# Intellectual Property Rights in Agriculture and the Interests of Asian-Pacific Economies

Keith E. Maskus
University of Colorado

Draft: March 8, 2004. Prepared for pre-conference meeting of "International Economic Relations and Structural Change: Issues and Policy Options for Japan and the United States," University of Michigan, Ann Arbor, March 13, 2004.

Very preliminary: please do not cite or quote.

Contact information: Maskus, Department of Economics, UCB 256, University of Colorado, Boulder, CO, 80309-0256; maskus@colorado.edu; telephone 303-492-7588; fax 303-492-8960.

This draft is a précis and overview of the full draft to be prepared for the final conference, May 15, 2004.

## 1. Introduction

Agricultural trade policy continues to be at the forefront of international controversy at both the multilateral level and on various regional fronts. Agricultural trade liberalization is likely to be the linchpin of any significant agreements in the ongoing Doha Development Round. Within the Asia-Pacific region, a number of bilateral trade agreements implicate agricultural support and trade policies in varying degrees. It is evident that Japan, Korea, and other East Asian economies remain relatively closed to trade in food, while protection is also high in critical agricultural products in the United States, Canada, and Australia.

An important, and sometimes overlooked, feature of farm policy and economics is that agriculture is a technologically dynamic sector. Agriculture is in the midst of two ongoing technological revolutions -- crop genetics and livestock industrialization -- and is in the early stages of a third -- gene modification through recombinant DNA. These technological changes have a number of implications. First, the evolution of large agro-business firms devoted to life science has generated substantial industrial concentration and vertical integration in the sector. Second, while research in agricultural product development is increasingly undertaken in the private sector, the relationships between public research agencies and private firms in establishing basic scientific results are increasingly complex. Third, there is increasing product innovation through the development of new plant and animal varieties, biologically based inputs for agriculture, and crop-based nutritional and pharmaceutical goods.

Taken together, these factors mean that the industry relies increasingly on formal means of protecting new technologies, including intellectual property rights (IPRs), and

there are strong interests pushing for international harmonization in this regard. There are three major forms of IPRs that affect such protection and the willingness to invest in agricultural technologies. These are patents on life forms, plant variety rights, and geographical indications.[1] Also relevant is competition policy, including the treatment of exhaustion (parallel imports).

Put briefly, the increasing application of science and industry to agriculture makes the sector increasingly globalized, as new technologies and agriculturally based multinational enterprises (MNEs) push to extend markets across borders. This trend clearly raises some difficult questions for policymakers in Asia and elsewhere. For example, to what extent can restrictive trade policies and agricultural supports be sustained in this environment? What would reducing such supports imply about the ability of firms to invest in agricultural technologies, given other basic determinants of comparative advantage in this sector? What set of IPRs standards would be appropriate for nurturing agricultural development and would such IPRs have the potential to offset the competitive pressures arising from trade liberalization? To what extent would IPRs need to be supplemented by additional policy support? How should innovation policies be established in light of difficult international controversies regarding sanitary and phytosanitary standards and issues of environmental use and biodiversity? It is evident that such policies exist in a second-best world.

In this paper I offer a largely qualitative analysis of such issues. While paying some attention to the interests of developing countries in East Asia, the emphasis is on the main players in Asia-Pacific trade and production in agricultural goods: the United

[1] Also important are trade secrets protecting confidential information or know-how, trademarks, certification marks, and protection of confidential test data. But these policies are not much under debate.

States, Canada, Japan, China, Korea, and Australia. In the next section I discuss essential technological changes in agriculture and some basic issues they raise. In section three I explain the nature of IPRs in agriculture, including the policy environment in major countries. In section 4 I look at the economic interests of these countries by considering information on endowments, technology, production, and trade. In section 5 I take up the question of linkages between IPRs and other supports, including trade policy and agricultural subsidies. Included are observations about the scope for regional policies and reforms in the WTO. A final section concludes.

