

**Report
of the
Working group to Review
the existing Institutional
Mechanisms and Structures
as well as the Management
and Governance of S&T
Sector**

Working Group appointed by Planning Commission vide OM
No. 12016/3/2011-S&T dt. 18-April-2011

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Background

Science and Technology (S&T) has always played a crucial role in development of societies through provision of new and improved products and services as well as enhanced economic activity. S&T also enables exploration and realistic assessment of resources and the environment and facilitates appropriate development choices and priorities. It is believed and projected that India's economy may rise from the present \$ 1.4 trillion to \$ 10 trillion by 2025¹. What would be the role of domestic S&T and Innovation in this journey and how we should organize the necessary effort, is a question which we need to address.

There is no doubt that Science & Technology have to play a greater role – a role

XII plan envisages expanding the scope of Science and Technology to areas that would help realize full potential of national S&T efforts. A paradigm shift in the approach for the Science and Technology sector is therefore being contemplated which seeks to shift to an output directed development path strategy rather than the input driven model hitherto followed.

to provide better quality of life and opportunities to every citizen – the Common man. Science and Technology also plays an important role in building self reliant national technological capability in strategic areas. In addition, there are key technologies which may or may not be accessible because of their dual use nature, unless developed by us on our own. Development of high tech materials; high end electronics including special sensors/detectors, several probing diagnostic and characterization equipment and a

variety of software and codes fall under such dual use category which may or may not be accessible when needed most to serve the strategic interests of the country, be it on the economic front or in security related activities.

The approach to the Twelfth Plan for the Science and Technology sector envisions scaling of new heights of achievements and putting India in the

forefront of the globalised world. It also envisages expanding the scope of Science and Technology to areas that would help realize full potential of national S&T efforts. A paradigm shift in the approach for the Science and Technology sector is therefore being contemplated which seeks to shift to an output directed development path strategy rather than the input driven model hitherto followed. This would call for creation of an innovation ecosystem most suited to the translation of inputs to the S&T sector to actual realization of set developmental objectives for the country. The approach expectedly stresses on the S&T sector to: specifically undertake goal oriented research to cover all aspects of development, particularly in the socially relevant sectors such as agriculture, education, health care, food, energy, water, minerals etc, as well as to serve as an instrument for rapid economic development with enhanced competitiveness by providing innovative technological inputs to the industrial sector on several fronts. This would require creation of; a vibrant landscape with effective mechanisms of partnerships between R&D institutions, universities and industry/society; a richer 'Knowledge Society' by way of creation of research based development pathways as well as participation of all strata of society enabled through ICT in a range of knowledge driven economic and social activities; IP through high quality research programmes and building both institutional and human capacities as well as leadership for meeting the needs of the Indian science and technology sector.

This would call for creation of an innovation ecosystem most suited to the translation of inputs to the S&T sector to actual realization of set developmental objectives for the country.

In addition, some new mechanisms and enabling framework would be required to trigger R&D outputs for commercialization and development of marketable products and services from the private sector. The approach paper envisages several incentives and policy interventions like: grants, equity and loan to private sector for undertaking R&D in public and social goods; establishment of test beds

for indigenous technologies developed by public funded institutions; exemption in custom duty on laboratory/testing equipments and promotion of a strong angel and venture capital supporting system to back up innovations.

Organisation of S&T

It has to be recognized that scientific research flourishes in a more relaxed ambiance where a critical mass of high scientific talent can pursue new ideas in an administrative and financial support system that is more a facilitator rather than controller. Management of scientific research needs to be driven by peer (both internal as well as external) processes rather than organizational hierarchy.

