MADHYA PRADESH
SCIENCE & TECHNOLOGY POLICY - 2007

PREAMBLE

Science & Technology (S&T) is the most potent tool for development in the world of today. Scientific and technological endeavour is therefore everywhere planned and organized to achieve specific objectives of social, economic and cultural development and prosperity. Be it the governments or the multinational corporations, civil institutions or defence establishments, they all recognize and give due importance to planned scientific and technological development in their plans and strategies.

India's contributions in diverse areas of S&T have been significant since the pre-historic and Vedic times till today. From the distant past to the present, India has always been a scientific and technological power to contend with, not only in applied S&T areas like agriculture, animal husbandry, healthcare, metallurgy, textiles, architecture and water management, but also in basic areas like linguistics, mathematics, astronomy, chemistry and life sciences. Madhya Pradesh also has had a strong tradition of (S&T); marks of this tradition may be witnessed at Ujjain, Indore, Sanchi, Bhojpur, Maheshwar, Chanderi and several other places of the State.

Madhya Pradesh is unique in the richness of both the material and human resources. The State is endowed with extraordinary agro-climatic and biological diversity. The challenge before the State is to fully harness this potential. The State has to catch up with the frontline areas of modern S&T on the one hand and improve upon its strengths in traditional S&T, on the other.

During Golden Jubilee Celebrations of the State, the then Honourable President of India placed before the State Assembly a great vision of a fast developing Madhya Pradesh through full utilisation of its core-strengths. The President also suggested several new missions based largely on appropriate use of Science and Technology to realise this vision. This new S&T vision is drafted and being adopted for the specific purpose of aligning the priorities and thrust areas of the State to the vision presented by the President of India.

BACKGROUND

Madhya Pradesh is one of the fastest growing States in the country today. The State has displayed a strong commitment towards social, economic and cultural development; and, it has been striding ahead in pursuit of its development objectives.

Management of the abundant natural resources of the State, conservation of its rich biodiversity, and sustainable utilisation of this natural abundance for equitable development of all the people have been integral part of the developmental commitments of the State.

Agriculture is the main vocation of its people. As much as 71.5 percent of the working population of Madhya Pradesh is engaged in agriculture, as against the national average of 58 percent. The State is the number one producer of pulses and oilseeds in the country, contributing about a quarter of the total Indian production.

The forest wealth of Madhya Pradesh is the highest in the country. A large number of its people, especially the tribal people, depend on forest produce.

The State has a reasonably good infrastructure of higher education. There are 13 State Universities, including a University of Technology, a University of Law and a University of Agriculture. In addition, the State has several well-endowed Deemed Universities.

The State has made efforts to decentralize management of natural resources through *Panchayati Raj* approach and under the new policy initiatives, setting up of ventures based on innovative technologies has become attractive.

Madhya Pradesh, because of its central location in the country, has remained a crucible of historical currents from North, South, East and West. Its geographical location makes the state a strategic hub. The vision of this new Science and Technology Policy has been based on this specific resource richness.

VISION

To utilise both the advances in modern S&T as well as the wide-spread traditional S&T knowledge and skills of the people to recapture ancient glory and grandeur of the State, and to achieve prosperity and improved quality of life for all citizens, so as to fully realize the timeless Indian objective of ensuring happiness, health and well-being for all: ***Sarve Bhavantu Sukhinah, Sarve Santu Niramayah, Sarve Bhadrani Pashyantu, Ma kashchit Dukh Bhagbhavet***.

OBJECTIVES AND GOALS

Science and Technology in the State shall be planned for:

1. **(a)** Raising productivity of foodgrains in the State from the present about 1 ton per hectare to at least 2 tons per hectare in the next 5 years and to 3 tons per hectare in the long term on a sustainable basis.

   (b) Doubling per capita availability of milk from the present less than 250 ml to 500 ml per capita per day in five years.

   (c) Ensuring growth of net State produce from the agricultural sector at the rate of minimum 10 percent per annum.

   (d) Assigning organic agriculture and dairying practices a key role in achieving these growth goals. Since the State is undertaking this effort of enhancing agricultural production and productivity at this stage when the value and effectiveness of organic practices is well-established, and since the State is particularly well endowed in resources and skills in this field, it is only appropriate that the Green Revolution of Madhya Pradesh shall be founded in environmentally sustainable healthy scientific practices.

