PLANNING COMMISSION

WORKING GROUP REPORT

ON
PUBLIC – PEOPLE – PRIVATE PARTNERSHIPS
FOR
TECHNOLOGY DEPLOYMENT

CONTENTS

PREFACE

Intelligent deployment of technologies for economic, social and public good involves complex and multifaceted inputs from several stakeholders. The role of partnerships is fundamental to achieve a seamless network of constituent entities in the knowledge space as well as on the delivery side, to realize the end objective.

The Planning Commission has constituted a Working Group, under the Chairmanship of Dr. T. Ramasami, Secretary, DST, on promoting Public-Private and Public – People Partnerships with Socio-economic Ministries / Departments and States for Technology Deployment. The composition of the Working Group may be seen at Annexure –IV.

The Working Group deliberated upon the issues involved in debottlenecking the present impediments and create new structures for partnerships to evolve for technology deployment. The formal meeting of the Working Group was followed by additional inputs from the members, which have set the contours of this report.

EXECUTIVE SUMMARY

Our efforts, so far, in technology sector have been broad based and disjointed, without formal mechanisms to connect various constituents in the knowledge space on one hand, and concerned stakeholders on the delivery side. This has resulted in a situation where we have knowledge assets not taken far enough to cover the entire value chain and there is relatively poor connect to the specific requirement of the user end. Understandably, the deployment level of technologies so far in the economic as well as social sectors leaves enormous space to be covered. Transactional approach needs to give way to partnership approach amongst various constituents and stakeholders at the development end and the delivery side. The entire effort should be user driven and taken up to the last mile coverage for real life deployment and usage. It is felt that the approach for the 12th Plan should be focused on building effective partnerships to realize this objective.

On the delivery side, we need to connect the knowledge institutions with research laboratories to convert ideas and innovations into proof of concept technologies. The knowledge institutions and research laboratories also need to be connected to the delivery side (Industry, Socio-Economic Ministries, State Government Agencies and Community Based Organizations) for demonstration and deployment of technologies for economic and social good. Making use of common infrastructure and administrative support system, including international alliances, will help optimal utilization of resources and realization of synergetic capabilities.

The following partnerships are being proposed for this purpose –

i) Public – Public Partnerships with Central S&T Agencies, Socio-economic Ministries and State Government Agencies. A competitive fund for deployment of public funded technologies in States has been

proposed along with higher allocation for S&T in the budgets of Socio-economic Ministries and PSEs.

ii) Public – Private Partnerships for R&D for public and social good, with incentivization of public funded R&D.

iii) Public – People Partnerships, involving community based organizations to cater to the needs of mass delivery at the grass root level in areas like agriculture and healthcare.

iv) International Partnerships to capture the best global practices and develop strategic alliances.

Some general issues also need to be addressed to strengthen the delivery mechanisms, debottleneck present impediments and support effective partnerships.

1. Introduction

India gained her political freedom in 1947, but the economy had remained disconnected to the global economy up to 1991. Indian economy was ushered to the path of Economic freedom only in 1991. This economic liberalization has impacted the growth of Gross Domestic Product favorably. India has registered a robust economic growth since 1991. Service economy has been a major contributor to the growth process. However, the share of technology-led manufacturing and share of global trade on advanced technology derived products has not kept pace with the global trends. The political and economic freedoms have not yet started to impact technology space adequately. Indian future path of growth is likely to gain if the country could be ushered into the path of technological freedom. For a large populous country like India enjoying demographic dividend and talent base, there remains an untapped opportunity for coupling technology with trade and knowledge creation with wealth creation sectors. Because of various factors intrinsic to the civilization in the country based on “unity in diversity” principle, the tools of partnerships and alliances have not so far been deployed for socio-economic benefits. In the area of technology development and deployment, partnerships and alliances have not matured adequately.

