Science Diplomacy 2.0: knowledge-based support to decisions

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Nowadays, the global challenges address *complexity* in the socio-economic system and in the governance, involving a diversity of variables and stakeholders. Complex systems are characterized by the difficulty to make accurate predictions on their evolution, which can result in abrupt changes, faster than the capacity to influence differently, with consequent geo-political shocks hardly to be managed.

If the geographical boundaries for an exhaustive approach to a problem should be defined by the problem's specificities, often the real problems are indeed the political boundaries. As an example, impacts of oils spills, where models of the sea circulation can establish the boundaries of the diffusion of contaminants, but regulation, technological capacity, interests, competencies and agreements can each drastically influence decisions for the intervention. Science can therefore support not only technical solutions but how to build a shared value between research, industry, public authority, civil society and environment.

The concept of "Science Diplomacy" and its perception have changed during last decades. It usually refers to three main types of activities:

- "Science in diplomacy": when scientific advice informs and supports foreign policy action.
- "Diplomacy for science": when diplomacy facilitates international scientific cooperation.
- "Science for diplomacy": when scientific cooperation can facilitate/improve international relations.

The *deluge* of data and news we are facing, plus the need to strengthen the stability and the resiliency of the systems, ask for a renewed approach to the role of *science* in supporting policy decisions.

Often, scientists struggle in providing *salient* and *responsible* advice for the adoption of effective action. One of the main challenges is not only a lack of common terminology between different communities but different levels of descriptions of the reality. The same challenge can occur between diverse scientific domains (i.e. medicine and physics) and a logical reduction of theories or opinions appear unrealistic: dialectical and dynamic relations can be more relevant.

The introduction of a scientific approach in the negotiation and comprehension of fundamentals in the interaction between information and context dependency, can impact in a cultural transformation of negotiation and decision processes, in a sort of Science Diplomacy 2.0, where science and diplomacy can entangle towards a knowledge-based support to policy.

This approach has to be built starting from training and introducing opportunities for dialectical relations between communities, in which thematic scientists (think about geologists, or biologists, etc.) understand the diplomatic logic and social sciences, and diplomats or decision-makers acquire the basis of scientific evidence and the ability to analyze/interpret data and results.

An education program aiming to provide the basis for structuring the relationships between science and decision-making, does not exist. Taking inspiration from any specific challenge, such as maritime traffic, food security etc., in the following a proposal on what aspects should be addressed as a common portfolio of knowledge.

Predictions

Fundamentals of statistics
Fundamentals of modeling and machine learning
Complex systems
Artificial intelligence
Reflections on accuracy, statistics or patterns, evidence or knowledge
The difference between advice for short-term and long-term impacts

Complexity in the scientific support to diplomacy

Complexity in governance and research levels
Evaluation of outputs and impacts of action
Impacts of ICT on Policy
Cognitive systems

Different approaches

Computational Social Sciences
Agent-based modeling
Game theories
Logic beyond Sovereignty
Managing conflicts
Reflections on consensus, feasibility, impact, timescales, risks