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Feeding the Mediterranean through knowledge

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I – About Feeding Knowledge Programme

Today, food security is still a promise. Knowledge is the way to make it real. Based on this concept, **Expo Milano 2015**, whose claim is “Feeding the Planet, Energy for Life” decided to launch an ambitious programme for supporting cooperation on research and innovation in the field of food security: “Feeding Knowledge”. Developed and implemented jointly by CIHEAM-IAMB and Politecnico di Milano, this initiative, started in 2012, will run until the end of the Universal Exhibition and will contribute to building up Expo Milano 2015 legacy.

Since 2012, “Feeding Knowledge” has contributed to the strengthening of Mediterranean cooperation on knowledge sharing for food security. It has produced some noteworthy results, namely **5 white papers** on research priorities for food security, **10 local offices** (Local Points) in 10 Mediterranean countries¹, a **network** of more than **2000** researchers, a database of around **800** research works, **3400** organizations/entities registered on the on-line collaborative platform (www.feedingknowledge.net) and more than **780** Best Practices for Sustainable Development collected under the International Call of Expo Milano 2015. These elements are a valuable store of experience on Mediterranean knowledge system. Building on them, the **FK ambition is to contribute to the international efforts aimed at reducing food insecurity in the Mediterranean with concrete recommendations gathered in this policy paper, which will be part of Expo Milano 2015 legacy.** In the upcoming months, “Feeding Knowledge” will work on the creation of a **Euro-Mediterranean Centre of Knowledge for Food Security**: a *hub* of knowledge and expertise based on a consolidated network of research organizations and national institutions. The Centre will have its main base in Italy (Milano and Bari) and local offices in other Mediterranean countries to facilitate its role of “knowledge mediator”.

II – Background: the path towards the policy paper

In February 2014, representatives of “Feeding Knowledge” Local Points as well as of ministries, institutions and international organizations from several Mediterranean countries gathered in Bari, at CIHEAM-IAMB, to comment and share ideas on a **preliminary draft** of the policy paper, based on the recommendations outlined in the 5 white papers of the Programme scientific network and on the results of an on-line survey on the needs for food security involving about **200** stakeholders in the Mediterranean region.

During the last year, “Feeding Knowledge” activities concentrated on collecting relevant **inputs** to draft an updated version of the policy paper which was discussed with Euro-Mediterranean institutions and organizations in an ad-hoc round table (Rome, **26 January 2015**) and which will be finally presented during the Universal Exhibition.

The updated version of the policy paper has been built following a comprehensive analysis of different elements of the knowledge chain in the Mediterranean region, with a particular focus on food security. Four main elements have been taken into account: first, a literature analysis of the state of the art of knowledge & innovation transfer; second, a comparative analysis of problems, strategies and tools of Euro-Mediterranean agricultural extension services; third, a

quantitative and qualitative analysis of the problems and solutions highlighted by more than 780 candidates who applied for the International Call on Best Sustainable Development Practices for Food Security of Expo Milano 2015; fourth, an analysis of the results of an Open Consultation launched through “Feeding Knowledge” Platform on the problems and priorities perceived by more than 100 Euro-Mediterranean research and innovation stakeholders and on possible tangible solutions. The results of this analytical work – which are briefly reported below – have further been deepened by Feeding Knowledge experts in order to draw some key recommendations which were discussed and shared with representatives of Euro-Mediterranean institutions and organizations during the Round Table organized in Rome on January the 26th, 2015.

III – A picture of knowledge and innovation transfer in the Mediterranean

In the last decades, the resources allocated to research and development in agriculture have increasingly been invested in **knowledge transfer**, reflecting growing attention to this issue in developing and developed countries. At the same time, there has been a gradual shift from the traditional linear model of innovation transfer to **systemic approaches**, where innovation is seen as a complex interactive process involving not only the technological and scientific sphere, but also the social one. As a consequence, the importance of communication and of the involvement of end users through specific activities (e.g. brokerage) has significantly increased. Hence, **the concept of innovation itself has become strictly connected with the local context to which it refers, stressing the importance of participatory processes such as the co-creation of knowledge**. In this scenario, agricultural extension services have evolved towards pluralistic supply models, where the public component is increasingly giving way to private agents and NGOs. In addition to this, the changes in modern agro-food systems, as well as issues regarding food safety, climate change, the role of multi-functional agriculture and the development of rural areas, are redrawing the boundaries of knowledge information in agriculture, fuelling the complexity of the governance of extension services.

