

Destination Management in a Time of Climate Change and Systemic Crisis

– the Case of Majorca, Balearic Islands

Angela Hof (Bochum) & Macià Blázquez-Salom (Palma de Mallorca)

Keywords: balearization, quality tourist model, water management, sustainability indicators, geography of power and the production of space

Summary

This paper presents interdisciplinary research based on in-depth comparative analysis of water consumption and land use patterns over a range of urban-tourist forms to illustrate current and future destination management challenges facing the paradigmatic Majorcan case study. As an outcome of state-promoted tourist specialisation, urban development expansion has brought about an uneven sociospatial urban landscape of water consumption. This urban-tourist landscape is vulnerable to changes in climate, because it is sustained by excessive use of water.

1 Introduction

The Balearic Island of Majorca is a paradigmatic example of tourism evolvement and transformation with time. Majorca is a major tourist destination within the Mediterranean with a success story of sustained mass tourist flows since the 1960s and constant reinvention of itself. Behind the success of the Balearics is a singular regional planning experience of urban growth regulation, which is the result of geographical constraints –insularity and seasonality– and of a social consensus against landscape deterioration and overcrowding (*Rullan* 2011). This regulatory framework has added a new appeal of quality-based criteria, that allows the persistence of both the sun and beach tourists and a new residential tourism supply for a more selected market (*Aguiló et al.* 2005).

The more recent development of quality-based and residential tourism is related to shifts in European and international market economies as at the same time triggering, enabling and structuring the Balearic transformation. The Balearic Islands are both a major European tourist destination and a major target for real estate investment, the latter fact being accelerated after the Maastricht Treaty (1992) which established the European Union (EU), granted EU citizenship to member state citizens and introduced a central European banking system and a common currency. Between 1992 and 2007, foreign investment into the Spanish real estate sector increased by 690 %, in the Balearic Islands the increase was

249 % (Vives Miró 2011). This development enabled and fuelled the so-called third tourist boom characterized by tourist specialisation as a complement to mass tourism that would create additional growth. The resulting proliferation of residential tourism, golf and yacht tourism has been marketed under the term “quality tourism” since the mid 1990s (Schmitt & Blázquez 2003). Residential tourism, that is, second home ownership and long-term tourism were actively encouraged for deseasonalisation of the tourism industry and in turn has made it possible for private investment to create houses as financial assets. In coastal municipalities in Majorca (Santanyí, Alcudia and Andratx), the proportion of second homes escalates to 60 %, while vacancy rates have been reported as being as high as 88 %, underscoring the function as investment rather than housing objects (Vives Miró 2011).

Tourist specialisation and the sustainability challenges of destination management in Majorca

Producing ‘quality tourism’ and ‘tourist excellence’ successfully operates through the urbanisation of nature and, in particular, of water. Consequently, a relevant facet of destination management in Majorca in a time of climate change is less the economic sustainability (which is demonstrated) but rather questions of ecological and social sustainability. Instead of adopting an economic and managerial perspective on tourism development, growth and sustainability, this paper takes a critical stand by addressing challenges posed to and at the same time exacerbated by tourist specialisation. The focus on tourist specialisation and environmental metabolism in terms of water consumption is particularly instructive because water is the main substance flow that sustains the current tourist specialisation. The pivotal role of water for tourism sustainability and the mismatch between water demand and water supply on Majorca has been discussed earlier (Essex et al. 2004; Garcia & Servera 2003; Kent et al. 2002). Empirical evidence on the magnitude of the additional water demand brought about by tourist specialisation has remained rare and this aspect is the focus of the following sections.

2 Materials and methods

The following analysis of land use patterns and water consumption exposes the spatially uneven production of water demand. In the face of climate change, the aesthetically pleasant quality tourist model which Majorca is pioneering may pose an additional and serious threat to sustainable water management. Calvià municipality is introduced as case study that is particularly relevant because it is spearheading tourism upgrading on the island.

