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Analyses

Drought management and desertification in the Mediterranean

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From Syria to Spain, the Mediterranean has sustained her people for thousands of years. But rapid changes in population, lifestyle and climate change are leading the region into conflict over water and land. The last ten years were the hottest on global record and in many Mediterranean areas have also been the driest. The resulting crop failures and water imbalances caused instability in many rural areas. In spite of a great collective effort to address the drought problem, from science to policy, many issues remain unsolved.

A new report by the United Nations highlights the alarming increase in human and economic losses from drought. In the Mediterranean countries, drought, aridity, water shortage, water scarcity and desertification are common and overlapping problems.

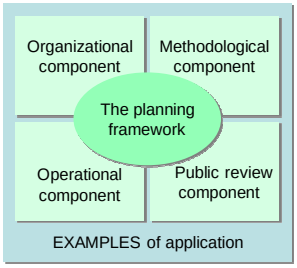
Drought is a natural random temporary condition of consistent reduction in precipitation and water availability with respect to normal values. Aridity is a natural permanent climatic condition with very low average annual or seasonal precipitation. Water shortage is the man-induced temporary water imbalance. When the imbalance expands over long periods of time it is often called water scarcity. Finally, desertification indicates the degradation of land in arid, semi-arid and other areas with a dry season, caused primarily by over-exploitation and inappropriate land use interacting with climatic variance. Desertification is man-driven and permanent.

Drought management and policy

In the last two decades the Mediterranean countries have improved drought preparedness strategies with a range of success stories (Iglesias et al., 2009). The success in most cases arises when there is an effective coordination of policy, physical and technical aspects. For example, in Spain there is a clear share of competences among the involved bodies, as well as a clear definition of the contents of a potential drought mitigation plan since the beginning of the century. Law 10/2001 applies a proactive approach to face drought risk: defines the basis to develop a system of hydrologic indicators to monitor and forecast drought events; gives responsibility to the Basin Authorities to prepare their drought plans and to the municipal water agencies to prepare drought emergency plans; and assigns responsibilities for drought declaration.

Contents of this edition:

The MEDROPLAN project (Mediterranean Drought Preparedness and Mitigation Planning) was co-financed by the EU MEDA Water Programme and involved 10 partners of 6 Mediterranean countries (Cyprus, Greece, Italy, Morocco, Spain and Tunisia) coordinated by IAMZ-CIHEAM. The project synthesised academic and policy aspects of drought planning and developed drought management guidelines to develop drought management plans, especially oriented to support policy. Drought management plans are actions taken by individuals, industry, organisations or institutions before drought occurs to minimise the risk of damage. There are strong differences among actions in their nature, expected effectiveness, societal impact or economic costs, therefore it is necessary to organize their timely activation within the framework of the drought management plan. Not all actions are suitable and applicable in every situation and at every moment. Drought management plans may be simple or complex depending on the territorial and institutional scope.



Nevertheless, the MEDROPLAN project proposes some main common elements (see figure below). First, a plan needs to define the institutional and stakeholder roles in the declaration of drought and the evaluation and revision of the plan (organisational component). Second, the plan should provide the tools and methods for the diagnosis of drought risk (methodological component). This is not easy since drought is characterised by a high level of complexity. The diagnostic rules and criteria have to capture the complexity of drought and at the same time be transparent and easily evaluated by the stakeholders. There is a range of tools and models that can be use in this diagnostic process from indices to complex models of hydrological and land use dynamics. Although indicators are simplifications of reality, they play an important role in the definition of thresholds for risk management. Third, an essential component of the plan is the definition of the management objectives in each drought level and selection of the drought management actions (operational component). Finally, the plan needs to be reviewed by the stakeholders at different times. The sustainability of drought and desertification policy depends on the ability to respond to social, economic and environmental change.

Actions that are taken before the initiation of a drought event aim to reduce the vulnerability to drought or improve drought preparedness. They are long-term actions oriented to increase the reliability of water supply systems to meet future demands under drought conditions through a set of appropriate structural and institutional measures, such as legislation development, demand management, construction of storage and transport infrastructure, etc. The actions taken after the start of a drought are short-term actions which try to mitigate the impacts of the particular drought event within the existing framework of infrastructures and management policies, on the basis of a plan developed in advance and adapted to the ongoing drought, if necessary. They can be specifically targeted to manage the risk of water shortages in the near future, or reactive, to mitigate impacts or allow for recovery after the drought. The implementation of the drought management plan is more effective if actions are grouped together in drought scenarios and are implemented when certain objective conditions (measured by the monitoring system) are met. In order to achieve efficiency, there should be only a few drought scenarios, like, for instance: normal conditions, pre-alert, alert and emergency.

Under a *normal scenario*, actions are designed to reduce drought risk and improve drought preparedness. These actions are usually of structural and long term nature. On the supply-side, actions may include the development of new storage infrastructure or water diversions, new systems of basin interconnection and water transfers, development of non conventional resources, such as waste water reuse or desalination plants, etc. On the demand side, long term measures may include modification of tariff structure, changes in irrigation technology, water saving and reuse in industry or promotion of alternatives for water-demanding activities. Water management actions are also important, such as promoting conjunctive use of surface water and ground water, establishing a framework for interchange of users' rights, or inter-administration coordination, new legislation initiatives, etc.

CIHEAM

Founded in 1962, CIHEAM is an intergovernmental organisation comprising thirteen member countries from the Mediterranean Basin.

CIHEAM is made up of a General Secretariat (Paris) and four Mediterranean Agronomic Institutes (Bari, Chania, Montpellier and Zaragoza).

In pursuing its three central missions (education, research and cooperation) CIHEAM has established itself as a reference in its fields of activity: Mediterranean agriculture, food and rural development.

At present, Mr Abdelaziz Mougou is CIHEAM's President and Mr Bertrand Hervieu is its Secretary General.

The *pre-alert scenario* is declared when drought indicators show the initial stage of shortage risk, usually associated to a significant probability of minor shortages or to low probability of serious shortages. The management objective in pre-alert condition is to ensure acceptance of measures to be taken in case of alert or emergency by raising awareness of the danger of drought. Pre-alert measures are usually low cost, indirect, voluntary and non structural, directed to influence water demand and avoid worse situations. They focus on communication and awareness and include the intensification of monitoring and risk analysis for worst case scenarios.

