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Coping, governance, and development: The climate change adaptation triad

David Manuel-Navarrete, Mark Pelling, Michael Redclift

Department of Geography, King's College London

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David **Manuel-Navarrete**[1], Mark **Pelling**[2], Michael **Redclift**[3]
Department of Geography
King's College London
Strand, London,WC2R 2LS, UK
[1]david.manuel-navarrete@kcl.ac.uk
[2]mark.pelling@kcl.ac.uk
[3]michael.r.redclift@kcl.ac.uk

Abstract

The need to tackle climate change and development efforts together is widely acknowledged. However, even just the possibility of alternative visions of development is seldom contemplated. In fact, adaptation research usually assumes as "statements of truth" the monolithic claims about development constructed from the status quo of global capitalism. We argue that global environmental challenges cannot be properly addressed just through more sophisticated coping mechanisms, but will require changing the ways societies articulate their collective vision about development. In the Mexican Caribbean, a region at the 'front line' of both globalization and climate change, we found a hegemonic vision that equates development with capital accumulation through real estate speculation and large investments in tourism. This vision supports a governance structure which defines climate coping in terms of keeping economic growth and profitability unaffected by "external" threats such as hurricanes. Despite a lack of counter-hegemonic visions some tourism pioneers, small entrepreneurs, Mayas, middle class immigrants, and ex-fishers articulate alternative claims about development. Such claims envision endogenous urbanization processes controlled by local middle-classes and based on small-scale eco-hotels. However, these groups largely operate under the dictates of the hegemonic vision. They have performed a few episodes of civic resistance, but with little success in altering the course of development. As regards to hurricane coping strategies, there is a general endorsement and support of the coping mechanisms devised from the hegemonic vision, which consists of effective evacuation procedures and the attraction of investment for rapid economic recovery. The paper illustrates how adaptation analysis can be enriched by considering the interrelations between development, governance, and coping. In the context of radical and new climate changes the emergence of counter-hegemonic visions and structures may become vital for adaptability.

1. Introduction

Adaptation is a pervasive element in the evolution of every socio-ecological system. However, adaptation to climate change is often reduced to strategies and policies to cope with increasing climatic variability (Adger et al. 2003; Baker and Refsgaard 2007; Klein et al. 2007; Wamsler 2007). Accordingly, adaptive action is situated either as that which incorporates climate change into existing planning structures, or into ongoing development policy (Schipper and Pelling 2005). These positionings of adaptation uncritically assume the hegemony of particular development visions and governance structures (Simon 2006; Yapa et al. 1995). An alternative approach would analyze adaptation by assuming the existence of a plurality of development visions, including those constructed from the bottom-up and that might have not yet manifested. We argue that considering an heterogeneity of visions may enhance the capacity of a social system to change its structures (adaptability) in response to contextual changes, climatic or otherwise. Consequently, climate change research can benefit from frameworks, such as the adaptation triad introduced in the next section, which assess the existence and potential role of alternative development visions. The usefulness of this triad analysis is illustrated for the case of tourism development in the Mexican Caribbean (State of Quintana Roo); a region experiencing recurring hurricanes.

2. The Adaptation Triad Framework

International organizations and governments usually conceive adaptation to climate change in terms of expert-led climate risk management (Burton and Van Aalst 2004; Undp 2005). That is, as specific policies, management strategies and actions to cope with climatic hazards. Typical examples include: increasing the robustness of infrastructures, enhancing the protective functions of ecosystems, incorporating climatic risks in development planning, market solutions, establishing emergency funds, improving societal awareness and preparedness, reducing institutional fragmentation, and creating policy frameworks for disaster management (King 2004; Klein and Tol 1997; Sperling and Szekely 2005; Un/Isdr 2004). The main goal is to carry out the needed adjustments to reduce the likelihood of negative impacts of hazardous events on populations and economies. This approach can be effective and legitimate when top-down planning processes are transparently enforced and democratically designed. However, it is narrow and largely static in the sense that it assumes, and does not challenge, pre-existing governance structures or development visions. That is, coping strategies are set against an enabling context, which is essentially analyzed away.

An alternative approach focused on reducing the vulnerability of the poor through development is broadly popular amongst academics and NGOs, and gaining currency amongst international organizations (Schipper 2007). By emphasizing the central role of socio-economic inequality this approach opens the possibility for the modification of governance structures. That is, of changes beyond new management frameworks and policies. Thus, vulnerability is expected to be tackled through institutional changes towards reinforcing democracy, transparency, and accountability. A theme commonly uttered for achieving good governance is to enable effective multi-stakeholder engagement for public policy. Such engagement, however, is not only circumscribed to better coordinate risk management, as it was in the previous approach. Quite the opposite, the main goal of engagement is to boost the vulnerable's own capacity to cope with climate change. Typical coping strategies promoted within this approach include: enhancing the assets of poor livelihoods (Knutsson and Ostwald 2006), building capacities for self-protection and group action (Allen 2006; Eakin and Lemos 2006), community risk assessments (Van Aalst et al. 2008), and social capital mobilization (Mathbor 2007; Pelling and High 2005). Yet, as in the case of governments and international organizations, alternative

visions of development are not conceived as an integral part of climate adaptation. The participation of civil society is generally focused on practical issues, such as acquiring more solid homes, rather than on social or political change. Local knowledge and traditional coping practices are re-valued as means to create or maintain local capacity (Gaillard 2007; Wisner 2004). However, locals are rarely invited to bring in their own vision of development as they pertain to their city or community as a whole (Pelling 2007). Consequently, the type of governance change that this approach can bring about is likely to be incremental and highly restrained by pre-established goals.

