

COMMUNICATION STRATEGIES FOR CREATING SUSTAINABLE PUBLIC AWARENESS ON AGRICULTURAL BIOTECHNOLOGY

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INDIA's long term economic prospects depend heavily on the agricultural sector which contributes a quarter of the GDP and provides livelihood to two-thirds of the population. It is, therefore, imperative that highest priority is accorded to agriculture. The rural demand for manufactured goods and services is also dependent on the expansion of the agricultural economy. India achieved 7 per cent plus GDP growth during 1995-96 and 1996-97, essentially due to the robust performance of the agricultural sector. Thus, development of agriculture is key to eradicating poverty, ensuring food security, generating demand for industrial goods and promoting overall development.

If the targeted rate of GDP growth of 8 percent envisaged under 10th Five Year Plan to be achieved, the agricultural sector must grow at a faster rate of 4 percent per annum. To achieve this growth rate, it may not be wise to depend entirely on conventional methods of developing and transferring the technologies. Therefore, it is imperative to promote Biotechnology in agriculture and allied sectors in a large scale.

While releasing the 10-year vision document on Bio-technology, the Prime Minister of India called upon the Department of Bio-technology to work more closely with private sector, venture capital firms and foreign academic and research institutes as R & D in Bio-technology was necessarily a global effort. He stressed that to achieve the formidable goal of 8 percent growth rate of GDP, India will have to not only increase the productivity in the traditional sectors of the economy, but also make huge advances in the emerging knowledge based enterprises like Biotechnology. The vision document

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has focused on Bio-informatics which says that 1000 trained experts in Bio-informatics with a complete genomics and Bio-informatics infrastructure and networking to be in place in two to three years.

In the recent past and during contemporary times, the most talked-about controversial topic is Biotechnology with arguments for and against. Will this technology innovation either end world hunger or damage health and environment, is it neither or both is the question of debate.

Biotechnology or ‘New Biology’ is an emerging scientific field that deals with heredity and life processes. It is the use of engineering techniques to solve problems associated with living organisms. Biotechnology is “any technique that uses living organisms to make or modify a product to improve plants or animals or to develop micro-organisms for specific uses”. In conjunction with conventional technologies, modern Biotechnology holds promise of increased and sustained productivity, efficient processing for improved product diversification and utilization, adaptation of product quality to functional requirements and decreased reliance on agro-chemicals and other external inputs. It may also promote better conservation and use of genetic resources and environmentally friendly management of natural resources (FAO, 1993). Modern technologies should be used as adjuncts and not as substitutes to conventional technology in solving problems.

Biotechnologies are likely to suffer the fate of non-adoption by the farmers and users. Even the technologies that have been hailed as solutions and innovations have suffered the non-adoption due to inadequate public awareness, inappropriateness to the farming system or agro-ecology and high cost / low profitability. People have prejudices that Biotechnologies are not suitable to stressful or unpredictable conditions. The R & D focus is on rapid pace of research and technology development with least importance to developing of common people’s knowledge. Hence, appropriate communication strategies have to be designed to increase public awareness.

Due to diversity among Indian people, particularly geographic expanse, economic, cultural and social differences, strategies for communication of Biotechnology cannot be uniform or one-shot-go. The challenge includes differences in

attitudes, varied levels of education and understanding of the issues, prejudices and preconceived notions, lack of coordination among groups offering services, lack of resources for communication and strong opposition to Biotechnology. The gap between rapid pace of scientific research and development and slower pace of societal learning needs to be bridged.

Frequently raised concerns about Biotechnology (Traynor, 2001):

- Fear of the unknown – due to little or no knowledge or no understanding of technical details and low levels of understanding about science in general; amplified by recent cases of unanticipated harmful consequences arising from other new technologies. For eg. introduction of exotic seeds, use of DDT pesticides.
- Mistrust- of government officials and multinational companies due to past experiences.
- Resistance to change- shown by placing a high value on traditional farming methods; assertions that Biotechnology is not needed because other methods would work as well.
- Sense of unfairness- those who reap the benefits are not the ones who bear the risk.
- Inaccurate perceptions of risk- shown by a desire or even demand for zero risk and proof of safety; reluctance to make trade-offs between risks, costs and benefits.

Need for public awareness on Biotechnology

- To provide food for one billion population, it will be necessary to expand food production faster than the rate of population growth. As further expansion of the area cultivated is impossible in most of the world's developing countries, the future gains in food production have to come from increased yield. (Bunders, etal – 1996).
- Bioengineering techniques are powerful new tools to supplement pathology, agronomy, plant breeding, plant physiology and other current ap-

proaches. If crop Bio-engineering techniques developed and applied in a manner consistent with ecologically sound agriculture, they could decrease reliance on a broad spectrum of insecticides which cause serious health and environmental problems.

- Biotechnological techniques could also assist in the development of crop varieties that are resistant to currently uncontrollable plant diseases.
- It has been proved that Biotechnology revolution in agriculture can dramatically reduce the costs and increase outputs. It is based on the frontier areas of science and are thus economically useful and viable. Biotechnological research cost is comparatively less in India than in the Western countries.
- The Bio-revolutions as against the green revolution can help in saving resources spent on pesticides, fertilizers, irrigation etc., leading to low cost of production.
- Biotechnology has been identified as one of the key carriers of the next wave of technological development as that of Information Technology.