R&D activities in public and private sector have remained disconnected. Technology development and deployment activities have not been linked. Technology and trade have grown uncoupled. There is an urgent need to bridge the divides between development and deployment in technology space and couple technology with trade. The emergence of India as a major global economic power will call for a high level of technological freedom. Such a technological freedom will be forthcoming only if partnerships and alliances are leveraged and knowledge and wealth creation sectors are more strongly coupled. Therefore, in 12th plan for science and technology sector, a special working group has been constituted to develop models for strategic alliances within the entire knowledge sector of research and development and partnerships among the knowledge and wealth creation sectors. New programmes execution under for Public-Public, Public-Private and Public-People partnerships during the 12th plan have been focused by the working group.

2. Role of Partnerships

The role of partnerships is imminent in developing technology and its deployment in commercial usage as well as social sectors. The overall R&D value chain is a long drawn process and involves several entities and stakeholders, in vastly diverse roles. The last mile connectivity always remains an issue between the development and the user end. The complete transformation of knowledge and ideas into processes and products of commercial value is only possible with the help of active partnerships between various constituents and stakeholders. Currently, knowledge transfer to industrial and socio-economic sector follows a transaction path where knowledge is transacted for money. In other words, technology transfer follows a buyer-seller arrangement between research and development and industrial sectors. The industry is not engaged in identification of R&D priorities and technology development in public funded research and development systems. There is no viable relationship or partnership between knowledge creating and wealth creating sectors. A viable technology partnership could offer mutual benefits to the research and development and industrial sectors and consequently to national benefits.

3. Current Scenario

3.1 Need for Platforms for Fostering Knowledge Partnerships

Development of Science & Technology had been at the fore front of our national agenda, traditionally. Considerable resources have, therefore, been allocated to Central S&T Agencies through successive Five-Year Plans for the development of S&T Sector. Annexure – I (Budget Allocations for Central S&T Ministries) summarizes resource allocations to various S&T Agencies for the current (eleventh) and the preceding (tenth) five year plans.

Although the extent of funds earmarked, of the order of Rs 89,000 crores, and resources deployed in these departments are defined and known, the R&D outputs relating to wealth generation and creation of industrial turn over or employment generated are not precisely estimated. In the absence of adequate mechanisms for forging linkages and partnerships and collaboration among various R&D centers in the country, economic and social outcomes of these investments are not adequately estimated. Suitable mechanisms for reaping the synergy-benefits of investments into R&D bodies with science sector would be necessary. The proposals for the programmes to be implemented during the 12th plan by the Science sector should be urged to develop an input-output linkage and establish funding and oversight mechanisms for collaborative and networked projects. The approach to planning focused on the avoidance of duplication of investments for competing objectives and forging linkages for shared objectives through shared investments was not adequately addressed during the previous plan periods. The 12th plan proposals could explicitly make the shared investments and objectives for R&D for public and social good as a specific mandate and provide special funds for collaborative partnerships among various arms of the central science sector.

Annexure – II presents an indicative summary of the R&D Budget of Socio-economic Ministries. The level of deployment of funds for R&D by the socio-economic ministries is as less than Rs 8500. This would represent a sub-critical level of allocation and importance for R&D needs of the socio-economic sector. Delivery mechanisms for deployment of the relatively sub-critical levels of funds are not well developed in many of the sectors. These ministries enjoy the potential to promote PPPs in their relevant sector. New paths for promoting synergy among S&T institutions in the central science sector as well as those under socio-economic ministries need to be developed during the 12th plan period. Under such a

relationship model, Public-Private Partnerships for meeting the R&D needs of specific socio-economic sectors could be fostered. Some good global models for promotion of R&D under sector specific PPP could be studied and country specific models for such partnerships promoted during the 12th plan period

Over a period of time, S&T agencies have developed a large basket of technologies which can be readily deployed for developmental activities in social sector. In addition to this, these agencies have acquired adequate expertise and capabilities to develop tailor made technological solutions to meet specific user requirements. However, the level of usage of such technologies in commercial applications is low. The actual deployment of these technologies had been rather poor so far due to lack of information, proper linkages and an effective mechanism for their real life deployment and an enabling platform for knowledge partnerships.

3.2 Some Recent Initiatives for Fostering Knowledge Partnerships

During the last two years, several initiatives have been taken by DST to overcome these problems. Cataloging of technologies available with S&T agencies has been done. This process has been made dynamic with the creation of a Technology Portal, which will enable continuous updating of information on available technologies on real time basis and also provide an interactive interface between S&T agencies and all the States and Union Territories of India.

