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Introductory on Conservation Participation, Willingness to Pay (WTP), Mangrove Forests, and Ecotourism: A Review

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Abstract

Species of mangrove become endangered and unprotected in the modernization world. Therefore, from genre into specific literature review, which indicates majority researcher focus on mangroves and willingness to pay, are tends to agree and support on the conservation perspective in protecting the mangrove. Although there are various and different ideas on protecting the mangrove, the finding provide evident that most of studies see participation in conservation efforts as communication with an intention to enhance the local communities' interaction with other stakeholders and conservation activities.

Keywords: mangrove, willingness to pay, conservation, protection

Introduction

Mangroves are being threatened around the world. The destruction of mangrove forests is normally related to human population density. Major reasons for the destruction are urban development, aquaculture, mining and over-exploitation of mangrove forests for timber, fish, crustaceans and shellfish. Various techniques and methodologies have been implemented in different countries for conservation of mangrove forests. Effective restoration and management of mangrove forests are solutions to achieve both economic and environmental conservation goals. Local communities, as important stakeholders, can play an effective role in the conservation of mangrove forests.

Bagdi (2005) defined people's participation as concerted efforts by a group of local participants with the aim of achieving common goals and sharing benefits. In this study, participation refers to the involvement of local communities in conservation activities that have been organized and directed to maintain the sustainability of mangrove forests (Ping and Hua, 2017; Hua, 2016). For instance, the participation of local communities in activities organized by government bodies or NGOs could reduce forest-logging activities and increase their income by protecting the mangrove forests. This could enhance greater awareness and social development among local communities towards sustaining the mangrove forest ecosystem.

Related studies on conservation participation

Bagherian *et. al.* (2009) studied factors that influenced the local community's participation in watershed management programs (WMP) in Hable-Rud basin in Iran. 200 respondents were gathered

through personal interviews during August and September of 2008. Findings of the study indicated that the level of participation in WMP was moderate. The regression analysis indicated that there were five (5) factors that provided the best predictions for the level of participation in WMP. The factors were the level of people's satisfaction of prior programs, people's attitude towards WMP, people's knowledge of WMP, their income from alternative occupation and their expectation of WMP. Thus, more efforts are needed and in-depth studies should be carried out to further enhance the people's participation in WMP.

Zare *et. al.* (2008) investigated the importance of forest conservation through people's participation in the Arasbaran region in Iran. The study was carried out in Hejrandoost village using the Participatory Rural Appraisal (PRA) technique. This technique facilitates or stimulates community awareness and capability regarding a problem or issue about protecting natural resources. The findings indicated that forest conservation needs the people's motivation, which can expand the people's perception and knowledge about the values of the forest as well as more involvement in different stages of forest management.

Another study by Amjad and Jusoff (2007) surveyed mangrove conservation through community participation in Sonmiani Bay in Pakistan. Sonmiani Bay is the only place along the coast of Pakistan where three species of mangroves such as *Avicennia marina, Ceriops tagal,* and *Rhizophora mucronata* naturally exist. Most of the local community directly depend on coastal resources such as fisheries and mangrove forests. Besides that, the main profession of these local communities is fishing, which is the livelihood of the majority of these communities. Different techniques were developed to restore the mangrove ecosystem through the plan of action formulated by the World Wildlife Federation (WWF) - Pakistan and local NGOs involving community participation for protecting and conserving the mangrove ecosystem for future Pakistani generations. The techniques used were semi-structured interviews (SSI), transect walk, development of resource map, Venn-diagram, trend analysis etc. Finally, all the community representatives in that area agreed with the plan of action and participated with the WWF.

Furthermore, Stem *et. al.* (2003) examined the model links between the conservation perspectives and practices, participation in ecotourism and the distribution of tourism benefits as well as its impact on the local population that lives in Costa Rica. This study had used stratified purposeful sampling, focus-group discussions, open-ended informal interviews, direct observation, linear regression and the chi-square test. The result showed that direct employment in tourism has a significant impact on household conservation perspectives. Education levels also showed a strong relationship with conservation behaviour and perspectives. However, there should be a higher level of awareness or appreciation from local residents towards conservation of forests and wildlife.

