

# Tourism and Cultural Landscape at the Tengger, East Java, Indonesia: The Implications for Ecotourism Planning<sup>1</sup>

Luchman Hakim<sup>2</sup>, Sun-Kee Hong<sup>3\*</sup>, Jae-Eun Kim<sup>3</sup>, Nobukazu Nakagoshi<sup>4</sup>

## 인도네시아 동자바의 텡거마을의 문화경관과 관광<sup>1</sup>

-생태관광계획에 대한 영향-

Luchman Hakim<sup>2</sup> · 홍선기<sup>3\*</sup> · 김재은<sup>3</sup> · Nobukazu Nakagoshi<sup>4</sup>

### ABSTRACT

Tourism in the natural environment grows significantly and in many tropical countries it becomes the important earning of the nations. Nevertheless, tourism impact to environment and cultural values has become the threats to the sustainability and competitiveness of such industry. Therefore, the appropriate planning and management of tourism destination sites where environmentally and culturally fragile are needed in order to increase economic benefits, sustain local culture and conserve environment in balance. The aims of the paper are to examine tourism practices, to determine socio-cultural and natural resources, and to assess local people perception to cultural landscape and its future tourism development in order to formulate the appropriate strategies to achieve sustainable tourism. A case study was carried out at Tengger highland, Bromo Tengger Semeru National Park(BTSNP) East Java. Official documents were gathered and interviews with several key persons had conducted to determine recent status of tourism, resources capital and the existence of local people. Semi-structured interviews and questionnaires were carried out at Tenggerese villages to explore local people perspectives to tourism development, culture preservation, and cultural landscape conservation issues. It is followed by descriptive analysis of vegetation to assess the recent status of environments based on vegetation information. Our findings reveals that tourism grows significantly at BTSNP, and Tengger Caldera as spiritual and cultural sites for local people become the centre for tourism activities. The abundance cultural and natural resources are the significant capital for sustainable tourism. Tenggerese argues that tourism should be planned to provide benefits to local people, preserve tradition and able to conserve nature in order to ensure the living sustainability of Tenggerese. The overall result of the study provide general feature of recent status of the cultural and natural resources as well as positive society perception in order to establish a strategy for sustainable tourism in cultural landscape.

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2 인도네시아 브라비자야대학 생물학과, 일본 히로시마대학대학원 국제협력연구과 Department of Biology, Brawijaya Univ., Jl. Veteran Malang 65145, East Java, Indonesia and Graduate School for International Development and Cooperation, Hiroshima Univ., 1-5-1 Kagamiyama, Higashi Hiroshima(739-8529), Japan

3 국립목포대학교 도서문화연구소 Institute of Islands Culture, Mokpo National Univ., 61 Dorim-ri, Cheonggye-myeon, Muan-gun, Jeonnam(534-729), Korea

4 일본 히로시마대학대학원 국제협력연구과 Graduate School for International Development and Cooperation, Hiroshima Univ., 1-5-1 Kagamiyama, Higashi Hiroshima(739-8529), Japan

\* 교신저자, Corresponding author(skhong@mokpo.ac.kr)

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**요약**

자연 환경을 이용한 관광은 많은 열대 지역 국가에서 활성화되고 있으며 중요한 국가의 수익이 되고 있다. 그럼에도 불구하고 환경과 문화 자원에 미치는 관광의 영향은 관광산업의 지속 가능성과 경쟁력을 위협하고 있다. 그러므로 환경과 문화적으로 민감한 관광 지역에 대한 적합한 계획과 관리는 지역의 경제적 수익과 더불어 지역 문화와 환경을 균형 있게 유지하기 위해서 필수적인 사항이다. 이 논문의 목적은 사회·문화 자원과 자연 자원을 결정하기 위한 관광 사업의 관행을 탐구하는 것이다. 또한 문화 경관에 대한 주민 인식을 평가함과 더불어 지속 가능한 관광을 성취하기 위한 적절한 전략을 수립하기 위하여 미래의 관광자원 개발에 대한 논의를 하는 것이다. 본 연구는 인도네시아 East Java 지역의 Bromo Tengger Semeru 국립공원(BTSNP)에 있는 Tengger 고산 마을에서 진행되었다. 문헌 자료와 주민 인터뷰를 통하여 최근 관광 현황과 자원 활용에 관한 내용을 파악하였다. 관광 개발에 대한 주민의 관점, 문화 보전, 문화 경관 보호에 관한 사항을 주민 인터뷰와 설문지를 이용하여 얻었다. 식생 정보를 이용하여 최근 환경의 상황도 파악하였다. 조사 결과 BTSNP와 지역 주민의 정신적 문화 자원인 Tengger Caldera 지역의 관광은 현저하게 증가하고 있었다. 문화와 자연 자원의 풍부성은 지속 가능한 관광을 위한 중요한 자본이다. 주민들은 관광 사업이 주민들에게 이익을 주고, 자연을 보전하고, 마을 주민들의 지속 가능한 전통적 생활을 보장하도록 계획되어야 함을 주장하고 있다. 이 연구에서는 문화 경관의 지속 가능한 관광을 위한 전략을 수립하기 위해서는 긍정적인 사회적 인식과 자연·문화 자원에 대한 고유적인 특성의 보전이 필요함을 설명하고 있다. 끝으로 이러한 관점에서 지역 주민의 이익을 높이고 문화와 문화 경관을 균형 있게 보호하기 위한 생태적 장치가 필요하다.

**주요어 :** 문화, 토착지식, 경관보전, 관광개발, 전통적 관습

**Introduction**

Tourism is a fast growing industry throughout the world, and in Indonesia tourism becomes the most important sector for generating foreign earning. In particular, tourism in natural environment has grown and scholars argue that this sector will become a significant tool to promote local development, reduce poverty, and support resources conservation(Gunn and Var, 2002; Cochrane, 2006). Issues of tourism in natural environment revealed that ecotourism is a significant tourism form which plays an important role to improve economic earning, support conservation objectives, and preserve cultural traditions of local people(Ross and Wall, 1999).

