If I were to formulate Science and Technology Policy 2011 for India

What is National Policy? A country's national policy is instructions and guidelines by Government of a country on various areas like trade, industry tax or Science and Technology policy. These policies form basis of country's progress. However formulating Technology policy depends on social, political and economic factors.

Importance of a National Policy: Developing a right Technology policy is crucial for overall industrial development. Indian Industry is already adopting, adapting and diffusing technologies that originated in other countries. Links must be built between R & D institutions, educational and scientific bodies, technical institutes and industrial and technology promotion agencies in the public and private sectors.

Aims of Technology Policy: Aim should be to (1) Attain self reliance, (2) Reduce vulnerability particularly in strategic and critical areas, (3) Provide employment (4) Make best use of traditional skills and capabilities (5) Make country's products/services international competitive (6) Help energy and environment concerns

Traditional areas of Research: Atomic Energy, Space Technology was among the first departments set up by Ministry of Science and Technology under India's S & T Policy. Later, departments of ocean development biotechnology technology of information and communication, technology forecasting and assessment, international collaborations and promotion of S & T activities were also started.

Technology policy should not only for Products but also Services: Science and Technology collaborates with other branches of business and fields like Defence, Medicine, Agriculture etc to form new avenues for integrated and multi faced growth and development.

KEY CONSIDERATIONS FOR PREPARING S & T POLICY

Promote technology Management at National level: China is a good example to show how high growth rates can be achieved by technology adoption and management. Japan – a small country produces high degree of technical innovations

Newly Emerging Areas for S & T Research: Biophysics, Molecular Biology, Neurobiology, Liquid Crystals, Biomedical Devices, Superconductivity, Condensed Matter Physics, Astronomy, Astrophysics, Power Processing, Advanced Materials, Organic Chemistry Solid State and Surface Chemistry, Numerical Weather Prediction, Parallel Processing and Atmospheric Sciences, Aeronautics and Super computers.

Policy must foster commercialized new product development: Commercialized Technologies like petrochemicals like p-xylene, olefins, agrochemicals, pharmaceutical, leather processing, engineering material and equipments.

Government must play a key role: in managing technology at national level. Institutes such as Prestigious National Universities, Private Institutes, and Government supported organizations must carry Research and Development work by hiring specialists.

R&D is a risky and expensive business: As initial one time investment as well as recurring monthly and yearly expenditure. Initial cost could be say for Space Technology - Equipment Cost or Initial Infrastructure Costs for research. Areas of Social Interest or common good appear unattractive for private companies to take up, hence government must also take up research in these areas.

Keywords for Government: Should be Research and Development, Technology Acquisition, institutionalisation of technology policy measures, tax-incentives for R&D, strategy for technology development, technology base and regime of liberalisation.

Protection of Technology related copyrights: is also responsibility of Government. Government must not only support but also motivate technological development. State must also sponsor to develop new technologies within the country.

Acquiring New Technology: Technology can be acquired from a source outside the organization or Develop technology within the country or contract/Outsource the technology development to private industry player or develop jointly or in collaboration with other countries. Areas like Defence, Atomic Energy, Space need huge investments and work of R&D would predominantly be undertaken by Government.

Some technology can be threat to national interest: Hence sale/purchase of all technology knowledge, R&D needs to be regulated and licensed. Hence, government must also decide which technology is for public domain and which is not.

Increase opportunities for high-end graduate studies in the sciences: Help rebuild India's human capital in science and technology. Exchange programmes for graduate training in the sciences could be the backbone of this effort and will jump start the process of sending large numbers of scientists abroad for study and research.

CONTENT OF NEW POLICY

New Policy must use Information Communication Technology: Internet, Computers and Telecommunication as basis for (1) e-governance (2) e-learning and Online Education and (3) Services for the masses (public), (4) e-commerce, (5). However, at the same time, it is also responsibility of Government to formulate a privacy

Government must give Special Incentives for High End technological product and service development: Encourage electronics hardware manufacturing and help build a country wide National Knowledge Network. Also, encourage Small and Medium Scale enterprise, entrepreneurship and business growth.

It is important to leverage International Collaboration: and welcome global Inputs on research areas, particularly on Effective Rural Technology Delivery (including Partnership with Voluntary Organisation) and Strengthening Academia Industry Interface (including Public Private Partnership)

Strengthen research in India by Indian and NRI scientists: Create Scientific Research Institutes that will work with the local Indian scientific community to establish a nucleus or Institute that could be the focus of development for this initiative.

Government must encourage Technology entrepreneurs: particularly in areas of Computers, Internet and Information Communication Technology. Technology Information Sharing and Distribution and Technology Management Programmes are demands of this decade. Consultancy Development in these areas must also be encouraged, promoted with tax exemptions, benefits etc.

New Technology Policy must show spotlight on areas, such as: (1) Focus on Energy and Electricity, (2) Technical Cooperation among various Industrial sectors and Research Institutes (3) Indigenous Research and Development within country (4) Promote Research and Development at Smaller level by private organizations.

Promote and Strengthen New Research and Development in areas: (1) Biotechnology (2) Ocean Science (3) Mega Science Project (4) Space Technology (5) Cross Disciplinary Technology Areas.

MY RECOMMENDATIONS

Knowledge Management combined with Technology Management: Must be done at country level to obtain our country's global competitiveness. Research and Development must be according to global demands and expectations. That means there should be international Industry tie ups and research collaborations of Indian Universities with their international counter parts.

2. Religion and Vedic Mathematics and Sciences are inseparable and essential ingredients of our country's culture and uniqueness. Publishing of Indian knowledge, database on research work on Indian Scientist and Scholars, in areas of science, engineering, technology, medicine, agriculture and veterinary sciences must be promoted.

3. Creativity is essential ingredient for modern day success: Hence we must also support a Creativity Development in our HR and Technology Management Policy. India must develop

suitable support to encourage innovation and creative thinking for science, technology at school and college level.

4. Indian Art, Culture with indigenous Technology must be encouraged. Knowledge about India, our ancient systems is not written. What is not written doesn't exists for common man, hence we must write our Indian knowledge be it Ayurveda, Yoga, Art and Spiritualism etc.

5. National Human Development Policy must be combined with Technology Development Policy. Technology for Education - Internet, TV based must be strengthened particularly for technical education.

6. Technology Initiatives for Agriculture and Information Technology must be strongly supported. As benefits of this economic growth and impact of IT Revolution must benefit then poorest of the poor.

7. Tourism and Entertainment: New Technology development in areas of tourism and entertainment technology must be encouraged.

8. Collaboration of Indian and Foreign Universities: for Technology Education, Research and Development. Increase number of PHD courses in: Science, engineering, technology, medicine, agriculture and veterinary sciences. Significant number of research institutions must be setup.

9. Patents and Copyrights: It is essential to setup infrastructure, procedures and mechanisms for patent for Indian Inventors at country and international level.

Conclusion: By all accounts, India's is a potential source for a large number of talented scientists. Technology policy must help develop India's future as a major player in the world scientific community. Science is part methodology, part creativity and part luck. No one can make any guarantees as to the final outcomes as a result of this effort to make major investments in people. Investments in people are, however, a prerequisite for success over the long term. Without these technological management changes, India will likely not be able to participate actively in the global knowledge economy.

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