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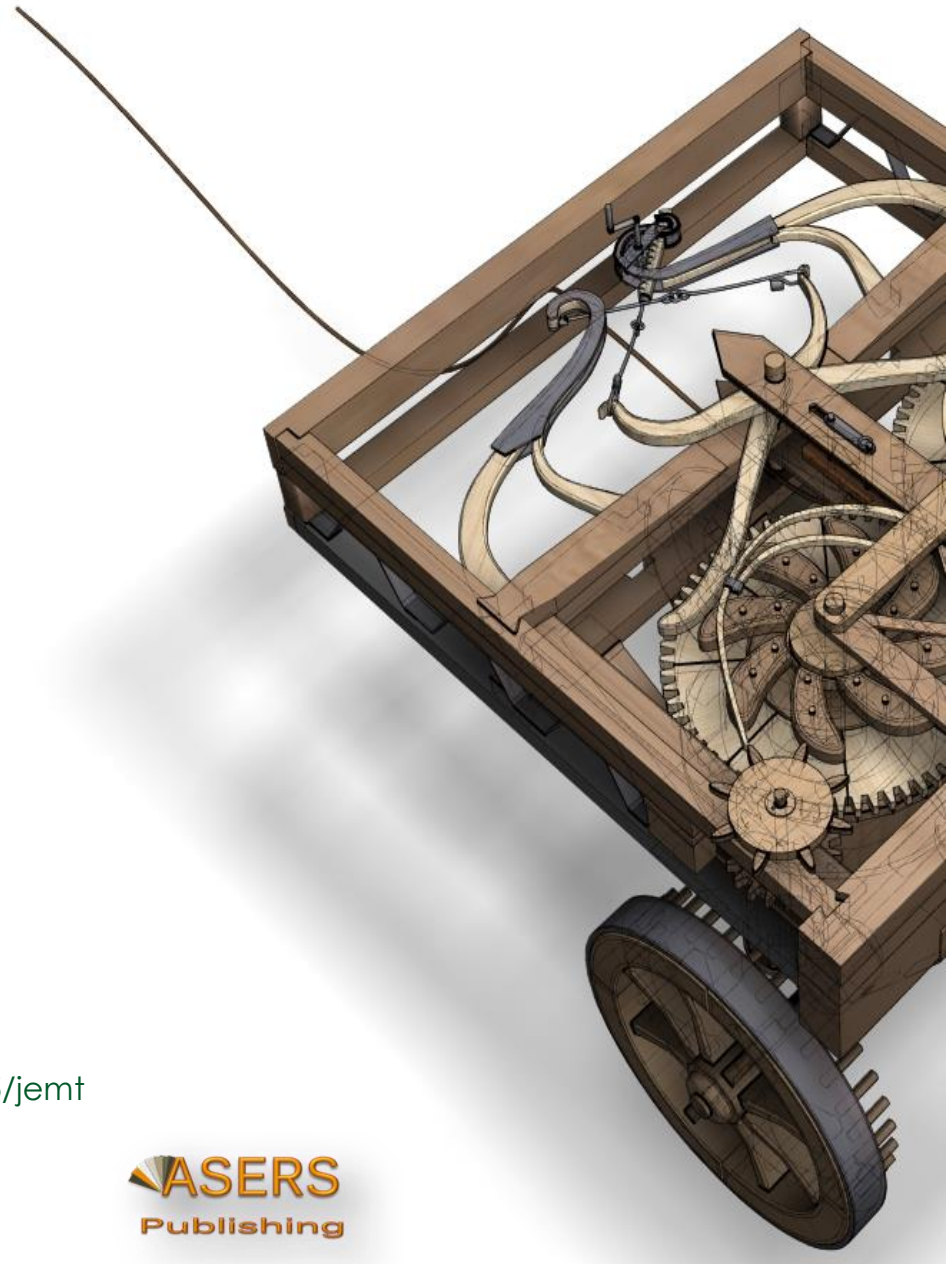

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SOCIAL DIVERSITY: A LOOK AT TOURISM

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Abstract:

This paper addresses the issue of social diversity, with reference to the phenomenon of tourism in Italy. Social inequality influences numerous socio-economic phenomena: tourism has been scarcely examined under this perspective. Tourism has significant effects at social level: both on travelers and on the inhabitants of the visited regions. Italy that is one of the most important touristic nations is significantly affected by the phenomena we are studying and, therefore, is an ideal context to analyze and identify the characteristics of tourism and its interaction on various aspects of social diversity. We could consider the interactions on tourism by persons with different economic and social conditions, race, gender, age, religion, mentality. These issues are usually considered by qualitative approaches. This paper attempts to give a quantitative dimension to these phenomena looking for possible statistical and administrative sources. We examined some, direct and indirect, official sources of the National Statistical System and other sources disseminated by European projects and research institutions. To get a more detailed picture of a particular form of social tourism, we used the data provided to us by a very active association in this area. This study is only a first approach in order to find a strategy to help assessing some quantitative characteristics of accessible tourism. The development of this type of tourism shall imply actions, techniques, and policies aimed at reducing the problems about social diversity in the sector, in order to make tourism become a factor of social inclusion.

Keywords: social distress, statistical sources, tourism.

JEL Classification: A13, L83, Z13.

1. Introduction

The theme of social diversity, in this paper, is addressed with specific reference to the phenomenon of tourism in Italy. The main objective is to find the way to give some quantitative references to these themes through statistic and administrative sources. However, since these aspects are not easily measurable, we will try to highlight some empirical evidences, valorizing the limited existing data sources. In our opinion this is very important because, in a world in which there is a "data deluge", we must increasingly consider the information content of the data that relate to these topics.

The second paragraph takes into consideration tourism as "primary social need"; since this is the way, it is now being assessed, examining some relative public and private initiatives.

In the following paragraph, some aspects of the complex relation between tourism and social diversity are analyzed; a case study that regards the activity, in Tuscany, of an association that promotes tourism for a

specific unprivileged part of the population is presented following. Some final and perspective considerations end the work.

2. Tourism: a social need

With the term "social diversity" we refer to a variety of phenomena that pass through the fabric of the population of an area (at city, regional, national, or continental level) and are registered with different indicators, and that are often studied with a multidisciplinary approach, showing what occurs in the different cultural contexts. Therefore, the theme of diversity or, in general, of social inequality (Sen, 1980), is dealt with by various observers, who examine it from different points of view, considering both the communities and the phenomena present in them.

The first perspective regards the system of relations that can be established at different levels of interdependence: single individual and family, local and national communities; the object of study is, in this direction, the one relative to the social and cultural dynamics that influence the context.

The second perspective can also disregard the type of community, underlines the single paradigms that characterize social diversity: gender, race, culture, disability, age, nationality, work activity, religion, sexual orientation, etc.

Social inequality influences numerous socio-economic phenomena (income distribution, consumption patterns, access to education, job placement, etc.) and among these, tourism is one of the most important ones even if, up to now, it has been scarcely examined under this perspective.

In fact, tourism is not only an important economic activity sector, but it also has significant effects at social level. In this field, a first distinction can be made assessing the effects on travelers on one side, and the ones on the inhabitants of the regions visited on the other.

Italy, known as one of the most important touristic nations in the world, is significantly affected by the phenomena we are studying and, therefore, is an ideal context to analyze and identify the characteristics of tourism that can interact with the various aspects of social diversity. It is known that tourism is more and more considered an important economic factor. In Italy the assessment of the national accounts of 2010 indicate that the Value Added (V. A.) produced by tourism and the activities related to it amount to almost 83 billion euro, which represent 6.0% of the V. A. of the entire economy. However, at territorial level a part of V. A. produced by tourism, which is considerably higher than the national one, can be observed in some regions: Tuscany 7.6%, Sardinia 8.1%, Veneto 8.8%, Aosta Valley 14.2%, and Trentino - South Tyrol 28.8%.

Moreover, the tourism activities represent an efficient instrument for increasing one's own knowledge and favoring the development of their personality. "For all these reasons today it is necessary to ensure access to the tourism experience to all citizens, regardless of personal, social, economic, and any other condition that can limit the use of this asset. To achieve these goals it is fundamental to refer to the principles of "Universal Design", design and organization model of the services that considers the needs of the different typologies of users whose proposals of global solutions that take into consideration human diversities represent an essential quality standard" (Italian Ministry of Tourism, 2009).

In other words, tourism is considered more and more as a primary social need. For this reason, in 2009, in Italy, within the Ministry of Tourism, the "Commissione per la promozione e il sostegno del turismo accessibile" (Committee for the promotion and encouragement of accessible tourism) was established to focus the tourism system on each person and his needs. Among the multiple classifications applicable to tourism, so is defined the concept of accessible tourism. The concept of "accessible tourism" refers to the characteristics of the demand and specificity of the supply structure. Recently ENAT (the European Network for Accessible Tourism) has promoted a conference inernazionale on "Accessibility in tourism: an ethical value, a business opportunity" (BIT/2013).

Specifically, the demand for accessible tourism refers mainly to tourists with special needs, tourists that must have access to all the same services used by all the other travelers. This means that accessible tourism refers to various categories of people: elderly, disabled, sick, poor, persons with food and environmental intolerances, pregnant women, families with children, and so on. Concerning the offer, the accessibility is expressed with a combination of structures and services: transport, gastronomy, accommodation, beach, etc.

From an economic point of view, accessible tourism represents, annually, a target of about 38 million tourists in Europe and 3.5 million tourists in Italy. It must be noticed that for every tourist with special needs, we must consider a multiplier equal to 2.8 for the size of the family (etc.) this means that more than 100 million travelers in Europe could be part of this type of market.

A “Carta dei diritti del turismo” (Charter of Rights of Tourism) was also established in Italy and the “Manifesto per la promozione del turismo accessibile” (Manifesto for the promotion of accessible tourism) was published.

In the Manifesto, it is affirmed that the accessibility implies the involvement of the entire touristic sector, at national and local level, starting from: the transport system, accommodation, catering, culture, free time activities, and sports.

Another important concept to be considered in the framework of the "diversity / travel" relation is “social tourism". This type of tourism is largely preferred to accessible tourism, both because of economic problems and reasons linked to the travelers with special needs (ISTO, 2010). An important aspect of social tourism is represented by the fact that many of its categories cannot be assessed quantitatively and in an easier way compared to the more general “accessible tourism". Social tourism, which had initiatives in Italy before the World War II, developed mainly during the 1950s, and includes tourism activities promoted by non-profit organizations in favor of the "unprivileged classes". Over the years, this type of tourism has been always aimed at satisfying the need for better social relations, and therefore, it is not only aimed at persons with special needs. The elements that motivate the demand of social tourism are not very different from those that refer to “accessible tourism ". The main difference is that social tourism strives to eliminate, with specific organizational models (generally developed by non-profit associations or foundations), the economic and social ties that prevent many categories of people from satisfying this primary social need.

In this regard, we can identify two categories of actors:

- Public institutions (regions and local authorities) that contribute to social tourism through support policies for the travelling of the unprivileged categories;
- Private subjects that act to support the unprivileged persons. Among these there are, above all, non-profit operators whose objective is (in accordance with public institutions) to increase the accessibility level of the tourism offer, in physical, demographic, and economic terms. In this sector, there is a large variety of operators: from the churches to company clubs, from sports associations to cultural ones. In Italy there is even a federation, Federazione Italiana per il Turismo Sociale (FITuS) (Italian Federation for Social Tourism), which develops projects and initiatives in this direction.

3. Tourism and social diversity: some empirical evidences

It is not easy to assess quantitatively, through the main official statistical sources, the concepts that we have expressed in relation to accessible tourism.

In Italy, there are different sources of official data, which directly or indirectly, supply information regarding tourism:

- Arrivals and nights spent in the Italian tourist establishments (ISTATa);
- Trips and holidays in Italy and abroad (ISTATb);
- Household Consumption (ISTATc);
- Capacity of the accommodation facilities (ISTATd).

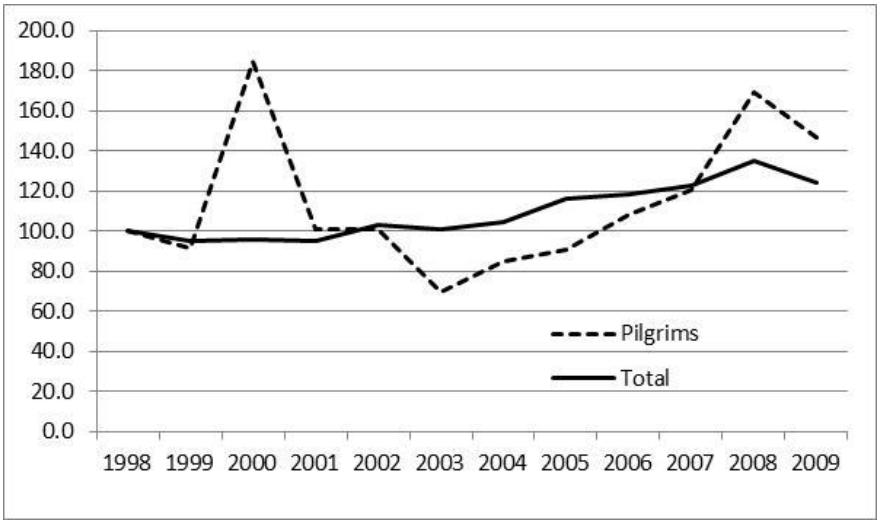
In these four sources of data, disseminated by the Istituto Nazionale di Statistica (ISTAT - The Italian National Statistics Institute), there is no specific information concerning accessible tourism.

For this reason, we have searched for some proxy information. First, always considering all the data disseminated by ISTAT, we find some interesting information among those regarding social tourism.

For example, in the ISTAT source “Trips and holidays in Italy and abroad ", we found some information regarding the relation between tourism and diversity. Among the different types of tourism in this category, we examined the one regarding pilgrims; the tourist demand included in this typology can reasonably be considered both in the context of accessible tourism and in the social tourism one. In Figure 1, we refer to the information regarding the trips made by residents in Italy for "religious reasons, pilgrimage". We used this data relative to trips made for "religious reasons, pilgrimage" (about 2% of the total trips), also for the availability of a specific very detailed Tuscan source, on which we will develop a specific analysis (see paragraph 4).

Figure 1 highlights three specific characteristics relative to the phenomenon examined, about what happens for the tourism demand as a whole:

- A peak during the Holy Year of 2000;
- A peak in 2008, for the 150th anniversary of the apparitions in Lourdes;
- A greater elasticity of this series, which however shows a higher increase (46.9% instead of 24.7%).



Source: ISTAT.

Figure 1. Trips made by Italian residents for "religious reasons, pilgrimage" and total no work tourism (index number 1998=100)

After having shown this simple result, the only one possible related to the ISTAT data, we considered the field of administrative sources and other non-systematic data sources.

The first opportunity is represented by Istituto nazionale ricerche turistiche (Is.Na.R.T. - National Institute for Tourism Researches) that since 2008 has been publishing an annual report about "social tourism in Italy", with the aim of analyzing the demand and the supply of services dedicated to social tourism.

In the Is.Na.R.T. report from 2012 on "Social tourism in Italy" we discovered that:

- In 2011 social tourism represented about 2.3 million holidays (2.4% of the total in Italy) with an increase of 9.6% compared to 2010, while the total holidays registered a decrease of 2.6%;
- Social tourism has a different time distribution: this way it produces an important "smoothing" of the seasonal pattern (that, in this field usually represents a very important problem);
- Social tourism represents a linking factor between some selected operators (3068 structures, representing 4% of the total offer in Italy) and a mixed group of organizations: cultural, companies, and sports associations, churches and other religious groups, schools, etc.

Therefore, social tourism is an important factor since it balances the market increasing demand and distributing tourists' presence during the year. The information on social diversity obtained through the study of social tourism, allow also evaluating the instruments that can reduce, at least partially, the existing social and economic gaps.

At international level, there are other researches and approaches for the assessment of the relation between social diversity and tourism.

Among the international programs, very important is the Calypso initiative. Calypso considers social tourism as a remarkable tool to help those people, who normally cannot go on holiday (Calypso). Calypso identifies four groups of subjects:

- Young unprivileged adults, between 18 and 30 years of age;
- Families with financial or other problems;
- Disabled people;
- Over 65 and retired people who cannot afford travelling.

The aim of this program is also to increase low season tourism, whose costs are usually lower than those of the other periods, being this already an advantage for travelers and, as we have already said, it has a positive effect on the accommodation system.

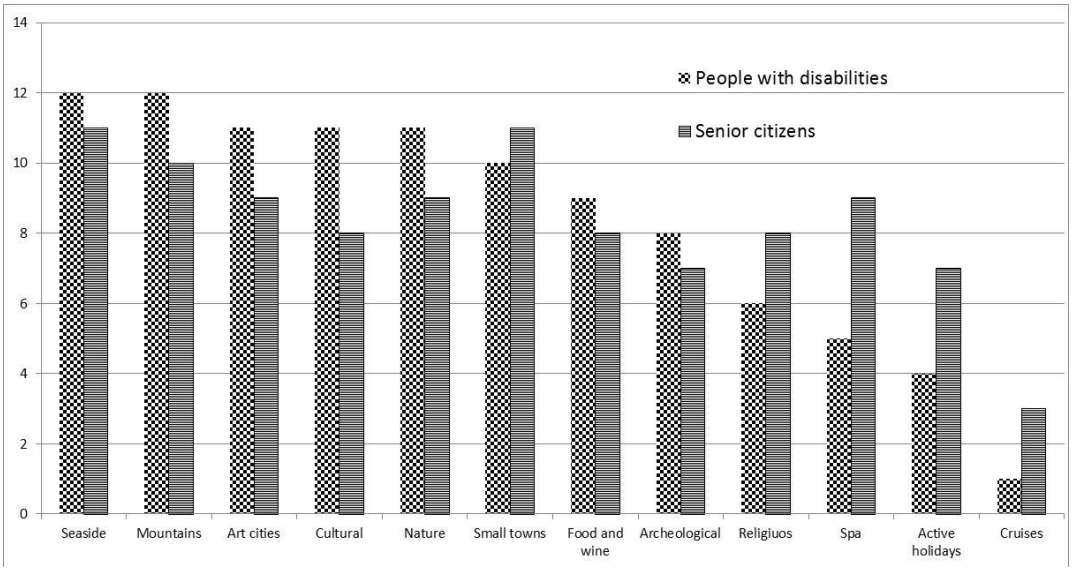
In brief, "Calypso model" is aimed at:

- Promoting off-season tourism, in particular in those regions where tourism is already well developed, but with a high seasonality.
- Allows less well known, small, or emerging destinations, to have the opportunity to come into contact with a wider range of European tourists

- Encourages a longer lasting employment in the tourism sector, offering the possibility of extending work relationships beyond the high season period.