2.1 Case study in Calvià municipality

Located in the southwest of Majorca Island, Calvià is a paradigmatic example to unfold a discussion of future tourism pathways, options, and challenges in the face of climate change and the limits of growth on the island (cf. fig. 1).

Fig. 1: The Balearic Island of Majorca and the study areas in Calvià municipality



Embracing a sustainable tourism policy, its innovative Local Agenda 21 won Calvià international environmental awards and prizes (“Sustainable European City” from the European Union in 1997; “Good practice for improving the quality of town life” from the United Nations in 1998; “Green Globe Award” from the World Travel and Tourism Council in 1998). The development objectives include the limitation of urban growth and a reduction of water consumption in the residential and tourism sector. The Agenda 21 came alongside a municipal strategy of more diversified tourism development, tourist specialization and a new tourism model. As a result, 12 % of the yacht berths and 25 % of Majorca’s golf courses are concentrated in the municipality which has a proportion of more than 60 % second homes and is characterised by an urbanized coastline with residential resorts, villas and low density residential settlements around mass tourist centres (Hof & Schmitt 2008). Calvià ranks among the Spanish Mediterranean tourist zones with the most urban sprawl, the highest per capita water consumption levels, and the highest sensitivity to climate change (Saurí *et al.* 2011). Through residential tourism growth, the official residential population grew by 71.5 % (1994-2008) in Calvià municipality, and per capita water consumption rose from 300 litres per person per day (lpd) to 700 lpd, exceeding the predicted demand (Murray 2010). The role of burgeoning residential tourism to increasing urban water demand has eluded statistical observation and is untangled in the following section by an empirical analysis linking land use pattern to water consumption.

2.2 Comparative water consumption analysis

In Majorca and most other Mediterranean tourist destinations, the water demand of tourism and its different sub-sectors (hotels, second homes, facilities, activities etc.) eludes statistical observation. Water consumption data mask the spatial variability of water consumption that is related to urban-tourist land use patterns (Hof & Schmitt 2011). One objective of the present analysis is to compare the share of quality and mass tourism in domestic water consumption levels on a per capita basis. Another objective is to compare land use patterns that account for the spatial variation in water consumption and climate sensitivity on a per capita basis. For this purpose, the relevant water consumption, land

use, and population data were assembled over the whole range of urban-tourist forms (cf. fig. 1).

Monthly water consumption data (2005-2007) for the domestic residential sector were collected from the water providers *ATERCA S.A. (Aguas del Término de Calvià)*, *Calvià 2000*, and *EMAYA S.A. (Empresa Municipal d'Aigües i Clavegueram)*. The data exclude the loss in the water supply network, the water consumption of commercial users and golf courses. These high-spatial resolution water consumption data were collected by fieldwork and written requests to the water providers – the data are not published or disseminated and are usually restricted to internal use.

A land use database was built from digital cadastre data and on-screen digitizing of high resolution digital colour orthophotos (year 2006, geometric resolution 50 cm/pixel), (*Dirección General de Catastro 2010; IDEIB 2010*). Pool area, garden area, and built-up area (sealed surfaces and buildings) were mapped per parcel at 1:600 scale using the geographic information system Arc-GIS™. For every parcel in the geodatabase, the numbers of official tourist beds in hotels and apartments as listed by the Calvià municipal government for the year 2007 (*Ajuntament de Calvià*, unpublished data) and the number of single houses and the number of flats in multi-residential houses were recorded. This geodatabase structure and content allows for the calculation of relevant information on a monthly basis and in a spatially explicit way. The relevant outdoor land uses (garden and pool area) can be determined per parcel and for different tourist and residential housing types. Monthly water consumption was calculated per capita per day for the ambient population (the sum of official residents and official tourists), taking the monthly percentage of open hotels and tourist apartments, and their capacity utilization into account (*CITTIB 2009*).

