Synthesized Institutional Analysis of Coastal Vulnerability to Climate Change in Three Countries: Britain, France, and South Africa

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1 Part I: System Structure - Collective Action

The synthesis analysis of coastal vulnerabilities to climate change blends research from the following three coastal regions into one report: (1) Cornwall, Britain (case no. 297); (2) the Languedoc coastal region in southern France (case no. 298); and (3) Eden District municipality, Western Cape Province in South Africa (case no. 299). Each study area encompasses numerous communities of various sizes in their respective coastal and inland areas, including along rivers, lagoons, estuaries, and in the vicinity of freshwater and brackish wetlands. Fieldwork conducted in 2014 and 2015 revealed similar action situations for the three sites in which inefficiently coordinated institutional frameworks, austerity measures/lack of government funding, community fractures along socio-economic lines, and a predominant focus on the amenity industry (tourism) are resulting in high levels of unemployment, social inequity, and vulnerability transfers. The resource system (natural infrastructure) in each of the areas consists of terrestrial (including coastal and riparian) land, the watershed and topography (shared).

1.1 The Commons Dilemma

- **The potential over-appropriation/poor coordination of appropriation problem:** In all three study sites public land, which often includes environmentally sensitive habitat and coastal and riparian areas that are vulnerable to climate-change-induced severe weather events, is over-appropriated for private purposes to meet increased housing demand for tourism, affluent second-home owners, lower income housing developments (Cornwall), and large infrastructure projects (France).

- **The potential under-provisioning of public infrastructure:** The asymmetrical focus of existing coastal development policies on tourists and affluent community members combined with government austerity measures and high unemployment rates is leading to the under-provisioning of public services (e.g., disaster response, implementation of climate change mitigation strategies) resulting in a vulnerability transfer from the wealthy to the poor and from the government (public provider) to the private individual.

1.2 Biophysical Context (IAD)

- **Natural infrastructure:** The natural infrastructure in all three systems is a heterogeneous mix of surface geology, hydrology, and human-built structures (public and private) within which a variety of urban/rural coastal communities are situated. The riparian, estuarine, and marine hydrology is susceptible to climate change which may lead to flooding, coastline erosion, and salt water intrusion into freshwater aquifers. These vulnerabilities are exacerbated by inappropriate development in ecologically sensitive areas.

- **Hard human-made infrastructure:** The **public hard human-made infrastructure** iin all three systems (e.g., roads, railways, energy and water transportation systems) is constrained by devolution of governance to the local level and concomitant austerity measures which significantly limit local communities' climate mitigation strategies.

  The **private hard human-made infrastructure** (e.g., private homes and businesses) is subject to asymmetrical vulnerability transfer from the affluent to poorer segments of the community.

1.3 Attributes of the Community (IAD)

- **Social Infrastructure** All three study sites report that feelings of empowerment and agency to effect change are being challenged by community fragmentation between native populations and an influx of (affluent) newcomers; mainly seasonal homeowners.

- **Human Infrastructure** General human infrastructure appears to be good with existing traditional land/flood management knowledge remaining in many communities in Cornwall; highly skilled and culturally embedded population (in general) in France; and sufficient environmental knowledge of development professionals and long-term residents in South Africa. However, research suggests that the general human infrastructure of affluent, seasonal property owners in all three study sites, and that policy makers decision-making processes may be guided by short-term political goals. Although collective action forums exist in two of the three countries (Britain and France) in which citizens can learn and provide input into government decision-making processes regarding coastal zone management policies, their effectiveness is uncertain.

1.4 Rules in Use (IAD)

- **Position Rules:** At this time, no critical position rules have been identified.

- **Boundary Rules:** At this time, no critical position rules have been identified.

- **Choice Rules:**

  - Policymakers at the national level may devolve authority for coastal zoning, watershed management, and environmental protection to the local level (decentralization).
  - Policymakers at the national level may cut budgets of local governments.

  - Policymakers at various governance levels must enforce existing coastal zoning and development, water management, and environmental protection laws which can be in conflict with each other.

- **Aggregation Rules:** Aggregation rules to clarify and/or coordinate which government agency has authority to decide which action or set of activities need to be undertaken, and what laws/regulations need to be followed appear to be missing in each study region.

