

Precaution and the survival threshold: Oscillations between the Plimsoll Lines¹

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Biotechnological interventions generate tremendous concern and anxiety in the field of agriculture, though the same interventions in human medicine are accepted without much ado. Apparently the difference in perception is caused by the risks as well as uncertainties involved in introducing Genetically Modified Organisms (GMOs) in the nature. Part of the problem is also that the available information about various risks has not been shared as widely as was necessary to influence public opinion. Finally, the increasing corporate control over biotechnological alternatives also generates tremendous anxiety in the mind of consumers.

In countries such as India where a very large research programme on transgenics is underway in public sector, the popular perceptions are obviously quite different than in Europe where such is perhaps not the case. It is not my argument that public sector cannot be irresponsible or mask information. However, the individual motivations and the permeability of the organizational boundaries could certainly be different in public systems. Another issue which has remained less explored is the relationship between the quantum of risks involved in a technology and its potential pay off in solving urgent food problems. Notwithstanding the fact that large number of transgenic crops have been developed to increase chemical consumption (through herbicide tolerance), there are equally large biotechnological interventions possible which can reduce chemical consumption. Further, given the adverse environmental consequences of chemical pesticides and insufficiently developed markets in many developing countries, the uncoupled technologies (seed, fertilizer and chemical separately) always impose higher transaction costs compared to the coupled technology (seed with resistance to pests, incorporation of higher nutrients, tolerance to salts or other stresses). In this paper, I tried to develop one more argument for considering biotechnological interventions more parsimoniously. And this is about the attitude towards risk that small farmers take every day in order to survive and manage their resources. If we can match their capabilities to deal with risks and manage uncertainties in the context of biotechnological interventions, we would have made a significant progress in steering the research on biotechnological alternatives in more benign and sustainable directions.

The logic of survival and perception of risk:

The precautionary principle has always been a part of survival algorithms of small farmers in developing societies particularly in risk prone environments such as drought, flood prone areas, mountainous and forest regions. However, the farmers always manage risk aversion in certain markets by taking extreme risks in other resource markets as a

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part of their portfolio strategies depending upon the access, assurances, and abilities commanded by them. The issue therefore is to understand how households survive by taking risks in a manner that they not only cope with the consequences but also improve their capacity to deal with uncertainties in future.

Thus, risk taking as an input into capacity building for dealing with bigger risks or uncertainties requires a different way of thinking compared to the choice of risk at a level of survival threshold. To define a survival threshold, one can take the analogy of plimsoll line. If a ship tilts beyond the boundary of this line, it may sink. But within the range of this line, it can cope with turbulence. Survival threshold is the limit within which risks are taken. Occasionally farmers gamble, just as countries and corporations do. What we have to see is whether the gamble is worth it, what are the possible consequences for human health and life, dignity and ultimately for the ecosystem health.

Learning from risks taken to make green revolution possible:

In the mid sixties Indian planners decided to gamble by importing bulk quantities of seeds from Mexico to herald green revolution in India. There were lot of risks, of diseases, weeds and pests. Indian scientists went to Mexico and inspected the fields from which the seeds were collected and the entire operation quickly transformed within two years the total food production from 67 million tonnes to 110 million tonnes.

A country termed as a 'basket case' moved towards food self-reliance. Today it produces more than 200 million tonnes. Income disparities increased initially, sustainability decreased eventually, productivity of inputs declined and the soil and water quality deteriorated due to excessive chemical use. The agrobiodiversity declined drastically during the same period and entirely due to public sector driven dissemination of high yielding varieties. There was hardly any private sector intervention in grain seed sector.

Can we argue therefore that biotechnological risks have to be analysed through the same the same principle, i.e., a reasonable trade off between the known risks and the social pay off through sufficient institutional capability to deal with the consequences? We must of course, learn the right lessons from the green revolution experience. Without appropriate tuning of institutions (credit, irrigation, insurance, prices, etc.) the technology could not have shown the results. The technology I have argued is like words and the institutions symbolize grammar. The biotechnological interventions will need to be supported by simultaneous development of institutions to take care of risks, unforeseen consequences and at the same time ensuring proper precautions.

Making trade off rationally:

How do we ensure that the trade off between known negative externalities caused by use of chemical pesticides and other inputs vis-à-vis some of the unknown externalities likely to be caused by use of bio pesticides or transgenic crops? Is it necessarily ethical to avoid taking risks and subject societies to suffer deprivation merely because of some risks, which are not completely quantifiable? Should we reduce the risks by getting

location specific testing done in each country under rigorous conditions and with all the risks fully disclosed? Each country should have the choice to decide whether the risk is worth taking or not.

Once the level of risk is mutually agreed upon after prior informed consent, the responsibility of the global community is to ensure that a proper support system is available to safeguard the interests of technologically backward countries if such a need arises.

The precautionary principle is a valid means of generating responsibility in taking risks. It is not a means to prevent recognition and calibration of the risk. Once the risks are calibrated, it will depend upon the specific socio-economic conditions and cultural milieu, which will determine how much risk, is acceptable at what stage of economic development and with what consequences. Currently, concern with unknown risks is not matched with responsibility for known consequences of chemical pesticides and other environmental risks such as excessive extraction of ground water, decline in biodiversity, etc.

There are several issues in this debate which have remained obscure. For instance, how to link ethical issues in poverty alleviation with ethical concerns in using or not using risky technologies with suspected environmental impacts; similarly how to deal with the risks that are known but are not attended to adequately (adverse envt and health effects of chemical pesticide, there are hardly any hoardings in most developing countries telling farm workers how to use chemical pesticides safely or deal with the effects caused already) vi-a-vis the ones which are likely to cause the adverse effect in future; what is ethical basis of differential norms of disclosure by the same corporation in developed countries vis-à-vis developed countries; how do we deal with ethical basis of not allocating sufficient research resources to tackle the problems of low productivity in rainfed regions; how to deal with anxieties and fears generated by the larger corporate control of biotechnological research which has not been the case in conventional research; what are the peculiarities of processing complex information in dealing with biotechnological risks compared to other kinds of risks.

An approach to evaluate the risks on ethical, economic, equity and environmental grounds taking into account the prior experience in dealing with different kinds of technologies in a given society is needed. The question is whether the precautionary principle is better used as a tool with which to stop uncharted action, or as a motivation by which to chart those actions contemplated or taken. My preference is for the latter alternative.