Within the context described above, our triad framework introduces the premise that adaptation is not shaped by policies and local capacities alone, but also by the ideas and believes that social groups hold about development and progress. Consequently, a more holistic view of climate adaptation should encompass the interplay between coping, governance and development visions. In fact, this triad should be seen as an organic whole in the sense that changes in each element will affect the other two. Coping strategies are specific efforts deployed to manage experienced or expected impacts of hazardous events. Governance structures refer to established (formal and informal) patterns of relationship among the state, market players, civil society, and individuals. Visions, the most innovative element of the triad, express something of the intangible quality of peoples' aspirations, the will to anticipate and influence that which may come to be. Visions are given substance through the relations between individuals and values, ideas, perspectives, meanings, feelings, intuitions, mindsets and worldviews. Individuals can hold multiple, even conflicting value systems internally, and indeed can be contradictory in their actions as they navigate through the social structures governing their lives (O'brien 2009). In this context, development visions perform the function of sustaining mental images about the future which bind together the members of a social group, or, in the case of hegemonic visions, a whole society. In some cases visions may point to equilibriums in which the needs and desires of human individuals, families, and social groups are visualized in balance with the conditions and conflicts of their mutual coexistence (Ingold 2005). Alternatively, development visions can show "the path" rather than "the destination" or future equilibrium; for instance, illustrating virtuous ways of life or preferred ways of structuring social relations (Verweij et al. 2006).

Multiple visions will usually coexist but only a fraction will be enabled through prevailing governance structures. Following Gramsci (1971), one may think of "hegemonic" visions that are articulated by a dominant class or group and endorsed or consented by the majority of society as the only possible development path. Femia (2006:31) describes hegemony as:

"[T]he predominance obtained by consent rather than force of one class or group over other classes [...] attained through the myriad ways in which the institutions of civil society operate to shape, directly or indirectly, the cognitive and affective structures whereby men [humans] perceive and evaluate problematic social reality"

In addition to acknowledging the emergence of hegemony, the adaptation triad also contemplates the possibility of a plurality of development paths. This plurality suggests that contrasting visions may lead changes in governance structures and subsequent coping strategies (Heijmans 2004; Wisner 2003). This framework recognizes the power and visible stability of governance regimes, which can sometimes be overwhelming; but also the scope for individuals including those at risk to shape their own fate, their community, and in the context of global environmental change also humanity's fortunes.

3. Methods

Development visions can be identified and characterized through the analysis of claims, narratives, and discourses produced and reproduced by social actors and individuals; political discourses and priorities;

planning documents, policies and programs proposed or implemented; and tangible manifestations of development patterns whose features inscribe visions of development on the socio-ecological landscape.

Between August 2007 and October 2008, evidence was collected regarding the manifestations of the three spheres of the adaptation triad (i.e., strategies, structures, and visions). Our main source of evidence consisted of qualitative data drawn from 84 open interviews with local people identified through a "snow-ball" method. Their views were unpacked through inquiring about their personal experiences and opinions regarding the processes of urbanization, governance, climate change, and tourism development in the Mexican Caribbean. The overall goal was to "give voice" to personal narratives and stories. Fieldwork was centred in Cancun, Playa del Carmen, Tulum and Mahahual, although, insights from Tihosuco, and Chetumal were useful for regional contextualization (Figure 1). The views expressed by local people were contrasted through archival research, and the review of historical accounts, planning documents, press clips, non-participant observation, and participant observation in meetings and workshops. The opportunity of living in the area for over a year was instrumental for acquiring enough of an insider's sensitivity towards local perspectives, while at the same time trying to maintain analytical distance.

Figure1: Location of the Mexican Caribbean and urban centres under study
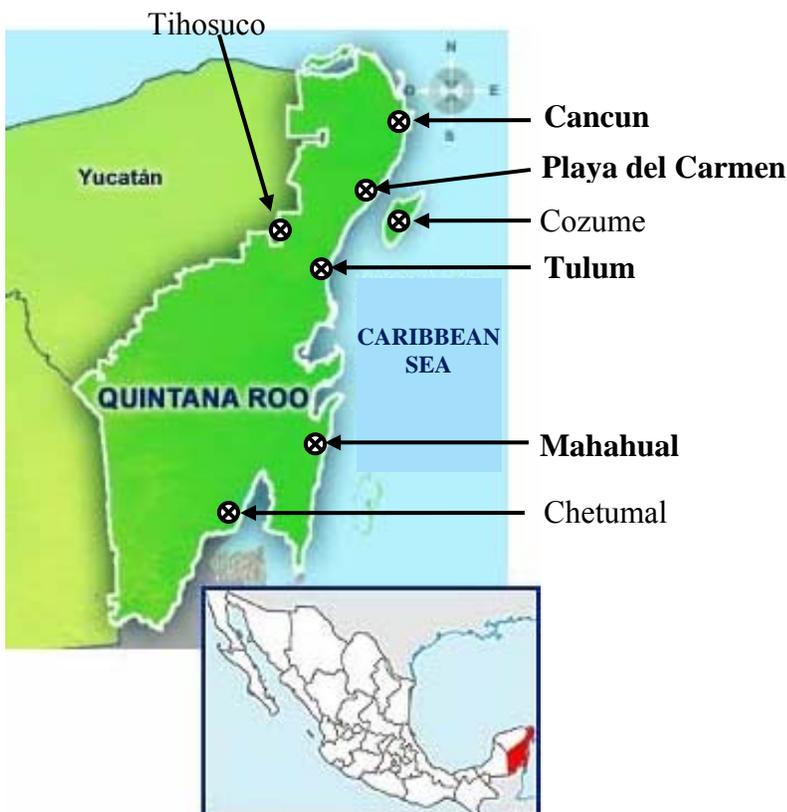
Source: Adapted from *Cuéntame... de México* (http://www.cuentame.inegi.org.mx) retrieved 28 April 2009

