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# **Sustainable Tourism Development Using Soft System Methodology (SSM): A Case Study in Padang Panjang Regency West Sumatra, Indonesia**

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## **ABSTRACT**

Geographically, Padang panjang regency which located in a heart of Western Sumatra have great potentials for tourism industry. However, these potentials have not been fully utilized for increasing local economic development and peoples welfare.

The purpose of this study is to determine the most appropriate strategies in accordance with the objective conditions of Padang Panjang Regency, using soft system methodology (SSM). The results showed that establishing connectivity and cooperation with the surrounding area are the most appropriate strategy to ensure sustainability of tourism sector in Padang Panjang Regency, while the most suitable cooperation with surrounding area is integrated promotion and travel packages.

*Keywords: Sustainable tourism; minangese; regional cooperation; integrated promotion; travel packages.*

## **1. INTRODUCTION**

Tourism industry is the third largest industries that contribute to the gross national income in Indonesia, Tourist growth in Indonesia has continued to increase in the last 10 years, and has not been impacted by the national economic crisis. This sector has caused the local economy to increase dramatically. Tourist arrivals also lead to the development of local businesses by providing services and facilities for tourists during their trips. It also encourages equitable development throughout Indonesia, reducing unemployment and poverty in the regions.

Padang Panjang is one 19 regency/city in west sumatra Indonesia which has potential of attractive tourist destination, because it has some cultural sites, such as *minangese culture center* and *thawalib education center*, one of the oldest religion education system in Indonesia, and the most popular cultural attractions in West Sumatra [1]. Padang Panjang Regency is also a place for the international event "Tour de singkarak", very popular event of world bicycle racing, the second famous of world racing after Paris-Dakkar tour. This region can also serve as a connector for its surrounding tourism areas, such as Kota Gadang, Japanese Caves in Bukittinggi, Lake Singkarak, and Lake Maninjau. in addition, this city also has a Minangkabau Cultural Information and Documentation Center which is very interesting as a cultural center of west Sumatra.

The main problem is how to develop the tourism potential to encourage sustainable local economic development to improve people's welfare and reduce unemployment.

The purpose of this research is to select the most appropriate strategy to develop sustainable tourism sector as the basis of the economic development for the local community according to real condition.

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## 2. LITERATUR REVIEW

Tourism sector is the third largest industry that contribute to the Gross National Income in Indonesia. This sector will be always prospective in the future due to higher public welfare [2]. Currently, Indonesia's tourism sector contributes to approximately 4% of the total economy. In 2019, the Indonesian government wants to increase double to 8% of GDP, an ambitious target which implies that within the next 4 years, and the number of visitors should be increased to approximately 20 million [3]. To realize this expectation, the government will focus on improving infrastructures (including information technology infrastructure and communications), access, health and hygiene and also improve the online promotion campaign with the support of information technology. Infrastructure is the main problem in Indonesia, it's impact is not only increases logistics costs but also making less attractive of investment climate, and reduces the tourist trips to tourist destinations area [2].

According to [4], Tourism sector has a major role in providing jobs. In the last 10 years the number of tourism sector employment continued to rise; estimated in 2015 reached 15.1% of the total workforce. The government expects in 2017 the number of employment in the tourism sector of 12.4 million people with a revenue of IDR 182 trillion [2].

To increase the number of tourists, especially foreign tourists, local governments are encouraged to develop tourism sector in accordance with existing objective conditions. Geographically, Padang Panjang Regency which is located between Bukittinggi Regency and Tanah Datar Regency is an excellent potential for the development of tourism industry. The main tourist attraction in Padang Panjang is cultural tourism: Plate dance and Thawalib education system [5].