The *alert scenario* may be declared when drought indicators show that drought is occurring and will have impacts if measures are not taken. The management objective is to overcome the drought situation and to guarantee water supply while emergency measures can be put in place. The measures applied are usually of low cost, coercive and with direct impact on consumption costs. They are non structural measures directed to specific water use groups, such as water restrictions for uses that do not affect drinking water, temporary changes in management strategies, revision of water tariffs, activation of rights exchanging centres, etc.

The *emergency scenario* is declared when drought indicators show that impacts have occurred and supply is not guaranteed if the drought persists. The management objective is to minimise impacts, giving priority to essential uses, such as drinking water or ecosystem conservation. Measures are usually high cost, direct and restrictive, and are approved as general interest actions. Water restrictions are applied for all users, including urban demand, although with different levels of intensity. Emergency supplies are activated, for instance through water transport by trucks or barge, transient overexploitation of groundwater, exceptional operating rules for reservoirs, etc.

Critical points and open questions

Planning efforts are not easy and effective plans to combat drought and desertification are faced by some key challenges: Complexity, social change and climate change. First, drought and desertification are complex multi-dimensional issues from the physical and social point of view, involving a variety of stakeholders with different responsibilities and sometimes inadequate legal systems. Second, the evolution of society, technology, and policy may or may not contribute to lowering vulnerability to drought.

In Mediterranean countries drought management issues are increasingly complex due to reinforced environmental awareness, rising marginal infrastructure costs, and public participation in the decision-making process. Climate change is emerging as an additional challenge to effective management.

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Election Secretary General of CIHEAM

At the 121st meeting of the CIHEAM Governing Board in Paris on 7 May 2009, the thirteen member states of the institution unanimously elected Mr Francisco Mombiela Muruzabal (Spain) to the post of Secretary General of CIHEAM.

Currently serving as Director General of Food Industries and Markets at the Spanish Ministry of Environment, Rural and Marine Affairs (MARM), Mr Francisco Mombiela Muruzabal, who has extensive experience of international and European negotiations, will take up his new duties in October 2009.

He will succeed Mr Bertrand Hervieu (France) who has been Secretary General of CIHEAM since October 2003.

A new study suggests that the impact of climate change on the Mediterranean region will change precipitation and evaporation rates over land and sea, creating even drier conditions. A greater amount of atmospheric moisture will be lost from the region. Agriculture may suffer as a result, and the salinity of the Mediterranean Sea could increase (CIRCE). Finally, drafting drought management plans requires the selection of the most appropriate combination of long term and short term actions. Current plans to combat drought and desertification based on changes in mean climate variables should be revised to account for climate change and the potential increase in anomalous events.

Mediterranean countries are making a great effort to reduce the impacts of drought and to avoid desertification. The solution is to plan in advance. The implementation of a preventive and proactive approach implies drafting plans in which the mitigation measures are clearly defined together with the instructions for their implementation. No single management action, legislation or policy can respond to all the aspects and achieve all goals for effective drought management. Multiple collaborative efforts are needed to integrate the multidimensional effects of drought on society. To this end, a clear assignment of competences among the different institutions involved appears to be a key issue; therefore a legislative act which defines the responsibilities is necessary in each country. Such an act could be part of national water resources policy and/or strategy to fight the risks of drought and desertification.

Scientific Advisory Committee of CIHEAM

At its 120th meeting in Montpellier on 22 January 2009, the Governing Board of CIHEAM, appointed four new members to the Centre's Scientific Advisory Committee.

The new members – Luis Miguel Albisu (Spain), Dimitris Diakosavvas (Greece), Ali Zouba (Tunisia) and Masum Burak (Turkey) – were appointed for a period of four years. They will be joining a Committee which also includes Mr George Attard (Malta), Mr Mohamad Tallal Farran (Lebanon) and Mr Foued Chehat (Algeria).

At the 121st meeting of the Governing Board in Paris on 7 May 2009, Mr Masum Burak, Director General of Research at the Turkish Ministry of Agriculture and Rural Affairs, was appointed president of the Scientific Advisory Committee.

Land and water degradation in the Mediterranean countries

Marc Bied-Charreton
Emeritus Professor at the University of Versailles Saint Quentin en Yvelines
Researcher at UMR 3ED/IRD
President of the French Scientific Committee on Desertification

The different Mediterranean countries have many points in common. They all have a characteristic "Mediterranean" climate, their agricultural sectors are divided up into rainfed production systems and intensive irrigated systems, and in some cases transhumant stock rearing is still practised. The dominant woodland areas and vegetation communities are chiefly made up of softwoods (or a mixture of hardwoods and softwoods), maquis and brushwood, all of which are highly sensitive to forest fire. The plateaux are crossed by extensive steppes, which provide varying amounts of plant cover. Whereas the higher ground tends to be rough and sensitive to water erosion, the alluvial river valleys are well suited to intensive agriculture. Cereal crops such as hard and soft wheat, barley, maize and even rice are cultivated there, as are vegetable crops, flowers, orchard crops (olives, oranges, etc.) and grapes.

But one common characteristic, which presents an increasingly serious challenge, is the population drift from rural to urban zones and from inland to coastal areas. Work by Blue Plan clearly shows that the urban and coastal areas are becoming more and more densely populated and are likely to be home to 80% of the population within twenty years. There are many reasons for this shift: the productivity of agriculture has improved, causing redundant workers to leave the countryside for the cities, and there is a growing need for workers not only in the industrial and dock sectors but also in the tertiary sectors. Certain developments warrant particular attention, as their impact is becoming more and more marked and they are aggravating the threat of desertification.

- The abandonment of the agricultural and rural world means that landscapes are no longer being cared for, land is becoming derelict, forests are not being properly managed, erosion control terraces are being neglected and riverbeds are not being maintained. Erosion is therefore more likely and increasingly severe when it does occur. Animals no longer graze in the forest and some areas are either completely uninhabited or inhabited only by a few retired persons or by "neo-rurals", who are incapable of maintaining the countryside themselves. These neo-rurals are actually commuters who travel back and forth every day, leaving a high carbon footprint. This desertion of the countryside is one of the most obvious causes of the degradation of natural resources.

