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Litter impacts on scenery and tourism on the Colombian north Caribbean coast

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HIGHLIGHTS

- Assessment of beach type, litter, scenery and management for 35 Colombian Caribbean beaches.
- Colombia depends on the above for economic growth.
- A Sector analysis approach is introduced.

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ABSTRACT

This paper provides the location, scenery and litter evaluation of 35 Colombian Caribbean beaches (9 remote, 9 village, 14 urban and 3 resort). Four litter grades were found. A: excellent (5); B: good (8); C: fair (19) and D: poor (3). A Decision Value parameter (D), for scenery gave: Class I – extremely attractive/natural, D > 0.85, 6 sites; Class II – attractive/natural sites, D = 0.85 –0.65, 2 sites; Class III – mainly natural sites, few outstanding features, D = 0.65–0.4, 1 site; Class IV – mainly unattractive sites, D = 0.4 to zero, 6 sites; Class V – very unattractive sites, D = <0, 20 sites. Litter amounts placed most beaches into a poor scenic category and many scenic beaches could jump a grade by means of clean-ups. A graphic methodology highlighted beaches with contradictory results for litter/scenic grades. Tourists abhor littered beaches and clean-ups would improve scenery scores.

1. Introduction

Tourism is one of the largest growth industries in the world (EEA, 2006) and its GDP contribution ranges from ~2% for small scale tourism countries where the tourism weighting can be very large, to >10% for countries, such as, Colombia (Briguglio, 1995). Currently tourism represents one of the most important activities for Colombia and during 2007–2015, its Caribbean coast had 2,441,033 international arrivals (mostly from the U.S.A., Canada and the European Union) and close to 4,000,000 domestic arrivals (ANATO, 2015). The industry's growth capacity appears to be almost limitless. An increase of 21,000 international arrivals occurred between 2013 and 2014 and the same trend was currently recorded with 115,100 international arrivals during January–March, 2015 (ANATO, 2015). The tourist industry's rapid growth meant an increase of almost US$ 270 million per year in the Colombian Gross Domestic product (BANREP, 2015). The Gross National Product, relating to tourism (>US$ 3600 million in the balance of payments for travel/transportation), is the third highest source of foreign exchange after oil and coal, exceeding exports of coffee, bananas and flowers (ANATO, 2015).

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The tourism trend is likely to be exacerbated globally and as Colombia wants to increase tourism numbers and for beach management to be successful it is important to know what coastal tourists desire? From >1000 beach questionnaires regarding visitor beach preferences/priorities at Mediterranean tourist destinations, the beach was deemed to provide some 80–85% of a holiday's enjoyment and much of a country's revenue. For example, Yepes (2005) pointed out that in Spain, with only 0.001 per cent of beach space, beaches generate roughly 10% of the Gross National Product; Clark (1996) has stated that good beaches are worth billions of dollars. Wilson and Liu (2008, 130) carried out a number of peer-reviewed non-market valuation studies (1970–2006) of coastal-marine ecosystems and found that beach recreation had *'inordinate attention in the economic literature'*. As to what parameters tourists desire from a beach, these can be grouped under five major headings the 'Big Five'; namely very good water quality, safety, facilities, no litter and excellent scenery (Williams & Micallef, 2009). The priority changes as they are functions of location type, e.g. urban, resort etc.

Beaches can be classified in many ways (Williams & Micallef, 2009) and headings given in Table 1 can be found in any beach setting, but for the purpose of this paper, which deals with sites utilized by national and foreign tourists, the anthropogenic classification has been used. Water quality and its testing are basically a function of Government and beach managers usually have little control over such matters. Safety usually tends only to be important at urban and resort beaches where lifeguards, facilities (showers, sun loungers, etc.) and safety equipment are usually mandatory in the latter, but less so in the former as they are the responsibility of the urban governing authority. In Spain, lifeguards can be found even on village beaches.