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Autonomy, freedom for individual ideas, flexibility to carry forward a promising idea in a selective manner in a framework driven by peers, liberal funding, a responsive engagement with academic, societal and industrial domains around and sustained collaborative exchange with similar high quality international research programmes are some key features of a conducive ecosystem for research. Development of technology in addition, needs a more

organized and coordinated effort by different groups across disciplines and expertise domains (at times from across organizations) and necessitates specific policy interventions with strategic vision appropriate to creating conditions favourable for translation and growth of a specific innovation and technology. There is often a challenge of managing infrastructure resources within an institution for realizing deliverables for a number of diverse programmes driven by different project teams. A sound matrix management (organization on one axis and project on the other) structure is thus essential to ensure efficiency and avoid strains arising out of dual accountability. Depending on the programme

profile of an institution, one needs an appropriate management framework that can address such diverse needs. Visionary leadership capable of flexible handling of diverse situations within a streamlined organizational set up consistent with value systems that simultaneously nurture excellence in somewhat diverse domains such as research, technology and entrepreneurship is the key to success in S&T programmes. S&T system management where creativity and innovation needs to be encouraged and there is ability to move forward despite the risks involved on the basis of sound technical judgment is thus very different from other systems.

For S&T system in the country to remain vibrant and self rejuvenating, it must be comprehensively engaged with the higher education system in the country. For this purpose, we must aim at creating a broad based R&D infrastructure in our higher education institutions and create programme linkages between university laboratories and national programmes as well as industry. Imaginative and state-of-art School and Higher Education in Science & Technology with judicious mix of technology enabled and face to face (physical presence of teachers in class rooms and experimental labs) learning environment would help in preparation of good scientist and technologist. Creation of a large eco-system that freely allows horizontal interaction between students, teachers, researchers, developers and entrepreneurs is crucial to strengthening the country on the innovation front and take our industry and indeed our country to the forefront.

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Identification of technologies and their performance requirement to meet plan development goals also requires adequate attention. Such assessments help in

defining technology development needs and their priorities for national S&T sector.

Addressing the Terms of Reference

The work procedures in the present system of governance in many S&T Institutions are very time consuming and have too many checks/ control points which have led to delays and low productivity. There are other weaknesses which include: inappropriate personnel policies; rigid at times externally driven micro-management in administration and finance; slow procurement and construction management processes; lack of mobility of personnel; etc.

There are weaknesses which include: inappropriate personnel policies; rigid at times externally driven micro-management in administration and finance; slow procurement and construction management processes; lack of mobility of personnel; etc.

There are thus two distinct terms of reference for the Working Group. (Annex-1) The first seeks a review of the existing institutional mechanisms and structures and the second to review management and governance of S&T programs. The working group felt that the subject matter is too large to be dealt with within the short period

of time that is available and hence it was decided that rather than taking a look at every institution it would be appropriate to very broadly look into some of the best practices to arrive at recommendations.

S&T Governance at Government Level

It was recognized that the functions within the Government involve both development and control aspects and both these are carried out using similar bureaucratic set ups, procedures and mind sets. While a development activity by its very nature leads to creating assets and is thus a productive endeavour, the

control activity on the other hand, though essential, involves recurring expenditure which often leads to concerns about being non-productive. While efficiency in expenditure would be of paramount importance on both sides, governing both on the basis of generalized universal instructions surely creates obstacles to development process and more importantly leads to a standardized procedure controlled management rather than an objective oriented management. At least for S&T

It would be important to grant S&T institutions maximum autonomy from routine general instructions and meet the requirement of public accountability through pre-specified deliverables and benchmarks. Capabilities to verify accountability can be ensured through a structured rigorous and institute specific peer review of management and key deliverables.

institutions, which have very special requirements as brought out earlier, it would be important to grant them maximum autonomy from routine general instructions and meet the requirement of public accountability through pre-specified deliverables and benchmarks. Capabilities to verify accountability can be ensured through a structured rigorous and institute specific peer review of management and key deliverables.

Categories of S&T Institutions

The existing Government funded S&T institutions can be classified into three broad categories viz Government laboratories, Autonomous R&D Institutes and Universities carrying out R&D.

Government laboratories are directly funded by the government. Each of the Government laboratories is tasked with a specific mission mandate. These laboratories are engaged in meeting their assigned mission objectives duly backed up by relevant R&D programmes. They also implement several plan

projects to strengthen their capability as well as deliver on the mission objectives. Planning Commission defines the programme deliverables and the delivery of the same is through institutional projects.

