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**SIXTH REGIONAL 3R FORUM IN ASIA AND THE PACIFIC,  
16-19 AUGUST 2015, MALE, MALDIVES**

**Contribution of 3Rs in Sustainable Tourism Development and Protection of  
Marine Ecosystem ~ Win-Win Solutions through 3R as an Economic  
Industry**

**(Background Paper for Plenary Session 3 of the Programme)**

**Final Draft**

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This background paper has been prepared by Prof. Shun Fung Chiu, for the Sixth Regional 3R Forum in Asia and the Pacific. The views expressed herein are those of the author only and do not necessarily reflect the views of the United Nations.

**Sixth Regional 3R Forum in Asia and the Pacific**

**16-19 August 2015, Male,**

**Maldives**

**Background Paper on**

**Contribution of 3Rs in Sustainable Tourism  
Development and Protection of Marine  
Ecosystem ~Win-Win Solutions through 3R  
as an Economic Industry**

**(FINAL DRAFT)**

**Plenary Session-3**

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Prepared as an input for the Sixth Regional 3R Forum in Asia and the Pacific.

## Foreword

Tourism in developing countries, emerging economies and small islands and developing states (SIDS) has significantly increased in the last six decades. Impacts, both positive and negative, have certainly been felt directly and indirectly by local communities, national government and tourists as well. Monetary benefits through macro-economic indicators and demographic statistics have documented the number of international tourists and the earnings made by tourism products and services. Tourism destinations have been diversifying and has largely included the Asia and the Pacific region with international tourist arrivals growing about fivefold since 1990 (23% market share in 2014 at 263 million tourists) and international tourism receipts capturing 30% of the market in 2014 at US\$ 377 billion.

Tourism is now widely regarded by nations and international organizations to have a role in the development and economic growth of many countries, in particular developing and the least developed countries that have made tourism its priority development agenda. UNWTO forecasts that in 2015, international tourist arrivals in emerging economies would for the first time be more than that in developed economies. In the last decade, work has been done to incorporate and strengthen the position of tourism to alleviate poverty through regional networks and by international organizations. More work is underway to realize this position and incorporate further the linkage between sustainable tourism and a healthy marine ecosystem with particular consideration for the environmental impacts of tourism service and related consumption practices. The Programme on Sustainable Tourism of the 10 Year Framework of Programmes (10YFP) on Sustainable Production and Consumption has been launched in 2014.

This paper has been prepared as a background note for discussions at the Plenary Session on Sustainable Tourism Industry in SIDS at the 6<sup>th</sup> Regional 3R Forum in Asia and the Pacific in Maldives. It brings to light the need for sustainability in tourism industry and protection of the marine ecosystem, the opportunities and challenges for 3R implementation in tourism, and finally, the implications of 3R activities to the marine environment. These sustainable tourism issues are discussed in the context of developing countries and SIDS to support dialogue and action at the regional level.

## **Abbreviations and Acronyms**

3R	Reduce, reuse and recycle
EPR	Extended producer responsibility
GDP	Gross domestic product
GHG	Greenhouse gas
ILO	International Labour Organization
LCT	Lifecycle thinking
LDC	Least developed country
PET	Polyethylene terephthalate
PPP	Public-private partnership
RASM	Revenue per available seat mile
SCP	Sustainable Consumption and Production
SIDS	Small Islands and Developing States
SNV	Netherlands Development Organization
STP	Sewage treatment plant
UNEP	United Nations Environment Programme
UNWTO	World Tourism Organization

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## **1. Executive Summary**

Tourism represents a significant sector to all economies from least developed countries to developed countries and has showed robust growth despite many economic, geopolitical and health challenges in the past years. The growing sector of tourism is evidenced by the continual increase in international tourist arrivals, tourism revenues and gross domestic product. Being the fourth largest export category of both emerging and developing countries, tourism contributes to socioeconomic growth and development through tourist spending or purchases and livelihood opportunities to the local community. The importance of tourism industry to the economy and society is illustrated by its contribution to the recent graduation of tourism-based economies of Cape Verde and Maldives from being categorized as least developed countries. Many other small island developing states has indicated tourism as priority development sector. Statistics show growing tourist arrivals in LDCs and developing countries, supporting positive outlook in the next decades.

To strengthen the positive impacts of tourism to economy and society, tourism development need to be planned for sustainability, taking into consideration growth projections, socioeconomic conditions, cultural heritage, land and marine zoning, resource and energy efficiency (water, energy and other raw materials needed to support locals and seasonal influx of tourists), waste generation and management, among others. Acknowledging that tourism can be a vehicle for socioeconomic development through employment, foreign investment and export earnings, this background paper sets forth policy approaches and measures for utilizing 3R (reduce, reuse, recycle) as an economic industry for the sustainable development of tourism sector and the protection of the marine ecosystem by exploring the nexus between tourism and marine ecosystem (Chapter 2), identifying challenges and opportunities for 3R in the tourism industry (Chapter 3), providing policy approaches and solutions for 3R as an economic industry (Chapter 4) and charting next steps towards sustainable tourism (Chapter 5).

Consumption of resources and generation of various wastes in the provision of tourism services account for the biggest impact of the sector. Greenhouse gas from transport services, water consumption, use of plastics and chemicals in product containers and packaging, food waste and associated waste from hotels and cruise ships present a problematic scenario for sustainable tourism. Enormous wastes generated both by locals and the tourists (that on certain months outnumber the locals) can have extensive, lingering and long-term impacts to the environment, specifically the marine ecosystem. Improper handling, processing and disposal of solid, hazardous and toxic wastes result to plastic and other waste debris along coasts and running off to the oceans, microplastics in the oceans, and leaching of chemicals from plastic containers, leading to the destruction of corals, reefs and marine life. In the fragmented nature of service provided in tourism sector, actions and measures for sustainable development of this sector need to be focused and specific as well as holistic.

The problem that tourism in SIDS and developing countries face relate to provision of basic needs of the population and tourists, quality tourism related service, and to absorb or manage the impacts of these activities. The resource and land-constraint of SIDS and geographic isolation contribute to the problem of addressing the impacts and sustainability of tourism activities. Technical capacity and economy of scale are needed to deploy technologies and solutions to

manage waste, utilities and infrastructure needs and deploy proactive measures for waste minimization and sustainability in tourism service providers.

The challenge for 3R as an economic industry is to minimize resource consumption and waste generation, while at the same time providing decent jobs, social equity and economic viability. Baseline assessment of these problems and integration of management strategies to development strategies present a holistic approach to promoting development through tourism and protecting the quality of marine ecosystem. Planning complete with targets, objectives, strategies, action plans and activities is important so as not to negate the benefits tourism brings.

Policy approaches and technical solutions applied to implement 3R and other sustainability measures have been widely demonstrated already, and these can be used as benchmark of SIDS and countries facing similar challenges. Water and energy efficiency and resource conservation measures, sustainable tourism certification schemes, regional action plans, SCP tools and green economy can be implemented in the fragmented tourism service sector. These solutions can be very basic to technical processes of limiting the impacts of tourism sector to the environment. Approaches in the policy and fiscal realm are also needed to support 3R especially in the context of post 2015 development wherein sustainable development is highly supported. Global initiatives, policy recommendations and technical guidance manuals are also available to serve the needs of developing countries in developing sustainable tourism in the context of green economy. Knowledge of technology, policy approaches and solutions need to be translated into practical, viable and feasible strategies in the tourism industry, and this will need significant inputs on creativity of strategies and action plans to match the development needs and challenges of SIDS and developing countries.

This background paper offers discussions on pertinent issues on tourism development and marine ecosystem, 3R implementation challenges and opportunities, policy and technical solutions and implications in moving forward with sustainability in tourism sector. A number of cases are presented to illustrate how solutions and policy approaches are used and lessons learned in the process. Emphasis is given to the need for integrated sustainability approach in tourism in the context of sustainable development, for baseline assessment of SIDS context and environmental challenges to understand the problem before being able to define country-specific objectives, targets, strategies and action plans for the implementation of 3R and sustainability measures in the tourism sector. As tourism sector is interlinked with many other economic sectors, identifying these interactions and how it impacts sustainability will be of importance coming into the post 2015 development agenda. Planning strategies and development path should be dynamic to consider evolving challenges, changing priorities and urgent actions to chart a path towards sustainability. Sustainable tourism policy should also be able to frame the issues relevant to tourism industry, adopt a policy framework to best address these concerns, and establish strategies and changes needed for sustainable tourism sector to support a resource efficient and green economy. It is the hope of this paper to incite discussions on such questions for the sustainable development of coastal communities and countries.

## 2. Nexus between Tourism Industry and Marine Ecosystem from 3R Perspective

### 2.1 Tourism Sector

The tourism industry is regarded as a key economic sector and contributor to the global economy. In the last six decades, tourism has grown globally from 25 million international tourist arrivals in 1950 to 1.13 billion in 2014 despite occasional geopolitical, health and economic challenges, with international tourism receipts worldwide recording an increase from US\$ 2 billion in 1950 to US\$ 1.25 trillion in 2014<sup>1</sup>. By region, Asia and the Pacific posted a strong growth at +5% which translated to 263 million tourist arrivals in 2014, second to the Americas having +8% growth and a total of 182 million tourist arrivals; but with Europe still being the most visited region recording half of the world's international tourists at 584 million<sup>2</sup>. Having a positive global outlook in 2015, tourism in Asia and the Pacific region is expected to remain strong at +4 to +5%<sup>3</sup>. Exports in terms of earnings by destination and from international passenger transport services are also on the rise. For both emerging economies and developed economies, tourism is the fourth largest export category, earning US\$ 485 billion and US\$ 924 billion<sup>4</sup>, respectively.

Tourist destinations has increasingly diversified in recent years and become important source of revenue for many developing countries. UNWTO statistics show that developing countries welcomed 46% of international tourists in 2011; international tourist arrivals in emerging and developing countries in 2011 totaled 459 million; tourism is the top or second source of export earnings in 20 of the world's 48 least developed countries; and tourism can account for up to 25% of the GDP of developing countries, in particular SIDS<sup>5</sup>. The tourism-based economies of Cape Verde and Maldives and to a significant extent Botswana has allowed these countries to graduate from a least developing country (LDC) status in 2007, 2011 and 1994<sup>6</sup>, respectively. It has been identified that 90% of the LDCs listed tourism as a priority economic sector<sup>7</sup>. The role of tourism in the development of LDCs is backed by recent tourism statistics. In the 10 years between 2000 and 2010, international tourist arrivals in the 48 LDCs has tripled to about 17 million with a corresponding tourism receipts of US\$ 10 billion<sup>8</sup>, a fourfold increase in the said period.

