Position on Draft Policy on ICT&E R&D Policy of Government of India

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1. Executive Summary

The Centre for Digital Economy Policy Research (C-DEP) appreciates the high quality of the draft policy on ICT&E R&D.

C-DEP believes that the policy can be further enhanced by also bringing in focus on non-structured innovation, especially those coming from MSME's and vocational centres and by focusing on institutionalized processes for roping in large domestic corporations early on into a R&D lifecycle, in order to ensure appropriate commercializations and economic benefits.

The above thought is based on the Innovation Framework shown below:

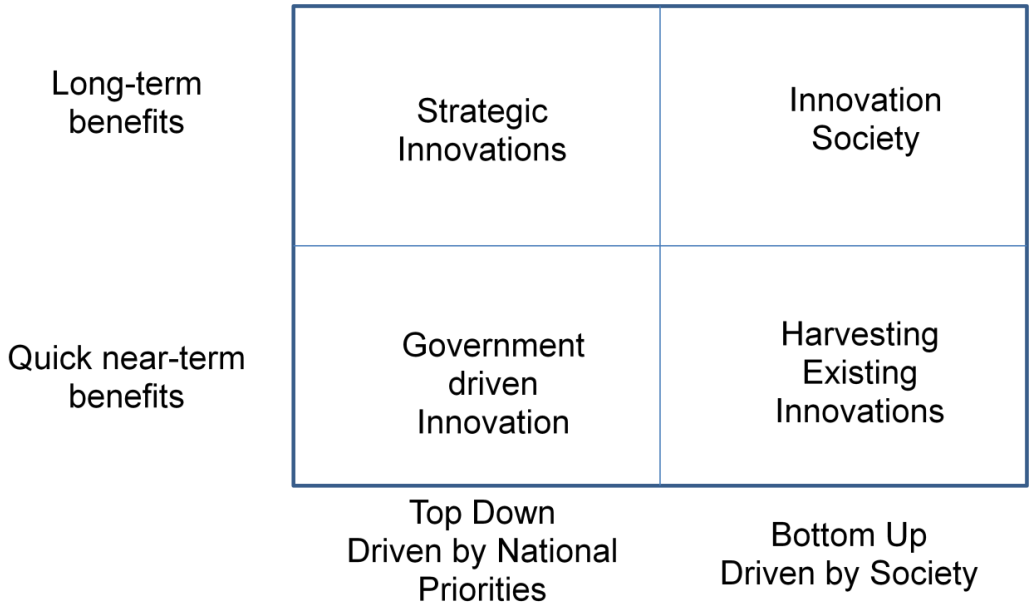

Figure 1: Innovation Framework that recognizes non-structured innovation driven by societal needs

Also, it would be highly recommended to have a metric to measure the economic benefit of each initiative undertaken, so as to ensure the desired impact on the economy, in the long run.

2. Purpose

The purpose of the document is to provide inputs to the draft Policy on R&D in ICT&E by the Department of Electronics and Information Technology, Ministry of Communication and Information Technology, Government of India, in order to strengthen the policy.

3. Background

Department of Electronics and Information Technology, Ministry of Communication and Information Technology has presented a draft ICT&E R&D Policy for public comments.

The policy is aimed for promoting R&D in ICT&E in the country such that India attains global leader in ICT&E.

This document compiles the potential areas observed by C-DEP for strengthening the policy.

4. Observations on Vision

The vision of the policy has been stated as follows:
"To attain global leadership in the ICT&E sector by building an eco-system to nurture, encourage, promote, facilitate and support research, innovation and product development for rapid, inclusive and sustainable growth of the country."

Given the experiences elsewhere, **self-sustainability** of the eco-system is critical for a long term R&D policy. notable in Israel where the Government's efforts to promote research initiatives led to innovative companies being formed which eventually were sold and acquired by foreign firms as the innovative firms could neither sustain themselves, nor scale up. Moreover, at some point in time, the eco-system need not require any further government support and assistance.

Therefore it is suggested that the vision be modified by including the term "self-sustaining".
"To attain global leadership in the ICT&E sector by building a **self-sustaining** eco-system to nurture, encourage, promote, facilitate and support research, innovation and product development for rapid, inclusive and sustainable growth of the country."

