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SUSTAINABLE ECONOMIC DEVELOPMENT - INDIAN PERSPECTIVE

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Dr.K.Sasi Kumar, Assistant Professor/MBA,VICAS

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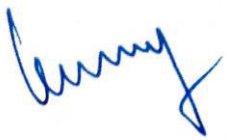
EDITORIAL MESSAGE

We take great pleasure in welcoming you to our Edited Book. The immediacy of e-based publication makes it possible for us all to be fully connected to each other and to developments in our field and to be directly involved in ongoing knowledge construction.

With several economies gearing towards the end of lockdowns, it's time for organizations to implement Post-COVID-19 business recovery strategies. Although it will let organizations restore balance to an extent, total recovery from the crisis is going to be a long and strategic battle. With these concepts in mind, we invited with scholarly discussions to facilitate new ideas for business sectors. This book also stands as a platform for Students and research scholars to express their innovative business models and solutions.

We are thankful to all academicians, research scholars and students who have contributed for this edited book. We also acknowledge the valuable suggestions and support offered by our colleagues and students. We are delighted that you are joining us as readers and hope you will also join us as contributors.



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SUSTAINABLE DEVELOPMENT OF ECONOMICAL GROWTH IN INDIAN PERSPECTIVE

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ABSTRACT

Scienceiscriticaltotacklecomplexchallengesforhumanitysuchasclimatechange,biodiversity loss, pollution and poverty reduction, as it lays the foundation for new approachesand solutions. How can science best fulfill this commitment to society? How can we createdynamicconnectionsbetweenknowledgeandaction?Theseconcernshaveledtoanewapproach: sustainability science. UNESCO, with the generous support of the Government ofJapan,is bringing togetherkey stakeholdersfrom academia,the policy-making community,specializedinstitutionsandtheUnitedNationsinordertobetterdefineandbroadenthesustainability science approach in support of the 2030 Agendafor Sustainable Development.This 2-year project was launched during a symposium held at UNESCO Headquarters in Parisearlier in April. “The 2030 Agenda is transformative, and it requires a multidisciplinary approachto achieve the Sustainable Development Goals and targets, while ensuring policy coherenceacross the different interventions” explained Nada Al-Nashif, UNESCO’s Assistant Director-General for Social and Human Sciences. “This is a critical role for sustainability science - as itpromotes cross-disciplinary approaches to advance the understanding of human-environmentinteractionsandsystems,and howtheseinteractionsaffectthechallengeofsustainability.” The sustainability science approach is essential for effective decision-making with regard toglobalsustainability,sincesocial,environmentalandculturalsystemsarecloselylinked.UNESCO will continue, with its partners, to continue to support efforts to educate and advocatethe development of this approach. This approach is a powerful reminder of the complexity of thechallenges the world is facing, and the immense responsibilities this creates for internationalorganizationslikeUNESCO.

Introduction

Three Symposiums will be organized in the framework of the project, to bring togetherkey experts and perspectives. The second symposium will take place in early 2017. The finaloutcome of the Project will be a set of policy guidelines defining sustainability science, settingthe principles within which the approach should be undertaken, and providing guidance on itsapplicationatmultiplelevels.

Evolution ofScienceandTechnologyPolicyin India

Thischapterdiscussestheevaluationofscienceandtechnologypolicyin Indiaalong with the fundamental values that inform the strategies and decisions deriving from it. It followsthe post-independence debates and the twelve five-years plans on science and technology. Thevalues of access,inclusion and equity are identified andanalyzed as the guiding principlesunderlying policy actions in India and explain the conceptual differences that we witness in theperceptionofscienceandtechnologyethicsinthethreeregions.

This chapter focused the evolution of science and technology policy in India, its linkagewith national developmental plans and the challenges ahead for India in science, technology andinnovation policy. In India, as in many post-colonial countries, the state has played a major rolein using science and technology fornational developmentbesides givingita special thrust.While India succeeded in creating a sizeable science and technology infrastructure within fivedecades of independence, the globalization of science and technology and changes in the externaleconomicenvironmentnecessitateda changeinthe orientationofpolicymakers.

The Twelfth Five Year Plan (2012–2017) focuses on sustainable and inclusive growth,whiletheScience,Technology andInnovationPolicy of 2013emphasizesnewmodelsforpromotinginnovation.Intheglobalinnovationdiscourse,India’scapacityforfrugalandinclusive innovation is recognized, and the National Innovation System is also bringing aboutchange,withcontributionsfrommanyquartersrangingfrommultinationalcorporationstograssrootsinnovators.