- Bad agricultural and pastoral practices arising from failure to adapt production methods to the increase in the population are having harmful effects: overgrazing and damage to forests is resulting in soil depletion and reduced biodiversity and increasing the likelihood of wind and water erosion. Greater pressure on natural resources is therefore one cause of desertification. Erosion is also producing increased sediment transport in rivers and marine discharges that may affect the marine ecosystem.

- The increase in the urban and coastal populations and the spread of industrial and commercial zones in particular are producing more and more artificial farming environments. For several decades development policies have opted for detached housing schemes in place of the older, traditionally dense towns. Runoff in these residential areas is consequently greater while storm drainage systems are no longer sufficient. Demand for potable water is increasing and at the same time road infrastructure, electricity supply lines, and water distribution and sewage networks are becoming more extensive and more fragile.

- The last GIEC report indicates that extreme weather conditions will occur more and more frequently. This means that the Mediterranean region will see successive periods of drought, of varying duration, interspersed with more rainy periods. The latter will however bring even heavier rainstorms than we have experienced hitherto (in the North of Alès in the department of Gard, for example, 600 mm fell in the space of a few hours). The result will be severe flooding, both in urban and in rural zones, with damage to property and loss of life. This more aggressive climate, characterised by violent swings between dry and wet periods, is likely to more make land more vulnerable to wind and water erosion by reducing plant cover and organic matter in the soil.

We are therefore faced with a typical desertification dynamic, of which city dwellers are scarcely aware (except when there is major flooding) and which is not being adequately addressed by policy makers and administrators in Mediterranean countries. In addition, the ongoing and increasingly widespread practice of irrigated farming, together with the growing need for domestic water in urban areas will lead to a considerable rise in water demand. Identified water resources, however, will almost certainly prove insufficient to meet this demand: the irregular rainfall does not adequately replenish groundwater and water courses; suitable groundwater resources are not always to be found; and exploitation of aquifers is often uncoordinated. Moreover, desalination of seawater is expensive.

All of these problems – increasing erosion, lack of plant cover and diminishing biodiversity, greater vulnerability to forest fire, risk of flooding and water damage in cities, greater vulnerability of urban and rural ecosystems, and the risk of water shortage – generate annual costs that may amount to a significant percentage of the GDP of the countries concerned. For example, the successive droughts in Morocco have caused cereal production to fall and have therefore had a negative impact on the country's GDP. The indirect cost of the loss of all services provided by the Mediterranean ecosystem has not yet been worked out, but an assessment needs to be made soon so that the extent of the problem is brought home to the policy makers and officials concerned. For it is necessary to rein in developments that increase the risk of desertification as a matter of urgency and to find more appropriate ways of adapting to foreseeable climate change impacts in the medium-term.

It is important that existing international cooperative efforts focus on issues relating to desertification, degradation of natural resources and increased vulnerability of ecosystems.

It is necessary to look beyond purely agricultural issues and consider the full range of the environmental factors that determine whether or not our urban and rural ecosystems function properly. CIHEAM is certainly one of the oldest of the international organisations qualified to tackle these questions in the future. Blue Plan with its prospective studies has done much to provide the information needed to draw up possible solutions. CEDARE is a more recent body, set up under the auspices of the United Nations. For its part, the Sahara and Sahel Observatory, which is concerned with the southern part of the Mediterranean Region, has established procedures for joint management of shared aquifers and is working on a drought alert system with the MAU.

8th CIHEAM Ministerial

Since 1999, CIHEAM has been organising meetings of the Ministers of Agriculture of its 13 member countries in cooperation with the authorities of the countries hosting them. These meetings are also attended by high-level representatives of CIHEAM's partner institutions (European Commission, FAO, AOAD, IFAP, MAP, and others).

The 8th CIHEAM ministerial will be held from 8-10 March in Istanbul at the invitation of the Turkish authorities, who plan to place the subject of "climate change and its effects on Mediterranean agriculture and food" on the agenda.

The United Nations Conventions on climate change, biodiversity and desertification require signatories to adopt national action plans to facilitate adaptation to change, reduce greenhouse gas emissions, safeguard biodiversity and combat desertification. These plans are not always very well coordinated at national level but they do have the merit of making decision makers more aware of the problems, encouraging better coordination on the part of governments and involving civil society. The plans are also intended to have a regional dimension.

Annexes are attached to the Convention to Combat Desertification. Annex 1 is for African countries and recommends a plan of action for the region, while Annex 4 is for countries to the north of the Mediterranean that claim to be affected by desertification: Portugal, Spain, Italy, Greece and Turkey. These countries cooperate closely on such matters as alert systems and coordination of national plans.

The Barcelona Convention and the New Union for the Mediterranean (UfM) are expected to act as catalysts in the effort to persuade decision makers and populations of the importance of three strategic projects:

- the establishment of a resource-degradation monitoring, forecasting and early warning system;
- an analysis of the economic and social cost and potential consequences (in terms of civil peace and domestic and international migration) of an increase in poverty in the most threatened areas;
- the restoration of degraded ecosystems, as part of an effort to identify and set up urban areas and transport systems that are less harmful to the environment.

For more information: http://www.csf-desertification.org

Interview

Dr Najib SAAB
Secretary General of the Arab Forum for Environment and Development (www.afedonline.org)

The Arab Forum for Environment and Development (AFED) is a non-governmental international organisation founded in Beirut in 2006. Its main objective is to galvanise policy makers, economic players, researchers and civil society representatives into making sustainable development a driving force behind the economies of Arab countries.

Q: How would you characterise the cycles of drought we have seen in the southern Mediterranean countries in recent decades?

They are more acute and more recurrent than those we have seen previously. This point has been confirmed several times by environmental experts and agronomists. Moreover, if we compare the data on climate change with the data on rising temperature over the past few decades, we find that there is a strong correlation between the two. It should be pointed out that it would not have been possible, even ten years ago, to be so clear and categorical about the relationship between climate change and rising temperature.

The findings of scientific studies on this subject quite clearly point to substantial modifications related to climate. Among other things, they show that the Middle East and North Africa are now among the regions most affected by climate change, all the more so because they are arid or semi-arid zones. Climate change will manifest itself in these regions in the form of increasingly long periods of drought and will consequently affect agricultural land and sources of fresh water.