To indicate the interrelatedness of land use patterns and water consumption, the monthly per capita water consumption values for each study area were converted into standardized z-scores based on the 2005-2007 mean and standard deviation of the per capita water consumption in litres per person per day (l/p/d). Likewise, the garden and pool area per capita were converted into standardized z-scores based on the 2007 mean and standard deviation. These outdoor leisure structures have a strong influence on the rising water consumption in the domestic residential sector throughout the Mediterranean, creating permanent water demands and additional consumption peaks in the season of low rainfall and high evapo-transpiration (*Essex et al. 2004*). The differences in water consumption are triggered by different land use patterns (*Hof & Schmitt 2011*), and translate directly into a sensitivity of water consumption to variations in climate (*Balling & Cubaque 2009*).

3 Results and discussion

3.1 Urban-tourist model, land use, and water consumption patterns

The results from the analysis of the land use and population geodatabase and the juxtaposition of land use variables and water consumption data provide in-

sight into the composition of per capita water consumption data published for municipalities and the spatial variation they are masking (cf. tab 1). At 700 l/p/d, the municipality of Calvià has one of the highest water consumption levels on the island of Majorca (Murray 2010). The low density areas which have developed due to the second home boom in Calvià municipality are main contributors to this high level of water consumption (cf. tab. 1). In contrast, at 237 l/p/d the municipality of Palma has a much lower consumption level (Murray 2010), but it also includes areas like Son Vida, an exclusive luxury suburb with a five times higher per capita consumption (data not shown). The proliferation of large gardens and private swimming pools associated with second homes is giving the low density residential areas an appealing, resort-like character. This is in contrast to the built-up, vertical growth urban form of the established mass tourist centres. The standardized values of garden and pool area per capita reflect the uneven spatial development of land use pattern in the study areas and the different metabolism of land and water associated with these sociospatial change processes. Moreover, these results allow for a ranking of the study areas with respect to climate sensitivity as these outdoor uses require high levels of water input. The ratio of summer versus winter water consumption is further evidence of a geographic pattern in climate sensitivity. Low density urban-tourist areas produce higher water consumption per capita than the mass tourist and high density residential areas. In a previous study, the relationship between the sensitivity of water consumption to a change in temperature and precipitation was analysed with water consumption and climate data for the years 2005-2007 (Hof

Tab. 1: Land use and water consumption patterns in the study areas (2007)

Study area	Tourist model and urban form	Water consumption [litres/person/day]	Pool area/capita z-score (rank)	Garden area/capita z-score (rank)	Ratio summer to winter water consumption
Santa Ponsa	Mass tourism	209.9	-1.09 (6)	-0.87 (6)	1.14
Palmanova/Magaluf/Cala Vinyes	Mass tourism	340.7	-0.99 (5)	-0.81 (5)	0.85
El Toro	High density residential	187.6	-0.48 (4)	-0.45 (4)	1.37
Nova Santa Ponsa	Low and high density residential	771.2	0.50 (3)	0.00 (3)	1.63
Costa de la Calma	Low and high density residential	535.6	0.68 (2)	0.33 (2)	1.44
Sol de Mallorca	Low and high density residential	1181.1	1.37 (1)	1.81 (1)	2.06