ScienceandTechnologyPolicyin India

'Science: The Endless Frontier', a report by Vannevar Bush published in 1945, played animportant role in setting the agenda for post-war science and technology policy in the USA. Thereport saw it as the task of science policy to contribute to national security, health and economicgrowth. It emphasised the potential economic impact of investing in science. Science policy is atool for managing and funding the accumulation of knowledge by establishing, funding andsustaining organizations (e.g. universities and research laboratories) and directing their outputsand accumulated knowledge towards meetingnational objectives, among other things—anditcanbejustifiedfromaneconomicperspective:

A general economic rationale for STI policy is that we pursue it because we think it willlead to technological progress, and we think that technological progress is a crucial determinantof economicgrowth,whichin turn we regard as ultimately vital towelfare of theindividualswho comprise society (Kane 2001). Given the wider impact of science policy, it can be analysedfrom various disciplinary perspectives (see, for example, Husbands Fealing et al. 2011). In post-colonial societies science policy became a prominent policy in national developmental agendas(Salami1 and Soltanzadeh 2012). Thus science policy is primarily a post-Second World Warphenomenon. This is equally true of India, but the development of science policy there can betracedtotheresponse ofIndiansocietytomodernscience (Sinha1992).

TheresponsestomodernscienceinIndia'straditional society were of threekinds:modernists wanted India to follow the European model, critical modernists argued for a creativesynthesis of European and Indian civilizations, absorbing the bestfrom Europe, and criticaltraditionalists emphasized the need to give primary importance to Indian tradition and culturewhile drawing upon European knowledge and culture (Parekh 1989). The responses to modernsciencewithinthenationalmovementandIndiansocietywerevaried,andsowastheunderstandin g of science. Often science was equated with modernity. By the 1930s, groups ofscientists, nationalists and others were arguing that science would have to play an important roleinpost-independenceIndia.TheNationalPlanningCommitteeconstitutedin1940hadasubcommitteeonscienc e.Indiagaineditsfreedomin1947,andthefirstprimeminister,JawaharlalNehru,inspiredbyFabiansocia lismandcentralizedplanninginthethenUSSR,

envisaged centralized planning and strong support for science in India. He gained the support ofscientists such as Homi Bhabha, Meghnad Saha and S.S. Bhatnagar, and the restructuring ofscience and technology infrastructure was started. The infrastructure left behind by the Britishwas upgraded,andmany newlaboratories and universitiesand research centres were setup.India gaveprioritytoresearchinatomicenergy.

The first science policy statement was issued in 1958. In 1983 the government came outwith a Technology Policy Statement, followed by a Science and Technology Policy Statement in2003. In 2013 the Department of Science and Technology issued its Science, Technology andInnovation Policy. These statements and policies have provided the overarching frameworks forscience and technology policy and its linkage with developmental goals. Since 1952 there havebeen 12 five-year plans. The current five year plan (2012–2017) emphasizes sustainable andinclusivegrowth.The keyfeaturesofthefiveyearplansare setoutinTable1.1[Dogra(2011)].

Table1.1India'sfiveyearplans

Plan	Timeline	Key feature
First	1951–1956	Agriculture-led
Second	1956–1961	Socialistic industrial policy
Third	1961–1966	Self-reliance in agriculture and industry (plan affected by wars with China and Pakistan in 1962 and 1965 respectively), price stabilization
Fourth	1969–1974	Society-oriented (education, employment and family planning)
Fifth	1974–1979	Non-economic variables
Sixth	1980–1985	Infrastructure (6 % per annum growth achieved)
Seventh	1985–1989	Welfare sector, programmes such as Jawahar Rozgar Yojana
Eighth	1992–1997	Dismantling licence prerequisites and reducing trade barriers
Ninth	1997–2002	Agriculture and rural focus
Tenth	2002–2007	Globally competitive growth
Eleventh	2007–2012	Employment and social indicators
Twelfth	2012–2017	Sustainable and inclusive growth

[a]India had three annual plans between 1966 and 1969

Science for national development and security, and self-reliance, have been at the core of India'sscience and technology policies. Although India had no documentsimilar to 'Science: TheEndless Frontier', its science and technology planning was led by scientists and technocrats whoshared the visions of the politicians. This alliance led to a broad consensus on applying scienceandtechnologyinIndiaandtocontinuedsupportforscienceandtechnologyfromsuccessive

governments.Inthatsensethepost-colonialstateinIndiawasan ardentsupporterofscienceandtechnology.

