



# Toward a sustainable environmental management plan for the resorts in the Cox's bazar sea beach: Issues and actions

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## Abstract

Sustainable environmental management of a tourist destination benefits all of its stakeholders. The main purpose of this research was to deal with the preliminary step toward a sustainable environmental management, which involved identifying the relevant issues, actions to address those issues, and justifying their importance or feasibility. Toward this, literature review, and focus group discussion and questionnaire (200) survey among employees from the resorts, hotels or similar enterprises in Cox's bazar had been conducted. The significances or the relationships between the issues and actions were measured based on the reliability of data, correlations/coefficient of determinations ( $R/R^2$ ), and effect size (Eta:  $\eta/\eta^2$ ). It has been found that sustainable environmental management of Cox's bazar sea beach is dependent on waste, biodiversity, energy, water and sanitation, beach erosion reduction, carbon footprint, sustainable communication, and risk management issues. However, waste management has been found as the most prioritized issues. The identified actions have also been found as significant to address the identified issues to bring a substantial change into the current vulnerable environmental situations of the beach. Overall, the participants' long term commitment, and their intention to jointly programme development and resource sharing are required for successful implementation of the actions.

**Keywords:** Sustainable Environmental Management, Coastal Destination, Cox's Bazar, Waste, Biodiversity

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## 1. Introduction

In order to ensure better quality entertainments for the holiday makers and better quality lives for the local residents, a cleaner, greener and safer environment is required for a destination (Artal-Tur and Kozak, 2016). Such an environment can enhance the competitive sustainability image of a tourist destination. This kind of environment of a destination can be developed through appropriate management of its physical environment and man-made environment (Mihalic, 2000). However, in a coastal destination, sustainable environmental management means special management of the man-made environment's impacts on natural components of the broader environment (Ong et al., 2011), which is a major focus of this research.

This research was aimed at assisting the resorts, hotels or similar enterprises operating in Cox's Bazar sea beach of Bangladesh by identifying the issues, and the actions to address those issues toward a sustainable environmental management. In particular, the objectives of this research were: to explore what is meant by sustainable environmental management of a coastal sea beach through literature review, to identify current issues and the actions to address those issues for sustainable environmental management of Cox's Bazar sea beach through a focus group discussion, and to justify, whether the identified issues and actions are perceived by the employees of resorts, hotels or similar enterprises as important to a sustainable environmental management through statistical analysis of the surveyed data. So, the research proposed the following hypotheses (a) there is a significant positive relation between the identified issues and sustainable environmental management and (b) there is a significant positive relation between the identified issues, and the actions to address those issues.

### 1.1. Context

Cox's Bazar is the world's longest unbroken sea beach and the most visited destinations by the domestic as well as foreign tourists in Bangladesh that mainly offers nature based tourism (Zahra, 2013). This beach is situated in the southern part of the Chittagong Division, and is one of the four municipalities of Cox's Bazar district (BBS, 2013) (See Figure 1 to know the location of Cox's Bazar on map). The local people are mostly dependent on tourism, fishing, and fish processing businesses (Ahammed, 2010).

Cox's Bazar has already been introduced as a surf town in the Indian sub-continent (Butler, 2012). It has a big conch shell market, prawn farms, coral stones, dry fish industry, waterfall, eco-park, and game forest (Hossain, et al., 2013; Hassan and Shahnewaz, 2014). Moreover, it offers basking and swimming, speed boat race, sunbathe, beach horse ride, bird watching, and various kinds of seafood (Hossain, et al., 2013). Almost 80% tourists visit the beach for recreation and beach experiences (Zahra, 2013). From September to March, during the peak season, it becomes overcrowded due to almost over 30,000 visitors' daily presence (Dey, 2014). Among the tourists, 80% comes with a group of 2-6 persons and 75.4% of them stay from 2 to 10 days (Mamun, et al., 2013). Many hotels, resorts, and similar enterprises are located very close to the beach (Dey, 2014).

