Valorising landscape: taking opportunities from drought to ecotourism high-end products

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Abstract. Naturally, area of Gunungkidul is dominated by unique hilly karst landscape. The area is poor in resources. Quality of soil is low and lack of sufficient water during dry session. Most of inhabitants work in agricultural sector, either as peasant with less than 0.5 Ha or pair workers. Physical characteristic of the area allows only certain species of agricultural crops can be cultivated. A factor for high poverty rate status, it is because limited alternatives for farm diversity are available. Recent phenomenon on climate variability is another threat to rural living, farmers have pushed to adapt to range of weather that most likely leads to significant social and economic long-lasting problems. This paper is aimed to expose gradual shift in the rural setting. It was based on the survey and depth interview data, and was analyzed qualitatively. Agriculture will not provide sufficient income any longer for daily needs. Therefore, despite doing daily farm activities, some farmers have irregular forms to get additional income. They work in construction, home industries, or tourism sectors. Following national trend, growing interests to developing beneficial ways of living in ecotourism sector have been started. This trend is supported by recent exploration to many potential underground caves. Since then, many tourist management groups have grown in the village basis, selling cave-tubing experiences as recreational activities. Ecotourism sector offers sustainable income and valuable alternative out of poverty to many local people. Supported by development of industry 4.0, a powerful means seamlessly connecting people and information, local assets are promoted easily and quickly allowing the most vulnerable groups to escape from severe disaster like drought.

1. Introduction
Poverty is one of complex social problems that affecting greater communities and it is a devastating factor causing people have no hope and future. The main cause of poverty is mostly income disparities within particular of groups. In the developing world, poverty is very closely link to poor natural resources availability. Rural areas are places where most of its inhabitants depend on nature for income generating system. Main characteristic of rural resources is free in access. It is mostly bounded in the scheme of common property where all can take benefits. Agriculture has been the main source of life of most rural people, it contributes to national development agendas through providing nutrient and adequate employment [1]. However, since global climate change is followed by declining in the ability of nature to sustainably feed the world, the number of rural poor has increased significantly. Extreme natural disaster has started affecting rural poor. It is reducing agricultural productivity, threatening food supply and finally increasing food price. Increase in food price is detrimentally ruining food security and creating new groups of community lied on the poverty line [2]. As low agricultural performance is continuing, people seeks for alternative on more prospective non-farm economy. The non-farm activities
provide varied type of occupations and absorb wide range of people ability from fully skill to unskilled, and more gender neutral [3].

There are growing movements in the rural areas to develop non-farm activities in ecotourism sector. This movement is based on awareness to explore and exploit potential rural resources particularly to running poverty alleviation programs. Ecotourism is vied as new strategy to providing employment and generating sustainable income particularly for the poor [4]. These rural movements are a response to new trend of global community life style toward ecotourism in recent time, which is more in favor of nature-based component for their holiday sessions. Visiting wild life, natural scenery and doing special interest trip are now becoming prominent phenomenon in the tourism sector [5]. The existence of harmony between nature and culture in the rural setting is seen as an attractive element to sell. It could be grown as large industry that characterized by labor-extensive as provide large opportunities for rural people to participate and take economic benefits [6]. Share benefits served by ecotourism to community surrounding will be a promising mode for rural development programs [7].

In the development perspective, ecotourism is seen from its ability to provide positive impacts for inhabitants. There will be physical development supporting the establishment of tourist destination for instance road and housing [8]. This will also be equipped with adequate tools such as transportation, food market, clinic and so forth that bring trickle-down effect for local people. Ecotourism creates economic growth and higher standard of living in the rural areas. Socially all developments as effect of tourism sector development will generate resurrection of traditional practices, conservation movement to local assets and in the end improve quality life of local people [9]. All possibly means for rural people who previously work in the fragile agricultural activities which is very influenced by weather condition to more sustainable income in tourism.

Drought and water scarcity are common phenomenon in Gunungkidul regency. Poor environment condition hinders the possibility of farmers to intensively growing diverse crop products. In consequence, poverty rate reached 21.73% in 2015 in this area [10]. However, since the last 5 years, new emergence of social movement has gotten much attention from society and government in particular considering occurrences of significant shift from agricultural activities to tourism based activities lead by many rural youths. This new movement drives rural economy and reduce gradually poverty rate. Based on statistical data, ecotourism contributes to declining 4.53% poverty rate in 2018 [10]. This paper is trying to explore local endeavors to positively stand and take benefit from poor natural condition as new way developed by rural in disaster management programs.

![Image](image_url)

**Figure 1.** Research location.

2. Methods
Qualitative research method was applied during the research process. Data were collected through these following field observation, in-depth interview and desk study. The next phase was analyzing and interpreting data. Data were reviewed to see if there was close correlation with all themes being developed. This research held in Gunungkidul Regency, Special Region of Yogyakarta. Large of the area is 1,485.36 km² and comprised of 144 villages. The area is inhabited by 729,364 with an annual growth rate 0.95 and known as karts area [10]. The region consists of several types of physiography include Seribu Mountain Range, Wonosari Plateau, Oyo Valley, Baturagung Mountain Range, and Panggung Masif.

