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Pre-feasibility study for application of a beach certification scheme on river bathing areas in the State of Meta, Colombia

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Abstract

Tourism beach certification schemes have been widely implemented in marine coastlines around the world. Based on some of the most important beach management principles their aim is to sustain good environmental conditions, while providing important assets for tourism activity. In the last decade Latin America has witnessed development of many beach certification schemes. However, these certifications apply to marine beaches only. As a result of fast development of not only international tourism, but more importantly domestic tourism in Latin American countries that has led to increased demand for leisure activities, a river based tourism became a real possibility. The objective of this project was to assess viability of implementation of a beach certification scheme (BCS) to river bathing areas in a State of Meta, Colombia. The project used BCS's common basic requirements to set a benchmark for safe and environmentally sound management of fluvial river-based bathing areas. Through secondary and primary research, a set of pre-requirements, which a river bathing area has to comply with, was established and then a number of common marine beach certification requirements were used to evaluate one particular beach in Meta. The objective of this exercise was to establish if it is possible to implement these requirements to river environment. The results show that it is possible to implement a BSC to river bathing areas in Meta, although there are very strong limitations. Although it is very viable to comply with all standard requirements of BCSs, it requires very strict river conditions that are difficult to be met. The bathing areas that met all conditions are also those that either have seen strong engineering interference or do not move high volumes of water. It can be concluded that the conditions for river BCSs have to be highly controllable, thus many potentially attractive rivers cannot comply with them without hard engineering solutions.

1. Introduction

Marine coasts are multidimensional systems, in which the natural and human subsystems are in a continuous, dynamic and complex relation (Ariza et al., 2008a; Roca & Villares, 2008). They are home for many fragile ecosystems are highly vulnerable to the risks of natural processes as well as socioeconomic activities. The coastal zone is limited and subjected to multiple uses, which in some cases are conflictive (Lechuga, 2002). Very similar situation present rivers that involve similar problems of use conflicts and fragile balance between environment and entropic activities.

Although one of the dominating uses of the coastal zones is recreational that has been growing steadily from the mid XX centaury (De Araújo & Costa, 2008), the rivers have never managed to build the same level of attraction. Nonetheless, the constant development of mass beach tourism has led to the point that the supply of clean sandy beaches will be a critical factor in the future (Orams, 2003).

In the last decade Latin America has witnessed development of many beach certification schemes. However, these certifications apply to marine beaches only. On the other hand, fast development of not only international tourism, but more importantly domestic tourism in Latin American countries has led to increased demand for leisure activities. It is especially the case of large cities that are major generators of domestic tourists that more often look for less expensive and high quality destinations that are close to their place of residence. The coastal cities do not have major issue in this respect, but for located deeply inland cities such as Bogota in Colombia it is almost a requirement to have a variety of tourist destinations that would provide leisure attractions for almost 7 million inhabitants.

Tourism beach certification schemes have been widely implemented in marine coastlines around the world. Based on some of the most important beach management principles their aim is to sustain good environmental conditions, while providing important assets for tourism activity (Nelson & Botterill, 2002; Marin, 2006). Nonetheless, implementation of a beach certification scheme on a river bathing area is questionable and it has never been done before. River bathing areas have very different conditions from marine ones and thus there are a lot of factors that should be taken into consideration. The feasibility of this endeavor is a question that will be answered in this document, although in a very general terms as the topic is very new and there is no previous research in this area.

1.1. Problem analysis

Bogota is located 9 and 15 hours by car from Pacific and Caribbean coasts respectively. This large distance requires either one whole days of travel by car or by a 1.5 hours flight. Both options are time consuming and expensive, thus, there is a demand for water based attractions that are easier to reach and more appropriate for short haul holidays. Rivers can fulfill this role.

Although rivers are not attractive enough to attract tourists to stay over for few days, their main function is to provide an alternative for people who live far from the sea. Normally they stay for one day or a weekend, but they avoid the cost of travel in terms of money and time. This type of tourism is especially important in a country such as Colombia, where a great proportion of the population lives in the capital city of Bogota located over 2000m above the sea level. I consequence, the temperature during the day osculates around 20 degrees. On the other hand, just 1.5 hours away, in the low lands, there is tropical weather and rich hydric resources in terms of hundreds of rivers. The rivers provide economic alternative to the marine coast, which is located hours away or require air travel.

Meta is rich in crystal clean rivers that could be used as important tourism assets for the entire region. Pursuing quality and safe experience, the rivers might not be the best attractions for water-based activities. It is commonly thought that rivers are more dangerous and provide less experience than marine beaches. Having that in mind, the marine beach certification schemes are a good tool for assessing if river bathing areas can match marine bathing areas in terms of safety, environmental quality, service, security and management. In terms of aesthetic value it is much more difficult to judge and it is not the subject of this document.

A prefeasibility study has an objective of giving the general picture of possibility of implementation of a beach certification scheme to river environments. It is also important to note that beach certification schemes are used as tools to assess the viability for development of river-based beach tourism. It is not the main objective to implement a beach certification, but rather to evaluate if safe and high quality tourism can be developed around river resource. Many specific for rivers factors have to be considered, but the outcome is crucial for understanding of a real potential that have rivers for tourism development.

1.2. Objectives and research question

General objective:

- Conduct prefeasibility study for application of a beach certification scheme on a river bathing areas in Meta, Colombia

Specific objectives:

- Characterize the state of river bathing areas in the world and in Colombia
- Define general preconditions that a river has to avoid in order function as a bathing area
- Assess if river bathing areas of Meta are able to comply with BCSs' requirements.

1.3. Methodology

The research is based on compliance aspects found in Latin American beach certification schemes. Despite the existence of a BCS in Colombia, the objective of this research was to look at application feasibility of general requirements, not of a particular certification. This choice is partly conditioned by the fact that currently there is no Latin American certification that can be directly applied to fluvial beaches, thus if one is to be created, it needs to take into account general aspect considered of the mayor importance by different certification schemes. In this way, the set of requirements used in the project was defined by Botero (2008), who carried out a research on general requirements of existing Latin American certification schemes. These requirements were further extended based on experience carried out from a project "Development of a rating and environmental certification system for tourist beaches", financed by the Tourism Promotion Fund in 2008 (Zielinski & Botero, 2012).

The first phase of the research was to take a closer look and analyze general aspects of existing fluvial tourist beaches. There are some characteristics that a beach and a river must have in order to cope with requirements to become legally established bathing areas. This phase was based on the secondary research carried out using internet sources and scientific databases.

Due to the size of the area of the State of Meta there was a need to implement prioritization filer that would facilitate the choice of rivers with highest tourism potential. For this a two-stage method was designed. In the first stage, the whole municipalities were eliminated from the list due to three key factors: safety, accessibility and lack of river based attractions.

The second sage was a research conducted in November 2013 in Meta. Between 5th and 30th of November, 28 bathing areas were analyzed in 12 municipalities of the State of Meta (Figure 1). Through a rapid checklist, a set of visible characteristics was assessed in order to identify the compatibility of each bathing area's with requirements set by certification schemes. The checklist was an improved and extended version of a tool used by the Colombian Ministry of Commerce, Industry and Tourism to evaluate the level of attractiveness of natural tourist attractions (MCIT, 2010). The checklist takes into consideration the level of deterioration of the natural environment in terms of: air pollution, water pollution, visual pollution, acoustic pollution, state of nature conservation, diversity, singularity and importance as a tourism attraction. Additionally, some points were added such as the presence of sandy beach, level of space for recreation inside and outside of water, infrastructure, pollution of the space outside of water, river safety, accessibility, quality of current infrastructure, services offered and life guarding. The score received by each bathing area was used as one of three factors that determined the potential that the beaches have for tourism development. However, the tourism potential is not the subject of this document, although it was used as one of the filters. Finally the 28 bathing areas were used to assess the preconditions needed to implement a beach certification scheme.

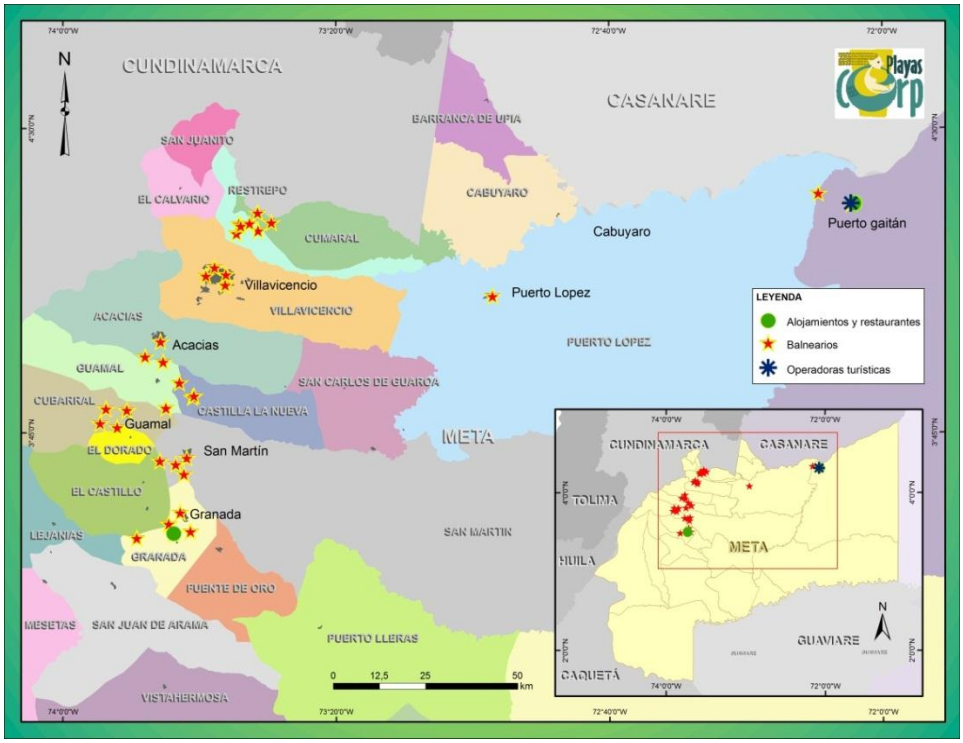

Figure 3 Map of the State of Meta with analyzed river bathing areas

In order to assess additional, not visible conditions, various interviews were carried out with the people who know the river in different seasons of the year. Based on the results in the evaluation lists and interviews carried out at every river, a final list of preliminary conditions that a river beach must avoid was created. The conditions were integrated into a table. Those conditions are crucial for a river bathing area to be able to strive for a certification scheme. It has to be noted that without avoiding these negative conditions, the process of river beach certification cannot be started.

Finally, the set of beach certification requirements defined by Botero (2008) was applied to the “El Malecon” beach in Puerto Lleras. The evaluation was carried out through secondary research and three visits to the beach. Puerto Lleras was chosen by the project to be a pilot municipality that will take part in more detailed analysis than the rest of river bathing areas in Meta.

During the first visit, the local stakeholders that have their business in the area were interviewed. During the second visit a tool designed to evaluate the level of compliance with beach certification schemes was applied. The checklist was based on the original requirements by Botero (2008) and additional requirements that were discovered during the previous phase of the project. The categories used in the study were:

- Environmental characteristics
- Level of pollution
- Services offered
- Safety risk

- Information and educational activities
- Management of the bathing area

For each requirement a list of level conditions was created. The levels were assigned from 1 to 5 depending on the level of compliance of each requirement. For example a requirement called "monitoring and protection of the ecosystem" could be assigned in Level 1 to Level 5 depending on how many aspects comply with Level 5 requirements (Table 1).