Autonomous R&D Institutions are generally funded by one or more than one government S&T departments and are having a broader mandate in the area of an identified domain of research. These institutions have a periodic system of review and hence purely at the research level they have by and large done well. Scientists in these units seek research funding from funding agencies on a competitive basis. The focus mostly is on basic research and the quality of research is by and large globally competitive. Mission oriented agencies like

DAE, DOS and DRDO also invest in research in a major way, both in their own R&D institutions and also through extramural research.

Our research institutions need to be better linked with universities on one side and industries on the other in order to facilitate better HRD as well as technology translation linkages. Further co-location of institutions from these diverse domains with complimentary focus would help translation of research to technology and field applications and strengthen the innovation ecosystem.

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domains with complimentary focus would help translation of research to technology and field applications and strengthen the innovation ecosystem.

Universities are in many cases far away from good quality R&D primarily due to a fairly large teaching load and lack of resource both in terms of good quality faculty and funds. We must recognize that this also has an adverse impact on the

quality in academics. Support for research to the faculty members in Universities and other Institutions of higher learning comes primarily from DST/DBT and from Ministry of Human Resource Development. Coming on a competitive basis after a peer review, this funding is generally well utilized. There is however a need for expanding the reach of such funding through quality improvement where ever necessary. Being individual scientist centric, this support mostly leads to publications and rarely a new product or process. On the other hand, this has had a significant impact on the development of human resource in the areas of Science and Technology. Recognising that the research infrastructure in our educational institutions is weak, DST introduced the FIST scheme, again on a competitive basis. The impact of this scheme has been assessed to be extremely good. We need to give a major impetus to strengthen the research infrastructure in all our educational institutions of higher learning and where ever possible build competent research groups which can handle larger challenges through coordinated research.

Universities may house dedicated laboratories set up by national technology programmes and industries. Such initiatives need to be multiplied as a part of efforts to build and expand innovation ecosystems at least in some of our better Universities.

A cultural divide seems to have been developed between our scientific institutions and the academic system in the country. The Inter University Centers and more particularly the Consortium for utilization of DAE facilities is an initiative that has brought the two groups closer. Similarly the Centre for Basic Sciences in Mumbai University represents a good model for pursuing high quality academic programmes (including at undergraduate level in an ambiance of high quality research) in our universities with actual participation of teachers, researchers and institutions in the vicinity. Further there is need for greater emphasis on parking some of the research facilities of our scientific Institutions in Universities to bring in involvement and inputs from University research into programmes of our

national programmes. Some Universities which are already at a higher level may even have dedicated laboratories set up by national technology programmes and industries. Such initiatives need to be multiplied as a part of efforts to build and expand innovation ecosystems at least in some of our better Universities.

In a vibrant S&T education system, engagement between students and quality teachers is crucial to enhance the competence in S&T. Towards meeting this important need, we need to strategize and inspire our best available S&T talent to engage themselves in science teaching in school, colleges, institutes and society. This should be a crucial aspect in the 12th Plan to be able to lay the foundation for success in competitive international markets and also meeting our aspirations and objectives in S&T.

Human Resource for S&T

There is a serious issue about finding high quality faculty. Since we now have a number of new high quality institutions that are engaged in high quality research, we have an opportunity to create massive research infrastructure in such high performing institutions and create opportunities for young people to pursue scientific research at these institutions and in turn address the issue of faculty shortage.

The trend of students wanting to pursue science seems to be improving. There is a need to create attractive career opportunities for them. Government has created a very large number of new high quality higher education and research institutions in the country. In addition some of the better quality higher education institutions are expanding. There is a serious issue about finding high quality faculty for these institutions. Since all these institutions are engaged in high quality research, we now have an opportunity to create massive research infrastructure in such high performing

institutions and create opportunities for young people to pursue scientific

research at these institutions and in turn address the issue of faculty shortage. We could bring in a paradigm shift by investing a sizeable fraction of total Government R&D spending in University system by setting up laboratories for carrying out research for national programmes, PSUs and industry. Such laboratories should be funded by concerned ministries or industry and jointly managed by the university and sponsors. This would not only boost research and post graduate programmes in the universities but also create a right ecosystem.