Tourism is seen to be a sound priority for economic development and also for poverty alleviation. UNWTO together with the Netherlands Development Organization (SNV) has led the way in pursuing this strategy and published a manual providing guidance in planning actions and strategies for poverty alleviation in tourism, the *Manual on Tourism and Poverty Alleviation – Practical Steps for Destinations*<sup>9</sup>. To promote discussions about the link between tourism and

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<sup>1</sup> UNWTO. (2015). *UNWTO Annual Report 2014*. Madrid: World Tourism Organization.

<sup>2</sup> Ibid.

<sup>3</sup> Ibid.

<sup>4</sup> Ibid.

<sup>5</sup> <http://step.unwto.org/content/tourism-and-poverty-alleviation-1>

<sup>6</sup> Honeck, D. (2012). *LDC Export Diversification, Employment Generation and the "Green Economy": What roles for tourism linkages?* World Trade Organization Economic Research and Statistics Division, Staff Working Paper ERSD-2012-24.

<sup>7</sup> EIF. (2012). *Enhanced Integrated Framework*. Available at: [http://www.wto.org/english/tratop\\_e/devel\\_e/teccop\\_e/if\\_e.htm](http://www.wto.org/english/tratop_e/devel_e/teccop_e/if_e.htm).

<sup>8</sup> UNWTO. (2011). *Tourism and poverty alleviation*. Available at: UNWTO.org.

<sup>9</sup> UNWTO & SNV. (2010). *Manual on Tourism and Poverty Alleviation – Practical Steps for Destinations*. Spain: World Tourism Organization and the Netherlands Development Organization.

poverty reduction, working papers and notes have been circulated by the International Labour Organization<sup>10</sup> as well as UNESCAP<sup>11</sup>.

## 2.2 Impacts of tourism sector

Despite economic and livelihood benefits from tourism, effects of tourism strongly impacts the environment. In coastal areas such as the Mediterranean and the Pacific, where most SIDS and developing countries that rely on coastal and marine tourism are located, waste generation and lack of capacity to manage these have been a constant problem. The small land area coupled with urbanization, population and tourism growth along with lack of infrastructure and local skills to appropriately dispose of solid, electronic and hazardous waste or practice recycling are the biggest challenges of the countries in addressing waste management, that is, both quantity and characteristics of waste generated.

The tourism sector generates a diverse and significant waste stream including organic wastes, plastics, construction wastes and e-waste<sup>12</sup>. Roughly 50% of wastes in SIDS are organic wastes, and most of the waste stream are being landfilled<sup>13</sup>. Wastes, specifically wastewater and plastics, pose a direct risk to human and environmental health. Improper handling and disposal could lead these wastes to runoff to the oceans and impact on marine life and ecosystem health. Local livelihood like fishing and coastal and marine tourism activities like snorkeling and dolphin tourism/ watching can be affected by deteriorating environmental quality, and this can have negative effects on tourism and livelihood. Tourists will opt to go to other destinations where the quality of reefs, coastlines and deep sea are maintained. Fishing activities will suffer from dead coral reefs. Human health will also feel the impacts of marine litter considering the aesthetic, cultural and spiritual contributions of nature, and also of the health impacts of bioaccumulation of toxic chemicals leaching from plastics and other wastes that are eaten by fishes and consumed by humans.

Aside from environmental and health impacts, tourism when not properly planned, can also have negative economic impacts. Tourism is a significant source of foreign investments and earnings of SIDS and developing countries, but the lack of a manufacturing industry in these countries make them dependent on imported goods which can result to income leakage. In addition, most of the consumer goods that are being disposed of in the islands are imported. Where land is scarce and the technology or methodology to dispose of these imported goods is unlikely to be known in the islands, waste management will be a problematic concern, which adds to the financial burden of waste disposal in the countries. This is a particular concern for tourism industry since tourists generate twice as much waste as locals and as much as four times for passengers of cruise ships<sup>14</sup>.

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<sup>10</sup> Bolwell, D., & Weinz, W. (2008). *Reducing poverty through tourism*. Geneva: International Labour Office, ILO Sectoral Activities Programme.

<sup>11</sup> Jamieson, W., Goodwin, H., & Edmunds, C. (2004). *Contribution of Tourism to Poverty Eradication*. UNESCAP Transport and Tourism Division.

<sup>12</sup> UNEP. (2014). *GEO Small Island Developing States Outlook*. Nairobi: United Nations Environment Programme.

<sup>13</sup> Schandl, H., & Hosking, K. (2014). *Position paper on the implementation of the Hanoi 3R Declaration Sustainable 3R Goals for 2013-2023, Fifth Regional 3R Forum in Asia and the Pacific*.

<sup>14</sup> Binger, A. (2011). *Economic Opportunities in Waste Management in Small Island Developing States (SIDS)*. New York: UNCSD.

### Box 1. Dichotomy of Impacts of Tourism

- Tourism can, for example, provide employment for local people but it can also contribute to an increase in their cost of living, e.g. housing, food.
- It can give visitors a greater understanding and appreciation of people from diverse backgrounds but it may result locally in a disruption of traditional customs and traditions.
- It can improve roads and infrastructure but it may require communities to raise taxes for additional services.
- It can provide better recreational and cultural facilities but also create overcrowding, traffic congestion, litter, vandalism and crime.

Source: UNESCAP, 2003 as cited in UNEP. (2012). *Sustainable Consumption and Production: A Handbook*

Growing concerns on the sustainability of tourism has been emphasized in recent years. Sustainability of tourism covers issues corresponding to the three pillars of sustainable development and included sustainable energy supply, management of waste generated from tourism activities, securing food supply, creating decent jobs, protecting the health of marine ecosystems, and protecting and preserving cultural heritage among others. Sustainable tourism is increasingly warranted given the pressures it exerts on the environment and society, as summarized in the UNEP report *Green Economy and Trade*<sup>15</sup>:

- a. Rising greenhouse gas (GHG) emissions – including significant emissions from transportation (e.g. aviation and road transport) and accommodation (e.g. from air-conditioning and heating systems);
- b. Water consumption – increased pressure on already diminished water resources; in some regions, tourism can compete with other sectors for water such as agriculture and the subsistence needs of local populations;
- c. Waste management – considerable impacts of waste and local wastewater; for example, it is commonplace for hotels to discharge untreated sewage directly into the sea;
- d. Detrimental effects on biodiversity – including the erosion of coral reefs, coastal wetlands, forests, arid and semi-arid ecosystems and mountainous areas<sup>16</sup>;
- e. Increased conflicts with local communities – arising from failure to incorporate biodiversity concerns into destination planning, investment and benefit sharing; and
- f. Threats to cultural integrity – arising from unplanned (no prior consent or participation) and unmanaged tourism.

These environmental pressures are manifested in terms of environmental pollution, resource depletion and physical change in the environment, and impacts may be felt directly (algal bloom due to sewage discharge into water bodies) or indirectly (GHG emissions due to fossil fuel use), immediate (water shortage due to competing uses) or slowly progressing (decreasing fisheries output due to coral reef degradation), and controlled (waste and wastewater discharge) or perhaps irreversible (changing coastlines due to coastal development). One impact may lead to another (coral bleaching as a result of climate change brought about by increasing GHG

<sup>15</sup> UNEP. (2013). *Green Economy and Trade – Trends, Challenges and Opportunities*. Available at: <http://www.unep.org/greeneconomy/GreenEconomyandTrade>.

<sup>16</sup> UNWTO. (2010). *Tourism and Biodiversity: Achieving common goals towards sustainability*. Madrid: World Tourism Organization.

emissions) or be compounded (bioaccumulation of chemicals from marine litter eaten up by fishes and marine mammals which nourish humans). And so on.

### **2.3 Tourism and marine ecosystem nexus**

Tourism is closely linked with marine ecosystem especially in SIDS which is have vast coastlines and marine ecosystems. The interest in marine and coastal tourism in SIDS and developing countries that offer similar experience of beach and aquatic life has benefited from the growth of eco-tourism subsector. However, the development of tourism is not without challenge. Tourism development along coastlines has changed the landscape of marine ecosystems, resulting to overcrowding along the shore and pooling of litter or debris that is washed away to the ocean. Altering the natural state of the coastlines and subsequent impact of tourism activities along the shore and in marine areas can have long-term effects to fisheries, corals and livelihoods. Tourism and tourist arrivals in these countries also result to GHG emissions from associated travel and transportation service. Water, as a basic need, is necessary and is consumed in greater amounts with the influx of tourists to the islands which in many areas exceeds the local population. Food, also a basic need, is consumed not only from local sources, but is increasingly imported in huge quantities and sometimes comes in unnecessary packaging that result to increasing amounts of waste generated from packaging and food waste.

The tourism-marine ecosystem linkage is one with socioeconomic and environmental nature and that is hinged on sustainability of society-nature interaction. Ecosystems deliver provisioning (e.g. food and water), regulating (e.g. climate and air), cultural (e.g. spiritual & recreation) and supporting (e.g. water and nutrient cycles) services. Marine ecosystems can exist without tourism activities, but tourism is highly based and dependent on the experience of unexploited natural environments. It is important for this relationship to be a mutually beneficial one since a healthy ecosystem is able to support tourism activities and sustainable tourism supports marine ecosystem, and at the same time sustainable tourism industry revenues can support conservation efforts.

On the other hand, the relationship is evidently mutually destructive if and when tourism development is not planned and managed. In terms of waste, improper or lack of waste management has direct and indirect negative impacts to tourism and marine ecosystem. Increasing waste generation adds to the environmental burden and economic cost of waste disposal. Additionally, when the marine ecosystem deteriorates, it will affect human wellbeing through the decreased capacity in providing ecosystem services. Therefore, it is an imperative to address the impacts of tourism before it happens, as it happens, in retrospect and in prospect. What can be done to prevent waste<sup>17</sup>? What can we do with waste? What could we have done better in managing the waste generated? What can we do better?

The next section takes a closer look at these questions from the perspective of 3R (reduce, reuse, recycle), and analyzes the challenges and opportunities in implementing 3R in developing countries and SIDS.

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<sup>17</sup> Waste may also refer to air emissions associated with tourism and travel as the atmosphere (together with ocean) is regarded as an open resource, with no ownership. For the purposes of this report, waste will mostly refer to litter although it may also apply to air pollution.

## Box 2. Aviation Profitability and Marine Ecosystem Quality

Leisure travel to the Caribbean is a key pillar of JetBlue’s business model, with many customers flying to the region to enjoy paradise-like beaches and pristine waters. However, the ecosystems that support and provide those crystal-clear, turquoise-tinted seas are at risk. Some have already grossly deteriorated. Large-scale environmental degradation in the Caribbean is a risk to demand for leisure air travel to the area, thus impacting JetBlue.