Biodiversity is a primary asset for all coastal tourist destinations (Green and Islam, 2012). However, the local community of Cox's Bazar is not concerned enough about the impacts of their activities on local

biodiversity (Anwar, 2014). The excessive pressure from tourism and local people is creating a threat to its overall sustainability, so a sustainable environmental management is badly needed for this destination (Zahra, 2013). However, no effective tools/techniques or processes have been used by the policy makers, to make Cox's bazar a sustainable tourist destination (Hassan and Shahnewaz, 2014; Khandakar, 2014), and no mentionable research has been conducted yet in this regard (Zahra, 2013). Considering the currently vulnerable environmental situations of this beach, the current research has identified some issues and actions, and justified their importance based on the opinions of the employees of the resorts, hotels and other similar enterprises in assisting them to build a plan for sustainable environmental management.



**Figure 1.** The location of Cox's bazar on google map (identified by an arrow)(Source: Google Map)

## 2. Literature review

The way by which an organisation responds to its environment, and the pattern of responses, completely depends on its environmental management system. Any kind of sustainable environmental management system starts with identifying and evaluating issues and actions (Baby, 2011). An environmental management plan with properly identified, defined, and justified issues and actions can minimise the risks generated from the interactions between business operations and environmental aspects (Hyde and Reeve,

2001). It can also prevent reasonably avoidable adverse environmental impacts of operations in some occasions (DEAT, 2004).

Nowadays, in many tourist destinations, due to improper initiatives taken by the resorts, hotels and similar enterprises in selling diversified tourism products, tourism itself is creating multiple threats to the total environment (Baines et al., 2008). From many contemporary researches, it has been found that tourism alone is responsible for dramatically damaging and distracting the flora and fauna in many destinations (EEA, 2003). For example, damage to corals is the most common forms of damage to biodiversity (Waddell, 2005). Due to lack of underwater communication systems to monitor tourists' behaviour, they are continuously harming the lives of marine mammals (BBC news magazine, 2011). For example, tourists disturb the way of natural resting, feeding and social behaviour of marine mammals by throwing of lead and other fishing materials (Esberg, 2010), waste from safari boats, and generating underwater noise (Constantine, 1999).

In many tourist destinations, tourism not only impacting local biodiversity negatively but also declining locals' quality of lives by causing a shortage in water supply and increase in wastewater due to the overuse of water by the hotels, swimming pools, golf courses and personal use by tourists (Sunlu, 2003). Another common negative impact of tourism is that how it generates waste and consumes energy. For example, from a case study in Mexico it has found that tourism accounts for approximately half of the total waste stream that adversely affects the lives of local residents (Tousignant et al., 2011). Also, over consumption of energy, creates pressure on fossil fuels, and negatively impacts a destination's sustainable growth, and only a proactive energy management system can shape the traditional energy consumption behaviour of the resorts in tourist destinations (Kelly and Williams, 2007).

Many recent researches show that although the coastal destinations are vital to the economy of many nations, they are under significant threat of erosion, worldwide; so beach nourishment, especially, integrated coastal zone management is justified for managing coastal resources and mitigating the increasing pressures from tourism (Phillips and Jones, 2006). Therefore, only an effective environmental management can manage waste, biodiversity, energy, water and sanitation, beach erosion, and carbon footprint. An effective environmental management not only emphasizes on identifying environmental related issues, but also focuses on sustainable communication, which connects all the elements of an environmental management system each other, so that it does work (Sobnosky, 2001). Moreover, such an environmental management system can't ignore the multitude and disruptive effects of risks in implementing an action plan (Osborne, 2012) because, risks are found within and outside of the environmental management system (MITRE, 2015).

### 3. Methodology

A mixed method approach (see Figure 2) was used for this research as seen in some tourism researches (e.g. Barr et al., 2011; Liu and Tsaur, 2014; Chen and Tung, 2014). To refine the research idea and explore the clear explanations of the subject matter (Saunders et al., 2009), a literature review was done. Then a focus group of 8 professionals working in the tourism sector in Cox's Bazar has been conducted in February 2016. The focus group is a proven tool at the beginning stage of designing a larger research project (O'Neill, 2012).

It helps to explore new ideas and explain complex issues when little or no information is on hand to aid in the development and design of quantitative research (Weeden, 2005), for example, for identifying and explaining items for questionnaires or surveys (O’Sullivan, et al., 2008). Moreover, it is useful in a context specific environment, where the participants are knowledgeable, willing and capable of communicating rich and detailed data that provides contextual information in a semi-structured session, which can be understood more holistically (Carey and Asbury, 2016). The focus group was given forty minutes and was asked to identify the issues and actions to address those issues for an environmental management based on their current observations on Cox’s bazar as a tourist destination. The group identified eight issues and four actions for each of the issues to address them. The focus group discussion was taken place in an open space at the beachfront area of Cox’s bazar sea beach.

