected forest (Forest Office of Tomohon, 2012). This Mahawu mountain is still active volcanically up to this time, however, much in demand by foreign tourists who visit to enjoy the natural landscapes beauty of tropical mountain ecosystems.

Mahawu mountain is one of ecotourism objects visited by many tourists because it has the diverse ecotourism attractions such as the biodiversity of tourist plants and beauty landscapes of caves, lakes, waterfalls and crater (Butarbutar, 2003; Butarbutar and Soemarno, 2013). As one of the most attracted

tourist destinations, the Mahawu mountainous ecosystem suggest the distinctive-views with the high biodiversity of natural plant, diversity of beautiful landscape, agrotourism of the Rurukan village, and biodiversity of the wild bird species such as: *Scalybreast kingfisher* (local name is “Cakaka hutan dada bersisik”), *Mountain tailorbirds*, *Crimson-crowned Flowerpeckers*, *Sooty-headed bulbuls* (*Pycnonotus aurigaster*), Grey-sided Flowerpeckers (Tasirin and Hunowu, 2010).

In the Mahawu mountain region are found about species of natural plants (Butarbutar *et al.* (2014), classified into the Magnoliaceae family (*Michelia champaca* L., *Elmerillia celebica* Dandy, *Elmerillia ovalis* Dandy), Euphorbiaceae (*Macaranga minahassae*, *Homalanthus populneus* (Giesel) Pax); and Verbenaceae family (*Gmelina arborea*, *L. camara* LINN). Species suggesting the ecotourist value are *Pinus merkusii* (local name is Pinus), *Lantana camara* LINN (local name is “Kembang telek, Saliara”), *Blechnum capense* (L.) Schltld (local name is “Paku merayap, Paku pedang”) and *Hedychium coronarium* Koenig (local name is “Gandasuli”).

Biodiversity of the natural plant in the Mahawu mountain regions can serve as the leading factor in formulating the appropriate development strategy of ecotourism in accordance with the visiting tourist preferences (Tsang and Ap, 2007). The strategic analysis should be conducted to achieve these goals effectively with regarding internal factors (strengths and weaknesses) and external elements (opportunities and threats) (Verbeke and Go, 1995). The strategic analysis in this research resulting the following internal and external factors.

The Strengths factors include the five things: (1) Biodiversity of plants that have a high value of ecotourism (such as: *Pinus merkusii*, *Lantana camara* LINN, *Blechnum capense* (L.) Schltld and *Hedychium coronarium* Koenig), (2) There is an interesting views (such as: Lokon volcanic activities, views of Tondano lake, Tomohon city, Island of Old

Manado, mountain of Klabat and Manado city); (3) The activities of tree planting; (4) Learning activities for students, visitors and researchers; and (5) There is a natural crater suggesting the ecotourist value on the top of mountain zone.

The Weaknesses factor include the five things: (1) conservation of the ecotourist plant species that still no publication; (2) the beauty natural landscapes is less structured and no promotion; (3) availability of tree seedlings at the tourist sites is not sufficient yet; (4) the information on locations of the tourist plant species is still insufficient; and (5) supporting facilities and tourist attractions have not been developed yet.

The Opportunities factor include the five things: (1) Carrying out of plant conservation in tourist sites and be socialized to visitors by distributing a brochures and leaflets; (2) Structuring the beauty natural landscapes to be enjoyed by visitors; (3) planting the tree seedlings by the professional organizer; (4) Tourism managers make a information postal who is useful as a learning facilities for students, visitors and researchers; and (5) Supporting facilities and tourism attractions (for example: the flying fox attraction).

The Threats factor include the five things: (1) The conservation of nature plant species; (2) The traditional architectural expertise to make the beauty views; (3) Locations of plant species conservation; (4) Literature regarding with natural species of plant to complement the tourist informations; and (5) natural risks for visitor (local, domestic and foreign tourists). *Development strategic of natural tourism Mahawu using SWOT analysis*

Results showed that the highest scores in the strategic analysis is the internal factors (strength) with the score of 1.592. While the low score in the weaknesses factor is 0.940 (Table 1). These strength factors suggest the high priority in the development strategy of ecotourism based on the biodiversity of natural plant species (O'Reilly, 1986)

The total score of internal factors is 2.532, it suggests that development of nature-based plant species are located at the average position (Table 1). This suggest that tourism operators (government and private) provide a high positive response to any opportunities and threats affecting any natural attractions

(Lindberg, McCool and Stankey, 1997). Strength factor with the high score (0.354) is biodiversity of tourist plant species, such as: *Pinus merkusii* (Pinus), *Lantana camara* LINN (Kembang telek, Saliara), *Blechnum capense* (L.) Schltldl (Paku merayap, Paku pedang), *Hedychium coronarium* Koenig (Gandasuli).

Table 1. The IFAS Matrix (Internal Factors Analysis Summary).