The process of mapping technology requirement for States, has been initiated. It is planned to carry out this exercise for most of the States and Union Territories in the Twelfth Plan period, possibly all. A prioritization matrix will be generated through this exercise and 2-3 most significant areas (in terms of reach, visibility and impact) will be identified for active intervention. As the next step, it is proposed to set up few demonstration units in different States and different areas, based on the priority matrix. These demonstration units could be funded by the Central Government, for which the proposals could come from the concerned State Governments / S&T Councils. More units of similar kind can be replicated by the same or the other States on their own, once their workability and utility is demonstrated.

3.3 Engaging Private Sector Participation into R&D: A Need for Future

The contribution of industry in supporting research and technology development in India is far behind other nations (Ref: Annexure-III; R&D Expenditure by Industrial

Sector). In order to target higher contribution of industry, it is essential that investment in technology development should be made attractive through various policy and fiscal measures, while mitigating the risk and enhancing potential rewards. Many technologies fail to get commercialized on account of last mile coverage.

Some socio-economic ministries also manage Public Sector Enterprises (PSEs) with large turn over and profits. These ministries could take a proactive role in a) persuading PSUs to invest into in-house R&D, b) forging linkages with R&D laboratories under their own administrative control and c) promoting partnerships with both knowledge institutions like IITs, NITs, universities as well as national laboratories of science ministries. Mutually gainful partnerships could be fostered between PSUs and R&D systems. The investments of the order of Rs 1300 crores per year are relatively low. Policy decisions by the socio-economic ministries on the extent of R&D spend by profit making PSUs as a percentage of turn over or profit could be a valuable next step.

Currently, total R&D spend in the county is estimated at less than 1% of GDP. Whereas in developed and other emerging economies the share of R&D investments of the private sector exceeds 66%, in the Indian social context the private sector engagement is estimated at less than 25% of total investments into R&D. A new investment partnership between public and private sectors into R&D is essential for the country. Such partnerships could be fostered only to a limited extent through fiscal incentives so far. Investment partnerships between private and public sectors increase only when the shared investments lead to co-generation of values. Academy and Research sectors should re-invent their mechanisms and processes for being able to develop partnerships with private sector. Performance appraisal of public-funded R&D institutions could involve the measurement and incentives for number of value of long term R&D partnerships built with private sector. This could be a 12^{th} plan paradigm.

3.4 Need for Inter Sectoral Synergy

The presence of substantive partnerships in technology development and deployment is hardly evident in the current scenario. There are isolated instances and minor schemes to support public-private partnership at a grossly sub-critical level. Annexure-IV provides an indicative list of some of the existing schemes,

operated under PPP mode by various S&T Departments, along with corresponding resource allocations. There is no formal structured mechanism to promote such partnerships at a reasonable scale and realize the full potential of synergetic – collaborative approach to technology development and deployment.

Governance structures required for promoting applications of leap-frog innovations are very different from those employed by the public sector. Public sector R&D is almost risk averse. Private sector does not invest adequately into risky innovations and hence demand pull for innovations is low.

TDB, SIBRI, BIPP, BIRAP etc are mechanisms developed for promoting early stage innovations and PPPs, large scale National impact of such schemes is yet to be realized. Penetration of venture capital assisted technology start-ups and turn over increases by application of R&D outputs from indigenous research through commercialization needs to be enhanced many fold. Inter-sectoral synergy between Knowledge and financial sectors is not adequate to leverage innovations into wealth creation A facilitating innovation ecosystem would call for much grater partnerships between financial and knowledge sectors in the country.

4. Proposed Models for Technology Partnerships

There are several entities engaged in research and technology development activities falling under the public domain, corporate structure and non-profit organizations. All the S&T Departments at the Centre have a structure of fairly large number of laboratories spread all over the country. Corporate houses have in-house R&Ds as well as standalone R&D outfits, run as no-profit entities. Socio-economic Ministries also have R&D laboratories to support their sector specific requirements. Ministry of Human Resource Development has a large number of academic institutions, which are primarily engaged in doing basic research.

