Qüestions CIDOB
D.L.: B-8441-2012

THE CHALLENGE OF CLIMATE CHANGE IN THE MIDDLE EAST

30
JUNE
2013

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Ideological debates aside, man-made climate change caused by the increase in greenhouse gas levels is not controversial among scientists and the informed public. What is unclear, however, is how climate change might affect political and social constellations and what actions are being taken to address it, if any.

Climate change is a paramount global issue and could ultimately affect the conditions necessary for the maintenance of current and projected population levels.

So far, the best response the international community has managed to come up with is the 1997 Kyoto Protocol to the United Nations Framework Convention on Climate Change (UNFCCC), an international treaty that sets binding obligations on industrialised countries to reduce emissions of greenhouse gases. 191 countries (all UN members, except Andorra, Canada, South Sudan and the United States), as well as the European Union, are Parties to the Protocol. The United States signed but did not ratify it and Canada withdrew from it in 2011. Among the 37 countries currently with binding targets, Belarus, Kazakhstan and Ukraine have stated that they may withdraw from the Protocol. Japan, New Zealand, and Russia (which participated in Kyoto's first round) have not taken on new targets.

Depending on the degree of pressure from domestic public opinion, individual countries have developed renewable energy production, improved energy efficiency and reduced deforestation. But a number of developed countries have commented that the Kyoto targets only apply to a small share of annual global emissions (countries with second-round Kyoto targets made up only 13.4% of annual global anthropogenic greenhouse gas emissions in 2010). Developing countries, on the other hand, have emphasized the need for developed countries to have stronger binding emissions targets, while shunning any targets for themselves. Even in the case of Kyoto-target abiding countries, the outsourcing of energy-intensive industries to the East, as done by the EU, is not only causing dismal environmental conditions there (the highest levels of carbon dioxide pollution in the world today are recorded in

China), but indirectly leads to a further increase of CO2 emissions. Globally, existing policies are insufficient to prevent global warming exceeding 2 degrees Celsius above the pre-industrial level.

Eckart Woertz --whose book *(Oil For Food, The Global Food Crisis and the Middle East)* has just been published by Oxford University Press --, thinks that in addition to the fact that this is a huge global problem which requires drastic global measures, the sheer number of variables and their complex inter-relations make it very difficult to appraise its regional and local consequences --and hence, what is to be done on a practical level.

Interdependence/complexity has taken hold of decision making?

We know that climate change is happening and that it is human-induced. We know that it disproportionately affects countries that are less resilient –countries that are poor and do not have diversified economies, where agriculture (adversely affected by climate change) represents a relatively high share of GDP. Considerable uncertainties exist about how fast and far global warming will go and how often extreme weather conditions (droughts, hurricanes) will occur. With all these *caveats*, the current consensus is that the Middle East, Pakistan and India, North and South Africa will be most affected. But, how? Some countries may be affected by climate change, but have other, non-agricultural export items they can offer to international markets –this would be the case of Israel, for instance. Such countries can adapt to climate change more easily by importing food for example. Higher temperatures in the Northern hemisphere will enhance vegetation periods and could actually lead to increased agricultural production while in arid and tropical countries food production will suffer. Again a lot of uncertainty exists. Most models do not take indirect effects of climate change into account (e.g. the consequences of major flooding or an increase in pests) and more carbon dioxide in the air does not only lead to higher temperatures, it also has a fertilizing effect via rainfalls. It is a big question how such a carbon fertilization effect might have a countervailing effect for agricultural productivity. Oceans will also continue to function as a carbon sink for a couple of decades, yet it is safe to assume that by 2050 the aggregated effects of climate change on food production will be negative even in a scenario of increased investments in agriculture an production growth in the Northern hemisphere. Food trade as an adaptation instrument will then be less and less viable.

By 2030, 47 per cent of the world's population will be living in areas of high water stress, according to the Organization for Economic Co-operation and Development's (OECD) Environmental Outlook to 2030 report. Almost half of humanity will face water scarcity. Some analysts worry that wars of the future will be fought over "blue gold", as thirsty people, opportunistic politicians and powerful corporations battle for dwindling resources. And strategists (from Egypt to Turkey and Central Asia) prepare for strife. Are the prospects of water wars becoming increasingly likely?