Tourism destinations are areas or geographic regions that differ in one or more administrative regions include: tourist attraction, tourism facilities, accessibility, community as well as tourists are interrelated and complementary to the realization of tourism activities. While tourist attractions is anything that has a unique, convenience, and value in the form of the wealth of diversity of natural, cultural and man-made results that were targeted or tourist visits, [6]. Tourism produces direct local impacts on air, water, soil and biota; and indirect impacts from manufacture and transport of material items. Impacts derive from atmospheric emissions, solid and liquid wastes, and consumption of water, energy and materials, [7,8,9]. There are three main tourist activities: something to buy, something to learn and something to do, [10]. Tourism also can support conservation through private reserves, communal conservancies, and contributions to public protected areas, but only under some circumstances, and with associated environmental costs, [11,12]. Negative impact of tourist activities are air pollution, solid waste, land degradation, shortage of water resources. Water, especially fresh water is one of most critical natural resources. The tourism industry generally overuses water resources for hotels, swimming pool, golf courses and personal uses of water for tourists, [13], so the sustainability of tourism development threatened [14].

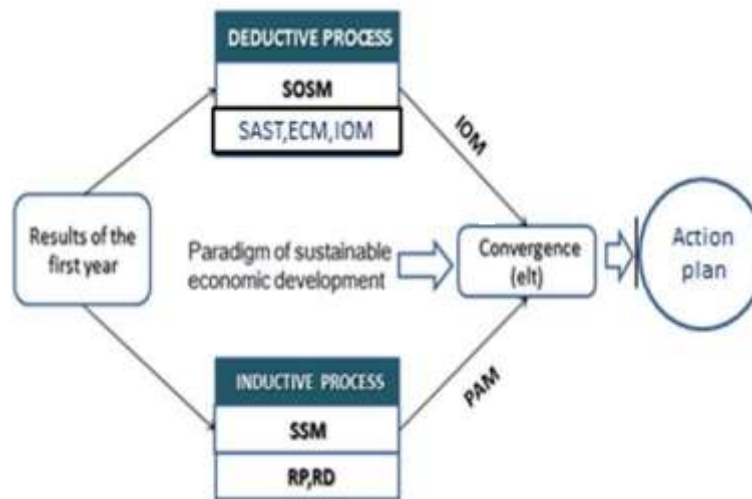
Sustainable tourism development guidelines and management practices are applicable to all forms of tourism in all types of destinations, including mass tourism and the various niche tourism segments. Sustainability principles refer to the environmental, economic, and socio-cultural aspects of tourism development, and a suitable balance must be established between these three dimensions to guarantee its long-term sustainability [15]. It mean that sustainable tourism should (1) optimal use of environmental resources, (2) respect to social cultural and traditional value, (3) providing economics benefit to local people. In the context of sustainable tourism, the main indicator sustainability of a destination [16,17]. Thus, sustainable tourism is responsible tourism which minimal impact on the environment and culture [18].

Local communities involvement have a big role in developing sustainable tourism [19,20], one of the most important roles of local communities on involvement stages of tourism development is the provision of culinary and accesories, support and participate in the development of cultural atraction, [10]. Minangese social culture is one of the most tourist attraction in Padang Panjang City [21]. Minangese is a special dance from Padang Panjang Regency, played by the public by bringing a plate, this dance became the main show every official event. Sustainable tourism development has three key component: (1) Environmentally, has a low impact on natural resources, particularly in

protected areas. (2). Socially and culturally acceptable, it does not harm the social structure or culture of the community where it is located, (3) Economically feasible, it contributes to the economic well being of the community, generating sustainable and equitable income for local communities and as many other stakeholders as possible.

### 3. METHODOLOGY

Method used was system approach by combining inductive and deductive process. The inductive process using Soft System Methodology or SSM [22]. This method selected to describes connectivity of all entities and activities in the development of a sustainable tourism sector. While deductive process using SOSM (System of System Methodology). SOSM is a systems approach which can be used as a basis for decision-making [23] some of methods usually used in SOSM are Interpretative Structural Modeling (ISM), Analytical Hierarchy Process (AHP), SAST (Strategic Assumption Surfacing and Testing (SAST), Exponential Comparison Method (ECM) and Decession Matrix (DM) [24,25]. To determine the most suitable strategy in accordance with objective condition, SOSM method chosen was SAST and ECM. Generally method used as shown below.