2. **(a)** Fully utilizing the potential of the rich forest resources of the State consistent with the requirements of maintaining environmental stability and ecological balance.

   (b) Ensuring appropriate R&D, training and promotional efforts for sustainable harvesting of the forest produce and for scientific cultivation and processing of medicinal and aromatic plants of desired quality, while ensuring conservation of biodiversity.

3. **(a)** Increasing the number of matriculates to twice the present number within the next 5 years and laying strong foundation in basic sciences and technical skills.

(b) Raising the number of degree, diploma and certificate holders in agriculture, animal husbandry and forestry to five times the present number. The number of Agricultural, Dairying and Veterinary graduates in the State today is a mere 7,000.

(c) Doubling the proportion of Science, Engineering, Medicine and Information Technology (IT) professionals among the graduates and post-graduates in the State from the present about 7 percent.

(d) Expanding opportunities of learning the whole range of skills required to cater to the service sector, especially tourism, and also special needs of Madhya Pradesh to conserve its archaeological, cultural and natural heritage.

4. **(a)** Effectively managing the water resources of the state and evolving better technologies and practices for agricultural, domestic and industrial uses of water. Harnessing an additional 50,000 million cubic meters of water for irrigation and conserving at least 5 percent of water used in irrigation through improved agronomic practices.

   (b) Ensuring availability of potable drinking water for all people and livestock of the State.

5. **(a)** Creating scientific, technological and infrastructural capabilities to ensure that the State reaches 10,000 Megawatts of installed capacity within 5 years, transmission and distribution losses are reduced to the minimum possible level.

   (b) Creating the necessary scientific and technological capabilities to ensure that the State begins to obtain a substantial part of its energy requirement from non-conventional energy resources, so that the rich bio-resources of the State are effectively utilised and Madhya Pradesh becomes a role model in this field.

6. Ensuring health for all citizens of the State. Research, training and development activities in the area of Indian systems of Medicine and Yoga shall receive a new thrust. Preventive and promotional care will be a priority area in Arogya, also the games and sports will be promoted in a big way among, schools, colleges and PRIs.

7. Establishing the necessary scientific and technological infrastructure to make the State a leading participant in the frontier technologies like Information Technology, Biotechnology and Nanotechnology.

8. Achieving annual growth of employment at the rate of 5% per annum, especially through development of entrepreneurship based in S&T.

9. Application of S&T for inclusive growth by focussed attention on SC & ST population and for minimising regional disparities.

10. Women empowerment would be a key area in S&T action plan of the State.

STRATEGY AND ACTION PLAN

In order to achieve the goals set out above in a time-bound manner, the State shall undertake specific initiatives along the following lines:

I. S&T Education & Research

1. Science education at the Matriculation and Higher Secondary level shall be given a major thrust. The State shall prepare appropriate schemes for improving the science laboratories in all schools, and for upgrading the skills of science teachers.

2. The State shall ensure the establishment or up-gradation of at least one fully equipped high quality Polytechnic in every district and one good ITI in every block.

3. To give a major thrust to vocational education, the State shall explore the possibility of establishing a new polytechnic stream where intake will be at the level of metric/high school/higher secondary failed students and also skilled artisans. The certificate and diploma of polytechnics in this stream shall be properly recognized.

4. The basic concept and practices of ***Nai-Talim*** and SUPW (Socially Useful Productive Work) will be implemented in all high schools, and middle schools. The new polytechnic stream shall be in fact an effort to implement *Nai Talim* in the modern context. Public-private partnership model will be evolved for the meaningful implementation.

5. A State level nodal agency shall be created to develop syllabi, curricula, evaluation and teacher training practices and modules for the new polytechnic stream and for *Nai Talim* and SUPW components of the regular schools.

6. Education in Science, Technology, Engineering, Medicine (including Ayurveda), Agriculture and other allied fields at the graduate and higher levels shall be given a new thrust. Science teaching departments shall be established in arts and commerce colleges. A new liberal policy for the opening of new engineering and medical colleges in both the private and the public sector shall be evolved.

7. The State shall evolve schemes to offer special scholarships and incentives for students in the S&T stream at the graduate and post-graduate level on merit basis. Science talent would be especially identified, nurtured, promoted and rewarded from class X onwards in both urban and rural schools.