In order to realize the full potential of these individual entities, it is essential to network them through effective partnerships and synergize their complementary strengths into tangible deliverables. With this objective in mind, the following types of partnerships are explored.

4.1 Public-Public Partnerships

The entire landscape of public funded institutions dealing with Science & Technology is fairly large. All these entities can be broadly classified into the following categories:

i) Knowledge Institutions (MHRD) : The country has developed a vibrant and broad based system of knowledge institutions comprising of IITs, Universities, NITs, IISERs and other similar institutions of national eminence. Most of these institutions come under the Ministry of Human Resource Development (MHRD). In the last one decade, several private academic institutions have also come up, some of which are making rapid strides to establish themselves as serious stakeholders in doing scientific research.

These institutions are essentially knowledge institutions, which are engaged primarily in education which is focused on understanding natural phenomena. These institutions in recent times have started to undertake Research and Development in areas relating to applications. They do not have the skill-set and resources to transform these ideas into comprehensive technology packages and provide the proof of concepts and ideas with respect to their workability. These knowledge institutions are mostly engaged in generation of new ideas and

exploration of those ideas to the level of proof of concepts. The education is also not focused on generation of solution designers for solving problems. The emphasis in education is on analysis with inadequate stress on applications.

The problems selected for designing R&D solutions are mostly self-generated. Industrial sector approaches these institutions for mostly consultancy services to advise specific problems in ad-hoc manner. Research and Development activities within these institutions are not based on team work and inter-disciplinary effort. Selection of priorities for R&D is mostly focused on generation of scientific publications and not Intellectual Products leading to Patents with commercialization potentials. In recent times, Indian industry is sponsoring R&D in institutions abroad and has been buying plants elsewhere in the world. In the absence of a viable academy-industry partnership within the country, knowledge and wealth creation sector remains disconnected.

MHRD and Scientific funding agencies make a plan R&D grant for Knowledge institutions like IITs and NITs for proposals developed jointly between the institution and PSU and private sector industrial enterprises.

ii) Research Laboratories (S&T Agencies): India has established a large number of research laboratories under the fold of various S&T Departments & Agencies working in non-strategic as well as strategic and specific sectoral areas. There are as many as 220 institutions under the administrative control of S&T agencies. These laboratories have developed expertise to cover substantial space in the R&D value chain and develop technologies for further scale-up and commercialization. The linkages between academic institutions and research laboratories are not strong and they seem to operate largely in competition space. The level of commercialization of technologies developed and patents created by research laboratories in non-strategic sector for industrial production is inadequate. These laboratories are working with industry on technology transfer model rather than relationship models wherein industry and research laboratories are working in close tandem. Only some laboratories are able to generate revenue flow from industry to meet at least 50% of their revenue expenditures from the private sector.

A Performance Related Incentive Grant Scheme for R&D laboratories under S&T ministries based on royalty earnings and the level of revenue earning realized from private sector could be developed.

iii) Research Laboratories (Socio-economic Ministries): Various Socio-economic Ministries also have established research laboratories which carry out developmental work to provide sector specific technological solutions. There are as many as 300 institutions under various socio-economic ministries. Majority of these institutions are working in isolation and remain weak for generation of new knowledge for applications. The inter-linkages among knowledge institutions like IITs, IISc and universities on the one hand and research laboratories with the science departments on the other could be significantly strengthened. Whereas these institutions enjoy the advantage of proximity to the industrial sector and intimate knowledge of the industrial needs for knowledge products, they are not in R&D space to be able to generate knowledge products necessary for technology-led industrial manufacturing. These institutions need to develop capacities to participate as major players in innovation chain. For this, these institutions need to forge linkages with both knowledge institutions and research laboratories with Science ministries on the one hand and serve as link agents between academy and research. New models for partnerships and alliances are necessary for leveraging the full potentials of the research laboratories with socio-economic ministries.

