



**PRIMA**  
PARTNERSHIP FOR RESEARCH AND INNOVATION  
IN THE MEDITERRANEAN AREA

## **CALL TEXT AND SUPPORTING INFORMATION**

### **Call: Section 2 – Multi-topic 2018**

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## 1.1 Thematic area 1: Sustainable water management for arid and semi-arid Mediterranean area

Topic 1.1.1: Water resources availability and quality within catchments and aquifers

Topic 1.1.2: Sustainable, integrated water management

Topic 1.1.3: Irrigation technologies and practices

### **TOPIC 1.1.1 WATER RESOURCES AVAILABILITY AND QUALITY WITHIN CATCHMENTS AND AQUIFERS**

#### **Challenge**

The challenges now faced by water planners require a new generation of water management models that addresses the broad impacts of global changes on hydrological and hydraulic balance at catchment and aquifer level. Innovative options and technologies are required to ensure availability of groundwater resources for future generations and in particular to deal with storage and overexploitation, groundwater-dependent ecosystems, seawater intrusion and salinization, anthropogenic and geogenic contamination of the whole water cycle, and long-term sustainability. On the other hand, surface water bodies in the Mediterranean regions are characterized by intermittent streams. The lack of surface water during long periods of time constitutes a challenge to characterize their hydrological regime and the geomorphological and ecological status.

#### **Scope**

Quantitative analyses on ecosystem services require an in-depth understanding of their underlying processes. To meet this need, it is important not only to use adequate modelling methods, but also to apply effective monitoring tools and research on new methodologies to understand biogeochemical cycles. Particularly important is the development and demonstration of effective monitoring and modelling tools to gather appropriate data and provide forecasting capabilities across the freshwater to marine salinity gradients. Developing efficient simulation models is necessary to analyse future scenarios at the spatial scales to be used for natural resource planning and management, and to identify cost-effective strategies and techniques for a rational use of water and protection of land and soil. There is a need for developing early-warning systems to detect potential pollution transport through the soils and deep vadose zone to groundwater. This research should provide the needed information to support decisions on remediation strategies.

For surface water studies, new methods should be developed to characterise the hydro-geomorphological and ecological status and degree of human affection on ephemeral rivers. The methodology will address the hydrological regime, water and sediment connectivity, geomorphological conditions of river channels and river corridors, biogeochemical functions and the spatial structure of the plant and animal communities. In addition, in the semi-arid regions of the Mediterranean basins, floods are not only natural hazards but also renewable water resources.

There is a need to understand the hydrological processes for the assessment, management and use of floodwaters. Proposals within this topic should allow to quantify a) the processes controlling this recharge, b) long-term recharge quantities (decade to multi-decadal scales) that determine the sustainability of these water resources and c) to translate these results into specific management strategies for alluvial aquifers of ephemeral rivers in Mediterranean regions.

### **Expected impact**

A more efficient water management, linked to studies devoted to understand the hydrological processes mediating ephemeral river flows, flooding events and aquifer overexploitation, recharge and salinization should have direct impacts on surface water bodies systems by increasing water flows and improve the water quality and reduce the underground water exploitation and salinity levels. In this sense, the proposals to successfully meet the impact of the call should promote some of the following expected impacts:

- Designing new modelling routines for determining the basic components of the water cycle, including economic, social and technical aspects (e.g. groundwater accumulation storage and recharge) and for forecasting droughts
- Mitigating pollution processes by better assessing water management policies and the impact of anthropogenic activities.
- Improved hydrological monitoring in ephemeral rivers, hydrological regime, water and sediment connectivity, geo-morphological conditions of river channels and river corridors.
- A reduction in the risk of saline intrusion and improved management of salt accumulation in overexploited underground water bodies.

## **TOPIC 1.1.2: SUSTAINABLE, INTEGRATED WATER MANAGEMENT**

### **Challenge**

Water sustainability in the Mediterranean region should be ensured by improved technical tools coupled with socio-economic studies able to improve the efficiency of water and energy use in certain key regions under present and future global change scenarios. In this sense, recognizing the water-energy-food synergies and balancing the potential trade-offs between water and energy use efficiency is required.

