Global Aspects of Intellectual Property Rights on Plant Genetic Resources

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Trend of international IP agreements

International agreements	Patent	PBR	Farmers rights
Paris Convention (1883)	*		
UPOV (1961)		*	
International Undertaking of PGR (1983, 89)			*
Convention on Biological Diversity (1993)		*	*
TRIPs (1994)	*	*	
International Treaty of PGR (2001)			*

1. Patent

- In most countries, plants and plant products are not eligible for a patent, except
  - United States, Europe, and Australia
- In United States,
  - Any living organism is patentable, as long as it is the product of human intervention (*Diamond* vs. *Chakrabarty*, 1980)
  - Protectable objects: plant varieties, plants, parts, components, methodologies, vectors, etc.
  - Dual protection: patent and plant breeders' rights (*J.E.M. AG supply vs. Pioneer*, 2001)

Current international status

- In Europe,
  - European Directive (1998), through European Patent Office
  - Plant varieties per se are not patentable; they are protected by separate plant breeders' rights.
  - Transgenic plants are patentable.
- In Australia,
  - All technologies are patentable, except human beings.
  - Like the U.S., plant varieties are patentable.

Features of patent system

- Not enough quantitative information so far
  - U.S.: 1200 patents for plant varieties; 2500 for plants and methods, for the past two decades.
- Features of patent system
  - Different impacts on different industries
  - Static view: Balance between the generation and distribution of innovation
  - Dynamic view: Balance between the current and future incentive for innovation
    - Research tools: upstream research
    - Final products: downstream research

Patenting and Plant Genetic Resources

- Issues in (medical) biology
  - Patenting of basic research tools
  - Anti-commons: too many property rights
  - Royalty stacking: high transaction costs
  - Privatization of public knowledge
- Changing trends
  - Less patenting on basic technologies: public goods
  - Liberal licensing of research tool: Public Intellectual Property for Agriculture (PIPRA)
  - Open source movement: software

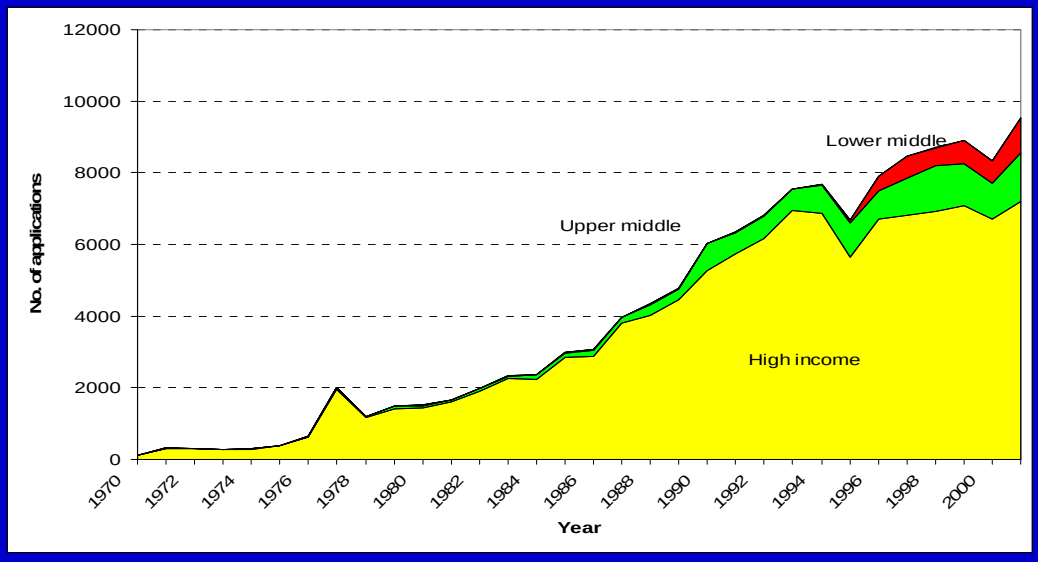
2. Plant breeders' rights

- **UPOV (International Union for the Protection of New Varieties of Plants)**
  - International guideline of PBR (1961, 1978, 1991)
  - Weaker form of protection (DUS)
- **United States**
  - Plant Patent (1930) + Plant variety protection (1970)
- **Europe**
  - National protection from 1940s and 1950s
  - Community Plant Variety Rights (1995)
- **Developing countries: start in late 1990s**
  - India: PBR + farmers' rights (2001)