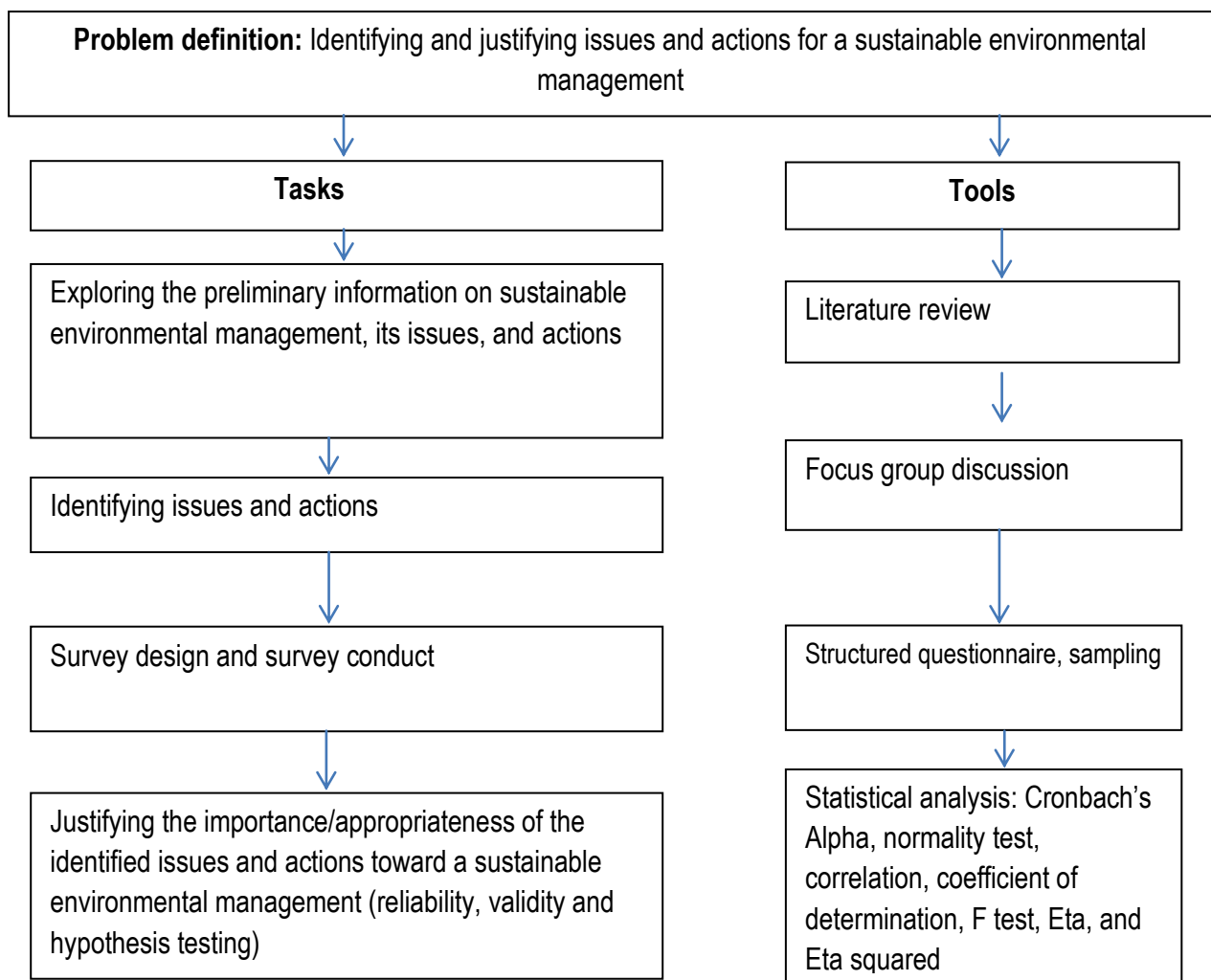


Figure 2. Flow chart of the research methodology

Based on the identified issues and actions, a self-administered survey questionnaire was designed. In that structured questionnaire, first, the respondents were required to mark how much they agree or disagree with each of the identified issues (waste, biodiversity, energy, water and sanitation, beach erosion, carbon footprint, sustainable communication, and risk mitigation) based on their importance in sustainable environmental management. For example, respondents were required to choose an option between strongly disagree-01 and strongly agree-07(07 options) against the following statement ‘I think biodiversity is an important issue for sustainable environmental management’. In the second part, the respondents were asked to mark how much they agree or disagree with each of the actions based on their importance in addressing those identified issues. For example, respondents were required to choose an option between strongly disagree-01 and strongly agree-07(07 options) against the following statement ‘I think avoiding and discouraging selling of souvenirs made from any kind of endangered species is an important action for all the tourism enterprises to manage the biodiversity of Cox’s bazar sea beach. There were eight questions related to the identified issues in the first part except the general introductory questions, and 32 questions in the second part related to the identified actions.

The survey was conducted among 200 professionals working in the resorts, hotels, or similar enterprises. These organisations were selected because they can generate significant employment through diversifying sustainable tourism products, and support the local communities, conservation programmes, and joint development of sustainable projects (UNEP and WTO, 2005). Among the 200 questionnaires 151 were received with complete answers, and used for statistical analysis using SPSS software. The reliability and validity of the data were tested using Cronbach’s Alpha, F-test, and normality tests; also a one-tailed test was selected as the hypotheses are directional (only positive) (Field, 2009). Moreover, the hypotheses were tested based on the measures of associations/ correlation (R), coefficient of determination ( $R^2$ ) (Field, 2009, Kline, 2011), and effect size- Eta ( $\eta$ ) (Levine and Hullett, 2002).

#### 4. Issues and actions identified in the focus group discussion

The focus group identified the issues currently important to them for sustainable environmental management and the actions suitable to address those issues, which are presented in Table 1.

