Maritime Communities & Climate Change

Role of public authorities and cooperation networks

Fabienne Vallée[1], Gunnar Tietze[2], Niko von Bosse[3], Peter Beckmann[4], Cheng Sheng Hai[5], Laurent Bellavence[6]

[TERRITORIES OF BREST, KIEL/SCHLESWIG HOSLTEIN, SHANGHAI PUDONG, QUÉBEC]

Full contribution to the conference PIMXXXIII Sept 2 to 5,2010, Beijing

[1] Manager of International cooperation – Science Park Brest – France – fabienne.vallee@tech-brest-iroise.fr
[2] Executive manager – GeoTopic- Kiel – Germany – gunnar.tietze@geotopic.de
[3] Executive manager – Maritime Cluster Schleswig Holstein – Germany – vonbosse@wtsh.de
[4] Executive manager – Economic development agency of Kiel – Germany – pbeckmann@kiwi-kiel
[5] Executive manager – Shanghai Lingang Marine Science Park – China – Cshai69@sina.com
[6] Executive manager – Maritime Technopole of Quebec – Rimouski – Canada – lbellavance@tmq.ca

1. ABSTRACT

With globalisation phenomena, the "blue planet" is becoming a major driver of the economy: supporting 90% of international trade, welcoming more than 45% of the world's population within 50 km of the coasts, providing millions of jobs, 40% of energy resources...

Ports and port Cities are the corner stones of this economy. If they are per nature major transportation and economic hubs, driving local and regional development from all marine and maritime related activities, they are also the connection point between two worlds, the earth and the sea, and between human activities, on-shore and offshore.

For port cities, and maritime regions, the questions raised by the "sustainable development" concepts address quite concrete and complex issues. They constitute a set of challenges for public authorities, who must deal with urban, social, economic, cultural, environmental facets of the development prism to define suited policies, in a more and more competitive and global world, with a new threat: "climatic change".

The paper is a joint contribution from partner port cities and territories. It is based on **parallel studies carried out by interest and cooperation networks: the Conference of Peripheral port Cities, the International Association of Port and Cities, the Conference of Maritime Regions, the International Association of Science parks. Convergent strategies emerge from these studies and they have clearly two dimensions: the regional and the international one.**

Through the presentation of concrete cooperative actions undertaken, at local and international levels, the paper aims at setting out potential roles maritime cooperation networks may endorse to federate maritime communities and provide self-defined (adapted and localised) measures to reduce the impacts on the environment, and per consequence on climate change.

2. KEYWORDS

- Sustainable development of maritime territories, ports and port cities
- Natural hazards, environmental and climatic changes
- Impact of global changes and public perception
- Maritime spatial management, ICZM[7]
- Conflicting interests
- Solution provision by cooperation between public authorities, science and industry
- Support of regions and territories
- Organizing action at three levels:
  - local
  - regional
  - global
- Public private scientific partnership (PPSP)

[7] ICZM = Integrated Coastal Zones Management

3. INTRODUCTION AND OBJECTIVES – POSITION OF THE PAPER

Often repeated and very true – no need to explain in detail to this distinguished audience:

- Water covers over 72% of the blue planet.
- Most people live in coastal zones within 50 km from the oceans, which are
  - the hot spots of economy and
  - man's activity.

Its magnitude and importance is continuously **rising**, demanding increased

- **knowledge** and
- **understanding** of the oceans' complexity

regarding **resources** and **environment**.

Maritime communities, people living close to and in most cases thanks to the sea, are affecting the oceans' health by over exploitation and degradation of marine resources. Also inland communities are using the oceans as their main trade-way, energy supplier or for dumping wastewater by the rivers. They all are contributing environmental change and – probably – have also an impact on climate.

At this point we make a break:

At least in the Western world, public authorities and engineering capabilities got used to design the living environment of men on a white board and then go out and build it. This means to adapt nature to whatever design.

Obviously mankind needs a change in paradigm in order to face the hazards from environmental and climatic change (as well as other changes). As nature (including climate and environment) is the platform for all living all policies should derive as a function of natural resources and opportunities, instead the other way round.

Maritime communities are aware of their responsibility but are also conscious of their role at taking in charge the development of better practices and techniques, to preserve their living and economic resources and to adapt themselves to future changes.