Abdolmaleky *et. al.* (2011) conducted a study in Hamedan province in Iran about factors affecting farmers' engagement to co-manage watershed conservation programs. By using classified sampling, 285 respondents were selected as the sample size. The findings of the study revealed that 94.6% of the respondents joined and participated in at least one or more stages of delivering watershed management programs according to their self-interest. Meanwhile, the multiple regression analysis showed that users' participation in extension and educational courses, utilizing mass media, trust on governmental staffs and income variable factors had positive and significant relations in the study. These factors affected farmers' participation in watershed management programs even though there was a negative significant relationship between user's participation and dependence on the government.

Studies by Zhang *et. al.* (2011), Huilan *et. al.* (2008), Baral and Heinen (2007) pointed out that the socio-demographic characteristics of the local community had a significant influence on their participation in conservation activities. Huilan *et. al.* (2008) explained that the effectiveness of biodiversity programs was strongly and positively associated with the level of education, which could reduce hunting, use of forest products and the use of fuels other than wood. In addition, Baral and Heinen (2007) agreed that socioeconomic factors such as gender, education, household affluence and conservation attitudes affected the conservation attitudes of people participating in decentralized conservation programmes. The central government should play a major role in local communities,

which would enhance the effectiveness, efficiency and equity in managing the buffer zones around the protect areas. Zhang *et. al.* (2011) conducted a study on factors that influence farmer's willingness to participate in the conversion of cultivated land to wetlands (CCW) in Heilongjiang province in China.

There were about 330 households in 11 villages that were chosen as respondents through questionnaires and field investigations using the purposive technique. The findings indicated that age, education, amount of cultivated land, the perceived benefits and risks as well as geographical location were important factors that influenced farmers' willingness to participate in the CCW program in China. Furthermore, it suggested that the government should increase their role by enhancing wetland policies and improving the farmers' understanding of CCW activities as well as their ability to participate in future programs.

Agrawal and Gupta (2005) explained that having a good relationship with government officials would enhance local community participation due to greater access and interaction with the government officials. Thus, greater participation in conservation between local communities and government officials could possibly protect the forest resources and its wildlife.

Spiteri and Nepal (2008) compared community participation and its barriers between Non-Tourist (NT) and Tourist Villages (TV) in Annapurna Conservation Area (ACA) in Nepal. A survey questionnaire was distributed to 188 households in communities of the Upper Mustang extension of ACA. Non-parametric statistics such as the chi-square test for independence (X^2) was used since the data were not normally distributed. The findings revealed differences in participation in community programs between NT and TV because of barriers to participation and their perception of benefits accrued from participating. Due to their strict spatial, demographic and attitudinal differences, NT and TV have their own set of needs, values and motivation factors that cannot be generalized.

The study identified that conservation agencies need to be creative in formulating strategies and initiatives appropriate for specific groups that could optimize their input in participatory conservation. Bandyopadhyay *et. al.* (2009) found that conservation had a positive beneficial effect on household welfare by examining their rights associated with participation, ownership and benefit sharing in the future.

Related studies on Willingness to Pay (WTP)

Shuib (2009) evaluated the recreational value of mangrove forests in Larut Matang in Perak. The data collection method used questionnaires that were distributed in the study area. The non-market value of goods was used to estimate the Willingness to Pay (WTP) by employing the Contingency Valuation Method (CVM), which resulted in a value of RM 44.58, while the mean value indicated RM 41.18 per visit. In addition, this study also indicated that policies to enhance the conservation of mangrove forests would benefit not only the forestry industry but also the local communities as well as recreationists who support forest conservation.

Dayang, Davis *et al.* (2012) estimated the individual WTP for conservation of outdoor recreational resources in Bako National Park in Kuching, Sarawak. Questionnaires were distributed using CVM to the respondents for estimating the values they used for WTP. The result indicated the estimation of the median value to be RM 7.765 per person. This study suggested that in order to increase the satisfaction of visitors, management should make efforts to clean and protect the natural environmentx as information, securities and park facilities.