**Table 1.** the issues and actions identified by a focus group discussion

Issues (codes)	Actions' codes	Actions
Biodiversity (BIODIVERSITY_MGT)	BIO1	Avoiding securing fish and seafood through unsustainable ways.
	BIO2	Avoiding and discouraging selling of souvenirs made from endangered species.
	BIO3	Encouraging guests to avoid environmentally harmful games/sports.
	BIO4	Jointly developing a biodiversity management team.
Waste (WASTE_MGT)	WASTE1	Providing toiletries with glass or ceramic containers.

Issues (codes)	Actions' codes	Actions
Energy (ENERGY_MGT)	WASTE2	Avoiding non-refillable products.
	WASTE3	Reducing paper use, but increasing digital presence.
	WASTE4	Emphasizing on composting kitchen waste.
	ENERGY1	Investing in renewable energy sources.
	ENERGY2	Maximising use of natural light and air.
	ENERGY3	Maximising use of energy saving equipment/devices.
	ENERGY4	Calculating per guest' energy use and rewarding the lowest user.
Water and sanitation (WAT_SANT_MGT)	WATSANT1	Using sensor or disperse system to reduce water use.
	WATSANT2	Using sustainable wastewater treatment infrastructure use for multiple purposes.
	WATSANT3	Jointly build reasonable number of public toilets in a safe zone away from the beach front area.
	WATSANT4	Maximising rainwater harvesting.
Beach erosion (BEACH_ER_RDC)	BER1	Avoiding building new construction around the beachfront area.
	BER2	Organizing tree plantation activities for guests and local communities.
	BER3	Reducing the number of events in the vulnerable areas.
	BER4	Jointly building a buffer zone.
Carbon footprint (CRBN_FT_PRNT)	CFT1	Securing maximum supplies from local sources.
	CFT2	Encouraging guests to taste locally made food and drinks.
	CFT3	Rewarding tourists who walk more than using transports.
	CFT4	Encouraging guests who use public transports.
Sustainable communication (SUSTAINBLE_COMMU NICATION)	COM1	Providing guests with personal guidance and informative materials on the environment.
	COM2	Providing staffs with environmental education based on-the-job-raining.
	COM3	Organising short seminars and workshops for the employees.
	COM4	Using SMS, key rings, posters, and map to transmit quick environmental responsibilities.
Risk mitigation (RISK_MTG)	RISKMTG1	Reduce communication risks by providing more clear and persuasive information in all the demonstrations/presentations.
	RISKMTG2	Commitment to continue resource allocation.
	RISKMTG3	Testing all actions through pilot projects.
	RISKMTG4	Setting up standards and check performance in the middle of a project.

