



## STATEMENT ON SUSTAINABLE DEVELOPMENT OF AGRICULTURAL AND FORESTRY SYSTEMS

A Statement by the International Council of Academies of Engineering and  
Technological Sciences, Inc. (CAETS)

Prepared by: National Academy of Engineering of Uruguay (ANIU)

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### **Introduction**

The 2018 CAETS Convocation, held in Montevideo September 10-12, 2018, covered a broad and diverse set of issues related to the sustainable development of agricultural and forestry systems. More than 200 participants from more than 25 countries were in attendance.

All contributions were made within the framework of a sustainable development concept by which human needs are met equitably by minimizing harm to the environment and working to ensure that future generations will be able to meet their own needs.

This statement describes the main issues identified by Convocation participants related to sustainable development of agricultural and forestry systems.

### **Sustainability in agriculture and forestry systems**

The global challenge of sustainable agriculture and forestry systems was presented and explained how it is linked with the land-use change and the climate change. Two pillars for action to confront the challenge are mitigation and adaptation. Success requires sustainable decision making starting at the local level and extending through the regional and up to the global level, demanding interdisciplinary and inter-institutional collaboration at every level.

Two key resources involved in agricultural and forestry sustainability are Soil and Water. The main threats and recommendations as evaluated by the World Soil Resources Report were presented; discussion included how these topics are related to the emerging national and regional regulations for soil and surface water conservation.

### **The role of certification**

Various successful experiences were presented, covering the certification programs applied to forestry plantations and the chain of custody as well as agricultural crops of industrial use. These certification programs are increasingly used to demonstrate the application of good forestry and agricultural practices as required by the sustainability imperative mandated by worldwide markets.



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### **Afforestation and Reforestation**

Forestry plantation has a clear and important role for the protection of the world's forests, which in turn – including the plantations - are relevant mitigators of the greenhouse gas (GHG) effects.

Temperate regions of South America will continue being one of the leading forestry development geographical zones.

Given the current and foreseeably increasing difficulties to obtain seeds from some origins of forestry trees which are of global importance, it was proposed that a germplasm bank be created as reservoir of forestry genetic materials for the world to ensure the availability of a diversified germplasm basis for future developments.

### **Renewed focus on the development and application of wood as an engineering material**

The use of wood as structural timber locks in carbon for the long term and in addition it displaces the use of other materials, such as steel and concrete, which are more carbon intensive, thereby improving countries and global carbon balance.

This renewed interest has driven a wide spectrum of developments of engineered wood materials and its application to innovative design and constructions, including wooden high-rise buildings, large span roofs and timber bridges.

A key component of the engineered wood materials are the adhesives; very significant progress has been achieved in the steep reduction of harmful volatile organic chemicals emissions (mainly formaldehyde). Research and development are ongoing to reach the long-term aim of substituting petroleum-based adhesives with naturally based ones, mainly bio-based polymers.

### **The scope for extended biomaterials value chains**

There is a widely agreed conscience of the global GHG effects and impacts; this drives the view that a key building block of the much-needed solution agenda is the application of innovation and technology for the development of sustainable biomaterials to substitute non-renewables.

Significant advances have been made in the development of further downstream products derived from natural cellulosic materials such as the production of modified fibers and crystals, lignin adhesives, biofuels and other bio-derived chemicals.

### **Location and the logistics challenge**

A traditional motto in the pulp and paper industry says: "Pulp is produced near the forests, end-use products near the markets".



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To enable and provide feasibility of long-distance supply chains to markets it is required to apply advanced and efficient logistics solutions, making the best use of state-of-the-art Information Technologies.

Another approach to solve the distance challenge is the development of industries which contribute to the addition of value at the source, including waste stream recovery to create a circular economy. Biomass is local: primary production will play an important role in the viability and competitiveness of bio-based products.

### **Engineering talent and the interaction of Industry, Academy and Government**

The current and future availability of a sufficient quantity of engineers with the required formation quality is a common and extended bottleneck in many countries. In this respect there is an unavoidable need for Academy, Industry and Government synergic collaboration in the developments of engineering talents.

The open, systematic and cooperative relationship of Industry, Academy and Government was highlighted as key to promote the successful running of applied research systems and specifically for the development of new circular economy models.