

6. Conclusions

6.1 Ethics in governance

The persistently under acknowledged problems of governance of biotechnology need to be transformed into action based meaningful solutions by inviting all the interested parties at national and international level to dialogue. There is a need for serious evaluation of the potential cumulative implications and potential unintended side-effects of biotechnology development trajectories. Recent controversies suggest that new biotechnologies have profound social and political reverberations, reflecting high ethical content. In many debates on novel biotechnologies, only epistemological uncertainties of genetic modification are recognised, and there is a need for evaluation of deeper ontological uncertainties. The work of international agencies is based on strong ethical foundations, however, the balancing of the ideals sensitive to cultural and social particularities makes it complicated and sometimes these pose seemingly insurmountable challenges to the authority of established regulatory frameworks by pointing implicitly to their limitations.

There is need for separation of ethical concerns from the issues that tend to be marginalized. Some issues may be labeled as political, or emotional. In global governance often ethical issues are dealt within the context of "scientific" and "rational". However, the casting of ethics as technical or professional speciality deprives international and local governance institutions of meaningful debate on the core ethical values implicated in the use of novel biotechnologies as a mode of reproduction. There is a need for incorporation and linkages of ethics as an explicit dimension in the regular governance of biotechnology, for promotion of wider understanding of different ideologies that sometimes are specific to culture and particular socio-economic conditions.

A summary of how ethical principles lie at the foundation of global governance of biotechnology is shown in figure 27. Ethical principles shape our personal and global values. We need to balance the needs of the society while safeguarding environment for the present and future. Ethical principles guide us to do no harm to other organisms and also whole ecosystems. They are a foundation for the regulatory mechanisms at national as well as international level. Multi-sectorial cooperation between all the stakeholders

involved in biotechnology is needed and a participatory approach should be taken in the global governance of biotechnology. Public participation in a fair and democratic way is essential for understanding the needs and demands of people to take a balanced approach in order to decide national policies and regulatory frameworks.