Other information on social tourism was disseminated within Calypso program. Specifically, Calypso year 3 (2011) includes information about Italy (and other seven European countries), while the 2012 program involves another six countries (the program includes a total of fourteen countries: Italy, France, Spain, Portugal, Poland, Finland, Czech Republic, Malta, Belgium, Germany, Sweden, Hungary, Romania, Croatia).

Two groups of subjects involved in the accessible tourism were identified in the Italian report "Calypso-study on social tourism": Tourists with special needs (not necessarily disabled, but for example, with special diet needs, allergies, etc.); and Disabled tourists.



Source: Calypso program.

Figure 2. Main holiday offers in Internet (%) for people with disabilities and senior citizens

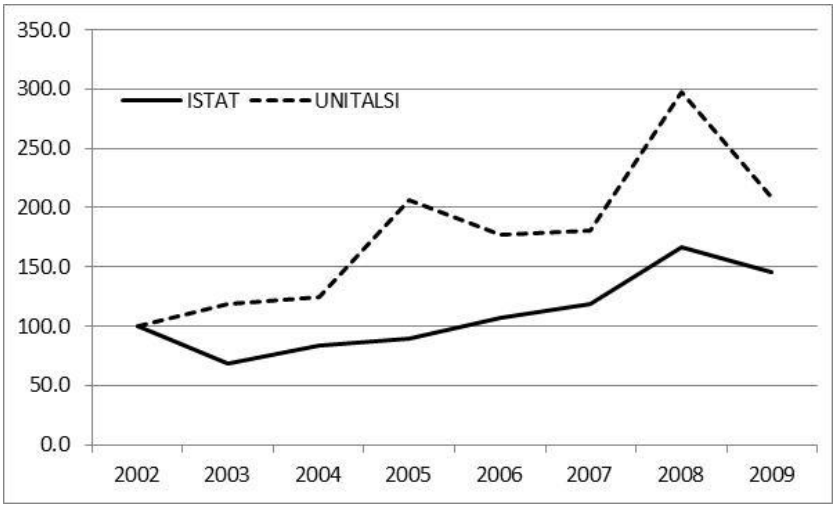
The tourists with special needs prefer a cheaper kind of accommodation, such as non-hotel. They are especially women (54%). A significant percentage of tourists with special needs, are represented by elderly people (22.6% is over 64) and about half of them live in northern Italy (49%). The disabled tourists have a medium-low income (about € 800-900). An important aspect is the absence of specific seasonal peaks for this last category of travelers.

In Figure 2, there are the results of a survey carried out on Web Sites in order to identify the holiday offers for disabled and elderly people. In this figure, it is possible to observe inhomogeneity between the offers (destinations) for the disabled and the ones for the elderly. For example, holidays linked to nature, culture, and cities of art are considered more appealing, thus they are offered more to the disabled, while cruises, active holidays, and spa, are considered more suitable for the elderly.

4. A Tuscany case study

For a more detailed overview of the relation between tourism and diversity, we have used some information of Tuscany region regarding the activities of the "Unione Nazionale Italiana Trasporto Ammalati a Lourdes e Santuari Internazionali" (Italian National Union for the Transport of the Sick to Lourdes and International Sanctuaries) (UNITALSI) from 2002 to 2012. In fact, UNITALSI is a non-profit organization, whose main activity is to organize pilgrimages (mainly by train) to the most important sanctuaries for the sick who are accompanied by physicians, priests, and friends. Non-disabled people also participate in these pilgrimages, thus these activities can be considered also as social tourism (not only as accessible tourism).

In Figure 3, we have compared the trend of the UNITALSI groups of Tuscan travelers with the trips of the other residents in Italy (ISTAT source) for religious or pilgrimage reasons (only from 2002 to 2009, since the second series was limited). The first and most general consideration, regards the overall trend of the two series. In fact, we notice that their dynamics is essentially the same.



Sources: ISTAT and UNITALSI.

Figure 3. Trips made by Italian residents for "religious reasons, pilgrimage" and UNITALSI travelers (index number 2002=100)

However, while the UNITALSI series shows a greater variability, even with a very positive trend (with a more than doubled end value: +109.2%) the ISTAT one, shows a decrease between 2002 and 2003 and, successively, a positive trend that recovered, only in 2006, the initial level. The total growth of this series reaches 45.1%. Therefore, we notice that travelling for religious or pilgrimage reasons did not suffer from the ongoing global economic crisis (at least not in this time period). Apart from the higher growth, the Tuscan series shows two peaks: in 2005 and 2008. The 2008 peak, which was due, as already said, to the 150th anniversary of the apparitions in Lourdes, is present also in the ISTAT series; while the one in 2005 is a specificity of the UNITALSI trips.

The composition of the UNITALSI travelers from 2002 to 2012 is shown in Figure 4.

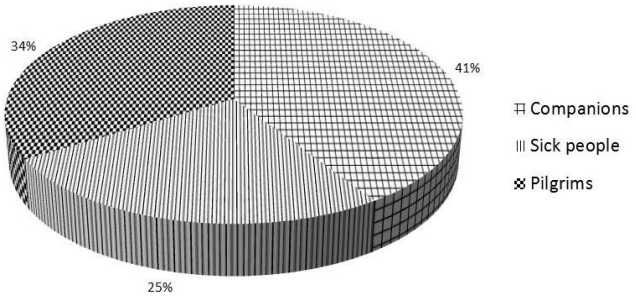


Figure 4. UNITALSI traveler composition

The participants in the pilgrimages are divided into three groups: one fourth includes the sick accompanied by a remarkable number of physicians, priests, and friends, which represent over 40% of the travelers. The remaining part, equal to one third of the total includes the pilgrims that is, non-sick people that are neither responsible for the transport nor for assistance. This component determines the accentuation of the global data dynamics.

In Figure 5, it is possible to observe the evolution of the UNITALSI travelers over the years (always referred to the period 2002-2012). In fact, we notice a greater stability of the series relative to the sick and those who accompany them (physicians, priests, and friends); while the one regarding the pilgrims is remarkably influenced by special events (as it has already been noticed before).

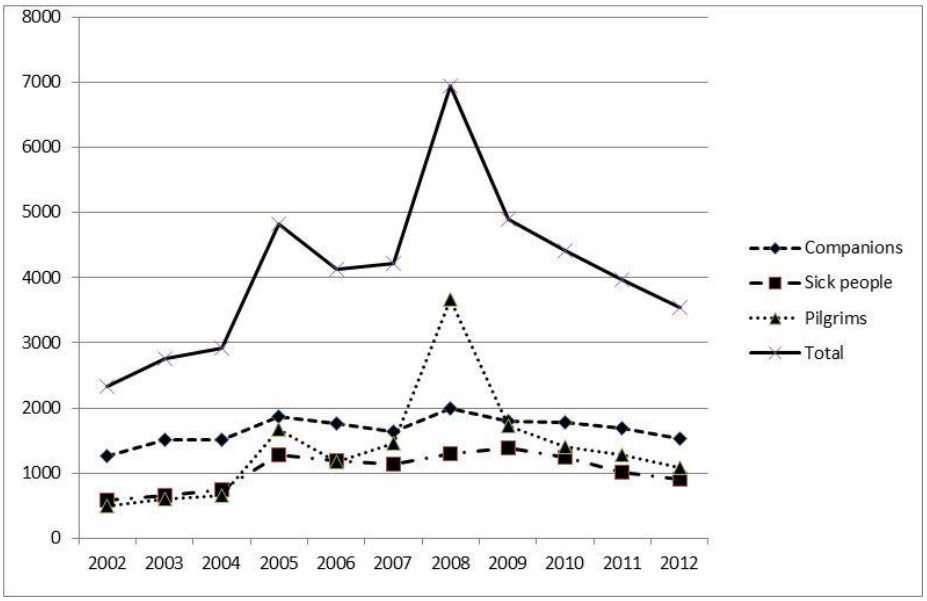


Figure 5. UNITALSI traveler dynamic and composition

In Figure 6, we notice that the UNITALSI trips are represented mainly by non-Italian destinations; travelers going abroad are averagely over 77% of the total. In this representation, it is possible to observe how the extraordinary events can influence even the composition in accordance with the destination.

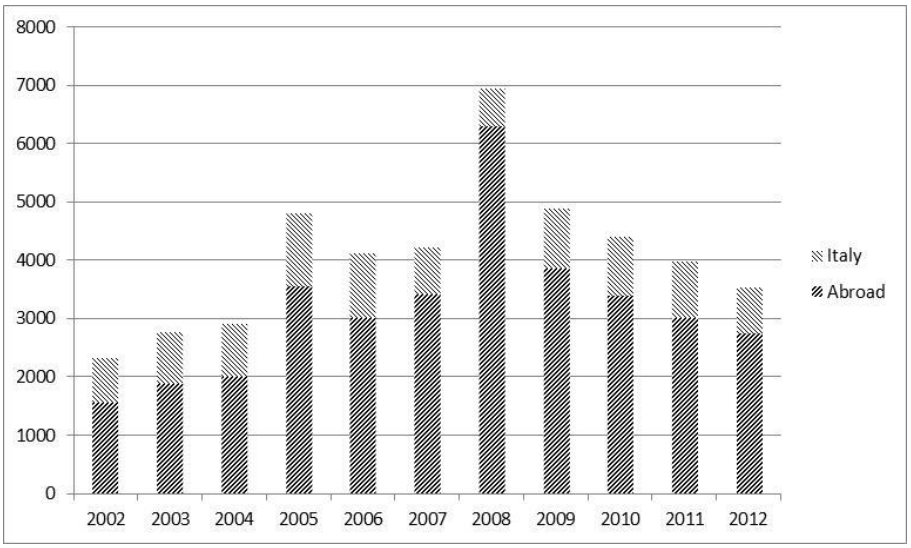


Figure 6. UNITALSI traveler destination

These events have remarkably strengthened the outbound component, for example, the increasing of the pilgrimages to Lourdes in 2008.

Conclusion

Equal opportunities to have the same tourism services are a theme that is being perceived more and more at various government levels. As all the action that need interventions, even innovative, the knowledge and dimension awareness of the phenomena connected to it, represent essential elements for the identification of priorities, even on the basis of the empirical evidences.

Here, we have tried to identify and use quantitative references regarding the relation between tourism and social diversity. This allowed us to evaluate the dimension of accessible tourism indirectly. However, there are no statistical sources regarding accessible tourism directly. Therefore, we took into consideration some proxies as

for example, the information regarding social tourism and its components such as trips of elderly people, families with problems, pilgrims, disabled people, the sick, and so on.

In this context, we have examined some elements:

- The interventions of the Ministry of Tourism;
- The assessments produced by an Italian study center;
- Some results obtained by a European program;
- The data supplied by a non-profit organization.

This study is only a first approach in order to find a strategy to help assessing the quantitative and qualitative characteristics of accessible tourism. The development of this type of tourism shall imply more and more, actions, techniques, and policies aimed at reducing the problems about social diversity in the sector, in order to make tourism become a factor of social inclusion. All these activities allow establishing relations with other people in order to ease their discomfort.

In our opinion, it is necessary that the national and local authorities, responsible for the tourism sector, aim to its organizational and structural improvement. This implies the carrying out of two direct actions in the sector: monitoring the accessibility of all the services connected to tourism with a constant data updating; and supply economical and technical support to tourism industry, to promote the accessibility of its structures.

The availability of structures suitable for accessible tourism, does not regard only the accommodation ones, but also every type of service connected to tourism. These initiatives are not important only for tourists and operators of the sector (who can increase their turnover), but also for all the tourism destinations local communities, and all this in an international competitiveness scenario. Apart from these direct interventions for the sector operators, it is necessary to promote the accessibility culture (for example, with incentives and awards) with appropriate communication campaigns, starting from schools.

We believe that in this framework it would be important to change the perspective from which we approach these themes: change from "development of the tourism to tourism for the development" (Carli, 2010), a situation in which the quality of people, organization, and community must be the hallmark of a sustainable development. For this reason, high quality information, with suitable quantitative references, represents an efficient vehicle of promotion for accessible tourism, with positive outcomes for everyone.

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DIGITAL COMPLEXITY IN DESTINATION BRANDING: A PRELIMINARY ANALYSIS TO DESTINATION PORTUGAL

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Abstract:

Tourist destinations demand strategic thinking and dynamic instruments, methods and tool to address the contemporary digital complexity. The application of information communication technologies by tourism destinations, when correctly articulated with a destination branding strategy, could be a driving force to improve their strategic positioning, and enhance competitiveness. In addition, reinforce perceived images and to optimize the benefits they derive from tourism. Tourism is an important and dynamic sector in the economy of destinations. Our aim is to reinforce tourism as necessary for an economic and social transformation and as a response to the contemporary challenges. The novelty of this preliminary analysis lies in the strategic approach to the digital complexity in destination branding by researching developments in branding Portugal as a tourism destination. In terms of methodology, a brief content analysis, complemented with a text mining study, were developed. Perceive how online tourism-oriented promotional channels characterize Portugal as destination, and further discuss the best branding strategies, is a central element along the article.

Keywords: content analysis, destination branding, digital complexity, Portugal, strategy, text mining.

JEL Classification: M31; L83; R11.

1. Introduction

We live in digitally complex times where the internet has revolutionized our travel planning process. Therefore, makes sense questioning when was the last time we visited a travel agent to plan our holidays? In addition, when was the last time we selected our holiday destination after reading a travel catalogue? We can find ways to reply these questions, but there are no assertive answers. According to the Digital Portal of the European Travel Commission, 183 million European internet users visited travel web sites in March 2013 and 76% (up from 13% in 2003) used *internet* to book their holidays; 18% used *travel agents* (down from 65% in 2003) and 5% the phone (down from 22% in 2003). In addition, the *Attitudes of Europeans Towards Tourism* (2013) survey highlight the most frequently information sources of for trip planning: (1) *recommendations from friends, colleagues or relatives,* with 56%; followed by (2) *internet web sites,* with 46%; (3) *personal experience about a destination,* with 34%; (4) *travel agencies and tourism offices,* with 21%; and (5) *tourism brochures and catalogues,* with 11% (see Travel Daily News 2013). Given these facts, what are the challenges for tourist destinations and the destination branding process? Should places/destinations keep *shouting* their tourism potential by using mainstream marketing campaigns, such as catalogues, paper magazines ads, television spots, or do something more creative, innovative and adapted to the digital reality?

In today's competitive environment a wide range of challenges are confronting tourist destinations. Destinations, such as countries, cities, regions and islands have been struggling to improve their own assets, features, attributes and unique elements to become attractive destinations to visit and spend leisure time

(Alvarez 2012). Understanding exactly how individuals perceive and use the information spread by both, online and traditional promotion channels, when planning their trips, is a challenge that requires suitable strategies at the destination level (Alvarez and Asugman 2006). The plethora of information communication technologies (henceforth ICTs) has been transforming tourism globally. Factors including development of the internet, a new wave of web-based communities known as Web 2.0 (e.g. *Facebook, Twitter, Instagram, Youtube and Tripadvisor*) have changed market conditions for tourism agencies and Destination Marketing Organizations (henceforth DMOs) and the destination branding process itself (Buhalis *et al.* 2011; Page 2009). Tourism has often been seen a key element in the development of places and destinations, which are adopting branding strategies - meant to gain a competitive position and assert their identity - in their communication with potential tourists (Morgan *et al.* 2011; Morrison 2013).

The accelerating and synergistic interaction between ICTs and tourism destinations has transformed the nature of tourism products, processes, business and the competitive environment around them. An upgrading of the communication channels used by destinations, articulated with an effective branding strategy, can fulfil the requirements of the destination stakeholders and (potential) visitors, allowing efficient responses, enhanced image, in addition to improving their long-term prosperity and competitiveness. Among the range of ICTs, the Internet is the number one source of information for travel and tourism. Web sites are incredibly important for business communication, namely for the business of destinations (Buhalis *et al.* 2011). The internet has transfigured the way in which consumers make their travel decisions. However, there is a lack of statistical information to prove it so. The European Travel Commission (henceforth ETC) through the New Media Trend Watch (2013), the World Tourism Organization, the digital marketing agency eMarketer and recently the report *Attitudes of Europeans Towards Tourism* conducted by TNS Political and Social at the request of the European Commission last 2013 (henceforth EC) have been publishing statistics regarding the ICTs usage in travel and tourism.

According to eMarketer (2013) in the United States of America (henceforth US) the digital travel sales, which include leisure and unmanaged business travel, purchased online and via mobile devices, will increase between 2013 and 2017, achieving a 5.36% compound annual growth rate. Digital travel sales accounted for more than 40% of total travel sales in US in 2012. In their May 2012 Consumer Barometer survey, Google, Interactive Advertising Bureau and TNS Infratest found that 81% of US internet users who had booked travel in the past 12 months had researched their trips online, while 74% of respondents had booked online (Consumer Barometer 2012).

The Internet web sites are the most important source of information for respondents in seven European countries: The Netherlands (63%), Finland (63%), Iceland (60%), Denmark (57%), Luxembourg (51%), Malta (46%), and Cyprus (42%). Internet remains the most common way to organize holidays (preparation stage), with 53%. The utilization of the Internet to research and plan holidays has mentioned by respondents located in: Norway (80%), The Netherlands (75%), and Ireland (73%). Therefore, the digital complexity in destination branding is challenging DMOs to enhance their efficiency and to re-engineer their communication strategies and the destination branding process. Hence, devising agile and effective strategies for tourism destinations is required, either at a strategic level, or at tactical and operational management levels (Buhalis *et al*. 2011). The recent empowerment of the visitor it should be taken at the heart of any destination branding exercise.