Prize for the best CIHEAM thesis in 2008

Following a careful study of eight theses, selected on the basis of their scientific quality, their originality, the applicability of their findings in the Mediterranean contexts and their exemplary value for Mediterranean cooperation, CIHEAM's Scientific Advisory Committee has unanimously awarded the prize for the best thesis in 2008 to Mr Bachir BALECH (Lebanon), an intern at MAI Bari.

The title of his thesis is *"An integrated molecular and morphological study to design DNA barcode discrimination protocol for Fusarium species involved in dry roots disease of citrus".*

The goal of the study is to develop a standard, reliable way of identifying and distinguishing between the various *Fusarium* fungus species, which are the cause of many serious diseases in economically valuable plants. These diseases include the dry root rot disease in citrus plants, which poses a serious threat to the citrus fruit industry in the Mediterranean and across the world.

Q: How would you rate public policy on climate change in the Mediterranean?

In the Northern Mediterranean zone, measures have been taken to meet the challenge of climate change, including the introduction of stricter rules on greenhouse gases. Admittedly, these measures differ from one country to another but they are nevertheless in place. In the Arab part of the Mediterranean zone, on the other hand, the authorities have been slow to introduce such measures, which therefore tend to be lacking in most of the Southern Mediterranean countries. However, we now realise that common sense requires us to take action that will not only alleviate the effects of climate change but also enable us to cope with it. Let us not forget that the possibility of a four degree rise in temperature by the end of the twenty-first century is highly plausible. While the European countries are, for example, making serious preparations for the likely migration of tropical diseases to different parts of Europe, the southern Mediterranean countries are taking no such steps to deal with these diseases or for that matter with the effects of climate change on tourism, coastal zones (the low-lying ones being particularly vulnerable), or infrastructure. These areas nevertheless require urgent attention.

This raises the major issue of food security. What we need in the Arab world is a genuine strategy in this area, given that it will be difficult for us to grow the same varieties of wheat in the future as we grow now on account of global warming. The time has come for a serious effort to develop varieties that can adapt to conditions such as salinity and drought and can be grown in other seasons.

Q: In your opinion, what experience gained outside the Mediterranean zone might be of help to the Mediterranean peoples in the fight against desertification?

We cannot combat desertification by planting hedges to ward off sand. Moreover many people wrongly believe that desertification is the encroachment of desert zones onto arable zones. It is rather the transformation of arable zones into sterile zones as a result of drought or bad crop management. Staying with the Arab world, we could reduce the progress of desertification by using inexpensive irrigation techniques involving a number of localised systems. The latter might include drip irrigation systems, provided we are able to control them properly and ensure, for example, that salt does not leach into the soil, subsoil or groundwater. A different approach might consist in opting resolutely for crop varieties that consume less water. We need to deal with climate change by putting our own houses in order and changing some of the bad habits we have acquired. Israel, a southern Mediterranean country, has established itself as one of the world leaders in the fight against desertification through its scientific research. It has launched several scientific programmes on crops that are able to adapt to such extreme conditions as drought and salinity. And it is able to offer the benefits of its experience in the fight against desertification to more than a hundred and fifty other countries across the world, in exchange of course for support for its policy and general outlook. For its part, the Arab world, which has the largest inhabitable desert area in the world, could clearly be another pioneer in this field provided it invested in science.

Q: How can the Arab Forum for Environment and Development contribute to the fight against desertification?

This is a very topical question. We addressed it thoroughly in the seventh of the eighteen chapters of our first report entitled "Arab Environment – Future Challenges", which was published in October 2008. It represents the first stage in an in-depth study of this phenomenon which severely affects all Arab countries. We are currently drawing up a general scientific report on the effects of climate change on these countries. This is the first time any such investigation has been undertaken. It involves about fifty Arab researchers and scientists who are working in collaboration with the world's leading research centres. Among other things it addresses levels of greenhouse gas emissions in each of the Arab countries and carefully evaluates the action taken by each country to alleviate the problem. The investigation will also address the effects of climate change in relation to such matters as rising sea levels, food production, water regimes, health, ecosystems, biodiversity, urbanisation, roads, basic infrastructure and tourist activity. Furthermore, the report will consider the way Arabs approach the international negotiations on climate change which are now underway and which are intended to prepare the ground for the post-Kyoto arrangements. It also looks at the relationship between these negotiations and those being conducted under the auspices of the World Trade Organisation, for there is a distinct correlation between them inasmuch as the reasons for combating global warming are nothing if not economic.

MAI Zaragoza

MAI.Z is organising two advanced courses in the framework of the FP6 Integrated Project DeSurvey (A Surveillance System for Assessing and Monitoring of Desertification).

The first, from 28 September to 3 October 2009, is on assessing and monitoring desertification and land use systems vulnerability. The second concerns desertification forecasting in the medium term and will be given from 18 to 23 January 2010.

These courses will provide participants with an introduction to approaches to the monitoring and modelling of desertification processes, detailed guidance on the three main modelling products developed within the DeSurvey project, hands-on practical experience of running and working with these modelling products, and a basis for the independent application of these products for sustainable land management.

www.iamz.ciheam.org/

www.desurvey.net

The new report we are working on will feature satellite images taken for the benefit of the Forum in collaboration with the remote sensing centre of the University of Boston under the direction of Dr Farouk Al Baz, the eminent Arab-American scientist and specialist in space studies. For the first time maps will show the how climate change has affected the Arab region over the past three decades. They will also provide a means of determining trends and making forecasts with respect to climate change, the rise in sea levels around the Arab world, and the state of plant cover over the next few decades. The report will be presented at the next annual conference of the AFED, which is due to be held in November, just before the International Conference in Copenhagen in December 2009. I would like to point out that representatives of all the Arab countries will meet with those of other countries in the Finnish capital with a view to drawing up a plan of action for coping with climate change after 2012.

Q: We are hearing more and more of the "desertification" of the seas and oceans. What do you think of this usage?

Indeed, the term "desertification", which normally applies to land, is often used by scientists and popular science writers to refer to a marine condition characterised by unprecedented degradation of fisheries resources, including coral reefs. We cannot emphasise the point too strongly: most of these reefs will disappear if the temperature of the sea rises by 2° C by the end of the century. It will have catastrophic repercussions for marine ecosystems, biodiversity, the biological balance of the sea and, for that matter, tourism: in the Gulf countries, for example, the tourism sector depends chiefly on the existence of these reefs.

