Téoros
Revue de recherche en tourisme

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A Case Study of Gili Trawangan, Indonesia

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Numéro hors-série, 2012

Innovations en tourisme durable
Innovations in Sustainable Tourism

URI : https://id.erudit.org/iderudit/1036566ar
DOI : https://doi.org/10.7202/1036566ar

Aller au sommaire du numéro

Éditeur(s)

Université du Québec à Montréal

ISSN

0712-8657 (imprimé)
1923-2705 (numérique)

Découvrir la revue

Citer cet article

Willmott, L. & Graci, S. R. (2012). Solid Waste Management in Small Island Destinations: A Case Study of Gili Trawangan, Indonesia. *Téoros*, 71–76. https://doi.org/10.7202/1036566ar

Résumé de l'article

Solid waste management is a critical, complex, multi-dimensional challenge for societies. The nature of solid waste management in each community can differ based upon a number of factors including economic activities and geographies. Solid waste management in small island tourist communities is often complicated by their isolated geographies and tourism dominated economies, resulting in even greater challenges for ensuring sustainable solid waste management. This article discusses a case study of the small tourist island of Gili Trawangan, Indonesia that has addressed their long-standing issues of solid waste management through a governance and management approach centered on a multi-stakeholder partnership. The partnership involves collaboration between a community-based organization and environmental non-governmental organization, each having broader ties to stakeholders in the island community. Through this partnership they have seen improvements with stakeholder involvement, access to resources, financial support, transparency and accountability, and have been able to implement a number of key initiatives to improve waste management in this destination and move towards sustainability. Initiatives include source separation, expansion of collection services, revised collection fees, material reuse projects, education and awareness initiatives and enhanced planning.

Solid Waste Management in Small Island Destinations
A Case Study of Gili Trawangan, Indonesia

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ABSTRACT : Solid waste management is a critical, complex, multi-dimensional challenge for societies. The nature of solid waste management in each community can differ based upon a number of factors including economic activities and geographies. Solid waste management in small island tourist communities is often complicated by their isolated geographies and tourism dominated economies, resulting in even greater challenges for ensuring sustainable solid waste management. This article discusses a case study of the small tourist island of Gili Trawangan, Indonesia that has addressed their long-standing issues of solid waste management through a governance and management approach centered on a multi-stakeholder partnership. The partnership involves collaboration between a community-based organization and environmental non-governmental organization, each having broader ties to stakeholders in the island community. Through this partnership they have seen improvements with stakeholder involvement, access to resources, financial support, transparency and accountability, and have been able to implement a number of key initiatives to improve waste management in this destination and move towards sustainability. Initiatives include source separation, expansion of collection services, revised collection fees, material reuse projects, education and awareness initiatives and enhanced planning.

Keywords : waste management, multi-stakeholder partnerships, collaboration, Gili Trawangan, Indonesia.

A multitude of studies have identified numerous challenges that impede efforts in solid waste management. These include technical concerns, financial restraints, lack of capacity, education and awareness, concerns with management, corruption, stakeholder influence and poor planning (Taylor, 1999; Henry *et al.*, 2006; Pasang *et al.,* 2007; Joseph, 2006; Kuniyal *et al.,* 1998; Mongkolnchaiarunya, 2005; Manaf *et al.,* 2009; Troschinetz and Mihelcic, 2009). These challenges result from traditional, top-down, regulatory, end of pipe approaches taken in waste management that are largely ineffective (Furedy, 1992; Scheinberg *et al.,* 2004). Small island settings and tourism-based economies can further complicate waste management scenarios. A partnership approach has been adopted in Gili Trawangan, Indonesia, which through capacity building has successfully addressed a number of challenges this island has been facing with solid waste management.