The aim of this article is to discuss the use of digital platforms by tourist destinations and the impact of digital upon strategy-making in destination branding. In terms of methodology, the present article applies the methods of text mining (see Lau *et al*. 2005; Singh *et al*. 2007) and content analysis (see Hannam and Knox 2005; Govers and Go 2005). Aimed at understanding what is going on in terms of the utilization of the online channels to communicate Portugal as a tourism destination - by searching key words on online sources such as *Visit Portugal* internet page, and the Facebook social media page. Additionally, a content analysis on the travel page of *The New York Times*, and *The Guardian* has been elaborated. Thereafter, an exercise of comparing what has been written about Portugal in a tourism-oriented perspective with the *National Strategic Plan for Tourism 2013-2015* (Turismo de Portugal 2012). We also aim to contribute to the discussion concerning the best strategies for branding Portugal as a tourism destination. In addition, open up new academic paths in destination branding research acknowledging that this is a preliminary research, hence with several limitations. In order to generalize the findings, a more in-depth research should be conducted by amplifying the sample of data and conducting primary research.

2. The complexity of the digital environment in destination branding

Understanding the challenges involved in the branding and management of destinations is an essential element for the success of tourism activity. Challenges may include those provoked by economic imbalances (for instance the economic and financial crises in some European countries such as Greece, Spain, and Portugal. OECD 2012) social and political protests (the recent protest in Turkey, Egypt, and Ukraine), environmental and natural disasters (for example the tsunami in Bali) and the exponential growth and influence of digital channels (see Oliveira 2013a/c). Hence, it is a difficult and time-consuming task to persuade visitors and tourists to change their minds/perceptions about a certain tourism destination. Nowadays, there are a large number of channels to communicate the tourism potential of destinations (e.g. internet web pages, social media networks). Every conceivable tourism destination wants to improve, reverse, adapt, or in some way manage its domestic and international image and reputation (Morgan *et al*. 2011). Destination planning and manage asks for the design of strategies capable to leave a clear and unique image. Leave a clear image, trough digital destination branding, for instance, should have consistency in all media choices (Balakrishnan, 2009). Different images associated with a destination can create sound confusion making it harder to take a decision to visit. Furthermore, to foster momentum and competitiveness, the quality of the experience and service must live up to the promised level (through assertive communication) or it will lead to dissatisfaction (Balakrishnan, 2009).

The use of ICTs facilitates the tourism experience throughout the whole spectrum of preparation, during and post-visit. ICTs could be used as a tool to coordinate stakeholders more effectively (Buhalis, 1997), as well as to boost the multiplier effects in the economy (Buhalis and Spada, 2000). For better economic performance and split the benefits through the host communities is necessary to develop suitable strategies. Local communities should be the firsts to benefit from the tourism potential of their own territory. Destination branding strategies requires a strong vision, strategy, focus and commitment of time. The right cooperation networks, resources and changes in policy decision-making, culture and mindset (Balakrishnan 2009; Balmer 2001; de Chernatony and Riley, 1998). In destination branding exercises it is fundamental to capture the elusive spirit of the visitors, a campaign can quickly go viral and become highly influential, positively but also spreading in seconds a negative massage and hence damage the reputation of a destination. Successful destination branding strategies in the digital and networked environment relies on a collaborative approach among destinations stakeholders and local communities. Harnessing the power of the online contents, the community, and like-minded brands where the overall effect is greater than the sum of the individual parts (Munro and Richards 2011); collaboration, cooperation, coordination play an important role is successful destination branding exercises.

3. Making strategies in destination branding

Destination branding has become one of the hottest topics amongst place branding research, from Turkey to Portugal, from Berlin to Edinburgh. These destinations, and many others, are facing challenges at economic, social, environmental and technological levels. Therefore, understanding of the critical issues involved in the branding and management of destinations is an essential element to secure the success of global tourism industry (Fyall *et al*. 2012). In that regarding, the use of branding has been considered a powerful tool available to develop tourism destinations (Morgan *et al*. 2003). The application of a place branding approach to tourism destinations, known as destination branding, is focused in lowering costs, changing the type, the nature or the behavior of visitors, but also changing tourism products, integrating stakeholders and communities, avoiding irritations and responding to issues created by the present economic crisis, and challenges at the digital level (Law, 1993).

The literature, such as Buhalis (2000), Morgan *et al*. (2011), Pike (2005; 2009), Caldwell and Freire (2004) define a tourism destination in multiple ways. Traditionally, destinations are geographical areas as countries, regions, cities, or islands (see Hall 2000; Davidson and Maitland 1997). Moreover, a destination is also a perceptual concept, which can be interpreted subjectively by visitors, depending on their travel itinerary, cultural background, purpose of visit, level of studies and previous experiences. According to Buhalis (2000) tourism destination is a geographical area, which is understood by its visitors as a unique entity, with political and legislative framework for tourism marketing and planning. As a complement to the definition, Saarinen (2004) cited in Morgan *et al*. (2011) interprets a tourism destination as socio-culturally produced space in a constantly evolving discursive practice. As argued by Brent-Ritchie and Crouch (2011), tourism destinations are composed by a complex range of social, economic, legal and technological policies that affect their appeal, attractiveness,

competitiveness and sustainability. According to Fyall *et al*. (2012), tourist destinations are inherently complex, inter-related nature and are best understood as composite entities.

Enhancing the line of reasoning along this article, a tourism destination, while communicating the value and strengths of its assets, through a destination brand, integrated in a wide strategy, could earn a better position in the tourism market. This integration could be operationalized through strategic spatial planning initiatives (more spatial/territorial oriented) or strategy-making (Oliveira 2013a) in addition to tourism planning practice (more market/business oriented). In addition, the search for the right strategies for destinations branding lies in understanding that strategy in planning involves the translation of knowledge into action (Friedmann 1987). Strategic spatial planning initiatives works better in coordinating and integrating spatial policies when it engages in inclusive and participatory processes, involving the communities values, needs, assets and place identities, thus supporting a destination branding strategy. Researching the links between destination branding, strategic spatial planning and spatial strategy making remains a wide topic for researchers, both theoretically and in practical terms (Oliveira 2013a/b).

On the other hand, the complexity of the destination branding exercises requires digital strategies to face the advancement of digital technologies. Social networking websites provide forums for visitors and tourists to discuss the places they have visited. They dream about a trip, they plan, they book the tickets and accommodation, and they actually travel to the destinations with high hopes to feel the experience. Afterwards they will share their thoughts, images, videos, experiences and feelings by using online means (e.g. social media platforms). The vast numbers of digital platforms are challenging destinations to enhance their efficiency and to re-design their digital strategy.

4. Digital strategies in destination branding

A tourism destination seeks to be positively positioned in the minds of potential visitors. A key component of this positioning process is the creation, management and communication of a distinctive and appealing image (Echtner and Ritchie 2003; Oliveira 2013c). Destinations are subject to increasing market complexity (e.g. globalization, internal and external government policies, foreign exchange fluctuations and natural environment instability, such as earthquakes of floods) and increasing marketing and promotion costs. Tourist destinations have been pursuing the uniqueness of their tourism potential, hence to define the best strategies to enhance competitiveness. Thus, develop points of attractions and/or highly specialized competencies in terms of specific tourism products and processes are fundamental. As financial resources for destination branding processes are scarce, it is advisable to lower the high dependence on public funding by identifying business partners and alternative rationales and revenue mechanisms able to make a destination branding initiative financially sustainable (Laesser and Beritelli 2013). Appling the right tools and designing strategies for destinations is fundamental for successful destination branding. According to Munro and Richards (2011), an effective digital destination branding strategy should tactically deploy and instigate stories that address the destination negatives points. Therefore, the argument stated here emphasizes the need for a strategic thinking in whole destination branding process.

Tourist destinations are increasingly spending more on advertising, marketing campaigns and online promotional activities. The destination branding processes that use digital platforms, such as web pages, blogging, and social networks have become more puzzling. So, how best to use online channels to communicate a destination to the outside world? For starters, destination managers should provide reasons and purposes for a visit to potential tourists. They should do it in a coherent way by maintaining communities of interest, collecting user-generated content, displaying photos and videos, emphasizing local events, and encouraging word-of-mouth recommendations. Understand that content is king and communicate qualitative and diverse information. A destination brand should be part of the destination's overall branding effort, and that is much more than creating a logo, a tagline or opening a Facebook page. That effort should consider the community's needs, being clear in terms of objectives. Engage with stakeholders and build the destination brand with them in an active and participatory way (Oliveira 2013a/b/c).

The present article highlights the digital challenge in destination branding. A brief content analysis of travel and tourism oriented websites where Portugal has been mentioned, provides a starting point for future discussions of a strategic thinking and strategy-making in destination branding.

5. Portugal as tourism destination

Tourism in Portugal is a key growth driver for the national economy and for the social, economic and environmental development of the country says the *National Strategic Plan for Tourism 2013-2015* (Turismo de

Portugal 2012). According to data from Statistics Portugal tourism revenue increased by 7.2% in 2012 (note that the information is up-to-date). As described on table 1 the total contribution of tourism to the GDP was 26.2 billion of euros, 15.2% of the total GDP in 2011, and is forecast to fall by 2.1% in 2012 and is expected to rise by 1.8% pa in 2022. In 2011, tourism generated 322,000 jobs directly, 6.6% of total employment, and this is forecast to fall by 0.3% in 2012 to 321,000 (6.7% of total employment). Despite the importance of the tourism to the GDP and employment, The World Travel and Tourism Council (henceforth WTTC) forecast (i.e. 2012-2022) shows a negative growth for the year 2012 and lower growth of the tourism by 2022.

Table 1. The economic impact of tourism in Portugal (data for 2012)

	2011	2012	2022 (forecast)	2020 Growth (forecast)
Tourism GDP (% of National GDP)	**15.2**	**-2.1**	**15.7**	**1.8**
Tourism Jobs (% of total employment)	**17.8**	**-0.3**	**18.9**	**1.2**

Source: World Travel and Tourism Council (2012).

Analysis of Table 1 underlines the direct contribution of tourism to the GDP in 2011 that was 9.2 billion euros (5.3% of the total GDP). This is forecast to fall by 2.2% in 2012 and register a 1.7 growth up to 2022 (10 year forecast). This primarily reflects the economic activity generated by hotels, travel agents, airlines and passenger transportation services. Nevertheless, it also includes, for example, the activities of restaurants and leisure industries directly supported by tourist activity. The total contribution to employment (including wider effects from investment, the supply chain and induced income impacts) was 866,500 jobs in 2011 (17.8% of total employment). This is forecast to fall by 0.3% in 2012 and increase by 1.2% by 2022 (18.9% of total employment) according with WTTC (2012). The Travel and Tourism Competitiveness Report 2013 reveals the Travel and Tourism Competitiveness Index-TTCI (World Economic Forum, 2013) and states that Portugal is the twentieth most competitive country/economy in the world in terms of tourism, among one hundred and forty economies assessed. Countries such as Switzerland, Germany and Austria occupied the first three positions. According with the same report, Portugal received 7,412.2 international tourist arrivals in 2011 within 11,338.6 US$ (i.e. United States dollars) as international tourism receipts. Since 1997, international tourist arrivals and international tourism receipts progressively increase. The same Travel and Tourism Competitiveness Report 2013 (World Economic Forum 2013), emphasizes the ranking indicators of environmental sustainability where Portugal holds position number fifteen in terms of environmental sustainability and position number nineteen in terms of safety and security, out of one hundred and forty countries. That enhances the position of the country as a tourism destination and reinforces the importance of tourism to economic and social dynamics and to support a strategic (structural) change. In terms of tourism promotion *Destination Portugal – The beauty of simplicity* has been used to communicate the tourism potential of the country.

6. Research methodology

Increasing numbers of researchers in the field of tourism studies are using discourse analysis as a means of critical investigation when faced with qualitative or textual forms of data, such as written documents, or visual materials (Hannam and Knox, 2005). Deepen the knowledge about what is going on in certain destination in terms of both strategies and tactical interventions is necessary for a resilient approach able to enhance competitiveness and boost the economy of the destination. An increasing number of researchers in the field of tourism studies (Hannam and Knox, 2005), hospitality (Singh *et al*. 2007) and destination image online (Govers and Go, 2005) are using specific research methods that are often conveniently organized under the term discourse analysis. For instance, text mining and content analysis, when faced with qualitative or textual forms of data, such as written documents (e.g. strategic plans), or visual materials (e.g. photographs; videos) (see Hannam and Knox, 2005).

6.1. Text mining

Similar to data mining, text mining explores data in text files to establish valuable patterns and rules that indicate trends and significant features about specific topics (e.g. tourist destinations visited). Text mining works with an unstructured or semi-structured collection of text documents (e.g., corporate documents, web sites, newsgroup postings, see Berson *et al*. 2000). With the availability of huge volumes of text-based information

freely available on the internet (e.g. travel blogs, social media), text mining can be used by the tourism industry to develop competitive, strategic and operational decisions (Lau *et al*. 2005). According to Lau *et al*. (2005), tourism agencies and DMOs may find the text mining methodology valuable in several areas of their operations, including:

- ✓ Scanning customer intelligence by analyzing newsgroups, online bulletin boards, and surveys;
- ✓ Acquiring customer intelligence by analyzing personal home pages, comment cards, and qualitative survey data, and
- ✓ Improving efficiency in destination management exercises, which includes analyzing visitor's databases, and strategic documents of sectorial guidelines (e.g. master and strategic plans).

The methodology tool of text mining it is best suited for learning and discovering information that was previously unknown. While text mining may work with almost any kind of information, it delivers the best results when used with information that is text-based, valuable and explicit text. Therefore, it fits the aims we want to achieve with this article.

6.2 Content analysis

Content analysis is concerned with categorizing and counting occurrences of aspects of content (Hannam and Knox, 2005). Content analysis is an empirical technique, which involves the counting, identification of issues and interpretation of the content of a text, which is assumed as relatively significant. Content analysis calls for the categorization of the various elements or components to help researchers understanding tourism trends (Krippendorff 2003). Even though it requires the researcher to use personal judgment in making decisions about the data collection, the decisions must be guided by an explicit (objective) set of rules that minimize - although probably never quite eliminate - the possibility of subjective predisposition (Singh *et al*. 2007).

A content analysis attempts to identify image arrays and identify the key words they use to characterize tourism destinations. Furthermore, is a useful tool to design successful destination branding strategies. For instance the numerous times a word have been mentioned while describing a travel experience (e.g. relaxing holidays; stunning landscape); these keywords were collected in previous studies (see Oliveira 2013b).

6.3 Sample the data

In Portugal the entity in charge of tourism planning and development is *Turismo de Portugal* (tourism of Portugal. Tourism of Portugal – communicated as *Visit Portugal*, integrated in the Portuguese Ministry of the Economy and Employment, is the national tourism authority responsible for the enhancement and sustainability of the tourism activities in the country. In addition, stimulate tourism activities, from the supply sector to demand, operationalizing, and coordinating the promotion of Portugal as tourism destination.

The Visit Portugal entity is currently promoting the tourism sector under the campaign of *Destination Portugal - The Beauty of Simplicity*. Managing Portugal as a tourism destination, while seeking to increase its reputation at international level, consolidating the country's image, strengthening tourism as one of the core growth engines of the Portuguese economy in tandem with the regional tourism entities and local stakeholders (e.g. accommodation sector; municipalities) are the main goals of Tourism of Portugal.

To sample the data, an online search was conducted on the Visit Portugal web site, available on http://www.visitportugal.com/ and the Facebook page, available on its web site https://www.facebook.com/Visitportugal. A content analysis of the three most read articles that mention Portugal, between 1st of February and 15th of May of 2013, on the online travel page of the *The New York Times*, on its web site http://www.nytimes.com/pages/travel/index.html and the online travel page of *The Guardian* on its web site http://www.guardian.co.uk/travel was conducted. Thereafter, a cross comparative study linking the findings of the content analysis with what is written on the *National Strategic Plan for Tourism 2013-2015*, the main document for the tourism in Portugal (Turismo de Portugal 2012) was elaborated. Is the information widespread by online channels connected with the *National Strategic Plan for Tourism*? The findings will attempt to some clarifications.

7. Research findings

Six online articles, out of ten, are analyzed and research findings for each one presented. To set out the frequency of words the tool – word cruncher has been applied on each article from The New York Times and The Guardian. While several limitations were acknowledged during this study, overall the findings provide a preliminary foundation for future research to investigate online channels usage and social media involvement to promote Portugal as a tourism destination and therefore attempt to design effective destination branding strategies.

7.1. Content analysis I: The New York Times

Article I: On Portugal Beach, Riding a Wave That Hits Like a Quake

Quotation	(…) "Despite its charm and a stunning 14th-century church, Nazaré, Portugal has seen some bad times, with the decline of its once-prosperous fishing industry and an exodus of local youth. Thanks to a photo that electrified the world last month - showing a big-wave surfer named Garrett McNamara (…)"
Source	http://www.nytimes.com/2013/02/25/world/europe/on-portugal-beach-riding-a-wave-that-hits-like-a-quake.html?_r=0
Keywords frequency	**4 times**: Nazaré (place); Portuguese; Surfing. **8 times**: Norte (north); Praia (beach). **12 times**: McNamara (the surfer); Waves.

Article II: On Trails Less Traveled

Quotation	(…) "For explorers seeking quiet pathways, a few outfitters offer pioneering routes and a comfortable place for you to put up your feet at day's end" (…)
Source	http://travel.nytimes.com/2013/04/21/travel/on-trails-less-traveled-in-europe.html?_r=0
Keywords frequency	**4 times**: Vicentina (name of the route); Mountain; Rural; Travelers. **8 times**: Route; Walks.