Table 1 Five level conditions for "monitoring and protection of the ecosystem" requirement

Description	Lvl.
Monitoring is not being carried out and there are no documents and/or monitoring plans. A certified laboratory is over 100km away. The municipality has no capacity to carry out monitoring; there is no equipment and personnel knowledgeable on the topic.	1
There is a monitoring plan, although it is not implemented. There is no personnel able to implement it. There are no plans and programs aimed at ecosystem protection, but there are personnel with knowledge to create and implement one. There is one or more laboratories able to analyze samples within the municipality.	2
There is a monitoring plan, but only some of the required parameters are sampled at least once a year. The sample analysis is carried out in uncertified laboratory. There are plans and programs aimed at ecosystem protection, but they are not executed in any way. There are people able to carry out this kind of activity working for the municipality.	3
There is a monitoring plan that is executed periodically at least twice a year. The staff that carries it out is capacitated. The sample analysis is done in a certified laboratory. There are ecosystem protection programs and plans, but they are not executed. The monitoring results are available to the public.	4
The monitoring is carried out with a minimal frequency 4 times a year. The samples are analyzed in a certified laboratory and the results are available to the public. There are ecosystem protection plans and programs that are executed by knowledgeable personnel. All information is available to the public.	5

The final level score in each category was further divided into 3 levels: low, medium, and high to show how far a bathing area has gone or how ready it is to receive a certification scheme. It has to be underlined that the requirements are basic and do not grant any certification. However, compliance with all the basic aspects guarantees high level of preparedness to opt for a real specific certification scheme.

Another aspect that is a limitation of the 5 level system for compliance with each requirement is the fact that although all of them can receive level 5, some of them are very easy to achieve and some of them difficult and expensive. In consequence, a beach which scores medium or even high in easy to implement and low cost requirements might still need a lot of work, effort and money to achieve the highest level. This particular condition was not taken into consideration because it is not the objective of this evaluation. The main objective was to show if it is feasible to implement a certification scheme to a river bathing area, thus the main factor was to prove the possibility to comply with all requirements and not estimation of the effort of a particular bathing area to reach a certification level. In this framework, feasibility of each requirement was assessed and existing limitations to reach level 5 were listed.

2. Theoretical framework

2.1. Integrated coastal management and beach management principles

With the objective to face the negative impacts of human activity over the planet, in 1992 at the United Nations Summit the concept of sustainable development (SD) was introduced. The SD can be defined as development that satisfies the present needs without endanger the capacity to satisfy the needs of future generations (WCED, 1987). In this way, the SD concept implies that it is possible to reach economic development and in the same time protect the environment.

During the same Summit, the integrated costal management (ICM) principles were introduced that was seen as the model for development of the world´s coastal zones. The concept is based on the same principles as SD, but applied to marine and coastal resources. ICM is fully supported and promoted by international organizations such as UNEP, FAO, OCDE and EUCC, because of the methodological framework that is seen as the most appropriate for development and management of coastal zones (UNEP, 2009). In this way the ICM has become the framework for management of different coastal activities such as fisheries (FAO guidelines) and more recently the coastal tourism.

At the micro (local) level, the aforementioned fusion was applied on beaches that have been exposed to intensive use from tourism activity. In the same ICM framework the integrated beach management was born, which is an application of those guidelines at the local scale (Botero & Hurtado, 2009; Williams & Micallef, 2009). According to Bird ECF (1996, cited in Micallef & Williams, 2002) the integrated beach management can be considered an initiative to maintain or improve a beach as a recreation resource and means of coastal protection, providing facilities that satisfy wants and needs of the beach users. This concept includes development and enforcement of regulations and decisions on location of structures needed to facilitate the use of the beach environment.

The beach management aims at optimal development of a beach having in consideration physical use that respects natural physical elements of the environment, at the same time meeting social needs of beach users (Williams & Micallef, 2009). These definitions are oriented towards the beach users, which is an important factor in relation to the competence of the socio-economic and environmental interests at the coast. For this reason it can be said that the prioritization of type of management depends on the management objective. Normally, the management is focused on improvement of tourist commodities, or in the contrary, on beach conservation, depending on the type and intensity of use of a particular beach (Micallef & Williams, 2002).

According to Micallef & Williams (2002), generally an effective beach management can be achieved as a result of:

1. Management philosophy: where beach management should focus on understanding and working with natural processes if the management plans aim at long term effectivity.
2. Understanding of coastal processes including identification of sediment sources and its transport characteristics.
3. Availability of data on coastal processes and characteristics related with sediment.
4. Use of adequate management practices that incorporate application of different techniques and professional expertise in order to analyze correctly the coastal problems, having in mind that beach management is essentially a work of multidisciplinary team, because one person cannot understand the total complexity of a coastal zone (Williams & Micallef, 2009).
5. Development of an affective legislation and execution and enforcement mechanisms. In this case, the beach management would determine not only environmental roles, but also the roles and responsibilities of different governmental institutions, whose jurisdiction directly or indirectly applies on the beach.

As a result of application of appropriate environmental management it is possible to achieve optimal use of the beach resources to provide coastal defense, recreation and/or environmental conservation. High priority should be given to identify beach user's preferences, which reflect the social consideration in the management of natural resources (Micallef et al., 2002; Marin et al., 2009; Phillips et al., 2009; Roca et al., 2009; Williams at al., 2009; Oh, Draper y Dixon, 2010).

2.2. Integrated beach management and beach certification schemes

The beach certification schemes (BCS) are widely considered to be one of these tools for sustainable management of beaches, filling the gap between recreation and conservation (Nelson & Botterill, 2002; Marin, 2006). According to FEE (2010), the BCSs are recognition of the environmental protection and tourism quality of a beach. Their objective is to evaluate the characteristics of a particular beach through measureable compliance criteria. Thereby, the BSCs function as quality and environmental management systems linked together.

Nonetheless, the BCSs have been widely criticized by scholars such as Micallef, Morgan & Williams (1999), Boevers (2008), Phillips & House (2009) and Williams & Micallef (2009) for their orientation towards beach user satisfaction and the management objectives centralized on improvement of the tourism facilities. A great deal of criticism is dedicated to the lack of aspects related with socio-cultural sustainability such as participative management, inclusion of the community values and stakeholders' perceptions (Nelson et al., 2000; Boevers, 2008). It is evident that the top-down approach to management dominates in the case of beach certifications and in the field of beach management in general (Williams & Davies 1999; Marin et al., 2009; Roca, Villares & Ortego, 2009). Finally, there are a growing number of studies that demonstrate incapacity of beach certifications to attract visitors, caused by marginal public

recognition of the schemes (e.g. Nelson et al., 2000; Nelson & Boterrill, 2002; McKenna, Williams & Cooper, 2011).

Nowadays, there is an increasing variety of beach certifications in Latin America. Each BSC is based on a list of specific requirements or compliance aspects that can vary greatly from one scheme to another. In this context, many Latin American countries have chosen to create their own schemes, according to their necessities, specifications and the national legislation. In consequence, the number of compliance aspects and their vary from one BSC to other. Although the schemes are based on the same general beach quality indicators used globally (Arellano & Espejel, 2009), each BSC gives more importance to certain categories of requirements over others.

It should be noted that the studies published on beach certification schemes are very scarce. The existing research is focused either on specific aspects of beach management such as litter (De Araújo & Costa, 2006; Storrier et al., 2007; Ariza, Jiménez & Sardá, 2008), infrastructure and services (Lechuga, 2002;), quantification of beach users (Jiménez et al., 2007; Guillen et al., 2008), safety (Ballantyne, Carr & Hughes, 2005; Harada, Goto & Nathanson, 2011) or the users' perceptions (Cervantes et al., 2008; Lubinsky et al., 2009; Marin et al., 2009; Oh, Draper & Dixon, 2010), although rarely in the context of beach certifications.

This scarcity of studies that approach beach certifications in a non-fragmented manner generates confusion about the terms and definitions, raising a need to standardize the concepts. The different beach classification systems proposed by Pereira et al. (2003), Micallef & Williams (2004), Espejel (2006), De Araújo & Costa, (2008), Williams & Micallef (2009) and Arellano & Espejel (2009) are not always able to accommodate all of the certifications' requirements. In consequence, their applicability is limited and it is rather difficult to compare them in a common framework.

In this context, Botero (2008) carried out a research in order to facilitate comparative studies among different schemes. Additionally, a relevance analysis of the requirements was carried out based on their frequencies in each scheme. The results of his study were a set of categories that include the most import aspects are: environmental, service related, security & safety, education & information, and management. The list of requirements was further extended based on the results of xxx project.

2.3. Categories and compliance aspects defined by Botero

The requirements proposed by Botero are based on a research of existing Latin American certification schemes and experience derived from a project in Colombia. As a result five distinctive categories were created to accommodate requirements. For the purpose of better understanding, the descriptions of each requirement can be found in the chapter 5 of this document.

The objective of the **environmental** requirements is to gather information about the environmental and sanitary condition of the beach, necessary to maintain control over impacts produced by the tourism activity. Normally, these impacts can be measured through: 1. Environmental parameters; 2. Analysis of the ecological structure of the ecosystems; and 3. Completed environmental management actions. The environmental parameters are measured to control the sand and seawater quality, in order to guarantee safety of the beach users; thus, they are usually based on the national legislation.
Most common basic environmental requirements: Presence of garbage cans, Sewage discharge measures, Promotion of recycling, Solid waste management, Protection and monitoring of ecosystems, Landscape protection measures, Water quality analysis, Sand quality analysis, Prevention from acoustic pollution

The **service-related** compliance criteria make a reference to the infrastructure, including the limits of the bathing area and access roads, and the economic activities carried out informally by individuals (stationary shops and beach peddlers) or formally by public institutions (sand cleaning and oxygenation service) or private companies (hospitality sector) with the objective to satisfy the needs and wants of the consumers – the beach goers. These requirements are described by scholars as fundamental elements in the users' decision making process (e.g. Yepes & Cardona, 2000; Arellano & Espejel, 2009; Williams & Micallef, 2009), at the same time they are widely acknowledged to be the principle factors leading to destruction of the natural environment (Micallef & Williams, 2002; Nelson & Botterill, 2002; Gheskiere et al., 2006; Malm et al., 2004; De Araújo & Costa, 2006; Schlacher & Thompson, 2008; Defeo et al., 2009).
Most common basic service-related requirements: Accessibility, Regular cleaning, Sanitary facilities, Availability of drinking water.

The **security and safety** requirements refer to the physical integrity of the beach users. The former group of requirements defines guidelines for the surveillance and protection, through the presence of the police or private security, while the latter focuses on the risk management and lifeguarding, providing protection of the beach users from threats such as rip currents, red tides or dangerous coastal construction zones. According to beach users these requirements are fundamental for the beach quality (Cervantes et al., 2008).

It should be noted that the studies on the beach safety have been focused mainly on the sanitary conditions, namely on the microbiologic and physicochemical seawater and sand quality (e.g. Williamson, 2006; Ashbolt et al., 2010). On the other hand, authors such as Hartmann (2006), White & Hyde (2010) and Harada et al. (2011) have focused their research on

beach users' safety, evaluating the relation between drowning accidents and the presence of lifeguards. The studies of beach security are even scarcer and there are only a handful of researches carried out on certified beaches. As concluded by George (2003), Ballantyne et al., (2005) and Sherker et al., (2010), the knowledge and security practices are deficient on the beaches studied by the authors. Finally, it should be noted that none of these studies was conducted in Latin America, where the subject is still to be explored.
Most common basic security and safety requirements: Safety of accessibility, Safety & security plan, Lifeguarding, First aid assistance, Prohibitions, Risk management plan

The **education and information** requirements, in general terms, are linked together, thus they make up one category. The first type of requirements is related with the disclosure of information to the public, such as beach environmental quality, prohibited activities, beach signage, the limits of the bathing zone and other information relevant for the appropriate use and enjoyment of the beach. This information is normally displayed on signs and boards, which often are predetermined by each certification scheme. On the other hand, the education requirements are related with the plans and programs aimed at teaching beach users about importance of the environment, the impacts of inappropriate use and other subjects within the framework of environmental education. The objective is to promote environmental behavior and foster environmental and sometimes cultural consciousness of the visitors and the people working on the beach. The education and information is often considered to be the key solution for the problem of littering (Bravo et al., 2009) and for the beach safety (Yepes & Cardona, 2000). Nonetheless, this category is also the one that has drawn least attention of researchers.
The most common basic education and information requirements: Signage at the bathing area, Information board, Code of conduct

The **management** requirements are criteria that promote, facilitate or impose better organization of the beach, aiming at sustainable development through environmental management and active participation of the local stakeholders. They can be interpreted as the total control over the beach related decisions and activities by institutions or organizations (Kay & Alder, 1999), hence they are directly related with the management of day to day activities in the beach zone. The management category is set in the integrated beach management's core principles, which is nothing else than application of coastal management's guidelines at the local level. "Beach management seeks to achieve optimal physical usage and development of beach resources that respects the natural physical elements of a beach environment while satisfying basic social needs within that environment" (Williams & Micallef, 2009: 3). Thus, beach management is based on expertise, stakeholder's cooperation, local knowledge, shared responsibility and clear management objectives that depend on agreed beach uses. In this context, Steer et al. (1997), Yepes, Esteban & Sierra (1999) and Rubio (2005) suggest articulating a local beach management body in charge of planning, coordination and management that would also focus on optimization of the human, financial and material resources.
Most common basic management requirements: Zoning, Organization of beach peddlers, Tourist carrying capacity

3. River beach tourism in the world and Colombia

3.1. General characteristic of river bathing areas

Currently river beach tourism is not a mayor economic activity on a global level. Based on research of river based tourism articles in specialized journals it is clear that until today the only tourist products that have been developed in countries that are rich in hydric resources are related to sports such as rafting, tubing and sport/recreational fishing. There are very few examples or river based bathing areas and scientific research on the subject in practically nonexistent.

