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Nationale Akademie  
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## InterAcademy Partnership Project on “Food and Nutrition Security and Agriculture”

### Project Description

The German National Academy of Sciences Leopoldina, in collaboration with the InterAcademy Partnership, is undertaking a project on 'Food and Nutrition Security and Agriculture'. Supported by IAP for Science, it is one of three projects identified by the InterAcademy Partnership for implementation in 2015. The project is almost exclusively funded by the German Federal Ministry of Education and Research (BMBF) as the project on “**Strengthening the Global Network of Science Academies (IAP) - Global and regional statements on food and nutrition security and agriculture**”. IAP is also providing financial support, while some IAP member academies and the affiliated regional networks will provide in-kind support.

**Time Frame:** 1 November 2015 to 30 June 2018 (3.5 years)

### Project Aim:

A global report focusing on the specific regional/continental situation will provide scientific recommendations on the topic of "Food and Nutrition Security and Agriculture". It shall give advice to policy-makers and decision leaders as well as Foundations and donors worldwide. Reports from the four regional academy networks will form the basis of the global report.

### Project Rationale:

At a time of increasing pressures from population growth, climate change, social and economic inequity and instability, the continuing need to avoid further loss in ecosystem biodiversity, and pressures on other critical resources (such as water and energy), there are major challenges in delivering **food and nutrition security**. Viewed broadly, food and nutrition security covers a wide range of issues for the physical, biological, socio-political and economic environments. Agriculture has a central role to play in tackling food and nutrition security. Furthermore, tackling the challenges of sustainable agriculture requires the deployment of all available approaches, including both traditional and novel, building on existing achievements of good agronomic practices.



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For food (including nutrient and micronutrient) security, there is an ongoing need to identify and tackle key targets and to link health-related indicators with the forthcoming Sustainable Development Goals. Project work will encompass demand-side and other considerations (e.g. the need to reduce food loss and waste and the impact of changing food preferences and dietary composition) as well as food production issues.

The topic of agriculture and food and nutrition security – encompassing quality, sustainability and innovation – is highly relevant for IAP. The project is anticipated to focus on selected aspects where science has a major role to play.

**National science academies** have a responsibility to ensure that the collective voice of science is heard in major policy debates. By engaging its four regional networks (AASSA, EASAC, IANAS and NASAC), IAP has the capacity to advise on the scientific dimensions of policy making at the regional level and across disciplines (including economics and other social sciences). The organization is also able 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.

It is expected that this project will produce four regional reports along with a global synthesis that highlights the similarities and differences between the regions, providing advice and recommendations for implementation at global, regional and national levels, customised according to local circumstances and strategic needs. Indeed, a core part of this IAP activity is to combine the twin goals of 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.

#### **First Project Meeting:**

The project was initiated with a meeting at the German National Academy of Sciences Leopoldina in Halle (Saale), Germany, on 31 May - 2 June 2015. This meeting sought the advice of experts from around the globe to clarify the choice of topics where work by IAP and its regional academy networks might add value to the considerable work already conducted by many other scientists in seeking to advise policy-makers. To this end, experts from IAP's affiliated regional networks discussed the issues at stake, drafted a project roadmap, and agreed on a focus of the working groups' activities as well as a suitable timeline.

#### **Proposed Main Activities:**

##### **AASSA**

AASSA divides activities into the following four groupings in view of the large geographical land area: Region I: *Australasia-Pacific Rim*; Region II: *South East Asia*; Region III: *South Asia*; and Region IV: *Central Asia and Caucasia*. The activities will be focused on two broad areas:

1. *Science, Technology and Innovation Policies for realizing the goals of the project*
  - (i) Agricultural land use and resource base;
  - (ii) Enhancing education quality of the agriculture community;
  - (iii) Promoting gender equality;
  - (iv) Extension work to transfer latest knowledge and techniques;
  - (v) Definition of nutritional needs of persons of all economic strata including fundamental health related aspects;
  - (vi) Widening of food basket by adding to the protein sources vegetables, dairy products, fruits, meats, animal feeds etc.;
  - (vii) Standardization challenges and quality assurance;

- (viii) Identification and creating a data base of the standards and techniques; and
- (ix) Target year 2030 in the planned forecasts.

## 2. *Identifying Main Challenges in the Science and Technology Domain*

- (i) New varieties of protein sources producible under widely varying climatic conditions;
- (ii) Identification of affordable yet effective nutrients and micro-nutrients; and
- (iii) Strategies to deal with climatic variations and changes.