8. The State shall give a new thrust to education in entrepreneurship. New technological and other Universities in the private sector shall be encouraged to offer market-driven educational opportunities.

9. Public and Private partnership shall be encouraged in Ph.D. research programs wherein the network of universities and industries could pool their resources. Qualified professionals in industry would be encouraged to undertake Ph.D. programs while retaining their jobs through industry university tie-ups.

10. While encouraging private participation in education, the State shall evolve a regulatory mechanism to ensure quality and equity in all educational institutions.

11. The State shall endeavour to ensure that at least one institute of excellence each in Science, Engineering and Medicine, along the lines of IISc, IIT and AIIMS, respectively, is set up in the State during the next five years. A centre of Excellence in Biotechnology and Nano-technology will be established at the earliest at proper location.

12. A MISSION EXECELLENCE will be launched to promote scientific aptitude and technical capabilities among school children and youth. It will focus on development of innovative skills and competitiveness at all levels through effective networking of corporate sector, cooperative sector, KVKs & KVIC network, R&D institutions, universities, colleges and schools and involvement of community based organisations at all levels.

II. Agriculture, Horticulture, Animal Husbandry & Forestry

Since agriculture and related activities constitute the core competence of the State and the development of the State is dependent on rapid growth of this sector, the following steps shall be undertaken to qualitatively enhance Science and Technology capabilities in these areas:

1. Four centres of Jawaharlal Nehru Krishi Vishwavidyalaya (JNKVV), Jabalpur lying in different agro-climatic zones shall be upgraded to fully-fledged Agriculture Universities. Efforts shall be made to carry out such upgradation of at least two centres within the next five years.

2. The State shall endeavour to establish one advanced centre for research and extension in the area of Agriculture/Horticulture/Animal Husbandry in each of the eleven agro-climatic zones of the State.

3. Efforts shall be made to document and preserve Traditional Knowledge and bio-diversity in Agriculture, Horticulture, Forestry and Related Activities. A separate cell or centre to study, conserve and develop traditional knowledge in these sectors shall also be opened in all Universities and Institutes concerned with the sectors of Agriculture, Horticulture, Forestry and Animal Husbandry.

4. Regional Development Plans for S&T inputs focussed on specific crops in cereals, pulses, oil seeds, vegetables and other varieties with specific time bound targets shall be prepared for each of the 11 agro-climatic zones of the State.

5. A Centre of excellence for research in quality control, standardization, promotion and certification of organic inputs and produce shall be set up at the State level.

6. A Directorate of Organic Agriculture and ***Go-Samrakshana*** shall be carved out of the present Directorate of Agriculture and the Department of Animal Husbandry. A Department of Organic Agriculture and ***Go-Samrakshana*** shall also be established in Jawaharlal Nehru Krishi Vishwavidyalaya (JNKVV), Jabalpur, and later in every Agriculture University set up in the State. The objective of these efforts shall be to nurture and develop a specialised cadre of scientists and extension specialists in organic agriculture and related activities.

7. Effective execution of the State Forest Policy shall be ensured and a corpus of at least Rupees 1,000 crore shall be created for forest conservation. This fund shall be generated through the contributions from State, Central and International agencies.

8. Genetically modified organisms shall be allowed to be introduced in the State only after the establishment of their environmental safety. The State shall establish appropriate institutional arrangements for this purpose.

III. Water Resources

1. Harness additional 50,000 million cubic meters of water per year for irrigation and create additional storage capacity through water harvesting, especially check-dams of various types, leading to a drought free Madhya Pradesh.

2. Adoption of improved irrigation practices for conserving at least 5% of water used in agriculture by 2012 through training in and popularization of improved practices and setting up of demonstration projects.

3. While carrying forward the new momentum in increasing the irrigation capacity, a special thrust will be given to enhancing utilization of the existing irrigation capacity from 46% to at least 75% within next five years.

4. A new scheme will be launched for identification, renovation and revival of traditional water bodies and structure all over the State.

5. It will be mandatory for all new constructions to have rain water harvesting system.

6. The State shall introduce a system of water-audit of all major consumers.

7. It shall be mandatory for all major consumers of water to set up systems for water recycling.

8. The State shall empower an independent agency for testing and monitoring quality of potable water of all public supplies.

IV. Energy and Environment

1. Effective implementation of State Policy regarding utilization of cultivable waste and barren land for cultivation of appropriate and economically useful plant species with special emphasis on the cultivation of oil-bearing species, which may be used as bio-fuel.