From the tourism point of view, the mayor advantage of marine beaches over river beaches is the sensation of infinity, sand and space that provide marine beaches in comparison to limited space and often rocky bottom of rivers (Zielinski & Avellaneda, 2013). These are just few examples. In reality, the river based sport activities are unique products that have been designed with the river environment in mind and thus managed to be positioned on the market.

The importance of marine beaches for tourism development is related not only to its natural beauty as its main attraction factor, but also to the space that it provides for many visitors that in consequence allows development of a tourist destination around the main resource – the beach.

The rivers have very different conditions. The high flow rivers are normally the main rivers that carry waters from many smaller rivers. Many of these small rivers flow through agricultural, industrial or urban areas and thus are polluted by all sorts of contaminates. In result, these rivers have no conditions to be tourism assets. On the other hand, smaller rivers that are more likely cleaner and have better natural conditions, because of its size or limited water flow are unlikely to provide a base to develop a tourist destination.

It has to be noted that in Europe, USA, Canada and Australia the recreational function provided by aquatic resources other than sea belong to lakes, rather than rivers. Lakes have characteristics that allow development of whole tourism destination around the resource. In general terms, they provide an area large enough to develop many small recreational centers, each of them with its own bathing area. Additionally, the lakes offer conditions that are easier to control in terms of currents, dangerous zones and bottom material is normally silt or sand. These are the main reasons why river based bathing areas are not developed as much as river on the global scale. Despite low popularity, there are river based bathing areas. Those that exist can be classified in three main groups:

1. Urban river bathing areas

Urban bathing areas can be found close to urban areas of a city. Normally they are well established in time and have developed supporting infrastructure and have been subjected to engineering solutions to protect the shore; enforced embankments, barriers, dams, dredged bottom and other artificial protection measures are common. These solutions are done either to

limit bathing zone, create the water level high enough for bathing, create more space or control the water flow. On the other hand the urban bathing areas have highly develop tourist facilities such as restaurants, shops, parking area and pace for sport activities. In some cases the water in urban bathing areas is not suitable for bathing, but the beach and area around it provide recreational facilities and good conditions for sport and leisure activities.

2. Natural river bathing areas

This kind of bathing areas have very good natural conditions in terms of water quality, transparency, natural landscape (vegetation and landscape features), with very little human intervention and low level of infrastructure. The rivers have normally rather low flow, which means that it is not far from its source and thus have not been exposed to pollution from terrestrial sources. This type of bathing area does not have tourism infrastructure or it has very basic one. As a consequence of good environmental condition, the natural bathing areas are regarded to be attractive for western visitors.

The natural bathing areas have high potential to position themselves as tourist destination, but they require high investment and are rather risky too invest due to long period of the return on investment. Nonetheless, the river with exceptional quality can be converted into high quality bathing areas and attract visitors that normally would not visit a river in its natural condition.

3. Certified river bathing areas

These are the urban or natural bathing areas that offer natural conditions and infrastructure and services of quality that is high enough to meet certain specific requirements. To the knowledge of the author, based on detailed research, currently in the world there is no certified river beach, although one located in Spain is ready and will apply for a certification in 2014.

The beach certifications are schemes that evaluate characteristics of a particular beach, normally touristic, through measurable criteria (FEE 2006 in Botero, 2008). The implementation of a beach certification scheme (BCS) is voluntary and the benefit is related not only with the conservation of the beach environment, but also with recognition and differentiation of a beach as a tourism product.

The certification aims at touristic use of a beach, where the managers are confronted with a task of administrating in a correct manner a resource, services and security and safety. Various studies on the topic (Micallef et al., 1999 in Williams et al., 2009; Phillips et al., 2009) show that the majority of the certifications are related with parameters that aim at meeting the needs of visitors such as:

- Resources: beach surface, environmental quality, flora and fauna, etc.
- Services: beach accessibility, showers, toilets, etc.
- Security and safety: lifeguards, dangerous zones, signage and navigation routes, etc.

In this way it is possible to certify a natural beach, but it requires a certain level of infrastructure, which takes away from the natural condition of a beach. There are not many cases of certified natural marine beaches, except few beaches that are certified by schemes specially design for natural beaches. It is due to the fact that only beaches that receive big amount of visitors or are financed by the municipality can sustain the cost of maintenance.

3.2. River bathing areas around the World

The activity of bathing in natural rivers and lakes is called “Wild Swimming” in England and the place itself where once can bath in natural conditions is denominated “swimming hole” in the USA. In Europe and North America, in order to be attractive, the bathing areas should meet few of the following characteristics (Willimas et al., 2011):

- Water quality
- Bathing area and leisure area free of garbage
- Safety
- Attractive landscape: this characteristic can be divided in few more aspects such as water color and transparency, availability of sand and its color, presence of landscape features such as mountains, valley, waterfalls, cliffs, rocky formations or presence of historical villages / historical infrastructure.

In this way, it is possible that an attractive bathing area had good water quality, could be clean and offer variety of services and not offer attractive landscape. In the same way, it is possible that a bathing area does not have any infrastructure and services, but offer very attractive landscape features and thus is considered attractive by visitors. The attractiveness of landscape features is one of the main factors in the decision making process by potential visitors, which is confirmed by studies by Williams et al. (2011) and Botero et al. (2013).

The river bathing areas established as tourist destinations exist in Europe and North America, but they are not so many of them. Their role is to provide recreational function to the urban centers (Figure 2 and Figure 3), be a supportive attraction to more popular attractions and destinations, normally historical or natural (Figure 4 and Figure 5).

Figure 2 Hidropark Beach in Kiev (Ukraine) is an urban beach located at the Dnieper River few metro stops from the city center. The beach offers swimming, volleyball, restaurants, gym, water sports, discothèque and casino. There is lifeguard station and towers, but the beach is not managed according to some particular scheme or rules. Pictures: www.gidropark.org.ua

Figure 3 The urban beach of Neva River, next to the Peter and Paul Fortress in St. Petersburg (Russia). The beach is currently not in a very good environmental condition. The water quality is not sufficient for bathing, but the beach provides space for variety of leisure activities. Pictures: http://www.petersburg-lodging.com/st-petersburg-russia-pictures

Figure 4 Natural/historical river bathing area on Schwäbis River in Switzerland. The bathing area was constructed in 1869/70 and renovated in 2006. The infrastructure includes a restaurant, changing rooms and access for handicapped people. The main role of this bathing area is to provide support for the main historical and natural attractions in the area. Pictures: www.thun.ch

Figure 5 Natural river bathing area at Robert H. Treman State Park, Ithaca, NY (USA). It is a State Park that established the swimming area that includes lifeguarding service. The natural areas can provide high level of experience due to the beauty of landscape formations and clean waters. Picture: John Rozell / NYS Parks

In the south of France the river beaches seem to be more popular that in many other European countries. The bathing area of the Cesse River is located in the village of Bize-Minervois, known for wine production and considered one of the most attractive in the area (Figure 6). This is one of the examples of Mediterranean river bathing areas that are visited by locals and people who rent villas in picturesque wine villages to spend few days up to a week. This form of holidays in rural areas in Mediterranean region is getting more popular since the 1990s. It should be noted that in many of these type of bathing areas in south of France, the water quality is measured by the local authority regularly during the summer season. Also, the presence of life guards is very common.

Figure 6 Bathing area on Cesse River, France. The rocky beach offers life guard service and regular water quality check in summer season. Pictures: http://www.creme-de-languedoc.com/

Figure 7 River bathing area in Lagrasse village, France. The river flows through the center of the village. During the summer season the river is dammed to increase its water level. Picture: http://www.creme-de-languedoc.com/

The fluvial beach certification is a very recent phenomenon, to the point that the author's research revealed that there are only few fluvial beaches certified and all of them are lake beaches. There is one certified beach in Span and two in Portugal, all of them received the Blue Flag in the recent years.

The most famous lake bathing area located in Spain is La Costa Dulce (Figure 8). It is characterized by an artificial beach without sand; it is made of asphalt. However it is well prepared to satisfy the needs of 3000 habitants of the nearby village Orellana la Vieja and the people who live in the area. The beach is well equipped according to the requirements of the Blue Flag.

Figure 8 La Costa Dulce beach (Spain). Picture: Raul.G.Coto

There is only one river beach that will apply for the Blue Flag in 2014 (Image xxx). The beach is located on the Leréz River in city of Pontevedra in Spain. The bathing area was established in 2009 and quickly became the favorite place for people from the area. The beach is located 3km from the mouth of Lerez River. Currently there is presence of life guards, systematic water quality measurement that has been carried out for years now and many other facilities that help take the beach to the certification level in 2014.

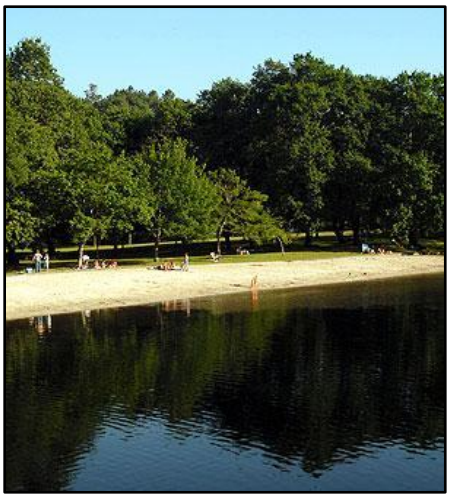

Figure 9 Pontevedra Beach on Lerez River - the only river bathing area striving for Blue Flag.
Pictures: http://www.minube.com/fotos/rincon/

The blue Flag is an award that is given to beaches and marinas that comply with a series of specific requirements. Blue Flag is currently present in over 30 countries in regions including Europe, South America, New Zealand, Canada and Caribbean. The compliance with the Blue Flag's criteria has to be made in various categories (Blueflag.org):

1) Environmental Education and Information

- Information about the Blue Flag must be displayed.

- Environmental education activities must be offered and promoted to beach users.
- Information about bathing water quality must be displayed.
- Information relating to local eco-systems and environmental phenomena must be displayed.
- A map of the beach indicating different facilities must be displayed.
- A code of conduct that reflects appropriate laws governing the use of the beach and surrounding areas must be displayed.

2) Water Quality

- The beach must fully comply with the water quality sampling and frequency requirements.
- The beach must fully comply with the standards and requirements for water quality analysis.
- No industrial, waste-water or sewage-related discharges should affect the beach area.
- The beach must comply with the Blue Flag requirements for the microbiological parameter faecal coli bacteria (E.coli) and intestinal enterococci/streptococci.
- The beach must comply with the Blue Flag requirements for physical and chemical parameters.

3) Environmental Management

- The local authority/beach operator should establish a beach management committee.
- The local authority/beach operator must comply with all regulations affecting the location and operation of the beach.
- The beach must be clean.
- Algae vegetation or natural debris should be left on the beach.
- Waste disposal bins/containers must be available at the beach in adequate numbers and they must be regularly maintained.
- Facilities for the separation of recyclable waste materials should be available at the beach.
- An adequate number of toilet or restroom facilities must be provided.
- The toilet or restroom facilities must be kept clean.
- The toilet or restroom facilities must have controlled sewage disposal.
- There should be no unauthorised camping, driving or dumping of waste on the beach.
- Access to the beach by dogs and other domestic animals must be strictly controlled.
- All buildings and beach equipment must be properly maintained.
- Coral reefs in the vicinity of the beach must be monitored.
- A sustainable means of transportation should be promoted in the beach area.