*EcoEarnings: A Shore Thing* seeks to quantify both the risk and return to JetBlue from the region’s natural attractions. This study seeks to link the importance of clean, intact, and healthy beaches and shorelines to JetBlue’s profitability in the Caribbean, with a focus on JetBlue and industry revenue per available seat mile (RASM).

Our study began by observing a positive correlation between ecosystem health and RASM. The goal is to calculate the impact of the underlying drivers of ecosystem health—including water quality, mangrove quality, and waste along the shorelines—on industry RASM.

We find positive correlations among water quality, mangrove health, limited waste on shorelines, and RASM, but more data is required to statistically prove and validate the model. This interim report serves as a call to gather more information about shoreline health and to rally the efforts of policy makers, the tourism industry, and tourists to protect the Caribbean’s greatest natural resources—its ecosystems.

Source: Executive Summary of the report *EcoEarnings: A Shore Thing* by jetBlue, The Ocean Foundation and ATKearney.

Available at: [www.jetblue.com/p/ecoearnings\\_report.pdf](http://www.jetblue.com/p/ecoearnings_report.pdf)

### 3. Challenges and Opportunities for 3R Implementation in Tourism Industry

#### 3.1 The 3R Approach in tourism industry

With tourism impacting the environment both locally and globally, calls for sustainability in the sector has been made. The UNWTO has defined sustainable tourism as “tourism that takes full account of its current and future economic, social and environmental impacts, addressing the needs of visitors, the industry, the environment and host communities,” and should be able to<sup>18</sup>:

- a. make optimal use of environmental resources that constitute a key element in tourism development, maintaining essential ecological processes and helping to conserve natural resources and biodiversity;
- b. respect the socio-cultural authenticity of host communities, conserve their built and living cultural heritage and traditional values, and contribute to inter-cultural understanding and tolerance; and
- c. ensure viable, long-term economic operations, providing socio-economic benefits to all stakeholders that are fairly distributed, including stable employment and income-earning opportunities and social services to host communities, and contributing to poverty alleviation.

Therefore, sustainable tourism involves resource conservation and resource efficiency, cultural integrity and socioeconomic wellbeing. Natural resource conservation entails reducing consumption to avoid waste, and changing the amount and pattern of consumption with preference for resource efficient and ethical consumption and production. Resource efficiency refers to “the ways in which resources are used to deliver value to society and aims to reduce the amount of resources needed, and emissions and waste generated, per unit of product or service<sup>19</sup>.” Resource efficiency means delivering the same amount of product or service at the same value with less inputs, emissions and waste. Cultural integrity pertains to preserving culture, heritage and traditional values of communities. Socioeconomic wellbeing implies equity in the benefits of tourism.

Regional conferences and forums on development of SIDS have resulted to documents highlighting their commitment to sustainable tourism. The recent one, the *SIDS Accelerated Modalities of Action (S.A.M.O.A.) Pathway* recognizes that sustainable tourism can drive sustainable economic growth and outlined seven actions to take including development and implementation of policies that promote responsive, responsible, resilient and sustainable tourism; diversification of sustainable tourism to include ecotourism, agrotourism and cultural tourism; and participatory approach in employment opportunities with particular regard for protection of natural environment and cultural heritage<sup>20</sup>.

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<sup>18</sup> UNEP & UNWTO. (2005). *Making Tourism More Sustainable - A Guide for Policy Makers*.

<sup>19</sup> Schandl, H., & Chiu, A. (2013). *Indicators for a Resource Efficient and Green Asia*. Prepared under the UNEP managed SWITCH-Asia Regional Policy Support Component.

<sup>20</sup> S.A.M.O.A. Pathway. (2014). *SIDS Accelerated Modalities of Action*.

### Box 3. Twelve Aims of Sustainable Tourism

- *Economic Viability*: To ensure the viability and competitiveness of tourism destinations and enterprises, so that they are able to continue to prosper and deliver benefits in the long term.
- *Local Prosperity*: To maximize the contribution of tourism to the economic prosperity of the host destination, including the proportion of visitor spending that is retained locally.
- *Employment Quality*: To strengthen the number and quality of local jobs created and supported by tourism, including the level of pay, conditions of service and availability to all without discrimination by gender, race, disability or in other ways.
- *Social Equity*: To seek a widespread and fair distribution of economic and social benefits from tourism throughout the recipient community, including improving opportunities, income and services available to the poor.
- *Visitor Fulfilment*: To provide a safe, satisfying and fulfilling experience for visitors, available to all without discrimination by gender, race, disability or in other ways.
- *Local Control*: To engage and empower local communities in planning and decision making about the management and future development of tourism in their area, in consultation with other stakeholders.
- *Community Wellbeing*: To maintain and strengthen the quality of life in local communities, including social structures and access to resources, amenities and life support systems, avoiding any form of social degradation or exploitation.
- *Cultural Richness*: To respect and enhance the historic heritage, authentic culture, traditions and distinctiveness of host communities.
- *Physical Integrity*: To maintain and enhance the quality of landscapes, both urban and rural, and avoid the physical and visual degradation of the environment.
- *Biological Diversity*: To support the conservation of natural areas, habitats and wildlife, and minimize damage to them.
- *Resource Efficiency*: To minimize the use of scarce and non-renewable resources in the development and operation of tourism facilities and services.
- *Environmental Purity*: To minimize the pollution of air, water and land and the generation of waste by tourism enterprises and visitors.

Source: UNEP & UNWTO. (2005). *Making Tourism More Sustainable - A Guide for Policy Makers*.

For all types of tourism to be sustainable, the impacts associated with it need to be decreased with regard to the absorptive capacity of nature – GHG emissions, waste and wastewater generation, and water consumption all need to decrease. Both resource extraction and waste (air and water pollution) disposal need to be within limits of the environment. To do this, there is a need to investigate the material cycle and close the loop to keep further resource extraction at a minimum (reduce) and keep in cycle those that are already in use by extending lifetime of materials (reuse), finding another purpose for materials that has reached end of life (recycle). Production and consumption of goods and services need to consider sustainability and effectively use resources and materials. Essentially, this means practicing 3R (reduce, reuse, recycle).

With the lack of infrastructure, land, economy of scale and skills, 3R for coastal countries and tourism-based economies translates to prioritization of measures for resource efficiency and waste prevention<sup>21</sup>. Measures need to be in place in both supply and demand side, the producer

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<sup>21</sup> UNEP, UN DESA & FAO. (2012). *SIDS-Focused Green Economy*.

and consumer, respectively as guided by market instruments, regulation and ethics<sup>22</sup>. 3R necessitates a behavioral change, a way of life that considers environmental conservation in all aspects of humanity.

Applying sustainability in tourism is need to be a detailed undertaking in itself. Considering the context of the country and the fragmented nature of tourism services, various factors need to be taken into consideration when planning and implementing sustainable tourism. Lifecycle thinking, 3R, waste prevention and minimization, and are essential frameworks or perspectives in designing sustainable tourism policy, in assessing options and designing alternatives. In this framework, sustainable tourism generally translates to:

1. Reduce. For tourism service providers, sustainable tourism means being able to provide tourists the same value for a service and related products, but with less resource inputs and waste outputs. Reducing inputs and impacts by tapping the supply side to be more resource and energy efficient in producing goods and services for tourist. Travel agencies, hotels and resorts, tour operators, airlines and cruise ships can all devise and practice resource conservation, waste minimization and resource efficient practices in their business operations. Travel agencies can practice established best practices in office operations. Advertising can be done with preference for online content rather than printed materials.
2. Reuse means preventing a throw-away culture and extending the lifetime of a product. On the consumer side, reusing could open up market opportunities for used items, like using reclaimed wood and refurbished furniture. However, consumers need to practice caution in choosing products to reuse and producers need to educate consumers on the matter or self-regulate and impose the maximum lifetime of a product (where buying a new airconditioning unit would make economic and environmental sense rather than continue to use less efficient and old units) at the point of sale. Extending the lifetime of some appliances may not be environmentally sound since energy efficiency of such appliances improves.
3. Recycle means being creative at giving materials for disposal another use. Instead of landfilling scrap plastics, metals and paper, these can serve as raw materials to produce the same or other goods. Waste is now increasingly treated as resource. Waste-to-energy or refuse-derived energy projects could be an option for SIDS and developing countries to lessen amount of landfilled wastes and at the same time provide energy in the islands. Technical, financial and land resources may need to be secured as well as project viability.

### **3.2 Challenges in implementing 3R in the tourism sector**

Practically, tourism caters to an experience economy. Tourists pay for the experience – culture, food, spiritual. It may be difficult to suggest a reduction of any of these experience, but changes can be made in how tourism can provide these experiences in a more environmentally conscious way. The tourism sector is composed of many fragmented service providers such as tour operators, hotels and resorts, travel agencies and airlines. Each of these service providers have

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<sup>22</sup> Holden (2009) argues that “whilst environmental policy may possibly have a greater influence in the future, it is the environmental ethics of the market that will be deterministic to the balance of the tourism-environment relationship.”

specific impacts to the environment and implementing 3R necessitates various approach and specific measures. The tourism-oriented economy of SIDS and other coastal developing economies imply that most of the earnings and investment have gone into tourism. At the same time, manufacturing sector has not significantly developed in the region and goods are mostly imported. The burden of disposal of goods now rests on the importing country which may lack the necessary skills to manage electronic waste, plastic and metals, among others. Introducing scale-appropriate technologies require skills.

Local infrastructure also has to cope with the tourism growth. This includes landfill, recycling and composting areas. Scarcity of land is a constraint in many of the countries. They may choose to collect recyclable materials and enter into an agreement with producers for a take-back scheme.

Energy security and sustainability in these countries are a challenge. Economy of scale may not be present for developing water treatment facilities, waste-to-energy plants and recycling centers, among others. Planning. Haphazard or unsynchronized rollout of 3R activities can cause problems as one action can counter another. For instance, significantly developing recovery and recycling activities may be prove to be less economically viable in the long run when ‘reduce’ activities are able to improve consumption level and consumption pattern, lessening the amount of recyclable materials to process (Box 4).

#### **Box 4. The importance of planning 3R Activities**

State of the art carpet recycling facility Polyamid 2000 was built in Premnitz, Germany at a cost of \$200 million dollars in 1999, and was only in operation until 2003 when it was closed down because recycling carpet was uneconomical when reducing inputs to manufacturing carpet had been successful in Europe. Carpet from all over Europe was to be collected and shipped to Premnitz where it would be sorted by type and recycled. Nylon was the main carpet component of interest to recyclers. Remaining unrecyclable carpet waste were to be sent to an on-site waste incineration facility to generate power and low pressure steam to be used in other parts of the plant. While covering operating costs and not on return on investment was the priority, the low nylon-content of waste carpet in Europe and the logistics of collecting and shipping postconsumer carpet proved challenging. Comparing with the European carpet, the yields of valuable face fiber per square meter of carpets from US was high. The plant began importing carpet from the U.S to make up for the lost yield. However, poor economics associated with shipping carpet from the USA, low yields and no significant outlet for low grade nylon 6,6 resins (recycling product) led the plant to shut down.