4. Cancun: The genesis of an hegemonic development vision in the Mexican Caribbean

Cancun, a remote barrier island located in the northern part of Quintana Roo, became in 1974 the first integrally planned centre (IPC)[1] for mass tourism[2] of Mexico. IPCs are funded and implemented by the Federal Government and the Bank of Mexico through the National Fund for Tourism Promotion (FONATUR, as for its Spanish Acronym) (Martí 1985). Cancun's Master Plan for Comprehensive Development was a corporate capitalist rationalization of the ultimate international tourism enclave; even though it was only possible on a basis of initial vast government interventions aimed at attracting private investments. A whole urban centre was put up from scratch (Torres Maldonado 2001). This urbanization was technocratically designed according to the premise of spatial segregation between the tourist use area (along the beach), and the housing area for tourism workers (inland and "out-of-sight" from the former) (Torres 2002). This form of segregation would become a distinguishing trait of subsequent IPCs (López-López et al. 2006).

In terms of visions, it is probably fair to say that Cancun's development was guided by a value system that privileges: (1) *capital attraction* through generating corporate investment finance (which is needed to develop land for intensive-urbanized tourism use), and (2) *capital gain for investors* through maximising of investment returns. The two are linked, capital *attraction* and *gain* are both facilitated by adding market value to sea-front land, as well as by increasing tourists' spending. Both principles are played out through relaxed implementation of environmental and labour laws, and manifest in a preference for capital intensive development, for example through the proliferation of all-inclusive resorts. This dynamic of mass-tourism development has manifested in other areas of corporate capital-led tourism development such as Acapulco, Copacabana, or Tenerife, to mention a few examples. However, Cancun and the rest of Mexican IPCs are singular for at least two reasons. First, they can be considered as frontier/enclave developments that targeted economically peripheral areas (Brenner and Aguilar 2002). This avoids having to negotiate with any locally established development vision. Secondly, while being initiated by the State, development plans were systematically given away to national and international corporate capital and elites. This has led to an ultra-liberal form of development which to the occasional observer appears to be solely constrained by capital availability. Such unrestrained growth, in turn, attracted thousands of immigrants competing to become part of the cash economy, even if through insecure, low-wage, and hazardous jobs. These immigrants flocked to the urban grid allocated for workers housing; a few miles away from the hotel zone. Hence, Cancun's tourism development has followed a for-profit vision characterized by a differential consumption of space with strict spatial separation between touristic and residential uses. This Mass-Tourism (MT) vision has enabled continuous touristic and real estate growth, which is "carved" by poorly paid immigrants for the benefit of financial elites. The ubiquity of this vision is noticeable in press headlines through the profusion of reports on hotel occupation, new investments and tourisms indicators. Almost everybody we interviewed assumed that tourism growth was the only means of creating jobs in the area. Another consensus view was that this development allows otherwise deprived Mexicans to, at least, get access to some cash opportunities. Some informants criticized the poor working conditions (and high suicide/accident rates) of construction workers, and the general low-wages that characterize the touristic sector. However, the customary discourse is that at least tourism provides higher wages than what immigrants would get at their places of origin (otherwise they would have not immigrated in the first place). This is commonly expressed as: "here at least there are paid jobs", "this *municipio* is one of the wealthiest of Mexico", "in my village there are no jobs at all", "we need the tourism!".

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[1] The other tourism IPCs are Ixtapa (1975) Los Cabos, Loreto (late 1970s), Huatulco (1985), and Nayarit (2005-)
[2] Large numbers of tourists consuming highly standardized, packaged and inflexible tourism products

In terms of governance structure, the MT vision is supported by a solid partnership between government and private corporations, and enabled by the lack of democracy and transparency of the Institutional Revolutionary Party (PRI) system (Manuel-Navarrete et al. 2009). This warrants an uneven distribution of resources and the disempowerment of tourism and construction workers, who clearly play subaltern roles. The PRI has been in power since the creation of Quintana Roo in 1974, and, with few exceptions, has also been in control of municipal governments. Accountability through the oversight of political and policy actors by civil society has been consistently undermined by this structure, and is further constrained by the rapid pace of demographic and economic change in the state. The PRI has put in place a strong political network of support constantly lubricated with public and private money. This network not only helps win elections, it also provides channels for implementing policies through paternalistic and patron-client relations (Kray 2006). As it was uttered along our interviews, the PRI plays "*Papá gobierno* [Daddy government]". Within the PRI political system, private sector accountability is almost nil due to the abundant corruption mechanisms that exist for enabling any form of public-private "partnership". As referred by a local environmental activist, and generally amongst local people: "one cannot do this and that, but in truth one always can do anything. It all depends on how much [bribes] one can put on the table".