Waste Management and Tourism

Solid waste is a commonly identified impact of tourism (Diaz, 2007; Chen *et al.,* 2005; Brown *et al.,* 1997; Gidarakos *et al.,* 2006; Kuniyal *et al.,* 1998; Kuniyal *et al.,* 2003; Neto, 2003; Nair and Jayakumar, 2008; Shamshiry *et al.,* 2011; Dileep, 2007), but is rarely examined in tourism literature (Dileep, 2007). Globally, it is estimated that the tourism industry is responsible for the production of 35 million tonnes of solid waste annually (UNEP and CI, 2003). This is problematic as poor waste management directly results in environmental damage and aesthetic pollution, which negatively impacts the tourist experience and host community (Nair and Jayakumar, 2008; Dileep, 2007). The tourism industry produces excess quantities of waste (Gidarakos *et al.,* 2006; Brown *et al.*, 1997; Jin *et al.*, 2006; Bohdanowicz, 2005). Waste from tourism can be generated at nearly twice the rate of local waste production (Shamshiry *et al.*, 2011). Excessive waste generation is only one dimension of the problem, as destinations have very limited capabilities for managing wastes (Diaz, 2007; Chen *et al.,* 2005; Brown *et al.,* 1997; Neto, 2003). Furthermore, impacts extend beyond the tourism industry to the local community as tourists influence locals with their cultures and lifestyles, exposing

them to new ideas and products (Nair and Jayakumar, 2008), which results in changes to local consumption and disposal patterns.

Waste Management on Small Islands

Waste related impacts of tourism can be particularly problematic in small island settings and are widely recognized as a pressing environmental concern (Deschenes and Chertow, 2004; Douglas, 2006; Diaz, 2007; Shamshiry *et al.,* 2011). Small islands increasingly choose to rely on imported products and choose not to control what waste is brought onto the island. This results in limited abilities to practice waste reduction, which is the most desirable approach for waste management (Skordilis, 2004; Chen *et al.,* 2005; Diaz, 2007). As such, the quantity of waste is often beyond what the island can handle, due to limited land availability for disposal and financial resources (Deschenes and Chertow, 2004; Chen *et al.,* 2005). This situation is further complicated, as small islands often have difficulties finding markets for the re-sale of recyclables on the mainland (Chen *et al.,* 2005; Diaz, 2007; Shamshiry *et al.,* 2011). As a result, solid waste on small islands is usually managed through open dumping on land and in water and open pit burning, with some locations practicing recycling (Deschenes and Chertow, 2004; Chen *et al.,* 2005; Diaz, 2007). The generation of waste results in widespread environmental, social, economic impacts to communities.

Collaboration and Partnerships in Waste Management

In the field of natural resource and environmental management there has been growing interest and application of collaborative approaches to management and decision-making (Selin and Chavez, 1995). Gray (1989: 5) defines collaboration as "a process through which parties who see different aspects of a problem can constructively explore their differences and search for solutions that go beyond their own limited vision of what is possible." As such, collaboration is represented by an inter-organizational effort, or partnership, to address problems too complex to be effectively resolved by independent action (Gray and Wood, 1991). The collaboration process is identified by Grey (1996: 61-65) as a three-phase framework involving problem setting, direction setting and implementation of the chosen course of action. Collaboration in solid waste management has manifested in a variety of contexts through partnerships.

Partnerships are widely regarded as having the potential to positively contribute to waste management, with proven success in a number of circumstances (Fernandez, 1993; Baud *et al.,* 2001; Massoud and El Fadel, 2002; Mongkolnchaiarunya, 2005; Ahmed and Ali, 2006; Pasang *et al.,* 2007). Partnerships can help to overcome many challenges, and improve the effectiveness and efficiency of waste services, encouraging civic participation and enhancing capacity for the provision of waste services through improving technological, planning and management abilities (Fernandez, 1993; Baud *et al.*, 2001; Ahmed and Ali, 2006). Partnerships can involve any number of stakeholders including various levels of government, large to small scale enterprises, local waste authorities, non-governmental organizations, community based organizations, informal waste sectors and other community members (Baud *et al.,* 2001; Fernandez, 1993). Roles can vary including service providers, facilitators, policy makers and supporters (Fernandez, 1993). Partnerships can take many forms, but are typically characterized by a shared governance structure and decision-making process (Ahmed and Ali, 2006). Relationships range from formal or semi-formal contractual agreements to small-scale business transactions (Baud *et al.,* 2001).

Research Setting: Gili Trawangan, Indonesia

Gili Trawangan is located off the coast of Lombok, in the strait between Lombok and Bali – Indonesia's main tourist centre. Gili Trawangan is one of three archipelagic islands collectively referred to as the Gili Islands. Gili Trawangan is six square kilometers in size (Hampton, 1998; Dickerson, 2008), has mainly low-lying topography and experiences a tropical climate (Cushnahan, 2004). Infrastructure on the island consists of a limited system of dirt roads and a generator for electricity provision. The island does not have a sewage treatment system. Transportation takes place by horse-drawn cart, as motorized vehicles are not permitted. The population as of 2010 was approximately 4,439, consisting of Indonesians and Western expatriates. Gili Trawangan is located within a nationally designated marine park, the Gili Matra Marine Natural Recreation Park, which is preserved for research, science, education, recreation and tourism purposes (UNEP, 2002; Afifi, 2000).