Keeping in mind the character and mandate of the above classes of institutions, the following partnerships are proposed under Public-Public mode:

a) Partnership between knowledge institutions and research laboratories for technology development, comprising of transformation of ideas (know-how) into proof of concept (show-how).
b) Partnership amongst Research Laboratories for technology development involving integrated solutions.
c) Partnership between Research Laboratories under Central S&T Departments and other R&D outfits under Socio-economic Ministries for sector specific technology development.
d) Centre – State Partnership between Central S&T Agencies and State level implementation agencies and Line Departments for technology deployment.

In order to realize the tangible deliverables and pursue these partnerships in a focused manner, it is proposed to launch ***Inter-Ministerial Missions*** in the following five sectors, identified based on demand, reach, impact and visibility:

- Clean Energy
- Affordable Healthcare
- Safe Drinking Water
- Communication
- Sustainable Environment

4.2 Public-Private Partnerships

The role of industry is critically important to realize the last mile coverage and connectivity in the process of technology development and deployment. The research laboratories normally have the capabilities to test a concept or demonstrate the workability of these ideas. Further scaling- up to real life scales, detailed engineering and commercial deployment is an area, where industry needs to assume the lead role. Hence, there is a scope for the following two types of partnerships for technology development and commercialization:

a) Bilateral Partnerships between research laboratories and industry (show how - do how).
b) Tripartite Partnerships between academic institutions, research laboratories and industry (know how –show how –do how).

The first type of partnership is more adept to yield immediate results and hence suitable to address short term needs. The second type of partnership is more holistic and is likely to support noble ideas and innovations for long term sustainability. The Prime Minister's Council on Trade and Industry constituted a sub-committee to prepare a concept paper for the promotion of Private-Public Partnerships for R&D and clean energy. The sub-committee has already submitted its report which has been accepted by the PM's council for implementation during the 12^{th} plan.

4.3 Public-People Partnerships

We do not always need technologies backed up by large capital inputs for addressing the issues related to developmental processes of a society with widely differing investment capacities. For a country like India which needs technologies for decentralized applications, intelligent adaptation and innovative deployment of affordable technological solutions to improve the quality of life of people is as important. The last mile connectivity of a different kind is needed to address societal and developmental issues, which can be achieved with the help of community based organizations, NGOs and other non-profit outfits under the private domain. Such organizations, with local presence and connectivity with people at grass root level, can be interfaced with Central S&T Departments with the help of State Governments and S&T Councils to source the technologies.

4.4 International S&T Partnerships

Various countries try and adopt innovative models to address problems, which are unique to their geography, culture, demography and availability of natural resources. There is a need to have a mechanism to capture such success stories wherever they are relevant to our own regional or national problems. It would be prudent to replicate such proven models for rapid growth and development, rather than reinventing the wheel. This may also require adaptation and retrofitting to suit local conditions and meet specific aspirations, which can be achieved through active partnerships amongst various stakeholders.

Several countries have started to realize potentials for leveraging technology partnerships with India using both bilateral and multi-lateral or regional models for S&T cooperation. There is now an emerging possibility to accelerate the development of a new technology culture within the country by cooperating with economies which have been able to link knowledge and wealth creation sectors better than India. Whereas the global innovation system is focused on process of innovations which offer advantages to the investor in a competitive market economy, Indian R&D system offers advantages for development of affordable innovations which could focus on public and social goods. There are several areas where

international S&T cooperation could be gainfully developed by India for benefit to people.

There is also wide spread recognition in the world that duplication of large R&D infrastructures is not advantageous. The benefits of global collaboration in the establishment of large R&D infrastructures like CERN, Accelerator facilities, large telescopes, ITER etc are realized. India has already moved along the path of participation in the creation of large R&D infrastructures and in leasing global R&D facilities for gaining access. The 12th plan proposals should make adequate use of emerging international partnerships for creation of large R&D infrastructures.

