Briefing paper: Project on agriculture and food and nutrition security

Globalisation of academy work

National science academies have a responsibility to ensure that the collective voice of science is heard. Academies are now building on the effective relationships created at the national level so as also to advise on the scientific dimensions in policy making at the regional level. The increase in efficiency possible when academies share resources to pursue mutual interests, together with the ability to speak on behalf of a larger constituency, enables the delivery of stronger messages.

In bringing together the regional academy networks, the newly established InterAcademy Partnership can spread good practice and begin to generate the critical mass essential to tackle complex issues of global relevance – where there may be regional variation in evidence, experience and perspectives – to provide independent advice to inform policy options through its member academies. The Partnership is able to draw upon the best science from all relevant disciplines and experience of the different contexts in which science has been applied and alsobenefits from the well-tested, merit-based academy tradition in utilising the processes of scientific culture, relying on rigorous collection of evidence, transparency in procedures, robust peer review and explicit exposure of areas of controversy.

It is expected that there will be synergy in the Partnership's delivery of policy advice at the global level with the continuing follow-up at the regional and national levels, customised according to local circumstances and strategic needs. Indeed, a core part of this proposed new activity is to combine the twin goals of the Partnership: delivering strong, consensus messages at the global level, with clarification of the scientific basis of current disparities in policy expectations and objectives and future options in different regions of the world. This type of collaboration is also expected to be valuable in bringing the networks closer together in support of our aims.

In addition to delivering advice to the policy-making communities, national, regional and global, there is an important complementary role to build better engagement with the public about the necessary place of science and innovation in sustainable development.

In order to achieve the above objectives it is necessary to:

- Bring together input from regional academy networks on issues, plans and priorities.
- Agree where Partnership initiatives, drawing on effort by the regional academy networks, could add value to what has already been done by other bodies.
- Pursue topics of agreed mutual interest within regional networks to collect additional evidence, solicit expert scientific guidance, resolve contentious points where possible, and identify key messages.
- Ensure that regional academy networks remain accountable for their roles to their respective scientific and policy communities.
- Identify supportive resource for drafting, peer review and other quality assurances to ensure efficiency and consistency.
- Initiate and improve further links with policy making bodies worldwide to raise awareness of the Partnership, prepare the ground for delivering evidence-based

advice, assess priorities of decision-makers, and provide sustained follow-up to maximise impact.

At the recent IAP Executive Committee meeting in Paris, and the 1st Meeting of the Board of the InterAcademy Partnership it was agreed that a first project should be started to address issues associated with the security of food supply.

Agriculture and food and nutrition security

According to latest FAO statistics[1], the number of people who are chronically undernourished has fallen to about 800 million. The Millennium Development Goal to halve the number affected by 2015 is on track to be achieved although Sub-Saharan Africa still lags behind the accomplishments in Latin America and Asia.

However, agriculture still faces major challenges in delivering food and nutrition security at a time of increasing pressures from population growth, climate change, social and economic inequity and instability, and the continuing need to avoid further loss in biodiversity and ecosystem services. Tackling the problems requires the deployment of all available approaches, traditional and novel, building on existing achievements for good agronomic practice.

The problems for nutrition security have recently been highlighted[2], but there is room for much more effort to identify and tackle key nutrition targets associated with what will be the Sustainable Development Goals. IAP work could help significantly to develop more robust strategies for nutrition security and food security.

Many academies have explored these issues in previous work and have often emphasised the role that the biosciences can play in the sustainable intensification of agriculture. The production of more food, more sustainably, requires the development of crops that can make better use of limited resources as well as reduce post-harvest losses and wastage. The topic of agriculture and food security - encompassing quality, sustainability and innovation - is highly relevant for IAP. The examination of the issues should be broadly based but it is proposed that one key aspect can be the issues for the biosciences relating to the better use of plant genetic resources and the applications of biotechnology. This includes marker-assisted breeding (and the issues for conservation and characterisation of plant genetic resources), genetic modification, and new breeding techniques. Taking this particular focus as one aspect within the broader context is suggested so as to build on the considerable interest and recent work by regional academy networks (e.g. NASAC, EASAC, AASSA) and academies (e.g. US NAS), to facilitate an early deliverable and exemplify the wider issues for linking science-innovation-policy in agriculture.

Among the questions that would be covered broadly in addressing the issues for productivity, sustainability and biodiversity are:

<u>The evidence base: regional variation in priorities, experience and resources</u>

[1] 16 September 2014 "State of food insecurity in the world", www.fao.org

[2] Lancet editorial 15 November 2014, "Feeding the world sustainably", referring to the WHO/FAO meeting in Rome on the post-2015 sustainable development agenda and the "Global Nutrition Report". The current draft of the SDGs and their specific targets is on http://sustainabledevelopment.un.org/focussdgs.html

- What are the regional needs for food and nutrition security? What is the state of knowledge of factors influencing security?
- What are the major targets for crops and traits and what are the limitations to yield/quotas? (including orphan crops)?
- What are related issues for food quality and safety, and verification of quality and safety?
- What are the success stories – what has worked in tackling particular challenges ? What has failed?
- What are the major challenges for land use and tackling soil erosion, farming structures and demographics, including the issues for small-scale farmers?
- What is the current impact of climate change on agriculture? What are the projected impacts?
- What is the state of the science base in plant sciences and agriculture? What is the balance between public and private sector R&D? What new technological applications are coming within range in consequence of advances in science? What are the skills needed to support science and its translation into agricultural practice.
- What is the state of agricultural extension services and what use is made of new communication tools to deliver knowledge?
- Regarding the application of the biosciences in agriculture, what is the regulatory situation? What are the controversies and what is the state of public engagement?
- What has to be done in addition to increasing productivity, e.g. reducing post-harvest losses and wastage?

<u>What might be the main areas for recommendations?</u>

- <u>Efficient and diversified land use</u> – resource mobilisation and productivity, including use of biosciences. Involving all stakeholders in strategic choices and improving public awareness of scientific, economic and environmental issues.
- <u>Regulation of technology</u> – developing coherent, science-based procedures for regulating all biotech-related innovation. Encouraging public sector and smaller companies and enabling uptake of innovation by smaller scale farmers.
- <u>R&D</u> – identifying priorities, re-invigorating public sector research and plant breeding efforts, supporting public-private partnership, satisfying skill requirements for next generation of researchers, plant-breeders and farmers, clarifying options for intellectual property protection and open innovation.
- <u>Integrating approaches</u> – for example, in addressing risks to plant health.
- <u>Other applications of the agricultural bioeconomy</u> – implications, for example, for biofuels, molecular "pharming" crop production of vaccines, pharmaceuticals and production of other high-value chemicals.

<u>Why is the Partnership intervention needed?: emphasising the added value of regional cooperation and work of the organization to deliver global messages</u>

- Commitment to defining global R&D priorities and to collaboration to tackle them.
- Addressing current policy disconnects that affect the relationships between countries/regions, e.g. the conflict between some regional objectives for product regulation and freedom to trade.

- Understanding, sharing and using examples of good practice, e.g. in agronomics, regulatory frameworks, for capacity building worldwide.
- Informing public engagement worldwide.
- Supporting international bodies and providing linkage with regional and national activities.
- Helping to reinforce the specific issues for nutrition security – evidence base and robust action.