In terms of coping strategies, the manifestations of the MT vision are contributing to further differential vulnerability and increase exposure to climate hazards. Tourism development is attracting massive influxes of people and property. Conservative estimates from the National Institute of Statistics show that the population of Quintana Roo has grown from 88,150 in 1970 to 1,135,309 in 2005. Consequently, about 13 times more people are presently exposed to hurricanes than just 35 years ago. In addition, the strict spatial division of land use, between tourists and workers, allows financial and public actors to discriminate the targets of protection and reconstruction efforts (favouring the touristic areas). The real estate sector is also increasing exposure. The GDP of the construction sector in Quintana Roo rose from about 384 million pesos in 1993 to more than 3 billion[3] in 2004. Moreover, the rapid cementation of the coast is severely degrading the ecosystem services for coastal protection and thus increasing further the exposure of people and property to storm surges and hurricanes (the impressive growth of hotel rooms is shown in Figure 2). As a result, Cancun beaches have, since 1984, suffered from chronic shoreline recession with rates of up to 2 metres/year (Silva-Casarin et al. 2006). Similar processes are taking place in other intensively urbanized beach areas near Cancun such as Playacar (Buzinde et al. 2009a). Particularly damaging erosion events were caused by hurricanes Gilbert (1988), Ivan (2004), and Wilma (2005).

However, increasing exposure is largely off-set by effective coping strategies. A crucial mechanism for avoiding human casualties, and therefore serious damaging on the image of the destination is the implementation of effective disaster management systems. Interestingly, these systems constitute, at the same time, governance and coping adaptations (thus, underscoring the analytical advantage of viewing 'adaptation' from the multiple perspectives of the triad framework). Accordingly, governance structures were modified in the 1990s by establishing a top-down and solidly coordinated "Civil Protection System" for emergency relief at the national, regional and local levels (State of Quintana Roo 1992). While in terms of coping, the government has funded and implemented hurricane refuges, evacuation procedures, and well-publicized early warning systems to enhance societal awareness and preparedness. As stated by government officials, the main goal is preventing human casualties. However, the system contributes directly and indirectly to project an image of "safe destination" amongst international

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[3] INEGI. Sistema de Cuentas Nacionales de México. Values for 1993 are expressed in 2004 Mexican pesos (11 pesos~1 US$)

tourists and operators. To this end, regular meetings with diplomatic representatives and the private sector are held to inform about the system's improvements.

Figure 2: Number of hotel rooms in Cancun and the Mayan Riviera (1975-2005)
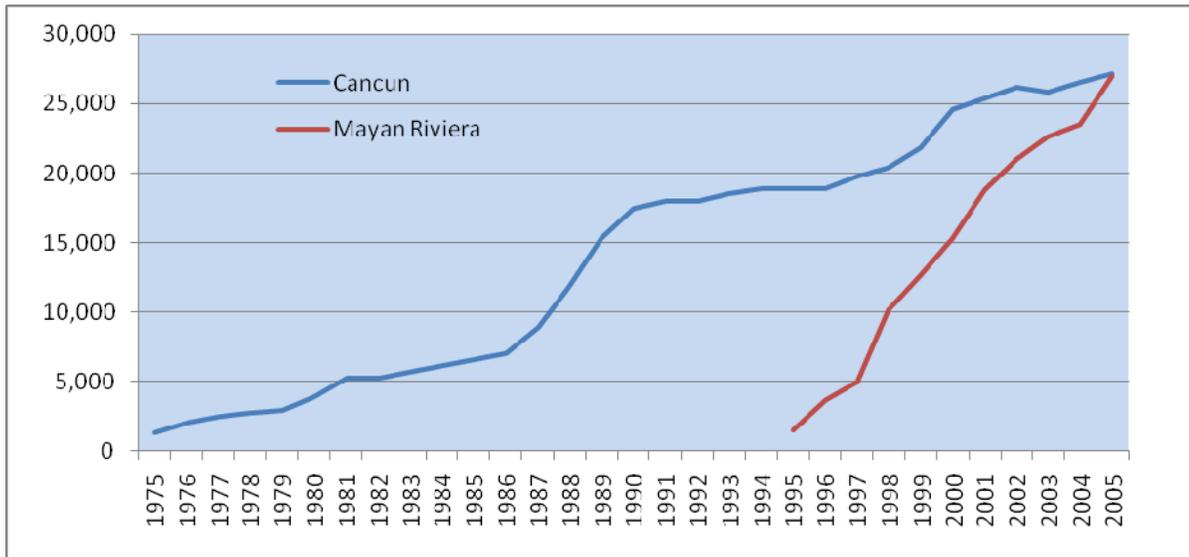
Sources: DATATUR – SECTUR (2007). Turismo en los Estados - Centro Turístico. URL: http://datatur.sectur.gob.mx/jsp/index.jsp; and Fideicomiso of the Mayan Riviera

A crucial question is how many hurricanes per decade is the disaster management system supported by the MT hegemonic development vision able to cope with. A key element for its success consists of tapping on exogenous resources provided by global financial markets and insurance companies. Although insurance exemptions and rates were considerably augmented after Wilma in 2005, they were re-accommodated in the last two years and are now affordable for most entrepreneurs (Personal communications with local entrepreneurs 2008). There are, nevertheless, numerous doubts regarding the sustainability of current adaptation strategies. One obvious limitation is the availability of exogenous financial resources, which cannot be taken for granted. Furthermore, from the perspective of mitigation, the continuous pouring of capital to reconstruct the same structures again and again might be judged as a maladaptation (Klein et al. 2007). In addition, recurring intense hurricanes may further threaten the sustainability of the coast by aggravating beach erosion, which constitutes a vital touristic resource (Buzinde et al. 2009b). Finally, although often neglected, the abundant availability of cheap labour is crucial for rapid recovery. As reported by Dixon (1991: 340): "Almost immediately [after hurricane Gilbert in 1988], at least 5,000 construction labourers descended upon the coast to work for $1.00 [US] an hour from dusk to dawn". However, low-wages may reduce the resilience and adaptation capacities of workers' households.