#### 4.1. Biodiversity

The biodiversity of the beach and surrounding forest area consists of five broad types of natural vegetation. It includes elephants, tortoises, corals, dolphins, birds, mangrove, fishes, invertebrates, different shells, squids, and octopuses (Green and Islam, 2012). The number of these species in their population is decreasing dramatically, and the major causes are similar to many coastal destinations, for example, over exploitation of sea resources, including, snail, shells, and sea foods (Baines et al., 2008). Moreover, the increasing demand of souvenirs made from sea species is fostering the small and medium sized traders and locals frequently collect corals and sea shells (Ethirajan, 2012). Also, beach compaction by vehicles, hunting of shorebirds, feeding of birds on dust in the beach area, and removing of the boulders are the causes of damage to the biodiversity (Green and Islam, 2012).

#### 4.2. Waste

More than 50% tourists consider the beach is dirty with haphazard littering (Zahra, 2013) that may discourage tourists' intention to revisit (Mamun et al., 2013). The lack of modern waste converter, limited facilities provided by the municipality, and lack of environmental knowledge among the local people are causing the landfill (Rahman, 2010). On the other hand, dumping into the sea is a threat to the marine biodiversity (Dhaka Tribune, 2014). However, unfortunately the waste and other toxic are mixing up with the sea water due to rain and wind (Hassan and Shahnewaz, 2014).

#### 4.3. Energy

In Cox's bazar an increasing trend of energy consumption by the tourism enterprises is observed, and the use of high power generators during load-shedding period damaging to the local air quality (Hossain, 2011). However, solar power, windmills or renewable sources are not popular among the property owners yet and so the sensors to monitor per guests' energy use (Shahan, 2014). Therefore, energy management is an important issue to be addressed.

#### 4.4. Water and sanitation

Tourists are found dissatisfied with the current health and sanitation services in Cox's bazar (Thomson, 2009). No sufficient water recycling and treatment system exist in the beach area (Hossain and Lin, 2001). Untreated and improperly treated wastewater and sewage are contaminating fresh water sources and coastal water and impacting the health of both tourists and locals (Sharma, 2011). Due to insufficient public toilets, many visitors randomly urinate and make some areas dirty and unhealthy both for human and other habitats (Hassan and Shahnewaz, 2014).

#### 4.5. Beach erosion

On the main beach, there are dozens of shops selling souvenirs, toys, clothes, and fast foods that causing beach erosion (Dhaka Tribune, 2014). The Jhou trees, which protect the beach from erosion and other natural calamities, are decreasing in number, due to high tide and lack of proper initiatives taken by the



authorities (The new nation, 2015). Moreover, the collection of shells and snails, removal of boulders, and use of the sand for volleyball and Childrens' playground is contributing to beach erosion.

#### 4.6. Carbon footprint

Usually, high occupancy rate, use of private transports of the tourism enterprises, and use of speed boats and motor boats of the tourists are causing the increased CO<sub>2</sub> emission. Moreover, the locals and enterprises in Cox's bazar are still mostly dependent on imported foods and fruits. The reasons, include the lack of knowledge of modern farming technology, lack of arable lands and expertise, weak supply chain linkage, and weak marketing to make local items attractive to the tourists. As a result, in one hand, CO<sub>2</sub> emission is increasing, on the other hand, the authenticity seeker tourists are losing their interest to revisit the destination (Sarkar and Begum, 2013).

#### 4.7. Sustainable communication

The success of an environmental management plan (EMP) depends on how creatively its subject matters are being communicated to the key stakeholders. In the case of Cox's bazar, the lack of communication between the tourism enterprises and all other stakeholders is the main cause behind the stakeholders' passive participation in the sustainable tourism governance process (Zahra, 2013). So, only sustainable communications can support the enterprises to achieve their environmental goals and objectives through increasing operational effectiveness, improving relationships, and transmitting the results of an action plan among the stakeholders (SPARC, 2006). This kind of communications, ultimately initiate and sustain actions, builds awareness, stimulate motivations and intentions, and foster quality performance among the internal and external stakeholders (Hyde and Reeve, 2001).

