Study and Analysis of Impact of Science Technology and Innovation Management on the Quality of life and Sustainable Growth

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ABSTRACT

In the present work the author has carried out the study and analysis of the impact of key parameters of science technology and innovation management on the quality of life and sustainable growth. This paper provides an overview of how science, technology and innovation management (STIM) can address key challenges for the sustainable development agenda. It addresses the priority themes identified by the author in the light of the findings of the Commission on Science and Technology for Development (CSTD) with the use of science, technology and innovation management for the sustainable development. In the present work two subthemes have been taken into consideration for the analysis viz., (1) Taking stock - A five year contribution of the CSTD to the Millennium Development Goals (MDGs). (2) Looking forward - science, technology and innovation management technology for fulfilling the next five years vision of development agenda. While the author is carrying out the impact analysis to evaluate the science, technology and innovation management prospects for the next five years with reference to the implementation of Prime Minister's Koushal Vikas Yojana (PMKVY), Unnat Bharath Abhiyan (UBA) and Swachh Bharath Summer Internship (SBSI) the flagship programs of Government of India (GoI) are seen as Sustainable Development Goals (SDGs). There has been a growing recognition that science, technology and innovation management have a decisive role to play in enhancing the National Happiness Index (NHI) among the Middle Income Group Families (MIGFs) and Lower Middle Income Group Families (LMIGFs) beyond industrial growth. They are seen as important tools to eradicate poverty, create new job opportunities and promote the achievement of several MDGs. This work shows indeed that the role of science, technology and innovation management is positive and critical at each and every stage of development process. This paper shows how the countries can harness the strong linkages between science, innovative technologies and visionary policies for the overall sustainable development and welfare. The paper highlights the possible tangible achievements of the Commission of Science and Technology for Development. This paper investigates the role of STIM in facilitating the developing countries to reach their potential and catch up with the developed countries and in the mean time taking care of the social inclusion goals that are promoted in the MDGs. This paper also makes an attempt to provide a forward looking insight into the next set of developmental challenges and policy implications surrounding the Science, Technology and Innovation Management visualization strategies in the Millennium Development Goals.

Key Words: Science, Technology and Innovation Management (STIM), Commission on Science and Technology for Development (CSTD), Millennium Development Goals (MDGs), Sustainable Development Goals (SDGs), National Happiness Index (NHI).

1. INTRODUCTION

The crucial and pivotal United Nations Conference on sustainable development Rio de Janeiro and adopted a far-reaching strategy on sustainable development after 20 years of first-of-its-kind conference in 1992. The new "Rio+20" strategy as has been outlined in the conference outcome document "The future we want" which was subsequently adopted by the UN General Assembly a month later, in July 2012 amply demonstrates the continuing commitment by the United Nations Member States towards sustainable development in three dimensions, such as promotion of an economically, socially and environmentally sustainable future for our planet and for present and future generations [1]. A special note was also made on the continuing degradation in the global environment including failure of past strategies to halt the fossil fuel based "business as usual" trajectory found in both developed and developing countries.

Among these three important dimensions of sustainable development, it is obvious that the economic sustainability is associated with poverty and further more directly connected to the Millennium Development Goals (MDGs). It is significant to note that the Social sustainability has a key role to play and it has recently been recognized as a parameter to lay stress on inclusive development. The most important third dimension, that is environmental sustainability is related to the ecological and natural resource crises facing the world today which threatens the

development prospects of all the countries around the world [2].   As can be observed that all of the three developmental dimensions are appropriate, the economic sustainability is particularly vital for the developing countries, since many of the countries are likely to be stuck in poverty or in the middle-income traps as their growth is not sustainable.

2. ROLE OF SCIENCE, TECHNOLOGY, INNOVATION AND MANAGEMENT: KEY TOOLS FOR SUSTAINABLE GROWTH OF THE WORLD

The United Nations passed on a new global Agenda with a view to put the world on a sustainable pathway of development in September 2015. This agenda was proposed to be implemented by 2030 as "2030 Agenda", which required to bring about the basic changes in the approaches. They are: (i) The proposed new agenda is based on the principles of universality, that is "no one will be left behind" principle and also the principle of " action in all countries for all countries" and integration whereby the three decisive dimensions of development - environmental, social and importantly the economic development are not separate pillars anymore but are intertwined to form an indivisible whole; (ii) The Sustainable Development Goals (SDGs) mark a shift in the economic and political relationships between developing, emerging and developed countries. This calls for remarkable rethinking not only on the part of European Union's (EU's) external action, which including development cooperation, but also noteworthy domestic one; and (iii) The new agenda calls for a new cooperative paradigm which is based on the concept of "full global partnership", for inclusive and sustainable development of emerging countries [3]. It is imperative that the transitional path towards sustainable development requires time and the mobilization of all citizens, stakeholders, business, policy makers, industrial establishments and political vision. In this view, these processes obviously need to be carried out in an encouraging and participative manner.

