International Chamber of Commerce
The world business organization

Discussion Paper

"Sustainable Agriculture" contributions by the private sector

Integrating biodiversity conservation into agricultural production
Replicating and scaling up winning solutions

Prepared by the ICC Task Force on Convention on Biological Diversity

Agriculture is the basis for feeding the world and many of the solutions that ensure that it is done so sustainably are already known. Representatives of agricultural businesses to the International Chamber of Commerce's Task Force on the Convention on Biological Diversity offer their views on how to meeting the challenge.

The Quest for Sustainable Development

The 1987 Brundtland Commission captured the complex concept of sustainable development in simple and compelling terms: "development that meets the needs of the present, without compromising the ability of future generations to meet their own needs." Five years later, the international community expanded the notion of sustainable development at the Rio Earth Summit, agreeing that environmental protection must be "an integral part of the development process and cannot be considered in isolation from it." As with other areas of development, agriculture must meet these definitions of sustainability.

Placing Agriculture in Context

For agriculture, the biggest challenge in the past century was keeping pace with the growing population, which increased from 1.6 billion in 1900 to 6.1 billion in 2000. The world population is expected to continue rising towards 9 billion people by 2050. In addition, consumption patterns of emerging economies are shifting from cereals to animal proteins, placing significantly more pressure on agriculture. Such a demand will require a doubling of the production of cereals from year 2000 levels to reach 4 billion tonnes by 2050. On top of these challenges, climate change is creating new obstacles to productivity. The quest for biofuels to help address climate concerns also places new demands on the production base of agriculture. Further, arable land is being lost as urban areas increase.

Taken as a whole, agriculture is a dynamic system that constantly interacts with the environment, market forces and policy frameworks. It is in this complex and evolving context that sustainable agriculture, including the impacts of unsustainable agricultural practices on biodiversity, must be addressed.

International Chamber of Commerce
38, Cours Albert 1er, 75008 Paris, France
Telephone +33 1 49 53 28 28 Fax +33 1 49 53 28 59
Website www.iccwbo.org E-mail icc@iccwbo.org

Document 213-15/2
4 May 2008

There are only two ways to produce more crops: cultivate more land or achieve higher yield on the land currently used. In practice, there is no rational alternative to increasing yield per hectare, since available land is finite and further encroachment into wildlife habitats is not an option. Agricultural productivity, whether measured in production per unit land or per unit water, has enormous remaining potential left. For example, for certain critical crops, some regions achieve only 20% of the productivity enjoyed elsewhere. Making up just half of that yield gap would revolutionise the relationship between agriculture and biodiversity, as well as contributing to poverty alleviation.

Increasing productivity only, however, is not enough. Care also must be taken to manage land and agricultural inputs sensibly to prevent erosion, maintain and conserve soil fertility, biodiversity and water flow and quality.

The Answer: A Global Mosaic of Solutions

There is no one-size-fits-all management tool or technology that can guarantee that all agriculture is sustainable. However, many of the solutions for meeting escalating demands while protecting the environment already exist. In the end, a global mosaic of viable solutions and site-specific approaches will be required to manage agro-ecosystems in a sustainable manner.

The challenge lies in gathering and disseminating knowledge about good agricultural practices and effective technologies for distinctive needs and scaling up their applications. In short, localised successes must be expanded dramatically to have a meaningful effect on the sustainability of agriculture globally. While many initiatives have been launched relating to sustainable agriculture, often in the context of improving practices in developing countries, these initiatives often overlap in terms of research undertaken and very little knowledge sharing occurs between them. What is needed is a systematic assessment of good practices, based on factual evidence, and aggressive efforts to spread knowledge-intensive approaches for sustainable intensification of farming.

To achieve this coherent and sustained governmental support will be required. More than 20 years ago, the world community agreed in the Rio Declaration that States must “cooperate to strengthen capacity-building for sustainable development by improving scientific understanding through exchanges of respective knowledge, and by enhancing the development, adaptation, diffusion and transfer of technologies, including new and innovative technologies.” If we want to maintain the partnership between agriculture and biodiversity, we must better implement this principle and ensure that known solutions are made available to all.

Plant Breeding

A dramatic increase in productivity is among the most impressive achievements of agriculture in the past 50 years. This increased productivity saved a landmass the size of North America from conversion to agricultural farmland. It is estimated that some 30-60% of increases are due to improved crop varieties made possible by plant breeding.