Tourism forms the large majority of economic activity on the island (Kamsma and Bras, 2000; Dickerson, 2008; Graci, 2007), limiting traditional fishing and agricultural livelihood practices. The tourism industry initially formed as a small-scale locally developed backpacker locale (Hampton, 1998; Kamsma and Bras, 2000), but has since grown into an established sun, sand and sea destination (Graci, 2007), attracting domestic and international tourists (Furqan and Puad Mat Som, 2010). The island's tourism industry has undergone rapid, uncontrolled growth in recent years, resulting in a number of adverse effects including coral reef degradation, beach erosion, issues with waste management, unauthorized development, illegal fishing and unrest between Indonesians and Westerners (Graci and Dodds, 2010). A number of challenges inhibiting sustainability on Gili Trawangan include inadequate resources, improper solid waste management, lack of momentum to implement initiatives, resistance to change, corruption, limited infrastructure and a lack of awareness amongst tourists (Graci and Dodds, 2010). The people of Gili Trawangan were able to effectively address these challenges through adopting a collaborative approach to sustainable management of the island.

Methodology

A case study approach was utilized for this study. Research was conducted on Gili Trawangan in the spring of 2010. Qualitative methodologies were implemented by means of semi-structured interviews, which were supplemented by observation for data collection. Interviews were conducted

with 54 stakeholders in the island's waste management system, representing all groups including public and private sectors, non-governmental organizations, community based organizations, waste service users and the informal waste sector. Open-ended interview questions examined all aspects of waste management on Gili Trawangan – stakeholders, technical and strategic aspects, seeking to identify details of the partnership approach adopted on the island and successes, challenges and future opportunities for waste management. Data was analyzed through thematic coding to contribute to this case study.

Findings: Waste Management on Gili Trawangan

Waste management services began on Gili Trawangan in 1996 in an attempt to address growing concerns over widespread burning and dumping practices, litter and uncollected material. A community-based organization called FMPL (Forum Masyarakat Peduli Lingkungan) or concerned citizens group for the environment was formed to serve as the island's waste management authority. It is operated and managed by a group of local Indonesians from Gili Trawangan that were appointed to this role by the local government. FMPL provides basic waste services including mixed waste collection, by means of horse cart and disposal in an open-pit landfill on the island. Despite having a high proportion of divertible material in the waste stream, no formal efforts at recycling or composting were initially put in place. The implementation of this waste management system coincided with the time when tourism development on Gili Trawangan began to increase and shift away from small-scale community based development towards larger scale development with satellite investment (Kamsma and Bras, 2000).

In the following years, Gili Trawangan continued to experience growth in its tourism industry, evident through an increasing number and variety of tourism businesses, tourists and local population. As a result the island quickly outgrew its existing waste management system. This became evident as people began to see a number of problems including collection inefficiencies, improper open-pit landfill disposal, limited waste diversion and burning, dumping and littering practices. As evidence of these problems grew, more stakeholders began seeking ways to improve the sustainability of Gili Trawangan.

One of the stakeholders that took leadership in this was the island's environmental non-governmental organization called the Gili Eco Trust (GET). Satria *et al.* (2006) describes the GET as a stakeholder representative of tourism entrepreneur (owners of tourism businesses and dive shops) interests. It was established in 2001 by a group of island dive shop owners concerned about degradation to Gili Trawangan's marine environment and is a collaboration between Western and Indonesian stakeholders. The GET manages a tourist eco-tax, where a 50,000 IDR (6 USD) fee is collected from tourists by dive shops and other tourism businesses on behalf of the GET to provide funding for sustainability projects. In an attempt to move towards sustainability the GET sought external assistance for planning and management of their tourism industry, by commissioning stakeholder consultation for the development of a sustainable tourism strategy. The strategy was completed in 2006, providing a framework for the island to integrate sustainability practices, as detailed in Graci and Dodds (2010). This strategy identified solid waste management as the most pressing concern, and provided insight on how waste management could be improved from both planning/management and technical standpoints. Under the guidance of this strategy, in addition to further consultation and planning conducted by the GET in cooperation with FMPL, substantial innovative changes were implemented to the island's waste management system in the spring of 2010.