There is also a question of lateral entry of mid career faculty into new institutions. The recent decision of MHRD is a partial relief. There is a need for a policy correction to enable attracting of outstanding scientists to work in the field of their choice and facilitating their horizontal movement.

Leadership in S&T:

Excellent track record of eminence, performance and ethics should be key criteria for high positions of leadership in S&T. Simply the number of years of experience (with repetitive assignments) and with no significant achievements should not become the basis for the important positions of the leadership in S&T. The country must learn to give highest position in S&T to persons with excellence in the age group of 40-50 so that they have higher stakes in achieving the spectacular results and performance. We should find mechanisms to attract a large number of teachers, researchers and technologists who are either NRI or citizens of other countries with clear interest in contribute to Indian S&T. The motivation, work environment and the infrastructure at the institutes would need a paradigm change if such a possibility is to be realized. Tenure assignments in all government

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establishments should be encouraged. The principles and judicious mix of permanent and tenure assignments should be defined in a clear manner.

S&T Database

Data bases with proper structures are important for decision making, avoid repetition, leverage of research and development, products & processes, modeling by interested in even small institutes, etc. Data bases and their management is a specialized topic of high relevance in knowledge economy. From governance perspective, unless considered otherwise from security considerations, all public funded work should form a part of national data bases with appropriate recording of invention patents, intellectual property from government funded work. Indian Institute of Science in life sciences and Indira Gandhi Centre for Atomic Research in metallurgy has taken strong and successful steps under the auspices of CO-DATA of Indian National Science Academy linked to international framework under the same title CO-DATA. Clearly this activity needs to be made comprehensive and scaled up.

Plan Proposals and their Approvals

There is a need to provide flexibility in the implementation of EFC approvals such as dynamic changeover to newer/better or efficient technological options to be able to adopt different series of items of equipment or processes or protocols to achieve the programme objectives and deliverables.

Formulation of plan schemes should clearly spell out the objectives, deliverables, time frames and mode of implementation including listing of institutions involved. There should be flexibility to make mid course corrections in the implementing strategy depending on the experience and new opportunities that may arise. There is a need to provide

flexibility in the implementation of EFC approvals such as dynamic changeover to newer/better or efficient technological options to be able to adopt different series of items of equipment or processes or protocols to achieve the programme objectives and deliverables.

The process of development of EFC proposals from S & T organizations should be reformed by making the inputs activity/objectives “Programme-oriented” rather than being tight-bordered with indifferent listing of equipment or programmes. The present practice of perfect listing and insistence by the system to restrict by letter and spirit to nothing more than what is listed is most detrimental for any upstream activity in a five year period, which is too long a period for predictably accurate listing of expected developments in technologies in different areas.

Financial and Administrative Support

Research by its very nature is about exploring new territory. Further, tougher the problem of research or a new technology development, greater would be the uncertainty. But this is where greater dividends are. This is where the more capable researchers should be working. There is also a question of creating a facilitating administrative and financial support system. Such a system should ensure adherence to the rules and procedures while facilitating a programme implementation in accordance with the technical decisions of experts. The system of administrative and financial control and monitoring of projects should thus take into account the capacity and competence of individuals and the complexity of the problem being handled. Actual involvement and participation of accounts and administration people in the project implementation group in a

System should ensure adherence to the rules and procedures while facilitating a programme implementation in accordance with the technical decisions of experts.

manner that creates ownership and passion should enable this in an indirect manner. The empowerment for implementation should also be done in a differential way for individuals and institutes with greater level of excellence so that they don't feel stifled in realizing the achievements for the nation.

Performance Reviews and Accountability

It is important that the mega plan objectives relating to S&T sector (for ex. meeting the requirements of key sectors like food, health, energy and environment security; needs of industry and manufacturing sector; ecosystems for innovation and technology; etc.) are clearly identified upfront at the level of the Planning Commission. These objectives may be further defined in terms of

Realisation of 'Key Performance Achievements' in a qualitative and quantitative manner should be reviewed by an Empowered Committee. The empowered committees should be able to provide charged inputs such as human resources, finance, enabling ministerial linkages to overcome obstacles, availability of experts, national and international linkages, etc.