Hybrid seeds have helped produce a significant increase in yields. Plant breeding also has been

widely used to improve resistance to disease and pests. More recently, genetically engineered (GE) crops have further contributed to better yields, quality, and greater pest resistance. These developments have resulted in savings to the farmer in terms of water, soil, energy, time and costs. Improved crop varieties are more efficient at utilising valuable resources, such as nutrients and water. Future improved seed varieties will be key to providing other traits that will be important for healthier diets (less trans-fatty acids, more proteins) or for adaptation to climate change, for instance, through the breeding of stress tolerant crops, that better withstand heat, drought, salinity or cold weather conditions.

In addition to contributing to increased yields, plant breeders also are helping conserve plant biodiversity. The first gene banks to preserve plant biodiversity were created by breeders in the 1930's. Today there are more than 1,500 collections of plant genetic resources around the world, holding more than six million plant samples.

Further, every year, thousands of new varieties are released. The 2000 OECD list of cultivars traded internationally, mainly in field crops, comprises 24,274 cultivars. Indeed, in some crops, plant biodiversity is being enhanced as the range of genetic material in crops is enriched by professional breeding, which benefits from inclusion of wild relatives conserved in the gene banks or originating from the original genetic source. For instance, the wheat variety VEERY, introduced in the 1980s and still used in breeding today was developed through 3,170 crosses involving 51 crop parents from 21 countries. Taking another example, in France, parent varieties derived from non-local germplasm represented less than one-third of all crops in the 1960s, but over half by the 1980s.

Integrated Farming Practices

Integrated Crop Management (ICM), a concept promoted since the 1980s, is one of the known solutions to an increase in demand for agricultural products, providing a sensible, balanced and holistic way forward. ICM is a knowledge-intensive approach that balances the economic (e.g. farmers' livelihoods), social and environmental "triple bottom line" dimensions of sustainability and sets a framework of good agricultural practices.

Practices promoted by ICM include a wide portfolio of management measures such as soil and nutrient management, crop choice and protection as well as dealing with water and energy management and landscape protection. Within ICM, pest control is referred to as Integrated Pest Management (IPM). This includes both indirect measures for weed, insect and disease prevention, such as crop rotation, and direct control measures through biological, biotechnological, chemical and mechanical means.

With regard to biodiversity conservation, ICM encourages the maintenance or (re-) establishment of natural habitats by establishing field margins, levees (e.g. rice cultivation), beetle banks or hedges. These activities not only safeguard habitats for flora and fauna by providing cover and refuge for beneficial insects, predators and wildlife but also serve as windbreaks to reduce soil erosion. The maintenance of natural habitats at the farm level also contributes to establishing a network of connected habitats at the broader landscape level called for by the Convention on Biological Diversity.

A large percentage of cultivated fields are situated on land that originally was afforested or on sloping land, which may lead to severe soil erosion. Effective practices are used to allow farmers to continue farming without reducing income, such as rearrangement of fields to follow contour lines, changes in planting methods, use of cover crops and reforestation schemes.

No-till or minimum-till farming have proven to be very sensible land management approaches, which have often been made possible by the availability of herbicide tolerant (genetically engineered) crops varieties. Among the biggest benefits of reduced tillage is a decrease in erosion and improved soil moisture conservation, generated through organic matter increase in the soil. This contributes to increased carbon sequestration and therefore avoids greenhouse gases emissions.

No-till methods are now being utilised on more than 95 million hectares world wide with increasing interest from farmers. The countries with the biggest area under no-till are the United States followed by Brazil, Argentina, Canada, Australia and Paraguay. In each of these six countries, adoption is above 1 million hectares. No-till farming acreage in the United States doubled in the five-year period following the introduction of herbicide-tolerant soybeans. Here no-till and minimum-till farming saved 247 million tons of irreplaceable topsoil and 234 million gallons of fuel in 2002 alone.

Water may become the limiting factor to sustainable agriculture in many of the hotter parts of the rural world. Making irrigation more efficient, creating rainwater reservoirs, improving the water table through land management and improved access to water sources increase crop yield and labour effectiveness in agriculture. They are all valid solutions for improved integrated water management approaches.