Ecotourism is the responsible travel to the natural area with the objectives of studying and enjoying the scenery, its wild plants and animals as well as any cultural manifestations of the area(Honey, 1999).

Numerous ecotourism destinations have been visited, ranging from coastal to mountain ecosystems, and varying

from cultural to natural sites(Honey, 1999; Gunn and Var, 2002). Recently, it has been extended to the uses of particular landscape associated to local culture and faith system as ecotourism destination(Dudley *et al.*, 2005; Brown *et al.*, 2005; Cochrane, 2006). One of the most attractive tourism attractions in such area is the local people interaction with nature which is rarely found in western society. Indigenous people for a long time in their history have developed interrelationship between human and nature and created numerous form of cultural landscape. Cultural landscape refers to the unity of landscape which for a long time is closed to the human culture and tradition(Plachter and Rossler, 1995; Hong *et al.*, 2007). In many place, it is associated to the religious and faith systems and therefore leading cultural landscape to become one of the prominent amenities in human being. For instance, there are sacred mountains, savanna, and forest are found and distributed in tropical countries as cultural landscape(Dudley *et al.*, 2005).

The emerging tourism activities in cultural landscape

are double sided sword. Besides benefits from tourism, such activities potentially contribute to the negative impacts. According to scholars, conflicts often occur where access to resources and cultural sites is limited, disturbed or transformed to other uses. Tourism also contributes significantly to the landscape changes which have special value for local traditions (Whitten *et al.*, 1996; Erb, 2000; Walker *et al.*, 2000). In order to mitigate potential conflict, planning and development in the society sounds to be significant. According to scholars, involving local community in the decision-making process is a key for planning and development success. In this regard, researchers argue that assessing society perception for any tourism development project should be implemented as prior action before drawing planning scenarios (Timothy, 1999; Walker *et al.*, 2000).

In Indonesia, studies of indigenous people's perception about tourism have been conducted in order to examine tourism economical benefits to local community (Walker *et al.*, 2000; Walpole and Goodwin, 2000), tourism impact to culture (Wall, 1996; Iswanto, 1998; Ross and Wall, 1999), and status of society participation (Timothy, 1999).

These studies were set up at the well known tourism destination in Indonesia such as world heritage in Yogyakarta (Timothy, 1999), an area which is naturally rich like in North Sulawesi (Ross and Wall, 1999) and an area which is culturally unique such as Bali (Wall, 1996).

Nevertheless, studies in sites which are related to culture and faith system are scarce. Few case studies are available because many of them located in the remotes and/or isolated areas and people psychologically often avoid outsider. In this regard, scholars point out that such discipline is relatively new in developing countries and some difficulties exist within this subject (Timothy, 1999; Dudley *et al.*, 2005). From the perspective of sustainable development, however, it is needed and considered important because the absence of such study led to a poor planning and as widely reported to contribute to the environment degradation.

These issues reveal that appropriate planning for cultural landscape is significant; particularly in order to facilitate tourism and cultural uses in harmony and at the same time environment is conserved. Therefore, the aims of the paper are to examine recent tourism policy and practices, to define socio-cultural and natural resources

status, and to assess local people perception to the site which is related to the indigenous culture and faith system.

By examining such issues, we will be able to make appropriate planning for conservation and sustainable uses of cultural landscape.

## Methods

This study was conducted at Tengger highland, East Java Indonesia. Officially, this area has declared as part of the Bromo Tengger Semeru National Park (BTSNP). It is the most amazing landscape in the world with 9 x 10 km wide sand-sea called Tengger Caldera. Five mountains exist at caldera, namely Mt. Bromo (2,392m), Mt. Batok (2,470m), Mt. Kursi (2,581m), Mt. Watangan (2,610m) and Mt. Widodaren (2,650m). Grasses such as *Imperata cylindrica*, *Polygonum chinense*, *Stypelia javanica*, *Foeniculum vulgare*, *Cheilanthes tenuifolia*, and some ferns grow in the floor of caldera in the southern part. Some species such as *Acacia decurrens*, *Cyathea* sp., *Casuarina junghuhniana*, *Vaccinium varingifolium*, *Albitzia lomphata*, and *Anethum graveolens* grow in the caldera wall. This highland is habitat for some rare and endangered species of mountain regions such as *Anaphalis javanica*, and numerous cultural and medical plants species (TNBTS, 2001; Hakim and Nakagoshi, 2007b).

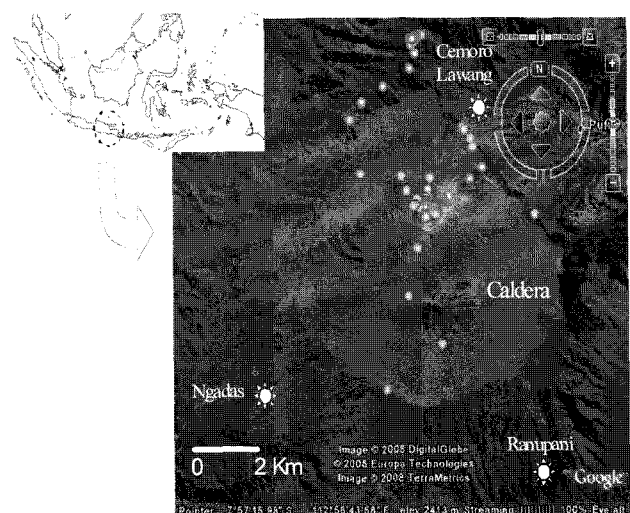


Figure 1. The geographic location of Tengger Caldera in Indonesia archipelago. Spots indicate the most visited place by international tourist to take photograph

Tengger highland is home of Tenggerese, one of the smallest indigenous community in Indonesia. They live in small villages which were distributed at highland area and bound each other through similar faith and cultural traditions. In this regard, Tengger Caldera plays an important as cultural and spiritual site. For a long time, Tengger Caldera has been visited by tourist, both domestic and international. Besides amazing landscape, Tenggerese custom often promoted as one of the interested tourism attraction. Several villages found in adjacent to caldera, namely Cemoro Lawang, Wonokitri, Ranupani, and Ngadas Villages(Figure 1). Among the Tenggerese villages, these villages have been experienced by tourism activities in BTSNP. The physical description of such villages is given in Table 1.