4) Safety and Services

- An adequate number of lifeguards and/or lifesaving equipment must be available at the beach.
- First aid equipment must be available on the beach.
- Emergency plans to cope with pollution risks must be in place.
- There must be management of beach users and events to prevent conflicts and accidents.
- There must be safety measures in place to protect beach users.
- A supply of drinking water should be available at the beach.
- At least one Blue Flag beach in each municipality must have wheelchair and accessibility features.
- Wheelchair access and accessibility features must be in place for at least one Blue Flag beach in each municipality.

3.3. River bathing areas in Colombia

The situation of river beach destinations is similar in Colombia, although there are not so many lakes, thus rivers provide more viable option for fluvial bathing areas. Similarly as in the case of European and North American bathing area, they can be divided into the same categories; they also have the same functions. The urban bathing areas provide a variety of leisure services to the nearby inhabitants. However, the infrastructure of urban beaches in Colombia is almost nonexistent and it is mostly centered in the food and beverage category, not in accessibility, water quality and safety like in Europe and North America. This limitation is due to the limited interest and budget of the local municipal authorities to invest public resources in this type of leisure activities.

A good example of this practice is the main leisure zone in the city, and probably the most known river bathing area in Colombia, the Hurtado Bathing Area on the River Guatapuri in the city of Valledupar (Figure 10). The bathing area offers simple infrastructure focused on food and beverage, but it fails to deliver simple facilities such as safe access points, life guards and first aid, in other words, there is neither official organization nor management, even though it is an important place for leisure culture of the whole city.

Figure 10 Hurtado Bathing Area on the Guatapurí River - the principal tourist spot in Valledupar.
Pictures: http://rioguata.blogspot.com/

The other example of an urban river bathing area is Guayabal in Cocorna (Figure 11). This place similarly to aforementioned Hurtado has only basic food and beverage infrastructure. Although it provides better access to the water, the basic safety and environmental measures are completely absent.

Figure 11 Guayabal bathing area in Cocorna Pictures: jgallegog (user at Panoramio.com)

Besides very few urban bathing areas the great majority are natural that do not have any infrastructure, management and ownership (Example Figure 12 and Figure 13). These river bathing areas are often of stunning landscape beauty and good water quality, and offer higher potential to become tourist destinations than the urban ones. However, they have several common disadvantages in terms of poor accessibility and thus lack of ability to attract enough visitors to justify the investment they require. Depending on the area where they are located, often the rivers are affected by rainy seasons. After heavy rainfalls rivers tend to flood surrounding areas, they become dangerous for bathers and their water quality is questionable.

Figure 12 La Mina bathing area, on the Badillo River, State of Cesar. Pictures: laminacesarr.blogspot.kr

Figure 13 Rio Hacha Bathing Area, Florencia, Caqueta.

The Colombian river bathing areas are very similar to the western counterparts, although the western bathing areas that do not belong to “wild swimming” category normally are under some kind of management, normally from the local municipality or a private owner that developed a recreational center around the resource. In this way, for the western bathing areas the safety, security and water quality are the aspects of highest importance. This is directly related with the status of public use that in western word is treated seriously and given a budget for maintenance and management. Normally the beaches are financed by local authorities and they are open for public use. In Colombia the lack of budget and interest in protection and management of public space are evident. The dynamic presented by public space is very different and it is focus on illegal provision of private services that use the opportunity given by the presence of visitors. It is very uncommon to see bathing areas, even marine ones, to receive fixed annual budget for maintenance and operation. In consequence, there are almost no managed bathing areas in the whole country.

3.4. River bathing areas in the State of Meta

The State (also called Department) of Meta is one the 32 states of Colombia (Figure 14). It is located in the center of the country. Its capital is called Villavicencio and it is located 90km from the Colombian capital city of Bogota. The State of Meta is one of the largest states with the area of 85.770 km², which equals of 7.5% of the total national territory. The state is very rich in hydric resources due to the proximity of the Cordillera Oriental - the widest of the three branches of the Colombian Andes.

The following bathing areas were used to define the main problems that have to be either absent or overcame in order to apply for a certification scheme. The final table that characterizes the bathing areas includes all of the visited ones, while the following descriptions are of the bathing areas that are the most representative for those characteristics. The main characteristics found in these bathing areas are typical for rivers in the state of Meta and thus should be included in a pre-requirement check, before a decision about starting a preparation process for implementation of a certification scheme is made.

Figure 14 Location of the State of Meta in Colombia. Figure Source: http://www.tecna.com/

"Caycal"

Figure 15 Bathing area Caycal, Meta

Located 7.6km from the center of a municipal city is a recreation area that has a park, small football field and beach volleyball field. The bathing area is made through damming a small creek creating an artificial swimming pool channeled by concrete walls. The water is supplied by an bypass system that takes water from the river that flow to the swimming basin and then again flow back to the river. This is a very typical system that can be found in many small bathing areas. Although the surroundings is very natural and in good environmental condition (little anthropic inference), the concrete infrastructure was built with donation from the local municipality and receives very little maintenance. In consequence, the deterioration can be clearly seen.

Figure 16 Supporting infrastructure at "El Malecon" bathing area

"El Malecon" (Acacias)

"El Malecon" is a river bathing area that has received most attention from the local municipality and in results it has been developed receiving paved beach front and basic infrastructure that includes park, outdoor sport facilities, public toilets, proper signage, garbage bins and parking lots. Very soon a variety of restaurants and kiosks were built to offer food and beverage to the visitors.

Although the river is rather shallow, the bathing zone is created during high tourist season (December – February), which is also the dry season, through damming downstream using the stones dredged from the bathing area. In this way the dam increases the water level, while dredged stones taken from the river bed increase its depth. Normally, created in this way bathing zone is maintained throughout the year, slowly losing the depth, because after heavy rains the current is strong enough to destroy the dam and carry lots of material back to the bathing zone.

Figure 17 El Malecon during high tourist season (dammed) and low tourist season (shallow water full of river material)

"Puente Amistad"

Figure 18 (above and under) Puente Amistad natural bathing area that is affected by seasonal variations of water supply

This natural (wild swimming) bathing area is located 2.4km from the municipal city of Cubarral. There are no facilities around the area, but the natural setting of the river is stunning, also due to the fact that various rivers that carry crystal water of different colors enter the main river here. The river is known for white water rafting during most of the year except the dry summer season. During the dry season the river flow is much weaker (Figure 18), so is the water depth that does not allow swimming.

The proximity of the mountains that receive a lot of rain and high angle of rivers are the main cause of fast currents. During the rainy season the flow is so big that the whole area turn to a river that carries heavy stones, which can be seen on the picture above. In consequence, when the flow decreases, very often the rivers find completely new bed to flow, different from the last one. This can happen various times even during the same season.

"Puente la Libertad" and "Bocatoma Aguas Claras"

Figure 19 Puente la Libertad and Bocatoma aguas Claras natural bathing areas

These two mountain type natural (wild) river bathing areas can be described together as they both have very similar characteristics. They are located in remote areas, although not far from the municipal city, in the same mountain range. Since they are mountainous rivers, the water quality is very good, but because of high angle of the river flow the current is strong, thus dangerous for swimmers. The number of large stones and the river bed generate vortexes and rapids that even further decreases safety of the bathers. While at "Puente la Libertad" once can find small sandy beaches full of golden yellow medium grain size sand, "Bocatoma Aguas Claras" is located very close downstream from a large dam, thus there is very little sediment on the river bed.

"El Alcaravan"

This bathing area is located 15.1km from the municipality of Granada. It is well known and well established bathing area with basic infrastructure such as restaurants, toilet, and changing rooms. The particularity of this bathing area is characterized by extreme water level change between the dry and wet seasons. During the dry season there are plenty of sandy beaches visible along the river (Figure 21), while during the rainy season the river receives water from many sources thus its quality is low. Moreover during rainy days the level of water is high enough to cover the beaches (Figure 20), although it is still quite safe to swim.

Figure 20 Alcaravan bathing area during rainy season

Figure 21 Alcaravan bathing area during dry summer season

"Humadea" Bathing Area

The bathing area is located in a municipality that is probably receiving the highest number of river bathers in the State of Meta. The Humadea River is the most popular bathing zone with lots of restaurants alongside the river that fill with visitors in the tourist high season (dry season).

Although the bathing area received many visitors during the whole year (mostly during weekends), it has one important particularity that may disqualify its potential. During the rain or after the rain the river has tendency to rapidly increase its water level to the point that water almost flood the area outside of the river channel (Figure 23). In just few seconds the river can become extremely dangerous with water flow similar to high level white water rafting rivers. There have been drowning incidents due to this extreme phenomenon. The unpredictability of the river is very high, because it is common that there was no rain in the area, but there were heavy rains in the mountains thus the water increase come completely unexpected.

Figure 22 Humadea bathing river during dry seaon (left) and after rainfall (right)

4. Factors that define feasibility for implementation of RBCSs

The characteristics or factors that define feasibility are pre-conditions that should not take place in order to certify a bathing area. These characteristics are related to natural conditions that present the reviewed rivers, without much physical atrophic involvement and engineering solutions. Most of these pre-conditions (limitations) could be solved using hard engineering methods, but avoiding them is one of the principal objectives of environmentally sound management. Moreover, the engineering would require large investments not only during the building phase, but most importantly during the maintenance. In consequence, the investment is not likely to be returned as a result of operation. In this framework, the bathing areas that meet the pre-conditions or rather lack of limitations have the highest feasibility to opt for a certification.

Seasonality induced by the rainfall

The State of Meta is very rich in hydric resources. The favorable temperature (Figure 23) and variety of rivers make it a desirable place for tourism development. However, there are climate conditions that have to be taken into consideration before development of river based tourism.

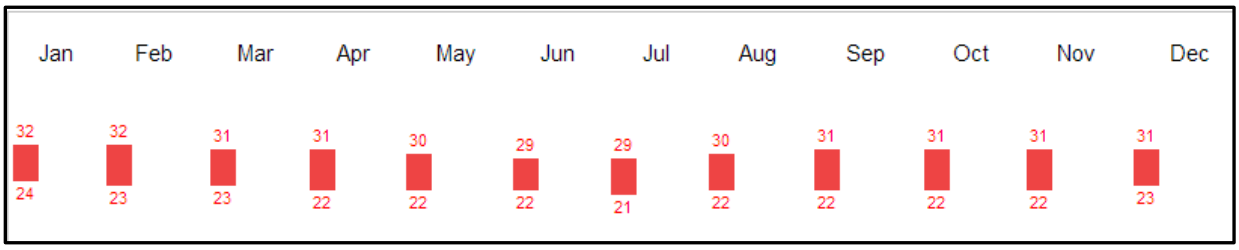

Figure 23 Annual average temperature in Meta. Source: IDEAM

Due to the fact that the region is characterized by high rainfall seasonality, only the three months between December and March are considered to be dry (Figure 24), while during the rest of the year Meta received high amount of rain almost daily. Normally the rainy season is not a major disadvantageous factor for tourist destinations as the weather during the rainy days is often sunny for the most of the day with an hour or two of rainfall, normally at a very specific time of the day. However, in case of Meta the problem is of different nature. The water from the rainfall accumulates and flow from small strings into rivers, not only bringing contaminants from many different land based sources, but most importantly, the amount of water is so big that the water flow become dangerous and often rivers flood the area around the river's channel.

