



# APRODEV POLICY BRIEF: EU HORIZON 2020

## AGRICULTURAL RESEARCH FOR SUSTAINABLE AGRICULTURE AND GLOBAL FOOD SECURITY

### Introduction

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Today's research priorities will influence and inform future policy choices. This is especially true of agricultural research which will greatly influence the direction and development of agricultural policies and practices, with important implications for sustainable development and global food security.

As part of the CAP 2013 reform, the Commission is proposing a new 4.5 billion Euro budget for agricultural research which is double the amount of previous agricultural research budgets. The Commission issued its legislative proposal for both the **Horizon 2020** and the **CAP reform** in Oct-Nov 2011. The Council expressed its general support of the Commission's proposal in 31 March 2012. The proposals are now under co-legislation in the European Parliament. A vote in ITRE – the lead EP Committee on Industry and Research is expected by end November 2012.

**Horizon 2020** was developed under the lead of DG Research and brings together all EU innovation and research funding on basic and applied research (FP7, competitiveness and Innovation Framework Programme CIP, and the European Institute on Innovation). Horizon has three priorities: 1) Societal challenges with a proposed budget of about 35bn Euro, 2) Industry leadership on enabling technologies, nanotechnology, ICT, biotechnology and risk finance with a proposed budget of about 20 billion Euro, and 3) Excellence in science and funding of programmes such as the European Research Council and Marie Curie fund with a proposed budget of about 28 billion Euro.

The focus of this briefing paper is on the first priority, societal challenges, which addresses food security, sustainable agriculture, energy, raw materials, marine and maritime research, and the bioeconomy. It also includes forestry and climate change, post harvesting, agri-food sector, safe and healthy diets, fisheries and bio-based industries. Sustainable production includes resilience, public goods, societal benefits-enhancing ecosystems, production efficiency and eco-services.

The research programme will be implemented through different instruments such as public-private-partnerships, public-public-partnerships (i.e. ERA-NET), joint programming initiatives, coordination with EU member states, and the European Innovation Partnership.

**The European Innovation Partnership (EIP)** has a programme on Agricultural Productivity and Sustainability. This will primarily be implemented through co-funding actions under the Common Agricultural Policy (CAP) pillar II on rural development policy. The programme aims to facilitate communication between practice and sciences and exchanges among innovation actors on the side of both the CAP and Horizon; with the latter feeding into the EIP with applied research projects, cross-border and cluster initiatives or innovation centres. The idea is to create operational groups and network facilities among all the stakeholders. The CAP proposal acknowledges that an increase in agricultural production, if not achieved sustainably, could result in stress and damage to the environment and that competition for market share acts as a driving force for short-term gains over long-term sustainability.

## What is the problem?

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### 1. Narrow focus on yield increases could lead to environmental problems and fails to address the challenge of addressing hunger and malnutrition

Under Horizon 2020 there is a risk that European agricultural research continues to be too narrowly focused on improving the productivity of primary agriculture production in Europe. We know that research invested in short term gains of increasing yields and profitability runs the risk of leading to long term losses of soil fertility and nutrient cycles and to ever increasing entropy, which leads to the loss of biodiversity and hence ecosystem functions. Further, the depletion of clean water and loss of relative ecosystem stability have now become global challenges.

Findings of the IAASTD<sup>1</sup> -International Agricultural Assessment of Knowledge, Science and Technology for Development- clearly call for increasing support to diverse and contextualised farming systems that ensure equity and ecologically sound and multifunctional agricultural systems. The IAASTD concluded that “the general [agricultural science] model has been to continuously innovate, reduce farm gate prices and externalize costs. This model drove the phenomenal achievements of agricultural knowledge, science and technology (AKST) in industrial countries after World War II and the spread of the Green Revolution beginning in the 1960s. But, given the new challenges we confront today, there is increasing recognition within formal science and technology organizations that the current AKST model requires revision. Business as usual is no longer an option”. Further, IAASTD argued that “successfully meeting development and sustainability goals and responding to new priorities and changing circumstances would require a fundamental shift in AKST (...). Such a shift would recognize and give increased importance to the multifunctionality of agriculture, accounting for the complexity of agricultural systems within diverse social and ecological contexts.”<sup>2</sup>

More recently, the High Level Panel of Experts at Committee for Food Security stated that “though research to increase yields is essential to meet broader food security goals, a continuing and accelerating refocusing of research to address a more complex set of objectives is required to meet the challenges of making food production sustainable and responding to climate change.”<sup>3</sup>

The EU's own SCAR report<sup>4</sup> describes the current European debate on agriculture in terms of tension between the productivity and the sufficiency narratives. Both paradigms are prevalent in and supported by European society. The productivity narrative one-sidedly emphasises economic profit and yield increases while ignoring social and environmental externalities. It regards the “subsistence economy” and subsistence farming community as backward and fit only for survival. However, the sufficiency narrative argues that small-scale and some forms of subsistence farming, which use agro-ecological production approaches, are more environmentally and financially sustainable, more productive, more protective of local culture and diversity, and more empowering of farmers, allowing them more scope to develop and utilise their knowledge and make decisions than industrial farming systems.<sup>5</sup>

The difference in approach is illustrated by attitudes towards farmers’ traditional seed systems, which are increasingly marginalised and undervalued in current research, despite the role these can play in preventing hunger, mitigating risks, and contributing to crop diversity; this especially in Europe, where the loss of agrobiodiversity is dramatic.