So, to accelerate these changes, in policies and practices:

- Have we considered other solutions than taxes and regulations?
- Have we considered the innovation capacities available in the «maritime community» and its capability at organising itself to improve its current practices and techniques?

The paper will consider these questions to explore means to better exploit the intrinsic capabilities of maritime communities at organising and inventing themselves the sea world of tomorrow.

So, based on global ocean observing, data and models provided by nature, we develop political strategies and action from this starting point by taking into account geographical facts. Following this idea, our paper is divided into two parts:

I. Environmental and climate change and impact on maritime communities

II. The role of public authorities and cooperation networks in addressing these impacts

4. ENVIRONMENTAL AND CLIMATE CHANGE AND MARITIME COMMUNITIES

This first part is dealing with the impact of these changes in maritime communities while the second part will discuss the response required and best practice examples.

4.1. QUESTIONS

So, what is the impact of climate/environmental change on maritime communities?

Why do we attempt do minimize the impact (whatever it is exactly)?
Or shall we better adapt to the changes?

Does mankind influence or even change the climate?
A positive answer would be a prerequisite to minimize the impact.

But: This is not the question, even though the discussion is open and often pursued with alacrity. Let's try to explain why.

4.2. ANALYSIS

As there are two major logical lines a table to develop them in parallel:

<table>
<tr><td colspan="2">"Climate" is defined by the mean statistics of temperature, air pressure, precipitation, wind, dust etc. (essentially all tangible values) in a given region over period of time, usually 30 years. – Weather is the spot situation of the same complete set of parameters at a given place and moment of time.</td></tr>
<tr><td>

30 years is long in man's life but very short on a geological time scale. Looking at this, we see that stable climate was rare and it usually changes; i.e.: At the very beginning of history in the early holocene a dramatic warming and sea level rise occurred.
As a matter of fact, the instrumentation to measure the climate and its derivate, the change, is poor, poor in space and in time.
Under-Sampling produces an aliasing effect. The result is incorrect data ever when strong high frequency signals overlay a long period signal. This is usually the danger when deriving climate from real time weather data.
Computer models help to overcome this dilemma. They reflect the actual status of man's understanding of the climate process. These models require ground truthing. They are accepted if plausible and free of contradiction to the measurements. However, even with historical data from geology and glaciology the lack of data in space and time is enormous
Generally, politicians and the press like indicators to promote some action. However, the matter is still too complex for defining a "Climate Dow Jones Index"
Data acquisition and research became very expensive. However, funds are restricted. Thus, contrary to the classical Humboldt university scientists in spite of their free spirit have to apply for money via proposals. These have to meet the criteria of politically decided programs. Does this shape the behaviour of science leading to politically welcome proposals resulting in some–how mainstream polarisation of research directions and goals? Is there a risk of a short circuit from politics to science?

</td><td>

However, climate is more than low pass filtered data, we need words to describe the climate in geography with seasonal and diurnal variation, probability of exceptional situations (i.e. hurricanes) its interaction and even reciprocity with agriculture and other human activities over centuries (like deforestation and urbanization, territorial water management and irrigation).
We want sustainable development.
But what does this really mean?

It certainly does not mean to fix the status quo,
Neither going back to some status quo ante.
Sustainable development implies development, raising wealth and quality of life.

Does not “sustainable” also mean to live in harmony with the environment?
Is a dynamic balance allowed?
Stone age Homo sapiens were chasing mammoths.
Was their way of life sustainable when after thousands of years at the end of the ice age the climate changed, the ice melted away and the manifold herds in the Eurasian steppes died out. This mass extinction of big mammals was due to climate change and just a little due to over-hunting when man kind grown in number.
As a result, sustainable development was not doable, but with new technologies as agriculture and stockbreeding mankind survived and thoroughly changed the face of the Earth.
What do we learn out of that: The point is not whether climate change is man made. The simple fact it changes urges action, no matter why. To find the guilty guy is more a juridical question,

</td></tr>
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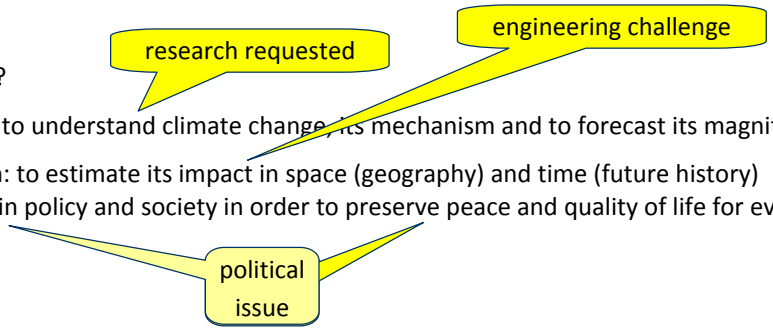
	▪ We have to accept climate change as a fact, and to develop new technologies, political networks and administrative structures to cope with. (By this we do not recommend careless boosting degradation of environment and climate.)