### **Scope**

A sustainable water management is crucial in the Mediterranean basin for ensuring efficient multiple water use in irrigation, animal production systems, drinking and industrial activities, as well as the preservation of natural ecosystems. This requires efficient governance at different levels: watersheds, districts, national. This call intends to improve water governance taking into consideration both the socio-economic context and the meteo-climatic trends of the Mediterranean basin, since both of them are considered as important drivers of current and future water resources management. The development of innovative governance strategies, advanced planning methodologies, appropriate and sustainable treatment technologies and monitoring tools has to take into account the huge number of physical, technological and socio-economic variables in water management in order to address the ever-growing need for water and food. This implies the use of technologies and tools for water accounting systems, including new remote sensing capacities coupled with governance allocation structures based on socio-economic rules for setting the limits for water and energy consumption.

### **Expected impact**

The water systems in the Mediterranean regions will benefit from the developed measures at different spatial levels in order to alleviate the existing pressure on water resources. By better defining the limits of water use and standardizing the water accountings procedures and methodologies, it will be possible to improve the analysis of the water footprints. More specifically some of the impacts expected by this call should be:

- Development of innovative tools and decision support systems for planning and adaptation to global change, including public and private stakeholders' involvement;

- Improving evapotranspiration determinations by surface energy balance, in order to better assess the water and energy budgets, particularly in dry water basins.
- Implementation of monitoring and forecasting systems to support the water management under scarce conditions, taking into account any anthropogenic effect on the integrated water cycle;
- Development of innovative approaches for the proper management of water infrastructures, including small and multi-purpose reservoirs and water harvesting systems

### **TOPIC 1.1.3: IRRIGATION TECHNOLOGIES AND PRACTICES**

#### **Challenge:**

In the Mediterranean basin, agriculture is by far the main user of water resources, and irrigation is a crucial field practice influencing crop productivity and product quality. In addition, irrigation is a major driver for solutes transport in arid and semi-arid environments, having an important role in the possible negative impacts of improper water management on soil salinization and aquifers pollution. Therefore, the challenge is to improve irrigation water productivity while minimizing the potential environmental risks associated with irrigation.

#### **Scope:**

Mediterranean countries have taken or are performing significant efforts to modernize irrigation infrastructures, particularly in terms of water uptake and delivery from the original source to the farm. However, more research and technology transfer is needed to improve water use efficiency at the farm and irrigation district level. This can be potentially appraised by introducing more efficient irrigation technologies aimed at reducing soil evaporation and water run-off while improving crop water use efficiency, for example by designing precision irrigation scheduling models using information and communication technologies. In some cases, the use of soil and plant sensors and irrigation scheduling models has already been shown useful. While most of the knowledge remains at a research level, there is now the need to boost exploitation of such knowledge by end-users, for instance by showcasing the promising technologies in demo studies in close collaboration with private companies, mainly SMEs. However, further research is still needed to develop new technologies to minimize losses and maximize efficiency of irrigation (also in view of the current search for climate-proof crops with reduced water requirements), to be associated with tools for estimating more precisely plant water and saline stress levels and their impact on productivity, in order to understand when and how to intervene with proper irrigation technologies. This is particularly important under the conditions of water scarcity faced by most of the Mediterranean irrigation districts, where the use of deficit irrigation practices is a possible, and sometime a unique solution to cope with water stress. Under these stressing situations, particular attention should be given to the salinization process and the use of reclaimed or high salinity water. The existing knowledge on precision irrigation and regulated deficit irrigation practices under good quality water needs to be adapted to the more water-quality limiting conditions existing in the Mediterranean agro-ecosystems.

#### **Expected impact**

- Improving on-farm water use efficiency while maintaining crop productivity, quality and safety, and soil fertility
- Upscaling the on-farm water use efficiency gain to the irrigation district level

- To demonstrate irrigation scheduling models and tools to be developed in collaboration with private companies, mainly SMEs.
- To determine irrigation protocols tailored to low-quality water availability and, particularly, high salinity water, and to new climate-proof crops with reduced water requirements
- To reduce contamination of aquifers, mainly by nitrates, thanks to the improved fertigation scheduling protocols

## 1.2 Thematic area 2: Sustainable farming systems under Mediterranean environmental constraints

Topic 1.2.1: Adaptation of agriculture to climate change.