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<sup>1</sup> See [www.agassessment.org](http://www.agassessment.org)

<sup>2</sup> IAASTD Synthesis Report, executive summary, p 3-4.

<sup>3</sup> Executive Summary of the High-Level Panel of Experts Report on Food Security and Climate Change, CFS 2012/39/3 Add.1

<sup>4</sup> SCAR (Feb 2011) Sustainable Food Consumption and production in a resource-constraint world, Report by the Standing Committee on Agricultural Research.

<sup>5</sup> Jules Pretty et al (2011) Sustainable intensification in African agriculture, in: International Journal of Agricultural Sustainability, p7-8

Ecologically sound agriculture is not only a question of changing farm practices but requires a transformation of knowledge and research systems<sup>6</sup>. Currently, the conventional agricultural knowledge system is supported by a powerful and stable network of actors composed of agricultural scientists, extension officials, and pesticide, fertiliser and seed companies and is based on the theory of market-driven technology change. This excludes family farmers as actors and presents a major hurdle to the fundamental shift needed.

It must also be stressed that the narrow approach on increasing yields fails to respond to the diverse issues that must be addressed to fight hunger and rural poverty.

## 2. Policy coherence and the global impact of European agricultural research on developing countries are not addressed

The EU has undertaken to, "take account of the objectives of development cooperation in all policies that it implements which are likely to affect developing countries" in a number of commitments to Policy Coherence for Development.<sup>7</sup>

The resources that the EU invests in agricultural research have an impact on developing countries in different ways. First, indirectly but perhaps most importantly, the European agricultural knowledge system, and the agricultural model on which it is based, is being transferred to many developing countries by way of, *inter alia*, technical assistance. Second, there is a direct impact resulting from private sector investments in the development of agricultural innovations which are not necessarily appropriate for tropical climates and soils or for the economic and social contexts in which developing country farmers are operating, and which therefore do not always have positive impacts on poverty reduction or on local food security and nutrition.

At the international level, the EU has committed to investing in agricultural research that will meet global development challenges. The outcome document of the UNCSD Conference, Rio+20, calls for strengthening of international cooperation on agricultural research for development, improvement of knowledge systems and knowledge and technology transfer that empowers farmers; and in this regard acknowledges the important role of traditional seed supply systems.<sup>8</sup> The call for increasing public investment for research on food security and climate change are echoed at international level by the FAO Committee on World Food Security (CFS).<sup>9</sup>

In the Horizon proposal, however, there is no priority goal for poverty eradication or increasing global food security. Instead there is a clear focus on increasing EU competitiveness. This is despite the fact that European and global agricultural research agendas are linked in many ways; for example, DG Research manages the Global Animal Health Initiative and the Joint Programming Initiative on Sustainable Agriculture. Moreover, the EU Joint Research Centre (JRC) co-chairs a network of 15 global and national monitoring networks and EU funding constitutes 40 percent of the budget of the Consultative Group of International Agricultural Research CGIAR. The JRC has been running models for DG Agriculture that look at crop yield prediction, and the same technology is now used for some areas outside the EU including Niger, North Korea, and the Horn of Africa. These models provide data that is used to inform EU security and foreign policies and emergency aid interventions.

<sup>6</sup> Roling & Jiggins (1998) The Ecological Knowledge System. Janice Jiggins was co-author of the IAASTD report.

<sup>7</sup> The European Consensus on Development (2006/C 46/01), Art 21(3) of the Lisbon Treaty states that: "The Union shall ensure consistency between the different areas of its external action and its other policies".

<sup>8</sup> United Nations Conference on Sustainable Development, Rio+20, Outcome of the Conference, 'The future we want' 19 July 2012, paragraph 108 – 118 (A/CONF/216/L.1)

<sup>9</sup> See Committee on World Food Security, Agenda for the 39<sup>th</sup> session, Rome, October 2012 (CFS 2012/39/3)

### 3. The bio-economy risks to be emphasized over sustainable agriculture

“Bio-economy” and “sustainable agriculture” are two of the proposed themes under the “societal challenges” priority in Horizon 2020. The two concepts represent different approaches to agriculture, and the risk is that the former will be emphasised at the expense of the latter. In the bio-economy approach the role of agriculture is reduced to deliver agricultural raw-material for industry, in contrast to the approach suggested by the IAASTD report, which emphasizes the multifunctionality of agriculture.