In order to examine tourism implementation within park and define indigenous response to tourism, we combine in depth interviews techniques and Participatory Rural Appraisal(PRA) approaches techniques to collect data and information. These were carried out following serial steps. Firstly, official document was examined and it was followed by interviews with head of national park and staffs. It is done because tourism data, information and planning policy is recorded and stored by park authorities. Villages relatively are poor in term of demographic data, as shown by most of the remotes and isolated village in Indonesia.

Secondly, the PRA techniques was implemented by organizing a public discussion in August 2005 at Ranupani Village with the special objectives to explore local community and stakeholder attitude towards tourism development, particularly about cultural landscape. Local staff government, park representative, and village leaders presented their policies and opinions related to tourism

development planning. Following public discussion, an intensive interviews were done with the key informant encompasses of *Dukun*(Tenggerese priest, an informal leader), *Pemangku* (Hindu leader) *Kepala Desa*(formal village chiefs), *Bayan Desa*, *Kepala Dusun*, *Ketua RT*(villages staffs), *Tokoh desa*(community figure), *Karang Taruna*(young generation), and staff of BTSNP. Moreover, questionnaire was distributed to 100 respondents to determine local people perspectives to the cultural value of Tengger and its conservation issues. In implementation, the questionnaire survey faced several limitations such as: (1) respondents were totally male because indigenous customs and (2) questionnaire didn't ask several questions such as respondent's age, household income, family member, education level, size of respondent's farmland etc. The main reason for such limitation related to the socio-cultural background.

Therefore, demographic data of respondents was absent. Both interview and questionnaire were conducted in local language, *Bahasa Jawa*. Ten issues were asked, and it were entirely designed to explore local people attitudes to Tengger Caldera and its role for their living, perspectives for tourism development, and perspectives for cultural landscape conservation.

As part of the PRA, descriptive vegetation survey was carried out by inventorying plant species which grows in rural and caldera environments. All plant species were recorded and identified using a field guide book. Data was analyzed descriptively. These approaches have been used widely among researcher and as far effective to explore the research objective(Wall, 1996; Timothy, 1999; The Mountain Institute, 2000; Hakim and Nakagoshi, 2007b). The flowchart of research and methodology was drawn in Figure 2.

Table 1. The description of Tenggerese villages in adjacent to Tengger Caldera

Villages	No. of Households	Topography	Altitude (m asl.)	Area(Ha)	Land Uses(Ha)		
					Settl.	Orch.	Others
Gubuk Klakah	838	Flat-undulating	1050-1100	384	42	332	10
Wonokitri	626	Undulating	1800-1850	1,120	63.65	887.6	169.1
Ngadas	184	Undulating	2090-2100	5,092	41	337	4714
Ranupani	198	Flat-undulating	2250-2300	8,293	106	475	7,712

Note. Land uses are divided into settlement(Settl.), orchards(Orch.) for growing fruits and vegetables, and another category including rural forest and public areas. Source: TNBTS(2001)

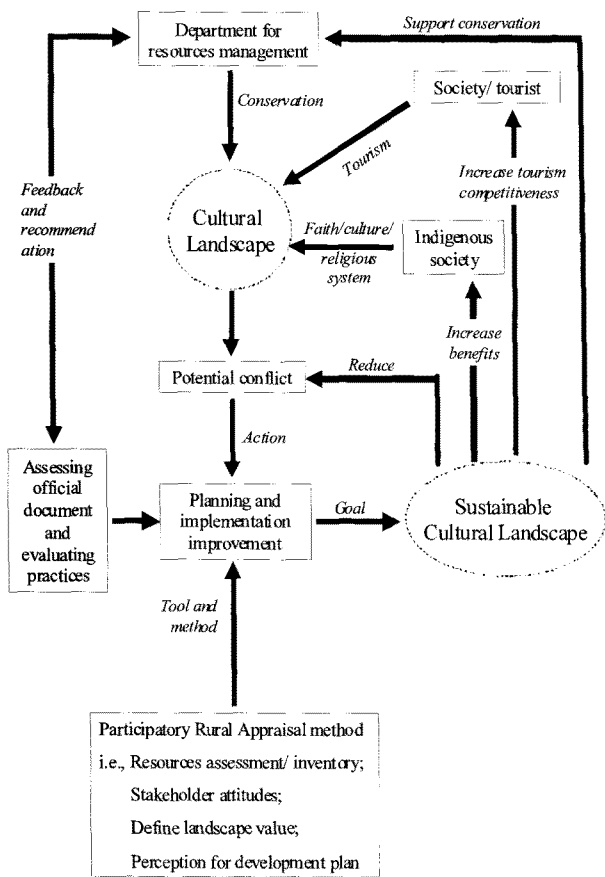


Figure 2. The flowchart of research and methodology

## Results

### 1. Tourism in Bromo Tengger Semeru

According to Indonesian law for nature conservation, tourism in national park is allowed in an intensive uses zone of park management system. Moreover, tourism practices should be coexistent with conservation program.