Innovation through a Multi-Stakeholder Partnership Approach

Management of Gili Trawangan's new waste system was implemented under a multi-stakeholder partnership. The primary actors in this alliance are FMPL and the GET. FMPL is responsible for the provision of waste management services – collection and disposal operations and is also involved with planning and management. The GET plays a supportive and facilitative role in waste management, and is largely involved with planning and management, facilitating diversion, enhancing public awareness and education and assisting FMPL as needed, including providing financial support. Prior to this the GET was not directly involved with waste management, leaving all responsibilities to FMPL. They now play a critical leadership role that initiated the formation of this partnership and provides the vision for improvement and support for initiatives. The partnership is also supported by the local government, which acts as the administrative head for decision-making.

The objectives of this partnership sought to improve the effectiveness and sustainability of waste management services on Gili Trawangan through improving the practical aspects of collection, disposal and diversion, while also working to address waste-related behavior, promoting reduction and enhancing education and awareness of waste related issues. This governance and management mechanism provided the basis for substantial improvements to the island's waste management system. Through this partnership, capacity for the provision of waste management services was improved, enabling waste services to be more reliable, efficient and effective.

A lack of capacity is a common challenge small communities face with regards to providing waste management services. This is characterized by an inability to perform tasks required for waste management and can result from insufficient resources and funding, knowledge and skills, planning and management abilities (Taylor, 1999; Henry *et al.*, 2006; Pasang *et al.*, 2007). Capacity in Gili Trawangan was improved through stakeholder engagement, access to resources, knowledge and networks, financial support and transparency and accountability.

Stakeholder Engagement

Involvement of stakeholders is widely regarded as an essential element in achieving success and sustainability in waste

management (Fernandez, 1993; Taylor, 1999; Henry *et al.,* 2002; Joseph, 2006; Kuniyal *et al.,* 1998; Mongkolnchaiarunya, 2005). Western and Indonesian stakeholders have been brought together through this partnership as FMPL is representative of Indonesians including the local community, government and the island's informal waste economy, while the GET is representative of Westerners and tourism businesses. The involvement of all stakeholders enables planning and management of waste services to be inclusive and reflective of stakeholder needs and interests, thereby improving effectiveness and efficiency of the waste system. When a system is reflective of stakeholders' concerns, those individuals are more likely to provide support by participating in desired behaviour, such as source separation. The involvement of stakeholders has successfully raised a high level of awareness of waste issues amongst the people of Gili Trawangan, and has improved education on the impacts of waste and desired practices.

Access to Improved Resources, Knowledge and Networks

Gili Trawangan's waste management partnership has also allowed for the sharing of resources, knowledge and networks. This supports waste services, as some stakeholders may have access to, necessary resources that can contribute to the operation of the waste management system. Improved access to resources has resulted in the involvement of external stakeholders to provide assistance as waste experts and advisors to Gili Trawangan. FMPL is working with the engineering department at the University of Mataram, Indonesia on establishing composting and the GET is working with a private waste company from Bali for developing educational programs and securing markets for recyclables. Financial resources and infrastructure have also been obtained. The GET was able to utilize networks with the Professional Association of Dive Instructors (PADI) donating to support the purchase of new waste containers. FMPL, with the help of the local government, works with the Indonesian government for assistance with obtaining necessary infrastructure such as horse carts for collection.

Financial Support

Financial contributions made possible by the GET have worked to improve capacity for waste management services on Gili Trawangan. Prior to the involvement of the GET, FMPL was regularly operating in deficit and was often unable to provide services as required. This resulted from collection fees that were not able to cover operating costs, high expenses for service provision and a lack of support from the Indonesian government. The GET utilizes funds from its tourist eco-tax to support waste management, contributing to monthly operating costs and infrastructure improvements. Without these contributions FMPL would be limited to raising funds through collection service fees, as tax revenues on Gili Trawangan are not provided to support waste management services.