#### 4.8. Risks in implementing the actions

To address the above issues some sustainable actions are needed, however, whilst taking the actions some events could adversely affect the implementation process of the actions (Garvey, 2008). So, risk assessment and cost-effective mitigation measures are important before and during the implementation process to reduce the multitude and disruptive effects of risks (Osborne, 2012). At the beginning stage of the implementation process, a few general risks might have to be faced by the employees in tourism enterprises. For example, conflicting guidelines, lack of sense of urgency, outcome uncertainty, inconsistent support from top managements, and ambiguity of standards (Chan, 2011). Moreover, some difficulties in administrating the policies, lack of active participations, and cost and time management of the responsible persons can hamper the plan (Hyde and Reeve, 2001).

## 5. Results and discussions

Analysing the Probability–Probability (P-P) plots, it is found that the collected data have met the criteria of normal distribution (see Table 2), which is very important for the test statistics to be valid and to test the

hypotheses (Field, 2009). The value of both overall Cronbac's Alpha and Split-half coefficient is over .960, which, according to Kline (2011), indicates the excellent reliability of the data. Also, the F-ratio, which is a ratio of explained and unexplained variation, and should be >1.0 for a good model with predictors' ability to estimate the outcomes (Field, 2009). This is for the research ranged between 15.400 and 110.034, considering all the variables, and is significant at .000 (*P*) under one tailed test.

**Table 2.** statistical results of the surveyed data

<b>Reliability and validity of the data</b>							
<b>Criteria</b>		<b>Statistic</b>					
Alpha: Cronbach's Alpha		.984					
Correlation Between Forms		.964					
Guttman Split-Half Coefficient		.979					
Tests of Normality		Kolmogorov-Smirnov <sup>a</sup> values: .150 to .215. Shapiro-Wilk values: .870 to .931. All values are significant at .000.					
<b>Strength of relationships between the independent and dependent variables.</b>							
<b>Variables</b>		<b>Statistic</b>					
<b>Dependents</b>	<b>Independents</b>	<b>R</b>	<b>R<sup>2</sup></b>	<b>Eta (<math>\eta</math>)</b>	<b>Eta<sup>2</sup> (<math>\eta^2</math>)</b>	<b>F</b>	<b>Sig</b>
SUST_ENVR_MGT *	WASTE_MGT	.774	.598	.808	.653	45.079	.000
	BIODIVERSITY_MGT	.741	.549	.780	.608	37.232	.000
	ENERGY_MGT	.739	.546	.766	.587	34.071	.000
	WAT_SANT_MGT	.703	.495	.720	.518	25.809	.000
	BEACH_ER_RDC	.697	.486	.710	.504	24.353	.000
	CRBN_FT_PRNT	.687	.471	.713	.509	24.885	.000
	SUSTAINBLE_COMMUNICATI ON	.639	.408	.667	.445	19.234	.000
WASTE_MGT *	RISK_MTG	.575	.331	.589	.347	15.400	.000
	WASTE1	.886	.784	.888	.789	108.12	.000
	WASTE2	.884	.781	.885	.783	104.52	.000
	WASTE3	.832	.692	.839	.703	56.788	.000
BIODIVERSITY_MGT *	WASTE4	.887	.786	.890	.792	91.640	.000
	BIO1	.877	.770	.881	.777	83.466	.000
	BIO2	.835	.697	.839	.703	56.908	.000
	BIO3	.830	.689	.843	.710	70.982	.000
ENERGY_MGT *	BIO4	.834	.695	.838	.701	56.384	.000
	ENERGY1	.872	.761	.874	.763	77.413	.000
	ENERGY2	.849	.720	.852	.726	63.505	.000
	ENERGY3	.856	.732	.860	.739	68.099	.000