5. Some General Issues

- State S&T Councils can play an important role to carry forward Centrally Sponsored Schemes and technology deployment initiatives up to the last mile in their respective States. They can facilitate local private industry as well as Government Line Departments for sourcing appropriate technology and its adaptation. The present scale of operation of most of the S&T Councils is sub-critical with serious constrains of human and monetary resources. This should be strengthened with higher allocations from the Central Government. Local patronage by respective State Governments is also very important to strengthen and empower the State S&T Councils to make them more effective.
- There is a general disconnect between development end and deployment end which needs to be addressed through proper linkages. To achieve this objective, technology facilitation as an entity and technology facilitators as a profession is a distinct possibility.
- Many technologies fail to get commercialized on account of last mile coverage. Specialized infrastructure for technology development and demonstration would be useful to overcome this barrier. Such initiative may be supported under the Technology Development Fund for socio-economic Ministries.
- Proper mechanism would have to be evolved to address critical issues like “Confidentiality”, “Conflict of Interest” and “Intellectual Property Rights” to promote ‘Private-Public partnership’. Proper guidelines need to be evolved to create an objective and transparent system to facilitate quick decision making and the highest level of accountability.

6. Recommendations

6.1 Public-Public Partnership:

New tools, mechanisms and models are required for fostering Public-Public Partnerships among Center-States in technology deployment areas. They are :

6.1.1 The establishment of Technology Portals to facilitate easy access to information on real time basis and linkage amongst various stakeholders.

6.1.2 Creation of competitive fund for states for deployment of technologies developed through public funded research,

6.1.3 Science Departments make an allocation in their budget for partnerships and alliances

6.1.4 Socio-economic ministries make larger allocations to R&D than what was possible in the 11th plan

6.1.5 Socio-economic ministries urge profit making Public Sector Units to allocate at least 0.8% of their turn over to R&D

6.1.6 Enrich the technology delivery systems to states by empowering S&T councils and other established mechanisms

6.1.7 S&T sector develops state specific Technology Deployment Plan in consultation with states

6.1.8 MHRD and R&D funding agencies develop a scheme for investments of Plan R&D grants academic institutions for joint programmes with PSUs and Private industry for work in their own institutions

6.2 Public-Private Partnership for R&D:

The sub-committee of PM's council of Trade and Industry has proposed a new paradigm for investing into R&D for public and social good by treating the entire knowledge sector in R&D as one continuum and relate investment decisions based on whether the final outcome is focused on public/social or private good. The sub-committee has made some important recommendations concerning Research-Industry and Academy-Research and Industry partnerships. They are:

6.2.1 A performance related incentive grants for public funded R&D based on royalty earned and share of revenue budget realized from private sector sources for commercialization of technologies

6.2.2 Launching of global bench marking study for models for Public-Private Partnership for R&D

6.2.3 Commissioning of a professional research study for development of a best-fit model for PPP for R&D in the country

6.2.4 Establishment of a PPP fund for investing into R&D for clean energy and environment, food and nutrition, affordable health care, water and sanitation and climate change adaptation

6.2.5 Implementation of major recommendations of the sub-committee of PM's Council for Trade and Industry on Promotion of PPP fro R&D and Clean Energy

6.3 People-Public Partnership:

Technology delivery to community in areas where social good is focused is a serious challenge. In the Indian social context, referencing of technological changes to the needs of the local community demands social trust. Several community based organizations are active in relating decentralized applications of technology to the people. People-Public partnership is often facilitated through such Non Governmental and Community based organizations. The Sub-committee has made some lead recommendations. They are:

6.3.1 For sectors like agriculture, which impinge upon livelihood of people, technological changes are best brought about through extension. KVKs and ICAR are active in field extension of technologies. Assistance of community based and Non Governmental organizations in field extension could be considered.

6.3.2 Grass Root Innovation system of informal innovators is vibrant in the country. Linking informal and formal innovation systems is a challenge in which National Innovation Foundation has been active. NIF has been able to develop and employ people-public partnerships. Case studies of such partnerships could be studied and employed in generation of open source innovation for better spread.

6.3.3 Science and Technology needs of rural India are significantly different from those needed for urban India. Technology delivery mechanism required also is markedly different. A multi- stake holder partnership involving people-public-private partnership may seem necessary. Case studies of successful models and the contexts in which success was registered could be valuable.

6.3.4 Sub-committee recommends consortium approach for fostering people-public partnerships and address the last mile challenges in technology delivery.