No.	Strategic Internal Factors	Weights	Rating	Score
A. Strengths:				
1.	Biodiversity of plants that have a high value of ecotourism (such as: <i>Pinus merkusii</i> , <i>Lantana camara</i> LINN, <i>Blechnum capense</i> (L.) Schltldl and <i>Hedychium coronarium</i> Koenig).	0.118	3	0.354
2.	There is an interesting sites (such as: volcanic activities of Lokon mount, beautiful view of Tondano lake, Tomohon city, Island old of Manado, Klabat mount and Manado city).	0.118	3	0.354
3.	The activities of tree planting	0.118	3	0.354
4.	Learning objects for students, visitors and researchers.	0.088	2	0.176
5.	There is a crater that has tourist value on the top of mountain zone.	0.118	3	0.354
B. Weakness:				
1.	The conservation ecotourism value of plants with low and there has been no publication.	0.058	1	0.058
2.	Area view is less structured.	0.088	2	0.176
3.	Availability of tree seedlings at tourist sites is still lacking.	0.088	2	0.176
4.	The information on tourist sites of plant species is still lacking.	0.088	2	0.176
5.	Supporting facilities and tourist attractions have not been there.	0.118	3	0.354
Total score		1.000	24	2.532

However the weakness factor with the lowest score (0.058) is the conservation of valuable plant species (Table 1). In addition, external factors also have an important role in the development of ecotourism. If this is not anticipated quickly then the number of tourists to the Mahawu regions will be reduced. Siwi (2010) says that the average number of tourists visiting the natural attractions of Mahawu mountain is 623 people every month with the economic income about Rp 18,542,747,800 per year.

calculated. Based on this analysis, total scores of external factor is 2.626 (Table 2). This suggests that ecotourism development strategy based on the biodiversity of plant species is in the position “on average”, it means that the ecotourism operators (government or private agencies) provide a positive response to any opportunities in minimizing any threats factors. The score of opportunity factor is 0.198, it means that this development strategy should be done to improve or to conserve the biodiversity of ecotourist plant species and in accordance with the tourists preferences (McKercher, 1993a).

The EFAS matrix is the useful tools in summarizing and evaluating opportunities and threats of a business development (David, 2006). Furthermore, the weights and rate (priority) of each external factors should be

Table 2. The EFAS Matrix (External Factors Analysis Summary).

No.	Strategic External Factors	Weight	Rating	Score
A. Opportunities:				
1.	Carrying out of plant conservation in tourist sites and be socialized to visitors by distributing a brochures and leaflets.	0.114	3	0.342
2.	Structuring the view area to be able to see interesting sights.	0.114	3	0.342
3.	Seedling trees by the organizer.	0.114	3	0.342
4.	Tourism managers make a information postal who is useful as a learning facilities for students, visitors and researchers.	0.114	3	0.342
5.	Supporting facilities and attractions (for example: the flying fox attraction).	0.086	2	0.172
B. Threats:				
1.	The conservation of nature plant species.	0.058	1	0.058
2.	The traditional architectural expertise to make the viewable area.	0.114	3	0.342
3.	Locations of plant species conservation	0.086	2	0.172
4.	Literature regarding with natural species of plant to complement the tourist informations	0.114	3	0.342
5.	Natural risks for visitors (local, domestic and foreign tourists).	0.086	2	0.172
Total score		1.000	25	2.626

Discussion

Internal and external factors of mountainous Mahawu region

According to Umar (2005), the concept Internal - External matrix consists of two dimensions, namely a total score of IFE Matrix (on the X axis) and the total score of the EFE matrix (on the Y axis). It results in the development strategy located on cell-I, cell-II, cell-IV and cell-V, with priority of horizontal integration strategy (Growth Strategy) and Stability Strategy.

The EFAS and IFAS matrices indicate the position of ecotourism development based on biodiversity of plant at the coordinates of (2.532: 2.626). It shows is that natural tourism position of Mahawu mountainous based on plants species is on growth and stability levels (Fig. 2).

In this condition, the manager of tourism business such as the governmental agencies, private agencies and government-private cooperation can expand their existing policies in managing ecotourism based on biodiversity of plant species. The existing policies up to this time is sufficiently good, but it needs to be expanded in obtaining the maximum benefits.

Positional matrix analysis suggest that the development strategy of ecotourism based on plant species is found at the point of 2.532 : 2.626 (Fig. 3). It suggests this position is very favorable to use strength factors in exploiting any opportunities factors. The recommended strategy should be supported by the progressive policy development of sustainable ecotourism (Liu, 2003; Shojaei *et al.*, 2010).

Based on analysis results of the IFAS and EFAS matrices, the priority of development strategies is the SO strategy (score 3.132), it is followed by the WO strategy (score 0.600), the ST strategy (score 0.506) and the WT strategy (Table 3).

		Total Score of Internal Factors		
		Strong 3,0 - 4,0	Average 2,0 - 2,99	Weak 1,0 - 1,99
Total Score of External Factors	High 3,0 - 4,0	I GROWTH	II GROWTH	III RETRENCHMENT
	Medium 2,0 - 2,99	IV STABILITY	V GROWTH (2.532 : 2.626)	VI CAPTIVE COMPANY OR DIVESTMENT
	Low 1,0 - 1,99	VII GROWTH	VIII GROWTH	IX LIQUIDATION

Fig. 2. The Internal – External Matrix Analysis.