Topic 1.2.2: Preventing emergence of animal and plant diseases.

Topic 1.2.3: Developing farming systems able to generate income, to create employment and to contribute to a balanced territorial development.

### **TOPIC 1.2.1: ADAPTATION OF AGRICULTURE TO CLIMATE CHANGE**

#### **Specific Challenge**

Climate change is dramatically impacting the Mediterranean area and solutions need to be found to adapt agricultural practices to rising temperatures, drought and soil salinity, and increasing occurrence of extreme events. Agriculture is indeed already limited by climate change all around the Mediterranean and this situation is predicted to worsen in the near future, with the northern part of the region experiencing similar conditions to those existing today on the southern shores. Adapting to climate change is therefore a common necessity for Mediterranean agriculture.

#### **Scope**

Research is needed to better understand how plants, soil biota and animals adapt to environmental constraints and why certain varieties/breeds are tolerant or resilient to biotic and abiotic single or multiple stresses, such as drought, multiple summer stresses, warm winters, salinity, etc. Primary focus should be on biological adaptation mechanisms and genotype-environment-management interactions (resulting in adapted and productive phenotypes), as well as on valorising local genotypes taking advantage of spontaneous and domesticated biodiversity in the Mediterranean agricultural and animal husbandry systems. The richness of Mediterranean biodiversity is an asset that can be used to restore or develop new varieties and hybrids, crops and breeds that are adapted to the environment and may be used for genetic improvement. Moreover, production of new breeds/hybrids/varieties adapted to the Mediterranean conditions and able to face climate change should be pursued.

#### **Expected Impact**

- Development and profiling of new varieties / hybrids /breeds that are tolerant/resistant/resilient to biotic and abiotic stresses, productive in Mediterranean climate conditions (aridity, drought, warm winters, uneven rainfalls and salinity) and efficient in the use of limiting resources (water/soil fertility) taking into account the needs of the users and the legislative constraints.
- Valorisation of the local biodiversity that has naturally adapted and show resilience to environmental constraints in the Mediterranean conditions and that may sustain agriculture in stressful environments exacerbated by climate warming. In particular exploitation of neglected spontaneous and domesticated biodiversity in Mediterranean agricultural and animal husbandry systems, and aquaculture.

### **TOPIC 1.2.2: PREVENTING and CONTROLLING EMERGENCE OF ANIMAL AND PLANT DISEASES**

#### **Specific Challenge**

The Mediterranean Region is a hotspot for biodiversity but it is also a rich and well-known center of origin and dispersion for virulent plant and animal pests and diseases. Diseases are increasing under the influence of climate change and of the intensification of trade flows in the Mediterranean. Plant and animal diseases and pests cause significant decreases in yield, quality and safety of Mediterranean crops, in particular fruit, cereal and vegetables and of animal productions, with strong economic and social consequences. When a new disease breaks out, it is already generally too late to find solutions. Scientific knowledge has to be obtained in order to understand outbreaks phenomena and to develop preventive solutions as well as Integrated Pest Management solutions.

### **Scope**

The challenge drives the need for a better understanding of the ecology and physiology of pests and pathogens, and the interactions between hosts, pests and pathogens, and other organisms at multiple trophic levels. Tackling these challenges requires trans-disciplinary research, involving plant/animal health specialists (e.g., on biology, entomology, pathology, microbiology and epidemiology), plant breeders, agronomists and zoo-technicians, food technologists. It should also involve social sciences to understand the determinants of current situation and study the acceptability of the proposed solutions. Prevention of plant and animal diseases, discovery and application of sustainable systems of pest/pathogen control (e.g. based on the exploitation of natural plant defence or multi-trophic interactions), and mitigation of the impact of diseases on food safety and/or human health are the main scopes of this topic. Stakeholders of the human and animal health sectors, taking into account ecology and environment within a One Health paradigm should be involved.