The BTSNP is the leading tourism destination in East Java and its contribution to regional earning is significant. The figure of tourist arrivals was fluctuating, ranging 132,840 visitors in 1993 and increase to reach 198,165 visitors in 1997. However, Indonesian political and economic crisis in 1997 lead number of tourist decrease, including tourist arrivals to Tengger BTSNP. In 2003, visitor was recorded about 96,329. Domestic tourist was dominant and the monthly arrivals were influenced by climate conditions, and in particular the travel warning. Natural disaster such as Mt. Bromo eruption in the middle

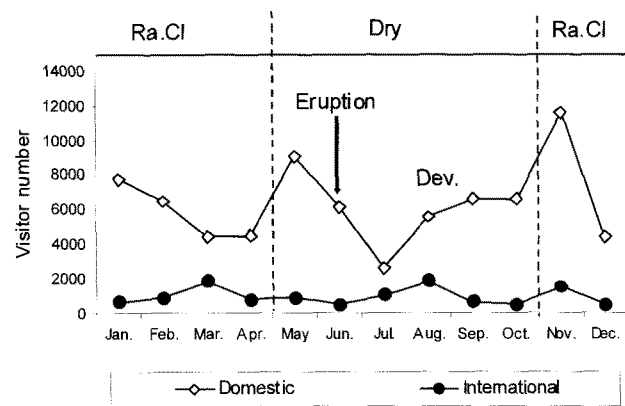


Figure 3. Visitor seasonality and its relationship to climate condition in 2004. Notes: Ra.CI is Rainy season and frequently cloudy (Oct.-Apr.); Dry is dry season (May.-Oct.); eruption date of Mt. Bromo on the middle of June 2004; Dev is development and recovery phase

of June 2004 also resulted to the sharp decrease of visitor to Mt. Bromo and Tengger Caldera. Nevertheless, several annual events hold during July to November, in particular Indonesia Independent Day and Kasodo celebration, lead tourist arrivals to park increase (Figure 3).

In BTSNP, the tourism policy was drawn at several official documents such as "Long Term Management Plan for Bromo Tengger Semeru National Park(1995-2020)", and "A Study for Nature-based Tourism in Bromo Tengger Semeru National Park(2001)". In terms of tourism planning, such document lacks of policy to involve local people during planning (TNBTS, 2001).

The park has many tourism spots to visit, but the scene of Tengger Caldera and embedded five mountains is the favorite site to visit (Table 2). Cemoro Lawang and Ranupani are the main tourism destinations at Tengger highland. Souvenir shop, hotel and tourism infrastructure have been developed at Cemoro Lawang, but undeveloped at Ranupani. Recent policy proposed Ranupani will be developed to become the rural tourism destination (TNBTS, 2001; GoEJ, 2005; Supriadijo, 2005).

### 2. The people of Tengger

The people of Tengger, known as Tenggerese, are living at mountainous villages of Tengger highland.

Historically, Tenggerese is isolated Javanese Hindu

Table 2. Visitor distribution to Bromo Tengger Semeru National Park

Year	Encounter landscape of caldera and Mt. Bromo panorama	Hiking to Mt. Semeru	Others	Total Visitor
1993	121,798	11,038	5	132,841
1994	179,998	*n.a	5	180,003
1995	126,810	2,267	60	129,137
1996	184,490	3,391	5	187,886
1997	183,747	4,135	24	187,906
1998	125,473	5,057	90	130,620
1999	134,040	6,780	315	141,135
2000	111,500	5,832	47	117,379

\* n.a.: data not available. Source: TNBTS(2001)

after the rise of Islam in the late of 18<sup>th</sup> century at Java. Tenggerese has rich folk beliefs and it leads them to the wise use of natural resources. Kasodo, which takes place every 270 days, is the main ceremony among Tenggerese in order to celebrate their origins. This ceremony opened with the inauguration of the honored members of Tenggerese society, and followed by classical art performance. At the midnight, inauguration of new priest is performed at the *Poten*(a temple) on the sand-sea of caldera. The Kasodo consists of a huge ceremony centered on the crater of Mt.

Bromo, into which offerings are thrown, and on a temple at the foot of Mt. Bromo and Mt. Batok, the neighboring peak. At the time of the Kasodo, it is estimated that an additional 20,000 to 25,000 people enter to the park. During performance and celebration, numerous plant species is used as honorable plant(Hefner, 1985; Whitten *et al.*, 1996; TNBTS, 2001; Supriadijo, 2005).

Nowadays, the majority of Tenggerese is highland farmer, where modern farming technology and knowledge is low. Some of them work in tourism business by rent of horse, cars, accommodation and offer adventure guiding to Mt. Semeru. Opening restaurants and souvenirs shop also common in Cemoro Lawang. However, generated subsistence from tourism sector was low(informants' pers.com.). Agriculture sectors support the economic of Tenggerese is quite moderate. Length of formal studies are 6 years, it means people has only elementary school education.

Traditional knowledge and practices related to agriculture have been applied for a long time, and several traditional ceremonies have been performed as a part of

agricultural system. However, in the late 1970's and early 1980's, new technology has been adopted among Tenggerese. Some farmer has been used pesticide and fertilizer to improve agricultural products. Recently, only old people practices traditional knowledge in agriculture practices. The interactions between Tenggerese and natural resources at BTSNP are seemed co-existent. Tenggerese believe that natural resources should be managed carefully to omit Mt. Semeru and Mt. Bromo eruptions, as they believe there are symbols of God punishment due to disturbance(informants' pers.com.; Hefner, 1985).

### 3. Tenggerese perspectives

#### 1) Cultural landscape and tourism development

The main role of Tengger Caldera in the Tenggerese daily life is mainly as a spiritual site(60%), site to generate economic income though tourism(35%), and others(5%). This landscape has viewed as very important sacred site(75%), sacred(20%) and non-sacred site(5%). This finding reveals that Tenggerese dependency to caldera was high, particularly to perform local cultural and traditions such as Kasodo ceremony. They state that, recent status of caldera environment is very good(10%), no changes (75%), and declining(15%).

All of the respondents have positive perspectives for tourism development. About 85% strongly agree, and 15% agree if tourism will be developed. According to respondents, government efforts to promote Kasodo as tourism events are good(70%), fair(20%), and need improvements(10%). It indicates that the cultural attraction is significant icon to invite tourist to come BTSNP.

