



Role of Science Diplomacy in Alleviating Impact of Climate Change on Agriculture: Way Forward for Sustainable Agriculture



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Introduction

There is sufficient capacity in the world to produce enough food to feed everyone correctly; nevertheless, in spite of progress made over the last two decades, 870 million people still suffer from hunger. In addition, the world's population is predicted to increase to 9 billion people by 2050. The most effective means of reducing poverty and achieving food security is to make agriculture more productive and sustainable. The Mediterranean region has a completely unique ecosystem, a type of micro-planet that contains a richness and diversity like no other.

Climate change is dramatically affecting agriculture in the Mediterranean region and solutions need to be found to adapt agricultural practices to rising temperatures, drought and soil salinity, and increasing occurrence of extreme events. Mediterranean agriculture is globally less and less able to provide sufficient food for its population; considering the climate change effects, the scarcity of resources, degradation of arable lands, desertification, loss of biodiversity and pollution. In order to achieve the sustainable development goals, the Mediterranean agriculture must change to meet the rising demand, to contribute more effectively to reduce the poverty and malnutrition, and to become ecologically more sustainable. Adaptation to climate change is become a matter of concern of the agricultural sector in Mediterranean region. Sustainable agriculture puts these conditions at the heart of transformational change in

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agriculture by concurrently pursuing increased productivity and resilience for food security while fostering mitigation where possible. Climate-smart agriculture, a concept developed by FAO, is an approach to developing the technical, policy and investment conditions to achieve sustainable agricultural development for food security under climate change.

Strategies to be adopted go beyond sectorial policies and must propose a global and integrated vision on a global scale. The Paris agreement integrates mitigation issues by reducing greenhouse gas emissions and adaptation by strengthening countries capacity to cope with climate impacts and establishes a system of transparency and global balance and recognizes the need for financial support to finance mitigation or adaptation projects. Mobilization and concrete initiatives of national and international civil societies such as the scientific community and The NGOs: contribute to the success of this agreement and to the increase in the fight against climate change.

This paper reports how science diplomacy contributes to mitigate climate change and to alleviate its impact on agriculture.

Common Threats, Common Solutions

Agriculture is the main source of livelihood for 1.3 billion smallholder farmers worldwide (WB, 2008) and is highly vulnerable to climate change (Salinger et al., 2005). Climate change-induced increases in temperatures, rainfall variation and the frequency and intensity of extreme weather events (Marcott et al. 2013; Steffen et al. 2016; NOAA 2017b).

The changing climate is also contributing to resource problems beyond food security, such as water scarcity, pollution and soil degradation. Agriculture must undergo a transformation in order to meet the intertwined challenges of achieving food security, reducing poverty and responding to climate change. Strategies to be adopted go beyond sectorial policies and must propose a global and integrated vision

on a global scale. For a transition to sustainable agriculture, national strategies seek to reinforce the pedagogy and support of the various actors in the sector to help them to structure and amplify their approaches in favour of this ecological. At farm level, in order to solve issues caused by conventional agriculture, several agricultural models have been developed at the level of farmers such as reasoned agriculture and organic farming; these models do not always reconcile the economic, social, and environmental objectives that constitute the pillars of sustainable agriculture. Consequently, the durability of these models is compromised.

Figure 1: Levels of decision making that impact the success of transition to sustainable agriculture



A Successful Climate Regime: Synergies between National and International Action

The Paris Agreement integrates mitigation issues by reducing greenhouse gas emissions and adaptation by strengthening countries capacity to cope with climate impacts and establishes a system of transparency and global balance and recognizes the need for financial support to finance mitigation or adaptation projects. It was adopted in 2015 and was ratified by enough countries for it to enter into force less than a year later - a record in international law. This historic agreement set in place a durable and dynamic

framework requiring all Parties to take climate action.

Under the Paris Agreement, countries have agreed:

- A global goal to limit average temperature increase to well below 2°C above pre-industrial levels and pursue efforts to keep warming below 1.5°C
- All countries will make nationally determined contributions to reduce emissions, and review their efforts every five years, to build ambition over time
- Robust transparency and accountability rules will provide confidence in countries' actions and track progress towards targets
- The importance of adaptation and resilience to climate impacts
- Developing countries will receive financial, technological and capacity building support.

No country can control the climate risk it faces on its own. Climate change is more challenging than many other global issues because it is a race against time, delaying action makes lower climate risk levels unattainable. It also requires profound choices that impact broad national interest debates such as development, energy, urbanisation and consumption.

International cooperation plays a relevant role to address common issues and to build bridges between countries. Diplomacy is the art of influence. It attempts to forge agreement but also to move political boundaries, expanding the realm of the politically possible. The practice of climate diplomacy requires three core capabilities, know yourself, know the other and the capacity of influence. Know yourself is the capability to develop and action a clear national position based on an objective understanding of how climate change influences and impacts core national interests. As in all other areas of policy, the process of forming the national interest is politically contested, may be dominated by unrepresentative and narrow interest groups, and often depends on less than perfect information. Know the other is the capability to gather and analyse intelligence on the interests, constraints and capacities of

other actors and how they perceive your own actions and positions. Capacity to Influence is the capability to effectively integrate national priorities into political and diplomatic channels. The command of basic tools of diplomacy and the capability to create a clear influencing strategy and to implement it through multiple venues, building alliances and strategic confidence, and framing and driving debates through private and public messaging.

Climate diplomacy is the interface between national interest debates and international cooperation. Climate diplomacy ensures the accurate assessment of other countries' interests and intentions and finds the space for agreement. The role of climate diplomacy is to deliver the timely construction of the complex international regime, ensure its effective operation, and shape its evolution to address climate change mitigation.

Science Diplomacy and Climate Change Mitigation: Case of Water Management

Agriculture is the main land use, user of water, and key activity for rural population over large areas in the Mediterranean. Water resources are essential to maintain a stable agricultural production, but also essential to supply to growing cities. In this region, it is likely that the stress imposed by climate change to agriculture is by means of reducing water availability (Iglesias et al. 2010a). Adaptation is a key factor that will shape the future severity of climate change impacts on food production (Lobell et al. 2008; Iglesias et al. 2010b).

Collaboration on water resources needs to be established across national borders in order to make progress towards sustainability. Science diplomacy can be a great vehicle to obtain improved water security.

International collaboration is often a stronger, and obviously, a preferable mechanism to sustainably manage scarce water resources than conflict (Lundqvist, 2010). Collaborations may be able to find enduring solutions for the benefit of all partners involved. In any case, adaptive

and preferably collaborative action is needed to reduce the likelihood of conflict and increase water security (OECD, 2011).

In 2005, the Contracting Parties to the Barcelona Convention adopted the Mediterranean Strategy for Sustainable Development (MSSD) in view to set-up a dynamic action plan for a better management related to the natural resources. The first priority of action during the process of the Barcelona Euro-Mediterranean Summit was accepted as integrated water resources (IWRM) and demand management as a more equitable and efficient management approach (Burak and Margat, 2016)

Conclusion

Climate change is a global challenge that does not respect national borders. Emissions anywhere affect people everywhere. Therefore, this requires solutions that need to be coordinated at the international level through international cooperation. In order to ensure the transition for sustainable agricultural and cope sustainable development goals, scientific cooperation are needed to build bridges and address concern. Since 2009, climate diplomacy has suffered stagnation. Diplomatic capacity will always be limited and countries in the Mediterranean region are already making hard choices where to focus their climate diplomacy in order to deliver the most impact. Similarly, while scientists have worked hard to publicize the predictable damage of global warming, policy makers to date have not taken radical decisions to reverse this trend.

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