Key Performance Achievements and linked to plan deliverables in respect of schemes of ministries/departments. Realisation of 'Key Performance Achievements' in a qualitative and quantitative manner should be reviewed by an Empowered Committee. The chain from formulation to delivery should be robust and ensure high performance results. The Committee reviewing key performance achievements must be empowered to ensure desired achievements. Thus, empowered

committees should be able to provide charged inputs such as human resources, finance, enabling ministerial linkages to overcome obstacles, availability of experts, national and international linkages, etc. This approach should significantly enhance the delivery in the mandated mega plan objectives. It should also be clearly articulated, as to what would be the 'penalties' to India's inclusive and sustainable growth story, if these objectives are not realized in the

stipulated time with envisaged results. As an example, Advanced Ultra Super Critical Coal Technology, could be one such programme for meeting the important objective of realization of clean coal energy technologies.

There is also a need to create accountability at the Institutional and Programme level. At the stage of formulation of projects resources needed for implementation of different work elements should be formally tied up and made accountable to project in-charge. The project management structure should reflect participating laboratories at the apex level as well as at the implementation level. There should be periodic reviews of the project involving all stake holders who have the capability to resolve technical, administrative and financial issues. R&D institutions on the other hand should also remain focused on capability build up in areas of their specialty covering all aspects like knowledge, skills, human resource development, technology development and sustaining an atmosphere of innovation. While the performance of the project manager should be evaluated on the basis of project progress and performance, that of a laboratory director should be on the basis of external reviews of the laboratory by experts in related fields.

While the performance of the project manager should be evaluated on the basis of project progress and performance, that of a laboratory director should be on the basis of external reviews of the laboratory by experts in related fields.

We should recognize that R&D laboratories are important assets and to maximize the contribution from these assets should remain a key objective. All round excellence with research and development at the frontiers of knowledge and technology in which students and industry/society also participate as appropriate should remain the key objective of a laboratory.

Utilization of laboratory assets should not suffer due to lack of researchers. In the existing mechanism, Planning Commission provides funds for setting up of assets it also helps in providing permanent positions due to continuation of

Pooling of resources and mobility of scientists plays an important role and should be encouraged. Mechanisms need to be developed for such movements within or across the institutions.

programme. For full utilization of assets it is important that investments are made only if there is sufficiently large interest in the programme from within the institute and across the institutes as otherwise we may create assets that remain underutilized. Pooling of resources and mobility of scientists plays an important role and should be encouraged.

Mechanisms need to be developed for such movements within or across the institutions. Strengthening of interface between institutions having similar or complimentary interests would also be important.

It is important that scientists are recognized on the basis of their merit as assessed by peers. The matrix of assessment should be consistent with the organizational objectives. Key results and Key performance indicators must be defined with due care and periodically reviewed. Implementation of quantitative performance based incentives should be done with due care so that cognitive creativity is not disturbed.

Bureaucracy in S&T

While we should get rid of “Bureaucratic” mind set of unmindful control in a creative R&D environment, a facilitating governance system that ensures meaningful public accountability is indeed necessary. Bureaucracy provides valuable in inputs to enable a meaningful and accountable way of managing public resources. As mentioned earlier, what is necessary is to make the administrative and finance system to become a facilitating part of the organization rather than being a representative of an external micro management

system. The thought process and driving decisions should originate in the top layer and should be implemented through the structure of the administrative and S&T systems, in effective manner. Broad objectives for each programme should be defined from top (plg com./Institution leadership etc.) after a due consultative process. Detailed implementation strategy then should be developed at the working level involving all actors including the bureacracy. Administrative system should be made accountable for facilitating implementation of the program.

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A few of the negative bureaucracy aspects relate to lack to decisions making or fuzziness in decision or compromised decisions and should be reformed with suitable guideline on simple way of functioning. Time period for decision making should be clearly defined for each case file.