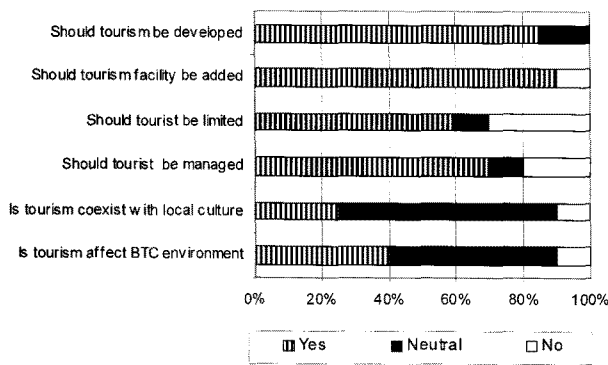


Figure 4. Local people(Tenggerese) perceptions for tourism development at Bromo Tengger Caldera

Government initiative to introduce tourism development policy to society was less(70%), fair(15%) and good(15%), indicates that mechanism for planning need to be improved. The majority of respondent argues physical building and tourism infrastructure should be developed and improved(90%), and about 10% disagree because cultural purposes, particularly in order to maintain Kasodo sacredness. In this regards, respondent argues that visitor should be strictly limited(60%), not limited(30%), and neutral(10%). Mostly respondents stated that visitors should be managed(70%), not managed(20%), and neutral(10%)(Figure 4).

During intensive discussions at Ranupani Village, authors found positive perspective towards tourism development. The forum also recommend several suggestions for tourism development, including improving environmental quality, increasing human resources, improving system and management of tourist especially during Kasodo ceremony, improving attention to local culture, and involving local people in the planning.

## 2) The issues of conservation

Tenggerese stated that caldera should be conserved for spiritual purpose(90%), and biodiversity conservation (10%). Respondents stated that environmental impact of visitors after Kasodo was less(90%) and 10% argues wastes and vegetation disturbance were the dominant environmental impact after Kasodo ceremony.

Local people perceptions related to stakeholder contribution to conservation were shown in Figure 5. Through the intensive discussion, the most attention for

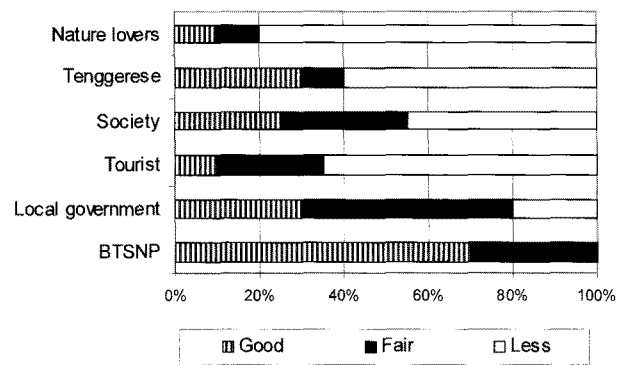


Figure 5. Local people(Tenggerese) perceptions related stakeholder attention to Bromo Tengger Caldera conservation

conservation has been paid by park authority, encompasses mitigating forest fire, reducing illegal harvesting, minimizing tourist impact to environments such as vandalism, pollution and illegal harvesting. Few attentions have been paid by local governments and stakeholder.

Little participation of local people in conservation was affected by lack of knowledge and information. Nevertheless, some key informants argues that environmental conservation was needed to protect *Tirta Suci* spring(Holly water, a part of ceremony) which taken from cave of Mt. Widodaren.

Respondents argued there were no significant changes related landscape changes. However, PRA results showing some species were fluctuate. Some species decrease and extinct(Table 3). While few study carried out about the vegetation dynamic at Tengger highland, this finding provide significant information for planner and park authorities to make conservation policy.

## 4. Recent status of resources

A survey of plants species diversity shows about 73 identified plants species grown and used by Tenggerese at Ranupani Village(Appendix 1). The role of such species are numerous, encompasses plants as food sources(37%), ornamental plants(21%), medicinal plants(16%), charcoals (5%) and wild plants(21%). The main agriculture products were cabbage, potato, corn, and onions. Some plants species were introduced due to religious and cultural purposes, encompasses *Cocos nucifera*, *Saccharum officinarum*, *Musa spp*, *Areca catechu*, *Oryza sativa*, *Zea*

Table 3. Plant species status at Tengger Caldera according to respondents during fieldwork at caldera(Notes: D is decrease, I is increase, S is stable and E is extinct).

No	Family	Species	Local name	Community status			
				D	I	S	E
1	Apiaceae	<i>Foeniculum vulgare</i> Mill.	Adas		*		
2	Casuarinaceae	<i>Casuarina junghuhniana</i> Miq.	Cemara gunung	*			
3	Compositae	<i>Ageratum</i> sp.	Wedusan	*			
4		<i>Anaphalis javanica</i> (Reinw. ex Bl.) Schutz ex Boerl	Edelweis			*	
5		<i>Anaphalis viscida</i> (BL.) DC.	Edelweis				*
6	Cyatheaceae	<i>Cyathea</i> sp.	Paku tiang	*			
7	Cyperaceae	<i>Cyperus</i> sp.	Rumput			*	
8	Dryopteridaceae	<i>Nephrolepis</i> sp.	Paku-pakuan		*		
9	Ericaceae	<i>Erica</i> sp.	Anting-anting			*	
10		<i>Rhododendron retusum</i> (Blume) Benn.	Rhododendron			*	
11		<i>Stypelia javanica</i> L.	-			*	
12		<i>Vaccinium varingifolium</i> (Blume) Miq.	Mentigi			*	
13	Fabaceae	<i>Acacia decurrens</i> (Wendl. f.) Willd.	Akasia	*			
14	Poaceae	<i>Deyeuxia</i> sp.	-			*	
15		<i>Imperata cylindrica</i> (L.) P. Beauv.	Alang-alang		*		
16		<i>Pennisetum purpureum</i> Schumach.	Rumput Gajah			*	
17		<i>Pennisetum</i> sp.	-	*			
18	Polygonaceae	<i>Polygonum chinense</i> L.	Rumput			*	
19		<i>Polygonum plebeium</i> R. Br.	Rumput			*	
20	Pteridaceae	<i>Pteris</i> sp.	Paku-pakuan		*		
21		<i>Cheilanthes tenuifolia</i> (Burm. f.) Sw.	Paku-pakuan			*	

*mays*, *Rosa* spp., *Cananga odorata*, *Michelia champaca*, *Michelia alba*, *Ixora* sp., *Jasminum sambac*, *Pandanus amarillifolius*, and *Piper betle*.