By way of conclusion, I would like to draw upon recent news for an example of the "desertification" currently affecting the waters of the Gulf, destabilising both the environment and the socio-economic activity of the regional populations. I am referring to a phenomenon known as "red tide", which is due *inter alia* to global warming and marine pollution and was first detected seven years ago in Kuwait. Red tide is a toxic algae bloom, which proliferates on beaches and kills hundreds of tonnes of fish. It occurs every year and is gaining ground: this year it contaminated the coasts of the United Arab Emirates.

Interview by Hassane Tlili

Journalist specialising in agricultural and environmental issues

MAI Montpellier

From 22 to 24 April 2009, the Institute of Arid Regions, based in Médenine, organised an international symposium in Djerba (Tunisia) on "Transitional societies and local development in difficult areas" (DELZOD), in collaboration with MAI Montpellier, the FAO, the GTZ, the OSS, the IRD and ICARDA.

This symposium brought together nearly 150 researchers, developers, technicians and NGO facilitators from eight Mediterranean countries. The goal was to suggest new development agendas for these "difficult areas" in view of the challenges arising in the context of globalisation, disruption of food markets and change in the environment (notably climate change).

The event ended with two panel meetings, one on strategies for the sustainable development of difficult zones, and the other on the role and priorities of research/development and education in these zones. All the contributions will be published in a book on the theme addressed at the symposium, which will also contain a record of the extensive discussion prompted by them.

www.delzod.ira.rnrt.tn/acceuil.html

Publication - *Mediterra 2009*

Entitled **"Rethinking rural development in the Mediterranean"**, *Mediterra 2009* is the fruit of cooperation between CIHEAM and Blue Plan.

This report analyses new trends in Mediterranean rural affairs with a view to examining progress in the implementation of sustainable development strategies and taking a fresh look at the policies being pursued in the rural world.

One of its strategic messages lies in an observation that is both simple and fundamental: in the Mediterranean Region, there can be no rural development without dynamic agricultural sectors just as there can be no agricultural development without vitality in rural areas.

The report, in eleven thematic chapters, is intended to provide players and decision makers in the Mediterranean world with the essential keys to understanding agricultural and rural development.

Mediterra 2009 was published in English and French in April 2009. It is soon to be published in Spanish, Italian and Arabic.

Order Mediterra 2009

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Interview

Dr. Mohamad Abdelfattah Al Kassas

An internationally renowned expert, Egyptian Scientist Mohamad Abdelfattah Al Kassas is regarded as a pioneer in the field of climate change. He began research into drought and desertification several decades ago and has collaborated on most of the international research projects on these subjects. Former president of the International Union for Conservation of Nature (IUCN), Dr Al Kassas has become increasingly interested in the consequences of global warming for coastal agricultural zones in the Mediterranean Region.

Q: You have been studying desertification for more than half a century. Do you subscribe to the view that it will assume alarming proportions in the southern Mediterranean Region and the Arab world in the future as a direct result of climate change?

Over the next few decades climate change will no doubt be a major factor in the spread of desertification, not only in the Arab world and on the southern shore of the Mediterranean, but also in many parts of the northern Mediterranean countries. What I find particularly worrying about climate change in the southern and eastern Mediterranean countries is the effect it has had, since first manifesting itself in these regions, on two corollary aspects of desertification: soil aridity and acute drought crises.

All surveys conducted hitherto point to the same conclusion: global warming will exacerbate the condition of much of the arid or semi-arid soil found in the southern Mediterranean zone and the Arab world. Moreover, it will manifest itself through harsher, longer and more recurrent periods of drought. In my opinion the most serious effect of climate change, as far as agriculture in these countries is concerned, is the rise in sea levels.

Q: You take a close interest in the consequences of climate change for Egyptian agricultural areas located on the Mediterranean coast. How do you see the future for this area, in the light of your research into the subject?

According to all the projections, the outlook is very bleak, whichever scenario you choose. If the waters of the Mediterranean were to rise by five metres by the end of the century, they would threaten the lives of between 10 and 15% of the population of certain countries, notably Libya and Tunisia. In Egypt the figure would be more than 20%. Even if the level of the Mediterranean rose by no more than one metre, the consequences for the population and agriculture of the Nile Delta would be catastrophic, with six million victims and the loss of 12-15% of some of the most fertile agricultural land in the region. In addition, more than 90% of Egyptian governorate land affected by the rising sea level would suffer economic damage. I would point out that a study of this subject made by the World Bank in 2007 forecast that Egyptian GDP might well fall by as much as 17% as a result of the possible repercussions of the rise in the level of the Mediterranean.

Q: How do you rate the experiments in containing desertification that are being conducted by certain Arab countries?

Sudan was one of the first Arab countries to tackle desertification at national level. In 1970 it drew up a national plan focusing especially on land used to grow rainfed crops, land that was degraded as a result of overgrazing, and land where the acacia tree grew. The project was implemented in 1976, ie one year before the first proper United Nations conference on desertification. Other Arab countries have attempted to launch ambitious national programmes inspired by the recommendations of the conference. They include Mauritania, Yemen, Egypt and Tunisia, which has pioneered techniques for accurately identifying natural resources threatened by desertification and safeguarding biodiversity in vulnerable areas. Unfortunately it must be acknowledged that none of the attempts to combat desertification in the region have lived up to expectations. One of the many reasons for this state of affairs is that governments have failed to place this particular problem on the list of priorities for sustainable development policies.

Education 2009-2010

The new course prospectus for 2009-2010 is now available on the CIHEAM website, which also describes all the administrative procedures that must be followed by candidates for the Master of Science and Post-Graduate Specialisation programmes.

The 21 Master's programmes currently being offered by the CIHEAM Institutes fall into four broad thematic categories: food production and quality management; environment and natural resources management; development economics and policies; and fisheries and aquaculture.

CIHEAM's new MSc prospectus represents a significant advance towards meeting the convergence and transparency criteria recommended under the Bologna process.

For the academic year 2008-2009, 388 students were enrolled on diploma courses in the four MAIs, of whom 275 were grant aided.

www.ciheam.org.

Q: Is it possible to give a new boost to Euro-Mediterranean relations through improved cooperation on the problem of desertification?