Public Private Partnership in Education and Research

Competitiveness in Indian industry would soon be dictated by their own level of innovation. To be able to build such a capability, there must be adequate investment in research and development by the industry and industry should become a part of ecosystem involving universities and research institutions. Public funding in precompetitive research (involving industry participation) with results available to interested industry for further customization should be encouraged. This could be in universities, government laboratories or even laboratories collectively owned by the industry. Research parks located in universities is another mode for industry research that benefits both the industry as well as the university. Further there could be contract research done for the industry for meeting their needs. Government could consider several financial

and policy support measures to encourage research investment by industry particularly in a manner that leads to creation of right ecosystem for innovation and research. There should also be measures to motivate our universities and laboratories to get into industry sponsored research in a big way. In an increasingly “inclusive endeavour” oriented strategy, the government institutions

Enhancement of research infrastructure in our universities as mentioned earlier and creation of hassle-free mechanisms for industry oriented research facilities in the universities on PPP mode should be one of the highlights of the 12th plan.

should be enabled to absorb directly investment from a private industry or organization on a “programme mode” to establish an infrastructural set-up or a “Professorial Chair”. Such arrangements should be without any strings on profit making outputs, and create mutually progressive development benefits to both organizations. Enhancement of research infrastructure in our universities as

mentioned earlier and creation of hassle-free mechanisms for industry oriented research facilities in the universities on PPP mode should be one of the highlights of the 12th plan.

R&D share of the Industry could be enhanced in successive stages through policy interventions, devising suitable strategies to enable industries to realize innovations and advances in technologies through Academic-Research-Industry interactions. Suitable targets should be aimed at in different sectors of industries through due consultative process.

The research at private and public educational and research institutions should be funded on equal merit basis by funding agencies. In a changing paradigm of India, private educational and research institutes who have demonstrated excellence with ethics would have ever increasing possibilities to become the best in the country and with encouragement, a predominant force on the world horizon.

S&T to meet International Standards

We must take our R&D to world standards and make our industry globally competitive on the strength of domestic innovations. Our technology leadership in some key areas as well as in-kind participation in international mega-science projects is one measure of our capability in this context. A country of our size and economy needs robust and effective contributions and voice in International Standards Organizations (ISO) and other related national and international bodies. India also should formulate and make new standards to be accepted by ISO. These are extremely important for protecting the interest of our industries and provide rightful place to good work in our S&T institutes. Currently the working of BIS does not meet such a perspective and performance. This aspect has been neglected for a long time and requires urgent change in governance and delivery by BIS.

Concluding Remarks

Some of the key recommendations arising from the above are as follows:

1. Human resource crunch at the level of faculty/researchers that we are currently facing needs to be remedied on a war footing. For this purpose create comprehensive research programmes and facilities in better performing universities and institutions.
2. Create innovation ecosystems around our universities with the involvement of industries (both public and private) and research institutions. Create incentives for this purpose for both industry as well as universities. Encourage institutions with complimentary focus to be co-located.
3. Encourage research by quality institutions in private sector on an equal footing.
4. S&T project formulation should have clarity on goals and deliverables and flexibility in terms of implementation details.

5. Organisation for S&T should be peer driven and free from micromanagement from above. Matrix organization that can continuously grow competence and at the same time ensure timely project delivery should be tuned to programme profile of the organization. Performance assessment should be consistent with value system necessary for meeting organization goals. Incentives should be implemented in a manner that motivates to do better but not damage creativity. Accountability should be on the basis of credible performance and deliverables.
6. Create administrative and finance systems in R&D institutions to be a part of the delivery team and not just be in control mode.
7. Leadership development is a crucial matter that needs attention. There should be flexibility in movement of scientists across institutions. Lateral induction should not create disadvantages to individuals.
8. Scale up S&T data base activities.
9. We should be able to adequately influence international standardisation activities to protect interests of our industries.

Reference.