Comparison between the Agricultural and Biotechnology Extension

Keywords	Agricultural	Biotechnology (*)
Focus	Production	Market
Target Group	Farmer	Consumer Farmer
Origin of technology	Field	Mostly lab
Time dimension	Time-tested	Recent Origin
Human Resources	* Labour intensive * Para-extension workers	* Capital intensive * Scientifically trained personnel
Linkages	Research-Extension-Farmer	Research-Extension-Farmer- Marketing-Consumer
Main stakeholders	Extension agency Farmers Policy Makers	Scientists, Industry, Traders, Financiers, Farmers, Extension Consumers, NGOs, Policy makers, Representatives of farmers and women's groups.
Orientation	Service	Profit-making

Keywords	Agricultural	Biotechnology (*)
Extension System	* Public Extension System * Free	* Private Extension System * Priced
Accountability	Service	Product
Credibility	High	Suspected
Understandability and adaptability	High	Low
Awareness among farmers and consumers	High	Low

(*) Mostly with higher form of Biotechnology (GMOs etc.)

Present Status of Knowledge(K), Skills(S) and Attitude(A) amongst main stakeholders about Biotechnology:

Stakeholders	Agriculture			Bio-technology		
	K	S	A	K	S	A
1. Research	H	H	H	H	M	M
2. Policy makers	H	NA	H	L	NA	H
3. Industry	H	H	H	H	H	H
4. Public Extension	H	M	M	M	L	M
5. Farmers	M	M	H	L	L	L
6. Consumers	H	NA	H	L	NA	L
7. Media	H	M	H	L	L	H
8. NGOs	M	M	M	M	L	L

(H-High; M-Medium; L – Low)

Consumer acceptance of any Biotechnology application will occur more readily when:

- * Most sought after technological applications (eg. golden rice)
- * Obvious benefits to the consumer (Eg. Lower price, better quality produce etc.)
- * Communications about the advancement are open, honest and free of Jargon
- * The risks are virtually nil and research is available to support this claim; and
- * The genetic modification is plant rather than animal based.

For planning and successfully carrying out the public campaign regarding the Biotechnology applications, necessarily the pulse of the public should be studied from time to time. Research should focus on gathering reliable and timely indicators of the changing attitudes and opinions for designing the communication strategy. Following are some of the communication strategies developed for building awareness among important stakeholders. The strategies presented here are not comprehensive in nature, but may do provide general guidelines and are based on relevant experiences in the field of Biotechnology.

Communication Strategies for Researchers / Scientists

- * Encouragement of Participatory Technology Development (PTD) rather than scientist centered technology so that the technology will be made easy for propagation and multiplication.
- * Conduct of on-farm and adaptive trials by involving all the stakeholders
- * Conduct of participatory forums to understand the technological needs of stakeholders and direction of research.
- * Organization of conferences and symposia to exchange and share the developments.
- * Video conferencing for clearing the doubts with other scientists.
- * Publication of scientific digests to disseminate the information at national / state level.
- * Creation of web pages and network of scientists and organizations contributing to the development of Biotechnology with e-mail Ids.
- * Broadcasting of talks on radio / T.V. in local language.
- * Conduct of annual / Biennial scientific forums at national / state level and provide incentives.
- * Production of video films and CDs on advancements in Biotechnology.

Communication Strategies for Policy Makers

- ♦ Constitution of multi-disciplinary teams of policy makers consisting of experts from the disciplines of Biotechnology, economics, environment, agriculture, sociology.
- ♦ Participation in stakeholders interface forum.
- ♦ Conduct of surveys to understand the pulse of all stakeholders which would help in appropriate policy formulation.
- ♦ Constant interactions with the internet and surfing through the relevant web pages.
- ♦ Pilot test of policy prior to application on a state / national level.
- ♦ Production of relevant video films and CDs for updating the information.
- ♦ Print media like newspapers, science journals etc.
- ♦ Organization of conferences and symposia to exchange and share the developments.
- ♦ Video conferencing for clearing the doubts with other scientists.

Communication Strategies for Industry:

- Constant linkage with scientific community to get updated on the latest technological developments.
- Scientific digests to understand the technological innovations.
- Attending conferences and symposia of scientists.
- Creation of web pages and network of scientists and organizations contributing to the development of Biotechnology with e-mail Ids.
- Conduct of surveys to understand the attitude of people.

Communication Strategies for Public Extension:

- Participation in Participatory Technology Development (PTD) process
- Interface with scientists to get updated on the latest technical developments and give feedback to the scientists.

- Attending the scientific get-togethers.
- Actively participating in on-farm and adaptive trials
- Attending trainings regularly
- Exposure visits within and outside states
- Publications like scientific journals and magazines.
- Production of video films and CDs on advancements in Biotechnology.
- Attending kisan melas that focus on Bio-technology.
- Creation of web pages and network of scientists and organizations contributing to the development of Biotechnology with e-mail Ids.