It is not only possible but, in my opinion, inevitable. Indeed, the European countries, by which I mean the northern Mediterranean countries, can no longer claim that this problem is not a priority for them. On the contrary, the consequences of global warming are all too evident on the northern shore and serve as a daily reminder to the Mediterranean populations that climate change matters to all of them. While I am pleased that people are beginning to take the idea of cleaning up the Mediterranean seriously, I only wish they showed the same degree of concern over problems associated with soil degradation and depletion of fresh water resources throughout the Mediterranean basin and the Arab world.

We already have the legal instruments required to make regional and international cooperation more productive, in terms of providing the resources needed to solve these problems. On this score I would like to refer to three international legal frameworks: the United Nations Convention on Biodiversity, the UN Framework Convention on Climate Change, and the UN Convention to Combat Desertification.

Q: What advice would you give to young researchers who wish to work on the problem of desertification?

I would tell them to approach this problem within a multidisciplinary context, for we should never forget that this phenomenon is highly complex and has many facets (physical, biological, socio-economic and institutional). I would also like to point out here that if the fight against poverty in the zones affected by desertification is not routinely incorporated into research work and public policy on this issue the problem will take an even more serious turn in the future.

Interview by Hassane Tlili

Journalist specialising in agricultural and environmental issues

CIHEAM-AFD Partnership

As part of the partnership between CIHEAM and the *Agence Française de Développement* (AFD), a technical workshop was held on 14 and 15 May 2009 in Tunis to discuss research studies on the outlook for agricultural policies in North Africa.

The studies in question are being prepared by a team of lecturers-researchers at MAI Montpellier in association with regional experts.

The workshop, which involved about fifty participants (researchers CIHEAM and AFD, officials, together with representatives of international institutions), made further progress on finalising the studies, which will be compiled in a special publication due out in the autumn of 2009.

Desertification, an emerging geopolitical issue

Sébastien Abis

Administrator, CIHEAM General Secretariat

World Day to Combat Desertification and Drought, celebrated every year on 17 June, marks the anniversary of the adoption of the United Nations Convention to Combat Desertification (UNCCD), drawn up in 1992 at the recommendation of the Rio Earth Summit. According to article 1 of this Convention, desertification means *"land degradation in arid, semi-arid and dry sub-humid areas resulting from various factors, including climatic variations and human activities"*. Desertification therefore denotes the irrevocable decline or destruction of the biological potential of land and its capacity to support or nourish populations. One billion of the Earth's inhabitants are currently threatened by desertification.

The theme of this year's World Day is *"Conserving land and water = Securing our common future".* This message is the natural extension of the trend in the international debate, where growing awareness of the effects of climate change goes hand in hand with a renewed focus on agriculture and a change in the world food situation. Particular attention will therefore be devoted to the security of land and water resources. Indeed, as the geopolitical variable gains new dimensions, reflecting the numerous ramifications of sustainable development, the concept of "security", now broader than ever, is applied to more and more thematic fields. Water and land resources, as vital as they are limited, become the subject of increasingly sophisticated geopolitical analysis as the desire to control them increases. From this perspective desertification and its collateral effects are gradually becoming matters of strategic concern. As the official communiqué puts it: *"desertification, land degradation and drought threaten human security by depriving people of their means of life".*

This observation is particularly relevant to climate migration, a longstanding phenomenon admittedly, but one that is becoming increasingly widespread as environmental tensions increase. The term "environmental refugee" was first coined in 1985 by an Egyptian scholar, Essam El-Hinnawi, as the title of a UNEP report. In law, however, the concept is still not fully recognised and has yet to be incorporated into the 1951 Geneva Convention relating to the status of refugees. Nevertheless, more and more individuals, mainly from poor regions in the world, will be forced to leave their territory on account of severe soil degradation. By 2050 it is estimated that there will be 200 million displaced persons, driven to migrate by environmental tensions. This "land insecurity" resulting from desertification exacerbates local living conditions, lowers the productive capacity of the soil, reduces yields and makes access to water more difficult. In the end this alarming combination of circumstances jeopardises the food security of local populations and forces many people into exile.

To the south of the Mediterranean, the land resources situation (already precarious: 90% of land suitable for agriculture is now being farmed) is being made more complex by the development of desertification, which affects about 80% of arid or dry land. The countries in this area are among those hardest hit by the consequences of climate aridity and now desertification is gaining ground in the steppe regions to the North of the Sahara. Governments are trying to implement policies that combine computerised surveillance of the ecosystems with innovative techniques for combating desertification. Studies made by the World Bank in 2003 estimated that annual costs relating to the degradation of land (as a percentage of GDP) were 1.2 for Egypt, 1% for Algeria, and 0.5% for Tunisia and Morocco. In 2007, on the occasion of the World Day to Combat Desertification, the Kingdom of Morocco announced that desertification cost the country about one billion dollars a year. It should also be pointed out that 2006 was declared "International Year of Deserts and Desertification" and that Algeria presided over the events.

There can therefore be no doubt that the process of desertification, in addition to producing a series of negative ecological, economic, sanitary and social effects, also has a distinct geopolitical dimension. Not only does it exacerbate hunger and poverty, it also causes migration and conflict. Again, as we explore the strategic challenges associated with rural areas and agricultural issues, we see how the local and global spheres are interwoven. It follows that the fight against desertification must also be seen as an attempt to alleviate the geopolitical shocks it administers to a planet that is already reeling from other crises. In this sense, national agricultural and rural development policies must of necessity take account of this phenomenon, whose repercussions are manifold. The fight against desertification involves a four-pronged attack designed (i) to preserve the natural heritage of the regions affected, (ii) to reduce the risk of drought, (iii) to redefine territorial development strategies and (iv) to support local development projects that bring together civil society players.

Websites

United Nations Convention to combat desertification (UNCCD)
www.unccd.int/

Sahara and Sahel Observatory (OSS)
www.oss-online.org/

International Union for Conservation of Nature (IUCN) – Mediterranean Centre
http://www.iucn.org/about/union/secretariat/offices/iucnmed/

FAO – Desertification
www.fao.org/desertification/

UNDP - Drylands Development Centre
www.undp.org/drylands/

European Network for Global Desertification Research (DesertNet)
www.european-desertnet.eu/

CIRCE (Climate change and Impact Research: the Mediterranean Environment)
www.circeproject.eu/

MAI Bari

launched in 2008 for a duration of four years, the MIRA programme (*Mediterranean Innovation and Research Coordination Action*) is an INCO-NET-MPC project that seeks to identify coordinated action in different areas (environment, health, ICTs, agriculture, etc.) and to establish "moments of coordination" between the activities of different European Union countries and the Mediterranean Partner Countries (MPCs) as part of the plan to implement the European Neighbourhood policy.