5. Observations on Mission

It is important build-in into the Mission, the metric for measuring the success of the policy. One of the ultimate metrics would be to measure the economic impact of the policy in terms of the size of the industry created by the specific innovations.

For example, if "Juggad" was allowed to be manufactured in the formal sector, one could have measured the turnover of all Jugaads sold and the extended economy of ancillaries and mechanics. That would have represented the total value add of the innovation.

Similarly, iPhone 5 of Apple is expected to add 0.33% to the US economy.

Therefore, it is suggested that the Mission be modified as follows:

> "To develop an effective and efficient R&D eco-system by channelizing the research efforts and resources into the priority sectors of the economy and by achieving excellence in ensuring that these efforts lead to design, development and manufacture of high quality, world-class products in the ICT&E sector, **providing significant value addition to the economy** "

6. Observations on Objectives

The suggested modifications are marked in bold below:

(i) To promote ICT&E research, innovation, system design, product development **and commercialization,** especially in cutting edge technologies in areas like Nanoelectronics, Microelectronics, VLSI, MEMS, NEMS, Electronics Materials, Photonics, Mobile Technologies, High Performance and Next Generation Computing including Cloud and Ubiquitous computing, Perception Engineering and Human Computer Interfaces, Convergent & Communications Broadband technologies, Indian Language Technologies, Cyber Security etc. **but not limited to the above listed fields.**

(ii) To leverage R&D in ICT&E for key social sectors like education, health-care, agriculture, skill development & employment generation, and empowerment of differently abled to achieve inclusive, sustainable and affordable solutions. **The differently-abled would include persons who are not literate.**

(iii) To promote R&D for infusion of ICT&E in Industrial sectors **and government**

(iv) To facilitate R&D led manufacturing in the entire value chain of ICT&E system design and manufacturing

(v) To establish Centres of Excellence in thrust areas of ICT&E for intensified and focused R&D activity

(vi) To support and encourage entrepreneurship to develop innovative products in thrust areas

(vii) To promote creation of incubation facilities/ centres for innovative product development

(viii) To strengthen the institutional mechanism for protection of IPR and to promote **the culture of** patenting **by ensuring addition of dedicated courses on IPR protection in regular curriculum as well as making the patent office more accessible and cheaper for non-corporate entities.**

(ix) To promote collaboration between industry, academia and R&D institutions **as well as with foreign technology partners**

(x) To enhance availability of qualified R&D manpower significantly by enhancing the availability of significant number of PhDs in disciplines related to ICT&E

(xi) To indentify and promote long term research in emerging areas to enable India move towards attaining global competitiveness

(xii) To promote basic research towards achieving outstanding scientific contributions

7. Observations on Scope

It is critical to include aspects of commercialization during the conceptualization and funding stages. Also, it is critical to identify and nurture existing innocations that would have come up due to serendipity. Therefore, following is the suggested modification to the scope

"The scope of the R&D policy encompasses the entire R&D life cycle, comprising of stages like the **identification of existing innovations that require support,** need assessment and idea generation, project/programme formulation, **commercialization strategy including, but not limited, to roping in of marketing partners with co-investments,** research and innovation, developing the proof of concept, prototyping and field testing, product development and technology transfer for commercialization. The R& D Life Cycle is depicted in the Annexure."

Hence, even the R&D Life Cycle need to be modified accordingly.

8. Observations on Strategies

A robust set of strategies have been conceptualized in the draft policy.

The policies are focused on structured R&D process, driven by national priorities.

It is suggested that the strategies also include unstructured innovation coming out of serendipity or from needs identified at the grass-roots. Such an approach comes out of the Innovation framework developed by Jaijit Bhattacharya, given below:

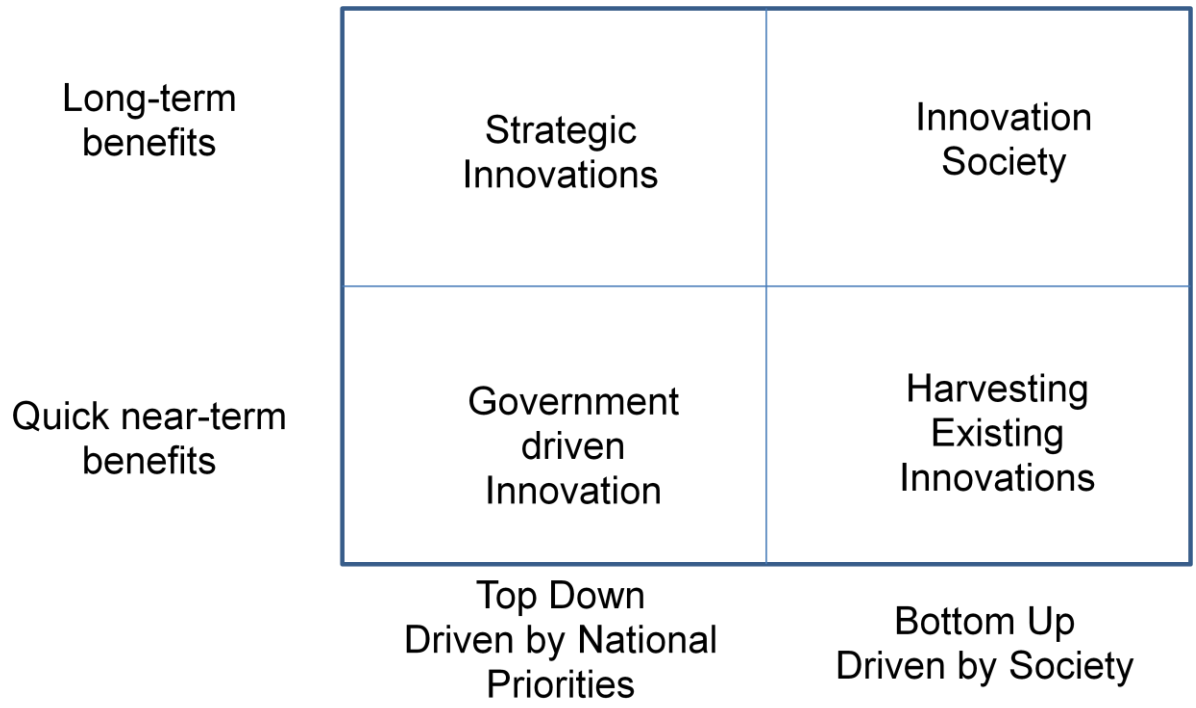

Figure 2: Innovation Framework that recognizes unstructured innovations

Moreover, it would be easier to sustain the innovations if the role of the private sector is defined early on for each new thrust area for research. This could be in the form of institutional mechanisms such as pooled in resources for development of specific technologies that would help domestic manufacturers reduce their royalty pay-outs, thus having a clear return on investment in R&D for the participating commercial entities.

The draft policy in the current form, envisions a limited participation from existing large domestic corporations.

Therefore, the following two additions are suggested in the strategy section:

6.9 Promote public-private partnership for R&D

Existing measures will be strengthened and new measures will be initiated to develop public-private partnerships for R&D and technology/product development on the following lines:

(i) Academic /R&D organizations will be encouraged to design projects with participation by industry

(ii) Industry experts will be encouraged to participate in R&D at academic and R&D organizations on short term assignments

(iii) Industry will be encouraged to utilize the major R&D facilities at the academic and R&D institutions for prototyping and product development.

(iv) Academia and R&D institutions will be encouraged to setup incubation facilities to promote entrepreneurship and start-ups

(v) R&D labs will be established for product development in specific cutting edge areas in public -private partnership

(vi) **In addition, model frameworks will be developed for investments from the private sector and for sharing the outcomes of the R&D, including framework for ownership of IPR output.**

6.12 Promote innovation and R&D in MSME and in vocational centres

Ensure that innovations from MSME and from vocational centres are nurtured and that they develop a culture of protecting their IPR and have access to capital to commercialize their innovations

9. Observations on Governance and Administration

The following are suggested modifications to the Governance and Administration:

7.1 A web-based portal will be established for managing the entire life cycle of R&D**, and will allow lateral entry of existing R&D, into the web portal**

7.3 A precise R&D manual will be designed to govern and regulate all aspects of R&D project management including performance/outcome management and financial management**, including norms of sharing the IPR and commercial benefits**