Article III: Haute Hostels Put to the Test

Quotation	(…) "Portugal has turned out a stream of stunning hostels. Every year the country scoops up armfuls of "Hoscars" the annual international awards presented by the booking site Hostelworld.com. (…) This year Lisbon hostels claimed the top four spots in the Best Worldwide Hostels" (…)
Source	http://travel.nytimes.com/2013/04/28/travel/haute-hostels-put-to-the-test-in-europe.html?pagewanted=all
Keywords frequency	**4 times**: Paris; Young. **8 times**: Barcelona. **12 times**: Lisboa (Lisbon).

7.2. Content analysis II: The Guardian

Article IV: 10 family trips in Europe for the school summer holidays

Quotation	(…) "Looking for an affordable and interesting getaway when the schools break up?"(…) "Set within the Rio Formosa, nature reserve, Quintamar offers a refreshing alternative to the Algarve's bland package holiday hotels". The stunning sand-spit beaches of the eastern Algarve are just a short boat ride away and the local fishing village of Santa Luzia is renowned for its seafood restaurants" (…)
Source	http://www.guardian.co.uk/travel/2013/may/09/10-family-holidays-summer school?INTCMP=SRCH
Keywords frequency	**4 times**: Algarve; Alternative. **8 times**: Beaches; Family. **12 times**: Children; Sleeping.

Article V: 10 trips during the school holidays – without kids

Quotation	(…) "Sintra, Portugal its air of genteel decay, exotic vegetation and fairy-tale palaces, the hill town of Sintra offers a cool respite from the sun-baked streets of nearby Lisbon. Explore the ramparts and towers of *Pena Palace*, the medieval splendour of the National Palace of Sintra and the lush, botanical gardens" (…)
Source	http://www.guardian.co.uk/travel/2013/may/10/summer-school-holidays-without-kids?INTCMP=SRCH

Keywords frequency	**4 times**: Sintra; Summer; Breakfast. **8 times**: Medieval; Marseille.

Article VI: Day trips from Lisbon, Portugal: readers' travel tips

Quotation	(…) "Sintra, Cascais and Portinho all offer tempting holiday excursions that are a short drive or train ride from Lisbon" (…) "The Convento de Cristo in Tomar is probably one of the most spectacular places in Portugal". (…) "For a cycling day trip, check out Sintra-Cascais natural park" (…) "Portinho da Arrábida is a tiny village on a white sandy beach about 45 minutes' drive south of Lisbon. The calm sheltered bay is great for snorkelling. Behind it rise steep limestone mountains, part of the Arrábida natural park" (…)
Source	http://www.guardian.co.uk/travel/2013/may/06/day-trips-from-lisbon-portugal-sintra?INTCMP=SRCH
Keywords frequency	**4 times**: Arrábida (place); Portugal; Tomar (place); Natural. **8 times**: Cascais (place); Portinho (place) **12 times**: Sintra; Lisbon

From the content analysis to the articles of the online version of the international edition of the newspaper – *The New York Times* and *The Guardian*, the image of Portugal as tourism destinations is commonly associated with relaxing holidays. Places located between sand and mountains with stunning landscape and historical buildings have been identified in these particular articles. The cities of Lisbon, Sintra, Porto and Algarve region are the places more often described. The aim of the present analysis is to reinforce that a destination branding strategy it could be structured based in the way the world sees territorial assets, tourist potential and characteristics. Expert and user generated content are fundamental to enhance the competitive position and attempt to a better economic and social performance of their communities. In advance, we acknowledge the limitation of the research as it should be carried out in a wider level by involving more documents and sources of information.

7.3. Content analysis III: performance of Visit Portugal Facebook page and website

Destination Portugal - The Beauty of Simplicity is the strapline that has been used to communicate the tourism potential of Portugal and spread through digital channels, including the Facebook page. The information shared via Facebook page, is usually from sources of information generated by experts, such as traveler bloggers and travel journalists. Other information shared on the page is user generator content, which is an opportunity to enhance the country reputation. Visit Portugal follows travel blogs or suggestions of visitors to promote the country as tourism destination, which is good to build an online community and engage with the target audience (e.g. Ben Fogle reports on surfing in Portugal, via The Telegraph Travel; or/and Lisbon, Portugal is one of the Best-value destinations in Europe for 2013 according to Lonely Planet). Visit Portugal also uses the Facebook to spread images and events that are taking place in Portugal. Visit Portugal frequently highlights the city's tourism potential (e.g. Romance in Coimbra; Historic centers of Portugal; Lisbon of the Discoveries; and short break in Porto and Northern of Portugal).

7.4. Content analysis IV: National Strategic Plan for Tourism 2013-2015

Portugal has started down a long road of economic adjustment to boost growth and correct an excessive reliance on debt. A wide range of structural reforms is required to raise productivity and rebalance the economy towards international trade and tourism as a key sector underlines the Organization for Economic Co-operation and Development report (OECD 2012) and the *National Strategic Plan for Tourism 2013-2015.* Deeper knowledge is necessary about what is going on in destination Portugal, in terms of both strategies, and tactical interventions, in order to support a resilient approach able to enhance competitiveness and boost the local economy. Tourism plays a crucial role as generator of jobs and revenues. Given this facts, it is paramount to understand what the main strategic documents define as strengths and opportunities but also as weakness and threats. A critical content analysis was applied to support the article's objectives here. The *National Strategic Plan for Tourism 2013-2015*, published by Turismo de Portugal (2012) underlines the need to develop the tourist activity with quality based on authenticity and unique experiences. Furthermore, it should be integrated in environmental sound urban fabric interventions (page 7). The emergence of tourism, as a spatial activity, that to

be healthy needs to be developed within a healthy spatial environment. Tourism is an engine of social, economic and environmental development at national and regional level.

The weak economic confidence has been acknowledged on the document and measures for improvement are presented. Mechanisms to finance companies as well as entrepreneurs projects related with the tourist activity as a means to overcome economic imbalances have been identified. With critical thinking, what we lack the most is an approach to more territorial elements, such as urban and regional planning (in particular because of the relevance of Northern cities such as Porto, Braga, Guimarães, Viana do Castelo), including natural landscapes, built environment and heritage. We found references to the need to value public spaces and rational usage of natural resources as well as heritage preservation. Spatial planning is only mentioned as necessary to facilitate licensing process for tourism development, such as accommodation infrastructures. Transportation and mobility are missing on the document, both fundamental for destinations planning and territorial development, not only with tourism ambitions. Tourism will be more effective if strategically planned for the long run.

The document does underline tourism planning but from a more corporate and less spatial perspective. In terms of branding, there is a misunderstanding between the definition of place brand and a place slogan/strapline (page 70). Regarding the tourist product - gastronomy - a slogan - *Prove Portugal* (translated to English by the author - *Taste Portugal*) is mentioned as a brand to be promoted. In addition, the existence of a "called" brand – *Destination Portugal - The Beauty of Simplicity* does not block the existence of sub-brands, however, it should be clearly sustained by a strategy, and therefore consistently communicated via online channels. Our interpretation is that sounds an isolated intervention. There is no attempt to strategically integrate the tourism potential of the country in wider spatial planning process. In addition, the references to place brand, even only focused in tourism, are not really 'brands' but simply promotion exercises.

Conclusions

Tourism is able to contribute to socio-economic development and encompasses growing number of destinations all around the world. These dynamic of growth have turned tourism into a key driver for socio-economic progress, and represents at the same time one of the main income sources for destinations. Tourism affects local economies in different ways. On one hand, tourism attracts resources such as labor, capital and housing from other sectors of the economy and, on the other hand, the income generated by tourism encourages development of other economic activities (see Kaur 2010). We have to be aware that a tourism boom may deteriorate environment and cause congestions in transportation systems and other public facilities (see Zhang 2012). Therefore, integration between tourism planning exercises and strategic spatial planning could led to new stages of development for a destination. There is a close interdependence between tourism and other economic, social, cultural and a panacea of spatial activities. Our approach examines the dynamic interdependence in a general equilibrium framework between a more corporate/business perspective to tourism, with a spatial dimension, more close to the reality and local communities. Bearing in mind the current challenges and complex issues posed to tourist destinations, such as at the digital level.

Tourism, at the global level, grew sharply in the second half of the twentieth century as result of several economic, social, and technological processes. The internet has been applied as a system of electronic intercommunication and a way of processing and presenting digital information. With intelligent thinking from people's imagination, it brings together unlimited opportunities to enhance the brand of a destination. The development of ICTs, social media, web 2.0 empowers DMOs and visitors (through user generator content). Thereafter, strategies, instruments, tools and methods are required to better prepare a response to challenges. For instance, produce and share qualitative and diverse information, offer trip planning tools and attractive visual material, always up to date, photo and video sharing. It is fundamental to support the design of a positive, focused and consistent message. Hence, the correct and coherent use of social media, web sites and travel blogs to communicate destination assets and the tourism potential of a territory will support interoperability, personalization and constant networking. Thus, increasing tourism revenues and enhancing competitiveness and destination reputation (Buhalis *et al*. 2011). DMOs, when planning the design websites or to use social networks, to communicate the tourism potential have to be sure to provide reasons and purposes for a visit, engage with potential visitors open up possibilities for a true and honest interactions (Morrison 2013). The content of the tourist message, consistency in communicating the destination brand are key to success of the destination branding process, as a whole.

Communicating a consistent message about destination assets becomes exciting when it engages a network of content generators, such as travel bloggers but also all the citizens, including locals, otherwise the

risk of producing inequality and unrest is high. Strategy-making in destination branding requires the right people, the right mindset, the right internal structures, and the right stakeholder and industry relationships where, across all of those things, innovation, decentralization, and collaboration/networks are all important (Morrison 2013). Together, they will enhance the destination's image, increase tourism revenues and improve competitiveness.

The dangerous of not designing a consistent destination branding strategy is visual and sound confusion from the outputs, such as destination logos, straplines and video promotion and the fail of fulfil the expectations of the visitors. Destination brands only have value if they are created by everybody. If this process is fuzzy a topo phobia may be generated. This means that repulsive feelings regarding a place/destination might be created in the mind of people. Making it simple is one of the key words to address the complexity of the digital environment tourism destinations, such as Portugal, have to deal with (Oliveira 2013c). Effectively using the multiple social media channels requires coordination and coherent communication strategies integrated with the destination branding process and with existing systems and platforms. An effective use of social networks and web sites to communicate the destination tourism potential will support interoperability, personalization and drive constant engagement with tourists (before, during, and after the visit). From the research findings, Portugal has been characterized as a less crowded and alternative tourism destination with scenario of natural landscape (e.g. beach, sun, waves, mountains, gastronomy, wine, Port Wine) and historic city centers (e.g. heritage sites, shopping opportunities). Those elements could be integrated in a future destination branding strategy for the country as a whole.

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INFORMATION AND COMMUNICATIONS TECHNOLOGIES FOR NATURAL RESOURCE MANAGEMENT

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Abstract:

The natural resources of most developing countries are under increasing stress, and many nations are increasingly concerned about achieving environmental sustainability through efficient use of land and water resources. As population is escalating very fast and consumer demand for high value agricultural products (fruits and vegetables, animal or fish products, etc.) is also changing rapidly.

Hence, need to take stronger step by national governments to monitor their natural resources and take immediate steps to maintain these resources when being overused. Data generation by visiting the place physically is tedious and time consuming. Modern ICT techniques provide solutions helpful in collecting data without visiting the place from distance. With development of modern technologies, ICTs are of immense use in Sustainable Natural Resource Management. These technologies are time and money saving, accurate compared to conventional assessment. Products of these technologies help the scientists and policy makers for taking appropriate decision in agriculture production.

It is thus important to recognize that the dissemination of these land and water-use management practices are largely knowledge-based; therefore, developing countries will be required to make substantial investment in public extension to train small and medium-scale farmers how to use Sustainable Natural Resource Management (SNRM) practices.

Keywords: information & communication technologies, natural resource management, sustainable natural resource management.

JEL Classification: Q0, Q01, Q16, Q59, Z0

1. Introduction

The search for socially desirable, economically viable, and ecologically sound pattern of resources use and ways of life, to promote sustainable development, has been going on ever since. The natural resources of most developing countries are under increasing stress, and many nations are increasingly concerned about achieving environmental sustainability through the efficient use of land and water resources. Also, giving continuing population increases, as well as the growing consumer demand for high value agricultural products (fruits and vegetables, animal or fish products, etc.), national government must take stronger step to monitor their countries natural resources and take immediate steps to maintain these resources when being overused.

For instance, the agricultural sector typically uses about 70% of a nation's water resources but increasing urbanization and industrial development, the water resources of many nations are being over-utilized, with long-term negative consequences. Farmer must learn how and be convinced of the need to use water, efficient technologies (e.g., drip irrigation) and/or to shift to more water-efficient crop and livestock systems. Also some technologies, such as water harvesting, require more labor input, while most irrigation technologies require substantial capital investment and higher operating cost. Other technologies, integrated pest management, can reduce production costs, but to achieve the adoption of these complex technologies will require substantial investment in non-formal education services, such as delivered through Farmers Field Schools (FFS).

2. Information and communications technologies' and natural resource management

With increasing challenges before India, the National Water Policy-2002 envisaged that establishment a well-developed information system for water related database at national and state level with a network of data banks by integrating and strengthening the existing central and state level stakeholders. The information system should comprises standards for coding, classification, processing of data and methods or procedures for its collection and promoting free exchange of data among various agencies. Apart from the data regarding water availability and actual water use, the system should also include comprehensive and reliable projections of future demands of water for diverse purposes. In this view, harnessing the potential of Information Communication Technologies (ICTs) as an instrument is crucial for inclusive growth of agricultural sector as India will be the third largest internet user base by 2013. ICTs is an umbrella term that includes any communication device or application, encompassing: computer based networks, hardware and software devices, satellite systems, community radio, television, cellular phones and so on, as well as the various services and applications associated with them, such as videoconferencing and teleconferencing. These ICT based tools are applied for processing, exchanging and managing data, information and knowledge management, and also having great ability to:

- Record text, drawings, photographs, audio, video, process descriptions, and other information in digital formats;
- Produce exact duplicates of such information at significantly lower cost;
- Transfer information and knowledge rapidly over large distances through communications networks;
- Develop standardized algorithms to large quantities of information relatively rapidly;
- Achieve greater interactivity in communicating, evaluating, producing and sharing useful information and knowledge;
- According to the European Commission, the importance of ICTs lies less in the technology itself than in its ability to create greater access to information and communication in underserved populations.

3. Information and communications technologies for efficient soil management

Soil is an important resource, has a specific kind of capacity to function within natural or managed ecosystem boundaries to sustain plant and animal productivity, maintain or enhance water and air quality and support human health and habitation. Soil functions are general capabilities of soils that are important for various agricultural, environmental, nature protection, landscape architecture and urban applications. The major soil functions are:

- Sustaining biological activity, diversity, and productivity;
- Regulating and partitioning water and solute flow;
- filtering and buffering, degrading, immobilizing, and detoxifying organic and inorganic materials, including industrial and municipal by-products and atmospheric deposition;
- storing and cycling nutrients and other elements within the earth's biosphere; and
- Providing support of socioeconomic structures and protection for archeological treasures associated with human habitation.

Date generation by visiting the place physically is tedious and time consuming. Modern ICT techniques provide the solution helpful in collecting data without visiting the place from distance. Remote sensing is any process that collects data about an object from a remote location. Some mechanical devices are used to achieve this process. These devices contain advanced sensors that can capture information via the reflection or emission of radiation from objects. Devices used for remote sensing are constructed to sense certain wavelength bands. The objects that are sensed have particular spectral signatures and one has to match the object to the sensor. The area reported with productivity decline is demarcated. Remote sensing products are collected and interpreted either visually or digitally for low productivity.

3.1. Aerial photographs

The simplest form of remote sensing uses photographic cameras to record information from *visible* or *near* infrared wavelengths. In the beginning cameras were positioned above the Earth's surface in balloons or kites to take oblique aerial photographs of the landscape. Many of these images were used to construct topographic and other types of reference maps of the natural and human-made features found on the Earth's surface.

Figure 1. Aerial photographs of salt affected lands-Chamrajnagar District, Karnataka
Source: (Singh and Meena, 2012)

Soil quality can be assessed from aerial photography. Areas without vegetation, with high reflectance, irregular in shape are demarcated and it can be examined for eroded or salt affected lands. Figure 1 shows the areas of salt affected lands with high reflectance. Even with cropped area will communicate differently through its high reflection if the soils have problems. Water logging, salinity, low nutrients etc., will affect the plants by reducing the uptake of nutrients. Light or pale color the plants indicates the low nutrient uptake status of the plant. Repeated photographs with different time interval will be useful for monitoring of soil quality status and assessment. Similar work was done and physical quality was assessed by Fieldli *et al.* (1997) of the soil restored after the gravel exploration in Switzerland. In order to minimize the soil damage, Infra-Red (IR) color photographs were taken at a scale of 1:3000 from an aircraft using a photogrammetric camera and at a scale of 1:1000 and 1:500 from a gas balloon using an amateur camera.

The following results were emerged from the present investigation that to assess the grass condition which was grown on restored areas, aerial photographs at a scale of 1:3000 are better suited than photographs at a scale of 1:1000 and larger scales. The IR color photographs taken with a photogrammetric camera from an aircraft have a better image quality than the photographs produced with amateur cameras and films. The visual interpretation of the geometrically corrected images was adequate, because the final image was affected by many factors besides soil conditions. Aerial photography has the advantage of allowing a quick and repeatable look at grass conditions over a total area simultaneously, and of providing permanent records of conditions at a specific moment in time.

3.2. Satellite imagery

Development and launching of high altitude satellite caused a revolution in remote sensing. Many orbiting objects were fitted with sensors to complete specific remote sensing jobs. Remote sensing of the Earth's climate for weather forecasting began with the launching of a number of satellites called TIROS. Over time sensors became more sophisticated and some of them were used to monitor the Earth's surface for a number of applications outside of weather forecasting (LANDSAT, SPOT, and RADARSAT).