Transparency and Accountability

There have been substantial improvements to the transparency and accountability of waste services under this partnership as a direct result of stakeholder relations and increased capacity. Stakeholders are now supportive of waste management as it is more reflective of their needs and interests and is more reliable. There is greater transparency and accountability, in terms of service provision, regulation and financial management resulting from shared management in the partnership. Improved transparency and accountability have increased relationships amongst stakeholders and willingness to actively participate in and financially support waste services. As a result of this and increased capacity overall, FMPL is now better able to provide waste management services as required, with fewer limitations and complications. This allows for improvements to the reliability, effectiveness and efficiency of waste services on the island.

The partnership approach was instrumental in achieving this and has effectively addressed past issues with corruption on Gili Trawangan. Corruption was evident, as the waste collection fee structure was not regulated, so those who were friends with employees of FMPL were charged less for services than those who were not. Improving transparency and accountability are critical dimensions of addressing corruption in governance of waste management (Henry *et al.,* 2006; Joseph, 2006; Taylor, 1999).

Waste Initiatives Under Partnership

Through their partnership approach a number of new initiatives to improve waste management have been implemented. The most substantial change involved the introduction of source separation and storage, which is essential for improving collection effectiveness and efficiency, as well as enabling waste diversion. This utilizes three separate standardized plastic lidded containers for separation and storage. With these new containers, curbside collection was extended to the entire island, including village areas, which were previously only serviced by centralized collection. With this change, 100% of island residents and businesses receive waste collection, which is substantially higher than comparable Indonesian locations, particularly non-urban settings (Pasang *et al.,* 2007).

Fees were revised and increased to assist with financial support. The fee structure, based on characteristics of property/business, remained the same but a uniform fee increase was negotiated, in agreement with stakeholders, who show a high level of willingness to pay for waste services. With separate collection in place and improved finances, recycling was initiated with efforts from both FMPL and the GET. FMPL began sending metal, plastic and paper products to mainland Lombok to sell to recycling depots, while the GET arranged for recycling of specialized products – Tetra-Paks and clean plastic bags in Bali through contacts with a private waste management company.

A project has been implemented, which utilizes discarded glass to repair the landfill access road, which is often inaccessible during the wet season because of the poor condition of the road. This project required coordination of resources and knowledge between partners; it serves to reuse material, thereby diverting it from disposal, while also providing a crucial improvement to waste infrastructure. A number of

educational, awareness and community involvement initiatives are underway including public meetings and demonstrations, assisted by a specialized private waste company from Bali, waste specific training for businesses performed by the GET and regular island clean ups assisted by the local school, dive shops, businesses, community members and tourists. There have also been improvements to the waste planning process; previously official planning did not occur to any considerable degree. More substantial planning that is inclusive of all stakeholders is now in practice, although it is still reactive in nature and relatively informal.

Conclusion

Through a partnership approach Gili Trawangan has seen substantial improvements to their waste management system. They have become a model of success, as the standard of waste management on the island exceeds the Indonesian standard overall in terms of level of service, willingness to pay and waste behaviour and practices. Gili Trawangan's waste partnership is effective, directly resulting in increased capacity, enabling change throughout the system that has brought the island towards having the capacity to manage its waste. This partnership is unique because it engaged and facilitated dialogue between Indonesians and Westerners, creating cooperation that is necessary for a waste management system to succeed. The FMPL and GET partnership has effectively overcome the divide that commonly exists between locals and the tourism industry in destinations. Capacity for waste management has improved due to a number of factors surrounding stakeholder engagement, access to resources and finances and improved transparency and accountability.

The waste management partnership on Gili Trawangan is dynamic and continues to evolve. There has been considerable success in improving waste management on the island through this approach, yet a number of challenges still exist. FMPL and the GET continue to struggle with stakeholder support in regard to service users waste related behaviour and institutional support from the public sector, along with private sector arrangements. They also experience difficulties with securing adequate resources, including finances and with knowledge and training. To overcome these challenges Gili Trawangan may find success with expanding their partnership to actively involve more stakeholders. These stakeholders can include service users, various levels of government, non-governmental organizations, informal waste workers and waste experts, fulfilling various roles to assist in addressing challenges.

Solid waste management presents a great challenge for small island tourist destinations. To ensure sustainable, effective and efficient waste management in these settings, dynamic, location based strategies must be adopted. Gili Trawangan has shown that the basis for success in waste management lies within a strong foundation of management and governance, achieved through a multi-stakeholder partnership approach. Through partnerships, capacity can be increased and initiatives can be implemented to improve solid waste management. ■

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