2. The State shall initiate a major project to document the potential of renewable energy with special emphasis on bio-energy and to draw up a comprehensive plan for the production of a substantial part of the energy requirements from bio-mass and other renewable resources.

3. Mission mode research shall be initiated in hydrogen-based energy, conversion of alcohol and oils to biofuels, production of energy from waste and fuel efficient products and processes.

4. The State shall institute a system of energy audit of all major consumers of energy.

V. Health Care, Ayurveda and Traditional Medicine

1. The State shall set up a University of Ayurveda at the State level and an Ayurveda College in each of 9 divisions of the State.

2. The State shall adopt Gujarat pattern in regard to Indian Systems of Medicine and Yoga in Primary Health Care.

3. The State shall initiate a major effort in the areas of preventive and promotional health-care based on ensuring better nutrition, sanitation, drinking water and life-styles, establishing facilities for games and sports, and promotion of Yoga.

4. The State shall promote telemedicine and mobile diagnostic-cum-treatment clinics based on traditional as well as modern medicine.

VI. Industrialization

1. **Vigorous Pursuit of the State Industrial Policy**: The main thrust of the State Industrial Policy is on developing infrastructure in identified industrial clusters. This policy shall be vigorously pursued, and arrangements shall be made for providing the necessary S&T inputs for this purpose. In particular, the following institutional arrangements shall be made for appropriate S&T

intervention in the implementation of the cluster-based Industrial policy of the State:

(a) To build both a competitive as well as supportive environment, industries and their ancillaries would be promoted in cluster while keeping in mind the availability of raw materials, skilled labour and market potential.

(b) The establishment of Industrial Parks and Industry Incubators shall be promoted through public-private alliances or sponsorships. Industry parks would provide viable mechanisms for upcoming companies to adopt new technologies with minimum financial inputs. These parks would facilitate the lab to land transfer of the technologies.

(c) To promote Madhya Pradesh as a hub of innovation, a network of relevant stakeholders will be developed. Public investment shall be made as a catalyst to promote clustering and networking so that it leads to enhanced creativity by sharing of expertise, resources and infrastructure.

2. **Promotion of Traditional and Rural Industries**: While carrying forward the plan for industrial rejuvenation of Madhya Pradesh spelled out in the State Industrial Policy document, following supplemental steps shall be undertaken to support the special emphasis of the S&T Policy on Agriculture and allied activities and on the rejuvenation of traditional skills of the people of Madhya Pradesh.

A. Industries allied to Agriculture:

(a) A comprehensive scheme shall be drawn up for giving priority and encouragement to industries related agriculture, horticulture, animal husbandry and forestry. Such a scheme shall be prepared and brought into operation within six months of the coming into force of this policy. While drawing up this scheme, priority shall be given to the encouragement of organic produce within this larger field of activity.

(b) Science, Technology, Engineering and Management institutions in the State shall be encouraged to pay special attention to the technological, managerial and marketing problems of industries based on agriculture, horticulture, dairying and forest produce. A special scheme shall be created to provide technology support for agriculture and forestry based processing industries and for

financing research, development and consultancy projects related to these fields.

(c) The State will ensure necessary steps to establish a single window which may be approached by entrepreneurs engaged in such activities for seeking solutions to their technological, marketing and entrepreneurial problems.

(d) The experiences gained from Sanchi, Vindhya Valley and Vindhya Herbals will be carried forward to ensure a strong impact on the beneficiaries, consumers and the market.

B. Artisanal and Traditional Industries:

(a) A State-wide survey of various artisanal skills available in Madhya Pradesh, of manufacturing and marketing potential of these skills, and of the technological, managerial or administrative problems faced by the artisans shall be commissioned and completed within 6 months.

(b) Based on the results of the survey, a special scheme shall be drawn up for encouraging small, medium and household scale manufacturing based on the artisanal and traditional skills.

(c) An effective system for quality assurance of the products of these decentralized artisanal and traditional industries shall be created.

3. Full Utilisation of the Mineral Wealth of the State:

(a) **Exploitation and Prospecting**: The available mineral wealth in the State shall be exploited scientifically keeping in view the environmental balance. A comprehensive techno-economic study and intensive systematic prospecting of the unexplored mineral wealth of the State shall be undertaken.