Two experts from each of the four regions will be actively involved in the project. It is proposed to hold two meetings of all eight experts every year. Each year one day will be devoted to joint deliberations for harmonization in one of these. In all, five meetings will be organized. The last meeting will be for finalization of the Report. A science journalist will be associated to prepare the final Report so that it can communicate the essential contents to political leadership, policy makers and general public in addition to the scientific community.

### **EASAC**

EASAC work will cover a broad front in support of project objectives in defining the issues for food and nutrition security in Europe (including regional heterogeneity) and for the science agenda, while recognizing the relevant work that has already been done by other EU bodies. Among some of the possible individual themes to cover are:

- (i) Reducing waste in food systems;
- (ii) Understanding connections with public health and producing new outcome measures (e.g. functional consequences of poor nutrition in childhood on brain development);
- (iii) Technologies for food production; and
- (iv) Other opportunities for employing novel technologies, e.g. self-monitoring of micronutrients.

The EASAC work will draw on previous academy work and continuing interests in food and nutrition security, e.g. plant genetics and the bioeconomy as well as on the linkage of issues for other resources, particularly energy, water and biodiversity. The connections between Europe and other regions (mediated, e.g., through consumption and trade), shared goals and implications for infrastructure, would also be covered. EASAC will emphasise where strong science capabilities can be shared with other regions to help solve problems and provide new international collaborations in mobilizing the best science worldwide.

In forming the EASAC Working Group, nominations of experts from member academies are being sought for a wide range of disciplines and experience, including: nutrition, food science, food safety, innovative foods, behavioural and social sciences (including economics), precision agriculture, plant breeding, animal science, soil science and water, aquaculture, bioeconomy (and with particular emphasis on bioenergy), modelling of food security, regulatory framework and policy, ecology/landscape, agronomy, agroclimatic change, non-communicable diseases and public health, and microbiome-human interactions.

### **IANAS**

The region of the Americas is heterogeneous and this variety will be reflected in the project. A country-by-country assessment will provide the basis for a high level summary that captures the major common issues and that identifies issues that are specific to particular sub regions. Project discussions will consider:

- (i) Supply-side, production issues (including new technologies) and the potential conflicts between agriculture, other land use (including production of bioenergy) and biodiversity;

- (ii) Issues for distribution and access, including population and vulnerable groups, governance, and infrastructural issues; and
- (iii) The implications for intersection with relevant government policies, including those for trade, investment, research priority setting, water and energy.

The scope overall covers excess as well as insufficient consumption of food and the work will aim to take account of future projections for climate change, demography, land use and availability of other resources.

It is proposed to convene a hemisphere wide two-day workshop on food and nutrition security. Each national academy will nominate experts to participate in the workshop. IANAS will select participants from the nominees, ideally three per country plus a country coordinator, to span the disciplinary range of this complex topic. Also key policy makers and international agency representatives will be invited to the workshop (e.g. FAO, IDRC, US AID, and IICA).

To assure uniformity, a template for the book chapters will be drawn from the Halle meeting. This will serve as a basis for the breakout groups who will work to define the approach to the writing tasks. A mid project meeting of the editorial committee is scheduled to review materials and to assess the progress of the various writing groups. A final meeting will synthesize key challenges common to the hemisphere and highlight specific challenges for different major regions (e.g. tropical environments, desert agriculture, mountain agriculture, arboreal regions).

A summary will be produced as an attractive brochure that will be used as the basis for public dissemination and discussion with policy makers by academies' leaders in each country.

### **NASAC**

While tackling food and nutrition security, a keen focus is placed on agriculture as well. There are interconnected problems for food, health and other resources, particularly water and energy. The biosciences are regarded as critical in providing integrated solutions. It will be useful to include an initial stocktaking phase in the project to determine the current status of knowledge generation and use. Some possible priorities for further investigation include:

- (i) The bioeconomy and its products, and new food sources;
- (ii) Impact of other breakthrough technologies on agriculture;
- (iii) Nutrient-rich food for the future (and capitalizing on traditional knowledge);
- (iv) Education in schools and universities and for the next generation of farmers;
- (v) Potential for agriculture in an urban environment; and
- (vi) Intersection with energy production and energy policy.

Africa is heterogeneous and each topic addressed will need to take into account cross-cutting dimensions of nutrition, societal determinants and impacts, potential for delivering innovation and for wider sharing of good practice, and environmental implications.