The results of the project and the outlook for future developments will be presented at the thematic workshop on agriculture, food, fisheries and biotechnologies, which will be held at MAI Bari on 13 and 14 July 2009.

The aim of this project is to help identify areas of research that might be included in future FP7 Work Programmes. The project coordinator is the CSIC: Consejo Superior de Investigaciones Científicas (Spain) and the Deputy Coordinator is the Technology Directorate at the Ministry of Higher Education, Executive Training and Scientific Research of Morocco.

News in Brief

Save the Lebanon cedar from the effects of global warming

The "Cedrus Libani", the millenary cedar tree and national emblem of Lebanon, could disappear as a result of climate change. Local environmental NGOs have been sounding the alarm for several years and today the threat is all too evident in some of the tree's habitat regions, which have been severely affected by long periods of drought. One such region is the North of Lebanon, regarded as the most important of the four regions where forests comprising these Pinaceae family conifers are still to be seen. Enemy number one of the cedars in this region is the Cephalcia, an insect that has been causing an unusual amount of devastation in the area for some years now, taking advantage of the drought to attack the leaves of the trees and reproduce four times a year instead of just once. Most experts who have studied the tree are adamant that the higher temperatures associated with the melting of the snows might well cause the Lebanon cedar to disappear. If the tree normally grows at heights of between 1,200 and 1,800 metres, they say that it will have to migrate further upwards to survive.

In an attempt to alleviate the effects of global warming on this tree, which is part of the ecological and cultural heritage of all mankind, teams of Lebanese and foreign researchers have been using a complex sowing technique to promote the reproduction of the cedar and reintroduce it into parks and natural reserves throughout most of the country. At present the largest of these is the Al Shouf reserve.

Organic products and farmers' markets on the increase in Spain

Despite the economic crisis, sales of organic products in Spain rose by 15-20% in 2008, continuing the upward trend of the past five years. In the words of Victor Gonzálvez, technical coordinator of the Sociedad Española de Agricultura Ecológia, "in five years, the turnover of the sector has doubled and now amounts to €600 million". And all the signs are that it will continue to grow. At present there are more than 19,000 products with organic accreditation on the market, up from 14,000 in 2006. The news is particularly good for producers since organic products are on average 20 to 30% more expensive than conventional products. As far as production is concerned, there has been a steady rise in the number of organic farms since 2001, with a notable increase in 2008 when 59 new enterprises were set up and 140 new producers were registered. According to the Spanish Ministry of the Environment and Rural and Marine Affairs (MARM), there are now more than 20,000 operators in the country and more than a million hectares are given over to organic production.

While the outlook may seem very good, the development of organic food in Spain continues to present a challenge. Consumption of this kind of food accounts for just 1% of overall consumption, compared with around 5% in Italy, France and Germany. In Switzerland, the European country with the highest consumption of organic products, average *per caput* expenditure on organic products is 150 euros, compared with five euros in Spain. This is why the Spanish sector exports much of its output to other EU countries, Spain being the second biggest producer of organic products of all the countries in Europe. One of the main reasons for the increase in the sale of these products in Spain is that more and more of them are being sold in supermarkets, such as Carrefour, Eroski, El Corte Inglés and Alcampo. Another factor is the rise of initiatives that lower costs and widen the market for the products, such as direct sales by the farmer to individual consumers or consumer associations, sales in local supermarkets run by producers and sales via the Internet. These "short distribution channel" initiatives, which bypass distributors and other middlemen, have developed in all Spanish regions for the sale of conventional as well as organic products. However, the organic producers were the first to go in for direct marketing, and some of them are now active at national level: the company Yoeco in Andalusia, for example, has launched a home delivery scheme for accredited products, which is designed to reduce the cost and increase national consumption of organic products. In 2009, the trades union COAG (Coordinadora de organizaciones de agricultores y ganaderos) set up the national ARCO network, which seeks to bring producers and consumers into direct trading relationships, dispensing with middlemen, and to promote systems that are both economically and environmentally sustainable. This initiative also provides for the sale of accredited organic products.

ARIMNet

Launched several months ago, the ERA-Net programme for scientific coordination of agricultural research in the Mediterranean (ARIMNet) recently acquired its own website, on which it is now possible to follow current developments in the programme.

On 3 and 4 February 2009, ARIMNet held a methodological workshop in Rome to define common criteria for mapping the research programmes underway in project partner countries.

Forthcoming work will chiefly consist in collecting and processing the information mapped so that the main lessons learned can be discussed at an extended conference of project participants with a view to selecting research programmes of a kind that lend themselves best to crossborder cooperation (Work Package 2).

www.arimnet.net

Encouraging results for agriculture in the southern and eastern parts of the Mediterranean

Eurostat, the statistical office of the European Communities, has just published a summary document showing the average agricultural output of the Mediterranean Partner Countries (Algeria, Egypt, Israel, Jordan, Lebanon, Morocco, Syria, Tunisia and the Palestinian Territories) for the period 2000-2006. The office analysed these countries' arable output: cereals, rice, fresh vegetables, fresh fruit, grapes, olives and dates.

Vegetables accounted for around 40% of output, or an average of 39 million tonnes (mt) a year in the period 2000-2006. Since 2000, average annual output has risen by 5.4% in this category (45 mt in 2006), which mainly comprises tomatoes, potatoes and onions. Of the countries reviewed in this period, Egypt was by far the biggest vegetable producer (with an average of around 18 mt), followed by Morocco (5.8 mt), Algeria (4.7 mt), and Syria (3.0 mt). The second most important crop was cereals, which accounted for 33% of arable crops (32 mt). 2006 was a particularly good year, with harvests of nearly 36 mt in the MPCs. Here again the main producer was Egypt, with an average annual output of 15 mt. It was followed by Morocco (6 mt), Syria (5.7 mt), Algeria (3.1 mt) and Tunisia (1.7 mt). The report states that since 2000 countries in the area, with the exception of Jordan and the Palestinian Territories, have increased their cereal output (9.6 of average annual growth), mainly by using greater quantities of fertiliser. The report also points out however that cereal harvests in the Maghreb are highly volatile because adequate irrigation systems are lacking and rainfall is highly irregular. As to rice, most of it is grown in Egypt (Lower Nile Valley), although Morocco is developing rice farming in the Gharb irrigated perimeter.