So, why two columns?

1. Left column: to understand climate change, its mechanism and to forecast its magnitude.
2. Right column: to estimate its impact in space (geography) and time (future history) and to react in policy and society in order to preserve peace and quality of life for everybody.

4.3. CONCLUSION

On that base we have to work on the extension of col. 2 as obviously there is not much time to loose:

- to dispread best practice solutions via the network of communities
- to adapt the solutions to the geographical specifities of a region including socio-geographical and economic facts
- to image new ways to finance the different maritime communities for their own needs of R&D
- to also adapt education and training programs
- to communicate to the public at large, including professionals.

If the impact of climate change on a region is within the bandwidth of weather variation, mitigation of the impact seams obsolete. However, this may not be true for all parameters. Just a synthetic example:

> If the regional warming falls within this bandwidth, society will not run into a problem due to some more nice summer days. However, if the sea level rises only a couple of metres, the same climate change may have a tremendous impact on the economy (i.e. port infrastructure).

Here both columns come together: It seems difficult to forecast the impact and to react in an economically reasonable way without understanding climate. It is well known that the ocean is the driver of climate. Its energy density (heat content) per cubic metre is thousand times higher than that of air at sea level. Here comes the link of climate and oceans and maritime communities. Thus, considering the oceans impact on mankind is condensed in the abstract action plan, task and motto "**Pacem in Maribus**".

Obviously, the proclamation to the UN-delegation and its 5 "overarching principles are directly addressed by the above said:

1. Our times call for a vastly improved ***integrated*** **understanding** of science and technology, communication, and governance structures that effectively manage our interdependent air, land, marine and human systems.
2. **Open and collaborative research**, data collection, data sharing and computer modelling is needed at the global, regional and local levels.
3. **Appropriate science-based recommendations for governance** mechanisms are necessary to shape mitigation and adaptation strategies to changing climate, ocean, and human security needs.
4. Socially just polices that **take into account the adaptation needs** of vulnerable populations must be a cornerstone of all recommendations.
5. **Communicating and "framing**" the issues so they're understandable and actionable by all peoples is an important corollary to the integration of science into sound policies.

4.4. ACTION

Have we considered all solutions:

- To accelerate data acquisition on climate/ environmental changes,
- R&D, adoption of better techniques and practices for a faster adaptation and reaction of the maritime community to that double threat: environmental degradation and climatic hazards,
- To imagine new ways to finance the maritime communities for their own needs in terms of R&D as well as application of cleaner / safer techniques and practices?

At this point we come to the second part of our contribution:

5. ROLE OF PUBLIC AUTHORITIES AND COOPERATION NETWORKS

The second part of the paper starts from case studies to set out the positive role public policies and cooperation networks can play to accelerate research and exploitation of research:

- For improving the management of the maritime territories.
- For improving quality and safety of the maritime industries.

5.1. LOCAL LEVEL: COOPERATION BETWEEN PUBLIC AUTHORITIES AND POLES OF EXCELLENCE

For port cities and maritime regions, the questions raised by the "sustainable development concepts address quite concrete and complex issues. They constitute a set of challenges for public authorities, who must deal with all facets of the development prism to define suited policies, in a more and more competitive and global world, and with a new threat: "climatic change".

Case studies will be presented to illustrate the positive influence of public policies:

- **Territorial management:** Cooperation between public authorities and experts (companies and scientists) enable developing both poles of competencies in operational environmental management centres with localised services (GIS, remote sensing networks and forecasting models).

- **Innovation and new economies:** Cooperation between science and industry organised in thematic R&D programs enable developing new techniques and services for a green and safe maritime industry. Among the success stories analysed, these "theme clusters" are very generally steered by "science parks" or High Tech Park "which are the liaison with public policies.