5. The extension of the MT vision towards the south

Located 68 Km south of Cancun, Playa del Carmen was a tiny fishing village until the mid 1970s. A few hotels were built in the late 1970s to serve tourists en route to the island of Cozumel or seeking the

tranquillity of Playa's relatively pristine beach (Redclift 2006). During the 1980s small-hotels displaying, and symbolically celebrating, materials from the region (i.e. guano palapas) started to pop up. Two of the main icons of that time, Las Palapas and Shangri-la hotels, are still operating today. These hotels perform cabins built of local materials and, although located at the town's centre, are still inserted in the original track of forest and palm trees by the beach. Most hotels and restaurants flanked the Fifth Avenue; a commercial passageway in the core of Playa with a rather chic European atmosphere in which family hotels and small businesses continue to thrive.

In the early 1990s the rapid growth of Cancun started to show some signs of exhaustion, while Playa's development went through a turning point. Population had jumped from 3,098 in 1990 up to 16,901 three years later (Solidaridad Municipal Government 2007). From the creation of the municipal government in 1993 until 2008 (the year when, for the first time, a resident Playense was elected as municipal president) local governance structures and coping strategies were imposed in Playa from supra-local spheres of power and inspired by the same MT vision that dominated in Cancun. The "seed" of MT had been already planted in Playa in 1968 when a Mexican developer bought 27 hectares along the southern beach adjacent to the urban centre (Redclift and Manuel-Navarrete 2008). This piece of real estate would become Playacar, a gated resort including golf courses, hotels, country houses, and apartments. In 1979 a private company was created to promote the development of Playacar. During the 1980s a few Americans and Mexicans built the first houses, and a 220 room hotel was erected at the entrance of the resort. In the 1990s, the resort's beach front was sold to international corporations to build large hotels. Playacar hotels would have lower densities than in Cancun, but followed the same all-inclusive operation scheme and attracted low-waged workers to be settled along Playa's new urbanization belts. As in Cancun, these workers needed to travel relatively long distances every day. Presently, Playacar has nearly 6,000 hotel rooms plus hundreds of houses and apartments.

By 1995 Playa del Carmen was already drawing thousands of tourists and an equivalent number of migrants seeking for jobs in the buoyant construction and tourism sectors (Table 1). Land became scarcer and some of the early tourism pioneers left in search of more peaceful locations. For a few of these pioneers the construction of the Playacar all-inclusive hotels was the indication to leave, for others it was the first traffic lights, some left with the arrival of Wallmart, and a number of them still stay (Personal communications with tourism pioneers, 2008). The opening of international franchises in the Fifth Avenue was opposed by some local people, mostly tourism pioneers, on the basis of their impacts on the aesthetic and the ravaging of Playa's distinctiveness (Personal communication with tourism pioneer, 2007). Regardless of this opposition, the permits for the first American fast-food corporation were granted by the authorities giving expression to the domination of the MT vision. However, as reported by one leader of the tourism pioneers opposition, the grantee of this first franchise sought some compromise and after discussing the issue with his opponents decided to build a palapa-like roof as a way of partly offsetting the visual impacts of his fast-food investment.

Beyond Caribbean-style embellishments, a more significant concession of the MT vision in its expansion to Playa was the strict limitation of the building's height; which has been consistently enforced through strict urban regulations. Accordingly, no construction is allowed to rise above three storeys. This regulation goes against the maximization of capital attraction and investment returns. Although there are many versions about the origin of this regulation, some argue that it responded to the idea of retaining a distinctive aesthetic identity in contrast with Cancun. Another frequent explanation is that it seeks to lower the wind turbulence of storms, thus reducing coastal erosion associated with wind storms. If the latter was confirmed, it would be a good illustration of the effect that slight modifications of a dominant development vision (*e.g.*, through negotiation and accommodation with alternative local visions) may have in terms of fostering coping strategies. In terms of official hurricane coping strategies,

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however, Playa exhibits the same mechanisms as the ones described for Cancun, including top-down civil protection and early warning systems.

