The exploitation of plant genetic information: Political strategies in crop development
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Conclusion

The collection and conservation of plants and seeds in developing countries and the legal protection of new plant varieties have provoked considerable controversy over the past decades. International agreement has not yet been achieved, as evidenced by the difficulties experienced in the conclusion of two major international agreements negotiated in the 1990s: the Convention on Biological Diversity (CBD) and the agreement on Trade-Related Aspects of Intellectual Property Rights (TRIPS). The crux of the disagreement is the question of who is to benefit from the exploitation of plant genetic information. For some, the transnational enterprises that exploit and protect plant genetic information collected in the developing countries are guilty of 'bio-piracy'. Others shrug off this criticism, pointing out that plants are a renewable resource, and that a careful collection of plants does not harm farming opportunities in developing countries. It is also often contended that domestic enterprises in developing countries are located in the midst of diverse genetic resources without exploiting them. If these enterprises do not themselves take advantage of the biodiversity, it is argued, why should they prevent foreign enterprises from doing so?

In this book we argue that the root of the 'PGR conflict' must be sought in the industrialization of agriculture. Agro-industrialization can be considered as the fundamental dynamics in agriculture and comprises the gradual transformation of farming into an industrial production process. Step by step, discrete farming activities are being replaced by industrially manufactured goods; horses are replaced by tractors, manure by fertilizer, landraces by high-yielding plant varieties, and on-farm saved seed by commercial seed. In some cases, industrially produced foodstuffs entirely replace farm produce.

Since the pace of agro-industrialization differs per country and region, the competitiveness of national agricultural sectors varies greatly and induces an international division of labour in agro-food production. The Third Agro-Food Order, which emerged in the 1980s, is based on an international division of labour in agri-
culture in which the OECD countries prevail. They are the main exporters of cereals, fruits, vegetables and flowers, while the developing countries, as a whole, are the main food importers. The OECD countries are also the world’s major exporters of advanced, commercial plant varieties. This situation is due to an international division of labour in crop development itself, with industrial conglomerates, based in OECD countries, constituting the nucleus.

We have shown that a country’s position in the international division of labour in agriculture is closely linked to its position in crop development. In order to produce competitively, individual countries are required to participate in the international division of labour in crop development, and to follow the internationally agreed rules regarding the conservation and exploitation of plants. For this reason, they have to design conservation policies that connect their national seed collections to the international conservation system, and they have to restrict unauthorized exploitation of plant varieties by accepting the various mechanisms that protect imported, foreign plant varieties.

The prime beneficiaries of the international regulatory framework seem to be the transnational crop development conglomerates. They are among the very few actors who have the financial and technological capacity to exploit the global gene-pool and to protect modified plant genetic information. Commercial producers in developing countries also have an advantage, but it is indirect. Acceptance of the international rules offers them opportunities to import better plant varieties. Plant breeding organizations in developing countries may benefit from the regulation, as they can protect their own plant varieties against unauthorized propagation. At the same time, however, their position vis-à-vis the conglomerates tends to weaken, because the opportunities to patent plant genetic information reduces their opportunities to exploit the pool of varieties freely for further breeding.

The major opponents of the international crop development regulation are the nature and farmer-oriented non-governmental organizations (NGOs) and indigenous peoples’ organizations. They act as last resort for all those small-scale farmers who cannot participate in the process of agro-industrialization, because they lack the land, the credit, the infrastructure, and the markets. In principle, the peasantry could play a significant role in the international division of labour in crop development as suppliers of plant genetic information. Much of the world’s biodiversity is found in, or around the peasants’ fields, and in the territories of indigenous peoples. However, they have little to win from international crop development policies that have the explicit objective to promote industrialized forms of agriculture. The number of so-called ‘non-viable’ farms, unable to keep pace with the agro-industrialization process and left to fend for themselves, is increasing. Unlike in OECD countries, there is little prospect of alternative employment in the industrial or service sectors, while adequate social security schemes are generally absent. As a result, the industrialization of agriculture and the associated international crop development regulations are considered as a threat to resource-poor farmers. The PGR conflict is therefore likely to intensify, irrespective of the regulations that are being developed to compensate developing countries or their rural population for the supply of plant genetic in-
formation. The sharp disapproval of the recently disclosed ‘terminator technology’ may serve as an illustration. The technology has been denounced as a “genetic bomb”, a “Trojan Horse”, and as “biological warfare” (RAFI, 1998c).

Every considered option to ease the PGR conflict must take into account the fundamental contradiction in policies that foster agro-industrialization. On the one hand, a further industrial transformation of farming seems to be unavoidable in view of an expanding, basically urban world population. On the other hand, the same process increasingly excludes parts of the rural population from participation in agriculture, forcing them to migrate to the cities. The management of this contradiction requires that the agro-industrialization process be led not by market prices alone, but also by active steering on the basis of national political agendas that mitigate or prevent undesirable consequences. Such political intervention is not just in the interest of the peasantry, but also of governments in developing countries, and of the transnational crop development industry.