Puan *et. al.* (2005) estimated the value of protecting a highland forest located in Fraser's Hill in Peninsular Malaysia. 226 questionnaires were distributed to residents living nearby by using CVM of the non-used values of the forests. The logistic regression models and Ordinary Least Square (OLS) method was involved in estimating the WTP. The result showed that the conservation values of the forest were estimated to be between RM 20.00 to RM 27.00 per individual resident. Furthermore, respondents are more likely to accept the offered bid if they have higher education, higher monthly

income and can contribute to the environmental organizations. This study demonstrated an alternative way of measuring non-market benefits of natural resources that indeed can conserve many critical natural areas such as tropical highlands.

Zaiton *et. al.* (2010) studied factors that determine WTP by visitors to Taman Negara National Park (TNNP) in Pahang using the CVM. About 196 visitors were involved in this study and the data were obtained by using systematic sampling with close-ended interviews. The study discovered that nationality, income, education and marital status factors had a significant relationship with the respondent's WTP entrance permit. Furthermore, the researchers suggest that the level of awareness among visitors can be increased by implementing educational programs. The right information would create more positive perceptions that contribute to a long-term sustainable development of TNNP if they managed it efficiently.

Seddigheh *et. al.* (2009) conducted a study of WTP for recreational resources at Kapar Bird Sanctuary (KBS) in Kelang by using CVM. 220 respondents were interviewed regarding their WTP for conservation purposes of KBS as a recreational site. The study showed that respondents with a higher income and education level were willing to pay more. Older visitors were more environmentally aware and less sensitive than the younger generation due to their experience. The findings of this study showed that the mean WTP ranged from RM 12.06 to RM 60.94. The majority of respondents indicated positive attitudes towards bird watching and recreational activities, while this economic value could assist policy makers regarding the management and development of recreational sites in Malaysia. Furthermore, Nuva *et. al.* (2009) reported that the visitors WTP for conservation of resources and their satisfaction towards the use of ecotourism resources in Gunung Gede Pangrango National Park (GPNP) in Indonesia. Sampling was done in the regent of Bogor, Cianjur, and Sukabumi in West Java, south of Jakarta. In this research, 423 respondents answered the questionnaires by using face-to-face interview.

The dichotomous choice of CVM and the logit regression model were used to determine the WTP. The results showed that many of the visitors come to GPNP more than once and most of them were satisfied with the ecotourism resources. The regression results indicated that income, gender (male) and residential (urban) were significant factors that influenced the visitors' WTP for entrance fees to GPNP. The mean WTP was found to be RP 7629.77 per visit. This result would be a good guideline for formulating an effective fee system by the authorities and important information for visitors to the park.

Martin-Lopez *et. al.* (2007) studied the relationship between among human attitudes towards biodiversity, its economic value and the public awareness of biodiversity conservation. This CVM survey was conducted in Donana National and Natural Park in Spain by using face-to-face interview. 672 respondents were selected but only 649 respondents managed to answer all the questions. This reveals that there are several reasons as to why respondents' were unwilling to pay for conservation. The reasons were their disagreement about the role of government in environmental management, dissatisfaction over new payments and conservation of the park was already funded by regional and national governments. However, the results indicated that there was a strong relationship between an individual's attitude towards species and WTP for biodiversity conservation. This strong relationship showed the importance of understanding people's preferences and their influence on conservation policies.

Surendran and Sekhar (2010) used an individual travel cost method (ITCM) to study WTP and the impact of ecotourism on the socio-economic characteristics of native inhabitants and natural resources in Anamalai Tiger Reseve (ATR) in India. About 60 stakeholders were selected as samples by using the purposive random sampling technique. The study indicated that travel costs and education had a significant as well as positive influence on the number of visits. The result showed that agriculture and forest dependents, tourist dependents and tourist are WTP an average amount of Rs 202 (US$ 4.03), Rs 449 (US$ 9.55) and Rs 656 (US$ 14.00) per annum towards ecotourism related externalities. Furthermore, the respondents' education, monthly income, age, education and number of animal species sighted are positively related to WTP and are highly significant. Hence, ecotourism activities

would create more employment opportunities and other tourism related income activities that could contribute additional income for local stakeholders.