Table 1: Population in Playa del Carmen (1960-2005) and Tulum (1990-2005)

	Playa del Carmen	Tulum
1960	93	92
1970	232	220
1980	737	540
1990	3,098	2,111
1995	17,621	3,603
2000	43,613	6,733
2005	100,383	14,790

Sources: (Inegi 1970, 1980, 1990, 1995, 2000, 2005)

About 64 Km south of Playa, today's active town of Tulum had been until the 1970s a Mayan ejido of subsistence farmers. In the ejidatarios' view, beach-front land was unproductive and inhospitable (personal communication 2008). It is worth noting that this development vision significantly diverted from MT. Accordingly, the settlement was established about 2 Km inland, and thus protected from hurricanes by a generous stretch of mangroves and forest. This constitutes another example of the relation between development visions and exposure. As in Playa, Tulum's population followed an exponential growth in the 1990s as low density eco-hotels proliferated along its outlying beachfront (Table 1). By 1990, only about 10% of the population were Mayan ejidatarios; while the majority of recently arrived immigrants were Yucatec Maya (often sharing language and cultural practices with ejidatarios), followed by non-Maya Mexicans, and a few foreign tourists and entrepreneurs (Juárez 2002). By 2004 there were 53 hotels in Tulum offering 1,235 rooms (Solidaridad Municipal Government 2007). Hotel designs range from concrete three storey buildings to very basic thatched cabins, and often include renewable energy and other eco-friendly features. The weight of Mayan culture has consistently decreased, but Tulum is still today the coastal urban centre of Quintana Roo with the strongest Maya identity.

In terms of development, both Mayas and eco-tourism entrepreneurs seem to have held an alternative vision to MT based on low-intensity and family-oriented development. Yet, the MT has been progressively taking over and confining any eventual alternative to the domain of a few individuals' dreams and aspirations. One of the entrepreneurs explains the process as follows (Personal communication 2008): "At the beginning all the cabana [eco-hotel] owners were kind of hippies. Then there was a second wave of entrepreneurs who came here looking for an alternative way of life but not as alternative as the hippies. In the last three years, though, most cabanas have been bought by people who do not even live here. They pay someone to manage the business and are increasing the densities. Now it is a business rather than a way of life and they get involved in everything: corruption and so on. They set bars with techno music and other nonsense. I have already decided to sell my cabanas".

In terms of governance structure, until 2008 Tulum was a dependency of Playa's municipal government. However, even though budgetary and political decisions were made in Playa, implementation was through Tulum's *alcaldía*, an administrative body elected through neighbourhood assemblies. This governance structure provided Tulum with a remarkable degree of independence from Playa and the PRI political system. Elected *Alcaldes* have always been local people and usually backed local visions of development. The intent from Playa to impose external candidates was successfully resisted by locals through direct confrontation (Personal communications 2008). A key element for this resistance has been a shared identity around the notion of Mayan culture. A coalition between Mayas and tourism pioneers who were sensitive to both environmental discourses and Mayan cosmovision has provided a cluster for social cohesion, which although frail was largely missing in either Cancun or Playa. In addition, hotel entrepreneurs created in 1998 an association for defending both their interests, and their nuanced interpretations of MT. As expressed by a chief member of the association: "we are worried about the concept of tourism that wants to be promoted in Tulum [in reference to MT]. I have studies showing that alternative tourism is increasing and leaves more money".

In 2005 a group of local people initiated a hunger strike at the entrance of the Sian Kaan Biosphere Reserve (a few miles away from Tulum) to protest against the type of "anti-ecological" development that was taking place in Tulum. This was probably the last significant sign of organized opposition to the MT vision of development. The movement was dissolved after negotiating with the government in Playa. In April 2008 the State government granted the independence of Tulum as a new *Municipio*. The first elections, held in April 2009, were won by the PRI, but in opposition to Playa's history, the first Mayor of Tulum is a local leader of Mayan origin. Nevertheless, the State government is planning an international airport and a huge resort called initially "Downtown Tulum" and now "Maya-Zama" after the complaints of local inhabitants for ignoring that there is already a downtown in Tulum. This development is implemented by Yucatecan entrepreneurs in concomitance with the governor of the State. The works for the first phase of *Maya-Zama* started in January 2008 with the urbanization of 77 ha of mangroves and forest which used to protect the town against hurricanes. The second phase comprises 450 ha; including a mega golf course that would extend up to the beach, and a grid of water channels resembling an inland (Venice-style) marina. If fully executed, this project would dramatically increase the exposure of Tulum to hurricanes by degrading the ecosystem services for coastal protection.

In terms of coping strategies, the hotel zone is the most exposed area of Tulum even if the coral reef provides some protection from storm waves. In its recent history, Tulum has been directly hit by Roxanne (1995) and Emily (2005), and indirectly by Wilma (2005) and Dean (2007). However, most hotels have proven to be very resilient. Some of their coping strategies differ from the ones applied in Cancun and Playa. Some examples are: elevating the cabins in order to let the water and dunes to circulate, and increasing dune stability by planting or maintaining the vegetation cover. The most vulnerable are the hotels that, as in Playa and Cancun, removed and built on top of the dunes. The only coping strategy for these hotels is to keep rebuilding after every hurricane. Even though Tulum hotels tap on the international insurance system and rely on the State Civil protection system when it comes to evacuation, one might hypothesize that their higher diversity in coping strategies responds to the overall higher resistance of Tulum to the hegemony of the MT vision. Another example that can be linked to alternative development visions is the traditional strategy that some Maya people still practice in Tulum of seeking refuge in caverns as the hurricane passes through.