The determined first challenge where STIM has a reasonably critical role to play is the challenging multidimensional poverty. In addition to income, there are various other factors that comprise the deprivation by the poor. This in turn includes lack of education, health, housing, sanitation, access to technology facilities, renewable energy, employment, personal security and more. As such, STIM has huge capacity and potential to make significant contribution for tackling these multiple dimensions of poverty through a variety channels and policy processes. For instance, STIM facilitates the much needed creation of jobs, enhance the delivery process of basic and essential public services. Furthermore, STIM can support in the improvement of access to honed transforming tool the knowledge and education and finally empowers the neglected and marginalized sections of our society. The second challenge is the daunting inequality, which is an indicator of whether the development is inclusive [4]. It is important to note that during 2006 - 2011, the income inequality has increased within most countries around the world [5]. Also over the last two decades, that is 1990 - 2010 the income inequality has shown an increase by 11 per cent in developing countries [6]. In order to meet the development challenges, policymakers need to pay utmost attention and care to both horizontal and vertical inequalities [7]. The vertical inequalities are the distances between rich and poor, while the horizontal inequalities are the distances between advantaged and disadvantaged culturally defined groups, such as genders, races, ethnic backgrounds, communities and religious groups. However, there is need to ensure that STIM efforts are directed through the powerful channels given below such that the larger population of both rural and urban background who are most in need are empowered and given relief and opportunity in the process to improve their quality of life.

(i) Pradhan Mantri Kaushal Vikas Yojana (PMKVY)
(ii) Unnat Bharat Abhiyan
(iii) Swachh Bharat Summer Internship

2.1. PRADHAN MANTRI KAUSHAL VIKAS YOJANA (PMKVY)

The Union Cabinet Chaired by Hon'ble Prime Minister, Shri Narendra Modi, on 20th March 2015 gave its approval for the Pradhan Mantri Kaushal Vikas Yojana (PMKVY) with an outlay of Rs. 1500 crores. This is the flagship scheme of Government of India (GoI) for skill training of youth to be implemented by the new Ministry of Skill Development and Entrepreneurship through the National Skill Development Corporation (NSDC). The scheme will cover 24 lakh

persons. Skill training would be done based on the National Skill Qualification Framework (NSQF) and industry led standards. Under the scheme, a monitory reward is given to trainees on assessment and certification by third party assessment bodies. The average monitory reward would be around Rs. 8000/- per trainee. The focus under the scheme is also on mentorship, training support and placement facilitation for which an outlay of Rs. 67 crores has been provided. An allocation of Rs. 150 crores has been made for training of youth from the North-East region [8]. Under the scheme the youth who earlier earned between Rs. 0 - 1000 a month increased to Rs.15000 - 20000. This is shown in Figure 1.

2.2 UNNAT BHARAT ABHIYAN

The Ministry of Human Resource Development (MHRD) launched the Unnat Bharat Abhiyan (UBA) 2.0 on 25 April 2018. **JSS Academy of Technical Education, Noida, in Uttar Pradesh** is the premier institution selected by the MHRD for participating in implementation of UBA a flagship programme of the MHRD. Hon'ble Minister of Human Resource Development, Shri Prakash Javadekar said that UBA 2.0 is in line with Hon'ble Prime Minister, Shri Narendra Modi's vision to transform India, in which students from 750 Higher Educational Institutions and Universities will go to nearby villages to get acquainted with the life of the village people and the problems faced by them in day to day life. The students could involve local village people at every stage of problem identification and solving issues and *find low cost technological interventions for the holistic development* relating to health, cleanliness, waste management, plantation, energy including renewable energy, improving technology of handicrafts and artisans, affordable housing, proper use of IT applications, drinking water, sanitation, education, financial inclusion and women and child development [9]. A financial allocation of Rs. 31.35 crores has been provided during 2018 - 19 and an allocation of Rs. 41.50 crores has been provided during 2019 - 20 [10]. For fulfilling the endeavour to cover the 45000 villages of the country under this movement, we need the participation of 8252 institutions of Higher Education and to make it a people's movement.
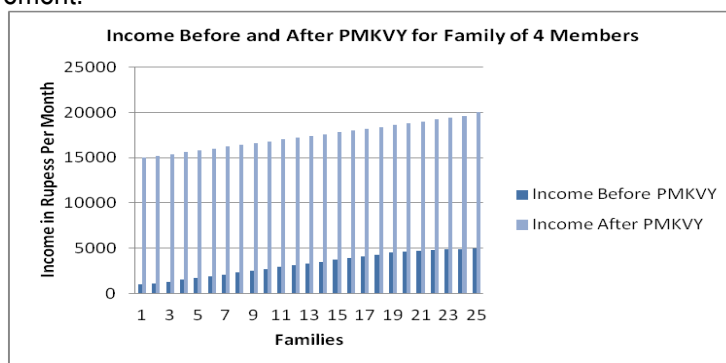