Scenery may be defined as *'the appearance of an area'* (Council of Europe, 2000, 4) and is a part of a coastal landscape inventory available for different coastal zone disciplines. Similarly, coastal landscapes can be described as '*a littoral area, as perceived by people, whose character results from the numerous interactions of natural and/or human factors*' (Council of Europe, 2000, 32). In Brazil, Barbosa de Araujo and Costa (2008, 1448) indicated that landscape was probably highly rated as an attribute in visitor's choice and '*the maintenance of the landscape quality of beaches must be the main priority.*' Scenic destinations for tourism purposes now seem to be well ensconced in tourism literature, e.g. '*Landscape is most frequently exploited by the government and the media as advertisements of Pernambuco State tourist resources.*' (Barbosa de Araujo & Costa, 2008, 1445). Boley, Nickerson, and Bosak (2011) and Nickerson, Jorgenson, and Boley (2016) utilizing the Geotraveler Tendency Behavior Scale showed that environmentally concerned tourists will specifically travel to an area for its scenic beauty. This usually satisfies the main tourism driver force – cash revenue – whilst helping to conserve the environment. However, environmentally concerned tourists could potentially have a devastating impact on the environment (Das & Chatterjee, 2015).

Most checklist and rating schemes e.g. Leatherman (1998) used for coastal assessment are open to criticism with regard to subjectivity and weighting. Grading assessments obtained from qualitative, subjective observations and/or pronouncements made in linguistic terms, as in the case of many coastal scenic assessment and landscape evaluations do not replace or overcome data vagueness. Evaluations used and given in the methodology used in this paper overcome this point, i.e. scenic assessment was based upon beach user interviews and utilizes a weighting/fuzzy logic scale resulting in a semi-objective analysis; litter grades are based upon actual field determined figures.

The basic scenic approach in study area locations (Fig. 1) was formulated upon the seminal work of Leopold (1969), where parameters were inventoried and assessed as to their suitability for addressing the aesthetic aspects of scenery in order to reduce subjectivity, so that, '*the results promise to be a useful, new kind of basic data needed in many planning and decision making circumstances.*' (Leopold, 1969, 1). Pilot scenic assessment studies of beach users asked the question (Table 2), 'what parameters make up a beautiful coastal scene?' A further n > 500 beach user cohort then ranked the top 26 given parameters (18 physical and 8 human in order to give weighting indices, which tended to emphasise human factors). X scale parameter values (Table 2; Fig. 2) were carried out via discussions by coastal experts and expressed numerically via a qualitative Delphi approach – a forward thinking procedure which uses specialist opinion and data collection for good practice and evaluation (Balkey, 1968). For precise details see Anfuso, Williams, Cabrera Hernández, and Pranzini (2014), Ergin, Karaesmen, Micallef, and Williams (2004), Ergin, Özölçer, and Şahin (2010), Rangel-Buitrago, Correa, Anfuso, Ergin, and Williams (2013). To quantify data vagueness/uncertainties and subjectivities inherent in parameter assessment, fuzzy logic was used (Ambala, 2001; Zadeh, 1965), This technique produces robust decisive factors based on individual parameter probabilities introduced as weighted averages into the assessment procedure culminating in a Decision Value parameter (D; Table 3).

Successful field-testing (>4000 interviews, a standard sampling error of <0.02) has been carried out in many countries: Portugal, Cyprus, Bosnia, Croatia, and southern Spain, but further field tested in, amongst other countries: Cuba, Colombia, Brazil, USA, China, the South Pacific, New Zealand, Australia, Pakistan, Tunisia and Morocco. For example, see Anfuso et al. (2014), Barbosa de Araujo and Costa (2008), Cristiano et al. (in press), Ergin et al. (2004), Ergin, Williams, and Micallef (2006), Langley (2006), Rangel-Buitrago et al. (2013), Ullah, Johnson, Upton, and Williams (2006), Williams (2011), Williams and Khattabi (2015), Williams and Micallef (2009). In ALL countries studied, similar D value natural breaks occurred when sites vs the D value are plotted; the higher this D value, the higher the scenic evaluation. Chi-square and Kolmogorov–Smirnov testing of the break points for these Gaussian

Table 1
Examples of some existing beach classifications (Williams & Micallef, 2009).

Characteristic	Attributes
Geomorphological	Reflective – Dissipative.
Composition	Muds, Sands, Gravels, Pebbles, Cobbles, Boulders, Mixtures.
Shape	Linear; Pocket; Logarithmic spiral.
Anthropogenic	Remote; Rural; Village; Urban; Resort.
Natural or artificial	
Usage	Heavy; Medium; Light.
Colour	Black–white.
Activity	Recreation – conservation.
Cliffed/Non cliffed.	