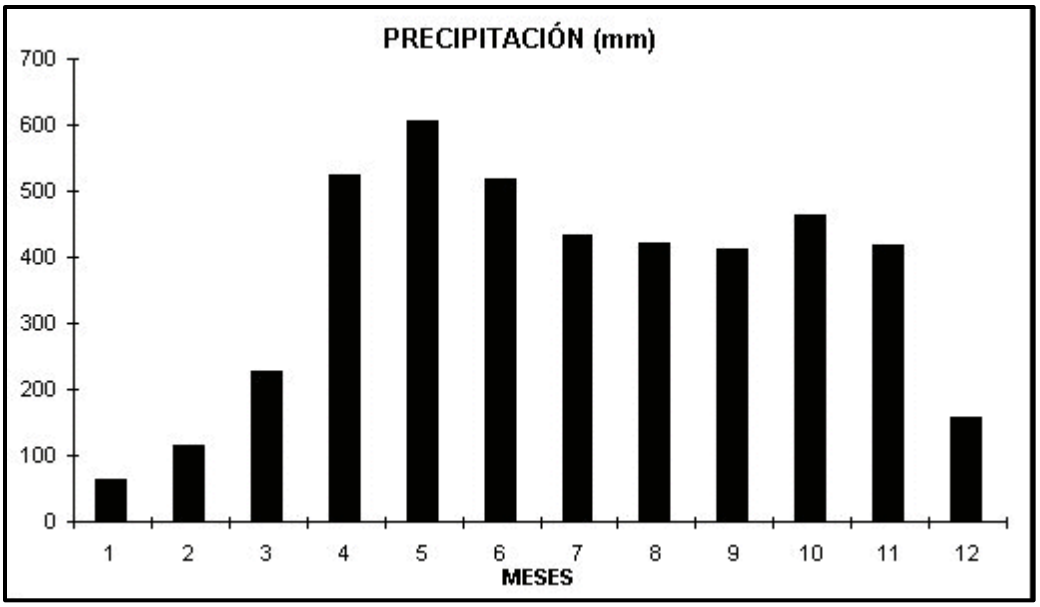

Figure 24 Annual average rainfalls in Meta (mm per month). Source: IDEAM

Although during the months between December and March not every day sees a rainfall and some rainfalls are not strong enough to noticeably affect the water flow, the rainfalls are very unpredictable and thus it is difficult or even impossible to schedule the bathing days on some rivers. When there is a rainfall during few consecutive days it is common that the rivers flood entire area causing damage and danger to people who live nearby.

The seasonality of rivers in Meta highly depends on their location and normal water flow. Rivers that move smaller volume of water for most of the year dry out either completely or turn into small strings during summer months (December – March). During the rest of the year they are manageable and can receive bathers, although the water quality may vary from day to day and the water level can change daily. One of the solutions used commonly in Colombia to ensure bathing in low flow rivers is damming. It is often carried out using the same material from the river (medium to large stones) dredged from the river bed to deepen the bathing zone and placed as a dam down the stream to increase the water level. Although this solution works, the environmental impact of this kind of works is very serious.

Bigger rivers that receive water from many smaller rivers are suitable for bathing only during the summer months (dry season). During the rest of the year they are unpredictable and although there are days that they present good conditions for bathing, there are also days that the flow is so strong that it is dangerous to enter the water.

This seasonality conditions put in question one of the main requirements of every beach certification even developed – water quality and its periodical measurement. Although it is common that after heavy rainfalls marine beaches might receive influences of polluted water, normally from nearby rivers, but the case of rivers is different in this respect. It is possible that between March and December a river in Meta will be constantly under influence of rain water, thus the water quality might change daily. This questions the standard methodology for

periodical water quality measurement that is based on assumption that a long term monthly sampling is enough to show tendiencies. It would be necessary to develop much stricter sampling methods for river bathing areas, but naturally it would be rather expensive to do so.

Negative factors:

- Excessive flooding (increased water level and water pollution during most of the year)
- River drying/low water level during high tourist season and extremely unpredictable water quality level/quality conditions during the rest of the year.

Rapid water level increase

This characteristic is one of the biggest safety concerns that a river bathing area in Meta can have. Some rivers increase their water level as a result of heavy rainfalls for an extended period of time, normally at least few days. This phenomenon had been described in the previous part. Although it is an unfavorable characteristic, it does not challenge safety of the bathers and it can be managed. On the other hand, rapid water increase is a very fast and sudden process that happens in less than a minute. The closest it can be roughly compared to a tsunami or a tidal bore, although on a very small level.

This phenomenon is caused by heavy rainfall in the upper mountain area. Due to the fact that some rivers have very large watershed area, the volume of water that enters the river is so high that it causes very sudden and violent level increase and thus a current that is extremely dangerous for people inside the water.

This particular characteristic completely disqualifies a river bathing area from obtaining any quality certification, unless there is a reliable early warning system in place that guarantees enough time to react accordingly. “Humadea” bathing area is affected by rapid water level increase, thus the locals developed very artisanal warning system that counts on alerts sent from a person living upstream. However, this method can be very unreliable and does not guarantee safety.

Negative factor:

- Rapid water level increase

Seasonal availability of sandy beaches

During the winter season between March and November the rivers in Meta receive high volume of water that come mostly from rainfalls. Due to the proximity of mountainous watershed areas that receive a lot of rainfall caused by attitude pressure changes, the rivers are affected by level change during most of the year. As a result of that, the river beaches disappear under the water and cannot be used for tourism (Figure 25). It negatively influences tourism activity and makes management rather difficult, because it is not possible to estimate when the beach will be

actually available and usable. Moreover, as a consequence of heavy currents in the rainy seasons, the availability, size and sometimes even location of the beach is very uncertain every season. It is possible that during some season the beach is small or it shifted into a different location entirely.

A consequence of this phenomenon is mostly related to the space available and management of the beach itself in terms of zoning, accessibility and safety of the beach located in a new area. The solution to this problem is not very cost effective and it requires assessment of the beach after every bigger rainfall and changes to some management and safety aspects, maybe even physical infrastructure in some cases.

Figure 25 Alcaravan bathing area during rainy season (left) and dry season (right). During the rainy season the beaches disappear completely

Negative factor:

- Seasonal availability of sandy beaches / unpredictability of the size and type of the bathing zone

Shifting river course

Larger rivers move high volumes of water during the rainy months. As a result of this pattern, these rivers change their course by tens of meters every season (Figure 26), sometimes even it happens during one season. This has various management and safety consequences similar to the previous characteristic “seasonal availability of sandy beaches”. Additionally, there is an important issue of infrastructure that would have to be adjusted every year. As the course shifts, the beach location changes, sometimes it is possible that the beach happen to be far from the main infrastructure. The requirements about safe access points to the water, zoning and limitation of the bathing area would be very difficult and expensive to be met. Thus, a beach with this characteristic is not suitable for certification.

Figure 26 Alcaravan bathing area in September 2011 (left) and January 2010 (right). Although water level is very similar in both case, the river course changed noticeably. Source: Google Earth

Negative factor:

- Shifting river course

Safety issues due to strong current

Some rivers in Meta flow through mountainous and sloppy areas that force the current to increase its speed. In result, even during the dry season the river's current is too fast and violent for safe bathing. This characteristic disqualifies a bathing area as certifiable. There are solutions to this problem, but they require heavy engineering and thus investments. It is a risky solution as it is very likely that the return on investment will not be high enough.

Figure 27 Tonoa River

Negative factor:

- Safety issues caused by strong current

Safety issues due to rocky bottom

One of the typical river characteristics is type of the bottom. In many rivers in Meta it is mostly rocky and sometimes sandy. The rocks are often of a size of human hand up to the size of human head. The rocks are covered by at least very thin layer of algae, which makes it really slippery and thus dangerous for bathers. Walking on this kind of bottom is very difficult sometimes impossible due to the river current. A certified bathing area should be free of this kind of dangers. In this respect, in order to qualify suitable for a certification, a bathing area should be cleared off. This solution requires engineering, investment and present environmental risk, this it is one of the pre-conditions that should be taken into consideration before employing any hard methods that physically modify the river bed. And even then, the dredging river bed modifications are very temporal, because after rainfalls heavy currents bring new portion of heavy material that replace the one previously removed. The river naturally comes back to its previous condition.

Negative factor:

- Safety issues caused by rocky bottom

Negative factors and Bathing Areas of Meta

In the scope of entire project that had the objective to define the river bathing areas of Meta with the highest tourism potential, three tourism potential levels were established by the research team. The methodology used is briefly described in the methodology chapter in this document, but it is not directly related to the subject of this thesis and for this reason only the results of that assessment are used. The bathing areas that represent high potential for tourism development are marked in green color, while the bathing areas marked by yellow and red represent medium and low potential respectively (Table 2 and Table 3). The river bathing areas with low tourism potential are either in very bad natural condition or in a place with limited and difficult access.

Based on observation, secondary information and direct interviews with people who either live around the area or can be considered river experts 28 river bathing areas in Meta were analyzed. Table 2 and 3 show the name of each bathing area and the limitation factors that apply to each of them.

Table 2 Negative pre-condition factors found in river bathing areas of Meta with high and medium potential for tourism development

	El Malecón	Río Tamoa/Ariari	Aguas Claras	Río Guacavía	Caño Mayusa	Los Maracos	Alcaravan	Sector Turístico de Humadea	Pozo Azul	Quebrada Blanca	Río Yucao	Cacayal	Río Tanoa (Puente la Libertad)	Los Mandarinos
Excessive flooding (increased water level and water pollution during most of the year caused by rainfalls)							X	X						
River drying/low water level during high tourist season and extremely unpredictable water level/quality conditions during the rest of the year.	X	X				X								
Rapid water level increase		X						X						
Seasonal availability of sandy beaches / unpredictability of the size and type of the bathing zone						X	X				X			
Shifting river course		X		X			X							
Safety issues caused by rocky bottom	X	X	X	X		X		X					X	
Safety issues caused by strong current			X	X									X	

Table 3 Negative pre-condition factors found in river bathing areas of Meta with low potential for tourism development

	La playa del otro lado	La Represa	Caño Arenales	Caño Cachirre	Donde Juancho	Caño La Cristalina	Iracá (Granada)	Caño Sibao	Las Cristalinas	Caño Auralito	Caño Camoa	Caño Iracá	Río Guatiquía	Caño Maizaro
Excessive flooding (increased water level and water pollution during most of the year)	X													
River drying/low water level during high tourist season and extremely unpredictable water level/quality conditions during the rest of the year.		X						X	X	X		X	X	X
Rapid water level increase													X	
Seasonal availability of sandy beaches / unpredictability of the size and type of the bathing zone	X													
Shifting river course														
Safety issues caused by rocky bottom									X				X	X
Safety issues caused by strong current													X	

As seen from the tables, in 10 out of 28 bathing areas there were no preliminary limitations to implement a beach certification scheme. However, all of those 10 bathing areas belong to one of the two very specific groups. In the first group are bathing areas that were built using hard engineering solutions. Normally the bathing area is established through channeling water, bypassing the natural river course, which arrives at a man-made normally concrete swimming pool. The water in the pool circulates and leaves back to the river through the similar bypass system to the one that delivers water (Figure 27). This kind of system can use any size river, because the conditions created by the bypass system have nothing to do with the natural conditions of the river. This kind of bathing areas are not very attractive visually, but are safer for the bathers and it is easy to control conditions inside them. In the case of Meta, 8 out of 10 bathing areas that do not have any limitations for beach certification schemes belong to this group.

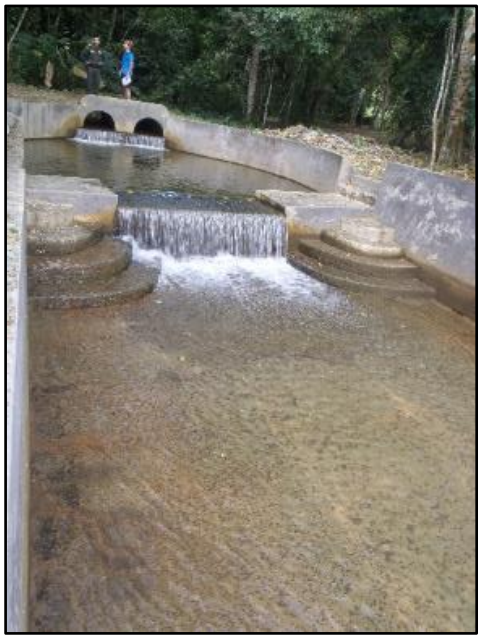

Figure 27 Donde Junacho bathing area built using a bypass solution. The water is filling up the bathing basin

The second group of river bathing areas that do not have aforementioned limitations for implementation of beach certifications is located on rather small rivers that move low volume of water and are not affected by heavy rainfalls. In this group only 2 out of 10 river bathing areas of Meta were classified. Both bathing areas are very small and located on a river bank that is much deeper than the rest of the river and thus have good conditions for swimming even during the dry season when the average water level outside the bathing area is lower than 50cm. Additionally, one of the two cases uses small dams made of river material as a solution for water level increase. The bathing areas of this type are more attractive, natural and the biggest limitation they have is little space available for bathing. In consequence, implementation of a beach certification, although possible, is very questionable in terms of financial feasibility and return on investment.