Source: Laseter, T., Ovchinnikov, A., & Raz, G. (2010). Reduce, Reuse, Recycle...or Rethink. *strategy+business*, pp. Available at: <http://www.strategy-business.com/article/10406?gko=ec603>.

### **3.3 Opportunities for 3R in the tourism sector**

Planning is important in creating opportunities for 3R in the tourism sector. 3R can be translated into various measures that could support marine ecosystem and promote sustainable tourism. Define what 3R means and implies to the tourism sector of the society. Plan what capabilities and skills are needed to support a 3R society. Plan for financial requirements and technical support. Involve the community in planning to contribute to their awareness and education, while at the same time gaining their insights for inputs in planning, support and ownership of community initiatives. Explore existing solutions and create localized plans.

Reduce. No waste is the best scenario, but when waste is inevitable, reduce is the next best option. Sustainability in consumption need to address the quantity of consumption and the pattern of consumption (preference for sustainably produced goods). This boils down to personal choices of consumers. Consumer education (starting in basic education) and values formation (especially in advertising), policy support (regulation) and market guidance (pricing mechanisms, taxation and incentives) can contribute to sustainable consumption. Reduce can mean consuming local. Instead of relying on imported goods, it may be a sustainable choice to produce it locally provided the environmental burden is less when it is imported with consideration for the entire lifecycle. Reducing the environmental burden of consumption can also mean relying less on bottled beverages and using refillable bottles.

Opportunities for reduce in the way products and services are delivered and consumed is practical and doable. As evidenced in Box 5, introducing energy and water conservation, collection and recycling, organic farming, and wastewater treatment, among others has enabled Hotel Sigiriya in Sri Lanka to stay competitive while becoming sustainable in its operations. Hotels and resorts can develop and implement simple measures like checking for leaking pipes and using energy efficient appliances, reducing use of chemicals and lessening food waste. The same can be the case for cruise ship travels.

Sustainability of a small coastal tourism community of Kaikoura in New Zealand has also been demonstrated (Box 6). Development of the area as a tourism destination was unplanned and unmanaged. Starting in the 80s when tourism growth began, Kaikoura has received more tourists than its population. By 90s, there has been increasing pressures from environment as waste accumulate and from tourists as the quality of coastal water become questionable. The local government embarked on sustainable tourism and development planning, and utilized environmental and social sustainability perspective with tourism at its core. The community used various mechanisms for their tourism industry to be sustainable, with public private partnership in waste management, voluntary offsetting emissions by the community and destination certification. Various approaches and initiatives that fit and are accepted by the community are needed to pursue sustainability.

### **Box 5. Environmentally-friendly Hotel Management, Sri Lanka**

- 3-star Hotel Sigiriya in Sri Lanka transformed from an old resort hotel to a more energy-efficient and environmentally-conscious business. Hotel Sigiriya's efforts towards environmental management and sustainability have been recognized with various awards, including the Green Award 2008 from the International Restaurant and Hotels Awards USA, the Green Apple Award 2008 for environmental best practices from Green Organization UK and Highly Commended status at the Virgin Holidays Responsible Tourism Awards 2008.
- The primary objective of environmental management efforts was to reduce energy costs, but as the projects developed, the scope widened to include climate change. The key performance areas of the sustainability project are (including sample initiatives):
- Conserving energy – Card key controls have been installed and fixed to the air conditioners in each room (a financial saving of US\$5,620 per annum from electricity cost);
- Conserving water – self-contained biological sewage treatment plant (STP); treated wastewater from the sewage treatment plant is used to water the garden; drip irrigation system is used for the organic vegetable garden
- Minimizing solid waste – laundry containers are now made from cloth (for dirty linen) and cane (to deliver laundered clothes), and shampoo is dispensed in ceramic bottles; over 90% of the hotel's suppliers use bulk packaging that is either environmentally-friendly or reusable (as requested by hotel); guests are requested to bring back picnic boxes and plastic water bottles, so that they can be disposed of properly
- Minimizing greenhouse gas emissions and air pollution – a gasifier using carbon-neutral energy was installed at a cost of 3.5 million rupees to replace the diesel-fired boiler to reduce GHG emissions
- Minimizing other chemical pollution – cleaning agents used are reduced-strength products and are certified as biodegradable and environmentally-friendly; Only natural pesticides such as Margosa oil are used in the garden
- Maximizing practices of reducing, recycling and reusing
- Maximizing the use of environmentally-friendly materials
- Maximizing indigenous flora in landscaping and eradicating invasive alien species
- Conserving biodiversity and
- Supporting local livelihoods.

Source: PATA, SNV & gtz Case brochure

### Box 6. Sustainability of a small community, Kaikoura, NZ

- Kaikoura, a small rural town, lies on the east coast of New Zealand's South Island and is stunningly situated on a peninsular of land between high mountain ranges and the Pacific Ocean. An unusual feature is a deep sea trench that comes to within 500 m of the shore and attracts a richness of marine life, including whales and dolphins, which are easily seen by visitors.
- 1980s: the town was in economic decline, with downsizing of the public and agricultural sectors bringing a serious loss of jobs. Since that time tourism has expanded dramatically, spurred by the launch of whale watching activities.
- 90s: Tourism development was largely unplanned and unmanaged, led by the market and with little knowledge of the impact on the environment and local community. By 1998 it was estimated that the town was receiving 873 000 visitors (against a local population of just 3 483), with an annual growth rate of about 14%.
- Triggers for sustainable tourism approach: threat of a diminishing visitor experience and income, local concern for the environment, local incident underlining tourism's environmental sensitivity (accidental poisonous chemical spill into the sea), reaching capacity in accommodating waste (as a result of tourism growth).
- Kaikoura Tourism Strategy: address the seasonality of the tourism offer, the length of stay and the economic return to the community, by attracting a more diverse market base and developing more local facilities and land based ecotourism activities; environmental and social sustainability; tourism at its core.
- Specific initiatives focus on overall environmental management of Kaikoura, and not just the tourism sector: waste management (non-profit joint venture company between the District Council and a community trust); tree planting to offset the emissions of the community; energy efficiency initiatives in local businesses; biodiversity, land and coastal management; destination certification under international Green Globe 21 scheme.

Source: UNEP & UNWTO. (2005). *Making Tourism More Sustainable - A Guide for Policy Makers*.

For airlines, fuel efficiency measures have been the focus of many, introducing sharklets in the wings of an aircraft that increase the distance that an aircraft can travel by up to 6% using the same amount of fuel. Another significant measure that has been on receiving attention is the emerging partnerships between developers of alternative fuels and airline companies. Box 7 provides an example.

**Box 7. Reducing carbon emissions from air travel through aviation biofuels**

# From trash to take off

Instead of household waste going to a landfill, it will now be delivered to a Fulcrum facility and converted into sustainable aviation biofuel.

UNITED **eco-skies**

Fulcrum's thermochemical process reduces greenhouse gas emissions by 80% compared to traditional jet fuel.

Trash is collected and delivered to a Fulcrum facility.

The drop-in fuel meets United's technical requirements.

**Clean » Scalable » Efficient » Reliable**

Total trash placed in U.S. landfills in one year = Energy equivalent of 10 billion gallons of oil (3 times United's total annual fuel use)

The average American produces nearly 1 ton of garbage a year = That's 65 gallons of biofuels processed by Fulcrum

©2015 United Airlines, Inc. All Rights Reserved.

Image from: <http://newsroom.united.com/fulcrumbiofuels>

- In 2013, United announced an agreement with AltAir Fuels for advanced aviation biofuels to be used on flights out of the airline's Los Angeles hub, making it the first U.S. carrier to execute a commercial scale agreement for aviation biofuels. United expects to begin regularly scheduled flights using AltAir's fuel later this year.
- In 2015, United made a US\$ 30 million equity investment to Fulcrum Bioenergy, Inc., a pioneer in the development and commercialization of converting municipal solid waste into low-cost sustainable aviation biofuel to develop five production units near the hubs of United Airlines with a target production of 180 million gallons per year. The first alternative fuels plant is expected to begin commercial operation in 2017.

"Investing in alternative fuels is not only good for the environment, it's a smart move for our company as biofuels have the potential to hedge against future oil price volatility and carbon regulations."

- United's Executive Vice President and General Counsel Brett Hart

Source: United Airlines news release, United Airlines Purchases Stake in Fulcrum BioEnergy with \$30 Million Investment. 30 June 2015. Available online: <http://newsroom.united.com>

For travelers, sustainable tourism means to consume sensibly. Differentiate between wants and needs. Determine how much of your need is actually needed and the maximum amount of what you want can you indulge in. And perhaps even better, can you do without your wants? Conversely, indulge in what you want, but practice responsibility by offsetting corresponding carbon emissions. Educating travelers and discouraging them to use the toilet onboard the aircraft for short haul flights, as the vacuum mechanism consumes energy, can be one of the ways to promote reduction in energy use.

For tour operators, proper maintenance of vehicles and providing option for cycling or walking tours can reduce energy intensity of providing their service.

**Reuse and Recycle.** An opportunity for reuse and recycle is for plastics which are durable, yet are used in a disposable manner. Plastic litter has been shown to accumulate in garbage vortexes in the Pacific Ocean and degrade into microplastics and leach chemicals into the ocean that gets accumulated in the system of marine life. Furthermore, these plastic waste can also serve as anchor for invasive species. Recovery and recycling of and energy recovery from plastics have become an important industry to reduce marine litter. Saint Lucia has benefitted from waste recovery and recycling, and exporting recyclable waste (Box 8). Mauritius, through government legislation on extended producer responsibility and privatization of plastic recovery and recycling has made progress in reducing plastic waste that goes into landfills (Box 9).