Reliability and validity of the data							
Criteria		Statistic					
WAT_SANT_MGT*	ENERGY4	.865	.748	.870	.757	74.869	.000
	WATSANT1	.867	.752	.873	.763	77.187	.000
	WATSANT2	.829	.688	.835	.697	55.147	.000
	WATSANT3	.829	.687	.837	.701	56.177	.000
	WATSANT4	.863	.745	.868	.754	73.513	.000
BEACH_ER_RDC *	BER1	.859	.738	.863	.744	69.822	.000
	BER2	.840	.706	.843	.711	58.928	.000
	BER3	.877	.768	.882	.777	83.738	.000
	BER4	.872	.761	.876	.767	78.796	.000
CRBN_FT_PRNT *	CFT1	.861	.741	.872	.760	75.876	.000
	CFT2	.880	.775	.882	.778	84.298	.000
	CFT3	.870	.757	.872	.761	76.250	.000
	CFT4	.867	.751	.873	.762	76.954	.000
SUSTAINBLE_COMM UNICATIO *	COM1	.784	.615	.791	.626	40.177	.000
	COM2	.757	.573	.761	.579	32.981	.000
	COM3	.727	.529	.739	.546	28.884	.000
	COM4	.746	.556	.767	.588	34.216	.000
RISK_MTG *	RISKMTG1	.861	.741	.865	.748	86.217	.000
	RISKMTG2	.883	.779	.886	.784	105.54	.000
	RISKMTG3	.888	.788	.890	.791	110.03	.000
	RISKMTG4	.884	.781	.887	.787	107.20	.000

\* significant at the 0.01 level (1-tailed)

sust\_envr\_mgt= sustainable environmental management

a. Lilliefors significance correction

The values of correlation coefficients (R) and coefficient of determinations (R<sup>2</sup>) between the independent variables (waste, biodiversity, energy, water and sanitation, beach erosion reduction, carbon footprint, sustainable communication, and risk management, and dependent variable (sustainable environmental management) are varied between .575 and .774 (>.5) and all are significant at .000 (P). According to Field (2009), this indicates a high positive relation (large effect of the independent variables on the dependent variable, and is too good to reject the null hypotheses. Moreover, the current findings show that the effect size- Eta ( $\eta$ ) or Eta ( $\eta^2$ ) between the issues and sustainable environmental management varied between .580 and .808, which, according to Levine and Hullett (2002), indicates substantial positive effects. So, the findings based on the reliability and validity of the data and the strength of associations between the variables, support the first hypothesis of the research (the identified issues in focus group discussion are highly positively related to the sustainable environmental management). However, among the issues, waste management has been found as the most important based on correlation (R), coefficient of determination (R<sup>2</sup>), and the effect's size Eta/Eta<sup>2</sup> ( $\eta^2$ ) (see Table 2) followed by biodiversity, energy, water and sanitation, beach erosion reduction, carbon footprint, sustainable communication, and risk management. Also, in the

case of the actions identified in the focus group, the values of  $R$  (.727 to .888) and  $R^2$  (.529 to .788), which are  $>.50$  (Field, 2009; Kline, 2011) as well as  $\eta$  (.739 to .890) and  $\eta^2$  (.546 to .792), which are  $>.50$  (Levine and Hullett, 2002), have a high positive perceived influence on the identified issues. So, the second hypothesis of the research (the identified actions in the focus group discussion are highly positively related to the respective issues of sustainable environmental management of the Cox's bazar sea beach) is also supported by the current findings.

The identified actions to address the issues that are justified by the current research findings, also aligned with the contemporary literatures on sustainable environmental management for the resorts, hotels, and similar enterprises. For example, to address waste management problem, Hassan (2005) and Soneva Resorts (2013) have emphasized on using refillable products to supply toiletry items to guests and composting kitchen waste. The current research has found that by providing toiletries with glass or ceramic containers in hotel rooms, increasing digital presence, and composting kitchen waste, it can be reduced to a certain level. The biodiversity issue can be addressed by securing fish and seafood only through sustainable ways. It is also important to protect the selling of souvenirs made from any endangered species and to develop a biodiversity management team to monitor any harmful games/sports or any other activities inside and outside of the resorts. Similar actions are suggested by Burlington (2011), Abir (2013), May, (2005), and Hassan (2005). According to the current research, through investing in renewable energy, maximising use of natural light and air, and utilizing energy saving equipment/devices wherever possible, energy consumption can be reduced to a certain level. Moreover, by calculating per guest energy use and rewarding guests based on lowest energy consumption, they can be encouraged to consume less energy. Also, Webster (2000), IFC (2010), and Fujitsu (2014) highlighted on similar guidelines for sustainable energy management.