Finally, Mahahual is a small town located a few hundred miles south of Tulum. It was founded in 1981 as a fisher camp. Tourism development had a slow start between 1993 and 2001 with the establishment of nine accommodation units totalling 83 rooms, four restaurants, and two diving centres (Daltabuit Godás et al., 2007). By 2000 there were still only 149 inhabitants registered (INEGI, 2000). This slow

development was dramatically accelerated with the construction of Puerto Costa Maya in 2001; a US$ 23 million port with three piers and a landside shopping centre of 6,500 m2. By 2004 the port received 214 ship calls totalling 500,000 passengers. Therefore, Puerto Maya suddenly brought to Mahahual the MT development vision. The local population rapidly adopted this vision and started to massively sell their land and to transform their fishing business into tourism activities. Many ex-fishers moved to Chetumal (Quintana Roo's capital) while new immigrants arrived in town to attend the demands of cruise tourism. Amongst these immigrants there was a group of investors from Europe and North America who established small hotels and other businesses. These foreign entrepreneurs imported a slightly different vision of development. However, their condition as foreigners has impeded their ability to influence governance structures. In addition, Mahahual has been always a political dependency of Chetumal and thus subjected to the dictates of the regional PRI structure.

In terms of coping with hurricanes, Mahahual is likely the most vulnerable of the four sites (Pelling et al. 2009). In 2007, hurricane Dean washed away the cruise ship infrastructure. By 2009, the town's economy had not yet recovered, although the cruise dock was completely rebuilt by the end of 2008. The coping strategies followed by Mexicans in Mahahual do not significantly differ from other towns. However, after Dean many people were forced to leave the town for good. In fact, the majority of them had not yet returned by 2009 due to the lack of jobs. This peculiarity can be possibly attributed to the fact that Mahahual's population had always been more free-floating due to the instable dynamics of cruise tourism.

Another peculiarity of Mahahual is that, even though the early warning and evacuation measures were as effective as in Playa or Cancun, the delivery of post-disaster aid was more ineffective due perhaps to the remoteness of the area. From the perspective of the triad analysis, it is important to note that an original coping strategy spontaneously emerged during Dean as it was fostered by foreign Mahahual's residents (who as we have mentioned hold a characteristic development vision which departs in some respects from MT). The main leader of this strategy describes it as follows: "When we realized that the government's help would not arrive, the rumour was spread out that they wanted to take us away from Mahahual. This was probably just a rumour. There were two critical moments. One was when we did not have any water left. We decided to resort to external help through the internet. The community could have collapsed in these moments if we could not have secured external help. There was risk of starvation, but the main risk was the desperation of people and the chaos that this was generating. We raised 100,000 US dollars through the internet. This money came from clients and people who knew Mahahual and knew me. When aid started to arrive, we did not know what to do and how. We made several mistakes and learnt from them. The most important was not to store the aid, this proved to be disastrous. We started organizing rapid distribution. We needed to coordinate the different communities/groups within Mahahual, identify leaders within each group that would help us with distribution".

This coping strategy relies on foreign governance structures which enable the actions of a virtually organized and self-reliant middle-class, which is absent in Quintana Roo.

6. Hegemony and climate adaptation

The adaptation triad provides a lens for analysing coping organically; that is without losing sight of its development context and underlying governance regimes. In the Mexican Caribbean we have found a hegemonic (in Gramsci's sense) development vision that we named Mass-Tourism (MT). Rephrasing Williams (1960:587), an hegemonic development vision can be defined as *an order in which certain paths and forms of progress are dominant and diffused throughout society, informing all social relations*

with their spirit and assumptions about reality. The dominant path of progress within MT is informed by the cultural discourse of modernisation and political narratives of neo-liberal democratic reform.[4] Progress is equated with the capacity to "generate" economic wealth, although very unequally and disproportionately contributing to climate risk.

MT is partly sustained by its ability to absorb the excess liquidity that was generated in the last decades, until 2008, by the international capitalist system (Harvey 2002). However, the supremacy of the coalition between government and business corporations, which is consented by low-income workers and immigrants, is probably its key sustaining structure. A vital factor for this consent is the trickle-down effect of rapid economic growth in a context of rural-urban migration. As commented by an informant working with low-income families (Personal communication 2008): "All that counts is that they perceive some incremental improvement, no matter how small, but something". Yet, consent is also prompted by controlling the institutional architecture shaping the cognitive and affective structures whereby low-income immigrants perceive and evaluate problematic social realities (Femia 2006). Accordingly, MT hegemony relies on a population which is expected to play passive social and political roles that are instrumental to economic growth. In fact the current governance regime is such that alternative social or political networks are actively discouraged and systematically co-opted by the government (Kray 2006). A crucial piece of such architecture is the undemocratic, and hardly accountable, governance regime of the PRI (Manuel-Navarrete et al. 2010). The intellectual and emotional acceptance of this regime builds on historic processes of internalization whose origins can be traced to the Mexican revolution and further back.

We have seen that the hegemony of MT was ubiquitous in all four study sites (Table 2). We only detected some signs of counter-hegemonic resistance, although ephemeral, in Playa del Carmen (until the early 1990s), and Tulum (up to recently). As we have discussed, this resistance might have at least lead to some concessions in terms of, for instance, limiting the height of buildings, which might have in turn affected exposure and coping strategies. Development in Cancun and Mahahual seems to have been always imagined utterly within the limits of MT. In the former case probably due to the overwhelming supremacy of this vision; while in the latter owing to the lack of means with which to formulate a significant alternative. This might indicate that size and degree of urbanization are not decisive factors to generate resistance, or that the optimum for counter-hegemony lays on mid-size. Other factors that do seem to promote counter-hegemonic resistance are: sense of local identity, political autonomy, and cultural diversity (*e.g.,* through the presence of Mayas or foreign immigrants). Tulum has enjoyed the strongest identity, relative governance autonomy, and the most significant influence of Mayan culture, which can be traced back to the Cast wars Of Yucatan (Redclift 2006). Not surprisingly, Tulum presents the most palpable manifestations of alternative development visions. In the case of Playa, the consistent control of institutions by exogenous political factions might have seriously hindered the capacity of local groups to hold alternative visions. Furthermore, Playa was never as influenced by Mayan culture as Tulum. Nevertheless, it is important to note that the main leader of the short-lived resistance offered in Playa by tourism pioneers in the 1990s is of Maya origin and highly respected amongst Mayas.