Figure 28 Pozo Azul, an example of a river bathing area without negative pre-conditions

Conclusions

The results of the simple analysis show that the rivers often have conditions that are not controllable and thus the bathing areas are either dangerous for bathers or very difficult to manage. There are two patterns that emerged from the analysis that make implementation of beach certification schemes feasible. The first one requires engineering solutions, while the second one is based on very stable conditions of rivers that move considerable lower volume of water. In result, it can be said that only controllable and predictable conditions would allow implementation of any sort of beach certification. In case of rivers in very natural conditions these factors are very limiting and only very few natural rivers in Meta would qualify as appropriate.

Very important aspect to mention is that all negative conditions that prevent from implementation of a BCS are manageable using engineering solutions. The bypass channels and damming are the most common ones to control the conditions of the bathing area. Increasing the width of the river on a small stretch of a bathing area would decrease main current's speed and increase space for bathing. Dredging the stones from the bottom could increase water level and make walking in the water safer, but this solution is very short-term in most of the cases because after heavy rainfalls there is a fresh supply of medium and heavy stones that replace the material taken previously. Most importantly, environmental impact of these kinds of solutions is rather heavy and only bypass would eliminate most of the common problems such as seasonal water level increase, river seasonal flooding/drying, shifting course, etc. Full management of bathing areas limited by one or more of the limitations would require a lot seasonal work (dredging, damming, adjusting the bathing area, changing course of water flow, etc.). Although, physically it is feasible, economic and environmental consequences make these solutions very risky.

5. Evaluation of Puerto Lleras bathing area through common BCSs' requirements

The objective of the previous chapter was to analyze pre-conditions of rivers in Meta to even begin the process that aims at awarding a certification scheme. This chapter is focused on the common requirements that most of beach certification schemes around the world have. If a river bathing area is not a subject to pre-condition limitations, it still has to be able to comply with a set of requirements of a specific BCS. In this way, this chapter gives an insight if it is feasible for a river bathing area in Meta to rich certification level.

In order to assess if river bathing areas can rich level of certification, the general requirements proposed by Botero (2008) and described in the chapter 2.3 were finally applied to one of the river bathing areas in Meta. The diagnostic tool designed to be used in the study was based on the same categories proposed by the original author. The objective was to evaluate the level of compliance with those minimal requirements.

For this each requirement was given five different levels of compliance. The level 1 is the lowest, while the level 5 means that the requirement has been reached completely, thus it corresponds with the certification level. All levels in between 2 and 4 show how advanced in a reaching of the certification level is a bathing area. It is important to note that the score is not that important, because it shows the current level of the bathing area, but rather it is important to evaluate if the river bathing area is able to reach level 5 thus the feasibility is the key and not the current state.

5.1. Compliance with Environmental aspects

Monitoring and protection of the ecosystems

The ecosystem monitoring is frequent, periodic and standardized observation of the environment, flora and fauna and the relations among different species or entire ecosystems in a given area. On the other hand, protection of ecosystems is focused on maintenance and protection of specific areas or ecosystems in their prime natural conditions from potential or real danger of the product of tourism activity in the area.

In the bathing area of Puerto Lleras there is no monitoring program nor is there any plan or document that specifies this aspect. The closest certified laboratory is 100km away, but it does not have personnel to conduct this kind of analysis. There are no people with knowledge on this topic working in the municipality.

Current rating: Level 1

Feasible to reach Level 5 rating: Yes, but with certain limitations

Although the requirement is feasible to be implemented, the limitations are mostly financial as it is more expensive and troublesome to hire specialized staff or outsource entirely monitoring and protection activities to organizations or companies located very far from the municipality.

Landscape protection measurements

The landscape protection measurements aim at conservation of the geographic aspects, integrated by the natural components of different taxonomic types formed under the influence of natural processes and human activity. In the case of the bathing area the landscape is the presence of non-consolidated sediments (sand), the watershed, biotic environment and the infrastructure.

There are neither plans in Puerto Lleras, nor activities that could be categorized and landscape protection measurements. There are also no personnel qualified to conduct plans and programs related to this field. Finally, there are no workshops or capacity building exercises for the local community in the area and planners/managers at the municipal level.

Current rating: Level 1

Feasible to reach Level 5 rating: Yes

Sand quality analysis

The sand quality varies depending on the specific use, in this case recreational. The quality is determined by microbiologic and granulometric characteristics of the material. The quality analysis is about quantification and control of those characteristics, specially the microbiological aspects that are of highest importance for sanitary safety of the bathers.

In the bathing area of Puerto Lleras there is no sand quality monitoring program nor is there any plan or document that specifies this aspect. The closest certified laboratory is 100km away, but it does not have personnel to conduct this kind of analysis. There are no people with knowledge on this topic working in the municipality.

Current rating: Level 1

Feasible to reach Level 5 rating: Yes, but with certain limitations

The limitations are mostly in terms of outsourcing the sampling and analysis activities to organizations outside of the municipality, located over 100km away.

Water quality analysis

The water quality depends on the human use and it is defined in terms of physical, chemical and microbiological characteristics that should be suitable for primary contact like in the case of bathing.

In the bathing area of Puerto Lleras there is no water quality monitoring program nor is there any plan or document that specifies this aspect. The closest certified laboratory is 100km away, but it does not have personnel to conduct this kind of analysis. There are no people with knowledge on this topic working in the municipality.

Current rating: Level 1

Feasible to reach Level 5 rating: Yes, but with certain limitations

The limitations are mostly in terms of outsourcing the sampling and analysis activities to organizations outside of the municipality, located over 100km away.

Prevention from acoustic pollution

The noise is an unwanted sound, which is disharmonic and bothering, even though the level of discomfort is a subjective aspect. The noise negatively affects health of human beings that are exposed to it, according to the intensity and the exposition period. The prevention from acoustic pollution has an objective to protect the bathing area's users and the ecosystems from any type of real or potential risk that is a product of human activity in the area.

In the bathing area there are no control and programs aimed at acoustic pollution. The commercial establishments are the main sources of noise. Often these establishments play very loud music, without intervention of any authority.

Current rating: Level 1

Feasible to reach Level 5 rating: Yes

Presence of garbage cans

A bathing area that has objective to be certified has to properly manage solid waste. In this respect, there is a necessity to install garbage cans that are designed to cope with the quantity of produced garbage related with the tourist capacity of the bathing area.

"El Malecon" bathing area has number of garbage cans that provide sufficient coverage. In terms of quality the bins are resistant and cope with the demand of the bathing area.

Current rating: Level 4

Feasible to reach Level 5 rating: Yes

Promotion of recycling

Although the tourism activity generates high volumes of solid waste, some types of garbage can be re-used or transformed into new products.

Currently there are no plans and programs that promote recycling in the bathing area. There are single ADHOC recycling activities performed in no regular manner. The garbage cans do not allow separation of solid waste.

Current rating: Level 2

Feasible to reach Level 5 rating: Yes

Solid waste management

During the tourist activity solid waste is generated, which often is deposited in the water or on the beach. They contaminate the ecosystem and the natural landscape. To avoid this, there should be solid waste management plant designed and implemented according to the nature of waste. The solid waste management plan is a set of dispositions and operations aimed at adequate destination of solid waste according to its characteristics, volume, source, cost, treatment and possibilities to recover, re-use, commercialize and dispose.

In the studies bathing area there is no solid waste management plan. However, there is little presence of solid waste in the area.

Current rating: Level 2

Feasible to reach Level 5 rating: Yes

Sewage discharge

In the municipality there is a residual water treatment system that discharges the water downstream from the bathing area. In the same time there are sporadic discharges of waste water upstream from the bathing area.

Current rating: Level 3

Feasible to reach Level 5 rating: Yes

Ratings in category "Environmental aspects"

Taking into consideration the sum of the points that obtained "El Malecon", the level of compliance with minimum standards in the "Environmental aspects" category is medium, although it hardly made to that level. The bathing area obtained 16 points out of 45 possible thus it does place itself in the second of three equally divided groups.

Table 4 Rating of "El Malecon" bathing area's compliance with environmental aspects

Requirement	Rating Lvl.
Garbage cans	4
Sewage discharge	3
Promotion of recycling	2
Solid waste management	2
Protection and monitoring of ecosystems	1
Landscape protection measurements	1
Water quality analysis	1
Sand quality analysis	1
Prevention from acoustic pollution	1
TOTAL	**16/45**
Rating level	**Medium**

5.2. Compliance with Service related requirements

Regular cleaning of the bathing area

The solid waste can be deposited in the area of the bathing zone for diverse natural but mostly human related factors, product of tourist activity. The waste should be removed in a regular manner from the beach. There should be a person responsible for removal of any type of waste from the area.

In "El Malecon" cleaning of the beach and of the area surrounding it is carried out by the owners and workers of the commercial establishments and local community that lives there. It is also the reason why there is no person, company or organization responsible for doing it. The

tragedy of commons paradigm applies, where nobody takes direct responsibility for public space, but everyone uses it for their own benefit.

Current rating: Level 2

Feasible to reach Level 5 rating: Yes

Accessibility

The access points to the public beach are constructed to facilitate easy entrance and communication path along the area. The accesses can be made of diverse material (cement, concrete, wood, etc.), thus they can generate unwanted negative impacts depending on their current state, quality and functionality. It is also important that a beach was able to be visited by people with disabilities especially those who suffer from limited movement.

“El Malecon” bathing area has three access points that are clearly marked and are in very good physical condition, providing safe access along the whole area of the beach. The access to the beach is free and it is clear and easy to identify where the points are. One of the points is designed to facilitate access to people with physical disabilities.

Current rating: Level 5

Feasible to reach Level 5 rating: Yes

Sanitary facilities

These are the services that are required to maintain good sanitary conditions in the entire area. They also have a supporting role to prevent from microbiologic pollution of the beach and bathing water. Generally this service is free of charge. The water discharged from the sanitary installations should be treated and discharged properly.

“El Malecon” does not have any sanitary installations. This kind of service is available only in the commercial establishments in the area, although the quality and sanitary conditions of those are poor. The maintenance of those facilities is carried out by their staff members. The systems are connected to the city’s sewage system and treated, thus they are not discharged directly in the river.

Current rating: Level 2

Feasible to reach Level 5 rating: Yes

Availability of drinking water

Water is a crucial resource for human beings. The availability of drinking water in areas where visitors are generally exposed to the direct sun throughout the day is an important aspect that has be considered at every bathing area. The water should be available to visitors and people working at the area equally. The providing device is not the main concern.

Drinking water is not available free of charge in the area of “El Malecon”. There is also no provision of drinking water that would be charged. The only place where water can be obtained is in the commercial establishments nearby.

Current rating: Level 1

Feasible to reach Level 5 rating: Yes

Ratings in category “Services”

“El Malecon” once more obtained low level of compliance with basic aspects. Out of 20 points it obtained 10. Although the access points comply with beach certification requirements, the aspects such as sanitary facilities and availability of drinking water scored low, thus the final score.

Table 5 Rating of “El Malecon” bathing area’s compliance with service aspects

Requirement	Rating Lvl.
Accessibility	5
Regular cleaning	2
Sanitary facilities	2
Availability of drinking water	1
TOTAL	**10/20**
Rating level	**Medium**

5.3. Compliance with Safety and Security requirements

Lifeguarding

During the stay in the bathing areas the visitants are exposed to different kind of risk and dangers, of which the most common that often results in death is drowning. The presence of life guards on a beach is a crucial element aimed at prevention from water accidents, control over activities inside the water and immediate rescue and first aid assistance in case of occurrence of unforeseen accidents.