3. Results and Discussion

3.1. Farmer, Landscape Management and Strategy to Survive
Gunungkidul is a hilly area. Most of the area is dominated by unique karst landscape with mostly groundwater supply availability. This physical landscape characteristic is main factor for water scarcity catastrophe incidences in this region. In recent time, drinking water is available through communal and government water pumps. Those outreaches public water pump have maintained traditional water harvesting by building private water container in their yard. Irrigation system for farm land is available in very limited amount. The sources of irrigation are rain water and springs. Poor and thin soil quality allows certain species of trees can be grown. Teak (Tectona grandis L.f.) is growing well in this area hence widely planted by people. Most of inhabitants are working as farmer. High stress in agricultural activities that currently worsen by climate variability forces family to create alternative for family income. Farm land can only be cultivated during rain session. Rice production is generally done in the rainfed paddy field that account for 43,850 ha, while 25% of rice production is done in irrigated paddy field [11]. Crop products are rice, maize, soybean, peanut and cassava. The rest of the areas are planted with teak.

Many of the farmers live in poor condition. They own less than 0.5 ha unfertile farmland. The farmland is managed carefully through polyculture planting method to maximize food production. The first 3 months of rain session is aimed to cultivate paddy while maize is planted in the empty areas. After paddy harvested, they are planting peanut or soybean. Cassava plays an important role in the local food security system for any failure in the harvesting time. Rice production is not aimed to sell. Almost all farmers keep their rice for own consumption for the whole year. Since landholder is very small, farmers operate their farmland extensively. When needed, yard is transformed to farmlands. They are cultivating paddy, maize and vegetables in the yard. Cassava is usually grown in the farm borders. Beside provide food safety, cassava is also needed to protect farmland from pest attack such as monkey. As landscape is dominated by dry land, cultivation of food plant can only be done twice a year for about 6 months. There will be periods between April and October when land cannot be cultivated, it means no farm activities at all. During dry session some farmers have shifted to work in other sectors. In certain areas of Gunungkidul traditional limestone mining becomes side job for many farmers. This activity has positive impact in the farmers’ point of view. First, it provides adequate cash income for family during dry session for miners. And second, it allows the owners of land mining to clean their land from limestone then do reclamation to enlarge their farmland.

Traditional limestone mining illegally operates around the area. Their existence is actually benefiting many landholders. Limestone delays crops growth and the land can only be planted with teak. This traditional mining is done very carefully without ignoring environmental impacts. Landscape is still managed based on the nature capacity. This environmental concern is based on the fully awareness that people have a parcel of land only to support their life. In order to maintain sustainable family income, farmers develop many strategies to survive. Drought is a regular occurrence in Gunungkidul. Household who highly depend on nature for generating income will seek alternatives to reduce possible risks from loss of assets. Many studies elucidate the significant influence of migration as strategy to cope with environmental stress. Members of household decide to migrate to work. This method is a form of
building investment aimed to reassure all family needs are fulfilled [12]. Not only to manage possible risks caused by unpredictable climate condition, migration is also purposed to maximizing gain and provide sufficient self-family insurance during calamities [13]. Temporary migration is the most appropriate way for farmers’ survival in this area. This mode of income generation is allowing farmers to work in certain period of time only. They are working in the nearest town and come back when planting session is started. There are many advantages gotten from this working system for environment. This system hinders exploitation of nature, and provides time for nature to develop self-recovering system. Migration has another positive impact in developing forest landscape in the privately-owned lands. This brings optimism for poverty reduction since tree roles in the rural saving system, but trees will only be sold when a household needs big amount of money.

3.2. Landscape Opportunities and Social Movements
Transformation of many societies following modern lifestyle has created wide spread practices that rearrange human to begin more closely link to nature again. Recent leisure concept is visiting to uncontaminated natural area for the purpose to adoring wild sceneries and enjoying many cultural events [14]. Therefore in the notion of ecotourism, landscape is the most essential factor that serves as background for endless visual image [15]. Landscape is used for nature and cultural contexts, and it is interpreted by people who decide to interact. For this concern, landscape modification will likely influence tourism demands negatively [16]. Luchman et al in his tourism study in Indonesia [17] recognize that recent high requests to more natural leisure activities have been driving valuable actions from local to give more respects to cultural heritages, actively conserve nature and provide satisfying facilities and services to visitors. Green purchase in ecotourism recent focus is a driving force for environmental development. It is a root for effective plans in land use and serious biodiversity conservation projects [18]. Concepts developed by green tourism provide means for the authorities and communities to produce more sustainability.