Recognizing objects from a remotely sensed image is often a difficult process. Many objects are hard to identify because their appearance in the image is unfamiliar to our memories because the objects in the environment mainly from a oblique perspective. Objects that are remotely sensed are often imaged from above and the sensors used in the imaging process may be recording electromagnetic signatures that are outside human vision. To aid in object recognition, users often use a methodical process that identifies features based on shape, image tone or color, pattern, shadow, and texture.

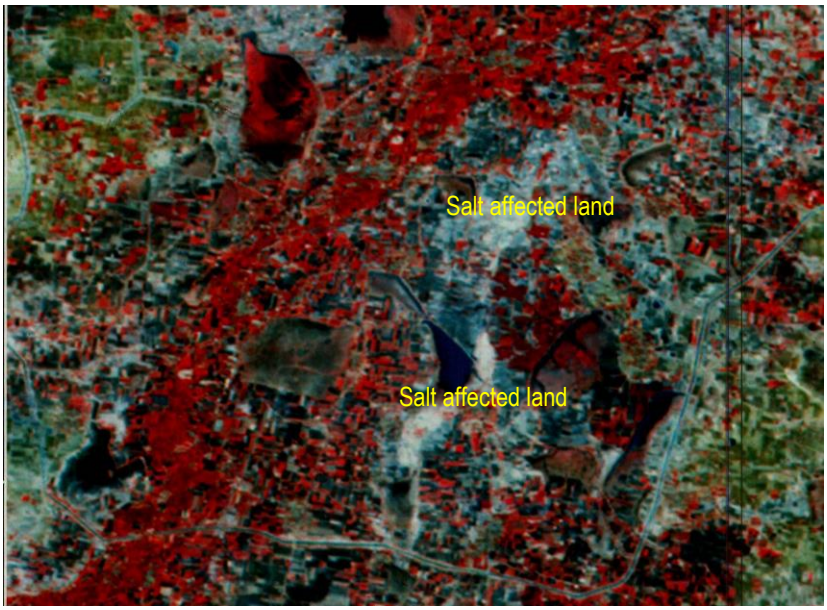
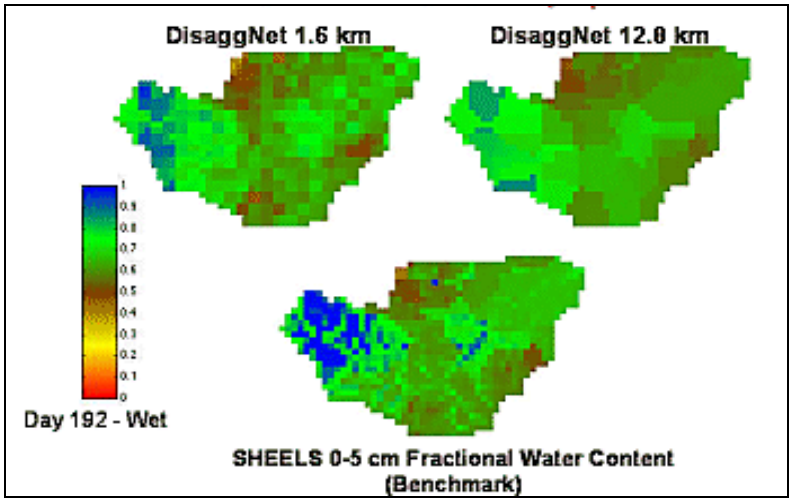


Figure 2. Satellite imagery of salt affected lands-Chamrajnagar District, Karnataka
Source: (Singh and Meena, 2012)

Reflectance of electromagnetic radiation forms the basis for soil quality assessment. Satellite imageries are developed in false color composite. Vegetation is shown in red color, water bodies are shown in black color and eroded and salt affected lands are shown in white color. Irregular white patches in the irrigation command of Kabini river shows the salt affected areas (Figure 2).

3.3. Microwave remote sensing

Microwave remote sensing encompasses both active and passive forms of remote sensing. The microwave portion of the spectrum covers the range from approximately 1cm to 1m in wavelength. Because of their long wavelengths, compared to the visible and infrared, microwaves have special properties that are important for remote sensing. Longer wavelength microwave radiation can penetrate through cloud cover, haze, dust. This property allows detection of microwave energy under almost all weather and environmental conditions so that data can be collected at any time. Passive and active microwave remote sensing are the two types. Passive microwave sensing is similar in concept to thermal remote sensing. All objects emit microwave energy of some magnitude, but the amounts are generally very small. A passive microwave sensor detects the naturally emitted microwave energy within its field of view. This emitted energy is related to the temperature and moisture properties of the emitting object or surface. Microwave remote sensing is used for soil moisture estimation. Soil moisture is an important component of the hydrological cycle. It contributes significantly to the water and energy flux from the surface of the earth, which in turn drives the atmospheric circulation. Remote sensing-based measurement of soil moisture is a better alternative to get this information over a large area (Figure 3)



Source: (Singh and Meena, 2012)

Figure 3. Soil moisture map in an area developed from microwave remote sensing

Remote sensing data are interpreted for the specific objectives such as cropped areas, water bodies, settlements, forest, hills, rocky area, salt affected land, eroded land, water logged land, mined land etc. Based on the above themes thematic maps are prepared. In case of soil quality assessment nature of reflectance are observe. Degraded lands such as salt affected or eroded lands shows high reflectance. Normal soil shows dark in color with less reflectance. Moist and water logged soils will also appear in dark color. Assessment of soil quality for any area will be in general, done with a pretext of productivity decline. The area for assessment is demarcated and soil samples are collected from different sites of representative area. Surface or depth wise soil sample are collected in the selected sites. Some of the site characteristic are also collected such as slop per cent, stoniness, drainage pattern, slop direction etc. Soil samples collected from the study are analyzed from different physical, chemical and biological indicators. Information technologies are using these analytical data. Soil analyzed data are incorporated in data base in the input files as per the requirement.

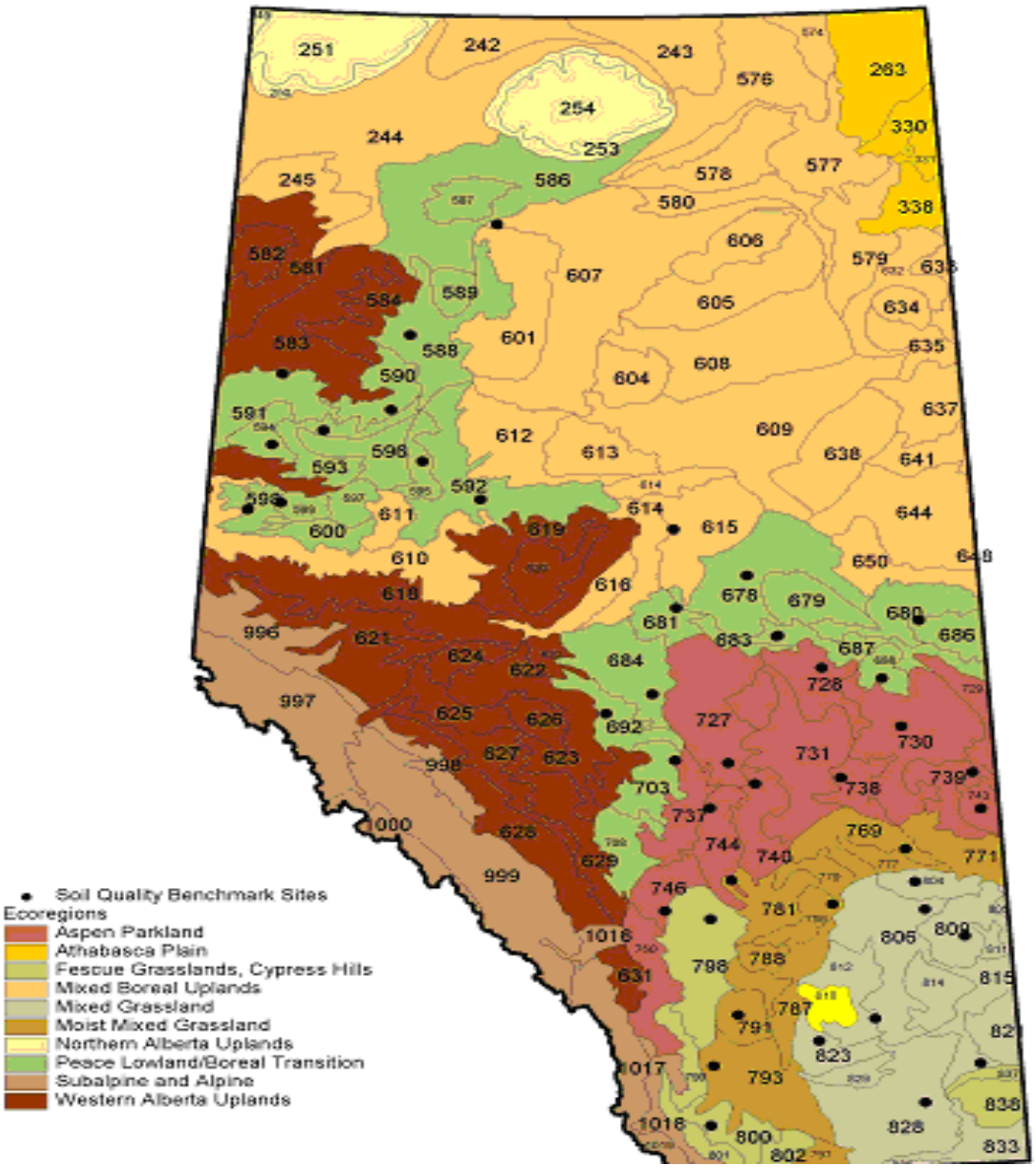
The data collected from the field using communication technologies will become input for information technologies. Analysis of soil samples brought from the field gives an idea of status of the soil quality indicators such as physical, chemical and biological indicators as follows:

- Soil physical properties such as bulk density, available soil water, micro-aggregates, total porosity;
- Soil chemical properties such as electric conductivity, pH, available N, phosphorus, potassium, copper, iron, manganese and zinc;
- Soil biological properties like organic carbon, dehydrogenase and urease activity.

These quality parameters are used in information technologies to assess the soil quality for efficient management.

3.4. Geographic information systems

GIS are another important tool. These systems combine computer cartography with database management software. GIS is used to: a) measure natural and human phenomena and processes from a spatial perspective; b) store these measurements in digital form used a computer database and digital maps; c) analyze collected the measurements. Geographic information systems (GIS) or geospatial information systems is a set of tools that captures, stores, analyzes, manages, and presents data that are linked to location(s). In the simplest terms, GIS is the merging of cartography, statistical analysis, and database technology. GIS are used geography, cartography, remote sensing, land surveying, natural resource management, precision agriculture, photogrammetry, urban planning, etc. GIS digitally creates and "manipulates" spatial areas. GIS developed for an application or purpose may not be necessarily interoperable or compatible with a GIS that has been developed for some other application, jurisdiction, enterprise, or purpose. GIS applications are tools that allow users to create interactive queries (user-created searches), analyze spatial information, edit data, maps, and present the results of all these operations.



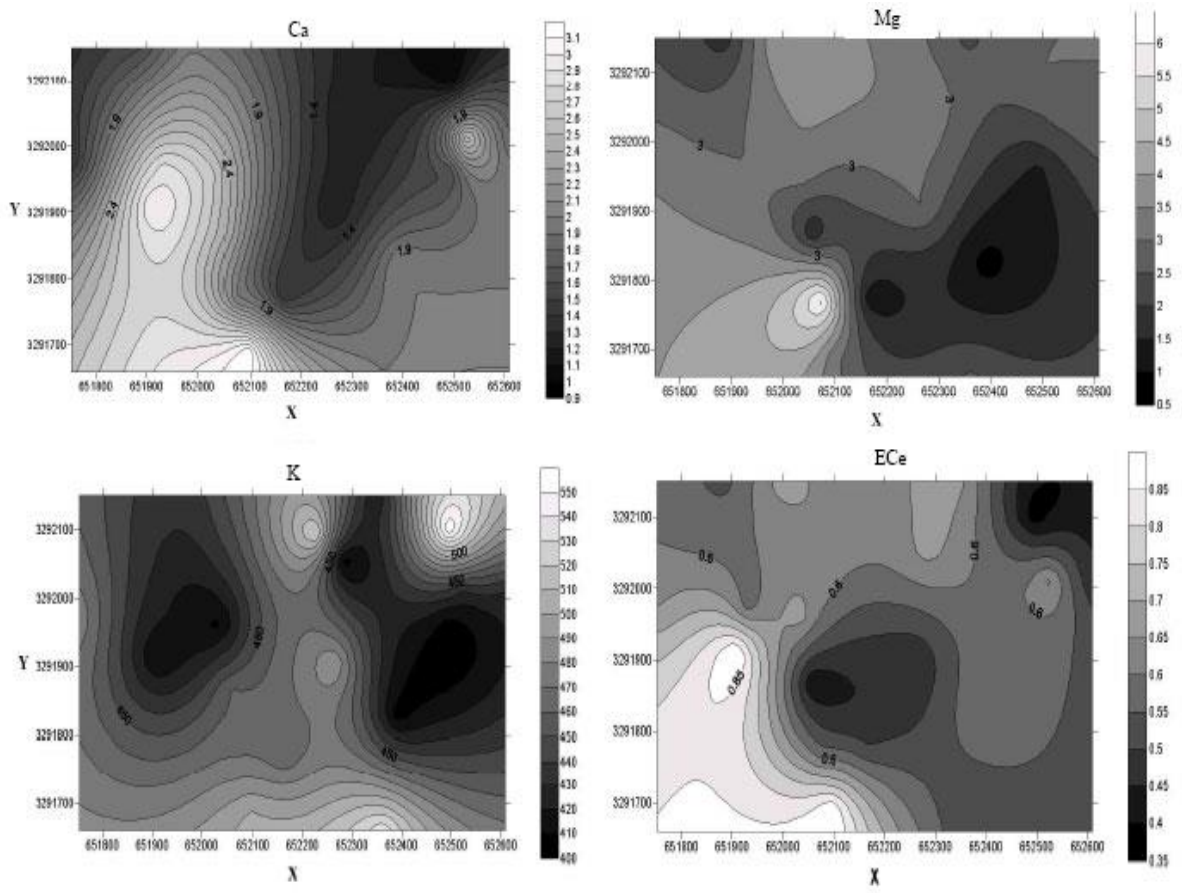
Source: (Singh and Meena, 2012)

Figure 4. Map showing soil quality benchmark indicators using GIS techniques

Soil quality of a region is visualized with geo-reference using GIS techniques. A comprehensive knowledge is acquired when all the soil quality indicators are put together. Land is categorized based on the soil quality and the management strategies that are planned accordingly (Figure 4).

3.5. Simulation modeling and geo-statistics

A computer simulation, a computer model is a computer program, or network of computers, that attempts to simulate an abstract model of a particular system. Computer simulations have become a useful part of mathematical modeling of many natural systems in physics (computational physics), chemistry and biology. Simulations can be used to explore and gain new insights into new technology, and to estimate the performance of systems too complex for analytical solutions.



Source: China by Liu *et al.* (2009).

Figure 5. Variation in soil quality developed using Krigging techniques

Unknown values of soil quality parameters are estimated with known values. Linear models are employed to predict the values in inaccessible areas or other than the measured areas in the girds. Interpolation is done to get the values in all the unmeasured areas using Krigging techniques (Figure 5) Soil quality is assessed exactly in each point and the contour maps are drawn. These developed maps are highly helpful for soil management such as irrigation, site specific nutrient management etc. Temporal variation due to land use from time to time is assessed. Using geo-statistics and GIS, the spatial variability of soil nutrients in rice fields in the Hangzhou–Jiaxing–Huzhou watershed, China, was studied by *Liu et al.* (2009) after 20 years of altered land management policy due to a shift from a collective farming system to individually-owned family farms. Soil samples, collected in 1982 and 2001, were analyzed for soil organic matter (SOM), total nitrogen (TN), available phosphorus (AP), and available potassium (AK).

The spatial variability of each of these soil properties decreased from 1982 to 2001, verifying that the extrinsic factors of the altered land management practices had a weakening effect on the intrinsic factors of soil formation properties. Spatial variability in organic matter content in the year 1982(A) and 2001(B) is shown in Figure 6. Spatial correlation ranges for SOM, TN, and AP in 2001 all decreased from 1982 with the exception of AK. Temporal geographic maps revealed significant changes in soil nutrient concentrations in the form of increases in SOM, TN, and AP and a sharp decline of AK during the period 1982–2001. This result gave an indication of the imbalance among N, P, and K fertilizers applied in the study area.

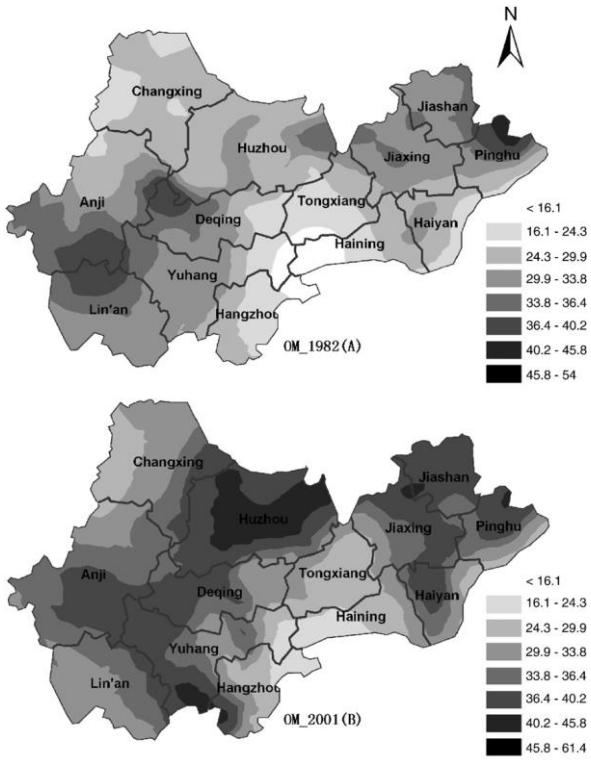


Figure 6. Spatial variability in organic matter content in the year 1982(A) and 2001(B)

3.6. Neural networks

An artificial neural network is a system based on the operation of biological neural networks, in other words, is an emulation of biological neural system. Although computation is advanced these days, there are certain tasks that a program made for a common microprocessor is unable to perform. Artificial neural networks (ANN) are among the newest signal-processing technologies. The field is highly interdisciplinary. An Artificial Neural Network is an adaptive, most often nonlinear system that learns to perform a function (an input/output map) from data. Adaptive means that the system parameters are changed during operation, normally called the training phase. After the training phase the Artificial Neural Network parameters are fixed and the system is deployed to solve the problem at hand (the testing phase). The Artificial Neural Network is built with a systematic step-by-step procedure to optimize a performance criterion or to follow some implicit internal constraint, which is commonly referred to as the learning rule. The input/output training data are fundamental in neural network technology, because they convey the necessary information to "discover" the optimal operating point. The nonlinear nature of the neural network processing elements (PEs) provides the system with lots of flexibility to achieve practically any desired input/output map, i.e., some Artificial Neural Networks are universal mapper.