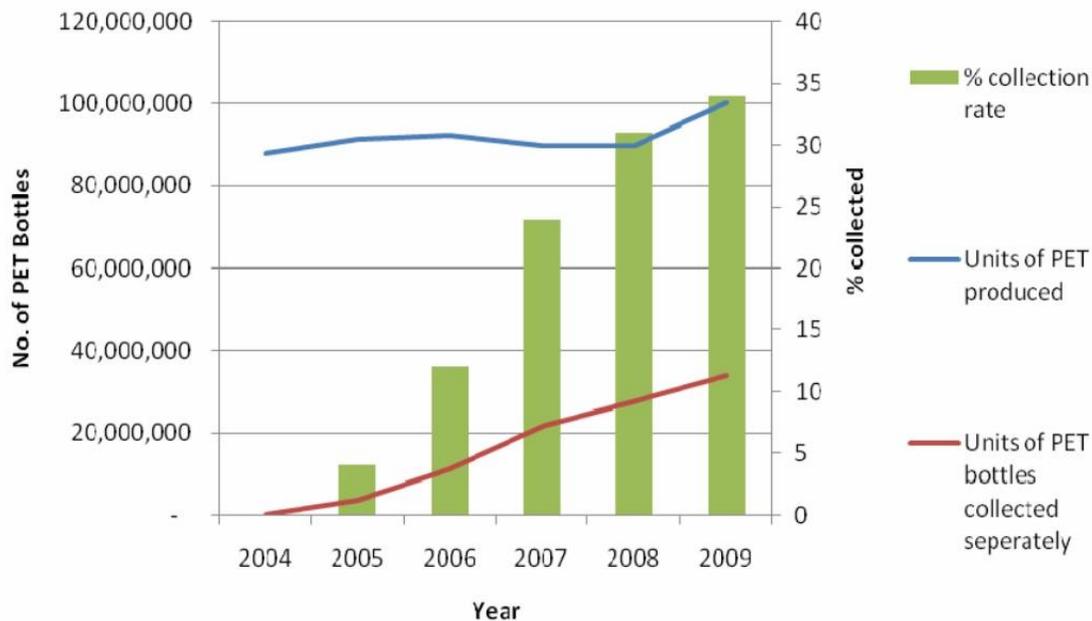
#### Box 8. Saint Lucia exports recyclable waste



- Significant reductions in waste disposal in landfills have been achieved in Saint Lucia through waste recovery, recycling and exporting recyclable waste materials which have a demand overseas. Recycling companies like Recycle It have been effective in addressing the growing waste stream in the Caribbean, and has been awarded the Sustainable Entrepreneurship Award (SEA) in 2014. Recycling has generated jobs and environmental benefits.

Source: UNEP. (2014). *GEO Small Island Developing States Outlook*. Nairobi: United Nations Environment Programme;  
<http://www.stlucianewsonline.com/st-lucian-company-cops-international-sustainable-entrepreneurship-award/>;  
<http://downloads.unmultimedia.org/tv/unifeed/00/2014/08/jpg/unifeed140822e.jpg>

### Box 9. Extended Producer Responsibility in Mauritius – PET Bottle Recovery



Source: Shanghai Expo 2010. A Guide for Sustainable Urban Development in the 21<sup>st</sup> Century

- Mauritius is an ecologically sensitive SIDS facing inherent challenges in management of rising volumes of MSW due to scarcity of appropriate space for disposal and treatment facilities, financial constraints and lack of capacity. Due to the growth of tourism, generation of solid waste is expected to rise in the island
- Recovery and recycling of Poly Ethylene Terephthalate (PET) bottles in Mauritius is a good example of enforcement of government regulation on Extended Producer Responsibility (EPR) leading to stimulation of recycling by private sector. Private recycling company charges the bottling companies per ton on PET collected and recycled.
- Collection rate of PET bottles increased since the privatization of collection, processing and recycling of PET in 2005.

The practice of 3R, resource efficiency measures and lifecycle approach can create opportunities for mainstreaming green economy in the tourism industry, including the green investment in tourism sector. The geography and size of SIDS and the lack of natural resources apart from the oceans and seas limit development opportunities to tourism. And, sustainable development of tourism need to consider these environmental constraints, along with land use and coastal management and assimilative capacity of nature. For SIDS economy to support resource efficiency and green economy, diversifying economic interests into high-GDP, but low impact sectors and resource efficient activities can be an option. Such has become one of the strategic directions of the tourism municipality of Calviá (Box 10) which once experienced the impacts of unplanned tourism.

#### Box 10. Sustainable strategy for tourism destination, Calvià, Spain

- *Municipality of Calvià: Western coast of the Island of Mallorca, with 56 square km area and 80% of the Municipality are natural areas. 40,000 inhabitants and more than 1.6 million visitors each year*  
*Well-developed facilities and infrastructure: many sport resorts, 5 marines, maritime promenades, 4 golf*
- *1960s to 80s: tourism development and growth – short-term interests, unlimited building out of tune with local conditions, and an unsustainable exploitation of exceptional natural resources*
- *Late 80s: deterioration of the environment and landscape, gross overcrowding of the tourist zone, difficulties of updating installations, a steady decline of the allure of the region and the threat to local development*
- *90s: “Calvià for Excellence” programme to revitalize tourism and environmental quality. Calvià: Local Agenda 21 was launched as new integral long term policy to reorganize tourist and local development on a sustainable basis, with 10 strategic action lines and 40 initiatives (top 15 priorities were first implemented). A key factor considered for future projects is the environment.*
- Some strategic actions include:
  - the integral rehabilitation of the urban areas
  - to increase the quality of Calvia as a tourism destination: to substitute the growth for sustainable development and look for the increase of the tourism expenditure
  - to improve the quality of the public transport and to promote cycling and walking
  - to invest in knowledge resources, to ‘dynamize’ and diversify the economic system
  - innovation of the municipal government and the widening of joint public-private capacity of investment

An innovative way of supporting green economy and green investment in tourism is carbon offsetting flights (Box 11). This service, now offered by a number of organizations already, calculates the cost of offsetting emissions of flights using an accurate system. Travelers can choose to offset all or a percentage of the carbon emissions of the flight taken. The sum that is collected is invested in renewable energy and energy efficiency projects in developing countries, a win-win solution for sustainability.

## Box 11. Carbon offsetting to compensate flights, Atmosfair

### Compensate my flight

1 [Intro](#) 2 **CO<sub>2</sub> balance** 3 [Shopping cart](#) 4 [Payment](#)

#### FLIGHT DATA

Flight: 1 times Round trip, 1 person  
Departure airport: Manila - Ninoy Aquino Int'l  
Destination airport: Male - International  
Flight distance: 10,768 km (Round trip)  
Flight altitude\*: 12,500 m

#### EMISSIONS DATA

CO<sub>2</sub> emissions: 2,250 kg CO<sub>2</sub>  
Contrails, ozone formation and other effects: 4,290 kg CO<sub>2</sub>  
Total climate impact \*: 6,540 kg CO<sub>2</sub>

#### MY FLIGHT IN COMPARISON

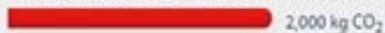
Emissions of one person on a round-trip flight



Climate compatible annual emissions budget for one person



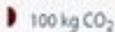
Annual emissions for one car (12,000 km; middle class model)



Annual carbon emissions in India per capita



Annual emissions for a refrigerator



This amount can be compensated by atmosfair through a climate protection project.

Compensation amount:  100% 150.00 EUR for 6,540 kg CO<sub>2</sub>  
Compensate half:  50% 75.00 EUR  
Choose another amount:  100%  EUR

[Back](#)

[NEXT](#)

Atmosfair is a climate protection organization that offers travelers a means of compensation greenhouse gas emissions from flights through the use of renewable energies and energy efficient measures. An online flight calculator at their website calculates for emissions from the flight data of the traveler (Point A to Point B, flight class & type, aircraft type) and the cost for offsetting it. Travelers have the choice how much they would like to compensate for the flight. Climate protection projects of the organization are located in developing countries.

Source: Simpson, Gössling, Scott, Hall, & Gladin, 2008; [www.atmosfair.de](http://www.atmosfair.de)

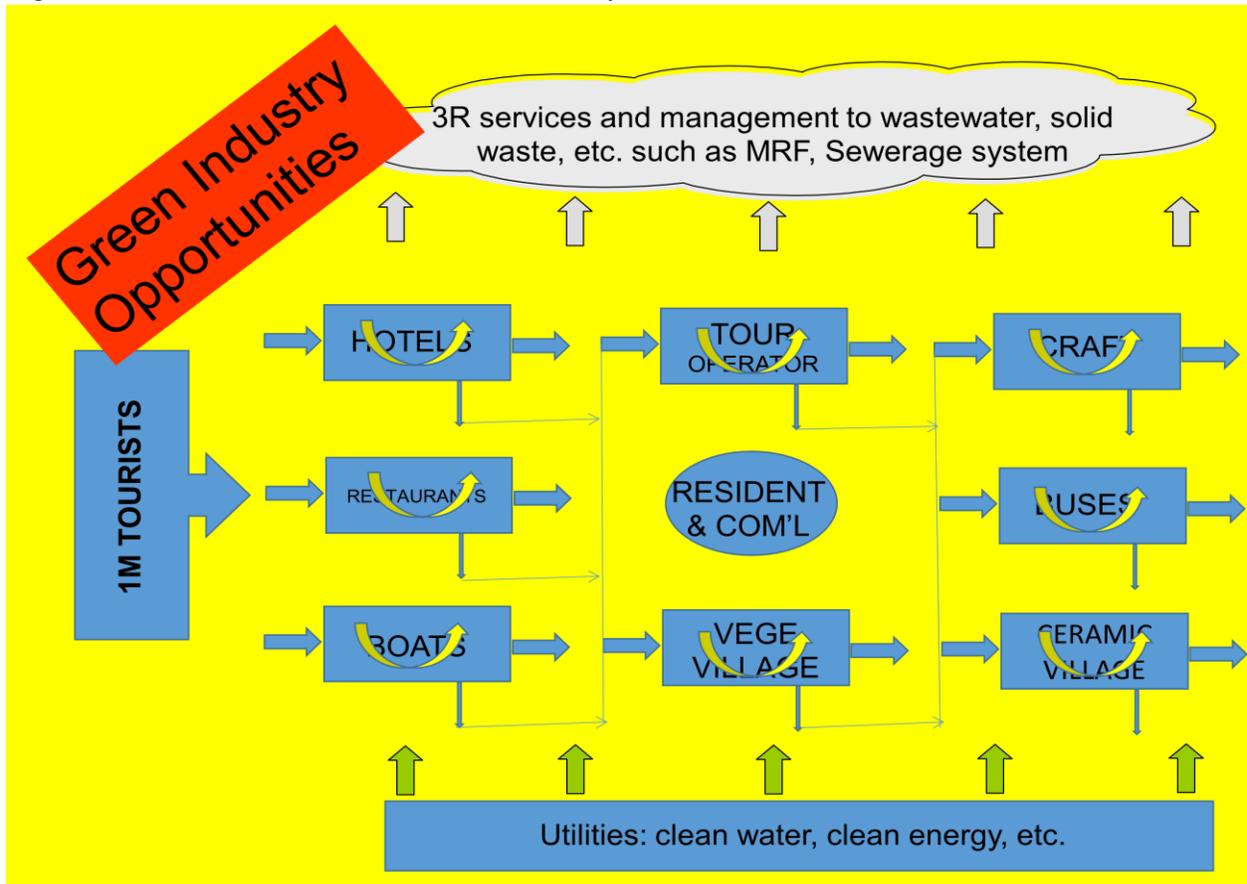
Tourism industrial symbiosis (TIS) is an emerging concept derived from the industrial symbiosis of Kalundborg and urban symbiosis of Kawasaki, for example. This was newly introduced as a green industry strategy to a UNIDO project in Hoi An City, Quang Nam Province of Vietnam. The concept consists of two components; namely: green industry and greening the industry.