Because of their innovative capacity and influence in the design of international conservation and IPR regulation, the industrial conglomerates have become central actors in crop development and agriculture worldwide. Their influence is so substantial that the conglomerates, such as Monsanto, DuPont-Pioneer, ELM-Pulsar, Novartis, Rhone Poulenc-Limagrain and Zeneca-Cosun, can no longer ignore the social opposition their strategies arouse. On the one hand, this is a question of ethics. Their key position in farming and food production bestows the industrial conglomerates with a public responsibility to farmers and consumers. On the other hand, however, it is a matter of sheer corporate interest. Large global sales are the fundament of the conglomerates’ influential position, but also make them vulnerable to civil resistance.

For example, local farming and indigenous organizations may hinder industrial exploitation of locally available plants. By challenging the authority of the national PGR curator of their country, they could obstruct the national biodiversity access regulation, designed by the central government, as agreed upon under the Convention on Biological Diversity. Encouraged by Greenpeace’s success in opposing the intended dumping of Brent Spar by Shell, farmers and consumers’ organizations may also use their purchasing power as a trump card in their opposition. Industrial crop development conglomerates also run the risk of violent opposition. Their personnel and products may increasingly be received with hostility by parts of the rural population in developing countries. In this respect we refer to the ransacking of the local Cargill office by farmers in India, some years ago. In order to diminish the chances of being the victim of such actions, Pioneer Hi-Bred Colombia has the policy of hiding its office. When we visited the plant, there were no signboards carrying the company’s name, and the location of the company was hardly known among the local population. The marginalization of an increasing part of the rural population in developing countries may have devastating effects. This process undoubtedly supports political agitation and instability, and encourages migration to the slums of national cities or to OECD countries. All these develop-
ments are taking place now, and potentially have not only regional but also worldwide consequences.

Now the question arises whether or not it is possible for governments and industrial conglomerates to adjust their strategies in order to reduce the high social costs associated with the process of agro-industrialization. We think it is possible, provided that a number of requirements are met.

The first requirement is that CEOs and governmental leaders reconsider their one-dimensional, global view on agricultural production and crop development. The metaphor of the 'global village' that is often employed to illustrate that adequate decisions can be taken at a global level about agro-food production and distribution, disguises the many national and regional differences. The uneven advances in the process of agro-industrialization, combined with the vast socio-economic and cultural diversity in world agriculture, make it impossible for agro-food production to be served from a central position, with a single uniform regulatory recipe. International crop development regulation may fit all those agricultural sectors - in OECD as well as in developing countries - that are incorporated in, and benefit from industrialized production systems. However, in most developing countries, a large part of the rural population pursues a basically non-industrial and non-commercial agro-food production strategy. It does not make sense that international crop development regulation is applied to, or interferes with, this type of production.

In the second place, it is essential that governments and CEOs recognize this non-industrial survival strategy, and consider production improvement by non-industrial means as a goal in itself. Instead of maintaining a dismissive attitude towards "backward" forms of production that should already have been replaced, the use of traditional varieties, on-farm saved seed, organic fertilizer and biological insecticides must be considered as a viable and inevitable production alternative that deserves professional support. Science should be employed to enhance the exploitation of resources readily available in the region, on condition that the knowledge, habits, preferences and ethics of the local communities are taken as a starting point.

The necessity to support non-industrial agriculture has already been acknowledged in recent policy papers of the international agricultural establishment (cf. CGIAR, 1998; Conway, 1997; Conway et al., 1995; Srivastava et al., 1996). In these publications it is recognized that, apart from an intensification of production in high-potential areas, more research is needed in lower-potential areas. The aims of this research should be the improvement of farming systems rather than specific commodities, a reduction in the use of external inputs (pesticides and fertilizers), and greater involvement of farmers and local communities in the research design.

Even though this policy shift is to be welcomed, the critical reaction it has provoked on the part of some farm-oriented NGOs, notably the Rural Advancement Foundation International (RAFI, 1998d), seems justified. The main international agricultural research centres and the CGIAR were the central engine of the Green Revolution, which facilitated the agro-industrialization process in developing
countries. It is therefore not obvious that these organizations should take the lead in the design and implementation of research in support of non-industrial agriculture. Most plant breeders and molecular biologists have been educated in the idea that agricultural improvement is determined by technological opportunities, rather than by farming and ecological capacity. In order to be able to facilitate low external input agriculture, they must first radically change their attitude towards non-industrial farming and farmers. This can only be achieved if a new, modern appeal is attributed to close peasant/scientist relationships and to many farming elements that are usually regarded as laborious, obsolete, traditional, and primitive. Those non-governmental organizations that are experienced in research on non-industrial agriculture in developing countries should be given a prominent role in this cultural transformation of scientists.

The third requirement for governments and industrial conglomerates to reduce the high social costs associated with the process of agro-industrialization and to ease the PGR conflict is an adjustment of the international crop development regulation itself. Below, we map out a number of specific options for such changes in regulation with respect to conservation, biodiversity access and plant-related IPR protection.