**Fig. 1. Method of study**

*SOSM: System of System Methodology, SAST : Strategic Assumption Surfacing and Testing, ECM: Exponential Comparison Method, IOM: Intermediate Objective Map, SSM: System of System Methodology  
RP: Rich Picture, RD: Root Definition, ELT: Experience Based Learning Theory*

SAST used to identify the most important and certainty aspects which considered to develop tourism sector running well and ECM used for selecting the most appropriate strategy in accordance with real condition. While RP and RD used for describing interrelated between aspects and actors involved in the development of tourism sector. IOM to describes claim which related to the development of tourism sector both in term of regulation, human resources, activities, and others. And PAM selected to identify important activities should be done in order to develop sustainable tourism sector. To obtain a destination profile, empirical data is also used through a questionnaire given to 30 people selected based on a purposive sampling method. Experiential learning theory (ELT) is system approach based logical thinking process [26], based on critical thinking and looking for some important indicators [24].

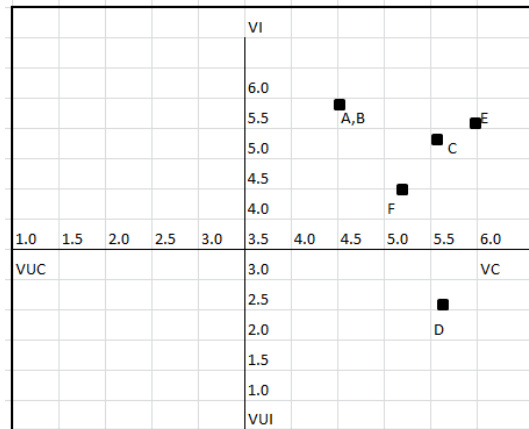
Data collection was done through expert discussion, which includes practitioners, academics, policy makers, businesses and local community leaders.

### 4. RESULTS AND DISCUSSION

Most of respondents (87.4%) stated that the main problem of the tourism sector in Padang panjang is very limited of geographical conditions (only 2,300 hectares), the small estregency in Indonesia; so

tourism development must be prioritized on cultural and culinary tourism and collaboration with surrounding areas. The key to success according to the most respondents (88,6%) is the involvement of business actors, the community, and academics in tourism development. This means that the development of the tourism sector must involve 4 main components, they are : academia, business people, the government and the community(A\_B\_G\_C).

SAST analysis showed that the most important things in supporting the development of the tourism sector in Padang Panjang Regency are: (1) tourist attractions; (2) tourist facilities (hotels, restaurants, malls) and (3) transportation; as following Fig. 2:



**Fig. 2. The strategic assumption for tourism development in Padaang Panjang City**

*Description : - VI : very important ; VUI: very unimportant; VC : Very certainty; VUC : Very uncertainty.  
A: Tourist facilities (Hotels, Restaurants,Malls); B: Transportation; C : Tourist Information ; D : safety; E :  
Tourist atractions; F : Accessories*

The result of inductive by Exponential Comparison Method (ECM) analysis showed that regional cooperation is the highest rank (395.78), followed by integrated promotion (389.12). This mean that the development of surrounding area especially Bukit Tinggi and Tanah Datar Regency are the key factors for tourist attraction in Padang Panjang. Because Padang Panjang lies between Bukittinggi and Tanah Datar regency, and there is only one road to Padang Panjang Regency through Bukit Tinggi or Tanah Datar Regency. The ECM analysis showed in Table 1.

