ABSTRACTS

CHAPTER 1

Combined with the effects of climate change, urbanisation, economic, social and demographic transformations exert even greater pressure on the already threatened natural resources. At global level as well as in the Mediterranean, the management of water, land, forest and biodiversity is more than ever essential to meet the Sustainable Development Goals by 2030. This chapter addresses the state of natural resources at global level while stressing the necessity to struggle against waste and losses of natural resources but also the need for cooperation, social and organisational innovation at different levels.

CHAPTER 2

Effective management that ensures the sustainable exploitation of living marine resources is crucial for the biological, environmental and socioeconomic vitality of Mediterranean fisheries. This chapter reviews the characteristics of the sector's management in the region and highlights challenges it faces, such as the reduction of discards and bycatch and the struggle against illegal, unreported and unregulated fishing. Current management efforts, such as the implementation of species prohibitions, gear selectivity measures, and fisheries restricted areas, are discussed, together with the legal framework and compliance mechanisms that support their application. Ongoing challenges and future action, both to better manage the resource and to improve sustainable livelihoods in the sector, are presented.

CHAPTER 3

While Mediterranean agriculture suffers from water scarcity coupled with great yield and knowledge gaps with a permanent wastage of food and resources, future scenarios of water availability seem to validate the fact that multi-level action and measures are to be necessarily implemented to guarantee food security. In this perspective, this chapter addresses the key components of water resources management in order to contribute to a holistic understanding of the problems and the

corresponding adequate solutions. The latter are a combination of technological and managerial interactions within the water-food-energy nexus that may only be addressed correctly after the identification of the sectorial gaps. For this purpose, this chapter sums up problems and solutions in the form of water policy recommendations, an indispensable starting point to achieve sustainable food security.

CHAPTER 4

This chapter analyses the status of land resources in the Mediterranean with a special focus on the Middle East and North Africa. The scarcity of natural endowments, limited options to increase cultivation and climate change threatening scenarios could increase the region's reliance on imported food. Consequently, sustainable land management becomes a strategic priority. The region must protect its limited productive lands and implement land use policies based on the biophysical potential, social and economic considerations and focused on the needs of farmers. In order to reverse the current land degradation trend and reduce the waste of arable land, a plan of actions and solutions should be provided to policy makers at different levels.

CHAPTER 5

The human pressure exerted on Mediterranean forests for millennia has resulted in highly humanised ecosystems, which are considered as complex socio-ecological systems. The unsustainable use of forest resources has both led to land abandonment and overexploitation that, combined with climate and socio-economic changes, is creating conditions for an accelerated degradation of forest resources. In order to avoid the waste of forest resources and preserve their multifunctionality, innovative approaches to sustainable forest management are strongly required.

CHAPTER 6

The Mediterranean area is a major centre for biodiversity that plays a key role in food security and nutrition and serves as a source of income and other services on which people depend for their livelihoods and welfare. This chapter provides an overview of the diversity of plant and animal resources in the Mediterranean region, including both wild and domestic species and focusing on crosscutting issues. Given the intensification of agriculture, tourism and demographic growth threatening these resources, as well as the challenges of increased food demand and climate change, this chapter highlights the importance and recalls the crucial need for a reasonable management of plant and animal resources and identifies possible solutions. The conventions and agreements on biodiversity signed by the majority of Mediterranean countries should be translated into national policies and strategic plans promoting the integration of agro-ecosystem approaches. The overview also reveals the need to better strengthen the institutional framework and capacities, particularly in the southern Mediterranean countries, and enhance the collaboration between existing organisations and programmes in the region.

CHAPTER 7

Northern Mediterranean countries are usually more energy efficient than southern and eastern Mediterranean countries. This also applies to the use of renewable energy, where mature and cost-effective technologies exist. Combining energy efficiency with an increased use of renewable energy would reduce the dependency of agriculture on fossil fuel and thus contribute to the reduction of GHG emissions. However, this requires improvements in policy measures and institutional settings, and the use of a water-energy-food nexus approach. Currently, there is international support to promote both improved energy efficiency and increased use of renewable energy in the region. Such support should also be adequately provided for the agri-food sector.

CHAPTER 8

While the 2030 Agenda is intended as a global framework, not much discussion has taken place yet to consider what the new Agenda could mean for a region such as the Mediterranean, given its unique features, particular challenges and fragmented political integration. Despite the progress made to achieve the MDGs in the region, several challenges remain to both ensure food security and reverse the degradation of natural resources. The waste of these resources is a serious constraint to sustainable rural and agricultural development while the loss of local knowledge associated to the environment is closely related to their depletion. This chapter outlines the main challenges faced by Mediterranean agriculture and natural resources in the framework of the 2030 Agenda towards the Millennium Development Goals (MDGs), highlighting critical improvements to be made and gaps to be filled with respect to the new Sustainable Development Goals (SDGs). It then specifically focuses on the main regional initiatives aimed at rural and agricultural sustainability, before an in-depth discussion on what it could mean and what it would take to implement the 2030 Agenda for Sustainable Development in the Mediterranean at regional, national and local levels.

CHAPTER 9

Given the existing food security and increased resource scarcity challenges, the issue of food loss and waste (FLW) has become very important for the international agenda as it has far-reaching social, economic and environmental implications. FLW are of particular concern in the Mediterranean area. Their reduction is therefore widely acknowledged to contribute to abating interlinked sustainability challenges such as food insecurity, climate change and water shortage. This chapter focuses on the connections between FLW and sustainable development, food security and nutrition and sustainable food systems while highlighting their main economic and environmental implications. The list of the main drivers and causes and their extent along the food chain enable a comparative analysis of FLW of different agro-food product. The opportunities and challenges for FLW reduction and prevention are also addressed. This chapter also gives insights into the legal framework and the institutional environment for FLW reduction in the Mediterranean. Coordinated action and a systemic and holistic approach fostered by a comprehensive policy

addressing efficiently and effectively the FLW issue are necessary. Organisation and governance of the agro-food chain must also be improved. As such, the CIHEAM and the FAO have a crucial role to play in the harmonisation and coordination of regional initiatives.