### **Expected Impact**

- Control of the effects of climate change and the associated risks for plant and animal health (including existing and emerging diseases, and adaptation of livestock systems);
- Provision of integrated pest and diseases control/management solutions, for plants and animal systems;
- Implementation of novel tools including the development of biocontrol agents, exploitation of natural defences, secondary metabolites and trophic interactions, development of vaccines, immunity and diagnosis tools, innovative therapeutics, development of biosystems that avoid the rapid surge of resistance of pests/pathogens to control agents;
- Research and disease surveillance networks in tight link with existing official networks such as the Euro-Mediterranean network for animal health (REMESA)

## **TOPIC 1.2.3: DEVELOPING FARMING SYSTEMS ABLE TO GENERATE INCOME, TO CREATE EMPLOYMENT AND TO CONTRIBUTE TO A BALANCED TERRITORIAL DEVELOPMENT**

### **Specific Challenge**

Agriculture is a major economic sector in Mediterranean countries and the growth of rural employment is critical for fighting rural poverty and stabilize population in the territories. Research and innovation is needed to enhance the potential benefits of agriculture in terms of employment and poverty alleviation, through the development of labour-intensive and environmentally-friendly agriculture and the design of

sustainable and profitable farming systems for small-scale agriculture. Potential synergies among activities of the various actors along the food chains and of the economic sectors in rural areas and rural/urban synergies should be enhanced, and addressed at different levels (farms, region, territories...).

### **Scope**

This topic calls for projects aimed at developing i) multidisciplinary approaches, including agronomy, food sciences, environmental, economic and social sciences for developing an integrated assessment and design of profitable and sustainable farming systems able to create employment and rural development and to sustainably use limiting resources, ii) tools (best practices, decision support systems, models, discussion and co-development platforms, precision farming, etc.) that can assist farmers to improve the management of their farms in a risky and uncertain environment, iii) participatory approaches for integrating farmers' knowledge in the innovation process, iv) territorial approaches that analyse the diversity and spatial organization of farming systems and their environmental and social conditions in the Mediterranean in order to be able to develop site-specific solutions needed by the heterogeneity prevailing within and between the Mediterranean countries and v) Social sciences approaches aimed at: understanding of the determinants for adoption of innovations by farmers and design of public policies aimed at enhancing adoption of innovation suited to improve farmers' livelihoods

### **Expected Impacts**

- Design of public policies aimed at enhancing adoption of innovation suited to improve farmers' livelihoods
- Implementation of tools (best practices, decision support system, models, discussion and co-development platforms ) that can assist farmers to improve farm management in a risky and uncertain environment, and secure a sustainable income;
- Delivery of participatory approaches for integrating farmers' knowledge in the innovation process.

## 1.3 Thematic area 3: Mediterranean Food Value Chain for regional and local development

Topic 1.3.1: Valorising food products from traditional Mediterranean diet.

Topic 1.3.2: Food Safety in local food chains.

Topic 1.3.3: Implications of dietary shifts and sustainable diets for the Mediterranean populations and food industry.

### **TOPIC 1.3.1: VALORISING FOOD PRODUCTS FROM TRADITIONAL MEDITERRANEAN DIET**

#### **Challenge**

Mediterranean areas are characterised by traditional diets connected to local traditional products. However, changes in life-styles have led to a change in the dietary patterns and a massive emergence of diet- and lifestyle-related chronic diseases.

A consolidated knowledge on the real value of Mediterranean foods, well characterized in the content and bio-accessibility of known healthy nutrients and bioactive compounds, is required. Composition and structure of food products should reflect the appliance of traditional recipes, linked to the cultural inheritance, on local ingredients, to re-establish the value of the Mediterranean diet.

#### **Scope**

The aim of this Call for Proposal is to valorise Mediterranean traditional foods by acquiring and organizing the relevant information on their peculiar and detailed composition and by increasing their quality and sustainability by means of a better use of raw materials, stable (micro) nutrient-dense ingredients, bioactive extracts and functional ingredients, combined with innovative and soft production and processing technologies. More specifically, research actions should be focused on the assessment of the content of health-promoting compounds, and on the sustainable production of traditional food products and ingredients, related to the culinary traditions, richer in such compounds. Furthermore, research actions should cover the protection of authentic fresh and traditional Mediterranean food products through the development of reliable traceability, geo-referencing and certification methods.