**Conservation**

It is necessary to remove the double agenda that currently governs global conservation efforts, financed by OECD countries. In whose interest is the global conservation system is in the first place? Obviously the crop development conglomerates are among the very few that have the resources and know-how to ‘tap’ the global conservation system for commercially interesting genetic information. The frequently heard argument that some peasant communities may benefit just as much is not entirely false, but should not disguise the fact that the system was not designed for them. The global conservation system is to support agro-industrialization and thus entails little benefit for non-industrial agriculture. To repair the broken relationship between local peasant interests and global conservation goals, it is necessary to design an additional, alternative conservation strategy that re-establishes the closed circle of conservation, local breeding, and agricultural production. Linking conservation to local production should be recognized as a goal in itself and not necessarily be related to the global conservation system.

**Access regulation**

Governments that are in the process of implementing the CBD tend to evade questions of access to and compensation for genetic information. An important reason is that a debate of these questions fans the flames of other more controversial issues, such as ethnic and territorial rights. Many governments, therefore, prefer a very diplomatic and ‘soft’ interpretation of the Convention. The fact that marginalized farmers’ groups and indigenous peoples' organizations use the CBD as a political ‘spring board’ is, nevertheless, an important sign on the wall. It indicates that the heated debate on fairly technical access and compensation issues cannot be
understood in the context of global environmental protection, but only in the socio-
economic setting of marginalized farmers and indigenous groups. In Chile and
Colombia, governmental attention for marginalized groups in the implementation
of the CBD is confined to their role as 'custodians' of biodiversity, and not as re-
presentatives of an alternative, viable, non-industrialized agricultural production
system. As long as non-industrialized farmers are not recognized as viable agricul-
tural producers, they will continue to 'stir up' the CBD implementation process.

Governments may benefit from a dual approach in the design and implementa-
tion of access regulation. The starting point for a dual approach is the recognition
of the divergent interests of industrialized and non-industrialized farmers in access
policies. Farmers who participate in industrialized, commercial agro-food production
systems often rely on foreign plant varieties or on domestic varieties that incorporate
foreign genetic information. They therefore have an interest in a free access regime,
thus allowing foreigners to use national biodiversity. A restrictive access policy of
their own government might provoke reciprocal actions from governments of coun-
tries where they obtain their varieties. The free access approach for industrialized
producers implies that, for example, Pioneer Hi-Bred is allowed use CIAT’s or
CORPOICA’s maize collections as long as these two institutes are convinced that
they will receive sufficient genetic information in return, be it in the form of DNA
sequences, finished varieties, or landraces from Pioneer’s own collections.

The dual approach, however, implies that farmers involved in non-industrial
production, who have no direct interest in global conservation, are free to interpret
access regulation in accordance with their interests. A strict access regulation may
help individual farming or indigenous peoples’ communities to generate funds
from foreign institutes or enterprises, as in the Merck - InBio ‘bioprospecting’
agreement. Monetary compensation, however, is not sufficient to counter the
process of marginalization to which most non-industrialized farmers are subjected.
Bioprospecting agreements should therefore be explicitly related to both the recog-
nition and the refinement of non-industrial agriculture. In practice this implies that
bioprospecting contracts should be linked to the pressing needs of the rural popu-
lation in the region where the plants are being collected. These needs are access to
land, credit, markets, infrastructure, health, education, empowerment, and non-
industrial crop development.

Plant-related IPR protection
The dual approach to access regulation should be extended to plant-related IPR
protection. It seems fair that plant variety protection (PVP) should be implement-
ed and enforced in industrialized agro-food production sectors in developing coun-
tries, such as that of cut flowers in Colombia and of fruit in Chile. It is undesirable,
however, that PVP should hinder propagation of varieties by the peasantry and
those categories of medium-sized farmers who are economically most vulnerable.
To this end, national governments deserve support for their attempts to retain
opportunities to exclude certain crops from PVP, or to exempt on-farm saving and
the exchange of seed among resource-poor farmers. In this respect, the PVP and
biotechnology patent legislation adopted in the European Union may serve as an international precedent. It also seems justifiable that governments retain the right to control the growing of hybrid varieties or varieties that contain the "terminator" gene. While such varieties are acceptable for industrial farming systems, they are inappropriate for (and may negatively affect) the majority of the rural population in developing countries.

So far, plant-related IPR has primarily attracted the attention in developing countries of farmer and environment-oriented NGOs, in view of its negative impact on farmers. Plant breeding organizations in developing countries have, to a certain extent, considered the impact of PVP on their future breeding activities, but not the effects of patent coverage - an issue they should certainly address. Patent protection of whole plants, plant varieties and their progeny entails the real danger that in the near future a large part of the gene pool of commercial varieties will no longer be freely available to plant breeders. For this reason, it seems justified to consider limiting the scope of the patent claims for plant-related inventions to techniques or specified genetic information.
Conclusion