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[4] Although it reaches one of its purest manifestations in Cancun, it has arguably been a dominant vision across Mexico and around the world in places like Punta Cana (Dominican Republic), Buzios (Brasil), and Phuket (Thailand).

Table 2: Manifestations of the Adaptation Triad to Hurricanes in the Mexican Caribbean

	DEVELOPMENT VISION	GOVERNANCE STRUCTURES	COPING STRATEGIES
Cancun	MT hegemony without negotiation	-Disaster management and financial structures for fast recovery supported by government & corporations -Low levels of governance autonomy	-Hurricane refuges and evacuation procedures -Well-publicized early warning systems -Federal disaster funds -Promoting investments -International insurance
Playa del Carmen	MT hegemony, but slightly negotiated with tourism pioneers in the 1990s	-Disaster management and financial structures for fast recovery supported by government & corporations - Very low governance autonomy until 2008	-*Idem* + -Limitation of buildings' height
Tulum	Tending towards MT hegemony in negotiation with Maya and eco-tourism entrepreneurs	-Relatively high levels of governance autonomy -Governmental disaster management & small business financial resilience	-*Idem*+ - Architectural designs that respect vegetation and the structure of beach dunes -Caribbean constructions that are easy to rebuild - Seeking refuge in caverns
Mahahual	MT hegemony only contested by foreign citizens	-Governmental disaster management and relative financial support for slow and partial recovery -No governance autonomy	-Hurricane evacuation procedures -International insurance -Limitation of buildings' height -Foreign private aid from middle-class who know and love Mahahual

MT : Mass Tourism

From the perspective of the triad a crucial question is: To what extent does the hegemony of specific structures and visions hinder adaptation? On the one hand, one may argue that the hegemony of MT intrinsically hinders adaptation by favouring the unequal distribution of risks, degrading ecosystem services, and increasing overall exposure to extreme events. In addition, the lack of social solidarity implicit in this vision does not help in building the type of social capital that might be crucial in emergency situations. This was particularly evident in the case of Wilma in Cancun when the effects of looting and insecurity were as dreadful as the hurricane strong winds (Palma 2006). In the same line, the dramatic erosion of the beach at the edges of all-inclusive resorts are testimony to ecosystems services degraded by the predatory character of MT; while the only "correction" that is envisioned by the hegemonic structures consists of engineering the coast. In addition, the increasing of exposure is illustrated by the fact that Wilma affected over two million people in an area that was virtually empty 30

years before. On the other hand, one can assess the effectiveness of the coping strategies to hurricanes generated from the hegemony of MT and its related governance structures. It can be argued that some form of status quo, while shamefully iniquitous, is nevertheless a way of creating the social order needed for top-down coping mechanisms (or *in extremis* for any viable form of society). As we have seen, the "hard" strategies associated with MT include internalizing environmental risks through bureaucratic and technocratic practices; for example, building more robust hotels, implementing beach restoration technologies, or improving early warning systems. These practices rest on the use of commercial insurance, mobilization of supra-local resources, prompt action of security forces, and political support from government agencies. They rely on abundant investments and plentiful availability of cheap labour, and are highly carbon intensive (*e.g.,* though construction and maintenance, importing goods, and bringing in the tourists). However, they also involve externalizing risk costs through, for instance, weakening unions or civil right movements. In fact, the scope of strategies within MT is dramatically narrowed to the interests of capitalistic and political elites. For instance, the soaring concerns over maintaining a good image for the touristic destination leads to prioritizing effective command-and-control strategies that avoid casualties and generate a broad sense of safety without addressing the roots of differential vulnerabilities. Likewise, MT provides with copious capital availability from international financial markets attracted by high profits expectations. This capital abundance may, to a certain degree, disincentivise coping strategies for reducing damage, such as restricting developments on hazardous areas. Furthermore, the capacity of undemocratic command-and-control arrangements to avoid human casualties and provide basic relief in the aftermath of disasters makes less pressing the advancement of democracy in general.

In the case of Tulum, the major diversity of coping strategies suggests that less intense levels of hegemony might be beneficial for adaptation. This preliminary finding deserves further research, but it shows how the triad framework allows discussing adaptation in a more systemic way. For instance looking at how a development vision favouring the use of traditional construction materials (such as guano for palapas) can empower local groups, provide better-paid jobs (palaperos are generally better paid than other construction workers), and prevent beach erosion; while at the same time the empowerment of local groups can further alternative visions of development. This paper has just started to explore the possibility that a diversity of development visions might be as of itself one of the most important adaptation capacities of a society. This includes, but transcends, the need to increase accountability and participation within established governance structures. To be sure it entails empowering the ability of people to fundamentally influence the shaping of governance structures according to both their own aspirations and the anticipation of the challenges we will be facing as the result of climatic change.

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