5.2. COOPERATION BETWEEN TERRITORIES

Maritime territories share similar concerns (environment, energy, climate, economic development). Territorial cooperation has proved to be a very powerful mean to transfer experience and to develop new visions and policies.

The examples taken demonstrate the positive effect of such cooperation when they are built on two layers:

1. between public authorities and
2. between their economic and scientific actors,

no matter if between "developed" territories, or between developed and less developed ones, at a scale of either city or region.

Example 1: Brest -Vung Trau/ Haiphong in Vietnam:

> At local/regional level, public authorities face the issues of a fast development (degradation of water and environmental quality), combined with the impacts of climate changes (sea level rise, erosion, typhoons...) and a necessary investment in infrastructures (ports, tourism, industries in particular).

This two-layer cooperation enables implementing concrete actions for sustainable management of the coastal areas (including climatic issues) by

- Developing local competencies in different maritime sectors of the maritime economy (coastal management, ports development, aquaculture/food safety...)
- Setting up "operational management centres of the environment" and their localized decision making tools.
- Providing education and training programs for industry and public authorities.

Even if the results are encouraging the example raises the question of funding. Such cooperation would require an easier access to "climate" and "development' funds in order to invest in technologies (monitoring systems, labs...) and in external services (status of the marine environment, hydrological an oceanographic studies ...).

Example 2: Brest – Kiel – Shanghai / Qingdao

A cooperation between the science/high tech parks and their members to develop coordinated R&D programs (transport and shipping, new energies, biotechnologies...) that contribute to the development of new techniques and services for a cleaner/safer maritime economy.

These cooperations are sustained by local, national, trans-national public policies. **Positive influence on industry**: At more global levels, these joint R&D programs inscribe themselves in larger cooperation networks, e.g. "e-navigation, e-maritime, "MITS" (Maritime Information Technologies and Services[8]), a cooperation between science and industry that aims at developing technologies and services for a cleaner, safer maritime economy.

These examples demonstrate that:

- ⇨ Whatever is their geographic and economic situation, territories can invent their own future, based on local competencies and cooperation between policy, science and industry.
- ⇨ This requires a strong involvement of public authorities, which provide the impulse, the funds and play as intermediates with stakeholders at national level.
- ⇨ The research results are exploited directly by public and private sectors: unlike R&D programs, which provide excellent scientific results but are generally poorly exploited. This is particularly important for the current needs of the maritime industry and policy: to invest rapidly in "clean and safe technologies and practices".

Both examples underline the efficiency of such R&D cooperation programs, which **accelerate the exploitation of research by the industry**. However, it underlines the lack of or access to R&D funds.

5.3. CO-OPERATION AT INTERNATIONAL LEVEL

Finally, at a global level, the analysis reveals a mesh of institutional, scientific, industrial cooperation, which constitute **an intrinsic innovation source** for the whole maritime community.

For public authorities, these cooperation networks are means to set out new development schemes, exploiting the collective knowledge issued from the number and variety of their members. There, all global challenges faced by maritime communities are being studied, in tight cooperation with the scientific and private sectors.

[8] MITS: An international cooperation set up to boost R&D and use of « Maritime Information Technologies and Services » what includes « Maritime Intelligent Transport Systems ».

At last, they induce efficient collaboration between territories, which have experience, funds, and experts, with developing regions, that, typically lack of human, technical and economic resources.

Some of these networks are analysed as examples:

- **The Conference of Maritime Regions** (CRPM):

  That involved itself in global challenges (globalization and maritime economy /innovation strategies; environmental degradation and climate change..). It supports concretely the development of territorial cooperation between developed and less developed countries facilitating the use of AID funds and the transfer best practices.

- **Networks of Port & Port Cities** (AIVP[9], CVPP in Europe):

  Which address the economic development and territorial management of Port-Cities (the Port & the City), the innovation and cluster strategies. This network carries out interesting and recognized studies from which emerge new policies, best practices, and cooperation.

- **Networks of Science Parks: International Association of marine science parks.**

  A truly global network that carries out studies, organizes conferences to set out needs, trends, best practices in a quite concrete way**.**

The set up of a sub-network:(**International Network of Marine Science Parks**) would be a real added value to reflect the e**mergence of networks of theme clusters** (maritime transport, offshore, energy, environmental management, biotechs…) and become the right hand of public policies (coordination of R&D programs, funds…).