#### **Expected Impacts**

Actions supported under this Call for Proposal should lead to (one or several of the following):

- The development of new products, bioactive extracts and molecules, and functional food, nutrients and bioactive compounds linked to local traditional protocols and recipes and according to seasonal and sustainable production schemes
- The proposition of local processing solutions, better addressing the quality management, deriving from sustainable traditional recipes while preserving the nutritional value of food
- The development of new tools to demonstrate quality and authenticity of raw materials and products;

### **TOPIC 1.3.2: FOOD SAFETY IN LOCAL FOOD CHAINS**

#### **Challenge**

Food safety problems are recurrent in Mediterranean Agri-food value chains, due to various factors including climate and demographic changes, global trade, and new determinants for consumers' choices. In addition, the informal setting with which the most of the Mediterranean agri-food firms operates does not favour the adoption of integrated solutions suitable for a rapid crisis handling, with reference both to upstream suppliers, who struggle to assess quality of raw materials, and downstream suppliers, who have to face serious problems in complying with more and more stringent standards of quality, traceability and product homogeneity, while achieving regular food supplies, as required by the customers. Food safety is today closely linked to innovation and sustainability in production systems, and investing in safety means reducing the risks of a sudden loss of trust (in the brand or supply chain as a whole) for accidental events.

### **Scope**

In the light of such considerations, the aim of this Call for Proposals is to guarantee food safety in the Mediterranean environment while preserving the cultural heritage, along the entire food chain. The selected projects should address research activities focused on the elaboration and adoption of innovative solutions aimed to improve quality and quality-control mechanisms and techniques throughout supply chains at both local and territorial levels to guarantee food safety along the entire food chain. The traceability of the links among place of origin, food manufacturing, distribution practices and consumer habits, adapting innovation to tradition should be considered.

Research activities can also tackle this challenge by addressing the development of models for hazards prediction and risk assessment related to new technologies, chemical and microbial food contamination. Research should include from the primary production up to food storage, transportation and preparation in the changing (environmental, economic and societal) conditions to prevent food crisis and facilitate trading of safe food in the Mediterranean regions.

Research on harmonization of norms and standards throughout the sectors along the supply chain (covering, among others, areas such as hazards and risk assessment, assurance of food shelf life, control of production factors, storage and transportation conditions) is still needed. This should be particularly analysed in the whole life cycle as a main determinant for the limitation of food waste and losses.

The development of recognized quality labels (included geographical indications and referencing) based not only on quality assurance systems, but also on the peculiar characteristics (e.g. sensorial and hedonistic) of the products correlated to the production environment and process while guaranteeing the safety requirements can also be addressed in this call.

### **Expected Impacts**

Actions supported under this Call for Proposal should lead to:

- Facilitate the development of new norms and standard for hazards prediction and risk assessment,
- Suitable procedures for qualifying and classifying production sites and zoning
- New systems and devices for food-safety monitoring along the entire food chain and best practices for all the food value chain phases, including post-sales;
- Develop and validate bio-based protection practices, to select and characterise the natural extracts and species with protective characteristics for food production, quality and storage;
- Develop innovative packaging for better controlling product deterioration, reducing the use of preservatives, the microbiological risk and/or extending the shelf-life, and reducing food waste and losses;
- Increase the awareness of the consumers

### **TOPIC 1.3.3: IMPLICATIONS OF DIETARY SHIFTS AND SUSTAINABLE DIETS FOR THE MED POPULATIONS AND FOOD INDUSTRY**

#### **Challenge**

While the traditional Mediterranean diet is considered particularly healthy, the Mediterranean is paradoxically one of the areas of the world where overweight and obesity are most prevalent—a clear sign of dietary shifts in progress and malnutrition: excess consumption of carbohydrates, sugars, saturated fat and salt, lower consumption of fruits, vegetables and fibers. The emergence of diet- and lifestyle-related chronic diseases (heart disease, cancer, chronic respiratory disease and diabetes) is massive in the Southern and Eastern Mediterranean. These diseases have become the leading cause of death both in the North and in the South. Strategies and policies to prevent diet-related diseases are still weak, The prevention of chronic diseases should be supported by scientific evidences demonstrating the relationship between diet and health in the Mediterranean context to convince the citizens about the validity of adopting a well-defined Mediterranean diet.