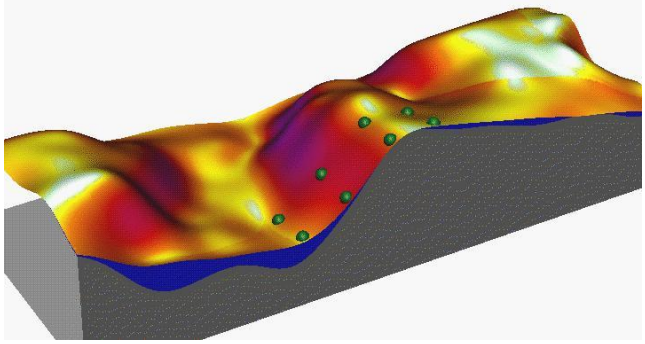
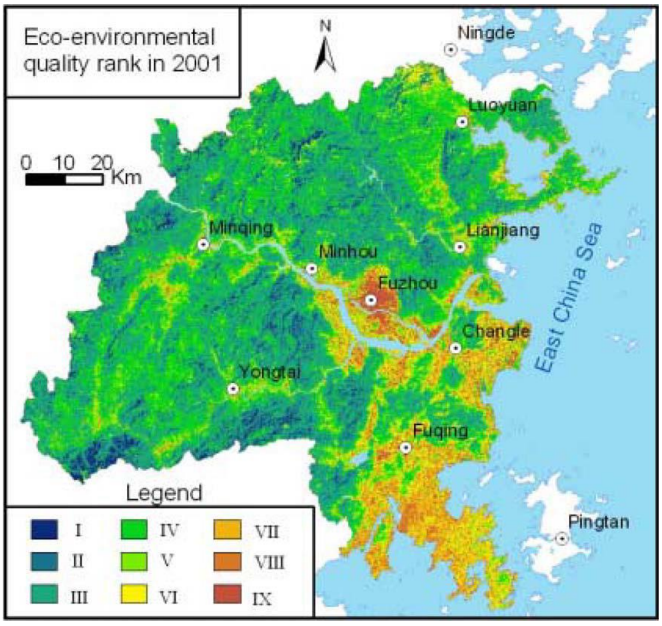


Figure 7. Neural network showing regional eco-environmental management
Source: Shi and Li (2007).

Neural networks is also simulation models and working on non-linear models. Based on the measured values the values are predicted in the unmeasured spots and contours are drawn. Elevation maps are also created to show the difference in soil quality parameters (Figure 7). Indicting soil quality indicators, environmental assessment is also done. Eco-environment quality evaluation is an important research theme in environment management. Shi and Li (2007) used the neural network for the regional eco-environmental quality evaluation. In the present study, Fuzhou city in China was selected as a study area and a limited number of 222 sampling field sites were first investigated *in situ* with the help of a GPS device. Every sampling site was assessed by ecological experts and given an Eco-environment Background Value (EBV) based on a scoring and ranking system. The higher the EBV, the better the quality of the ecological environment is. Then, three types of eco-environmental attributes that are physically-based and easily-quantifiable at a grid level were extracted: (1) remote sensing derived attributes (vegetation index, wetness index, soil brightness index, surface land temperature index), (2) meteorological attributes (annual temperature and annual precipitation), and (3) terrain attribute (elevation). A Back Propagation (BP)

Artificial Neural Network (ANN) model was proposed for the EBV validation and prediction. A three-layer BP ANN model was designed to automatically learn the internal relationship using a training set of known EBV and eco-environmental attributes, followed by the application of the model for predicting EBV values across the whole study area (Figure 8).

It was found that the performance of the BP ANN model was satisfactory and capable of an overall prediction accuracy of 82.4%, with a Kappa coefficient of 0.801 in the validation. The evaluation results showed that the eco-environmental quality of Fuzhou city is considered as satisfactory. Through analyzing the spatial correlation between the eco-environmental quality and land uses, it was found that the best eco-environmental areas were related to forest lands, whereas the urban area had the relatively worst eco-environmental quality. Human activities are still considered as a major impact on the eco-environmental quality in this area.



Source: (Singh and Meena, 2012)

Figure 8. Eco-environmental quality map drawn using artificial neural network

4. Information and communication technology and water management

The United Nations (UN) General Assembly has proclaimed the years 2005-2015 as the International Decade for Action 'Water for Life'. The main objective is to work towards achieving international commitments on water management issues in the United Nations Millennium Development Goals (MDGs) by 2015. Furthermore, in 2010 the United Nations declared that safe and clean drinking water and sanitation is a human right essential to the full enjoyment of life and all other human rights (International Telecommunication Union, 2010). Hence, water is a prime natural resource, a basic human need and a precious national asset. Indeed, sustainable water management policies have been high on the agenda of many governments around the world and the looming global impact of climate change in terms of sea level rise, longer drought periods and flooding is adding more

pressure on the availability of fresh water resources to sustain the growing demands of increasing populations and economic growth.

India has a typical monsoon climate and estimated rainfall is about 1170 mm. The total of average annual rainfall, snowfall and glacier melt in terms of volume is about 4000 billion cubic meters (bcm). However, due to losses through evaporation and evapotranspiration, the water availability has been assessed to be about 1869 bcm. Even this available water cannot be fully utilized due to topographical constraints and hydrological features and utilizable water has been estimated to be about 1123 bcm comprising of 690 bcm of surface water and 433 bcm of replenish able ground water. Besides, very large temporal and spatial variations are observed in rainfall and water availability in India. For instance, in the northwest desert of Rajasthan, the average annual rainfall is lower than 150 mm/year. In the broad belt extending from Madhya Pradesh and Maharashtra to Tamil Nadu, through parts of Andhra Pradesh and Karnataka, the average annual rainfall is generally lower than 500 mm/year. At the other extreme, more than 10 meters (m) of rain fall on the *Khasi* hills in the northeast of the country in a short period of four months. On the west coast, Sub-Himalayan West Bengal and in the northeastern states of Assam, Meghalaya, and Arunachal Pradesh the average annual rainfall is about 2,500 mm. In this view, effective and efficient water management is becoming more and more important for India.

The emerging ICTs tools such as Global Information System (GIS), Decision Support System (DSS), Management Information System (MIS) and Semantic Sensor Web can be used for water management by different stakeholders to increase water use efficiency. The availability of information about current conditions in a particular situation on a timely basis is crucial for decision making in water resource management. For instance, flood water management is a dynamic process, changing daily, weekly or monthly, de-pending on weather conditions and how ecosystems respond to climate variability. ICTs provides a unique opportunity for stakeholders involved in water management process, and helps them to obtain information about a number of physical and environmental factors. Besides, ICT also provides benefits in water management process such as real-time monitoring and control at wide scale; integrated management and decision support based on data collection and aggregation; empowering user with real time information to create awareness and stimulate behavioral change; water smart meters and ICT tools to support leak detection, automated meter reading through communication networks.

4.1. Applicability of information and communication technologies based tools in different water management areas

- *Mapping of water resources and weather forecasting*
  - Remote sensing from satellites;
  - In-situ terrestrial sensing systems;
  - Geographical Information Systems;
  - Sensor networks and Internet.
- *Asset management for the water distribution network*
  - Buried asset identification and electronic tagging;
  - Smart pipes;
  - Just in time repairs/Real time risk assessment.
- *Setting up early warning systems and meeting water demand*
  - Rain/Storm water harvesting;
  - Flood management;
  - Managed aquifer recharge;
  - Smart metering;
  - Process Knowledge Systems.
- *Just in-time crop irrigation*
  - Geographical Information Systems;
  - Sensor networks and Internet.

Therefore, the experiences of effective ICT tools such as Decision Support System and Geographical Information System in water management is presented below.

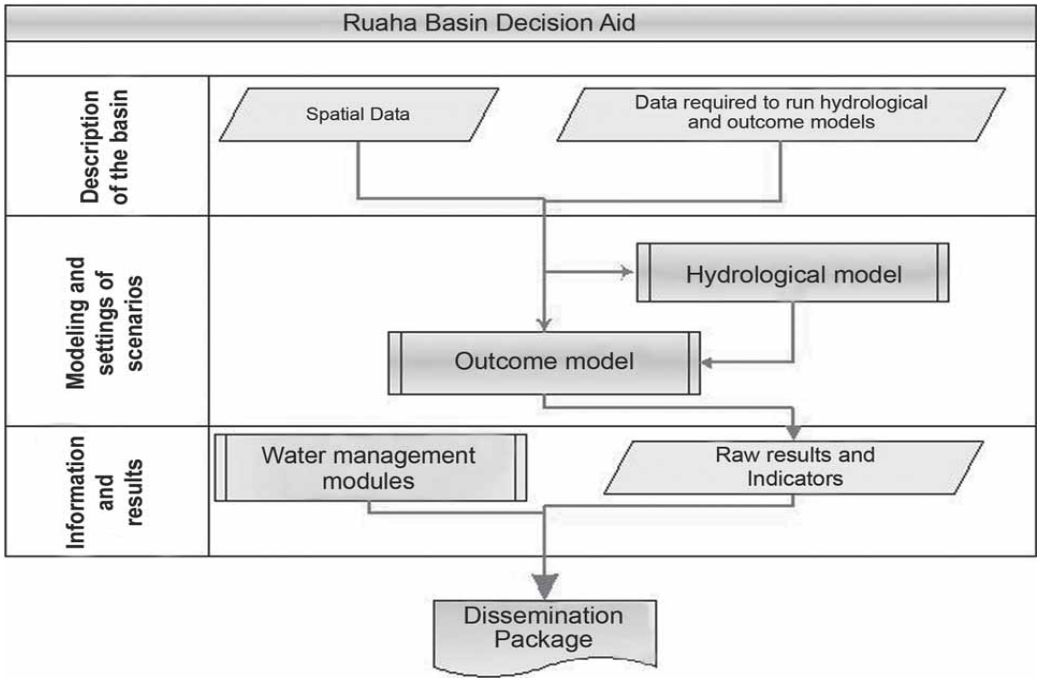
4.2. Decision support systems (DSS)

The complexity of water resources management and the difficulties of making decisions about the allocation of water resources are crucial. In such situations, decision support systems (DSS) are intended to assist to make strategic and rational decisions. Decision Support Systems is a specific class of computerized

information systems that supports organizational decision-making activities. A properly designed DSS is an interactive software-based system intended to help decision makers compile useful information from raw data, documents and personal knowledge, to identify and solve problems and make decisions. A DSS helps structural decision-making processes and support the analysis of complex situations.

4.3. Ruaha basin decision aid (RUBDA): The cases from Tanzania

In Tanzania, the National Water Act highlights 'water resources models and decision support systems' as instruments for the implementation of water policy and a means of achieving an integrated multi-sectorial approach. However, concerns have been expressed about the utilization of DSS for decision-making. These concerns focus on the lack of communication between developers and users, lack of documentation and support services and the lack of involvement of a subjective and value-dominated human element. In this context "Raising Irrigation Productivity and Releasing Water for Inter-sectorial Needs (RIPARWIN) Project" of Tanzania developed Ruaha Basin Decision Aid (RUBDA). The RUBDA is a computer software program intended to support water resource managers in the Rufiji Basin Water Office (RBWO) and District Councils to make decisions about the allocation of water between different stakeholders. It is based on several components, comprising a hydrological model, an outcome model and a water management module, and is accompanied by a 'Geographical Information System'. The structure of *Ruaha* Basin Decision Aid is presented in Figure 9:



Source: Cour, 2005.

Figure 9. Structure of Ruaha Basin Decision Aid

This RUBDA decision support system has significantly enhanced the ability of the RBWO to perform its core functions, namely, assessing new applications for water rights and matching water abstractions to available water resources. By analyzing hydrological and socioeconomic condition, it also provides the impacts of different of resource allocation, empowered to evaluate different water allocation decisions and useful for monitoring of ongoing program in the basin of Tanzania (Matthew *et al.* 2007).

4.3. Geographical information system (GIS) in watershed management

During last some decades, country has been taken large initiatives in the form of massive watershed development programs like Integrated Watershed Development Program, National Watershed Development Program, and Watershed Development in Shifting Cultivated Areas etc. for efficient water management and community development. All these programs made significant impact on water resource conservation and socio-economic development of watershed community.

In this context, Geographic Information Systems (GIS) in watershed programs will play critical roles in all aspects of watershed management, right from assessing watershed conditions, modeling impacts of human

activities on water management and to visualize the impacts of alternative management scenarios. GIS application in watershed management has changed from operational support (e.g., inventory management and descriptive mapping) to prescriptive modeling and tactical or strategic decision support system. Henceforth researchers, resource planners and policy makers have to be realizing the power of GIS and its unique ability to enhance watershed management. According to Tim and Mallavaram (2003) the role of GIS in watershed management as below:

- *Watershed characterization and assessment.* Data gathered from Geographical Positioning System (GPS) surveys and from environmental remote sensing systems can be fused within a GIS for a successful characterization and assessment of watershed functions and conditions.
- *Management planning.* Further, characterization and assessment information can be combined with other data sets to improve understanding of the complex relationships between natural and human systems as they relate to land and resource use within watersheds. GIS provides a common framework 'spatial location' for watershed management because, watershed data and watershed biophysical processes have spatial dimensions. GIS can be a powerful tool for understanding these processes and for managing potential impacts of human activities. Further, the linkage between GIS, Internet and environmental databases is especially helpful in planning studies where information exchange and feedback on a timely basis is very crucial and more so when there are several different agencies and stakeholders involved.
- *Watershed Restoration and Analysis of Alternative Management Strategies.* Watershed restoration studies generally involve evaluation of various management alternatives. In this view, GIS provides the perfect environment to accomplish that efficiently and accurately. It also provide a platform for collaboration among researchers, watershed stakeholders, and policy makers, significantly improving consensus building and offering the opportunity for collaborative work on interdisciplinary environmental issue.
- *Watershed Policy Analysis and Decision Support.* Policy planning and management are based on a generic problem-solving process which begins with problem definition and description, involves various forms of analysis which might include simulation and modeling, moves to prediction and thence to prescription or design which often involves the evaluation of alternative solutions to the problem. GIS can assist the decision maker in dealing with complex management and planning problems within a watershed, providing geo-processing functions and flexible problem solving environments to support the decision research process.

4.4. Strategies for effective application of information and communication technologies' in water management

- Strong 'Network of Information System' for water management at National, State and District Level;
- Pluralistic partnership between public, private, non-government organizations and water users association;
- Capacity building of different stakeholders including water users in the areas of ICTs;
- Introduction of ICTs in ongoing watershed programs for its effective implementation, monitoring and evaluation;
- Designing of different ICT based modules decision support system/expert system for water application methods, water conservation, water harvesting system etc.;
- Enhancing water use efficiency by using ICTs at field situation;
- Pilot program for 'ICT enabled Water Management System' and it's up scaling.

5. Emerging challenges of water management

The water management is the activity of planning, developing, distributing, managing, and optimum use of water resources under defined water policies and regulations. It may include management of water resources, irrigation methods and water table. The water management sector has emerged number of challenges before Indian policy makers, technocrats, extension professionals, water users, farmers and other stakeholders.

- *Water availability.* Reducing per capita water availability due to increasing population, deterioration in quality, over exploitation of ground water resources leading to decline in the ground water table in some part of country. The per capita availability of water in 1951 was assessed to be 5177 cubic meter, which is reduced to about 1650 cubic meter. However, the demand for water for various purposes is always increasing due to phenomenon of liberalization and globalization.
- *River pollution.* All of India's fourteen major river systems are heavily polluted, mostly from the 50 million cubic meters of untreated sewage discharged into them each year.

- *Water conflicts.* Severe water shortages have already led to a growing number of conflicts across the country. Nearly 90 % of India's territory is drained by inter-state rivers. The lack of clear allocation rules and uncertainty about water sharing has led to major disputes between states.
- *Ground water pollution.* The primary reasons are industrial pollution and extensive farming leading to agrochemical pollution of the groundwater. In case of industries, it is due to lack of treatment of effluents that are pumped into rivers and streams leading to groundwater pollution. Excessive use of chemicals and fertilizers and pesticides in agriculture sector is also a major cause of pollution.
- *Crumbling infrastructure.* India's past investments in large water/irrigation infrastructure have yielded spectacular results with enormous gains in food security in particular and agricultural development in general. However, much of this infrastructure is now crumbling and faced with poor water supply services. Farmers and urban dwellers alike have resorted to helping themselves by pumping out groundwater through tube wells. This resulted into most populated and economically productive parts of the country are in crisis situations due declined ground water table.
- *Inadequate storage capacity.* Developed and arid countries (United States, Australia) have built over 5000 cubic meters of water storage per capita and the countries like South Africa, Mexico, Morocco and China can store about 1000 cubic meters per capita. But, India is storing only 200 cubic meters per person. India can store only about 30 days of rainfall, compared to 900 days in major river basins in arid areas of developed countries.
- *Aquifer depletion.* Already about 15 % of India's food is being produced using non-renewable 'mined' groundwater.
- *Enhancing water use efficiency.* The agricultural rate of growth depend on predominant factors like economic and ecological access for augmenting productivity, profitability and conserving natural resources especially water. Indian water use efficiency seldom exceeds 40%. Available estimates indicate that by 10% increase in water use efficiency, country can gain more than 50 million tons of food grains from the existing irrigated area. Though India's irrigated area is about one third of the world, the area under drip and sprinkler irrigation is very meager compared to total drip and sprinkler area in the world.
- *Ever-growing water demand.* The 'National Commission for Integrated Water Resources Development (NCIWRD)' has assessed that about 83.00% of water is used for agriculture especially for crop irrigation and, remaining for domestic, industrial and other purposes. The Commission has projected water demand of 1180 bcm for the year 2050. Although the requirement for irrigation water would increase over the time, the share of irrigation water in the overall demand has been estimated to reduce from the present level of about 83.00% to about 69.00% by the year 2050. It can only be ensured by improving the efficiency of both surface water and ground water systems.