Negotiations are ongoing between DG Agriculture and DG Research on the definition and scope of the bio-economy as well as on funding allocations and instruments for implementation.

The current text in Horizon 2020 defines the bio-economy as a source of organic material (plants or animals obtained through farming or from oceans and forests) to supply the chemical industry. Commissioner for Research Marie Geoghegan-Quinn promotes a technology-based approach which sees primary agriculture production as supplying the biomass and raw material needed in industrial processes and value addition (food, feed, fuel, fibre, forests) to boost the competitiveness of European industry. Such an industrial bio-economy approach prioritises efficiency and control over resilience and diversity. It neglects the need for ecologically sound and equitable agriculture and increases the inequality of access to and control over productive and reproductive resources. The Horizon 2020 model of the bio-economy relies on expensive hybrid seeds and costly biotechnology, which increases the dependency and income poverty of farming communities in the North and in the South.<sup>10</sup> A focus on ensuring the competitiveness of European industry is driving this model, rather than long term sustainability, poverty reduction or global food security. In contrast, the agronomy-based approach promoted by Commissioner for Agriculture and Rural Development, Daçian Ciolos, in the CAP greening proposal, aims at making agricultural practices more sustainable.

Lack of proper assessment of the potential impacts of different approaches on the right to food and other human rights is a huge problem. There is considerable cause for concern about bioeconomy approaches that put the needs of business first. This is illustrated by the developments in the bio-fuels sector, which has contributed to food price increases, as a result of which the Commission has been forced to change its policies.

### 4. Only publicly funded research can be expected to invest in low external input agriculture

The problems identified above are reinforced by the fact that today the corporate for-profit sector accounts for a large share of agricultural research and development expenditure. Experience has shown that companies tend to shape research agendas with a view to generating high profit margins, while locking out solutions that may be less costly but very efficient, simply because they do not provide high returns on investment.<sup>11</sup> Agricultural techniques which are knowledge-intensive but require minimal external inputs are not prioritized by the private sector, yet it is these techniques that are often most beneficial for farmers and the wider society. Private companies have very small incentives to invest in such methods or crop varieties, as they may reduce rather than expand markets for them.

Long term sustainable agricultural solutions are thus most likely to result from public independent and participatory research that is close to farming communities and responsive to their needs. Therefore, publicly funded research has a crucial role to play in promoting and developing crops and agricultural methods that create business opportunities for small-scale farmers but not necessarily for agribusiness.

<sup>10</sup> See APRODEV and PELUM (2012) *Agricultural Research in Africa: Why CAADP should follow IAASTD*.

<sup>11</sup> Vanloqueren, Gaëtan & Baret V. Philippe (2009) *How agricultural research systems change a technology regime that develops genetic engineering but locks out agro-ecological innovation*. In Elsevier: *Policy Research* (2009) 971-983.

## Our proposal and recommendations

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### 1. The EU must honour the commitment to Policy Coherence for Development in its general priorities for agricultural research.

All agricultural research must contribute to a sustainable transformation of European food and agricultural systems. Such a transformation will address a more complex set of objectives than the bio-economy approach which regards agriculture primarily as a supplier of raw materials.

- **The transformation to a more sustainable agricultural system must remain a priority. Research must be refocused to address a complex set of objectives**, including adaptation to climate change, disaster resilience, global food security, poverty reduction, biodiversity, and the reduction of GHG emissions.
- **Research must include innovation on agro-ecological production, crop rotation and protein crops.** Agroecology is concerned with the maintenance of a productive agriculture that sustains yields and optimizes the use of local resources while minimizing the negative environmental and socio-economic impacts of modern technologies.<sup>12</sup> The IAASTD findings clearly call for prioritising agro-ecological research and innovation.
- **Agricultural research must contribute to reduce Europe's use of nitrogen based fertiliser** which is highly dependent on fossil energy and emits CO<sub>2</sub> in the production of nitrogen oxide.
- **Farmers' participation in research must be prioritised.** Research extension and training institutes, both in Europe and in developing countries, need to value farmers' knowledge and promote knowledge sharing and innovation systems that involve farmers. Farmers learn best when they are encouraged to experiment; researchers learn best when they work in a participatory way with farmers to ensure that plant materials and animals are suited to local needs and norms, for example through participatory plant breeding. Therefore, official agricultural research agendas in Europe and in developing countries should support and build on the successes of on-going decentralised participatory research and farmer-to-farmer networks and their support organisations. For this, a change of mindset is needed that embraces and respects diversity and the de-centralised nature of adapted farming models.
- **Participatory research must promote indigenous and traditional knowledge of seeds** and community controlled seed banks as well as crop and livestock technologies in the North and South.
- **Indirect land use and protein imports must be reduced:** European agricultural research has to commit itself to contribute to a vision of Europe that can live primarily by its own resources and thus reduces indirect land use in developing countries, particularly indirect land use that may result in land grabs. This is especially relevant in relation to the import of protein fodder for livestock.
- **A new mechanism for international technology evaluation and information must be established** to strengthen national sovereignty and technology policy choices. Technologies such as gene technology, biotechnology and nanotechnology raise new ethical questions, which require the application of the precautionary principle and the 'polluter pays' principle; as well as greater attention to impact assessment in relation to rights to food. Lessons must be learnt in this regard from experiences with first generation biofuels.