1. Planning Commission document 'Faster, Sustainable and More Inclusive Growth: An approach to 12th five year plan' Table-1, page 19

No. 12016/3/2011-S&T
Government of India
Planning Commission
Science and Technology Division

Yojana Bhawan,
Sanasd Marg,
New Delhi-110001

Dated 18.04.2011

OFFICE MEMORANDUM

Subject: WG-1: Constitution of Working group to Review the existing Institutional Mechanisms and Structures as well as the Management and Governance of S&T Sector

The Steering Committee on Science and Technology for the formulation of Twelfth Five Year Plan, during its first meeting held on 5th April, 2011 under the Chairmanship of Dr. K. Kasturirangan, Member (Science). Planning Commission has decided to constitute a Working group to Review the Existing Institutional Mechanisms and Structures as well as the Management and Governance of S&T Sector. The composition and Terms of Reference of the Working group are as under:

Composition

S. No.	Name & Designation	
1	Dr. Anil Kakodkar Former Secretary, DAE, and Homi Bhabha Chair Professor, Mumbai	Chairman
2	Prof. S.K. Brahmachari, Secretary, DSIR & DG-CSIR	Member
3	Dr. Baldev Raj, Director, IGCAR, Kalpakkam	Member
4	Dr. G. Sundararajan, Director, ARCI, Hyderabad	Member
5	Dr. Vijayalakshmi Ravindranath, Chairperson, Centre for Neuroscience, IISc, Bangalore-560012	Member
6	Shri A.K. Verma, Adviser (S&T), Planning Commission or his Nominee	Member
7	Dr.Indrani Chandrasekharan, Adviser(E&F), Planning Commission	Member
8	Shri K.C. Mehra, ASSOCHAM, New Delhi	Member
9	Dr K.V.Prabhu, Head, Division of Genetics, IARI, New Delhi	Member
10	Representative of the Department of Atomic Energy (R&D Sector)	Member
11	Representative of the Department of Space	Member
12	Representative of the Department of Science and Technology	Member
13	Representative of the Department of Scientific and Industrial Research/CSIR	Member
14	Representative of the Department of Biotechnology	Member
15	Representative of the Ministry of Earth Sciences	Member
16	Representative of DOPT	Member
17	Representative of Ministry of Finance	Member
18	Director, NIAS, Bangalore or his representative	Member

19	Director, ASCI, Hyderabad or his Representative	Member
20	Representative of the Director General, CII	Member
21	Dr. Arun Srivastava, DAE, Mumbai	Member Secretary

Terms of Reference

1. To examine and critically review the continued relevance of some of the existing institutions, structures, mechanisms, which have been created over the years to enhance India's Research & Development base and scientific capability and to ensure that the much needed resources, both financial and human, are deployed in an optimal fashion
2. To suggest specific measures/policies/procedural reforms to de-bureaucratize science through effective personnel and financial management in the S&T sector, including incentives, rewards, amenities etc. to the scientists and also for expeditious approval/sanction of various S&T programmes/schemes and timely release of funds to the scientists, while at the same time ensuring transparency and accountability in the system.
3. The Chairman may co-opt any other member.
4. The expenditure towards TA/DA in connection with the meetings of this Working Group in respect of Official Members would be borne by their respective Ministries/Departments. In respect of Non-Official Members, the expenditure would be met by the Department of Atomic Energy, as admissible to class-I officers of the Government of India.
5. The report of the Working Group would be submitted to the Steering Committee on the S&T for the formulation of Twelfth Five Year Plan by 15th July, 2011.


(R.K. Gupta)
Joint Adviser (S&T)

Copy forwarded to:

1. Secretary, Department of Atomic Energy
2. Chairman, all Members and Member-Secretary of the Working Group
3. PS to Deputy Chairman, Planning Commission
4. PS to Adviser to PM on PI³
5. PS to Minister of State (Planning)
6. PS to all Members, Planning Commission
7. PS to Member-Secretary, Planning Commission
8. All Principal Advisers/Sr. Advisers/Advisers/HODs, Planning Commission
9. Director(PC), Planning Commission
10. Information Officer, Planning Commission
11. Library, Planning Commission


(R.K. Gupta)
Joint Adviser (S&T)