#### **Scope**

The selected projects should encompass the strengthening of the link between the Mediterranean diet and health benefits through the identification of evident positive effects exerted by different active substances contained in local products. Different mechanisms should be investigated for better preventing the diet related diseases affecting the Mediterranean populations. Behavioural determinants of chronic diseases should be investigated in order to prevent the risk of many non-communicable diseases, stimulating the consumption of healthy food in vulnerable targeted population groups.

Research actions can also encompass the assessment of the eating habits, their heterogeneity and their determinants in order to stimulate particularly younger generations to adopt Mediterranean traditional eating habits and abandon imbalanced diets, thus identifying approaches favouring the consumption of existing Mediterranean foods and offering different solutions coherent with the new lifestyles. Research are also expected in the field of public policies design, with the objective to support the implementation of dedicated nutritional policies and of reforms of current agricultural policies to incorporate the goal of sustainable food.

#### **Expected Impacts**

Actions supported under this Call for Proposals should lead to the:

- Provision of affordable and adequate dietary patterns for Mediterranean population groups with specific nutritional requirements;
- translation of knowledge advancements on the Mediterranean diet into public food and health policies, strategies and guidelines for consumers, industry and for policy makers;
- Characterize the economic, social, and health impacts of nutritional transitions, determinants of consumers' behaviours, physical activity, diets of populations and households.

## Information about the Section 2 Call - 2018

Type of action	Research & Innovation Activities (RIA)
Total indicative amount allocated to this call	EUR 30 million
Funding level	depending on National Regulations
Expected number of grants	20 to 30
Additional eligibility conditions	<p>In addition to the standard admissibility and eligibility conditions described in the Guidelines for Applicants – Section 2 2018 (Section VII), the following additional eligibility conditions apply to this Call for Proposals.</p> <p>Each participant in a bidding consortium must check its own eligibility for participation/funding in accordance to National Regulations (these are available on the PRIMA website).</p> <p>In this context, participants have to check also the eligibility for funding of each topic per country as indicated in the Guidelines for Applicants – Section 2 2018 (Table 2, Section VII).</p> <p><b>An applicant cannot submit more than one proposal as coordinator in all the PRIMA calls but can be partner in different proposals.</b></p> <p><b>The same proposal cannot be submitted to different calls.</b></p>
Submission and evaluation procedure	Two-stage application procedure. For the first stage, a pre-proposal (maximum 10 pages) must be submitted. Successful applicants in the first stage will be invited to submit a full proposal (maximum 70 pages) for the second stage. A timeline for the submission and evaluation of applications can be found in the Guidelines for Applicants – Section 2 2018.
Evaluation rules	The scoring, thresholds and weightings for RIAs are listed in the Guidelines for Applicants – Section 2 2018.

<p>Grant agreement</p>	<p>Each national funding body will fund the beneficiaries established in its own country, thus, the national funding rules apply.</p> <p>Each national funding body will sign a grant agreement (or any official documents acting as contract) with their national beneficiaries taking part in the selected project. The coordinator of the project has to decide a common starting date of the project with his/her partners and send this information to all the funding bodies involved in funding this project, in order to ensure that the national contracts are synchronized in time to cover all the period of the project.</p>
<p>Consortium agreement</p>	<p>A consortium agreement mentioning the distribution of the tasks among partners (as listed in the proposal) must be concluded. Some national funding bodies may require this document before signing the grant agreement: it is necessary to refer to the National Regulations (available on the PRIMA website) and draft this document accordingly.</p>
<p>Project duration</p>	<p>3 years.</p> <p>Up to 4 years if justified and authorized by the national funding bodies according to their National Regulations.</p>