Communication Strategies for Farmers:

- Involvement of farmers in Participatory Technology Development (PTD) right from the identification of the researchable issue through various stages of final release.
- Demonstration through field trials.
- Organization of regular interface of all stakeholders involving farmers.
- Exposure visits to research centers and successful farmers' fields in districts where Biotechnology programmes are in progress.
- Development of resource persons among farming community to act as effective linkage between the stakeholders (eg. Through FOs / FIGs).
- Usage of television, radio and newspaper through short films and slogans in local language on a continuous basis.
- Conduct of kisan melas / exhibitions by universities and research institutes to share the research outcomes and familiarizing the farmers with technologies.
- Poster displays with curious queries about Biotechnology in prominent places of villages / taluques/ districts headquarters.

- Orientation of RAWE programme students of SAUs to spread the message of Biotechnology during their stay in villages.
- Conduct of series of gram sabhas with a Biotechnology expert.
- Advertisement through displays during Jatharas, shandis etc., in rural area

Communication Strategies for Consumers:

- Participation in Participatory Technology Development (PTD) process
- Organization of Bio-forums for consumers with interface of research, farmers etc.
- Preparation of display windows at shops with Biotechnology products.
- Regular broadcast of messages on AIR and Television including the private channels.
- Regular advertisements in the newspapers with brief slogans.
- Regular advertisement on the back covers of general magazines.
- Display of attractive posters at the retail outlets and during Jataras, Shandies etc.
- Presentations in gramsabhas with Biotechnology experts to attract the rural consumers.

Communication Strategies for Media

- ❖ Increase the Biotechnology community's awareness of the importance of cooperating with the media.
- ❖ Scientists and Biotechnology institutions should develop an active approach to the media to create a variety of background materials, briefing documents useful to various media.
- ❖ Exploration of opportunities to present information in a variety of local traditional media such as folk media, burrakathas etc.

- ❖ Encouragement of institutions to explore internships and other cross fertilization programmes between education institutions and the media.
- ❖ Need for creation of media cell at state and national level for propagation of uniform messages through radio, television etc.
- ❖ Encouragement of professional scientific organizations to discuss communication issues and involve the media where appropriate.

Communication Strategies for NGOs:

- ◆ Participation in Participatory Technology Development (PTD) process
- ◆ Continuous interface with scientists
- ◆ Attending scientific get-togethers
- ◆ Promotion of Farmers' Organizations / Farmer Interest Groups (FIGs)
- ◆ Involvement in conduct of on-farm trials / adaptive trials
- ◆ Organization of exposure visits
- ◆ Publication of literature in local language
- ◆ Orientation to consumers
- ◆ Coordination with local media

Conclusion:

Effective communication strategy on Biotechnology should create public and political confidence, encourage future investment, reduce fears and skepticism and improve the usage of Biotechnology products. The Biotechnology community should ensure access to the balanced and credible information so that people reap the benefits of Biotechnology by deciding that Biotechnology products would contribute to their well-being.

It is important to provide the public with information on how the Biotechnologically derived products have been produced, the systems followed to assess their safe use and the advantages in using these products. There is a need to change the image of use of Biotechnology to make them become fashionable rather

than being seen either as backward or risky, eg: Bio-pesticides. Creating continuous public awareness of this nature is all the more important in our country where large number of farmers are small and marginal and many are still illiterate. Building awareness is the preliminary stage of adoption. This needs to be followed by sustainable persuasive communication strategy in order to lead them to innovation-decision process and finally for adoption of technology. Therefore, we need to develop different media mix to the different stakeholders from time to time.

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BIOINFORMATICS CENTRE (BIC)

Nine BICs have been established with the task of providing subject / discipline-oriented to all institutions belong to the branch and other institutions and individual users interested in particular subject of information related to Biotechnology. These are listed below:

Bioinformatics Centre (BIC)	Contact address
<u>Genetic Engineering</u> Jawaharlal Nehru University Bose Institute Indian Institute of Science Madurai Kamraj University	alok@jnuniv.ernet.in dicdbt@boseinst.ernet.in bioin@physics.iisc.ernet.in kdharmalingam@vsnl.com
<u>Animal Cell Culture & Virology</u> University of Poona	joshi@bioinfo.ernet.in
<u>Plant Tissue Culture, Photosynthesis & Plant Molecular Biology</u> Indian Agricultural Research Institute	rkc@bic-iari.res.nic.in
<u>Immunology</u> National Institute of Immunology	deb@nii.res.in
<u>Protein Modelling & Protein Engineering</u> Institute of Microbial Technology	raghava@imtech.ernet.in
<u>Oncogenes, Reproduction Physiology, Cell transformation, Nucleic Acid and Protein Sequences</u> Centre for Cellular & Molecular Biology	mohan@ccmb.ap.nic.in

Some of the useful internet sites are:

www.agwest.sk.ca for Agbiotech infosource –
an informative newsletter for schools

www.ibc.asia.com/agbiotech.htm

www.biotech.bc.ca

<http://agbio.cabweb.org>

<http://biotech.nature.com>