2011). The mean rate of change in residential water consumption with monthly variations in temperature ($\Delta\text{Cons}/\Delta\text{Temp}$; the units are l/p/d per 1°C) and precipitation ($\Delta\text{Cons}/\Delta\text{Prec}$; the units are l/p/d per mm) was determined for each study area by averaging the regression coefficients showing the change in consumption for change in temperature or precipitation for each of the twelve months. The Spearman rank-order correlation coefficient between the $\Delta\text{Cons}/\Delta\text{Temp}$, $\Delta\text{Cons}/\Delta\text{Prec}$, and land use variables was calculated to determine what influences the spatial variability of the climate sensitivity. The results suggest that per capita water consumption in the study areas is more related to variations in temperature than variations in the area's precipitation. Consistent with the findings of other studies in similar climates and contexts, the analysis shows that outdoor uses of water contribute to high levels of water consumption and climate sensitivity (*Balling & Cubaque* 2009; *Hof* 2011). If climate change and water scarcity projections manifest for the Mediterranean (*Iglesias et al.* 2007), meeting tourists' and residents' water expectations could become challenging. Sustained tourist flows and the second home boom increase permanent water demand and vulnerability to climate change. The Majorcan water reservoirs are already under pressure and water supply increasingly relies on desalination and reuse of treated water (*Garcia & Servera* 2003; *Kent et al.* 2002). While the island has significant vulnerabilities to climate change, this challenge is rarely reflected in sustainable tourism policy and planning documents as being an important tourism issue (*Dodds & Kelman* 2008). From an urban political ecology perspective, the core question is which interconnected economic, political, social and ecological processes produce these highly uneven urban landscape of quality tourism production (*Swyngedouw & Heynen* 2003). While this and the preceding sections have discussed water consumption and its climate sensitivity as social and material artefacts resulting from the appropriation and transformation of land and water through urban change related with residential tourism, the next section focuses on the underlying political and economic processes that bring about environments that reflect and embody such positions of social power.

3.2 Destination management in the context of capitalism's systemic crisis

The Balearic Islands have become an important destination of capital investment in the built environment, using it as a fixed asset for consumption fund formation considered the secondary circuit of capital (*Harvey* 1978: 106-107). Tourism contributes in this way to maintain overaccumulated capitals' profit rates through its territorial fix with elongated effects over time and space (*Harvey* 1989).

The current systemic crisis – not only in economic, but also in environmental terms, for instance related to climate change – stresses the contradictions of capitalism. Capitalism's contradiction with nature (*Harvey* 1978) is characterized as external to capitalism, due to barriers in nature, such as natural resources depletion or congestion costs that threaten its own profits and capacity to produce and accumulate more capital. Several assumptions serve to provide relief to the second contradiction of capitalism, which can also be expressed by the

metabolic gap between the need of capitalism to grow continuously and the finiteness of the biosphere and its capacity to provide humanity with natural resources (O'Connor 1988).

Tourism development provides 'solutions' for capitalism's so-called second contradiction, between the imperative of continual growth and finite natural resources. Some examples of these 'solutions' for which tourism has a main role are the use of the rhetorics of sustainable development as an historical block, understood as "the ways in which the ideas and agendas of particular interest groups are promoted and imposed over a world of diversity, full of conflicting values and interests" (Igoe, Neves & Brockington 2010: 489), and the nature commodification through market segmentation such as with ecotourism (Fletcher 2012), which can be understood as another way of greening capitalism (Magdoff & Foster 2011), similar to carbon emissions trade, land grabbing or biofuel.

Environmental stress in terms of water metabolism of the aesthetically pleasant quality tourism model in Majorca shows us the empirical evidence of this contradiction, which results in a worsening of environmental and social threats due to its contribution to uneven geographical development (Smith 1984). Most of the answers to the current crisis maintain the dogma of growth, through the implementation of neoliberal policies of privatization, commodification, deregulation, and market proxies (Castree 2008: 142).

The supply of water in Calvià has evolved towards their water management companies' privatization. All of these companies were public owned until the 1990's, when neoliberal capitalism made popular its argument that privatization and free market were the best for ecological stewardship (Castree 2008: 146). Nowadays, only EMAYA is public owned and managed, while CALVIÀ 2000 has privatized its management, and ATERCA is owned by Aguas de Barcelona, which mother company is the French transnational company Suez Environment. This last corporation is also owning SOREA, with which they control the supply to the main tourist spots in Mallorca and Menorca, while Ibiza and Formentera's main tourist spots supply are almost completely under ownership of AQUALIA, which is a branch of the Spanish public works company named Fomento de Construcciones y Contratas (SABI 2012). Calvià's water supply for 2008 was 13,045,630 m³ which were coming from groundwater exploitation and desalination; the former particularly from a desalinization plant constructed in 2000 in Son Ferrer (Calvià) that treated 1.837.557 m³ in 2008, and partially from Palma's desalinization plant that began to work in 1999 and gave a total amount of 16.700.648 m³ in 2008 (Govern de les Illes Balears 2012). Increasing reliance on desalination as maladaptation strategy is also indicated by data that show that 41 % of the total desalinated water produced in Majorca was delivered to Calvià municipality (years 2003-2007).