Crop Protection Products

The introduction of new crop protection products takes, from discovery to commercialisation, on average ten years. Crop protection products are researched thoroughly to maintain human and environmental health. This rigorous testing regime makes them the most comprehensively studied chemicals in the world.

Research includes conventional laboratory studies, but also testing in the “field”, where the most sophisticated tools, such as radio telemetry, satellite tracking, high-resolution spatial analysis and powerful data processing, are used to assess and evaluate the interaction between products and agro-ecosystems. This enables the better understanding of the behaviour and the position of individual fauna and flora species within ecosystems, including those species living in water bodies or adjacent terrestrial ecosystems. The testing includes understanding the interactions of products with terrestrial and aquatic non-target species such as bees, plants and insects, as well as algae, fish and aquatic invertebrates such as water fleas.

Bees and other pollinators provide important services and other beneficial insects include predators and parasitoids that provide a valuable pest management service to agriculture. Pesticide evaluation has ensured for many years that insecticides will not adversely affect

pollinators or beneficial insect populations when used properly, so that they can continue to perform their valuable services to agriculture. Many pesticides, such as systemic products that only control those insects or diseases that harm the plant through sucking or biting, can be fully incorporated within IPM approaches.

Invasive Alien Species (IAS) can cause significant economic loss and present a great risk not only to agriculture but also to biodiversity and human health. The management of IAS requires thorough knowledge of their life-cycles to adapt management approaches. In many instances, the use of pesticides is an important tool in managing pest and non-pest IAS.

Meeting the Challenge: Identification, Adaptation and Dissemination of Solutions

The private sector is a key player in the development and promotion of practices and technologies that can make sustainable agriculture a reality for more countries, local communities, and farmers. As this paper shows many of the solutions needed to attain sustainability in agriculture are known. However, it is up to governments to create the right legislative framework to encourage the creation of successful technologies. This will require:

- Strengthening research to fill knowledge gaps between agriculture, technology and biodiversity;
- A shift towards more outcome-focused and tailored biodiversity-enhancing measures that address local, site-specific needs, rather than relying on arbitrary, non-science-based measures;
- Encouraging investment in the development of new improved varieties and technologies, by providing for intellectual property protection. Even with recurring seed cost, which are usually relatively low, this incentive to innovative variety development provides for a continuous supply of new improved varieties for the future, which is an advantage to both large and small scale farmers;
- Introducing market mechanisms that enable participation and strong ownership by farmers, suppliers, the food industry and governments, to make the health and environmental benefits of Integrated Crop Management more transparent for consumers; and
- Enabling farmers to implement sound agro-ecosystem management measures by means of targeted capacity-building programmes and by rewarding their commitment with performance incentives.

The private sector urges an all-out effort by the international community to replicate successful solutions and activities that harness and promote good practices. This will facilitate transfer, adaptation and scaling up of all the best approaches and technologies available today. Let us be optimistic, but practical. Let us share what we know, build on the best, and ensure farm-level choice to truly achieve sustainability. The private sector looks forward to being a partner with governments and other stakeholders in the quest for sustainable agricultural.

For more information on matters addressed in this paper, please see:

International Agri-Food Network, Background Paper for 16th Session of the United Nations Commission for Sustainable Development, available at: http://daccessdds.un.org/doc/UNDOC/GEN/N07/664/74/PDF/N0766474.pdf?OpenElement

International Seed Federation, "Seeds for Mankind: Plant Breeding, Seed and Sustainable Agriculture" (May 2002), available at: www.worldseed.org/en-us/international_seed/bookshop.html

Radha Ranganathan, International Seed Federation; "Plant Genetic Reousrces for Food and Agriculture: A Common Heritage of Mankind?" (2007)

*** *** ***

About ICC

The International Chamber of Commerce is the largest, most representative business organization in the world. Its hundreds of thousands of member companies in over 130 countries have interests spanning every sector of private enterprise.

A world network of national committees keeps the ICC International Secretariat in Paris informed about national and regional business priorities. More than 2,000 experts drawn from ICC's member companies feed their knowledge and experience into crafting the ICC stance on specific business issues.

The United Nations, the World Trade Organization, and many other intergovernmental bodies, both international and regional, are kept in touch with the views of international business through ICC.

For more information, please visit: www.iccwbo.org