For green industry, there is a need to aim for resource flow into and out of the system (in this case, the Maldives tourism industry as a whole) to remain green and sustainable. These would require vast investment on renewable energy, based on its geographical availability. These would also require on the appropriate waste treatment facilities, utilizing first the 3R until unavoidable level of waste that has to be treated. These would also opt not to build a treatment facility, but to do a benefit cost assessment (BCA) to opt for facilities construction or shipping out the final residuals.

For the greening of industry, there would need a mapping of activities within the tourism industry (laundry, restaurant services, hotel, bus operators, boat operators, etc.) and its peripheral industries; namely: upstream suppliers, downstream by product recipients, as well as other minor activities in Maldives, such as agri- and aqua-culture. In the process of greening the industry, 3R would be the priority preventative strategy, and whatever is leftover would be considered to be used as raw material to other peripheral industries. Figure 1 shows this model when proposed to the Hoi An UNESCO Heritage city.

3R as a base of strategic advantage combined with the concept of tourism industrial symbiosis at small scale in the SIDS has never been tested, and the Maldives 113 island-resort could be used as a testing ground for such innovative approach. Integrated with the Hotel and Restaurant Management (HRM) academic program, such as those in Switzerland; the SIDS model of 3R tourism industry may evolve into its own unique model. The island resorts can also be used as ground for internship (on the job training OJT) for global tourism programs.

Figure 1. Mixed resource Tourism Industrial Symbiosis



#### **4. Policy Options and Solutions for Implementing 3R as an Economic Industry through Tourism Sector**

##### **4.1 Lessons learned from 3R and sustainable tourism cases**

Public has a stake at the quality of environment, and this is especially heightened in coastal and tourism-oriented communities where the livelihood depends largely on the quality of coastal and marine ecosystem. Cases presented illustrate that public consultation and involvement in the development process is key to the success of agreed and planned strategies and measures. 3R initiatives and sustainable tourism services can be a means of poverty alleviation and decent employment, and hence, creating opportunities and capacity for the local human resources to participate in such activities can be viable and sustainable for growth.

Tap into the concerns of the community. Community awareness and support was vital in the sustainability efforts of Kaikoura. The community was concerned with the environment and it also became more prominent owing to an accident involving the coastal town. Community ownership was also shown to contribute in the recycling efforts in Kaikoura where there was community involvement, and in Calviá where the development of sustainable strategies was extensively consulted with the public. The local government had to demolish structures and establishments in order to rehabilitate the coastlines. A bottom up approach is seen to be effective in the case of sustainable tourism and marine ecosystem protection which are closely linked to local livelihood.

Public-private partnership can provide the skills, technology, funding and efficiency in proposed initiatives. In Maldives where a take-back/ deposit scheme for plastics have been implemented by the government has only resulted to 4% recovery of plastics. But, the combination of public policy on extended producer responsibility (EPR) and private operation has increased recovery and recycling of plastic in the country to about 35% in just a few years. Such achievement was also made possible through government regulation in support of EPR and recycling. Engaging with private sector to manage public challenges can be a rewarding undertaking since corporations have the capacity to turn address challenges through financially viable solutions and provide resources for implementation.

Plan, rethink and choose 3R initiatives wisely. An understanding of how to operationalize 3R is not enough. The wider impacts of available 3R options or initiatives need to be assessed, reviewed and reevaluated prior to implementation. There can be drawbacks in the simultaneous implementation of 3R activities as seen in the case of carpet recycling in Germany (Box 4). Improvements in carpet manufacturing (reduce) has rendered waste/ used carpet uneconomical for recycling. Rolling out a US\$ 200 recycling plant was not the smart solution at that time.

Lifecycle perspective is important in designing 3R initiatives. Having 3R projects will not be effective and efficient in reducing environmental impacts of tourism if these will produce more impacts in the process. Recycling consumes energy to take waste as a resource in manufacturing another material. If recycling will need more energy and consume more chemicals to result to a product than when it is produced using established means, then recycling is not an option in this case.

Sustainability initiatives need not be technology-intensive or capital-intensive, but be open to learning and applying proven solutions and new yet appropriate technological developments. Simple ways like composting, organic farming, changing from bars soap to liquid soap and utilizing natural bamboo products for containers in place of plastic result to more sustainable operations of the hotel. On the other hand, proven and reliable technology like sewage treatment plant and gasifiers are also needed to complement the basic water treatment and energy initiatives. Solutions need not be limited to those applied in developed countries, but creativity in applying simple and proven ways can be economically and environmentally sound options. Economy of scale is often cited as a constraint in waste management and 3R initiatives in SIDS and the like. Regulatory bodies and agencies in charge of sustainable tourism development need to consider scale appropriate technologies and recommending or deploying solutions that can be easily implemented within the premises where waste is generated such as in the case of hotels and resorts.

Waste is resource, but this should not deter sustainable consumption. Waste-to-energy and refuse-derived energy can provide relief from waste disposal and energy security, but caution should be exercised when planning such activities as it can slow progress in implementing activities that would improve resource efficiency and conservation. Such technologies should only be treated as interim solution to waste and energy challenges, as such long-term strategies need to focus on more sustainable options that employ 3R principles.

Collaborative effort. Planning sustainable tourism need to be in view of the overall development of the country or municipality and in consultation with stakeholders. The case of Calviá illustrated that unplanned development and tourism growth has endangered the local environment and resulted to loss of livelihood from tourism. Development planning in the municipality has adopted the Local Agenda 21 approach and viewed sustainable tourism as part of the strategies of the municipality. Taking this wider perspective in planning can enable planners to effectively map out synergistic relationships in support of sustainable development and antagonistic ones that could put the community at various socioeconomic and environmental risks.

#### **4.2 Other policy approaches and solutions**

The links of tourism to other economic sectors is evident. Transportation services and infrastructure, telecommunications, health and wellness, hotel and hospitality sector, food and beverage, waste management, and water and energy utilities are all necessary to provide quality tourism service. Hence, sustainable consumption and production tools can be widely applied to tourism service providers. Focused measures need to be implemented to specific service and production sectors for resource efficiency and cleaner production as well as to consumers for them to make the right decisions. It is important that consumers are not only informed of product characteristics, but also be inclined to make the right choices.

Resource efficiency and resource conservation are paramount to sustainable tourism. Various applications of 3R have been presented in the previous section. Implementation need not be limited to these success stories. Each SIDS and developing country have its own unique features, strengths, needs, values and aspirations that planning 3R initiatives need to consider in light of

sustainable tourism and development. Solutions need to be interpreted locally. General solutions and approaches are further recommended in this section for consideration.

**3R Policy Approach.** As already mentioned earlier, reduce can have a profound impact on recycle. When reducing waste has been effective, what else is there to recycle? Recycling remaining residual waste materials may prove to be costly, unproductive (use of energy) and uneconomical when there is no significant output. Governments need to factor this in planning policies. Should waste reduction measures be prioritized or recycling be a top choice in waste management policy and practices? Even though reduce and recycle are in the framework of 3R, there are varying and sometimes opposing implications in the implementation of these initiatives. Baseline data are needed to understand the problem and chart the course of action. It always pays to be able to understand and identify the problems before planning strategies and implementing actions.

**When to Reuse.** Reuse in 3R has its drawbacks, specifically when the ability of manufacturers to increase energy efficiency of electrodomestic products is considered. Reusing or extending the lifetime of electrical products may not be the preferred option when investing in a new unit is more energy efficient and can reduce electricity consumption and cost. In this scenario, reuse may be best relegated to specific products such as furniture and construction materials that are easily dispensable, but are in good condition and can still be used and which can be resold at a lower price. On the other hand, instead of owning products like furniture where utility depends on the owner's taste and where it is needed, products can be leased or rented. In the same manner, hotels and resorts that needed frequent renovation and upgrade, need not throw away usable furniture. Refurbishing and renting out furniture, and reclaiming wood for resale or reuse as furniture can create a new market and employment opportunity. Designing products as a service can be profitable and allow for materials to stay in the cycle for longer. Market assessment will be needed in determining if such an approach can be feasible.

**Business model for social enterprise.** Consumers are now aware and increasingly educated with the environmental impacts of socioeconomic activities. More and more consumers prefer sustainably sourced and organic products free from chemicals, and demand sustainable services. Business models can adapt to this concern for environment and make business operations more sustainable and production process resource efficient. Moreover, business models can also consider ethical considerations of consumers and be a force in alleviating poverty, empowering the community and promoting sustainable and decent work. Developing a business model for social enterprise in recycling activities can improve working conditions of informal sector in waste management, provide secure and decent paying jobs and protect the environment.

**Sustainable tourism for sustainable development.** As connections between tourism and other economic sectors remain strong, sustainable development strategies and sustainable tourism strategies need to be integrated to avoid replication of efforts and to promote synergistic effects. Being able to provide the basic needs of tourists in a sustainable manner can also contribute to the delivery of basic services to the community in more sustainable ways.

**Diversifying economic interests.** Tourism is heavily dependent on ecosystem services and marine ecosystem, making resource efficiency and decoupling of economic growth from resource extraction more challenging. SIDS and developing economies are experiencing growth in

tourism sector. Impacts of tourism can negatively impact the capacity of the environment to provide ecosystem services and maintain marine ecosystem integrity. As such, there is a higher demand and impetus for SIDS and developing countries to practice resource efficiency and conservation. This can imply continuing on with sustainable tourism development and also focusing on developing sectors that result to high gross domestic product (GDP) yet producing low risks or impacts. Depending on the available skills and local capacity, and of the potential for human resource development, different paths to decoupling exist. Banking and finance, insurance, and other less resource intensive sectors can be capitalized on to produce economic benefits with less environmental impacts, or produce the same benefits with positive environmental impacts. Box 12 provides the example of cultured pearl farming, a high-GDP sector that also benefits the local marine ecosystem. SIDS and developing countries can benchmark cases of small island countries that have developed economically from diversified interests such as Singapore.