This scenario dealing to environmental damages to the underground water table, energy consumption for desalination and the deepening of social inequality as a result of the accumulation by dispossession (Harvey 2003), that in the case of this study is seen through the privatization and elitization of the common resources such as water supply.

Majorca is like an early warning system, where sensible future destination management policies have been considered or can be applied easily. The exits to the current capitalism's systemic crisis can make deeper the metabolic threat, as far as capital accumulation solutions to capitalism's contradictions worsen environmental crisis, in this case in terms of water scarcity or climate change due to greenhouse effect.

Acknowledgements

Part of the research presented in this article is carried out within the project "La Geoeconomía y la Geopolítica turística. Análisis de la glocalización turística balear, implicaciones socioambientales" [Geoeconomy and Geopolitics of Tourism. Analysis of the Balearic tourist glocalization and its socioenvironmental implications] (CSO2009-08400) funded by the Spanish Ministry for Science and Innovation (National Plan for R+D+i).

References

- Aguiló, *Eugeni*, *Joaquín Alegre* & *Maria Sard* (2005): The persistence of the sun and sand tourism model. In: *Tourism Management* 26(2), pp. 219–231
- Balling, *Robert C.* & *Camilo Cubaque* (2009): Estimating Future Residential Water Consumption in Phoenix, Arizona, based on Simulated Changes in Climate. In: *Physical Geography* 30(4), pp. 308–323
- Castree, *Noel* (2008). Neoliberalising nature: the logics of deregulation and reregulation. *Environment and Planning A*, 40(1), pp. 131–152
- CITTIB (= *Balearic Tourism Research and Technologies Centre*) (ed.) (2009): Dades informatives 2009. El turisme a les Illes Balears. Conselleria de Turisme, Palma de Mallorca
- Dirección General de Catastro (ed.) (2010): Cartografía Catastral de Urbana 1:500 y 1:1.000. Web Map Service URL: <http://ovc.catastro.meh.es/Cartografia/WMS/ServidorWMS.aspx?>
- Dodds, *Rachel* & *Ilan Kelman* (2008): How Climate Change is Considered in Sustainable Tourism Policies: A Case of The Mediterranean Islands of Malta and Mallorca. In: *Tourism Review International* 12, pp. 57–70
- Essex, *Stephen*, *Martin Kent* & *Rewi Newnham* (2004): Tourism Development in Mallorca: is water supply a constraint? In: *Journal of sustainable Tourism* 12(1), pp. 4–28
- Fletcher, *Robert* (2011): Sustaining tourism, sustaining capitalism? The tourism industry's role in global capitalist expansion. In: *Tourism Geographies*, 13(3), pp. 443–461
- Garcia, *Celso* & *Jaume Servera* (2003): Impacts of tourism development on water demand and beach degradation on the island of Mallorca (Spain). In: *Geografiska Annaler, Series A* 85(3/4), pp. 287–301
- Govern de les Illes Balears (ed.) (2012): Portal de l'aigua. Conselleria d'Agricultura, Medi Ambient i Territori, Direcció General de Recursos Hídrics. <http://www.caib.es/sac-microfront/contenido.do?idsite=259&cont=6476&lang=ca&camp=yes>
- Harvey, *David* (1978). The urban process under capitalism: a framework for analysis. In: *International Journal of Urban and Regional Research*, 2(1–4). pp. 101–131
- Harvey, *David* (1989). The condition of postmodernity: an inquiry into the origins of cultural change. Oxford
- Harvey, *David* (2003). The New Imperialism. Oxford
- Hof, *Angela* (2011): Spatial indicators of water consumption and sensitivity to climate: an analysis of urban and tourist areas in southwest Mallorca, Spain. In: *Car, Adrijana, Gerald Griesebner & Josef Strobl* (eds.): *Geospatial Crossroads @ GI_Forum*, 11. Proceedings of the Geoinformatics Forum Salzburg. Berlin, pp. 122–131

