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Comment on Graff, Roland-Holst and Zilberman: Agricultural biotechnology and globalization: how will public-private partnership evolve?

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The paper takes two examples of public–private-partnership successes in agriculture and medical science: the green revolution and medical biotechnology. The green revolution was initiated by international research centres such as CYMMIT, CIP and IRRI: (i) the accessions and varieties were distributed to national institutes and breeding companies, (ii) the local extension services provided the farmers with advice on using well-adapted varieties, (iii) these activities were followed by the appearance of hybrids developed by breeding companies. Nowadays extension services have become privatized and farmers often lack information especially in the developing world; In contrast to the green-revolution period, the present extension services in many countries have disappeared or become privatized.

The difference between the green revolution and agro-biotechnology (ag-biotech):

1. Ag-biotech is an industrial issue, while variety improvement was an issue for farmers or small breeding companies.
2. Small breeding companies cannot afford the costs; in The Netherlands biotech companies have built a consortium of small biotech companies to perform contract research for them on a non-competitive basis; the costs are just too high for one company.
3. Small independent biotech companies often do not exist for a long time; they are bought by established companies; scientists from some private biotech companies in the US and Europe return to the university labs (Fame, Freedom, Fortune).
4. There is a crisis in developing countries as multinationals merge and buy small biotech companies: overall there is a decrease in private investment in ag-biotech.
5. After these mergers there are fewer private partners left to support research at universities, which counteracts the flourishing relations between public and private sector.
6. In addition, due to the GMO debate big companies are reluctant to invest in GMOs; the profits are often marginal; too many costly patents.
   This is in contrast with the situation in medical biotech.

The solution:

1. Make genome sequences of crops publicly available as soon as possible.
2. Let small start-up companies work on functional genomics.

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There is still much to be done; only 5% of the genome variation is exploited in breeding lines; a patent does not mean anything if it is not further developed into a product.

The problem of the North–South dialogue:

Incomplete delineation and protection of property rights.

1. Low per capita income.
2. Capital insufficiency.

Solutions:

1. Agricultural Clearing House; release constraints for commodity crops.
2. Found small public DNA labs in developing countries.
3. The (international) public sector should invest in genomics and functional genomics; little of the genetic variation in plants has yet been exploited in breeding programmes. Make genome sequences publicly available as will be done with the genome sequence of rice, a commodity crop; there are still so many biological questions to be solved that could be commercialized by the private companies globally.
4. Biotechnology is still in its infancy; there are big differences in consumer technology, medical research and Ag-biotech (food and nutrition; emotional factors).

The dilemma:

Does the (local) farmer benefit from more industrial genomics activities? The prices for his products will not increase; he has to produce more to keep the same standard of living! (a chicken egg in the Netherlands has hardly increased in price over the last 30 years!).