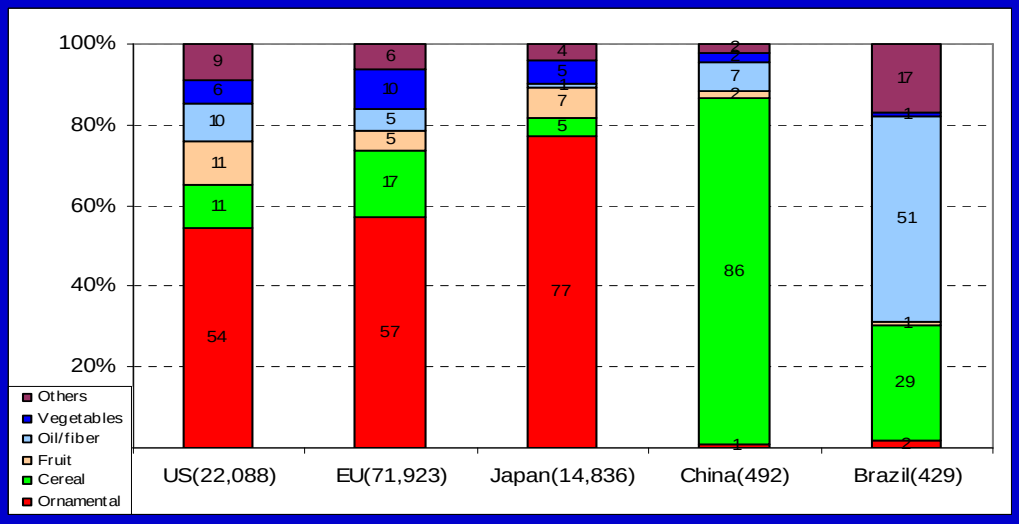
International plant variety protection (2004)

Economies	Statutory protection	Legislation prepared	Member	
			UPOV	WIPO
		(number of countries)		
High income economies (43)	**29**	**4**	**23**	**37**
OECD (24)	23		21	24
Non-OECD (19)	6	4	2	13
Upper middle income economies (34)	**20**	**4**	**14**	**28**
Lower middle income economies (53)	**20**	**18**	**13**	**36**
Low income economies (61)	**22**	**3**	**4**	**42**
Total (191)	**91**	**29**	**54**	**143**

Global trend of PBRs



Protected crops under PBRs by country



PBRs and plant genetic resources

- **UPOV-type PBRs**
  - A preferred way of implementing TRIPs requirement
    - "All member countries should protect plant varieties by patent or *sui generis* system or combination."
  - Increasing UPOV memberships
    - 5 (1961) → 20 (1992) → 29 (1995) → 54 (2004)
- **Cheaper and weaker means of protecting PGR**
- **But, there are mixed results of its impacts**
  - R&D investment might have not increased
  - Less protection with many exemptions
  - May have marketing value: Role of trademark

3. Issues of benefit sharing

- **Size of the benefits to be shared?**
  - Cumulative innovation: pedigree information
  - Substitute germplasm and the marginal value
  - Size of commercial market: ag vs. pharma
  - Non-monetary benefits
- **Costs of the benefit sharing system**
  - Reduced demand for germplasm: Access law
  - Reciprocity: I need to pay 'to be paid.'
  - High transaction costs: national and global
- **Net benefit under different sharing mechanism?**

Conclusion

- Patents are used in limited territories.
- PBRs are the preferred choice of mechanism
- Not enough evidence of the value of protecting PBRs
- Implementation of benefit sharing needs careful analysis of its likely net benefits
  - Possibly smaller benefits and larger costs than expected