CHAPTER 10

The Mediterranean Diet is a dietary pattern and lifestyle that is characterised by its multiple nutritional benefits, as well as by its effects on the environment, society and economy. This pattern has been eroding steadily over the last few decades leading to an increasing waste of food, knowledge and natural resources. In order to promote the Mediterranean Diet as a sustainable food consumption pattern, it is essential to identify and quantify its constituents and promote policies that will integrate these characteristics in the lifestyles of modern societies.

CHAPTER 11

In the Mediterranean region the food losses and waste are estimated to exceed USD 50 billion annually in terms of farm gate prices. These losses are often attributed to the lack of appropriate infrastructures throughout the food value chain; therefore there is a pressing need for establishing "green" food value chains to serve the specific goals of prevention, reduction and recapture centred on products, processes and systems. Within this context, critical issues in post-harvest management should be taken into consideration by implementing new technologies such as active and intelligent packaging, nanotechnologies, use of sensors, indicators and new ethylene removing approaches. Moreover, investment in research and development is a prerequisite for greening the food value chain in the Mediterranean while the major challenge is to attract funds for investments in green, innovative infrastructures in order to increase exports as well as food security. It is thus clear that policy-makers and policy-level decision makers must urgently consider these issues as they contribute to improved food security (and health and safety), the mitigation of climate change, increased employment opportunities and the struggle for gender equality.

CHAPTER 12

The potential of innovation when addressing the challenges faced by the agri-food system is widely recognised today. This chapter aims to explore the contribution of innovation to FLW prevention and reduction that weaken the sustainability of food security and the agri-food system in the Mediterranean. After presenting innovation models and types (product, process, organisational, social, political, institutional), it then describes the existent strategies in food waste management hierarchies and pyramids and provides concrete examples of innovations that have been used in different countries and contexts for the prevention and/or the reduction of food waste along the food chain. Some initiatives and good practices for FLW recycling and re-use are also mentioned. Innovative practices should be mapped and disseminated to reach the concerned actors of the food chain and to develop an enabling political and institutional environment.

CHAPTER 13

Food waste is directly related to consumer behaviour but it is also indirectly related to retailer behaviour. This chapter successively addresses the current trends in Mediterranean developing countries and those observed in developed ones. It also provides insights of some specific countries that are reviewing their national policies. This analysis reveals that food waste occurs with greater intensity in developed countries and developing countries should learn from past experiences of wealthy consumers. The economic crisis has resulted in a change in consumption habits and greater awareness on food waste. Food banks collecting important quantities of food, which are distributed to people in need, have strongly developed. Awareness-raising campaigns for short-term and long-term impact on consumer education seem to be the most effective tool to reduce food waste.

CHAPTER 14

This chapter and the section that it introduces address a little tackled and yet very important subject: the waste of knowledge and human resources. It provides an overview of the establishment and evolution of agricultural knowledge in its various forms (technical knowledge, knowhow and associated lifestyles). It highlights both the factors that threaten knowledge and their rediscovery under the form of new systems of knowledge and innovation. The chapter concludes by providing a number of recommendations for inclusive policies aimed at the protection and the remobilisation of this knowledge.

CHAPTER 15

The concept of agricultural knowhow here refers to the knowledge accumulated over centuries and that has been slowly carved by exchanges, confrontations, trade and the mixing of cultures even at very local levels throughout the Mediterranean. Although the differences between the North and South of the basin are strongly marked, each locality has traditionally enjoyed a unique identity and a strong individuality in its history. Closely related to the loss of traditional knowhow, the weakening of these identities is shaping a new Mediterranean. A Mediterranean that is northern and southern, local and global, technical and traditional, a constant rebalancing region that is a both complex and unstable. A Mediterranean where it is becoming urgent to save knowhow in danger of being marginalised (and depleted) and align it with the scientific advances of the past decade, in order to address in an integrated way, the various current and foreseeable crises that threaten the fragile balance supporting life in this basin. This chapter argues for the emergence of new production systems, breaking with the current trend of resource degradation and marginalisation of large rural areas, in order to meet these challenges. Agro ecology is presented here as one possible way to collectively live through this course in the cultural, scientific and economic evolution of the Mediterranean.

CHAPTER 16

This chapter addresses family agriculture and its assets to promote the development and the fight against all forms of waste starting with the waste of knowledge and human resources. It stresses the need to act in favour of this agriculture that is faced with several challenges. The well-known guidelines for such an action are recalled and new fields of intervention are identified in order to ensure that knowledge and innovation systems that are being implemented, or even the ongoing digital revolution in agriculture take account of family agriculture.

CHAPTER 17

This chapter aims at exploring ways to better link agri-food knowledge to food security needs and challenges in the Mediterranean area faced with different sustainability issues including food insecurity and malnutrition. It provides an overview of agricultural knowledge generation and dissemination and the role of agricultural extension and advisory services within the agricultural innovation system. It highlights the main knowledge and research needs related to the four dimensions of food security (availability, access, utilisation, stability). This chapter also presents some options and strategies for developing an effective knowledge system for sustainable food security by stressing the need for a new transdisciplinary science of sustainable food systems and the involvement of producers (men, women, and youth) and their organisations. Many of the challenges regarding food and nutrition security are common to all Mediterranean countries. This chapter concludes that it is vital to set up a joint research agenda and education programmes to address them in a collaborative way and calls for strengthened regional collaboration and agri-food diplomacy.