As a part of business and industry, people participation is key important element on ecotourism development. For specific purpose, ecotourism increases economic status of people involves. It creates new employment that previously absent from countryside. It likely enriches countryside with many sufficient facilities, promote creation of many innovative visual attractions and events, and end-up with increasing high living standard of community. Community participation is a key success in the sustainability of ecotourism projects. Hung [19] explains that development of ecotourism is based on 2 important factors. The first is opportunity that is understood as brand processing context. A situation that facilitates public to include in the participation processes. The element appears in the participation process should be comprised about communication channel between tourist developers and community surrounded. Within participation framework, equal distribution of power should be established first allowing all strata in the community involve without any discriminatory treatments. The second is ability. Developing new tourist destination entails fully informed community about tourism industry. Thereafter, ability is skills used to take any possible opportunities arise from tourism development. Development of many tourist destinations in the research site is a response to marginal condition of the area. Agricultural activities done by more than half of rural households do not provide adequate income to fulfill daily needs. Almost all yields are aimed for subsistence, hence farmer needs alternatives source of income. Unique landscape of Gunungkidul may be a weakness, but it is a strong point for the community. There are 36 tourist destinations exist based of Tourism Department of Gunungkidul webpage [20]. But recent time, Gunungkidul offers more than 30 new tourism objects to visit [21] and noted that there some are beginning physically constructed for other new potential destinations.

Gunungkidul is a host for many exotic hidden caves. The caves consist of beautiful stalactite and stalagmite, and the wall is also crafted with many glamorous natural ornaments. The caves are commonly flowed by underground river, an object for challenging cave tubing activities. This area is then well known for special interest tour. These emerging phenomena on developing tourist destination, a subset of social movements are driven by success of neighbouring communities on their way on exploiting local asset for tourism objects. The fact shows that economic benefits derived from tourism
sector development create new opportunity out of poverty. There are many new type of jobs are present in the rural setting. Tour guide, accommodation providers, web developer, transportation, souvenir and craft industries, restaurants, food stall and more are current jobs for many rural people. This sector is obviously absorbing more women in the labour force. Ecotourism in Gunungkidul is forecasted becoming an embryo for big business and industry in the near future. It is supported by statistical data states that number of visitors in 2013 was 1,822,251, four year later in 2017 the number reached 3,246,996 visitors [22]. Government support will be the most valuable means in this process of shift from traditional system of tourist management to professional management practices.

3.3. Rural Tourism Management Strategy in The Disruptive Era

Disruptive era is a period of time characterized by significant changing from considered as old fashion mode of business to totally new way of conducting business. Disruptive technology by means internet technology has impacted tourism sector dramatically. Entering this new era, where internet is widely used, is a challenging thing particularly for rural people. Internet allows community to interact worldwide and create positive networking. Indeed, internet provides fully support to promote tourism products. Internet is offering many advantages, it includes reduction in the promotion cost, simplify administration, and improving quality of service for tourists and so forth [23]. Besides many advantages, internet has also many disadvantages that likely prevent rural people to easily involve in the tourism industry. Open and fast communication allows only groups who quickly response gets the biggest economic benefits. Many tourism operators in the research site response to the emerging of internet smartly. Traditional and cultural events, natural assets and courteous rural community are fabricated and promoted globally to attract more potential visitors. Local agricultural products are also exploited through establishing many local culinary centres and displayed as high quality taste foods.

Internet and tourism bring about new face of communities. Rural attributes will also change allowing the most vulnerable one to take benefits particularly when the virtual media mainstreams are giving much attention on their hot topic discussions. There will be free mass publicity for tourism objects. All those kinds of marketing activities are persuading local communities to positively improve their properties. Many facilities for visitors such as public toilets, food stalls, parking and rest areas etc. were built independently, funded by rural administrator and some even provided by personal funds. Some rural authorities have even pushed their residents to involve in the management of traditional events and art performances. The yearly events schedule is published through local administrator and tourist operators’ webpage. The power of what so called as disruptive technology is enabling mass participation of world society. Internet may generate open competition but many advantages can be derived. Many tourist destinations in Gunungkidul get mass attention from big social media contribution. The objects have appeared massively through user albums, their positive comments and recommendations, a mode of effective promotions. Responding to this large support from world society, rural people get ready and equip their self with modern devices and tools. Internet is already used widely to send recent information, agendas, and to mobilize active participation. Tourist operators equip their organization with many trainings programs, complete equipment for special interest leisure, and many facilities for the purpose more tourists longer stay. Rural environment is also conserved to provide more natural view. Negative rural habits are transformed into more environmentally sound behaviours. All are processes to achieve rural welfare, and to reduce dependency from land based activities. Climate will no longer become a barrier to gain more prosperity. Marginal land is appreciated as powerful means to increase opportunity out of poverty.

4. Conclusion

Smart rural community will not only see agriculture as the only source of income. Current trends in tourism interests are new hope for rural economic growth. Ecotourism is an effective instrument in the poverty alleviation agendas particularly for marginal areas as Gunungkidul. The idea of experiencing unique beauty of landscape in the ecotourism projects is also a strategy to involve wide society in the conservation efforts. This method is in particular very useful for naturally fragile and impoverish areas.
The success of developing tourism objects is depending so much on active participation of local community. Local community empowerment will grow as collective action, where groups act to serve their needs and interests. Possible potential impact on locals is increasing their commitment to protect ecosystem. Furthermore, high respect came from visitors to local traditions drives locals to carefully reinventing more abandoned cultures.

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