With particular reference to developing countries, the importance of the processes of **adoption of innovations** has climbed up to the top of the international development policy agenda. Southern Mediterranean countries are no exception to this scenario. In most of them the traditional approaches based on technology transfer and delivery have gradually changed, fostering **decentralization**, involving private actors and civil society organizations, improving institutional capacity. However, despite the various reform processes of innovation and knowledge systems, there are still several **constraints** that limit the concrete possibility for some groups of adopting innovations (e.g. smallholder farmers, marginal livestock producers and women farmers). Also, this process presents some criticalities due to constraints of the institutional, economic and financial context of some Mediterranean countries. To this regard, literature case studies show that the simultaneous presence of key conditions might lead to interesting experiences of innovations adoption. Some of these conditions are the following: effective **participatory** approaches, activation of appropriate financial and credit facilities, reactive institutional framework. Yet, as highlighted on the occasion of an intensive workshop organized in 2014 by Feeding Knowledge and attended by representatives of the agricultural extension services of 8 Euro-Mediterranean countries, there are other constraints which negatively affect the effectiveness of extension process, such as weak linkages and coordination among researchers, extension staff and farmers; limited budget allocation; low acceptance of changes adoption in some farming systems; no tradition of on-farm experimentation. Surprisingly, according to the extensionists interviewed, there is little articulated connection between **extension and food security**. More attention is given to market orientation – but the potential for this to undermine food security needs to be kept in mind.

IV – Building up a new paradigm for knowledge: a Mediterranean laboratory

In the upcoming years, **food security** will be one of the main global challenges, equally urgent both for developed and developing countries. According to FAO estimates, the global demand for food products will increase by 70% by 2050, sided by a substantial increase in demand for seeds, fibers, biomasses and biomaterials. At the same time, there will be a slow-down of the food production growth rate – mainly due to the reduction of investments in agricultural research and to a growing pressure on the environment and on natural resources. An answer to this challenge is undoubtedly represented by the development of **research and innovation** and by an increase in the degree of research actors' awareness on the needs of the food chain operators. Accordingly, **knowledge and innovation transfer should be effective and supported by appropriate policies and investments. This implies the creation of stronger linkages between research and end users, a shortening of the knowledge chain.**

The need for a “**short**” **knowledge chain** becomes increasingly urgent even in the context of the Southern Mediterranean. Successful research is in fact more able to address the needs expressed by operators and better tailored to the regional context, so that it is possible to measure its effectiveness, to identify its criticalities and to trace its future developments. Thus, innovation becomes the result of the creation of a network, of an interactive learning process, of a negotiation among heterogeneous stakeholders.

A valuable **support** to the development of such a dialogue can today originate from new forms of spreading information. Thanks to their wide usability, they allow the exchange of all kinds of news and cognitive experiences, as well as of ideas and best practices, through a direct engagement in debates about the issues proposed. In the agricultural sector, these systems can enhance or even create **new links** between agriculture and local area, area and consumers, while their use not only allows the sharing of innovations and continuous updating, but also helps reach directly the user with precise and personalized messages.

Furthermore, thanks to these new systems and to the development of web networks and communities in all countries of the Southern Mediterranean area, users are becoming - from passive or uninformed actors - **active participants** and promoters of information, as the latest events involving those countries have showed. Therefore, the contents of communication, once launched, are gradually enriched thanks to the contribution of all users, thereby creating a valuable exchange of opinions, experiences and information.

This represents a crucial **asset** for the Mediterranean, where the main problem today seems to be not the lack of knowledge but the need to make good use of it. Therefore, strengthening **local capacities** to use modern information systems at a wider scale should become one of the policy priorities of knowledge transfer and innovation in agriculture, in order to fill the “information gap”, so often mentioned by research stakeholders.

V – Inputs from “Feeding Knowledge”

In order to enhance the dialogue among research actors, policy makers, farmers and all the other stakeholders involved in the food security domain, “Feeding Knowledge” Programme has developed several activities aimed at: identifying **research areas/topics** of mutual interest in the Mediterranean region, collecting inputs on the main **needs and solutions** in the food security domain, collecting examples of **best practices** (in terms of projects, products, processes, know-how) related to food security. Building on the results of these activities and despite the differences and peculiarities of each country targeted by the Programme, in some key common areas the need for new knowledge and the importance to enhance the knowledge in use have been identified. At

the same time, **most recurrent problems and suggested solutions pertaining to key priority themes related to food security have been identified and highlighted by the Programme.** Furthermore, thanks to the valuable set of data and information collected by the Programme, a comprehensive analysis of methods and tools to implement suggested solutions has been carried out, trying to stress the added value of the presence of an effective knowledge chain. The results of this work are briefly summarized below and are divided into five key thematic areas:

1. Managing ecosystem services

The main challenge seems to be the enhancement of ecosystem services, whilst maintaining productive agriculture. Intensifying production, within environmental boundaries - given that little, if any, extra land is available - requires that research deepens into the practical assessment and application of technologies such as conservation agriculture, no till or reduced tillage, agro-forestry, mulching, cover crops, controlled grazing, integrating crop and livestock production, well-designed terracing to control soil erosion and the use of halophyte crops in saline areas. Agricultural and innovation policies should be based on the principle of “sustainable intensification”, requiring significant efforts in research as well as in knowledge transfer. With particular reference to the Mediterranean, both research actors and local operators highlight the need to manage scarce water in a sustainable manner. Suggested solutions are: strengthening rain-fed agriculture production systems, increasing productivity in irrigated areas and improving water use efficiency at different scales from crop to irrigation systems, reducing water losses and wastage, increasing water resources availability through the use of non-conventional water, promoting policies that support water governance. The Open Consultation carried out within “Feeding Knowledge” Programme also highlighted the need to improve the effectiveness of extension activities as well as the importance of conducting awareness & knowledge raising activities.

2. Qualitative and Quantitative Enhancement of Crop Products

Sustainable integrated management and control of biotic and abiotic factors (both during pre-harvest and post-harvest stages) are fundamental to enhance quantity and quality of products. To this aim, research should focus on the efficiency of Integrated Pest Management and organic production systems under an eco-functional intensification approach. At the same time, food loss and waste have many negative economic and environmental impacts. Actions in this regard should be directed towards the whole food chain, since strengths and weaknesses affecting one part of the chain often have consequences at all other levels. As pointed out by the FAO and World Bank, investments in reducing postharvest losses can be as cost-effective as other agricultural investments and can provide good returns, especially when food prices rise. In this field it is also necessary to harmonize the laws that set a limit to the possible presence of mycotoxins in the main food products. This complex perspective needs to be accompanied by actions aimed at developing a better knowledge about where food is lost and wasted throughout the supply chains, and therefore where the pinch points for action are. According to the responses given within “Feeding Knowledge” Open Consultation, useful solutions to develop effective integrated pest management and organic production systems are also the increase of farmers knowledge and awareness, including better access to information. Also, new national and local policies are deemed necessary to be adopted in order to ensure more incentives to farmers and speed-up the adoption of organic farming.

3. Managing food in an increasingly globalized food system

A main topic for future research in this domain is to strengthen the availability of both quantitative and qualitative information as prerequisite to afford appropriate policy analysis. To this regard, an important priority is to set up tools that help understand how local and regional food systems might be affected by hitherto unexperienced events such as multiple bread-basket failure and

what would then happen to trade, price, food access and local land-use decision. Another problem is the changing nature of price volatility, which is now becoming a structural factor in a globalized food system, and one of the main sources of risks for farmers. To face this issue, agricultural policies should offer more opportunities for risk management and promote new tools for coping with risk. Public intervention should stimulate more opportunities in this sense. The Open Consultation highlighted also the need to promote actions of institutional capacity building in order to reduce the fragmentation of policy-making decision process and to enable the adoption of targeted policies alternatives.

4. Fostering sustainable development of small rural communities in marginal areas

Liberalization of agricultural markets and globalization have generally increased economic differentiation among communities and households. As a consequence, remote communities in low potential areas and households lacking adequate human, financial and structural resources, faced serious difficulties to cope with the new global scenario. A viable solution to this bottleneck is the creation and sharing of knowledge on sustainable agro-ecosystem and natural resources management aimed at promoting preservation and protection of fragile rural environments and groups. In these contexts the mechanisms of learning and innovation transfer are of pivotal importance in maintaining the health of local communities. Another feature of marginal rural areas in the Mediterranean region, like elsewhere, is the increasing male migration and the consequent rising number of households run by women. This important phenomenon calls for social and agricultural policies aiming at a concrete enhancement of the role of women in agriculture. In this context the Open Consultation underlined the importance of “farmers empowerment”, intended as creating enabling conditions to facilitate access to credit and subsidies, to provide technical support and knowledge development, to reinforce the public extension strategy and to establish local incubators for cooperative actions.