### Box 12. Pearl farming in a sustainable way, Pacific Islands

- Cultured pearl farming in the Pacific offers an economic activity in which sound environmental management and conservation are prerequisites to economic success. Pearl oysters are remarkably sensitive organisms. The more pristine an environment, the healthier the oysters are and the higher the likelihood of harvesting valuable, high-quality pearls. This new source of income has created an incentive for conservation by reducing pressure on reef fish stocks, and is increasing the resilience of these communities in the face of climate change.
- A pearl farm with a focus on quality pearls produced through responsible farming practices still very much has its place in the international market. Cultured pearls could be marketed as a sustainable alternative in an increasingly ecologically conscious jewellery market, particularly to luxury consumers.
- As a model of private entrepreneurship in SIDS (e.g. Fiji, the Federated States of Micronesia, and French Polynesia) pearl farming has modestly emerged as an economic activity that can offer many valuable lessons for development opportunities in remote coastal communities. It also provides evidence that marine conservation can be integrated within a viable economic activity leading to sustainable long-term growth in vulnerable Pacific environments.

Source: Laurent Cartier and Saleem Ali (from <http://www.thesolutionsjournal.com/node/1139>; & [www.sustainablepearls.org](http://www.sustainablepearls.org), as cited in UNEP. (2014). *GEO Small Island Developing States Outlook*. Nairobi: United Nations Environment Programme.

Wastewater treatment. Solid waste and wastewater generation are closely linked to the quality of freshwater available. Aside from addressing solid waste, electronic waste and construction waste through 3Rs, wastewater treatment also need to be supported. There is only a limited source of freshwater, and proper treatment of wastewater for reuse is a welcome approach and can be implemented together with rainwater harvesting to augment water supply.

Combined sustainable tourism and ecosystem-based management approach. A healthy marine ecosystem is needed for tourism. Managing coastal and marine ecosystem is beneficial to coastal and marine tourism. Finding a way of interlinking coastal management measures with sustainable tourism will be mutually beneficial. Box 13 presents the case of marine sanctuaries

and shark tourism wherein marine sanctuaries have grown in area to protect shark from being caught and sold to the market, protecting the larger-earning shark diving tourism, and preventing fishing equipment from improper disposal in the oceans.

### Box 13. Shark tourism and shark sanctuaries growth

- Revenue from tourism opportunities generated by the presence of shark species is rising in a number of countries. For example, in 2010 in the Pacific Island state of Fiji alone, shark-related diving contributed US\$ 42.2 million to the country's economy, while shark-diving operations produced US\$ 4 million for Fijians through salaries and local levies. Similarly, in Palau, 8 percent of the country's GDP, approximately US\$ 18 million annually, is derived from shark tourism. According to the Pew Environment Group, "Studies conducted on the economic value of sharks in Palau's waters indicate that a single reef shark contributes approximately US\$ 179,000 to the country's economy every year, compared to a one-time value of US\$ 108 if caught and sold on the market".
- In addition to Palau, the Bahamas, the Cook Islands, French Polynesia, Honduras, the Maldives and the Marshall Islands have also declared their entire Exclusive Economic Zones as shark sanctuaries. No commercial shark fishing is permitted, providing vital protection for the vulnerable species, some of which are endangered with extinction. In December 2012, the Cook Islands declared a 1.9 million km<sup>2</sup> sanctuary, contiguous with neighboring French Polynesia, creating an area of 6.7 million km<sup>2</sup>.

Source: Pew Environment Group. (2012). *Ocean Earth: How Rio+20 can and must turn the tide*. Washington D.C. : The Pew Environmental Group, Policy Recommendations.

& [www.pewenvironment.org](http://www.pewenvironment.org), as cited in (UNEP, 2013)

Incentives and subsidies. In the U.S., 'Pay people to recycle' program has been effective in increasing waste recovery and recycling rates. People would receive retail vouchers for recyclables they turned in at recycling facilities. This can be adapted to SIDS in different and considering that retail vouchers may further incentivize consumption. Perhaps recycle for education may be a good alternative if the cost of waste management (collection/ transportation, segregation, recycling, final disposal, landfill operation) is higher than the cost of education in the country. When a community achieves waste reduction/ composting/ recycling target, children can go to school for free. Creativity and public consultation in designing such schemes are necessary. Subsidies can also work to encourage people from practicing 3R. In Vancouver, Canada, composting bins have been subsidized by the government, and has since shown to increase the practice in the area. Fertile soil is a valuable resource. In promoting composting, there should be land, manpower, funds and skills available to properly organize organic farming.

Sustainability indicators. Sustainability indicators can be used to track progress and opportunities in resource and energy efficiency. Energy efficiency and waste disposal per economic output are some examples of indicators that can be used.

### 4.3 How 3R can be implemented as an economic industry to provide win-win solutions to tourism sector and marine ecosystem for sustainable development

Previous discussions have emphasized the importance of marine ecosystems in providing ecosystem services and tourism revenue to coastal communities, and the importance of 3R activities to minimize the impacts of tourism on the environment by reducing waste and resource input. Socioeconomic opportunities from tourism and marine ecosystems will be converted to costs when resources are depleted and the marine environment degraded. Stakeholders have a role to fulfill both in maintaining the marine ecosystem as well as sustainable tourism.

Baseline assessment of waste generated, characteristics, source and projected waste stream, resource extraction and demand for resources is needed prior to planning 3R strategies. This will be the basis of the measures to be established, implemented and monitored, along with societal values, cultural considerations, and environmental and economic aspects. Planning needs to be done in consultation with and participation of stakeholders.

As emphasized in foregoing discussions, tourism services are highly fragmented and sustainability of each segment of tourism service needs to be pursued. Travel agencies, tour operators, hotels and resorts and tourism activities in destinations and tourists need to pursue sustainability measures. These stakeholders, the businesses, government and tourists and local community are responsible for achieving sustainable tourism. Because of this fragmented nature, specific approaches for business, by government and individuals are needed. Sustainability of tourism destinations, hotel and tour operators can already be measured using existing sustainability criteria by the Global Sustainable Tourism Criteria and Council. Initiatives by international organizations are already in place such as the Sustainable Tourism of the 10 Year Framework of Programmes, Global Partnership for Sustainable Tourism (GPST), and Sustainable Tourism for the Elimination of Poverty (ST-EP). Businesses can also apply voluntary certification schemes to promote business sustainability and corporate social responsibility (CSR) which are now widely accepted to produce benefits for businesses and communities. Responsible tourism by individuals can be promoted by business through advertisement of sustainable destinations, providing information on sustainable tourism and how travelers can lessen their impact on the environment.

For 3R to be successfully implemented, institutional capacity, policy, business model, investments and human resources are needed. Aside from government regulatory functions, other requirements can be fulfilled through public-private partnership. Private investments can bring in the necessary entrepreneurial skills, business model, capital and skills (through training and needs assessment) to operationalize technical 3R initiatives.

Equally important to the implementation of 3R as an economic industry is how the general picture of related policies impacts 3R implementation. Again, it should be highlighted that prevailing legislation needs to be considered before any 3R strategies and business activities are implemented. If existing laws do not address increasing waste generation, then it would appear that implementing 3R would need policy support for recycling industries. If the country prioritizes exporting recyclables to source (countries where recyclable components of respective import products came from), then policies promoting extended producer responsibility, and waste segregation and recovery need to be in place. Assessment of existing legal framework, institutional capacity, and human resources are also vital to anticipate the needed supportive legal and institutional capacity to support 3R businesses and activities. In addition, such assessment will also be used to design capacity building needs and how local conditions can accommodate

increasing complexity and variability of 3R strategies. If local institutions and agencies are not well equipped to process the application and subsequently monitor, say, the operations of a recycling plant or a waste-to-energy plant, then such business initiative will face some constraints from the beginning of the process. It is important that the legal, institutional and supportive frameworks necessary in the implementation of 3R be present. This could also include the infrastructure present, industrial organizations and educational system needed to support the sustainable tourism and 3R strategies.

Next, market instruments need to be carefully designed to encourage 3R initiatives to complement each other in support of sustainable tourism. It would be beneficial to assess how application of specific market instruments contradict, complement and support each another to produce intended results. Market instruments are also crucial to attract business investments, and technology and knowledge transfer.

Local human resource preparedness need to be assessed to match investments in and requirements of 3R strategies and activities. If deficit in human resource is expected, government agency for technical and vocational needs can help train and enhance the skills needed to support planned activities. Informal sector may be formalized to allow the substantial contribution of this sector to the overall informal recycling economy happening in most countries. Enhance local ability to properly handle waste, chemicals and recyclables. This is important as a precaution to avoid incidents and accidents in the workplace and accidental release to the environment, and to ensure competency.

Laws and supporting mechanisms need to be clear with objectives. Objectives, measures, indicators, targets and implementation mechanisms has to be laid out early on. Ambiguity can lead to mismatching and contradicting activities.

Creating 3R as an economic industry needs collaborative effort among the stakeholders. Government clearly needs to outline the objectives and provide the institutional needs, legislative framework and regulatory mechanisms. Openness to private collaboration through investments are inherently important especially for SIDS and developing economies to benefit from the technology, technical training and support, financing and business model for 3R-related industries. Collaboration also fosters sharing of knowledge, experiences, resources and technology, and innovation (Box 14).

Lastly, co-benefits in implementing marine ecosystem-based management and 3R strategies may be explored to investigate ways it can complement or be implemented simultaneous with related 3R strategies in support of sustainable tourism. Making use of existing efforts at EBM for select 3R activities may be mutually beneficial since the local communities are usually empowered to monitor and manage marine resources, they can also be trained to address the needs of implementing 3R as an economic sector to protect and preserve marine ecosystem.

#### Box 14. Innovation & collaboration: adidas recycles ocean waste into shoes



- adidas has partnered with non-profit organization Parley for the Oceans, and supports its Ocean Plastic Program that aims to end plastic pollution of the ocean.
- adidas created a world first with a shoe upper made entirely of yarns and filaments reclaimed and recycled from ocean waste and illegal deep-sea gillnets. Parley partner organisation Sea Shepherd retrieved the nets after a 110-day expedition tracking an illegal poaching vessel, which culminated off the coast of West Africa.

*adidas has long been a leader in sustainability, but this partnership [with Parley] allows us to tap into new areas and create innovative materials and products for our athletes.*

- Eric Liedtke, adidas Executive Board member (Global Brands) & Parley for the Oceans Steering Committee member

Source: adidas (2015, June 30). adidas news stream excerpt: *adidas and Parley For The Oceans Showcase Sustainability Innovation At UN Climate Change Event*. Retrieved from adidas: <http://news.adidas.com/gb/Latest-News/ADIDAS-AND-PARLEY-FOR-THE-OCEANS->

## 5. The Way Forward

3R and other related measures such resource efficiency, marine conservation and economic diversification have already been implemented and demonstrated in tourism industry. The success of implementation rests in community involvement, private-public partnership, regulatory support, institutional capacity, technical viability and financial feasibility. Clearly, each stakeholder has a specific role to fulfill, and the approach in implementing measures are varied as well.