(b) **Research & Development**: Preparation of district-wise mineral inventory and location maps of the mineral wealth of the State shall be expedited. A well equipped laboratory shall be established for research and development activities related to the exploitation and processing of minerals.

(c) **Opportunities for Employment**: Areas reserved for Public Sector Undertakings where mining has not yet commenced shall be de-reserved and thrown open for entrepreneurs to generate new employment opportunities. Lease conditions regarding

employment and environment shall be strictly enforced, both in public and private sectors.

VII. New Frontiers of Science and Technology:

While the Biotechnology and Information Technology shall be promoted as per their respective policies, newer and important areas like Nanotechnology and Smart Materials, Artificial Intelligence, Medical Electronics, Remote Sensing, Organic foods etc. shall also be encouraged.

Quality Assurance System will be promoted and enforced in a systematic manner, keeping in view the recent developments.

VIII. Resource Mapping and Planning:

The State shall undertake to prepare, through appropriate agencies, detailed Resource Atlases of the State and all its districts which would provide extensive profiles of the State's varied material, human and knowledge resources. Similarly, detailed analysis of major problems facing different geo-climatic regions to identify the scientific inputs required to fill up technological gaps, which may exist shall be prepared.

IX. Science Popularization:

1. Madhya Pradesh Vigyan Sammelan shall be held annually.

2. Young Scientists shall be particularly encouraged to promote regional development projects in identified thrust areas.

3. Popular booklets on various areas of science concerning the people especially children and women will be brought out regularly.

4. An appropriate *Vigyan Patrika* will be published focusing on school children and science teachers.

5. *District Vigyan Melas* will be encouraged to promote innovation, creativity and adventure among school students and science teachers.

6. Science museums, herbal garden and technology parks shall be established in all districts.

7. Popular Science lectures in schools and colleges will be arranged to arouse interest of young students in scientific pursuits.

8. Science talent search will be organized regularly to search, nurture, promote and reward the talented children, both from urban and rural areas of the State.

Several schemes initiated by DST, GOI will be effectively implemented in the State to achieve desired results in above direction.

ROAD MAP

1. A special cell shall be created in the S&T nodal agency of the State, Madhya Pradesh Council of Science and Technology (MPCST), to work towards the implementation of the policy objectives and monitor its progress regularly.

2. A detailed exercise would follow regarding strategy and steps. Specific Task Forces and Expert Groups shall be constituted involving concerned departments to draft detailed mission proposals and to ensure their implementation in a targeted manner. All efforts will be made to enlist support from central government agencies in this direction. These Committees, with inputs and technical services from MPCST, shall also prepare blueprints for the new institutions to be created and for strengthening existing institutions.

3. A Steering Committee on S&T in the State Planning Board and a S&T Advisory Committee to the Chief Minister shall be constituted to ensure allocation and proper utilisation of 1% to 2% of SDP for S&T/R&D in the overall budgets of concerned departments, to ensure that efforts are made to obtain central and international funding for the programs/missions proposed, and to further ensure that funds thus made available are properly utilised and the necessary capacities are built in the relevant areas of S&T.

   Taking cognisance of the S&T Policy of the Government of India and of the Prime Minister's announcement at the Indian Science Congress, allocation to S&T shall be progressively increased to 2% of the SDP.

4. Teachers and professors working at different levels from schools to the university departments and technical institutions will be the main fulcrum on which the responsibility of proper implementation of this S&T Policy will rest. Also, entrepreneurs, both in agriculture and industry, shall take this Policy forward in their enterprises. The Administration will have an important role

in facilitating and empowering these agencies. All efforts shall be taken to empower the teachers and entrepreneurs to carry forward this task.

5. Science & Technology is not a new phenomenon in our society, there is a strong base of indigenous scientific know-how with our farmers, artisans and women, and Madhya Pradesh has a rich S&T heritage. We must relate science to that rich heritage using modern tools, build upon this indigenous base and move forward into new frontiers.

Madhya Pradesh Science and Technology Policy as visualised here can be implemented only with the collective resolve of the State and the society from the base to the apex levels. If properly implemented, this policy shall usher Madhya Pradesh into the league of top States of the nation based on its natural abundance and the extraordinary skills of the people. Let us march forward to fulfil our vision of ***Sarve Bhavantu Sukhinah***.