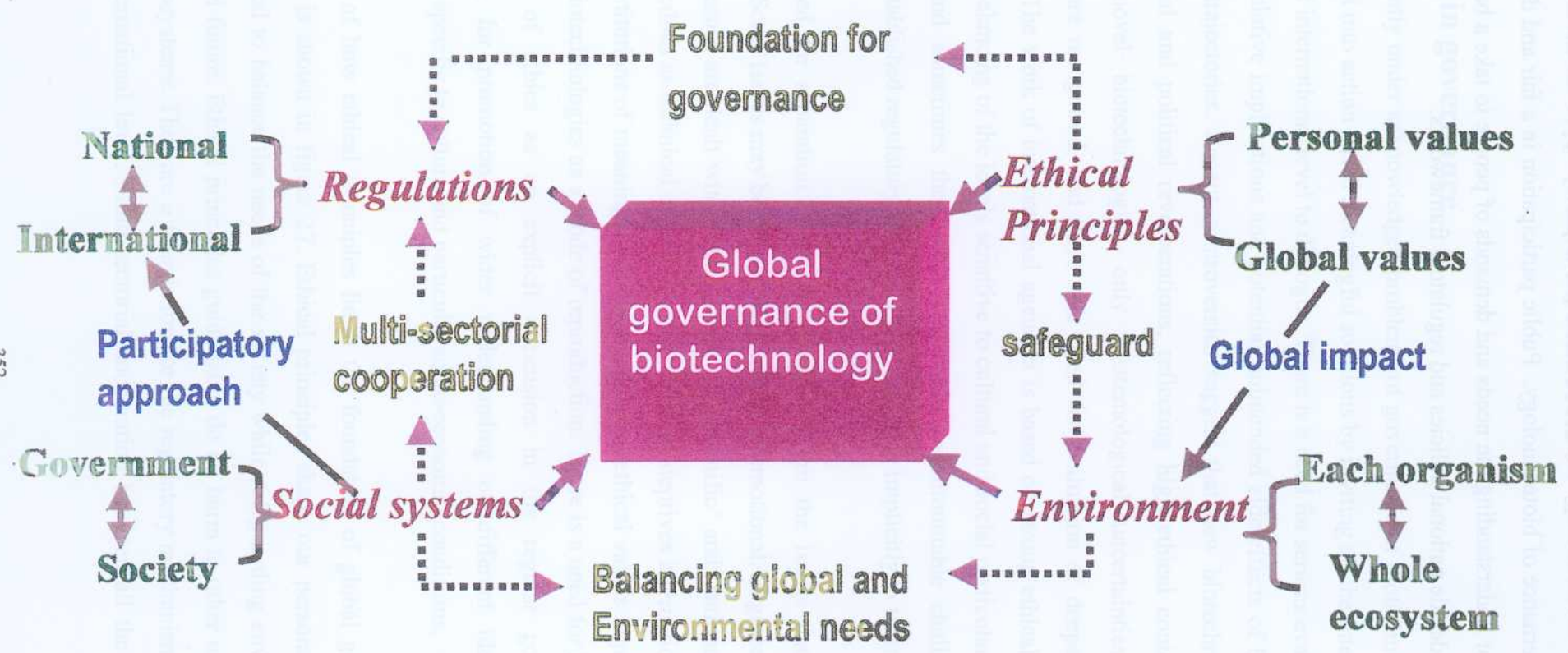


Figure 27: Foundation of ethical principles in the global governance of biotechnology

6.2 Policy implications for developing countries in biotechnology

Mobilizing modern biotechnology to address agricultural needs in developing countries implies growing responsibilities for policymakers, research managers, and scientists. These responsibilities include determining the benefits and risks of biotechnology applications, enhancing productivity and livelihoods of the poor, and determining capacity needs for biosafety. Given the rapid pace of technological change and the fast-moving international regulatory environment, developing effective national policy processes is a major challenge for developing countries. There is need for better understanding on how particular national and local contexts influence policy processes and what are their implications on poor people. Developing countries face the challenge in formulating policies that are pro-poor, pro-jobs and pro-nature oriented. These can be conceptualised through integrating tradition wisdom and technologies with most suitable new biotechnologies, while pursuing a holistic system to use and manage natural resources. Another challenge for developing countries is to convert the resources into skills and translating them into production and income generating activities through access to capital and support activities.

6.3 Scientific uncertainty of biotechnology in public policy and governance

In the global governance of biotechnology, international institutions face crucial questions of the management of the uncertainty, for example, with regard to the safety of novel biotechnologies like genetic modification. This scientific uncertainty is also the uncertainty perceived by the public and policy makers. The lack of confidence in scientific findings can be grouped in two categories. First there is uncertainty about uncertainty. The public is puzzled by the debate within the scientific community on "act now" or "wait and see" which signals confusion and ignorance, thereby supporting a rationale for inaction. The second uncertainty lies in the interpretation of science. For the ordinary public many of the scientifically significant findings seem irrelevant or incomprehensible to the exigencies of everyday life (Bradshaw 2000).

Lack of familiarity with scientific methods hinders a ready translation of science into personal choices in accepting or rejecting biotechnology. Underlying this are profound differences in perceptions of people that are characterized by different cultures, socio-economic conditions and governance systems. The gap between the public perception and governance of public policy in developing countries can be narrowed only by improving social education and learning and taking social actions simultaneously with better integration of ethical frameworks that are easily understandable and acceptable in the local, national and international governance structures.

6.4 Global bioethics and governance of biotechnology

Biotechnology is a multi-faceted subject involving many parties, linked to each other in both narrow and broad senses. In the governance systems issues need to be separated in order to solve them. However, issues should not be ignored while drafting policies and recommendations. Often national priorities of countries are important, at the same time there is a need for cooperation and understanding between all the stakeholders to have a balanced ethical approach for the resolution of the ethical issues in effective governance.

The present research confirms that the governance systems at all levels is built on a foundation of ethical principles. The terminology of ethics may not be that conspicuous in the international and national procedures, however, the principles are inherently applied at all stages of development. Ethical principles need to be applied on a daily basis, starting from individual level to the international governing bodies. The ethics of biotechnology starts from individual organism level and encompasses the whole environment, society, and governance systems. In the governance systems, environmental considerations need to be balanced with the needs of society while taking a holistic and international approach. Global bioethics is meaningful only when the integrity of society, and environment is kept sustainable for the present as well as the future. Good governance is essential for this.