Sustainable consumption and production tools, policy approached and technical solutions are available for adoption and adaptation to local conditions. A mix of these measures coupled with regulatory and financial mechanisms from the government can support the implementation of 3R as an economic industry and mainstream sustainability across related economic sectors. Global initiatives can be taken advantage of by many SIDS to help guide development of the sector towards sustainability (Section 4.3), along with success cases of implementation of various sustainability approaches in specific tourism destinations<sup>23</sup>, utilizing green economy approach in tourism<sup>24</sup> as well as regional strategy to support sustainability of tourism sector<sup>25</sup>, and private sector initiatives<sup>26</sup> and collaboration for innovative capacity in deriving economic benefits from waste. Regional voice to support and outline sustainable tourism policy can also be pursued in clusters of SIDS and developing countries. New approaches and regional priority actions are being developed and localized to meet the need for sustainable tourism such as the oceans economy (blue economy)<sup>27</sup>, policy recommendations by international organizations<sup>28</sup> and priorities for development<sup>29</sup>.

Key for the implementation of 3R is its implementation based on the overall sustainable development context of the country and tourism sector. Citing from the International Task Force for Sustainable Tourism Development policy recommendations, a general approach can be offered, as follows:

- a. Tourism planning
- b. Tourism operations and management
- c. Tourism investment

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<sup>23</sup> United Nations Environment Programme, SNV Nepal, and Nepal Tourism Board (2008), Building Nepal's private sector capacity for sustainable tourism operations: A collection of best practices and resulting business benefits.

<sup>24</sup> United Nations Environment Programme and World Tourism Organization (2012), Tourism in the Green Economy – Background Report, UNWTO, Madrid.

<sup>25</sup> Tourism Sustainability Group (2007), Action for More Sustainable European Tourism.

<sup>26</sup> World Travel & Tourism Council, International Federation of Tour Operators, International Hotel & Restaurant Association, & International Council of Cruise Lines (2002), Industry as a partner for sustainable development – Tourism, United Kingdom.

<sup>27</sup> UNCTAD, Division on International Trade Goods and Services and Commodities, TED (2014), The oceans economy: opportunities and challenges for SIDS, United Nations, Geneva.

<sup>28</sup> International Task Force on Sustainable Tourism Development (2009), Policy Recommendations on Sustainable Tourism Development (Marrakech).

<sup>29</sup> Office of the High Representative for the Least Developed Countries, Landlocked Developing Countries and Small Island Developing States (2011), Small Island Developing States: Small Islands Big(ger) Stakes, UN-OHRLS, New York.

- d. Tourism promotion and marketing
- e. Capacity building
- f. Consumption of tourism products and services
- g. Monitoring and evaluation of tourism development

In the context of post 2015 development, resource efficiency and green economy are going to have to play an increasing role and influence over the development of economies to achieve sustainable development goals, and 3R need to be translated in this context and the SIDS as well. In the 3R hierarchy, emphasis need to be placed on reduction of resource extraction followed by reuse and recycle rather than end of pipe treatment methods and waste disposal. Resource efficient production, responsible and sustainable consumption, and disaster resiliency are to be embedded in the development strategy of economies. Tourism and development plans will need to be carefully established, with strategies to support development goals, encourage green investment, enhance local capacity, commercialize products made from reduced inputs, develop sustainable destinations and empower consumer to make the right choices. The regulating function of the government need to be highlighted in establishing allowable emissions, pollution and management of polluting activities, and monitoring and/or penalizing violations on policy by industries and individuals.

The cases and analysis presented in the previous sections provide a general approach to sustainability of tourism, how to go about 3R as an economic industry, and the challenges and opportunities it brings. In light of the opportunities that 3R can bring to sustainable tourism and marine ecosystem management, there are a number of emerging priorities that SIDS and developing countries need to address as they develop and pursue a sustainable growth path that can be incorporated in planning tourism:



*Figure 2. Framework for sustainable tourism and 3R Society in SIDS and developing countries*

- a. In addition to the sustainability of tourism, there are a number of other priorities that need to be met by SIDS and developing countries. In particular, the competing resource requirements of the population and tourists, and equity in access to basic needs of local population. Countries need to be forward looking in planning to accommodate such emerging concerns and priority sectors, and investigative in assessing the challenges and how these are going to be built into existing development plans and priorities. Are basic needs of the local population such as housing, mobility and food going to be met as tourism is developed?
- b. As plans are being charted for sustainable tourism and sustainable development of the countries, are institutions well equipped to facilitate the transition? What competencies need to be developed and enhanced locally to support the necessary changes for sustainable development?
- c. Many of the cases presented in this background paper has shown the need for proactive approach in development in order to prevent unintended consequences of unplanned tourism. Haphazard development and without for future scenarios and needs can lead to waste of resources and dip in tourism activities, which is what happened to tourist destinations that has experienced sudden and sharp grown in a short period. In light of this, there are opportunities and benefits that can be missed when planning is not done meticulously to avoid such scenario. Which sectors of society and economy are likely to be impacted if sustainability is not introduced in planning for development? Are the missed opportunities in these sectors likely to be overcome with more focused development plans to address impacts early on?
- d. Cultural integrity and local way of life are not to be undermined in implementing changes or any new activity. Has there been any attempts at introducing new activities locally that can be a baseline for implementing further changes and introducing more activities that cater to sustainable development of tourism and related sectors? What lessons can be taken from these existing or implemented projects to strengthen planning, development and implementation of 3R and sustainability programs?
- e. Lastly, as SIDS and coastal areas increasingly face the impacts of climate change, how can these countries factor in climate change resiliency in tourism and sustainable development? It is crucial to make developments with resiliency as a perspective as countries consider tourism as a priority and also of the geographic isolation and small land area of SIDS that make them vulnerable to strong typhoons. How can planning be carried out to mainstream climate change resiliency and other concerns such as water availability and energy security in the development of tourism and the country in general?

Fig. 2 shows the components of sustainable tourism that can enable SIDS and developing countries to develop the tourism sector with particular regard for the environment, socioeconomic and cultural wellbeing. These eight components relate to policy, institutional and technological considerations for tourism to be sustainable. In addition to the questions posed above, Figure 2 can be considered as a guide in formulation of 3R policies, programs and plans.

## **5.1 Policy considerations**

Policy support for sustainable tourism -The framework adopted when drafting sustainable tourism and related policies can determine how well it addresses its objectives. In this context, three perspectives are considered for sustainable tourism, namely, lifecycle thinking (LCT), 3R and resilience. Lifecycle thinking has been the immediate approach to sustainable consumption and production. LCT enables the assessment of impacts from cradle to grave for sustainable approaches to be designed accordingly. On the production side, it opens up to the use of various sustainable production, cleaner production and resource efficiency tools appropriate to the objective. On the consumption side, it enables consumers to consider sustainability when making product or service choices.

Reduce, reuse, recycle considers the need to close the loop of material cycles. It places importance on reducing further extraction of resources and generation of waste. 3R is an important approach to sustainable tourism and marine ecosystem protection as this can enable SIDS and developing countries to cope with increasing waste generation by locals and tourists as well as protect the environment and tourism growth. Resilience mainly factors in the climate vulnerabilities of SIDS and developing countries for sustainable development. Small islands and developing countries are highly vulnerable to climate change impacts such as stronger typhoons or storms that can easily wash away or damage infrastructure (like communication and power lines), livelihoods (crops) and communities (housing/ property). Development planning and defining sustainable tourism priorities need to align with the goal of increasing resilience to impacts not only of environmental changes from tourism activities, but also of expected changes and challenges that climate change brings.

## **5.2 Institutional considerations**

For institutional considerations, public-private partnership and collective bargaining are deemed necessary components for sustainable tourism. PPP can bring in investments to support the government in providing services for the population. In addition, it can also have a significant contribution to the development of local skills and knowhow as private companies have the human and financial resources to build local capacity in their undertaking such as in managing waste, renewable energy and recycling. PPP can support the development of a 3R economy through capacity building, infrastructure development, financial investment and knowledge sharing. Enhancing cooperation with other countries and private firms abroad would allow for 3R ventures to expand in SIDS and developing countries such as in exporting recyclables to where there is a demand or technology available, installing waste-to-energy plants, and developing locally appropriate and viable procedure for waste management.

Collective bargaining is regarded to be important in sustainable tourism for SIDS and developing countries. As these countries share similar qualities like geographic isolation, size, needs and capabilities, they are in a position to gather their voices together and use it for collective bargaining in issues of concern to all like waste management solution in shifting the burden of

disposal to source of imported goods. Specific waste streams like electronic wastes where the local capability and scale may be absent, SIDS and developing countries can give a strong signal to importing countries for them to take responsibility and agree on mechanisms to exporting recyclable waste. Institutional alignment and cooperation need to be strong among SIDS and developing countries in exercising collective bargaining. Institutional capacity need to be strengthened to support 3R waste management activities, especially in dealing with the externalities.

### **5.3 Technological considerations Asia-Pacific countries should take into account to implement 3R and resource efficiency measures for sustainable tourism development**

PPP is an important technological consideration as this will be critical in rolling out 3R business opportunities for local implementation, employment and research and development.

It has been debated that even the international experts do not have a ready-fix solution for SIDS on resource optimization due to the lack of scale of economy. Scale-appropriate technologies are crucial for land constraints in SIDS and research and assessments are important to determine what will be appropriate given local conditions. Therefore, the SIDS have to consider with highest priority the human resource management (i.e. both capability building and capacity building) that would deal with the indigenous resources with innovative thinkings.

Research and development of high-value products/ services that are in accordance with sustainable tourism principles and 3R is also needed. This indigenous resource (on product and service) assessment would bring comparative advantage to the SIDS.

In conclusion, sustainable tourism development and marine ecosystem complement each other, while 3R initiatives provide possible business opportunities. SIDS need to consider four important factors in capturing such opportunities such as:

- preventative principle (of 3R);
- efficiency strategies (of 3R in term of total resource use);
- knowledge management (in the human resource development); and
- indigenous innovation capability (of unique SIDS scenario)

SIDS also need to explore 3R opportunities evolving from the conventional integrated waste management approach to a more dynamic and holistic life-cycle thinking of resource (material and human) management approach. These approaches shall be able to generate ideas of scale-appropriate technology and technique, life cycle thinking-oriented and resilience-oriented action plans (collective bargaining, for example, of EPR), value chain product and services, avoid unnecessary resource consumption (reduce), and others.

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