“El Malecon” does not offer any lifeguard assistance, even during the high tourist season and weekends. Moreover, there is no infrastructure that could support lifeguarding (lifeguard towers and equipment).

Current rating: Level 1

Feasible to reach Level 5 rating: Yes

First aid assistance

Similar as in the case of life guards, the emergency situations often require specialized assistance and equipment that can assist in saving lives. There is a necessity to have an area or a post in a separated building operated by a person able to assist victims of accidents that require medical help in terms of basic procedures such as fracture assistances, food/water poisoning or attack of epilepsy or other chronic diseases.

“El Malecon” does not offer any of aforementioned measures nor infrastructures.

Current rating: Level 1

Feasible to reach Level 5 rating: Yes

Safety of accessibility

There are different types of access routes to a beach. The most common is by foot. The infrastructure should be designed to support safe access. Very often accidents happen because a wooden catwalk was wet, old, damaged, etc. Other type of access route is fluvial, by boat. This type of access is the most dangerous and requires specialized infrastructure to avoid landings directly on the beach and disembarking without any facilities such as stairs or a pier.

The access to the bathing area of “El Malecon” is safe and easy. It is well signed and maintained. There is no fluvial access in use.

Current rating: Level 4

Current rating: Level 4

Feasible to reach Level 5 rating: Yes

Safety & security plan

During the development of tourist activities there is a possibility of occurrence of dangerous events, either for visitors or for workers on the beach, as a result of natural or human factors. This it is crucial to control and manage those risks through their identification and prevention, which can be carried out through a series of methodologies and strategies. After the identification phase comes planning process that define the actions that has to be taken when aforementioned emergency situations occur.

The bathing area does not have any plan that aims at prevention, mitigation and correction of the possible damage as a consequence of unexpected incidents that occur. There is personnel responsible for security but is not accredited, uniformed and has no training or knowledge on the aspect.

Current rating: Level 2

Feasible to reach Level 5 rating: Yes

Prohibitions

The vehicles such as cars, motorbikes and motorboats require gasoline to function, thus the only place to manage the refueling and handling it should be done outside of the bathing area due to the risk of sand and water pollution.

The activity of driving the vehicles inside the bathing area should not be allowed due to the danger they cause for visitors and bathers. Moreover, vehicles can cause negative effect on sand quality (compacting). The only exception to the rule should be small vehicles that pick up garbage, clean sand or provide emergency response (police, ambulance, fire fighters, life guards, etc.).

Activity of sport fishing in the bathing area is dangerous for bathers and thus should be prohibited. The only possibility to allow it is through specially delimited zone that excludes bathing.

Presence of domestic animals can cause direct danger to visitors and often pollution of sand and water by fecal matter. The only exception to that rule should be guide dogs, rescue dogs and police dogs.

Inside “El Malecon” none of the above prohibition is implemented and respected. Moreover, the majority of aforementioned activities take place, including fishing, presence of animals, gasoline handling and even entrance of private vehicles.

Current rating: Level 1

Feasible to reach Level 5 rating: Yes

Risk management plan

The risk management plans are strategies that aim at prevention and fast attention in cases such as water pollution and natural disasters including tsunami, red tide, storm surges, etc. In case of rivers these would be rapid water level increase, water pollution, mass slides, flooding, etc. The plan should include at least procedures that have to be followed in case of occurrence. The plans normally include response of environmental authorities and lifeguards.

“El Malecon” does not have any plan that aims at risk management or any similar sort.

Current rating: Level 1

Feasible to reach Level 5 rating: Yes

Ratings in category “Safety and Security”

“El Malecon” once more obtained low level of compliance with basic aspects. Out of 30 points it obtained 10. Eighty-three percent of the minimal requirements of safety & security are not obeyed, which implies that the bathing area is not safe. Only the access point safety obtained high amount of points which means it is up to a good standard

Table 6 Rating of “El Malecon” bathing area’s compliance with Safety and Security requirements

Requirement	Rating Lvl.
Safety of accessibility	4
Safety & security plan	2
Lifeguarding	1
First aid assistance	1
Prohibitions	1
Risk management plan	1
TOTAL	**10/30**
Final rating level	**Low**

5.4. Compliance with Information and signage requirements

Signage at the bathing area

It is important that inside the bathing area there is at least a basic signage showing the access to the bathing area, safe access to the water, parking area, dangerous areas in and outside the water, sport areas, sanitary facilities, drinking water access, lifeguards and first aid post. The sings should be design with clear and readable drawing and text and should be made according to internationally accepted color code.

“El Malecon” has some basic signage that shows mostly directions to the bathing area and the sport area. The sings are in good condition, but they are not designed according to international pictogram and color standards.

Current rating: Level 2

Feasible to reach Level 5 rating: Yes

Information board

The primary function of an information board is to provide resumed information about the main aspects of the bathing area. The board should be available in at least two languages (at least Spanish and English in this case, additionally it is advisable to include Portuguese). The board should include minimum the following information: the bathing area’s map, code of conduct, zoning, information point, access points, first aid post, parking area, sport area, sanitary facilities, drinking water point, food & beverage facilities, life guard facilities and zones under protection, prohibitions, safety recommendations, results of water quality monitoring, and dangerous areas.

In “El Malecon” there is no information board.

Current rating: Level 1

Feasible to reach Level 5 rating: Yes

Code of conduct

The code of conduct is a list of activities and conducts designed for visitors and people working at the bathing area to ensure safety, security and appropriate behavior in the area. The main difference between the code of conduct and prohibitions is the legal aspect of the latter. The prohibitions can be supported by law, enforced and punished, while codes of conduct have more voluntary character.

The bathing area does not have a code of conduct.

Current rating: Level 1

Feasible to reach Level 5 rating: Yes

Ratings in category "Information and signage"

Having in mind the final score for the category, "El Malecon" again scored low. With just only 4 points out of 15, only signage show some sign of development in the area, while the rest of the requirements are not met.

Table 7 Rating of "El Malecon" bathing area's compliance with Information and signage requirements

Requirement	Rating Lvl.
Signage at the bathing area	2
Information board	1
Code of conduct	1
TOTAL	**4/15**
Final rating level	**Low**

5.5. Compliance with Management requirements

Zoning

Zoning of a bathing area consists of division of area according to the most appropriate use it is supposed to have. These zones are: tourist services area, transition area connecting with public space, lounge zone (inactive zone where bathers sit, relax and sun bath), active zone (with human traffic and people playing close to the water), bathing zone, water sport zone, water traffic and landing zone. The zoning depends on the area available and activities and character of the bathing area itself, thus every bathing area might have different zoning solutions.

"El Malecon" has no zoning implemented, although activities and facilities are organized in different areas.

Current rating: Level 2

Feasible to reach Level 5 rating: Yes

Tourist carrying capacity

The natural and social systems have limits which can be overpassed causing damage. Every system can only tolerate certain population in an area without negative consequences. In environmental terms a big number of visitors will cause slow environmental degradation of the area, in social terms, congestion on the beach, in the water or in the facilities is likely to result on low satisfaction of the visitors. The maximum number of visitors that can stay in a given area without causing damage is called carrying capacity.

“El Malecon” does not have measured, nor implemented carrying capacity.

Current rating: Level 1

Feasible to reach Level 5 rating: Yes

Organization of beach peddlers

It is very common in Colombia to find peddlers working at the bathing area. Peddlers are people who sell variety of products as the move through the entire area. This modality of employment is informal although legal in Colombia. The problems related to beach peddlers is their high number that often causes irritation of beach goers. Additionally, the content of the sold products is often unknown, thus it can be risky, especially in case of fresh food and beverage. That is why it is important to control the number of vendors and quality of sold products. An organized peddler organization or union can take care of that, additionally food handling capacity building activities can be implemented.

There is a very little presence of peddlers in “El Malecon” bathing area. There is no organization responsible for this economic activity.

Current rating: Level 2

Feasible to reach Level 5 rating: Yes

Ratings in category “Management”

Having in mind the sum of the points that received the bathing area it can be seen that “El Malecon” presents rather low score in management category with 5 out of 15 points. The bathing area does not comply with basic management aspects

Table 8 Rating of "El Malecon" bathing area's compliance with management requirements

Requirement	Rating Lvl.
Zoning	2
Organization of beach peddlers	2
Tourist carrying capacity	1
TOTAL	**5/15**
Final rating	**Low**

5.6. Final classification

Puerto Lleras bathing area is a typical underdeveloped and underused bathing area in Meta that does not receive many visitors. Those who decide to visit it, do it during holidays and festival thus indicating that their main motivation to visit is not river bathing. In result, as shown by the exercise, the bathing area does not comply with majority of requirements set by any beach certification scheme (Table xxx). In all categories the bathing area scored low or medium (very close to low), which indicates that it is not under any sort of management with a scope on quality and user experience. The aspect that receive higher score levels are also those which are very easy and inexpensive to meet such as accessibility or presence of garbage bins. The great majority of bathing areas in Meta have similar level of development, which shows that there is a lot to do in this respect if Meta is to be a river-based tourist destination.

Table 9 Final score level in each requirement category

Requirement category	Points
Environmental	16/45
Services	10/20
Safety & Security	10/30
Information and signage	4/15
Management	5/15
TOTAL	**45/125**
Final rating level	**Medium/Low**

Low <41 (~33%)	**Medium 42 – 83 (~66%)**	**High 84 – 125 (100%)**

On the other hand, the exercise confirmed that all of the requirements are feasible to be met with certain amount of effort and investment. The main limitation is lack of availability in the municipality of personnel able to implement programs aimed at monitoring and quality sampling. Also the fact that the closest laboratory is far away thus aforementioned services most likely would have to be outsourced and expensive to carry out in a systematic fashion. This is a case of Puerto Lleras, which is a municipality located in a remote area. This situation would not be the case in many municipalities that have attractive to tourism river bathing areas.

6. Conclusions

The State of Meta being rich in hydric resources and having almost ideal climate conditions could be a perfect destination for river based tourism. The State is located in the central part of Colombia, far from Pacific and Caribbean coast, but very close to the capital city of Bogota that with its over 7 million inhabitants is the biggest generator of tourists in the country. In these conditions, use of rivers as tourist resources is logical and currently this option is receiving a lot of attention from the local government.

In the framework of safe and high quality bathing experience, the subject of beach certification schemes has been on agendas of many Latin American countries that designed and implemented their very own certification schemes, although based on common requirements. The topic is very new and only in 2014 the first marine beach in Colombia was certified. In terms of river bathing areas, there is no beach that managed to achieve it, although one is Spain is about to do it by the end of 2014. Certifications are associated with good environmental conditions of a bathing area and safe bathing experience thus can be used as a tool to measure if a bathing area is well prepared to provide tourism experience.

Nevertheless, in case of the State of Meta the same climate conditions that guarantee many sunny days and tropical temperatures throughout the year are also the main limitation factors for development of safe and high quality river bathing areas. Because of tropical climate the State of Meta is subjected to long periods of heavy rainfall. In consequence, there are limitations that have to be faced and solutions have to be developed in order to guarantee good bathing experience to the visitors.

The periods of heavy rainfall are reasons for safety issues caused by rocky bottom, dangerous currents, shifting river course, rapid and unexpected water level increase, unpredictability of the size and type of the bathing zone, excessive flooding and general difficulties in managing bathing zones that are exposed to very dynamic changes that happen more often that in the case of marine beaches.

The river bathing areas that can be considered attractive for tourism should have good environmental conditions and enough capacity inside and outside the water for visitors to swim comfortably, in other words, they require wider rivers that move higher volume of water. This characteristic is a paradox, because very large rivers do not have required environmental

conditions and medium rivers are subjected to the aforementioned limitations caused by rainfalls. From the list of rivers with highest tourism potential in terms of level of attraction, only two rivers did not have any of the limitations. The river bathing areas without limitations can be classified in two groups. In the first group are bathing areas that used heavy engineering to build either a dam system or water bypass system to canalize water into an artificial basin. In the second group are small rivers that do not move high volumes of water and are lightly affected by the rainfalls. Both solutions are for very small scale bathing areas. Although they could be certified, the investment will most likely never payoff.