6. CONCLUSION AND PROPOSALS

6.1. STATUS OF THE ANALYSIS

The Maritime Community has the capability to organize itself to define suited R&D and action plans in order to face new challenges such as the environmental and climatic ones.

The role and influence of public authorities has been underlined through its double impact on local maritime policies (innovation and sustainable development) and capability to transfer experience, knowledge at all levels through territorial cooperation.

Being it for the public or private sector, a funding strategy can be established, with and without climate taxes.

Our proposal thus is to favour a self-management of the problems raised by environmental and climatic changes, by maritime communities and for the benefit of maritime communities, investing in research to develop and adopt “cleaner and safer” techniques and services.

6.2. CORE OF THE PROPOSALS

THE PPSP MODEL: A COOPERATION MODEL TO ESTABLISH THE LIAISON BETWEEN SCIENCE, MARITIME POLICY AND ECONOMY.

The basis of the proposal relies upon cooperation, at local and international levels, between Public authorities, the Private and Scientific sectors.

[9] AIVP: International association of port and cities.

More concretely it relies upon the following components:

- Cooperation at two levels: Under the impulse of Public Authorities:
    - At local level: to develop local competencies to address environmental/climate issues and innovation/economic issues. Such
    - At bilateral and international levels: between maritime territories, from developed and less developed countries,
- These cooperation will benefit from the support of marine science parks (an International Network of Marine Science Parks): to provide a coordinated support for the development of advanced techniques and services:
    - Operational management centres of the environment, with localized services.
    - Technologies, services, applications for a cleaner maritime industry (port and shipping, offshore and new energies…).
- The Steering of International organisations like IOI or UNESCO is crucial for providing the initial impulse and power for science, policy and funding strategies.

TO PUSH INTERNATIONAL AWARENESS AT THE POLITICAL LEVEL AS WELL AS TO THE PUBLIC:
A « Sea World Expo » & an International Maritime Pavilion to link the maritime community

As one core idea the authors propose to set up a **permanent "International Maritime Pavilion" to assemble maritime communities on a common goal: to define and implement a new maritime policy by strengthening cooperation between science, policy and industry (the PPSP[10] model)**. This could take benefit of existing networks of marine/maritime related agencies, marine science parks, clusters and territories. They share the same will to work together for defining and implementing the next generation's maritime activities: safer, cleaner, and more sustainable

In addition, we propose to organise a true "maritime pavilion", to host a "Sea World Expo" at the next world expo in 2012 in Korea.

This year in Shanghai, besides many national pavilions, no pavilion hosts the oceans and maritime communities in their own, international **space** to address the importance and role the oceans play on food, renewable and exhaustive energies, mineral resources, climate, transport, ICZM, littoral spatial planning etc. Without the oceans' the World Expo looses part of its objective: communication and exchange between all communities of the world.

For the next edition in Korea the red line will be blue: The ocean. Setting up a "Maritime Pavilion" is more than evident: A truly international space to gather the maritime community, to promote international cooperation and to present and debate the complex multitude of maritime issues.

7. DISCUSSION

The discussion is open on the best way to proceed, under the coordination of relevant Inter-governmental and International Non Profit organizations such as IOI, UNESCO/IOC, IMO and UNEP.

Our proposal is therefore to set up a steering group to elaborate a detailed work program and to define concrete pilot actions that would prove the concept and initiate a larger scale international action.

[10] PPSP = public private scientific partnership

8. ACKNOWLEDGEMENT

We express our sincere thanks to:

- IOI and more particular to Dr Behnam and Virapat for their support, encouragements, and having enabled our participation to that important event “PIMXXIII”.
- SOA managers and staff who have welcomed us so kindly and efficiently.
- Public authorities, experts, science parks, clusters from maritime territories, especially from Haiphong, Vun Tau, Shanghai, Québec, Kiel and Brest, who have provided their support, information and their expressed wish to pursue the presented ideas by concrete follow-up actions.
- Partner networks and in particular the Conference of Peripheral Port Cities (CVPP), the International Association of Ports and Cities (AIVP), the Conference of Peripheral Maritime Regions (CPMR), the International Association of Science Parks (IASP) for basic ideas developed in their networks and compiled in our contribution.

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