Figure 1: Income Before and After PMKVY for Family of 4 Members

The Higher Educational Institutions (HEI) are largely funded by Government and people's money and their participation in this campaign will be a payback time. It is a two way process, where in HEIs will also learn from the wisdom of rural people while sharing their knowledge for problem solving. IIT Delhi has been designated to function as the National Coordinating Institute for UBA, with the intention to enrich rural India. IIT Delhi has developed excellent technology to take the development process to the rural areas. This programme will be extended to all the reputed HEIs both public and private in a phased manner. Each selected institute would adopt a cluster of villages / panchayats in consultation of District Magistrate and gradually expand the outreach over a period of time and will become very much a part of the process of development, planning and implementation. In this process, faculty and students of the participating institutes would be re-oriented and connected to the rural realities so that their learning and research work also becomes more relevant to the society. Father of the nation Mahatma Gandhi said that India lives in villages and every village has its own specialty and challenges also.

2.3 SWACHH BHARAT SUMMER INTERNSHIP

In pursuance of the objectives of the Swachh Bharat Mission launched as a national movement on October 2nd, 2014, the MHRD, in association with the Swachh Bharat Mission (Gramin), Ministry of Drinking Water and Sanitation (MDWS), has launching a "Swachh Bharat Summer Internship" (SBSI) programme. The internship is open only to the registered students of the HEIs, and they are expected to take up a project for promotion of cleanliness, by spending an approximate duration of 100 hours in the village adopted by the institution. The students will implement the project under the guidance of a Nodal officer registered on the MHRD website, who will guide the students throughout the

internship as per the guidelines of the MHRD. Under the GoI's most extensive cleanliness drive - the Swachh Bharat Abhiyan (SBA), aims to clean the roads and infrastructure of India's cities, towns and villages to make India open defecation free (ODF) by 2019. ***The knowledge base and science and technology resources of the premier institutions of the country are to be leveraged to bring in transformational change in rural developmental process and to improve the livelihoods in rural areas*** [11]***.*** The improvement in happiness of the rural families, which is a measure of National Happiness Index (NHI) is shown in Figure 2.
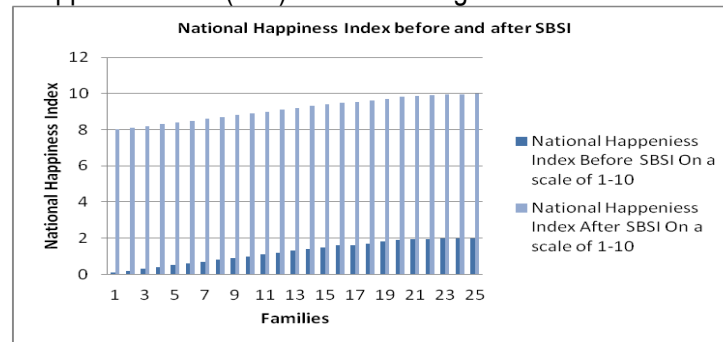

Figure 2: National Happiness Index before and after Swachh Bharat Summer Internship

The programme aims to enrolling the students for promoting swachhta in the villages. Under this, the students are invited to carry out swachhta campaign and appropriate projects in the villages selected by their institution and work with the village community for building a lasting system for improving the overall sanitation and hygiene in the village. It is expected that each student would devote at least 100 hours to swachhta, and carry out specific measures for improving the sanitation and hygiene in the villages. The registration for this programme was kept open from 25th April to 15th May 2018.