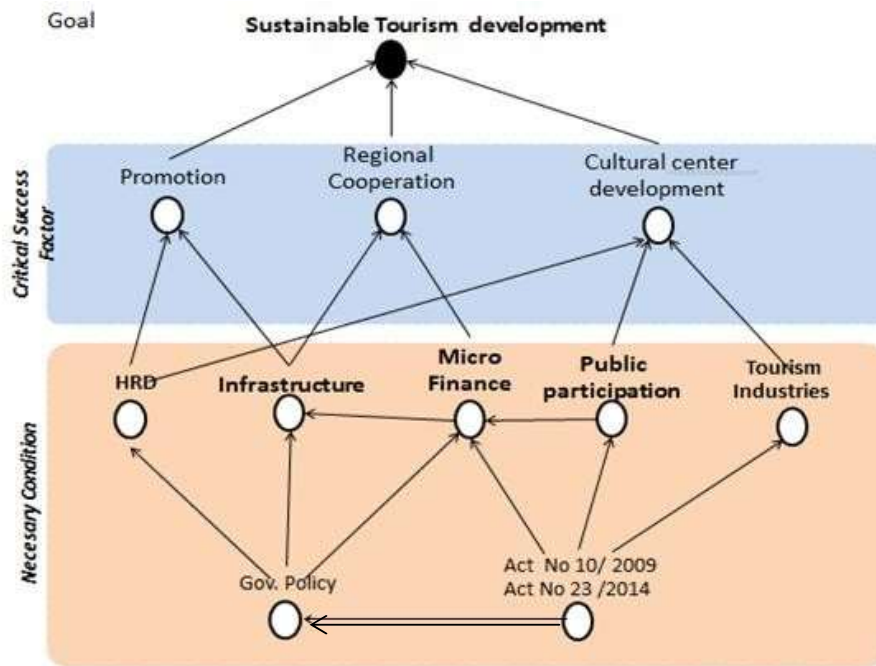
**Table 1. Exponential comparison method (ECM) tourism area development strategy in Padang Panjang Regency**

No.	Component	Critical level	Level of relatedness				Total value	Rank
			Social aspect	Economics aspect	Cultural aspect	Political aspect		
1	Infrastructure	2.6	24.09	52.87	27.95	32.17	137.08	7
2	HRD	2.6	36.76	47.10	36.76	27.95	148.56	6
3	Government policy	1.6	9.94	12.30	9.19	17.58	49.01	9
4	Public participation	2.8	124.43	71.73	112.38	63.34	371.89	3
5	Center of Minangese culture /Center of Excellence	2.8	42.01	80.81	80.81	48.50	252.14	4
6	Regional cooperation	3.0	110.59	110.59	110.59	64.00	395.78	1
7	The role of Tourism Industry	2.4	35.02	43.15	47.59	24.63	150.38	5
8	Integrated Promotion	2.8	124.03	71.73	150.95	42.01	389.12	2
9	Tourism Education Center	2.4	38.96	24.63	35.02	23.10	121.71	8

Regional cooperation is very important for tourism development in Padang Panjang regency, due to geographical limitations, through tour packages sharing with the surrounding area (Bukittinggi, Tanah Datar, and Pariaman), and collaboration with travel agent, or MICE (Meeting, Incentive, Conference and Exhibition) program organizers from several institutions / business sectors.

Integrated promotion with the surrounding area on various events (especially for tour de singkarak) which has become a calendar events of the year must be done, so the tourists and tour participants will able to stay in padang panjang regency.

Based on deductive analysis bySAST and ECM method, can be built claims as the following IOM (Fig. 3).



**Fig. 3. IOM analysis result**

IOM analysis showed that promotion, cultural center development and regional cooperation as the critical success factor which depend on government policy and government regulation (*necessary condition*), this mean that Government policies (legislative and executive) have a very decisive role for the sustainability of the tourism sector in Padang Panjang. Government regulation (Act no 10/2009 and Act No 23/2014) was the basis of the local government policy for local economic development based on the potential of local resources [1]. In order to develop sustainable tourism, IOM in Fig. 3 also showed that public participation, micro finance, infrastructure, touris industries and HRD (human resources development) have a significant role.