Global innovation systems tend to bypass large sections of the community. Innovation forinclusive growth implies ensuring access, availability and affordability of solutions to as large apopulationaspossible.Innovationthereforemustbeinclusive.Thepolicy goeson tolist‘Linking contributions of science, research and innovation system with the inclusive economicgrowth agenda and combining priorities of excellence and relevance’ as an important objective.The policy advocates the strengthening of linkages between the scientific and socio–economicsectors,anditstates thatNGOswillbeaccordedanimportantroleindeliveringscience,technologyandinnovationoutputs.

In India, prior to 1991, centralized planning by the state was the determining factor insettingprioritiesforscienceandtechnology.After1991,economicliberalizationandglobalization brought new challenges and opportunities in science and technology forward. Indiajoined the World Trade Organization and had to amend its laws and enact new ones to meet therequirementsoftheAgreementonTrade-RelatedAspectsofIntellectualPropertyRights(TRIPS). Similarly, India enacted a law to comply with the Convention on Biological Diversity.Globalization helped India realize its competitiveness in information technology services and thepharmaceutical industry. India became an attractive destination for foreign direct investment inresearch and development (Basant and Mani 2012). In 2010 the Science Advisory Council to thePrime Minister introduced its vision documententitled ‘India as a Global Leader in Science’with the following statement: In the next two decades, India is likely to become an economicallyprosperous nation and move significantly towards being a far more inclusive society, with thebulk of its population gaining access to facilities for education and health care and living a lifewith hope and security. To realize such a vision, it is essential that science is at the heart of thestrategy that the next stage of national development demands (Science Advisory Council to thePrime Minister2010).

It listed India’s achievements in science and pointed out that the complex problems thecountry faced called for a ‘proper use of science’. It argued that India itself was the most cost-effectivesourceofresearchanddevelopmentinIndiaasitaccountedfor0.5%ofglobal

expenditure on science and produced 2.5 % of the global outputin science.The documentsuggested many measures, including more funding for science to help India become a leader inglobal science (Science Advisory Council to the Prime Minister 2010). To conclude, the scienceand technology policy in post-independence India has been shaped by concerns over socio–economic development and the need for self-reliance. In years to come, however, the policy willhave to address new issues emerging on account of the globalization of science and technology,the opportunities providedby emerging technologies and the technological convergence andother changes taking place in the global science and technology landscape. At the same time, thescience and technology policy will havemakea substantial contribution tosustainable andinclusive growth.

ScienceandTechnologyPolicyDiscoursesin India

Although science and technology policy in India is largely driven by the state, the debateson the role of science and technology in Indian society and modes of applying science andtechnology help us understand the policy discourses. For convenience, we can classify thesediscoursesintothefollowingcategories:

- Nehruviandiscourse
- Gandhiandiscourse
- People'ssciencemovementsandtheir discourseonscienceandtechnology
- Othervoicesanddiscoursesonscienceandtechnology

Ethicsin ScienceandTechnologyPolicyin India

Indianscienceandtechnologypolicieshavebeenshapedbytheconcernthattheapplication of science and technology should enable faster socio–economic development and thatall sections should benefitfrom scientific and technological advances.The unstated assumptionin these policies is that value-neutrality and scale-neutrality are to be addressed by appropriateinterventionsinfavor ofmarginalizedsectionsofthe population.

India stands for and will be pleased to contribute on following dimensions of UNCSTDSTIefforts vis-à-vispost2015DevelopmentAgenda:

- AffordableInnovations,encompassingaccess,availabilityandusablesolutionstomeetingbasicneeds;

- Accelerated Inclusive Growth for aspiring nations – developing countries with thrust onbase of pyramid population (as a better replacement to the prevalent expression of bottomofthepyramid)(Relia2014)

Thus, in our view, access, inclusion and equity can be considered ethical values in relation toscience and technology policy. There are many issues that need to be addressed,includingdeveloping science, technology and innovation indicators for access, inclusion and equity, anddeveloping methodologies for measuring policy outcomes for access, inclusion and equity, andmore theoreticalworkneedstobe done onaccess,inclusionandequity.

Conclusion

Indian science and technology policy has come a long way since the early 1950's. Today,asIndiaaspirestobeagloballeaderinscienceandtechnology,itisimportantforIndianpolicyto give attention to ethics in science and technology policy. However, this does not mean thatscience and technology policy has to importvaluesfrom Europe or the USA.Rather,in ourview, access, inclusion and equity can be considered ethical values and can be used to assesspolicy outcomes. This makes better sense in the Indian context, as it links societal developmentwith science and technology policy. Italsoreflects the currentthinking on sustainable andinclusive growth.

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