The outcome is expected to be a policymakers' booklet on Food and Nutrition Security and Agriculture. The booklet will then be launched and a science-policy dialogue facilitated by hosting a scientific conference and ministerial roundtable at which the key recommendations will be analyzed.

During discussion at the initial meeting in Halle, various other general points were made regarding project scope, these highlighted

- (i) The importance of considering excess consumption as well as under-nutrition as part of the critical interrogation of causes of food and nutrition security.
- (ii) Addressing longer-term issues relevant to the interests of inter-generational equity.
- (iii) Other dietary components, not usually considered as nutrients, e.g. anti-oxidants, may also be included in the assessment.
- (iv) The Human Rights agenda, its legal implications and practical effects, including issues for particular groups, such as children, may also need to be covered.

- (v) Determinants of the inheritance of food habits and responses to diet, e.g. family and societal environments, genetics, epigenetics and microbiota, constitute an increasingly important part of the research agenda.
- (vi) Demand-side issues and demand management must be part of the discussion of food systems, sustainability and impact of environmental change. Clarification of issues for food waste and food loss will be an important contribution to improving efficacy of food systems.
- (vii) Biotechnology remains important but GMOs are not the only products. It is important to take account of research findings from the social sciences when evaluating societal issues relating to new technologies. There are various other emerging technologies and techniques that also need to be considered, e.g. nanotechnology applications, and other approaches to integrated pest management.
- (viii) There will also be priorities identified for education and training, e.g. for revitalising agricultural and plant sciences.

#### **Global Activities:**

A Project Coordinator will be engaged with the project for the entire project duration. He/she will attend networks' meetings and see to it that project goals are pursued.

Once the 4 statements from regional networks will be available, a global statement will be synthesized, which will then be launched at an international event, and disseminated among policy-makers and stakeholders globally.

#### **Proposed general template for project work by regional academy networks**

Following the discussions in Halle, a project template was proposed to all the Working Groups to enable consistency in their outputs:

- (i) Introduction to IAP project
- (ii) Regional characteristics for FNS and agriculture
  - How is FNS defined and cause-and-effect for the region
  - Variation of FNS within the region – among countries and with regard to vulnerable population groups
  - Overview of strengths of S&T in the region relevant to FNS, particularly with regard to “cutting-edge” science and how it might be used to support FNS
  - Role of academies in the region and their previous work relevant to FNS
  - External effects – implications, positive and negative, of activity within the region on other regions (including trade, knowledge and other spillovers, partnerships)

- (iii) Regional challenges where science can contribute:

#### **Priority themes**

- To cover demand-side as well as supply-side issues
- Links between FNS and health (under-nutrition and excess consumption)
- Need to prioritise diverse topics within food systems approach including: new food sources; nutrition and micronutrients; new technologies; bioeconomy, particularly biofuels; education; generating and using data; new forms of farming; food waste and food loss; governance and markets; food quality and safety; precision agriculture.
- Challenges for relationships with other regions

### Considering cross-cutting determinants

- Economics – costs of action and inaction
- Climate change and building resilient systems
- Demography
- Sustainability, including long-term and inter-generational equity
- Other resources, e.g. water, energy, and competing demands for land use, biodiversity
- Implications of increasing scale and globalisation
- Effect of other policies on FNS

#### (iv) Mobilising science and other resources for the implementation agenda

- Issues for supporting and generating fundamental science and interdisciplinary approaches
- Linking to, and building on, other relevant initiatives
- Considering relationships between regions, opportunities for new partnerships, and global priorities
- Options for new organisations and infrastructure and for education and training

#### (v) Conclusions and recommendations (with considerations of timescale)

- For academies and science community within the region
- For policy makers at national and regional level
- For public at national and regional level
- Implications for policy relevant between regions
- Issues, analysis and conclusions to bring forward for IAP global policy work

#### (vi) Working Group composition

Need to ensure appropriate competences – social sciences, including economics, and natural sciences – as well as sufficient geographical representation across the region.

**Lead Academy:** German National Academy of Sciences Leopoldina

**Project Head:** Professor Volker ter Meulen, Co-Chair IAP for Science & Past President  
German National Academy of Sciences Leopoldina

### **Partners:**

1. The Association of Academies and Societies of Sciences in Asia (AASSA)
2. The European Academies Science Advisory Council (EASAC)
3. The Interamerican Network of Academies of Sciences (IANAS)
4. The Network of African Science Academies (NASAC)
5. The InterAcademy Partnership (IAP)

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