Development strategic of natural tourism Mahawu using SWOT analysis

The SWOT analysis involve interpretation the internal and external factors in relation to ecotourism development in the Mahawu mountain regions (Weaver, Weber and McCleary, 2007). The final formulation of SWOT analysis is a series of basic strategies used in ecotourism development based on the biodiversity of plant species (Helmy, 2004; Holden, 2005). Development of the sustainable ecotourism should be in accordance with the natural carrying capacity, the existing opportunities and threats factors (Lindberg, 1991; McKercher, 1993b; Lane, 1994; Ladkin and Bertramini, 2002). The SWOT analysis can be used in formulating the tourism development strategy, i.e.:

1. S-O (Strengths Opportunities) Strategy, it is a strategy that uses strengths to taking advantages from any opportunities.
2. W-O (Weaknesses Opportunities) Strategy, it is a strategy that minimizing weaknesses to taking advantage of any opportunities.
3. S-T (Strengths Threats) Strategy, it is a strategy that to overcome any threats to implement strengths.

Table 3. Result of the Priority Strategy Analysis.

Quadrant	Quadrant Position (X : Y)	Extensive Matrix (X.Y)	Rating	Priority Strategies	Description
SO (I)	1.592 :1.540	2.452	1	Growth	Supports progressive strategy
WO (II)	0.940 :1.540	1.448	3	Retrenchment	Support the rationalization strategy
ST (III)	1.592 :1.086	1.729	2	Stability	Support the defensive strategy
WT (IV)	0.940 :1.086	1.021	4	Combination	Supports the strategy of combination

(2) W-O Strategy: Conserving the ecotourist plant species, supplying scientific informations of ecotourist plant species, providing tourism supporting facilities and tourist attractions in accordance with the tourists preferences (such as: the flying fox), providing the tree seedlings on the destination sites.

4. W-T (Weaknesses Threats) Strategy, it is a strategy that minimizing weaknesses and avoiding threats.

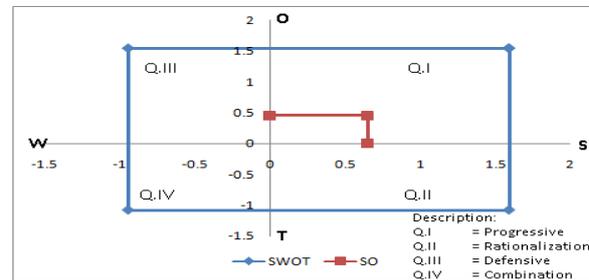


Fig. 3. Results of SWOT Analysis: Development of ecotourism based on the biodiversity of plant species in the Mahawu Mountain.

Each of these components are combined with the aim of determining priority of the strategy that should be implemented in developing the Mahawu ecotourism based on biodiversity of plant species and sustain ecological services (Hu and Wall, 2005). The interpretation of the SWOT analysis are as follows:

(1) S-O Strategy: : Conserving and improving the plant biodiversity that has a high ecotourism value, optimizing the plant biodiversity as a learning materials for students, visitors and researchers, optimizing the attractiveness values of the natural crater at the top of Mahawu Mountain, diversifying and improving the tree planting activities for tourists.

(3) S-T Strategy: Conserving and improving the ecotourist plant biodiversity, providing ecotourist supporting facilities for learning together among students and researchers, optimizing tourist attraction of natural crater, creating activities of tree planting.

(4) W-T Strategy: Improving ecosystem conservation and ecotourism promotion, supplying scientific informations about ecotourist species of plant at the ecotourism sites, providing supporting facilities and creating the tourist attraction in accordance with the tourist preferences (Snepenger, Dalbey and Wessol, 2007). For example, nurseries of ecotourist tree species in tourism destination.

Ecotourism activities should be enriched by the learning activities, such as: learning the name and benefits of plants and animals lived around the tourist sites, learning efficacy of leaves in traditional medicine, indigenous knowledge of local communities in forest conservation (Kontogeorgopoulos, 2005; Manyara and Jones, 2007; Zalukhu, 2009). Learning activities for tourists is expected supports natural conservation programs and conserving indigenous knowledge in forest resources management (Lipscombe and Thwaites, 2003). It can be done well if it is supported by using learning tools such as scientific brochures, leaflets, booklets or information boards.

Conclusion

1. Total score of the internal factor in the IFAS matrix is 2,532 and the external factor in the EFAS matrix is 2,626. These scores indicate the development position or a very profitable development supported by the Strengths (S) and Opportunities (O). The recommended development strategy is the Progressive Growth Strategy.
2. The right strategy that should be implemented in development of the Mahawu mountain ecotourism based on plant species are the SO strategy, i.e: Conserving and improving the plant biodiversity that has a high ecotourism value, optimizing the plant biodiversity as a learning materials for students, visitors and researchers, optimizing the attractiveness values of the natural crater at the top of Mahawu Mountain, diversifying and improving the tree planting activities for tourists.

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