Gunawardena and Rowan (2005) pointed out there was an economic valuation of a mangrove ecosystem in Rekawa Lagoon, Sri Lanka where most of the local communities in that area closely depended on mangroves for direct and indirect benefits. The CVM approach was used to measure the worth of preserving the Rekawa mangrove-lagoon ecosystem for shrimp development. However, low WTP from the survey showed that many of the households were operating at a subsistence level because the population faced poverty and were living in rural areas. The analysis revealed that the internal benefits of developing the shrimp farm were 1.5 times higher than the internal costs. While the external costs to society were between 11 to 6 times more than the benefits.

Howley *et. al.* (2009) explored the public's WTP for agricultural activities that protect the rural landscape in Ireland. About 500 respondents were chosen between November 2008 and January 2009. The result showed that income, education, household size and whether the respondents had sibling involved in farming were found to have a significant and positive effect on the WTP for conservation. Furthermore, the average WTP for protecting the rural landscape was estimated at €44 per person per year. Therefore, there is a strong justification for rural landscape through the increasing support of local people.

Related studies on Mangrove Forests

Din *et. al.* (2008) assessed the impact of local communities on mangrove development in Douala, Cameroon. The activities of the local communities were fishing, hunting and logging for fuel wood and charcoal. An eight point semi-structured questionnaire was used to interview 120 mangrove loggers in the local markets. A simple statistical manipulation was used to analyse the data. The findings showed that 61% of respondents were permanent workers and they would not stop exploiting the mangrove resources, as logging was their main income. Besides, they are predicting that more revenue would be forthcoming if there were more investments in this activity. However, the mangrove areas were destroyed annually at a rate of 1,000 ha and the genus *Rhizophora* was the species most exploited. High revenues that reached about 400,000 Euros per year aided the continuous exploitation of this species. The results showed that mangroves had significant economic value. Therefore, significant improvement and sustainable management are needed.

Lise (2009) reviewed several factors that influenced people's participation in forest management efforts in Haryana, Uttar Pradesh and Bihar in India because forests are an important source of revenue for the government of India. Participation from government employees, local leaders or strong communities could enhance a proper forest management initiative because the ultimate role of the state is to facilitate the people and to motivate their participation. Otherwise, the forest would continue to degrade due to the people's refusal to participate. Therefore, 13 households were interviewed in each village. However, the link between caste and social participation are only significant and positive in Haryana rather than Bihar and Uttar Pradesh states. The results showed that social indicators were the main consideration in participation followed by economic standing, which is indicated as the second factor. Furthermore, the significant and positive voluntary participation of peoples came from Haryana rather than other states due to its good forest management.

Iftekhar and Takama (2008) analysed the perceptions regarding biodiversity, environmental services, and conservation of mangrove plantation in south central of Nijhum Dwip Island, Bangladesh. 110 households were interviewed and more than 80% respondents indicated that the ecosystem was degrading. Due to this situation, the majority of respondents believed they should be allowed to participate and play a major role in the forest management decision-making process. The success of this could minimize ecological and economic losses of mangrove forests as this could be applied to those households that have a high dependency on the mangrove forests.

Sathirathai and Barbier (2001) estimated the economic value of mangrove forests to a local community to be in a range of US$27,264 to US$35,921 per hectare. The study done in Tha Po village in Surat Thani province in Southern Thailand revealed that the estimated value included the local community's direct and indirect resources collected from mangroves. There was an incentive given to local communities for protecting the mangroves, which was due because of their initiatives in managing the forest effectively. Another study by Walton *et. al.* (2006) estimated the direct benefits of mangroves to the local community in the Aklan province of Western Visayas, Panay Island in the Philippines. It showed that their revenue from mangrove fisheries, tourism and timber reflected annual benefits of US$315 per hectare. The results showed that more than 90% of all fishermen think that the mangrove provides protection from storms and typhoons as well as a nursery site in the Aklan province and should be protected. Due to that, many efforts were initiated and replanting mangroves was one of the efforts that could have a significant economic impact on the lives of coastal communities.