Fresh fruit accounted on average for 14% (13.6 mt) of total production in the period 2000-2006. Egypt (5.6 mt), Morocco (2.1 mt) and Syria (1.6 mt) are the main producers in the area, given that this category of product is largely dominated by citrus fruit. During the reference period, production of most arable produce increased steadily in the MPCs. Given that the agricultural land area has remained fairly stable, the rise must have been partly due to an increase in yields, which were up by as much as 10% in Egypt and Lebanon. Of all the MPCs, Egypt has the highest percentage of irrigated agricultural land (77%) and is the biggest producer of most types of arable produce. Morocco, on the other hand, although it has a usable agricultural area of 9 million hectares, only irrigates about 15% of it. Egypt also exhibited the least variability in crop yields over the reference period. Egypt's production capacity makes it the dominant producer in the region, not only of vegetables, cereals and fresh fruit, but also of table grapes. In the reference period, half the table grapes produced by the MPCs were grown on Egyptian territory. As to olives, the Mediterranean flagship product used to make olive oil, although average annual harvests amounted to 3.1 mt, there were distinct disparities from one year to the next. Most olives were produced in Syria (26%), Tunisia (24%) and Morocco (18%). Turning finally to dates, which are grown in all countries but Lebanon, the main producer again turns out to be Egypt (64% of the 1.8 mt produced on average in 2000-2006), followed by Algeria (25%).

Chile and Morocco wish to become close partners in agriculture

The Moroccan Minister of Agriculture and Fisheries, Aziz Akhenouch, is leading a large delegation of Moroccan businessmen from the agriculture, agro-industrial and fisheries sectors on a 10 day trip to South America. The Delegation first visited Florianapolis in Brazil on 21 March, moved on to Argentina and ended their trip on 29 March 2009 in Chile.

During the final leg, the Moroccan minister and his Chilean counterpart, Ms Marigen Kornko, declared that they had the same "strategic vision" for agricultural development and emphasised that the similarities between the two countries' agricultural policies was "confirmation that they could become close partners". The Chilean minister showed great interest in Morocco's agricultural projects, particularly the new Green plan which had been underway since 2008. She pointed out that the two countries' association with the EU could help strengthen their relations and provide an opportunity for shared development. The Moroccan delegation also had talks with the deputy minister for Fisheries, Jorge Chocair and spoke individually to various economic operators. According to the two governments the meeting served to tighten links between the two countries and give a more practical dimension to their relations. The two countries would like, for example, to negotiate a memorandum of understanding in the near future to boost bilateral cooperation on sea fishing and aquaculture.

IAM Zaragoza

The 4th International Symposium on the fig will be held in Meknès (Morocco) on 29 September and 3 October 2009. It will organised by the National Agricultural College of Meknès, the Moroccan Ministry of Agriculture and Fisheries, the International Society for Horticultural Sciences (ISHS) and CIHEAM, acting through its Zaragoza Institute.

The purpose of the symposium is to review current knowledge on all aspects of fig growing, identify key research issues for the future and initiate interaction between the different research disciplines and groups with a view to developing more integrated research in this area through multidisciplinary approaches.

The symposium will bring together scientists, producers and industrialists from many countries.

www.ficus2009.ma

MAI Chania

The FARVALDI project (*Frontier action for the conservation of regional agro- biodiversity and for the valorisation of identifiable product differentiation*) implemented by MAICH in the framework of INTERREGIII in the period 2005-2008 has been selected by EU as flagship project.

FARVALDI satisfies a pressing need for protection of agrobiodiversity through preservation of plant genetic resources in accordance with the biodiversity protection treaty adopted by EU.

The operation used a vertical approach comprised of collection, characterization and valorisation of endogenous vegetable and legumes accessions and landraces as well as the exploration of the potential for marketing of these products in niche markets of Northern Europe such as Holland.

www.maich.gr/

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FAO, *"State of the World's Forests, 2009",* FAO, Rome (Italy), 2009.

Chiara Platania, *"Labirinti di gusto. Dalla cucina degli dei all'hamburger di Mc Donald"*, Edizioni Dedalo, Bari (Italy), 2008.

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Francisco Mantino, *"Lo sviluppo rurale in Europa. Politiche, istituzioni e attori locali dagli anni '70 ad oggi"*, Edagricole, Bologna (Italy), 2009.

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Events

22-24 September 2009 – Buenos Aires (Argentina)
International Scientific Conference and Consultation "Understanding desertification and land degradation trends" *(information).*

13-15 October 2009 – Quebec (Canada)
International Conference: " Developing Rural Policies to Meet the Needs of a Changing World", organised by the OECD *(information)*

12-14 November 2009 – Tunis (Tunisia)
Green Ifriqiya 2009: business forum on technological innovations in the field of the environment and sustainable development.

28 June – 1 July 2010 – Montpellier (France)
Symposium "Innovation and sustainable development in agriculture and food" organised by CIRAD, INRA and Montpellier SupAgro *(information)*

CIHEAM Mediterranean Observatory

Recent publications

CIHEAM Analytical Notes

- *The Mediterranean: a history of a global region*, Jean-Frédéric Schaub, no 45, March 2009.
- *Current events in Mediterranean agriculture (January-February 2009),* Ciheam (collectively), no 46, March 2009.
- *Market dynamics and commercial flows in the fruit and vegetable sector in the Mediterranean area*, Giulio Malorgio and Luca Mulazzani, no 47, April 2009.
- *Current events in Mediterranean agriculture (March-April 2009),* Ciheam (collectively), no 48, May 2009.

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- *Inter-Lebanese conference on agriculture*, Pierre Blanc, no 57, April 2009.
- *Outlook for cereals in the world and the Mediterranean*, Paula Cusi Echaniz, no 58, May 2009.

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- Summary of the 01/2009 issue, April 2009.

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The CIHEAM Watch Letter

Every quarter CIHEAM issues its Watch Letter in English and French.

The next issue will be published in September 2009 and will address the new outlook for agricultural and rural policies in the Mediterranean.

To receive the Watch Letter, contact

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