Author survey related to home garden shows that ornamental plants are dominant. The highest importance value(IV) index was seen predominantly by flower plant species, including *Gladiolus grandiflorus*(IV=14.50), *Hydrangea macrophylla*(IV=14.53), *Rosa* spp.(IV=13.72). Such situation reflecting that flower plants contribute significantly to garden characters in the highland environment, particularly at Tengger(Hakim and Nakagoshi, 2007b).

## Discussion

The official statistical data, park authorities, local government, tourism stakeholders, and local people opinions demonstrate that tourism is growing in BTSNP and shows that Tengger Caldera as the most significant

sites for tourism. While Tengger Caldera becomes the most visited place, landscape planning is apparently defined through top-town approach and resulting in a few benefits to local people. As shown by park's documents, most policy making in connection with tourism planning and management was controlled by park authorities as government representative. This practice is widely found in Indonesia(Whitten *et al.*, 1996; Timothy, 1999). In the modern conservation approach, such approach has been recognized as one of the weaknesses of planning. Modern conservation approach argues that local sound and participation are crucial for drawing proper planning in order to achieve sustainable uses of resources(Dudley *et al.*, 2005; Pannell, 2006). This implies that the document for Tengger Caldera conservation and sustainable uses should be improved.

Moreover, our findings revealed that links between local people and nature are close, particularly nature as sites of religious and cultural performance(Figure 6). It is not



surprising because traditional Javanese perspective argues that mountain and its surrounding forest are home and territory of the Gods, which should be undisturbed by human (Hefner, 1985). These situations reveal that Tengger Caldera can be classified as cultural landscape according to UNESCO-ICOMOS categories. As a consequence, management plan should be able to embrace society into planning process and provide sustainable access to continuous and preserve local traditions (Dudley *et al.*, 2005; Pannell, 2006). For a long time, the landscape of Tengger Caldera has been viewed as natural phenomena and human dimension is neglected. This study, therefore, suggests that future planning should view Tengger Caldera as an integral cultural landscape, where its success depends on human-nature relationship dimensions.

Strengthening cultural landscape existence is fundamentally influenced by continuity of indigenous society knowledge and practice in resources utilization (Brown *et al.*, 2005).

In this regard, opportunities come from recent status of Tenggerese society that continue traditional practices and preserve local tradition to use resources. From the perspectives of tourism demand, it has been viewed as a key factor for tourism destination competitiveness because recent tourism generation seeks authenticity and originality of destinations. According to scholar, studying and enjoying indigenous people and its cultural traditions as well as their wisdom to environments are the most interesting programs for ecotourist (Honey, 1999; Gunn and Var, 2002). Meaning, the highland farmer's knowledge should be conserved, and furthermore should be encouraged to be able to support cultural landscape conservation as well as tourism development. The limitation of people involvement into planning widely found in Indonesia (Timothy, 1999; Erb, 2000), and it should become the target point to be improved in inviting and facilitating local people into planning.

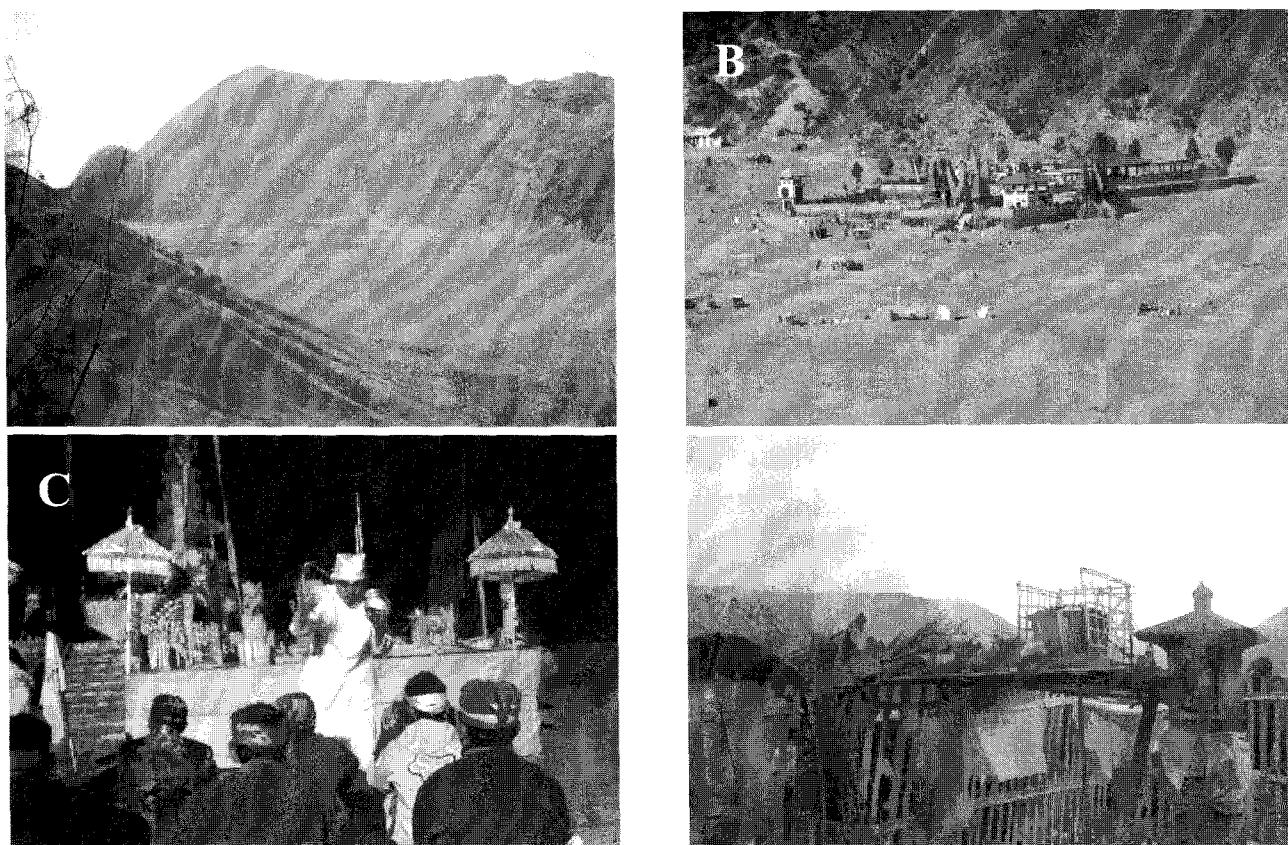


Figure 6. Tengger cultural landscape. (A) Tengger Caldera viewed from Jemplang, Ranupani, (B) Kasodo ceremony preparation, (C) the ceremony, and (D) the honorable plants for ceremonies rituals at Tengger Caldera