6.4 International S&T Cooperation:

International S&T cooperation of India is undergoing major expansion. Many countries are stepping their bilateral and multi-lateral S&T cooperation activities with India. There is a need to build strategic alliances and select priorities for S&T cooperation. Many countries in developing world look up to the India currently. The sub-committee recommends three pronged actions. They are:

6.4.1 Sharing of successful experience with friendly countries in the developing world.

6.4.2 Adoption of reciprocity and parity principle in development of partnerships with developed economies.

6.4.3 Creation of technology acquisition fund and mechanism as well as delivery structures for specific technological needs.

6.4.4 Develop structures for absorbing Global innovations and build technology alliances for international partnerships.

7. Resource Needs for Supporting Partnerships and Alliances

The working group opines that partnerships and alliances in S&T sector are not necessarily resource constrained or resource intensive. Since the knowledge and wealth creation activities are not strongly coupled and inter-sectoral linkage are weak, special efforts may be required to promote partnerships and alliances in S&T sector. Inadequacy of partnerships and alliances in S&T landscape is reducing the efficacy of R&D sector in delivering values to the developmental priorities and economic activities. Absence of linkages among academy, research and industry has remained a major National weakness. Therefore, new mechanisms, models and schemes are required to bridge gaps in the mind-market chain. The working group has made some recommendations for undertaking some studies relating to the development of partnerships and alliances. Some partnership funds within the budget of individual ministries may be considered based on the priorities of each department. Some indicative investments for promotion of partnerships and alliances of national R&D sector have been suggested.

7.1 Budgetary Estimates

S.No	Nature of partnership/ alliances and activities proposed	Nature of activity proposed	Fund needs projected Rs. in crores
1	Public- Public partnership for technology deployment		
	➢ Establishment of Technology portal	Activity of each of technology supply source.	Within budget allocations.
	➢ Centre-State Technology partnership	Competitive grant for States for technology absorption.	1000
		Empowering of State S&T councils and other delivery mechanisms.	200
		Preparation of State specific technology deployment plan.	50
	➢ Science departments and their institutions	Allocation of a %age for partnership development.	Within budget allocations.
	➢ Socio-economic ministries and their institutions	Development of R&D and investment plans.	Make a larger allocations for R&D within their own budget at say 0.8%.
	➢ R&D efforts and partnerships of PSEs	Inhouse R&D and R&D partnerships with public funded institutions.	0.8% of turn over of profit making PSEs.

S.No	Nature of partnership/ alliances and activities proposed	Nature of activity proposed	Fund needs projected Rs. in crores
2	Public-Private Partnership in R&D		
	➢ Promoting R&D partnerships of public funded academic and research institutions with private sector	A special scheme for Performance Related Incentive Grant for public funded institutions for royalty and revenues budget earned.	150
	➢ Implementation of sub-committee report of PM's Council of Trade and Industry	Global bench marking studies for partnership development.	20
		Commissioned study for country specific model.	20
		Sharing Creation of PPP fund with private sector.	2500*
3	People Public Partnership for technology delivery		
	➢ Case studies of successful models and public outreach of selected examples	Case study development.	20
4	International S&T cooperation		
	➢ Agency related activity		Agencies to make suitable provisions.
	Total		460**

- **PPP fund has not been added to this proposal because of separate allocations through non-plan fund had been proposed elsewhere from Technology cess funds.*
- ***Competitive grant for States for technology deployment has been included in the budget of Ministry of Science and Technology.*

8. Concluding Remarks

It requires a paradigm shift in our approach to promote deployment of public funded technologies in real life applications for economic, social and public good. All the constituents in the knowledge space and user segment need to be networked into one continuum to synergize their complementary strengths. The focus should be on the ultimate delivery right at the grass root level.

The Working Group has explained the entire scenario and proposed various models for building partnerships between Central S&T Agencies, Socio-economic Ministries, State Government Agencies, Industry7, Community Based Organizations and International Alliances. It is expected that these models can together address to divergent requirements for technology deployment in various sectors.