Inductive process begins with the formulation of root defenition (RD) as a description of linkages between aspects and actors in the development of tourism sector. The results of expert discussion and analysis of actual conditions showed that the root defenition can be formulated as follow:

1. *Sustainable tourist development by involving local people, research institution, tourism businessman and cooperation with surrounding region to build integrated promotion for incresing tourists visit.*
2. *Tourism sector development that environmentally friendly, improving social welfare of local community, and local goverment income, and encourage of local economic development.*

By using the above definition, rich picture can be described as (Fig. 4). This figure showed that local government and minangese center are two entities that play a very important role in developing sustainable tourism destinations in Paddang Panjang. Government's role is to provide basic facilities and infrastructure such as roads, electricity, telecommunications networks and clean water. While minangese center is an institution that protects and develops the uniqueness of the local culture which is a tourist attraction.

To support sustainable tourism development in Padang Panjang Regency there are some activities there are several activities that need to be carried out, described in PAM (Fig. 5).

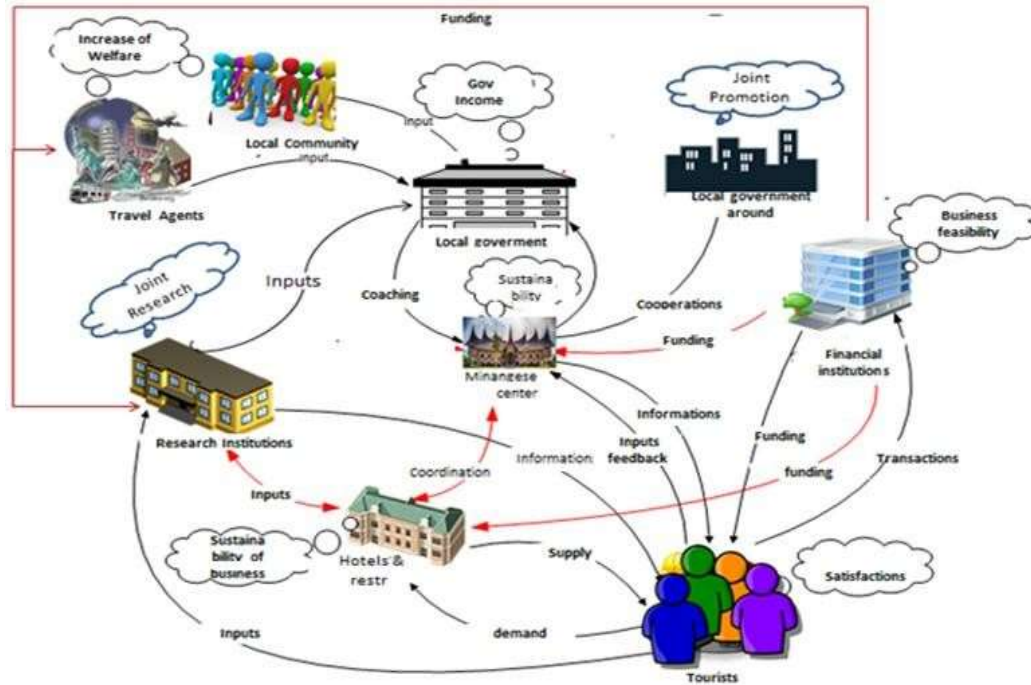


Fig. 4. Rich Picture sustainable tourism development in Padang Panjang Regency

Integrated promotion with surrounding areas is the key activities, by involving local community, academics and businessman. To ensure each activity well running, it should be defined the Key Performance Indicators (KPI) and monitoring and evaluation systems, as well as the supervision in order to the achievement in line with the targets. Government's role is very crucial to ensure the sustainability of the tourism sector development program. To avoid policy canges due to change in leaders it is necessary to build a strategic plan on tourism sector in the next 5 years.