Adhikari *et. al.* (2010) revealed the direct value of mangroves in three villages (Sonmiani, Bheera and Damb) in Balochistan to be US$1,287 per hectare. Meanwhile the total value for the village was calculated to be US$4,419,935, which shows that these communities depended on mangrove resources for their main income. Badola and Hussein (2005) studied the situation happen to local communities in Bhitarkanika, India who lived in the vicinity of mangroves benefited directly from the forests and contributed to tourism and agricultural productivity.

Meanwhile, those villages situated away from the mangroves were less dependent on mangroves but they were more appreciative of the functions of mangroves such as providing storm protection. In addition, they were also aware of the importance of mangrove forests in protecting their lives and property from cyclones and were willing to cooperate with the forest department in the restoration of mangroves.

Walters (2004) studied the two coastal sites (Bais Bay and Banacon Island) in the Philippines, which had been successful in mangrove reforestation and management of community-based efforts. There were 15 different villages and the majority of communities derived their principal income from fishing, aquaculture, or related activities. Before the government and NGOs promoted activities related to reforestation and management, both areas had practiced tree planting and management. This management system was a successful economic innovation. For instance, mangroves were planted to protect the homes and fishpond dikes from ocean waves and wind destruction. This shows that the mangrove system was successfully managed through voluntarily participation especially in the Banacon area because mangroves have its value and provides important benefits to the local communities.

Related studies on Ecotourism

Uddin *et.al.* (2013) conducted a study in the Sundarbans Forest Reserve in Bangladesh, in which the main cultural service was tourism and it provided an average revenue of US$744,000.00 and US$42,000.00 per year respectively during the financial year of 2001-2002 to 2009 – 2010.

This shows that increasing revenue from tourism is due to improved facilities provided by the Forest Department and private tour operators who generate huge revenues for this department.

Furthermore, tourism is the only marketable cultural service that the Sundarbans could offer compared to other ecosystem services such as regulatory services (e.g. protection from cyclones and storm surges, flood regulation, climate regulation) and supporting services (e.g. nursery for fishes, nutrient cycling, habitat for biodiversity). The mangrove areas, which are a part of the Forest Reserve, offer recreational activities such as river cruising, fishing, bird watching, jungle trails and wildlife watching that attract tourists every year from local and international destinations. It was also declared a World Heritage Site in 1997 and many educational and research programs have being undertaken by universities and other research institutions.

Salam *et.al.* (2000) stated that well planned tourism initiatives could provide economic and political incentives for proper management and conservation as this would bring additional benefits to local communities as well as regional economics. Local community participation in ecotourism efforts provide benefits to the communities especially through its direct employment and increases their awareness on conservation activities that protect the forests and wildlife (Stem, *et. al.*, 2003; Avau *et.al.*, 2011). Furthermore, tourism supports the conservation process through productive planning and comprehensive management if properly controlled by the involvement of all stakeholders, especially local communities. This also provides opportunities for education and recreational activities.

Satyanarayana *et. al.* (2012) conducted a mangrove study in Tanbi Wetland National Park (TWNP) in Gambia and evaluated the mangrove's utilization patterns and different mangrove resources in and around Banjul (i.e. timber, non-timber, edible and ethno medicinal products) including the possibility of ecotourism development. More than 80% of the peri-urban population rely on mangroves for its resources and it is important for their livelihood. Their major income is from fishing and tourism. The national park also received a positive response from different stakeholders (i.e. users, government and non-government organizations) as they focused on ecotourism via the development of facilities inside the mangrove area as well as their appropriate roles in revenue sharing, rights and responsibility on the area. In addition, the city council (Banjul City Council) had implemented initiatives for the local people as well as tourists by creating an understanding about the value of natural resources and its ecosystem through ecotourism activities. Other recreational activities included bird watching, visiting the local reptile park, a local lodge and mangrove sites via travelling inside the mangrove creeks. The local population in the mangrove areas also gave a positive feedback as they have a responsibility to protect their environment from threats.