- Hof, Angela & Thomas Schmitt (2008): Flächenverbrauch durch Qualitätstourismus auf Mallorca – Analyse und Bewertung im Kontext der Entwicklungsziele der Calvià Agenda Local 21. In: *Europa Regional* 16(4), pp. 167–177
- Hof, Angela & Thomas Schmitt (2011): Urban and tourist land use patterns and water consumption: evidence from Mallorca, Balearic islands. In: *Land Use Policy* 28(4), pp. 792–804
- IDEIB (= *Infraestructura de Dades Espacials de les Illes Balears*) (ed.), (2010): Orthophoto year 2006, on ideib.caib.es, Resolution 50cm/pixel. Web Map Service URL: http://ideib.caib.es/pub_ideib/public/Ortofoto/MapServer/WMSServer?
- Iglesias, Ana, Luis Garrote, Francisco Flores & Marta Moneo (2007): Challenges to Manage the Risk of Water Scarcity and Climate Change in the Mediterranean. In: *Water Resources Management* 21(5), pp. 775–788
- Igoe, Jim, Katja Neves & Dan Brockington (2010): A Spectacular Eco-Tour around the Historic Bloc: Theorising the Convergence of Biodiversity Conservation and Capitalist Expansion. In: *Antipode* 42(3), pp. 486–512
- Kent, Martin, Rewi Newnham & Stephen Essex (2002): Tourism and sustainable water supply in Mallorca: a geographical analysis. In: *Applied Geography* 22(4), pp. 351–374
- Magdoff, Fred & John Bellamy Foster (2011): What every environmentalist needs to know about capitalism. *Monthly Review*, 61(10)
- Murray, Ivan (ed.) (2010): Els Indicadors de Sostenibilitat Socioecològica de les Illes Balears (2003-2008), Versió Extensa, Observatori de Sostenibilitat i Territori, Grup d'Investigació sobre Sostenibilitat i Territori, Universitat de les Illes Balears, Palma (Mallorca). URL: <http://www.uib.es/ost/estudi/index.html>
- O'Connor, James (1988). Capitalism, nature, socialism: a theoretical introduction. In: *Capitalism, nature, socialism*, 1(1). pp. 11–38
- Rullan, Onofre (2011). La regulación del crecimiento urbanístico en el litoral español. In: *Ciudad y territorio. Estudios territoriales*, XLIII (168), 279–297
- SABI (= *Sistema de Análisis de Balances Ibéricos*) (2012). Bureau van Dijk. www.bvdinfo.com
- Sauri, David, Jorge Olcina, Hug March, Javier Martín-Vide, Fernando Vera, Emilio Padilla & Anna Serra-Llobet (2011): ESPON Climate: Climate Change and Territorial Effects on Regions and Local Economies. Final Report Annex 4: Case Study Mediterranean Coast of Spain. URL: http://www.espon.eu/export/sites/default/Documents/Projects/AppliedResearch/CLIMATE/ESPON_Climate_Final_Report_Annex4_Spain_Case_Study.pdf
- Schmitt, Thomas & Macià Blázquez (2003): Der dritte Tourismusboom auf Mallorca (1991–2000) – zukunftsweisender Trend oder überschrittener Zenit?. In: *Tourism Journal* 7(4). pp. 505–522
- Smith, Neil (1984). *Uneven Development. Nature, Capital and the Production of Space*. London
- Swyngedouw, Erik & Nikolas C. Heynen (2003): Urban Political Ecology, Justice and the Politics of Scale. In: *Antipode* 35(5). pp. 898–918
- Vives Miró, Sònia (2011): Producing a “Successful City”: Neoliberal Urbanism and Gentrification in the Tourist City—The Case of Palma (Majorca). In: *Urban Studies Research*, pp. 1–13