There are some important aspects which can be formulated from deductive and inductive process through convergence experience based learning theory (ELT) approach [27] as follows:

#### Deductive Process

- Integrated promotion
- Regional cooperation
- Public participation

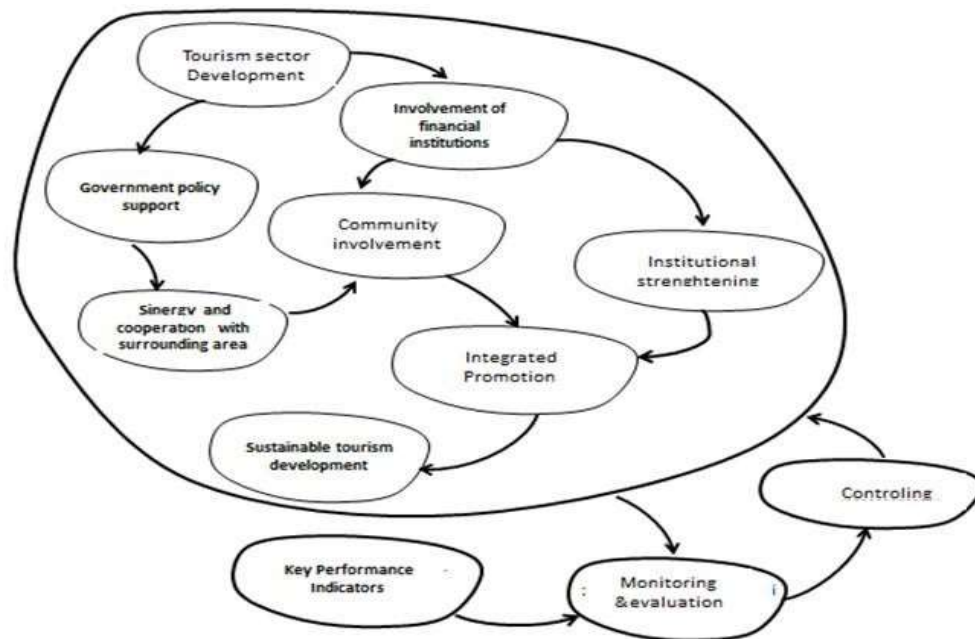
#### Inductive Process

- Synergy actions
- Institutional Strengthening
- Financial support

Integrated area development and promotion



Sustainable economic development paradigm [27] is balancing of environmental, economic, and social features. This mean that the beneficiary of tourism sector development should not only for businesses, but local people should be able to take economic and social benefits, and their environment conserved. The result of this research was in line with the previous research [28] that the local community would support if they get economic benefits. These will create a sense of belonging for the local people, so the sustainability of the tourist destinitaion will be maintained by local people.



**Fig. 5. Purposeful Activity Model (PAM) analysis of sustainable tourism development in Padang Panjang Regency**

## 5. CONCLUSION

There are some very important aspects which determine the success of sustainable tourism sector development in Padang Panjang regency: (1) tourist attractions; (2) tourist facilities (hotels, restaurants, malls) and (3) transportation. While the most appropriate strategy to develop sustainable tourist sector in accordance with the riel condition is integrated area development and promotion with the surrounding area.

## 6. RECOMMENDATIONS

The weakness of this study in practical perspective was not able to determine what is the most appropriate regional cooperation according to real condition in building a tourist area in west sumatra, and therefore need to further study using appropriate methods to know their respective roles.

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## COMPETING INTERESTS

Authors have declared that no competing interests exist.

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He worked as a senior lecturer and researcher. He graduated for mathematic statistic Bogor Agricultural University (1986), completed Master degree in Computer Science (1999) and obtained Ph.D. degree in Environmental Modeling (2004). He has done many research especially in environment management and agriculture fields. He has successfully completed more than 35 research projects which were financed by national or international financial organizations. He also served as a speaker in several national and international scientific meeting on environmental management and disaster. As a senior researcher he has published more than 30 scientific papers in international Journal and has also published 6 scientific books. Besides as a rector of Sahid University he is also as a reviewer in several national and international journals.

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