According to Mohammed (2004), it is important to reduce the decline of mangrove resources through community involvement in mangrove management and fishery resources. This is because the main livelihood for the majority of the community in Chwaka Bay, Zanzibar depends on fishing, which relies on locally made gear and vessels. This is also the key to sustainable and long-term utilization of the resources through the involvement of stakeholders, especially the local communities, in resource management. One of their initiatives is to involve the local community in tourism by promoting tourist attractions in the area associated with flora and fauna.

Part of the money accrued from the tourism sector in the area is shared by the communities and used towards the improvement of social services such as schools, health services, water supply and electricity. This collaborative initiative is the partnership between governments of Austria, Zanzibar and Tanzania and it has helped improve the local community's economic livelihood by providing business credit and savings such as beekeeping, vegetable farming, handicraft making and weaving. Studies by Stone and Wall (2004) and Alam *et.al.* (2009) showed that it is important to have good collaboration with other stakeholders as this approach contributes to the socioeconomic development of the local communities by promoting tourism activities.

Theoretical Framework

A theoretical framework (Figure 1) for this study was developed based on the reviewed literature to guide the study. The research framework used in this study was adapted from the social exchange theory proposed by Babbie (2010). The theory suggests that people develop attitudes toward other people and things in the context of anticipated personal benefits and costs to be derived from being in contact with them (Bagherian, *et. al.*, 2009). In other words, participation through the interaction of demand and supply factors is about sharing the benefits received as well as the role of the local communities or government bodies in maintaining the sustainability of the ecosystem. Local communities as residents, the government as policy makers as well as Non-Governmental Organizations (NGOs), visitors and business operators are the stakeholder; each group has needs and responsibilities to be fulfilled.

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Supply is the relationship between the price of the good and the quantity produced; whereas demand is the relationship between the price of the good and the quantity purchased. As participation occurs at the intersection of supply and demand, price is constant. Thus, the participation is influenced by factors other than price of the good. The supply factors might include campaigns and awareness programs, facilities, and the environment through the involvement and partnership between the government and NGOs and initiatives such as seminars, mutual aid programs, field and study trips or group discussions that could influence the behaviour of society to get involved in protecting nature.
Facilities are one of the supply factors that influence participation. Facilities such as electricity, clean water, access roads, community infrastructure and various other facilities provided to society would be beneficial to them and could ensure their future participation.