This study demonstrates that basically local people support development. It is similar with other studies with society's positive acceptance for development (Timothy, 1999; Walker *et al.*, 2000). However, in order to protect the sacredness of cultural sites and traditional ritual, Tenggerese emphasizes that sound cultural and environmental management should be implemented. The argument for visitor limitation and regulation apparently are related to the cultural and religious purposes. Such arguments should be appreciated and viewed as a positive signal towards practicing carrying capacity of tourism in natural environment, particularly in sites which considered as ecologically and culturally fragile. The concept of carrying capacity in tourism destination planning and management has been widely discussed and viewed as the foundations to achieve sustainable and competitive destination (Gunn and Var, 2002; Simon, 2004; Hakim *et al.*, 2007a). Moreover, applying carrying capacity would become the instrument to achieve co-existence of tourism and local culture where recently it is considered poor according to the majority of respondents.

Another important issues related to the sustainability of cultural landscape are society support and public awareness for conservation (Hong *et al.*, 2007). The reason for conservation is numerous and local people at Tengger highland argue that the ultimate reason for conservation related to faith and cultural purposes. According to the scholars, it is commonly happening in developing countries (Whitten *et al.*, 1996; Dudley *et al.*, 2005).

Nevertheless, the threat to the sustainability of Tengger cultural landscape lies on the few of public support, as inferred by Tenggerese. In his book, Whitten *et al.* (1996) shows the similar evidence that nature lovers in Indonesia are often contribute to vandalism. Moreover, Cochrane (2006) argues that motive of domestic tourist is to have recreation-oriented experience rather than concerns in nature conservation. This means, increasing society and public support should be done continuously. In particular, it should be introduced to the community that cultural landscape is a complex phenomenon, embracing a tangible and an intangible identity which should be viewed integrally (Plachter and Rossler, 1995). Besides focuses to the strategies to ensure species viability and maintain habitat integrally, governmental conservation program should be able to introduce the value and links among

faith/religious/ culture and nature to support conservation.

This study confirms that Tenggerese resource for tourism development is abundance. In the perspective of tourism planning and development, it is a potential resource to become competitive tourism destinations.

However, non-native plant species needs special attention because it has potential to disturb native vegetation and will lead to biodiversity extinction. Our previous study shows that impact of non-native species to the environment and the competitiveness of tourism destination is significant (Hakim *et al.*, 2005). We found that there are several reasons for non-native species introduction, including home garden component and honorable plants for cultural purposes. Using local and native plant species for home garden is recommended (Hakim and Nakagoshi, 2007b) because it will be able to minimize ecological risk and potentially create the unique and indigenous garden for tourism attraction purposes. In case of cultural uses of some honorable plant, the informal leader through cultural rule may be easier to contribute in non native plant species reduction than other party because they have authority on the community.

## Conclusion and recommendation

This study reveals that tourism in Bromo Tengger Semeru is concentrating at the Tengger Caldera which is socio-culturally representing significant site to local people. Planner, developers and tourist have been viewed such landscape as natural attraction while Tenggerese argues such landscape as part of their living system. Local people have been creating special relationship on human-nature/landscape and connecting nature/landscape into traditional culture and faith system. Therefore, Tengger Caldera can be viewed and classified into one of the cultural landscape category as being proposed by UNESCO-ICOMOS: the landscape connected with religious/ cultural/ natural elements of which planning and management should accommodate and involve local people.

As tourism continuously grows in this place, the positive response of local people for the use of their sacred site into tourism becomes the significant point for future tourism development in cultural landscape. However, considering the local people arguments, it should be

planned and practiced in a sustainable manner. Moreover, access to the spiritual and cultural sites should be allowed and ensured to facilitate society spiritual needs. These will become an effective key for development success. Special attention should be paid to the conservation issues due to less of public awareness. Therefore, action to increase public awareness and participation in cultural landscape conservation is urgent. There are several strategies available, but linking tourism program, education and conservation apparently become the significant keys. This is so because many tourists who come to nature-based tourism destination are naturalist, adventurer and some people who claim that they are nature lovers. Strengthening tourism program apparently would become the proper strategy for this matter.

Besides in term of cultural aspect, Tengger is known rich in terms of biodiversity value. It is become the significant resources, particularly in term of habitat planning for ecotourism development. Decreasing and extinction of some species are alarming for cultural landscape sustainability, both in ecological and socio-cultural values. Moreover, the existence of non-native species is one of the significant potential threats to cultural landscape, and therefore special attention is needed. In other words, resources conservation programs should be able to monitor the dynamics of resources and the growth of non-native plants species in order to ensure cultural landscape sustainability.

The overall result of this study suggests that Tengger ecosystem, whether as site of religious or tourism destination, is a complex system which needs integral attention. Only the integrity of ecosystem component will support sustainability of human being with its numerous uses, and therefore an appropriate planning which could be able to accommodate numerous resources utilization is needed. It means, among the religious-traditional practices, tourism and nature conservation should be coexistent to achieve sustainable community in the world.