To solve the water and sanitation problem, the sensor or automatic disperse system can be used in all the places require water. Also, the wastewater can be used for various purposes other than where fresh water is needed, sustainable wastewater treatment infrastructure can be tested, and rainwater harvesting can be maximised. Similar strategies are suggested by Sullivan et al. (1995) ,JA Jebel Ali Golf Resort (2015), and Hilton (2015) in regards to water management in resorts. The current research also supports the recommendations of Hassan (2005), Abir (2013), and Borgudd (2014) in reducing beach erosion reduction. For example, beach erosion can be minimised by avoiding building new construction around the beachfront area, organising tree plantation activities for guests and local communities, avoiding organising random events in the vulnerable areas of the beach, and building a green belt/buffer zone together with local people to protect the beach.

Burlington (2011) and Zarikos (2014) recommended some important guidelines for reducing carbon footprint in a tourist destination. Some of them are also applicable to Cox's bazar, and identified by the focus group discussion, and also the employees of the resorts, hotels and similar enterprises agreed with them. For example, carbon footprint can be minimized through maximizing the collection of food and drinks from local sources. Furthermore, by promoting the local foods, rewarding the tourists who use less motor transports for travelling in shorter distances, and encouraging guests to travel in public transports,  $CO_2$  emissions can be reduced to a certain level.

The communication in implementing the EMP can be made more effective if it is persuasive and provide key information to the guests regarding the environmentally sound behaviour. Also on-the- job training, seminars, and workshops are helpful for the employees. The resorts can use mobile SMS, key rings, posters, and maps with relevant information to quickly transmit environmental responsibilities to guests. These sorts of recommendations are also found in the guidelines for sustainable environmental management given by UNEP and UNWTO (2005), Hassan (2005), Burlington (2011), and Abir (2013).

The employees responsible for EMP should act on its every area, and all the actions should be scheduled, so that, the costs and time are not affected. The best performer should be rewarded that would motivate employees to perform environmental duty more responsibly. Initially, the risk of understanding of the EMP for the employees can be minimized by including practical applications/exercises, flowcharts, diagrams, tables, and photographs in all kinds of demonstrations/presentations. Moreover, by finding out alternatives for every action and testing all actions through pilot projects before finally implement them; the risks during implementation can be reduced. Also, by setting up the standard and checking performance in the middle of the project can help to reach desired goals. Chan (2011) and Hyde and Reeve (2001), in their research, have highlighted similar risk mitigation strategies for successful environmental management.

## 6. Conclusions and future directions

This research has generated some valuable insights into the preparations toward an EMP. It has not only identified but also justified the major issues, and the actions to address those issues towards an EMP through a focus group discussion and statistical analysis of the surveyed data. The findings show that sustainable environmental management of the resorts in Cox's bazar sea beach is dependent on waste, biodiversity, energy, water and sanitation, beach erosion reduction, carbon footprint, sustainable communication, and risk management. However, the employees of the tourism enterprises have prioritized waste management as the first issue to be addressed followed by another seven issues. Also, the actions identified in the focus group have been found significant by the hotels, resorts, and other similar enterprises to address the identified issues and found aligned with the contemporary literatures. The actions are not difficult to take and any small contribution to the action plan can bring a substantial change in the current vulnerable environmental situations of the beach. The resource shortage could be a problem for some resorts, but the owners of the resorts should think their long run benefit whilst investing in the key environmental management areas. They can be involved in jointly programme development, resource sharing, and try to get access to government's green funding for sustainable tourism development (Reve, 2012) whilst implementing a particular action.

This research is based on a small sample (151 respondents). In future, more extensive research, including a large sample could be undertaken, a critical measure of success could be developed, and key performance indicators (KPIs) could be identified. Then the KPIs could be used on a continuous basis to measure success of the action plan and over time these could be modified according to the changes happen in the local environment (Welford and Gouldson, 1993; Hyde and Reeve, 2001). From the methodological perspective, a

factor analysis could be done, and after a confirmatory factor analysis, regression and structural equation modelling could be run to test the effects of multiple actions on the multiple issues simultaneously.

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