NOTE: THE REST OF THIS PAPER IS IN OUTLINE FORM

**2. Technical Change in Agriculture**

- Agriculture has long been subject to significant technical change in order to deal with cost factors, endowments, etc. Mechanization and chemical use were early forms.
- Major role of government in this regard, especially in the US.
- Genetic improvements in crops (hybridization, Green Revolution, plant varieties) are a major force for technical change and diffusion. Figures to be provided for investment, adoption, diffusion and the apparent determinants in Asia-Pacific.
- Industrialization of meat production (poultry, beef, fish, etc.) is a significant form of technological change that has reduced the real costs of providing protein-based nutrition in Asia. Industrialization involves application of antibiotics and feed technologies that permit large-scale

aggregation of animals. Figures to be provided for such developments in Asia-Pacific.

- Genetic modification (recombinant DNA) of plants and animals is the newest major wave of technological change. Technologies range from genetic research tools through final products and affect agricultural and industrial inputs, food products, and pharmaceuticals. Figures to be provided for investments and production of such goods in Asia-Pacific.
- Implications of technical changes for industrial organization of agro-business firms (suppliers of seeds, fertilizers, etc.) and distributors. Increasing vertical integration of distribution with science. Look at whatever measures are available of multinationalization within these sectors in Asia-Pacific.

**3. The Protection and Regulation of Intellectual Property in Agriculture and Food**

- Definitions and norms for main forms of IPRs:
    - Plant variety rights provide exclusive rights for developers of genetically stable and new strains of plants. These rights exist for fixed time periods and may be limited by farmer's privileges and research exemptions (reverse engineering rights). Relate legal protection to effects of hybridization.
    - Patents in biotechnology and life forms provide 20-year exclusive production, sale, and use rights for new forms of plants, animals, and genetic technologies. There may be a research exemption but this is of

questionable scope. Issues of public interest in access to basic genomic inventions.

- Geographical indications provide exclusive rights to market a product under a mark designating the good as having come (in some essential way) from a specific region.

- The scope of required standards under TRIPS and ongoing debates at WTO.
  - Plant variety rights and adherence to UPOV.
  - Patents under TRIPS Article 27.3 regarding protection of cellular organisms and life-based technologies. Particular questions arise in context of genetically modified organisms.
  - Geographical indications protection required for wines and spirits and may be used more widely for food products.
  - Relationship of these IPRs to SPS agreement and to Convention on Biodiversity (Cartagena Protocol on biosafety).

- Brief overview of main policy approaches to IPRs in each of the major countries: US, Canada, Australia, Japan, Korea, and China. Analysis of significant differences in these approaches and prospects for harmonization. Briefly mention movements in this regard from bilateral and regional agreements.

**4. Economic Interests of Asia-Pacific Economies**

- Trends in agricultural activity in major economies.
    - Figures on land use, input demand, production, and consumption.
    - Trends in exports, imports of goods and technical inputs. Are there any detectable movements in such measures as revealed comparative advantage for major crops and products?
    - Comments on the extent of agricultural protection and supports (eg, PSEs and CSEs).

- Overview of innovation and innovation systems in agriculture in major economies.
    - Role of public sector and extension services; commercialization of basic results from universities and research laboratories.
    - Review available information on industrialization of food production and distribution.
    - Measures of research and innovation activity in agriculture, biotechnology, and food products. Data to be provided on trends in registration activity of each major country in agricultural/food patents, plant variety rights, and geographical indications.

- Conclusions regarding economic and policy interests in IPRs in agriculture in relation to comparative advantage, production, and technical change. Implications for unilateral policy reforms.

## 5. Linking IPRs to Trade Policy

- Discussion of scope for IPRs to enhance or limit technological improvements and new product development in the process of trade liberalization. To what extent might these policies be considered substitutes (eg, as tariff barriers fall would an increase in IPRs reduce competitive pressures) or complements?
- The scope for IPRs similarly to reduce the need for other agricultural support policies. What are the main circumstances under which such substitution might work and can food importers take advantage of this situation?
- Similar questions arise with respect to linking IPRs with policies on standards and labeling.
- Does this analysis support closer integration of main Asia-Pacific economies through greater harmonization of their IPRs policies? What would be their interests as regards continuing discussions at the WTO?

## 6. Concluding Remarks