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## Appendix 1. List of plant species at found at Ranupani

No	Family	Species	Common name	
1	Agavaceae	<i>Sansevieria trifasciata</i> hort. ex Prain	Viper's bowstring hemp	
2	Amaranthaceae	<i>Amaranthus</i> sp.	Amaranth	
3	Amaryllidaceae	<i>Hymenocallis</i> sp.	Spider lily	
4	Araceae	<i>Colocasia esculenta</i> (L.) Schott	Coco yam	
5		<i>Colocasia</i> sp.	Local yam	
6		<i>Apium graveolens</i> L. var. <i>dulce</i> (Mill.) DC.	Wild celery	
7	Apiaceae	<i>Foeniculum vulgare</i> Miller	Fennel	
8		<i>Hydrocotyle sibthorpioides</i> Lam.	Lawn marsh pennywort	
9	Apocynaceae	<i>Adenium</i> sp.	Desert rose	
10	Asparagaceae	<i>Asparagus officinalis</i> L.	Garden asparagus	
11	Brassicaceae	<i>Brassica oleracea</i> L.	Cabbage	
12		<i>Brassica</i> sp.	Local cabbage	
13	Cannaceae	<i>Canna ×generalis</i> L.H. Bailey	Canna lily	
14	Casuarinaceae	<i>Cassuarina junghuhniana</i> Miq.	Casuarina	
15	Chenopodiaceae	<i>Chenopodium ambrosioides</i> L.	Mexican tea	
16		<i>Anaphalis javanica</i> (Reinw. ex Bl.) Schutz ex Boerl	Javan Edelweiss	
17		<i>Anaphalis viscida</i> (BL.) DC.	Senduro	
18		<i>Chrysanthemum cinerariifolium</i> (Trevir.) Vis.	Pyrethrum	
19		<i>Chrysanthemum</i> sp.	Daisy	
20		<i>Dahlia pinnata</i> Cav.	Pinnate dahlia	
21		<i>Eupatorium perfoliatum</i> L.	Common boneset	
22		<i>Pluchea indica</i> (L.) Less.	Indian camphor weed	
23		<i>Eupatorium inulifolium</i> (R.M. King and H. Rob.) H.B.K.	Eupatorium	
24		<i>Tagetes erecta</i> L.	Aztec marigold	
25	Crassulaceae	<i>Crassula ovata</i> (Mill.) Druce	Jade plant	
26		<i>Echeveria elegans</i> A. Berger	Hen and Chicks	
27		<i>Kalanchoe blossfeldiana</i> Poelln.	Madagascar widow's-thrill	
28		<i>Kalanchoe gastonis-bonnierei</i> Raym.-Hamet & H. Perrier	Palm beach-bells	
29	Convolvulaceae	<i>Ipomoea batatas</i> (L.) Lam.	Sweet potato	
30		<i>Chamaecyparis obtusa</i> (Siebold & Zucc.) Siebold & Zucc. ex Endl.	Hinoki false cypress	
31	Cupressaceae	<i>Chamaecyparis</i> sp.	Cypress	
32		<i>Juniperus communis</i> L.	Common juniper	
33	Equisetaceae	<i>Equisetum debile</i> Roxb.	Equisetum	
34	Ericaceae	<i>Rhododendron</i> sp.	Rhododendron	
35	Euphorbiaceae	<i>Ricinus communis</i> L.	Castor bean	
36		<i>Acacia decurrens</i> (Wendl. f.) Willd.	Acacia	
37		<i>Arachis hypogaea</i> L.	Peanut	
38		<i>Mimosa pudica</i> L.	Shame plant	
39		Fabaceae	<i>Pisum sativum</i> L.	Garden pea
40			<i>Mucuna pruriens</i> (L.) DC.	Cowitch
41			<i>Phaseolus vulgaris</i> L.	Kidney bean

## Appendix 1. (Continued)

No	Family	Species	Common name
42	Iridaceae	<i>Belamcanda chinensis</i> (L.) DC.	Blackberry lily
43		<i>Gladiolus grandiflorus</i> L.	Gladiolus
44		<i>Acorus calamus</i> L.	Calamus
45	Liliaceae	<i>Allium porrum</i> L.	Garden leek
46		<i>Allium sativum</i> L.	Cultivated garlic
47		<i>Hippeastrum</i> sp.	Amaryllis
48		<i>Zantedeschia aethiopica</i> (L.) Spreng.	Calla lily
49	Lythraceae	<i>Pemphis acidula</i> J.R. Forst. & G. Forst.	Sentigi
50		<i>Cuphea melvilla</i> P. Browne	Candy corn plant
51	Musaceae	<i>Musa</i> sp.	Banana
52	Moraceae	<i>Morus alba</i> L.	Mulberry
53	Nyctaginaceae	<i>Bougainvillea spectabilis</i> Willd.	Bougainvillea
54		<i>Mirabilis jalapa</i> L.	Marvel of Peru
55	Onagraceae	<i>Fuchsia magellanica</i> Lam.	Hardy fuchsia
56	Oxalidaceae	<i>Oxalis corniculata</i> L.	Creeping wood sorrel
57	Poaceae	<i>Bambusa multiplex</i> (Lour.) Raeusch. ex Schult. & Schult. f	Hedge bamboo
58		<i>Saccharum officinarum</i> L.	Sugarcane
59		<i>Zea mays</i> L.	Corn
60	Portulacaceae	<i>Portulaca grandiflora</i> Hook.	Rose moss
61	Rosaceae	<i>Duchesna indica</i> (Andrz) Focke	Indian strawberry
62		<i>Rosa</i> spp.	Rose
63		<i>Rubus</i> sp.	Thimble berry
64	Saxifragaceae	<i>Hydrangea macrophylla</i> (Thunb.) Ser.	French hydrangea
65		<i>Brugmansia</i> sp.	Brugmansia
66	Solanaceae	<i>Solanum tuberosum</i> L.	Potato
67		<i>Solanum lycopersicum</i> L.	Tomatoes
68		<i>Capsicum</i> sp. 1	Capsicum
69		<i>Capsicum</i> sp. 2	Tengger eggplant
70		<i>Physalis minima</i> L.	Sun berry
71	Thymelaeaceae	<i>Phaleria macrocarpa</i> (Scheff.) Boerl.	Mahkota dewa
72	Zingiberaceae	<i>Hedicium coronarium</i> Koen.	Ginger lily
73		<i>Zingiber officinale</i> Roscoe	Garden ginger