Despite the fact that implementation of a beach certification scheme is feasible in only two river bathing areas classified with high tourism potential, the remaining bathing areas could use engineering solutions to limit the negative impact of heavy rainfalls. However, these solutions are expensive and have strong environmental impact. For these reason each case is different and should be looked at separately.

Finally, in terms of BCSs' requirements, the river bathing areas are able to meet all of the basic ones analyzed in this document. The only limitations are related to lack of specialized staff and infrastructure for environmental monitoring and quality sampling in many of the municipalities of Meta. These activities would have to be outsources in many cases.

All in all, there is a future for bathing areas in Meta. According to the interviews with local stakeholders some of them have been receiving thousands of visitors throughout the year. Nevertheless, the experience provided by those bathing are is medium at best, which is the reason why they are able to attract very specific groups of visitors, mostly from low income levels (Zielinski & Avellaneda, 2013). Even though there is an interest from the State Government, there is also a lack of clear vision on how to improve the existing bathing areas. In consequence, their quality level is similar to Puerto Lleras analyzed in this document. Although implementation of BCSs is very unlikely and feasible only on very few rivers, the State of Meta needs only few "flagship" attractions in terms of certified beaches, while many other rivers bathing areas have conditions to reach a decent quality level.

7. References

Arellano, P. & Espejel, I. (2009). Propuesta de una metodología Para evaluar Playas recreativas con destino turístico. Revista de Medio Ambiente, Turismo y Sustentabilidad, 2, 119 – 130.

Ariza, E., Jiménez, J., & Sardá, R. (2008). Seasonal evolution of beach waste and litter during the bathing season on the Catalan coast. Waste Management, 28(12), 2604–2613.

Ariza, E., Sardá, R., Jiménez, J., Mora, J. & Ávila, C. (2008). Seasonal evolution of beach waste and litter during the bathing season on the Catalan coast. Waste Management, 28, 2604 – 2613.

Ashbolt, N., Schoen, M., Soller, J. & Roser, D. (2010). Predicting pathogen risks to aid beach management: The real value of quantitative microbial risk assessment (QMRA). Water Research, 44, 4692 – 4703.

Ballantyne, R., Carr, N. & Hughes, K. (2005). Between the flags: an assessment of domestic and international university students' knowledge of beach safety in Australia. Tourism Management, 26, 617 – 622.

Boevers J. (2008). Assessing the Utility of Beach Ecolabels for Use by Local Management. Coastal Management 36, 524–531.

Botero, C. (2008). Proposal of Management Framework for Tourist Beaches based on ICM. Unpublished master's thesis in Water and Coastal Management, Universidade do Algarve, Faro, Portugal.

Botero, C., Anfuso, A., Williams, A.T., Zielinski, S., Silva, C.P., Cervantes, O., Silva, L., & Cabrera, J.A. (2013). Reasons for beach choice: European and Caribbean perspectives In: Conley, D.C., Masselink, G., Russell, P.E. and O'Hare, T.J. (eds.), Proceedings 12 International Coastal Symposium (Plymouth, England), Journal of Coastal Research, Special Issue No. 65, 880-885.

Botero, C., & Hurtado, Y. (2009). Tourist Beach Sorts as a classification tool for Integrated Beach Management in Latin America. Coastline Reports, 13, 133 – 142.

Bravo, M., Gallardo, M., Luna Jorquera, G., Núñez, P., Vásquez, N. & Thiel, M. (2009). Anthropogenic debris on beaches in the SE Pacific (Chile): Results from a national survey supported by volunteers. Marine Pollution Bulletin, 58, 1718 – 1726.

Cervantes, O., Espejel, I., Arellano, E., & Delhumeau, S. (2008). Users' Perception as a Tool to Improve Urban Beach Planning and Management. Environmental Management, 42(2), 249-264.

Cervantes, O. & Espejel, I. (2008). Design of an integrated evaluation index for recreational beaches. Ocean & Coastal Management, 51, 410 – 419.

De Araújo, M. & Costa, M. (2006). Municipal Services on Tourist Beaches: Costs and Benefits of Solid Waste Collection. Journal of Coastal Research, 22(5), 1070 – 1075.

De Araújo, M. & Costa, M. (2008). Environmental Quality indicators for Recreational beaches Clasfication. Journal of Coastal Research, 24(6), 1439 – 1449.

Defeo, O., McLachlan, A., Schoeman, D., Schlacher, T., Dugan, J., Jones, A., Lastra, M. & Scapini, M. (2009). Threats to sandy beach ecosystems: A review. Estuarine, Coastal and Shelf Science, 81, 1 – 12.

FEE - Foundation for Environmental Education. (2010). Blue Flag Beach Criteria and Explanatory Notes – 2010 – 2011. Copenhagen: FEE.

George, R. (2003). Tourist's perceptions of safety and security while visiting Cape Town. Tourism Management, 24, 575 – 585.

Guillen, J., García-Olivares, A., Ojeda, E., Osorio, A., Chic, O., & González, R. (2008). Long-Term Quantification of Beach Users Using Video Monitoring. Journal of Coastal Research, 24(6), 1612–1619.

Harada, S., Goto, R. & Nathanson, A. (2011). Analysis of lifeguard-recorded data at Hanauma Bay, Hawaii. Wilderness & Environmental Medicine, 22, 72 – 76.

Hartmann, D. (2006). Drowning and Beach-Safety Management (BSM) along the Mediterranean Beaches of Israel – A Long-Term Perspective. Journal of Coastal Research, 22(6), 1505 – 1514.

Jiménez, J. A., Osorio, A., Marino-Tapia, I., Davidson, M., Medina, R., Kroon, A., Archetti, R., Ciavola, P., & Aarnikhof, S. G. J. (2007). Beach recreation planning using videoderived coastal state indicators. Coastal Engineering 54. 507–521.

Kay, R. & Alder, J. (1999). Coastal planning and management. Journal of Sustainable Development, 8, 121 – 122.

Lechuga, A., (2002). El uso del espacio litoral: infraestructuras y playas. I Congreso de Ingeniería Civil, Territorio y Medio Ambiente. Colegio de Ingenieros de Caminos, Canales y Puertos. Madrid, España, pp. 415 – 424.

Lubinsky, D., Victoria, D.N., Cervantes, O., Espinoza-Tenorio, A., Delhumeau, S. & Espejel, I. (2009). El valor de dos playas turísticas de Ensenada, Baja California según la percepción de los usuarios. Revista de Medio Ambiente, Turismo y Sustentabilidad, 45-56.

Malm, T., Raberg, S., Fell, S. & Carlsson, P. (2004). Effects of beach cast cleaning on beach quality, microbial food web, and littoral macrofaunal biodiversity. Estuarine, Coastal and Shelf Science, 60, 339 – 347.

Marin, V. (2006). La gestione integrata del litorale: elaborazione ed applicazione di un método di valutazione degli aspetti ambientali e socio-economici per la gestione delle spiagge della Riviera del Beigua. Unpublished PhD thesis, Università Degli Studi Di Genova, Genova, Italy.

Marin V, Palmisani F, Ivaldi R, Dursi R, & Fabiano R. (2009). Users' perception analysis for sustainable beach management in Italy. Ocean & Coastal Management 52, 268–277.
MCIT – Ministerios de Comercio Industria y Turismo (2010). Metodología para la elaboración del inventario de atractivos turísticos. Bogotá: MCIT.

McKenna, J., Williams, A. T., & Cooper, J. A. G. (2011). Blue Flag or Red Herring: Do beach awards encourage the public to visit beaches? Tourism Management, 32(3), 576 – 588.

Micallef, A., Morgan, R., & Williams A. T. (1999). User preferences and priorities on Maltese beaches – Findings and potential importance for tourism. En: Randazzo G. (Ed.) CDROM: Coastal Environment Management, EUCC - ITALY/EUCC.

Micallef, A. & Williams, A. T. (2002). Theoretical strategy considerations for beach management. Ocean & Coastal Management, 45, 261 – 275.

Micallef, A. & Williams, A. T. (2004). Application of a novel approach to beach classification in the Maltese Islands. Ocean & Coastal Management, 47, 225 – 242.

Nelson, C. Morgan, R. Williams, A.T. & Wood, J. (2000). Awards and management. Ocean & Coastal Management, 43, 87 – 98.

Nelson, C., & Botterill, D. (2002). Evaluating the contribution of beach quality awards to the local tourism industry in Wales – the Green Coast Award. Ocean and Coastal Management, 45, 157-170.

Oh, C., Draper, J., & Dixon, A.W. (2010). Comparing resident and tourist preferences for public beach access and related amenities. Ocean & Coastal Management, 53(5-6), 245-251.

Orams, M.B. (2003). Beaches as a tourism attraction: A management challenge for the 21st century. Journal of Coastal Research, 35: 74-84.

Phillips, M.R., & House C. (2009). An evaluation of priorities for beach tourism: Case studies from South Wales, UK. Tourism Management, 30, 176–183.

Roca, E., & Villares, M. (2008). Public perceptions for evaluating beach quality in urban and semi-natural environments. Ocean & Coastal Management, 51, 314 – 329.

Roca, E., Villares, M., & Ortego, M.I. (2009). Assessing public perceptions on beach quality according to beach users' profile: A case study in the Costa Brava (Spain). Tourism Management, 30, 598-607.

Rubio, D. (2005). Gestión de playas. Agencia Valenciana de Turismo. Madrid: Sintesis.

Schlacher, T., & Thompson, L. (2008). Physical Impacts Caused by Off-Road Vehicles to Sandy Beaches: Spatial Quantification of Car Tracks on an Australian Barrier Island. Journal of Coastal Research, 24(2B), 234 – 242.

Sherker, S., Williamson, A., Hatfield, J., Brander, R., & Hayen, A. (2010). Beachgoers' beliefs and behaviors in relation to beach flags and rip currents. Accident Analysis and Prevention, 42, 1785 – 1804.

Steer, R., Arias, F., Ramos, A., Aguirre, P., Sierra, P., & Alonso, A. (1997). Documento base para la elaboración de la política nacional de ordenamiento integrado de las zonas costeras colombianas. Bogotá: Ministerio de Medio Ambiente.

Storrier, K.L., McGlashan, D.J., Bonellie, S. & Velander, K. (2007) Beach litter deposition at a selection of beaches in the Firth of Forth, Scotland. Journal of Coastal Research, 23(4), 813-822.

UNEP – United Nations Environment Program (2009). Sustainable Coastal Tourism: An integrated planning and management approach. Paris: UNEP.

WCED - World Commission on Environment and Development (1987). Our Common Future. Oxford, England: Oxford University Press.

White, K., & Hyde, M. (2010). Swimming between the flags: A preliminary exploration of the influences on Australians' intentions to swim between the flags at patrolled beaches. Accident Analysis and Prevention, 42, 1831 – 1838.

Williams, A.T., & Davies, P. (1999). Beach Management Guidelines: Dimensional Analysis. In: Randazzo G (ed.), Coastal Environment Management, European Union for Coastal Conservation, Coastlines '97. European Union for Coastal Conservation (EUCC), CD-ROM.

Williams, A. & Micallef, A. (2009). Beach management. principies and practice (1st ed). London: Earthscan.

Williams, A., Micallef, A., Anfuso, G., & Gallego-Fernandez, J. B. (2011). Andalusia, Spain: An assessment of coastal scenery. Landscape Research, 1-23.

Williamson, A. (2006). Feasibility study of a wáter safety data collection for beaches. Journal of Science and Medicine in Sport, 9, 243 – 248.

Yepes, V., Esteban, V., & Serra, J. (1999). Gestión turística de las playas. Aplicabilidad de los modelos de calidad. Revista de Obras Públicas, 3385, 25 – 34.

Yepes, V., & Cardona, A. (2000). Mantenimiento y explotación de las playas como soporte de la actividad turística. El plan de turismo litoral 1991-99 de la comunidad Valenciana. V Jornadas Españolas de Ingeniería de Costas y Puertos. Ed Universidad Politécnica de Valencia. Coruña, (Vol II): 857 – 876.

Zielinski, S., & Avellaneda, M.F. (2013). Potential of river bathing areas for tourism development in Meta. Unpublished report from the project. Villavicencio: Playascol Corporation.

Zielinski, S., & Botero, C. (2012). Guía básica para certificación de playas turísticas. Bogotá: Gente Nueva.