New dams, like in Ethiopia and Turkey, are giving rise to potential conflicts with downstream riparians like Egypt or Syria that fear that their traditional water rights might be infringed upon. But water also provides an incentive for cooperation. If you substitute domestic agriculture with food imports, like the Gulf countries are doing, you are adapting to climate change by importing "virtual water" embedded in agricultural products. One should avoid over-simplifications. Water wars have often been predicted, but have never happened so far. Doomsayers

have made a fool of themselves for decades now. Conflicts over water have been more on a local, community level than conflicts between countries. When speaking of water wars, the focus has always been on rivers (Indus, Nile, Tigris and Euphrates) and their corresponding water treaties and water sharing agreements. The big global problem, however, is ground water. Water saving technologies and reformed tariff systems are needed to encourage more sustainability. Another important aspect is the green water (from rainfall) encapsulated in the soil, which cannot be piped or bottled, but sustains about 70 per cent of global agricultural production. Green water and management of soil moisture is crucial for agricultural resilience and future prospects of food trade.

So, what is the international community doing?

To say the truth, not that much. The two largest emitters of greenhouse gases, China and the United States, essentially do not have emission targets and the Kyoto protocol has now been weakened further by Canada, Japan and Russia bailing out in one form or another. Essentially, countries send delegates to meetings to do some talking and not much else. Yet at least agricultural investments have increased after decades of neglect. The International Food Policy Research Institute (IFPRI) in Washington estimates that an additional $7 billion would need to be invested annually in the introduction of drought-resistant crops and improved irrigation in order to adapt to climate change. Yet the most affected countries are poor and cannot afford such adaptation measures and other forms of infrastructure buildup.

Let's take a region most likely to be hard-hit, such as the Middle East. What good practices in climate-change adaptation, if any, are being undertaken there?

The Middle East has been an arid region for a very long time and its peoples have developed techniques to cope with this harsh climate. One can say that it has millennia of experience in climate change adaptation. In many cases, one can build on this know-how or needs to rediscover it, if it has been lost. In Yemen, wasteful practices like the excessive use of oil-driven water pumps have led to the abandoning of terraced rain-fed farming. The World Bank now tries to improve rain-fed farming and conserve biodiversity by building on local traditional knowledge in the highlands of Yemen. Morocco, on the other hand, tries to make irrigation along its Oum Er Rbia River basin (which provides a large chunk of its agricultural production and comprises about half of its irrigated area) more sustainable.

On 11 May 2013, the amount of climate-warming carbon dioxide in the Earth's atmosphere crossed the 400-parts per million threshold (which means that there are 400 molecules of carbon dioxide for every million molecules in the air) for the first time in recorded history (it is estimated that the Earth's atmosphere hasn't had this much carbon dioxide in it for at least 800,000 years, and possibly for as long as 5 million years). This threshold (an important marker in UN climate change negotiations) has been tagged as a dangerous level by most climate scientists, who have been for years stressing the need to keep CO2 concentrations below, or pushed back to 350 ppm, for countries to meet the international target of keeping the average temperature increase below 2 degrees Celsius this century… Are we rushing (the lemming metaphor) to jump off a cliff?

There is a big risk, I'm afraid. But at the same time I would caution against environmental, neo-Malthusian determinism. It is for example an exaggeration to say that climate change was instrumental for the Arab Spring. Other factors were clearly more important: the economic malaise, unemployment, corruption, decades of dictatorship, etc. Essentially, the relationship of humans with the environment is not mechanistic, they have a choice and they form the environment as well via adaptation, they always have. The environment is not an external variable but quintessentially shaped by the humans. To postulate that people start rioting when the temperature rises by x degrees is just another example of an uncritical mathematical fetish in the social sciences that has become way too popular at the universities.

Some analysts say that even if we were to react now it would be much too late. And that the sheer scale of the financial resources required to fight the effects of climate change are quite simply beyond any country's possibilities…

Yes. Not only beyond the possibilities of countries most likely to be affected, which are those which can least afford it, but also beyond those of rich countries such as the US (the destruction in the New Jersey/New York area caused by Hurricane Sandy in 2013). It is a huge problem indeed: we cannot afford to fix everything that gets damaged by extreme weather conditions, and we will progressively be less able to do so as the frequency of such events accelerates and reconstruction costs multiply. This can contribute to social unrest (as in post-Katrina New Orleans). However, here again caution is needed: society is not a mechanical device that turns from unrest to war as temperature rises. There is no determinism in social phenomena. All these water wars that have often been predicted but have never happened might serve as a cautionary tale here.