2.3.1 COMPONENTS OF SWACHH BHARAT SUMMER INTERNSHIP

(i) The students who are enrolled for the internship are expected to carry out swachhta awareness programmes in the adopted villages to contribute to the cause of rural sanitation in India.

(ii) Duration of the programme: At least 100 hours in the period from 1st May to 31st July 2018 during summer vacation.

(iii) The parent institution is expected to organise necessary logistics for the activities and facilitate the students to successfully undertake the proposed events.

(iv) As a part of the internship, the activities that participants may conduct have been categorized into two clusters initially as suggestive in nature to follow up. (a) Information-Education-Communication activities. (b) Solid Waste Management related activities. Students may work in teams 10 each.

It is expected that that the students along with their nodal officer will harness creativity and find innovative solutions for making the sanitation of villages a reality.

2.3.2 Prizes and recognition

Once the summer internship is completed, the best 3 interns / teams of interns would be awarded at college level and their names would be forwarded for eligible awards at University level / State and National level.

(i) All participants will be given a Swachh Bharat Internship Certificate on completion of their internship and its approval by the parent institution.

(ii) The participants will be given 2 curriculum credits by the institutions affiliated with UGC, whose internships are certified by the parent institution as eligible for the credits on the basis of higher parameters.

(iii) The interns who would be adjudged as the BEST will be recognized at college, university, state and national level as follows.

(a) College level: Shields / cups given by the parent institution
(b) Cash Awards in addition to certificates provided by MHRD / MDWS
(c) University level: Rs. 30,000/-, Rs. 20,000/-, Rs. 10,000/- with certificates
(d) State level: Rs. 50,000/-, Rs. 30,000/-, Rs. 20,000/- with certificates
(e) National level: Rs. 2 lakh, Rs. 1 lakh, Rs. 50,000/- with certificates

Under this programme the students of premier institutions along with their nodal officer can contribute with their *science, technology, innovation and management skills* to make the villages and our country as a whole clean, green and healthy. With a view to understand the connections between STIM, poverty and inclusive and sustainable development, the results of STIM must be understood not just as technologies but as socio-technical systems [12]. In such a socio-technical system, humans and technologies work together to produce outcomes to effectively respond to societal challenges [13].

3. DISCUSSION AND CONCLUSIONS

This paper has tried to summarize the mandate of STIM and its deliberations and present its role while also looking ahead for improvement of quality of human life. The STIM as a torchbearer has focused on some of the key interfaces between STIM and development. It is suggested that the role of STIM as a cross-cutting theme in the development agenda needs to be strongly articulated if STIM has to contribute to sustainable and inclusive development. This paper clearly shows that there is need for new approaches to embed STIM policy as an inherent compound of sustainable development in national development plans and give it priority. In addition other Ministries, namely, Health and Environment, Rural Development must take a lead along with STIM agencies, to build sustainability into national agendas and a range of regulatory bodies should join the effort to successfully implement with total honesty. Most importantly STIM leaders need to work together with sectoral leaders to build strategic capabilities and give maximum support to the development process.

It is necessary to help and articulate the role of STIM in strategic planning on ways and means to use STIM to tackle future challenges. It is necessary that STIM acts as a forum where practitioners and experts exchange best practices in using creative and innovative tools and techniques for inclusive and sustainable development and help to accumulate lessons learned and improve practise on day to day basis. Developing countries like ours need to consider the following while implementing STIM which is honed to become the people's movement. Collaboration between the local and national programs in setting the conditions for indigenous innovation, creating strong long term programmes for collaboration between knowledge institutions and marginalized communities to bring together local and scientific knowledge in solving local problems in the villages. Strengthen collaboration between educational institutions for rural skill development. Encourage local entrepreneurship by eliminating any road blocks by promotion of grass root innovation and facilitation of commercialization of promising inventions for communities. Provide the encouraging support for local village innovation as much as possible instead of relying on imports in all sectors of the village economy. This can be achieved by incorporating STIM in to national developmental Policy, Planning and Implementation (PPI).

The efficacy of STIM is to note that there is broad consensus that a well functioning national STIM ecosystem needs to include, inter alia, political stability and vision, well functioning institutions, an educated and aware work force, sound education and research infrastructure, well established and effective linkages between public and private innovation actors, business, enterprises, industries committed to research and development and a balanced and acceptable Intellectual Property Rights (IPR) national framework.

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