5. Promoting sustainable food consumption patterns

There is an urgent need to assess the environmental, economic, social, cultural, health and nutritional sustainability of the current food consumption patterns and diets in order to design comprehensive, coherent and multifaceted nutrition-sensitive policies. These research activities should deal among others with: diet nutritional and health implications, food-related environmental footprints, economics of the Mediterranean food consumption patterns, food cultures and sociology in the Mediterranean, food system governance and food policies. The Open Consultation of the Programme revealed a general consensus on the importance of promoting economically, socially, culturally and healthy sustainable food consumption patterns in the Mediterranean region. To this end, suggested solutions are: raising public awareness through large scale campaigns and through the promotion of food education in schools. Also, awareness building actions addressed to farmers are seen as a potential solution to increase their income through know-how, innovation and post harvesting techniques. Consumption of locally produced commodities should also be encouraged.

Significant inputs for the development of a knowledge system for food security in the Mediterranean, also derive from more than 400 Best Sustainable Development Practices submitted by applicants of Mediterranean countries, which represent about half of the total Best Practices submitted to the International Call launched by Expo Milano 2015 worldwide. In fact, a good number of candidate Best Practices (35%) focuses on knowledge development and raising awareness, carrying out activities such as workshops, training, awareness campaigns and implementation of new knowledge development instruments.

VI – Key messages: a knowledge system for food security in the Mediterranean

Based on the issues outlined in the previous sessions, the following options should be further explored to build up an effective knowledge system for food security in the Mediterranean:

- **Renewing tools and approaches for re-designing social and agricultural policies**

Today, in the Mediterranean region, a high number of people is employed in agriculture with widespread family-run farms. Therefore, the target of social and agricultural policies often coincides and a consistent combination of these two levers is pivotal in mitigating the risks connected to price volatility and in creating long-lasting **development conditions**. In this context, fostering innovation and knowledge development in building agricultural and social policies is a priority. In fact, in order to make these two policies effective and mutually coherent, the decision making process should be based on accurate and comprehensive information and should be re-organized according to **innovative strategies**. At the operational level, it could be expedient to develop less expensive and more efficient subsidy schemes, accurately **tailored** to the status and conditions of beneficiaries. At the same time, such schemes should be backed by judicious social measures, such as the promotion of diversification of diets notably in those countries where food habits are based on one or two main products: these countries are in fact more exposed to inflation risks. One more need is the development of **infrastructure** in rural areas, the setting up of efficient organizations between farmers and end users and the promotion of risk management mechanisms. In this context, another factor that deserves attention in the elaboration of social and agricultural policies is the role of **women** in agriculture and in all the sectors linked to food security. Adopting mechanisms that enhance women's skills and knowledge and provide support to forms of women's aggregations, and to the promotion of female entrepreneurship in the agro-food sector, may be effective solutions to favour social inclusion and cohesion.

- **Supporting new paradigms for access to innovation**

The adoption of **innovations** is decisive for development strategies of the Mediterranean area. Traditional linear approaches have proved to be less effective; the necessity to build systems capable to put needs and solutions into perspective is widely recognized. Although several countries have already initiated innovation policies reform processes, a lot of criticalities still persist. There is a need to strengthen **decentralization** processes of national systems for the spread of innovations, to promote local institutional capacity building and to develop a participatory approach able to link needs and solutions thereby enhancing formal and informal knowledge resources. This results in a short knowledge chain, in new mechanisms of knowledge **co-creation** and in the transfer of research results also to marginal organizations.

- **Opening up knowledge for food security**

All the potential of new tools and methods for the collaborative creation and sharing of knowledge have to be exploited with the specific aim of **opening up knowledge for food security**. The common objective has to be **the inclusion** - in the knowledge-sharing process - of every person who holds knowledge that really matters with food security and nutrition, even those social groups which traditionally do not play this role. At the same time, **access** to knowledge should be guaranteed to whoever is interested in, regardless of his/her previous formal achievements, age, gender or language. Massive Online Open Courses allowing social learning, event-based learning paths, peer-to-peer learning processes, citizen science initiatives developed in an integrated way might set the toolbox for opening up a new knowledge eco-system for food security. This is particularly true for the Southern Mediterranean region, where the propensity to the use of new

technologies is rapidly increasing and where the number of people with less than 25 years is about one half of the population.

All these statements intend to contribute to the establishment of a sound strategy for reducing the waste of knowledge in the Mediterranean, building on the unique features and potentials of this region. After three years of intense activities, "Feeding Knowledge" Programme calls for the creation of a permanent Euro-Mediterranean Centre for knowledge development and sharing on food security, able to intervene at all levels of the knowledge "short" chain, from needs assessment to the development of solutions and transfer of research results.

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Notes

¹ The target countries of the Programme are: Albania, Algeria, Italy, Jordan, Lebanon, Macedonia (representing SWG countries), Morocco, Palestine, Tunisia, Turkey.