***Annexure* - I**

Budget Allocation for Central S&T Ministries

(Last Two Five Year Plans)

(Rupees in Crores)

S.No.	Ministry / Department	Tenth Plan (2002-2007) B.E.	Eleventh Plan (2007-2012) Projected Outlay
1	DST	4942	11028
2	DBT	1761	6389
3	DSIR / CSIR	3431	9000
4	DAE (R&D Sector)	3578	11000
5	MoES	1328	7004
6	DoS	12420	30883
7	DARE / ICAR*	--	12023
8	DHR / ICMR*	--	1517
	Total	**12460**	**88844**

Source: Eleventh Five Year Plan – Vol. I, 2007-12, Planning Commission

(*) Semi-formal inputs from Concerned Agencies

Annexure – II

R&D Budget of Socio-Economic Ministries

(Eleventh Plan Projections)

(Rupees in Crores)

S.No.	Ministry / Department	Budget
1.	Department of Ayush	636
2.	Ministry of Coal	75
3.	Department of Commerce	168
4.	Ministry of Environment & Forests	265
5.	Ministry of Food Processing Industries	221
6.	Department of Heavy Industries	1149
7.	Ministry of Home Affairs (BPR&D)	132
8.	Department of Information Technology	2302
9.	Ministry of MSME (Coir Ind.)	126
10.	Ministry of New & Renewable Energy	1061
11.	Ministry of Planning (Energy R&D)	2210
12.	Ministry of Steel	104
13.	Ministry of Textiles	9
14.	Ministry of Urban Development	111
15.	Ministry of Water Resources	261
Total		**8830**

Source: Eleventh Five Year Plan – Vol. III, 2007-12, Planning Commission

Annexure – III

R&D Expenditure by Industrial Sector

(Rupees in Crores)

Period	Public Sector	Private Sector	Industrial Sector
2002-03	1078	3498	4576
2003-04	1091	4471	5562
2004-05	1258	6039	7297
2005-06	1304	6039	8748

Source: R& D Statistics, 2007-08, DST

Annexure – IV

Some Existing Schemes (Indicative) under PPP Mode

(Rupees in Crores)

Agency	Scheme	Budget Outlay (Tentative)
CSIR	NMITLI	300
DBT	BIPP & BIRAC	128
	SBIRI	30
DST	TDB	300
	DRPR	20
	TIFAC	16
	NCSTC	02

Source: Semi-formal Inputs from Concerned Agencies

Annexure – V

Composition of Working Group

1. Dr. T. Ramasami, DST …. Chairman
2. Shri B.P. Rao, BHEL
3. Dr. Anji Reddy, Dr. Reddy Laboratories, Ltd.
4. Shri Jamshyd Godrej, Godrej Boyce Ltd.
5. Dr. C.T.S. Nair, Kerala SCSTE
6. Shri Anjan Das, CII
7. Dr. Rajiv Kumar, FICICI
   (Shri Dipanjan Banerjee)
8. Dr. Renu Swaroop, DBT
9. Dr. Neelima Jerath, Punjab CST
10. Prof. Promod K. Verma, MPCST
11. Shri M.N. Vidyashankar, Karnataka S&T
    (Dr. H. Honne Gowda)
12. Dr. V.K. Dhadwal, NRSC
13. Representative - Secretary, M/o Power
    (Shri K.P. Singh)
14. Representative - Secretary, D/o Heavy Industry,
    (Shri Sushil Lakra)
15. Representative – Secretary, D/o Chemicals & Petrochemicals
16. Representative – Secretary, M/o Mines
    (Shri Anil Subramaniam)

17. Representative – Secretary, M/o MSME
(Shri Amarendra Sinha)

18. Representative – Secretary, M/o Agriculture
(Shri P.K. Swain)

19. Representative – Secretary, M/o Petroleum and Natural Gas
(Shri Sukhvir Singh)

20. Representative – Secretary, M/o Water Resources
(Shri P.K. Mehrotra)

21. Representative – Secretary, M/o Rural Development
(Dr. T. Vijay Kumar)

22. Representative – Secretary, M/o Steel
(Shri A.C.R. Das / Shri B.D. Ghosh)

23. Shri Ram Mohan Mishra, Meghalaya S&T

24. Dr. V.V. Sadamate, Planning Commission

25. Dr. (Mrs.) Renu Parmar, Planning Commission

26. Shri A.K. Verma, Planning Commission

27. Shri Rajiv K. Tayal, DST …. Member Secretary