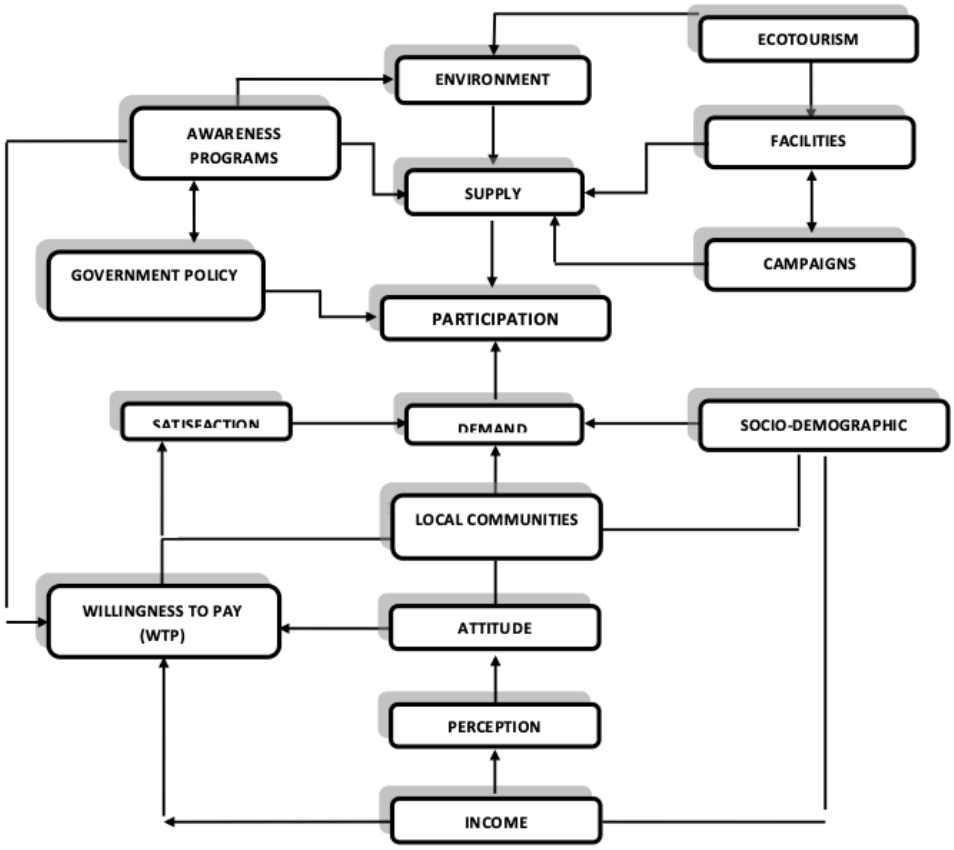

Figure 1: Social Exchange Theory
(*Source*: *Babbie, 2010; Bagherian et. al, 2009*)

This can be done by engaging local communities in activities and awareness together with a supportive environment between local communities and authorities in the area. Therefore, local communities directly share the benefits of their resources with the other stakeholders. In the case of mangrove resources conservation, ecotourism activities could also generate income for the local communities through job opportunities related to tourism such as resorts, small restaurants, homestays, nature guides, boat operators and handicrafts. In terms of awareness programs, the society should be alert and aware of the importance of nature conservation, which could reduce the effects of global warming. These awareness programs could motivate local communities to participate for a better cause and change for the future.

Government policy is one of the supply factors that determine the level of local community participation as it plays an important role in the organization. The Government, as an authoritative body that implements good management, policies and legislation could provide better guidelines and effective enforcement for protecting nature. Good management involves better teamwork and management strategies that increase participation in activities. It will increase awareness among the

community and influence their willingness to spend money for conservation activities. For instance, awareness could be achieved by educating children on the involvement in conservation activities.

Their involvement through hands-on experience in replanting mangroves will educate them on protection and sustainability of natural resources. In addition, the government should wisely use the investment or budget allocated for conservation programs. All public monies used for any program must be accountable; communities will be willing to pay for the conservation and participate in the conservation programs if the activities will benefit them and contribute to long-term ecosystem sustainability.

Apart from that, socio-demographic factors that influence participation are gender, age, educational background etc. Gender is part of the social-demographic factors that influence people's participation. This is because gender represents the importance of local community participation that reflects the conservation efforts made by the authoritative body for them. Perception is a measure of people's attitude through their positive or negative expectations. It is influenced by certain factors such as intention and behaviour, which can change people's attitude. For instance, environmental awareness could change peoples' attitudes towards positive or negative perceptions if there are awareness programs carried out. Income levels usually influence people's willingness to pay to participate in conservation programs. This is because they are willing to pay more if they have more income and their willingness could also assist the authorities to improve the effectiveness as well as the efficiency of conservation management. It is vital that this mutual understanding and trust as well as commitment to each other positively benefit the stakeholders. When people are aware of their environment, they tend to participate in related activities. Hence, satisfying the self-interest of various parties might bring about fair returns and equal economic benefits.

Conclusion

The literature indicates that various authors had investigated diverse studies on mangroves and the willingness to pay. What emerged from the literature is that even if the participation in conservation perspectives might differ, it is evident that most of studies see participation in conservation efforts as communication with an intention to enhance the local communities' interaction with other stakeholders and conservation activities.

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