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<sup>12</sup> Agroecology in Action, SOCLA, <http://agroeco.org>

- **The obligation to take account of policy coherence for development should translate into support for open access, sharing and use of scientific information** and the increased dissemination and use of knowledge and access to scientific data produced or collected by publicly funded research. This is particularly important for actors in developing countries and for tackling common challenges of global food security.

## 2. The EU can make a specific contribution to agricultural research for global sustainable food production and food security

Apart from taking into account the global implications of all agricultural research, the EU could play an important leading role in promoting agricultural research that delivers on global food security, particularly in food insecure and developing countries. Europe can draw on its own experiences on multifunctionality and rural development. This includes rural-urban linkages; local food communities producing good, clean and fairly traded food for local markets;<sup>13</sup> context-specific and new knowledge systems; organic and agro-ecologic research; and the contribution sustainable agriculture makes to the regeneration of natural resources. The EU would be in a unique position to become a champion for a new agro-ecological knowledge and innovation systems.

- **Part of the agricultural research capacities of the EU (research projects, personal, programmes) should serve to improve global food security** concerns in particular of developing countries with tropical and subtropical conditions.
- **Emphasis should be on building capacity in developing country research institutes**, for instance through partnerships between research institutions in EU and developing countries.
- **Explore the nexus of agriculture, rural health, nutrition and labour safety in EU agricultural research.** The EU's commitment to reduction of hunger should translate into research that puts marginalized food production of rural poor at the centre. The research focus should be on forgotten orphan food crops, the regeneration of depleted land and the diverse farming systems of social and economic groups that are excluded from knowledge systems and access to local markets.
- **Agricultural research must be based on participatory approaches that put the needs and knowledge of farmers at the centre of decision-making.** Dissemination of agricultural knowledge is key and innovative methods of extension need to be monitored and evaluated as part of the agricultural research agenda.
- **Support diversified agro-economic activities and crops:** Agricultural research must aim to provide the scientific, knowledge and technology foundations for more investment by farmers, government and the private sector into diversified agro-economic activities and crops. This will contribute to risk reduction and adaptation to climate change and help to minimize dependence of vulnerable communities and least developed countries on food commodities that are subject to global price fluctuations and speculation.
- **Support the development of agro-ecological models for poor communities:** The experiences of APRODEV's development partners and farmers' organisations in developing countries demonstrate the effective use and benefits of agro-ecological models for poor communities. These benefits include an increase in productivity, as well as the knowledge, opportunities for decision-making and incomes of small-scale farmers; reduced environmental degradation, natural resource restoration, and improved food security.<sup>14</sup>

<sup>13</sup> See for example, the Slow Food movement at [www.slowfood.it](http://www.slowfood.it) or [www.slowfood.com](http://www.slowfood.com)

<sup>14</sup> Ecumenical Advocacy Alliance (2012). Nourishing the World Sustainably: Scaling up Agroecology

- **Public research must support public goods** including hunger eradication, promotion of biodiversity, enhancement of soil fertility and protection of clean water supplies. As such, it should prioritise low external input, biological plant protection and ecologically sustainable small and larger-scale agricultural systems which actively involve farmers as experts on their own farms and agro-ecological contexts.
- **Research on and design of specific agro-ecological techniques need to be gender-sensitive** to avoid an increase in women's labour burden. It also needs to avoid an increase in child labour or any negative nutritional impacts.
- **Priority should be given to agricultural research that is scale neutral** or can be utilised on small scale farms and which is appropriate for technology transfer to smallholders in developing countries.
- **Publicly co-funded research by the EU should introduce the opportunity for royalty-free use of patents by smallholder enterprises** in agriculture and food processing operators in developing countries to build food production capacity and long term food security, in particular in least developed countries.
- **Poorly tested new technologies**, which bear a high risk for environmental and health concerns, should only be transferred to developing countries with utmost care, respecting the prior and informed consent principle and with the full liability of the exporting agent. The EU should do all the safety testing of a new technology which has been developed in Europe and are intended to be exported to a developing country, even if the technology does not apply for an admission to be marketed or released inside Europe.