Conclusions

With development of modern technologies, ICTs are of immense use in Sustainable Natural Resource Management. These technologies are time and money saving, accurate compared to conventional assessment. Products of these technologies help the scientists and policy makers for taking appropriate decision in agriculture production. Many industrially developed countries such as the US, Canada, Australia and New Zealand, have increasingly shifted the focus of their public extension systems away from technology transfer to training farmers how to use Sustainable Natural Resource Management practices. Also, it is important to recognize that the dissemination of these land and water-use management practices are largely knowledge-based; therefore, developing countries will be required to make substantial investment in public extension to train small and medium-scale farmers how to use Sustainable Natural Resource Management (SNRM) practices.

- First, farmers need to learn about long-term consequences of land and water degradation for themselves and the next generation;
- Second, they need to know how to utilize sustainable land and water-use management practices to correct these problems;
- Third, most subsistence farmers cannot afford to adopt capital intensive technologies, without first increasing their household incomes.

FFS is the best example of a well-organized approach of educating farmers about Sustainable NRM practices (van den Breg, 2004).

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RENEWABLE ENERGY FOR NEWFOUNDLAND AND LABRADOR POLICY FORMULATION AND DECISION MAKING

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Abstract:

Newfoundland and Labrador province is blessed with many natural resources. The province heavily depends on nonrenewable petroleum products for its domestic need and export. Considering the limited nature of the nonrenewable resources, the provincial government has taken many policy initiatives to develop its renewable energy sector. It has been found that the concentration was mainly on hydroelectric generation where the government is now implementing the formulated policies. But, policymakers are in policy formulation stage for wind energy development. Overall, the province has set its long term vision of sustainable energy supply and moving towards development of clean and environment friendly energy.

Keywords: renewable energy, policy formulation, Newfoundland and Labrador

JEL Classification: Q25, Q27, Q28

1. Introduction

Sustainable energy supply is very essential for sustainable development for an economy and appropriate policy formulation for renewable energy (RE), in the same way, is essential to ensure sustainable energy supply. Renewable energy is the inevitable choice for sustainable economic growth for any country in the present world and its government has the key and initial power for developing renewable energy development policy (Peidong *et al.*, 2009). Newfoundland and Labrador has enormous potential of RE generation. According to the government of Newfoundland and Labrador (2007), the state has the potential of 18,000 Megawatts (MW) electricity generation (renewable) whereas the requirement is only approximately 2,400 MW to meet its own electricity needs[1]. With this great store of clean, RE resources (hydroelectricity and wind energy), the province has the capacity not only to provide for its own long-term energy security but also has the potential to replace greenhouse gas-emitting energy sources in the North American marketplace (Energy Plan, 2007). Although the state has huge RE potential, it is highly dependent on its nonrenewable energy sources like crude oil and natural gas. This dependence on non-renewable, deplete-able energy of the province was more than 82% in 2012 (Enerdata, 2013).

Under these circumstances, the policy makers began to recognize this as a problem and set up agenda of developing renewable energy. During last few years, policy initiatives and strategies have been made to develop and expand the RE sector. The province has formulated its energy plan (2007) with the objective of protecting the environment, developing resources to serve long-term interests of the people and contributes to a vibrant and

[1] This production mainly comes from upper Churchill project. Because of the upper Churchill contract 1969 between Hydro-Quebec and CF(L)Co., the province will receive only 10 percent of the total energy production until 2041.

sustainable Newfoundland and Labrador. This energy plan shows the development plan of the state both for renewable and non-renewable energy resources. The natural resources department of the province also formulated its Strategic Plan 2011-14 to ensure sustainable development of the renewable energy sector.

2. Study scope and objectives

Under the existing situation of high dependency on non-renewable energy, a number of policies formulated/initiated and strategic decisions have been taken (in the form of Energy Plan 2007 and Strategic Plan 2011-2014). The government is working relentlessly with course of various actions to upgrade and finalize its policy package for the sector. It is very essential and time worthy to research on the rational policy planning of the province for RE development. This research paper will mainly deal with two objectives regarding the renewable energy policy of the province- explore the policy initiatives taken for renewable energy resources development and investigate the essentiality of these policies for the development of this sector. Here policy initiatives are the policy actions that are part of policy formulation and decision making stage of policy cycle. According to IPCC SRREN (2011), RE not only contributes to secure future energy supply but also contributes to social and economic development; reduce GHG emission and governments' needs to enact specific renewable energy policies to meet these objectives and substantial growth of RE technologies. With the same objective, the province has formulated a set of concrete policy guideline not only to ensure future energy need but also to keep environment clean. This research paper investigated this renewable energy policy guideline formulated by the province and determines the significance of these formulated policy initiatives for the development of this energy. The study will provide additional insight to the objective and goal of each formulated policy and strategic decision in order to determine the essentiality and significance of the policy to develop RE sector. The paper focuses mainly on the renewable energy policies and legislative measures taken for hydro and wind energy development and policies relevant to these two sectors. In this way, this research paper will try to frame the progress of RE policy of the province with policy cycle framework.

3. Theoretical backgrounds

The concept of policy cycle was developed by Harold Lasswell of USA in the 1950s. Policy cycle model is an analytical tool is that helps to understand the public policymaking process by breaking it into a number of stages and sub-stages. Each of the stages is interlinked and can be investigated alone or in terms of its relationship to other stages of the cycle (Howlett and Ramesh, 2013). The literature on policy cycle suggests that the public policy process consists generally of a set of four major functional stages- agenda setting, policy formulation and decision making, implementation and evaluation and termination (Jann and Wegrich, 2007; Dye, 1992). Once the existence problem is identified and needs to remedy, the next stage in the policy cycle is policy formulation and decision making. Policy formulation and adoption is mostly a government program that includes the definition of policy objectives and consideration of alternative actions or initiatives. Decision making is rational planning to achieve clearly defined goal and adoption of proposed policy depends on resource scarcity and actors competencies (Jann and Wegrich, 2007). The role of this stage is to identify and review the possible solutions to policy problems, determine favorable and the unfavorable factors, and make decision of accepting or rejecting the solutions or actions (Howlett and Ramesh, 2003). Policy makers of the province are currently finished the policy formulation and decision making stage with regard to hydro energy policies but for wind energy policy, they are still in policy formulation and decision making stage. They have formulated a number of policy action for hydro and wind energy but adopted mostly hydro energy policies keeping wind energy policies mostly on hold.

4. Policy initiatives

Energy is an essential part of human living and economic development not only for the present period, but also will be very significant for future generation. Good planning and long-term comprehensive stewardship is essential for attaining the goal of dynamic efficient allocation energy resources and is also critical for environmental preservation and economic development for a nation. Government of Newfoundland and Labrador through its department of natural resources has formulated comprehensive policy initiatives for the development of its highly potential renewable energy sector.

4.1. Managing energy warehouse

The province has abundance of natural resources in the resource scare world. Right resource management decisions are require for managing its Energy Warehouse. The province energy supply is heavily

relied on nonrenewable energy sources like oil and gas in the past years. Considering the depletion of these nonrenewable resources, the provincial government has taken initiative to leverage its non-renewable oil and gas wealth into a renewable future. The state will invest a significant portion of its non-renewable resource revenues in renewable energy infrastructure and development. Moreover, the state seek to work with other resource development partners to develop its resources for mutual benefit; and increase strategic investment in information gathering and options for the development of its energy resources. To govern the pace of development and benefit from energy resources, the state has planned to ensure that its policy and legislative structure provides with the appropriate tools. In this regard, the state has passed legislation in 2007 to create the new provincial Energy Corporation that will take a lead role in the province's participation in the development of its energy resources (Energy Plan 2007, p-14).

4.2. Policy initiatives for Churchill project

Newfoundland and Labrador has a number of clean renewable electricity generation source like hydroelectric projects at Bay d'Espoir, Cat Arm, Upper Salmon, Hinds Lake, Upper Churchill as well as the Lower Churchill. The province exports electricity several times more than its domestic demand. Hydroelectric generation results not only cleaner environment but also provides a solid and sustainable electricity industry with a secure supply of competitively priced electricity for economic development and domestic use. The province is considered as home of the most attractive undeveloped hydro project in North America on the lower part of the Churchill River. Its two installations at Gull Island and Muskrat Falls will have a combined capacity of 16.7 Terawatt hours of electricity per year. The provincial government is leading the development of the Lower Churchill Hydroelectric Project through the Energy Corporation. The project is also expected to create employment of over 10,000 people per year during its construction, and provide economic benefits from generation for decades to come (Energy Plan 2007, p-32). A significant portion of the jobs and business spin-off will occur in Labrador. Provincial government has taken initiative to ensure employment for the qualified personnel adjacent to the resource. The government also have a standby plan to provide future electricity needs of the state from alternative economically and environmentally attractive combination of thermal, wind and smaller hydro developments in case they unable to develop the lower Churchill hydroelectric Project.

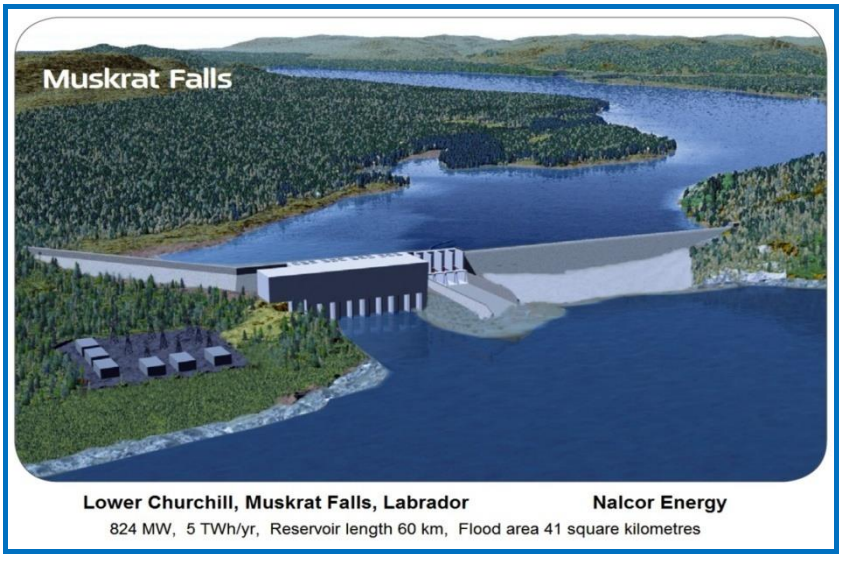

Figure 1. Churchill project – Muskrat falls

Provincial Government aims to support and improve the existing interconnected and isolated electricity generation systems like Upper Churchill facility and the services they provide to the citizens and industries. Upper Churchill project is third largest hydro-electric generating station in North America with the capacity of 5,428 MW. But the province will not enjoy the full economic or electrical benefit of this enormous asset until the expiry of Upper Churchill power contract with Quebec in 2041 (Energy Plan 2007, p-33). Given this fact, the government's plan is to ensure that CF(L) Co. continues to maintain the Upper Churchill facility to a proper operating standard so that it remains fully functional well beyond the expiry of its current commitments in 2041 (Energy Plan 2007, p-34). This will help the province to take full advantage of Upper Churchill power generation

project to export electricity after the power contract expires. The provincial government has planned to continue its exploration of opportunities for this facility to make a greater economic contribution to the province.

Newfoundland and Labrador government consider that renewable electricity resources will be the foundation for a sustainable economy of the province and they will maintain control and develop these projects. The objective of the government is that once the investments in renewable generation projects are recovered, the will produce electricity at very low cost.

4.3. New hydro developments

The province has a vast hydroelectric potential from the Churchill River that can more than enough for its electricity consumption and export needs. But the government has taken initiative to ensure adequate supply for a number of possible future industrial development scenarios. Energy Corporation of the government continues to work on feasibility and environmental studies of additional hydroelectric prospects. The government authorized the corporation to control and coordinate the development of small hydro projects that meet economic thresholds and provide cost-effective energy supply (Energy Plan 2007, p-34). The objective of the government is to maximize the benefits from resource developments and provide Energy Corporation with full control over any new hydroelectric generation assets.

4.4 Wind energy

The province is also blessed with another clean and renewable electric energy generation source wind and the province is considered as a potential wind energy powerhouse. The following figure shows the potential speed of wind at 50 meter above the ground and it is clear that wind speed is very high on the eastern side of the state. Apart from this, the cost of wind power generation is significantly reduced with introduction of advance wind turbine technology.

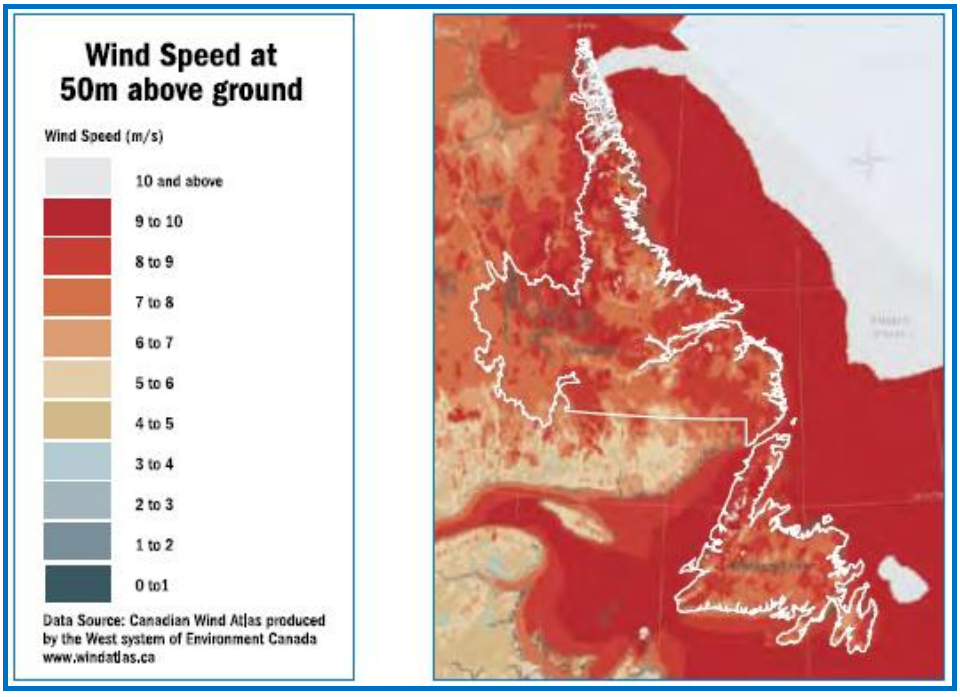

Figure 2. Wind speed and wind energy potential

Government of the province has taken many initiatives to tap this unexplored resource. They have taken the policy of issuing Crown Lands for wind power generation for the Energy Corporation or a company selected by it and this will allow them to obtain a Crown lease for a wind power development (Energy Plan 2007, p-37). Apart from this, many planning and implementation activities are currently underway both in Labrador and on the Island for wind developments. Department of natural resources of the province has provided funding in FY13 for the study on Coastal Labrador Wind Assessment (Annual Performance Report FY13, p- 17, 37). The government is also working with the aboriginal groups in areas where potential wind developments in order to settle all the obligations included under land claims agreements. Moreover, the government has taken initiative to capitalize

on the significant manufacturing and fabrication opportunities associated with large-scale wind projects in order to boost up the employment condition of the province. The province is delaying with the wind energy development because they have enough energy supply of hydroelectric power from Muskrat Falls to meet their medium term need until 2041 and also because of high investment cost and short term lasting of wind turbine. They find investment on transmission line is more essential.

4.5. Transmission for distribution and export

The province needs to have good transmission access to both domestic and export markets to realize the full economic and environmental benefit of hydro and wind generation potential. Constructing the transmission link between Labrador and Island and delivering Lower Churchill power to the Island, is a more cost effective and essential alternative to oil-fired thermal power resources. The government initiated to build a transmission link between Labrador and the Island in conjunction with the Lower Churchill development and working closely with developers to ensure transmission costs are understood and address the timelines. The government considers this as GHG emission reduction initiative and seeks financial assistance from Federal Government in the context (Energy Plan 2007, p-41). The broader goal of the government is to ensure low cost and reliable electric supply and attract new industrial development in the province particularly in Labrador. The government is also focused to build the energy transmission network with the potential export market of Canada and USA including Ontario, New Brunswick, Quebec, Nova Scotia, P.E.I., New England and New York. Two export routes for energy export are being investigated and pursued. One is through the province of Quebec, using Hydro-Quebec's Open Access Transmission Tariff (OATT) process into New Brunswick, Ontario, Quebec, Nova Scotia, New England and New York (Energy Plan 2007, p-44).