- **Scope rules:** Individual decision-making and the failure of government to enforce existing coastal zoning regulations is undermining collective mitigation efforts and resulting in vulnerability transfer from the individual to the collective, and from the affluent to the poor.

- **Information Rules:** The information rules governing the coastal land spaces varies between countries. In Britain and France, the rules facilitate collective action forums in which residents can gather information and communicate with government officials at the local level. The frequency and accuracy of such communications varies. In South Africa, such a forum does not appear to exist.

- **Payoff Rules:** At the policy level, short-term political cycle thinking of politicians and the contemporary opportunities to economically profit from an amenity-oriented economy override long-term decision-making that takes adaptation and mitigation to climate change into account. At the individual level, the instant gratification of living in a beautiful environment outweigh the costs of property loss in the case of a severe weather event for affluent seasonal property owners. Furthermore, losses are often mitigated, if not eliminated, through insurance.

1.5 Summary

Although research is still ongoing in all three social-ecological systems, it appears that despite the existence of collective action forums in two of the three countries and a plethora of rules and regulations designed to govern the development of coastal land spaces (natural and human-built) in a manner that mitigates vulnerability to climate change, these efforts are undermined in several ways. First, the number and complexity of different rules that govern coastal development has led to a partitioning of actions that focus in on one area (e.g. biodiversity protection, housing development) without taking into consideration the effect of other rules regulating the same area. Second, there appears to be a lack of aggregation rules to coordinate decision-making authority which is further magnified by a general devolution of authority from the national to the local level without the necessary financial support which has created confusion with regard to the authority and restricted the range of actions assigned to individual participants.

2 Part II. Dynamic Analysis - Robustness

2.1 Update on the Commons Dilemma

This report represents the original synthesis of the three case studies. There is no update to the commons dilemma in any of the three sites, since research is ongoing as of 2015. The

following exogenous drivers have been identified as potential contributors to future fragilities with the SES:

2.2 Exogenous Drivers, Capacities, and Vulnerabilities

Exogenous drivers:

...to and of the Resource (link 7 to R): Global climate change is expected to increase the occurrence of severe weather events, including flooding, storm surges, retreating shorelines, and sea level rise, in all three study areas.

...to and of the Public Infrastructure (link 7 to PI):

- *Hard/physical infrastructure:* Global climate change-induced extreme weather events are generating uncertainty regarding the long-term viability of the human-built infrastructure (homes, historic buildings, roads, bridges, railways).
- *Soft infrastructure (rules, regulations):*All three study sites appear to suffer from a lack of coordination of policies between the national, regional, and local governance levels. Furthermore, in France and South Africa, the influence of international and EU policies on coastal development and environmental protection plans is adding further complexity to existing governance structures. In Britain, watershed management is influenced by the EU Watershed Directive.

...to and of the Public Infrastructure Providers (link 8 to PIP):

- Policymakers are influenced by short-term political cycle thinking instead of long-term planning perspectives and policies.
- Focus on tourism as the main driver of economic growth.
- Decentralization policies and government austerity measures/funding problems (South Africa) is leading to government reorganization of power and responsibilities.

...to and of the Resource Users (link 8 to RU):

- Perceived community fragmentation between "locals" and "outsiders".
- Dual economic structure associated with increased inequity and social injustice.
- Poverty and unemployment.

2.3 Robustness Summary

Existing frailties within the robustness framework of the three coastal regions are further magnified by exogenous natural, social, and institutional shocks. The expected increase in severe weather events will heighten the vulnerability of coastal populations and ecosystems to irreversible change while at the same time a lack of coordination of existing policies and the influence of international and EU policies at all governance levels undermines the ability to create a stable enough governance structure to mitigate those changes. Community fragmentation and concomitant dual socio-economic structures will decrease the ability of a majority of the population to deal with those changes at a local level. The situation is not

helped by the short-term political cycle thinking of policymakers, government reorganization and devolution of authority to local governance levels without the concomitant funding support. Furthermore, the continued focus on tourism as the main driver of economic growth is exacerbating an already troubled situation in all three areas.

3 Part III. Case Contributors

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