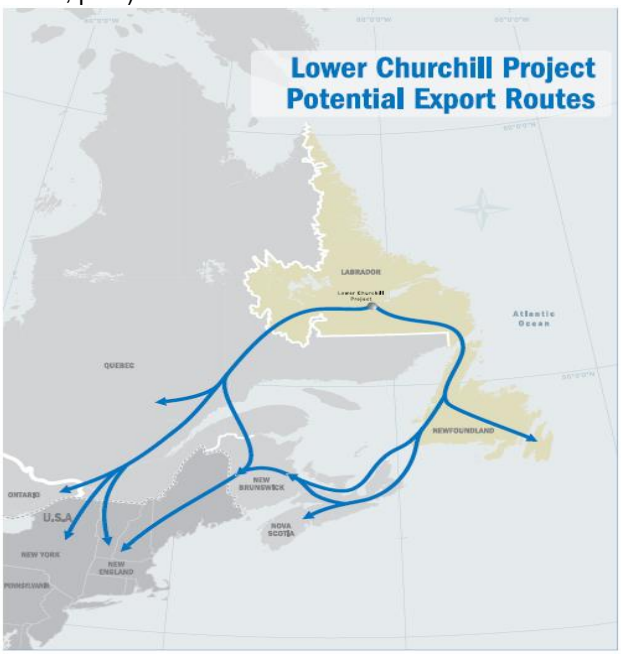

Figure 3. Churchill Project - Potential Export Routes

The other one is a subsea route from the Island into the Northeast United States. The prime objective of the province is to utilize its significant electricity resources to fulfill the needs of the province and provide a competitive, long-term, clean, reliable source of electricity at a reasonable price to the rest of the country and parts of the United States.

4.6. Other policy initiatives

The provincial government has taken a number of other policy initiatives that are either directly or indirectly focused to develop its renewable energy sector. The government strongly supports mechanism for investment in renewable energy projects and work to ensure that technology fund investments are directed towards regional and national initiatives facilitating obviously high value opportunities such as the Lower Churchill and the province's wind development opportunities (Energy Plan 2007, p-54). The emphasis has been given to work with the government of Canada and other provinces, as well as with industry to develop a

technology fund that will invest in transmission for the lower Churchill project and wind opportunities. Other than this, the provincial government provided support research and development into wind and hydrogen integration for isolated communities; pursue other technologically and economically feasible generation opportunities; affirm the lead role of NLH as the long-term planning entity for the electricity sector; ensure that the regulatory process can appropriately accommodate Lower Churchill and other power for use in both domestic and export markets etc. (Energy Plan 2007, p-39).

5. Strategic and legislative measures

The province has set its long term vision to realize the full benefit from the sustainable development of its natural resources. Department of natural resources of the province is working closely with the key stakeholders for policy development, coordination and ensure sustainable development. Accordingly the department develops, monitor and initiate regulatory and benefit optimizing activities.

5.1 Strategic Direction

The natural resources department of the province has set some strategic directions as guideline for accomplishment of the goal and objective that it has set in the coming years (Strategic Plan 2011-14, p- 8). Two of these strategic directions are for the development of the renewable energy sector and are discussed below.

- *Responsible Resource Development*. This strategic direction refers to development of clean and renewable energy through the lower Churchill project and search for the activities that support Social License granted by the community, including Aboriginal groups. The objective of this direction is to ensure marketing, sale and distribution of the power that will be generated from the lower Churchill project. The goal and objective of this directive is to advance renewable energy in the province focusing on the lower Churchill project;
- *Stable and Competitive Energy Supply*. This strategic directive primarily focused on three issues: alternative energies, electricity rate and the export of surplus energy; in order to address the goal of renewable energy development apart from the electricity generation from the Lower Churchill Project, development of wind and bio-fuels are seen as alternative sources of energy.

5.2. Strategic issue: renewable energy

The prime mission of the natural resources department of the province is to ensure growth of energy and mineral resource industries in sustainable manner by 2017. To meet the objective, the department has taken the strategic issue of renewable energy development. Renewable energy development of the province mostly centers on the most stable, least-cost lower Churchill hydroelectric generation project. Other than this, there are two wind developments and significant reserves of wood pellets and bio-diesel in the province. The natural resource department of the province has set up its goal to enhance legislation and policy measure necessary to advance renewable energy by 2014. On top of this goal, the department also has two objectives prioritize to hydro and electricity development by 2013; and ensure progression of the Lower Churchill project and initiate to development of a provincial wind policy by 2014 (Strategic Plan 2011-14, p-26). All these target set by the department of natural resources is to support the provincial government's strategic direction of responsible resource development and; stable and competitive renewable energy supply.

5.3 Legislative measure

The provincial government has taken many legislative measures to guide and govern the development of its renewable energy resources. The government has developed new acts and made amendment of the old acts to keep pace of the development of the renewable energy sector. The legislative initiatives of the government are briefly explained below (Annual Performance Report FY13, pp. 17, 85).

- *Muskrat Falls Project Land Use and Expropriation Act.* This legislation establishes a lands-related Act to govern the acquisition of land and land interests that are necessary for the Muskrat Falls Project;
- *Amendment of Hydro Corporation Act 2007.* This amendment sets out the mandate, powers and management structure of the Newfoundland and Labrador Hydro-Electric Corporation as a crown agency. Amendment of the act is done in 2012 to facilitate project financing and protection of non-project assets, and sufficient borrowing limits for Nalcor;
- *Amendment of Electrical Power Control Act 1994.* This amendment sets policy with regard to electric power rates and establishes provisions for the determination of such power rates by the Public Utilities

Board. Amendment of the act is done in 2012 for granting of exclusive, wholesale electricity supply rights and Crown equity payments to NL Hydro;

- *Lower Churchill Development Act 2001.* This act authorizes the Minister of Natural Resources to enter into an option agreement with the Lower Churchill Development Corporation (LCDC) guaranteeing the corporations executive water rights, rights to flood land and a sole option to purchase the Gull Island hydro assets;
- *Newfoundland and Labrador Power Commission (Water Power) Act.* This act extinguishes certain water power rights held at the time by BRINCO and provides for their assignment to Newfoundland and Labrador Hydro (Power Commission) to facilitate financing of the Bay d'Espoir hydroelectric project;
- *Miscellaneous Financial Provisions Act, 1975.* This act removes any restrictions elsewhere in provincial legislation on government assigning to Newfoundland and Labrador Hydro Electric Corporation a right, title or interest in royalties and rentals in clauses 1 and 8 of Part II of the lease between government and CF(L) Co.

Conclusion

The provincial government has formulated a number policy measures for the development of its abundant renewable energy resource and also provided legislative, regulatory support to ensure the development of clean energy supply. The research analysis shows that the province has formulated its RE policies focusing primarily to develop its hydro energy so that this energy can meet domestic supply and export demand until and beyond 2041. To ensure this objective, the province also formulated policy to set transmission lines and slowed down the investment for the wind energy development. This shows the rational planning of the province to meet the goal RE development and justifies the essentiality of concentrating policy actions more on hydro energy. The objective of these policy measures are not only to produce clean and environment friendly energy, but also contribute to the province's employment generation, export earnings from energy export, attract industrial investment and thus overall economic growth of the province.

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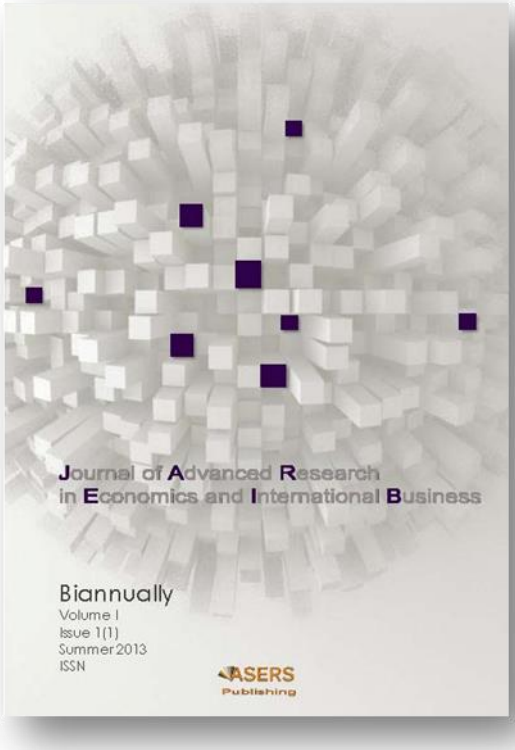

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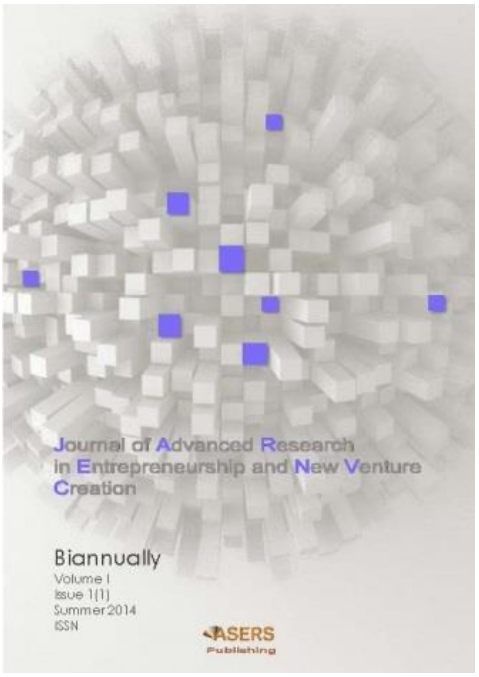

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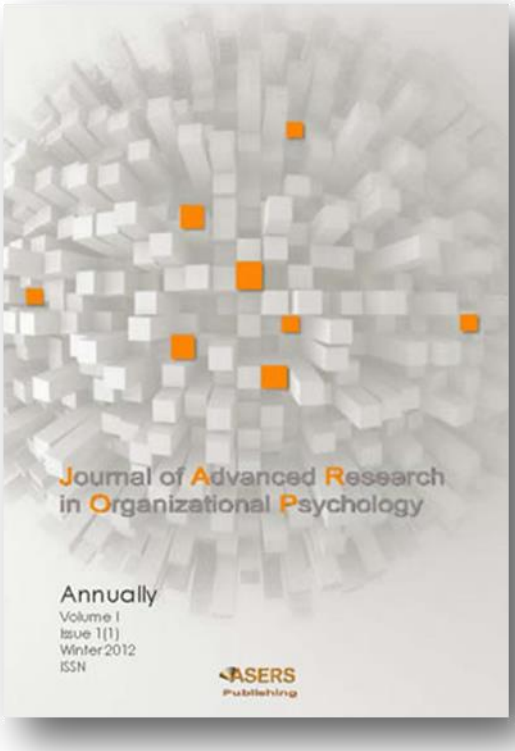

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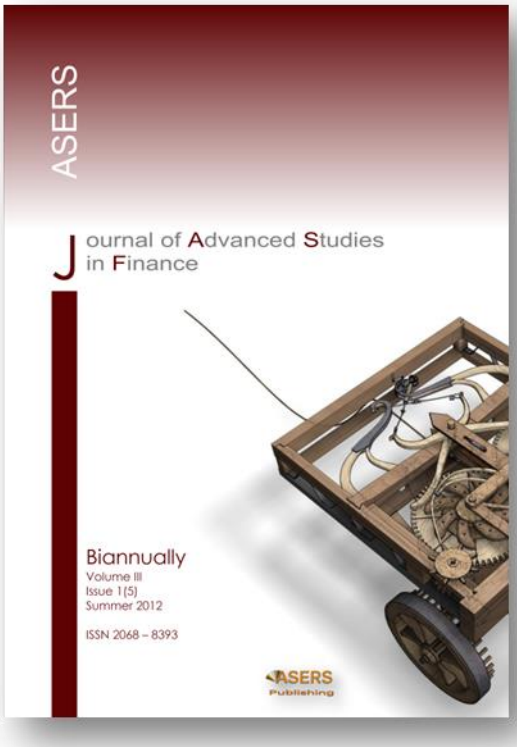

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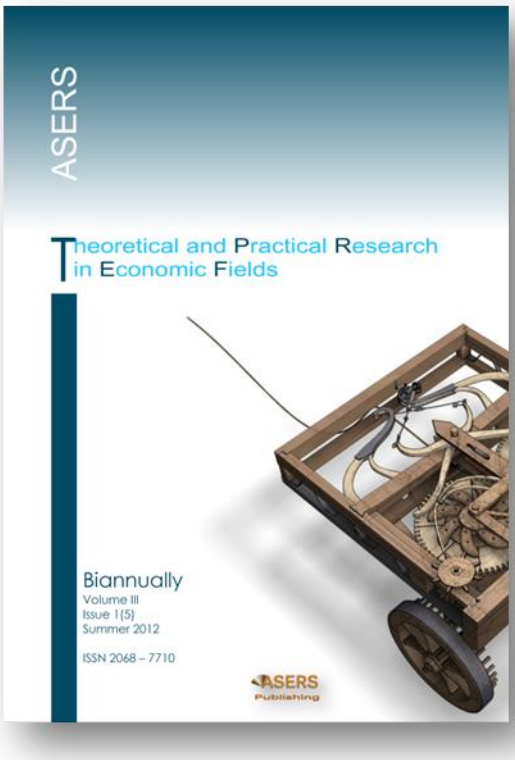

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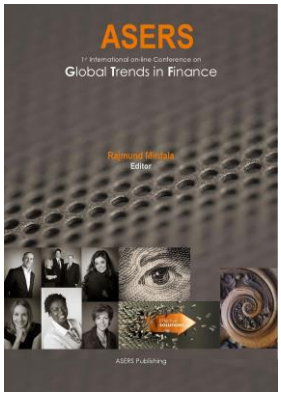

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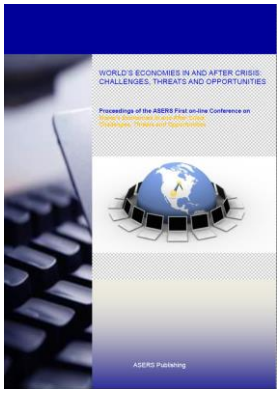

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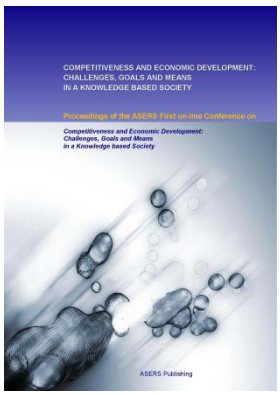

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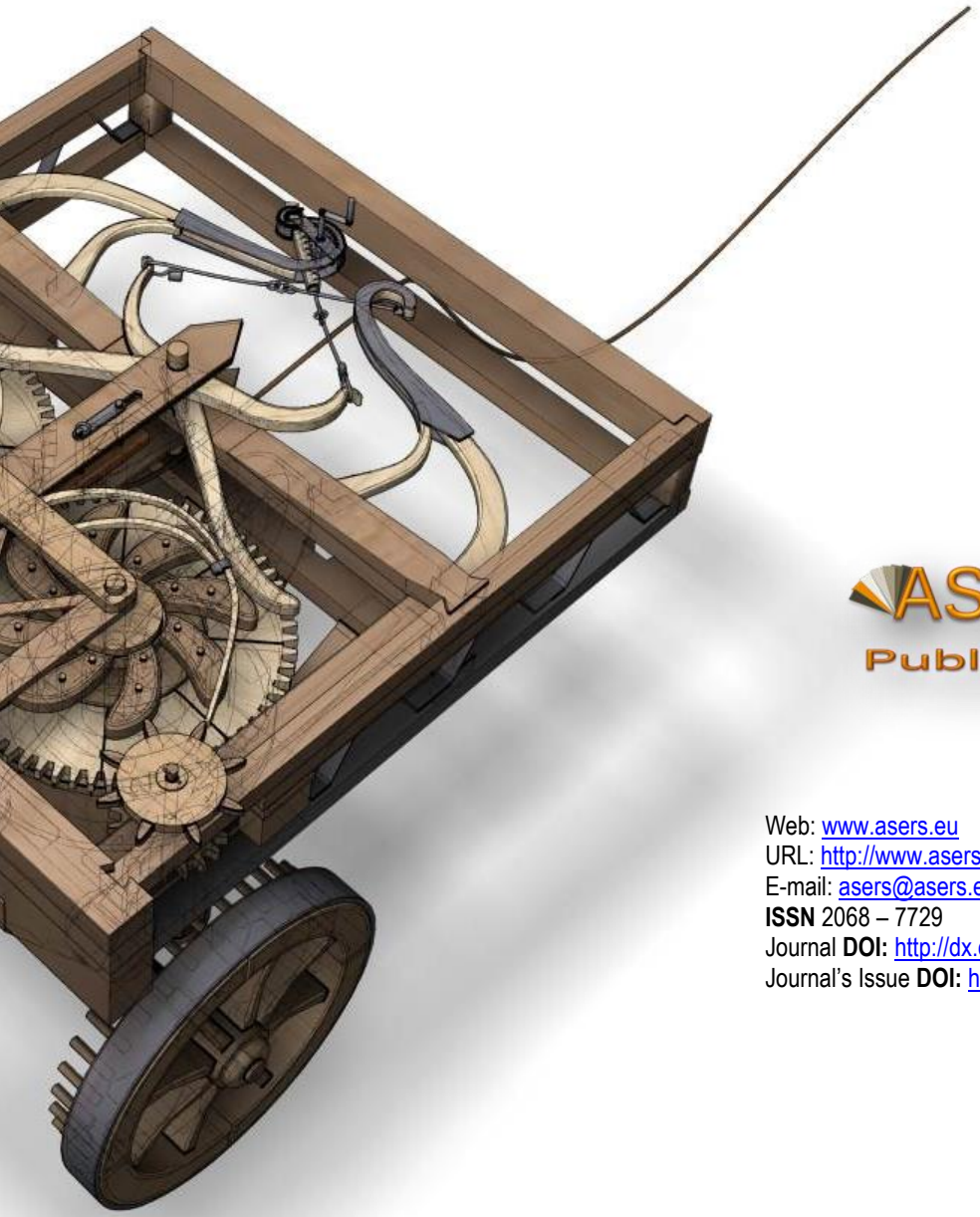

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