

Shaping the Waves through Innovation Eco-systems Approach- The contributions of public Research organizations,-Impact of policies with Global Experience-A study.

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Abstract:

Innovation Eco-system is one of the process investigated through the dynamic behavior of the product innovation and process Innovation which are obtained to stimulate the results. The Higher Educational Institutions to meet the challenges of the future commitment the Government Organizations speed up the research functions to perform innovativeness in manufacturing process. Today innovation as a determinant factor with a role of Economic growth an Engine for development of Innovative sector. By Innovation Eco-systems approach the public Research Organizations are obtaining a lot of outcome based Research institution.

Key Words: Innovation strategy, outcome based Research Education, Etc.,

Introduction:

There has been a growing significance for the National Innovation System (NIS) and its use as a tool for the competitive advantage of a country to date. In this paper, an NIS model has been developed with the use of system dynamics (SD) methodological approach. The objective of this model is to integrate the systemic approach, the computer modeling and the simulation discipline into a holistic dynamic consideration of the NIS. From this central structure, the paper analyzes the impact of innovation policies on the NIS performance. In particular the SD model is used as an “experimental tool” to conduct extensive what-if analysis scenarios with regard to alternative innovation policies. The effectiveness of policies is investigated through the dynamic behavior of product innovation and process innovation which are obtained by simulation results. By

innovation Eco-systems the public research Organizations are obtaining a lot of Outcome based research Education. In the current market scenario the conditions of public research Institutions like Universities and Government organizations which ensures the speed of increase research functions to perform Innovativeness in manufacturing process. Based on the literature a methodological framework is developed to examine the capabilities of higher educational public Research Institutions in fulfilling the successive tasks of new Economic and social contexts to meet the challenging aspects of future commitment. This paper makes an analysis of opportunities available to public research institutions , Industries and challenges faced by them in India for sustainable R&D Eco-system. A commendable approach has been made by the Organizations/

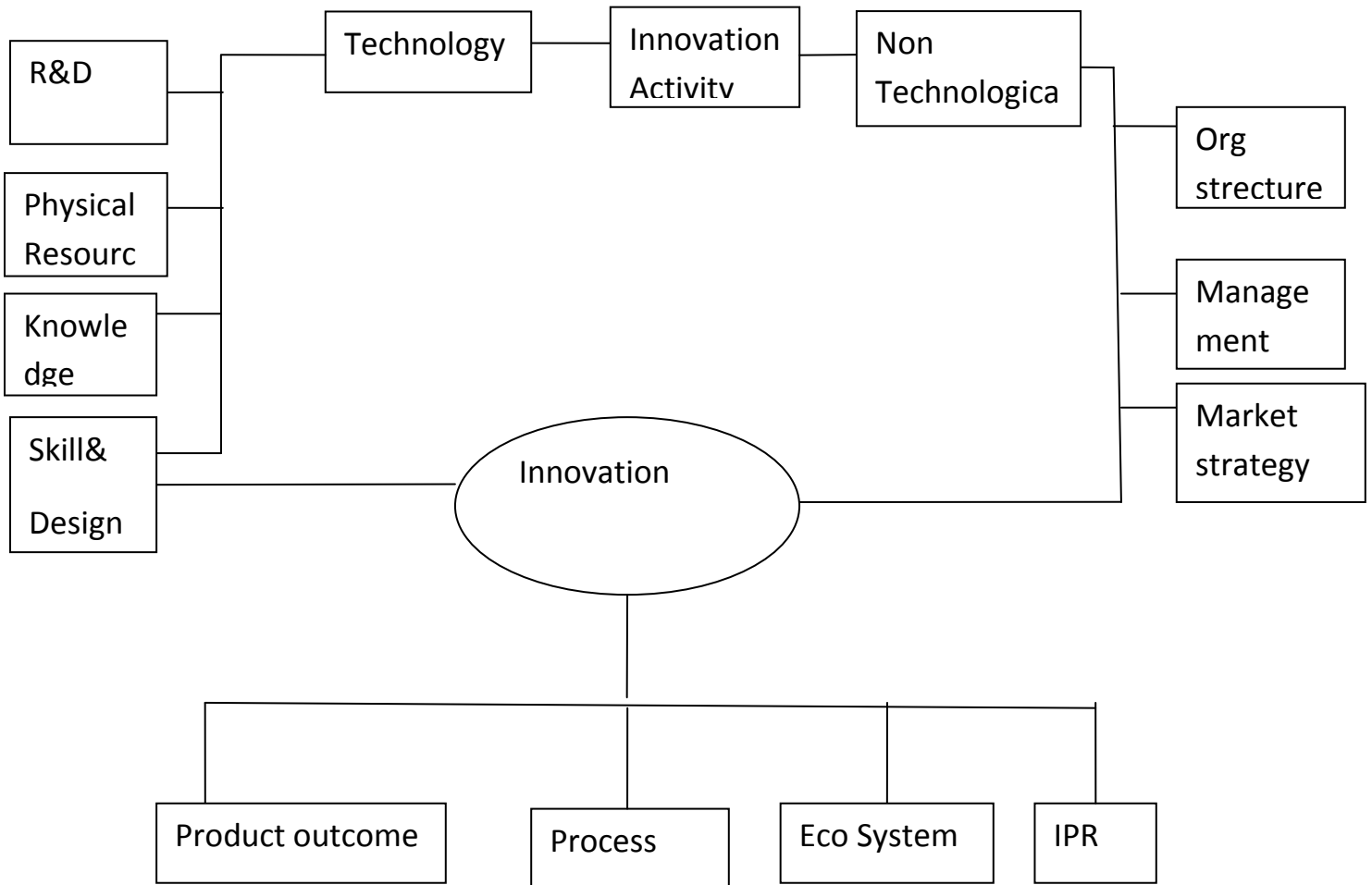
Individuals to put together fundamental issues to Innovations in the context of Developing Economies to make this proposal to policy makers, Planners and R&D Community.

Today the innovation as a determinant factor with a role of economic growth, an Engine for development of Innovative sector. Indian's Economic growth in the recent years has been impressive due to government policies and acts including Science & technology policies increase in spending in R&D and tax incentives. With current Government policies and acts, there are many opportunities for Domestic as well as foreign companies to invest in R&D in India to establish the competitive position in Domestic as well as export markets. However, the opportunities that are encouraged by policies, spending and tax incentives are also accompanied by many challenges to create a

Understanding Innovation;

Schematic view of innovation

strong and sustainable R&D. It is important for nations to increase their income and improve quality of life of their people. Hence, R&D to grow and sustain, many countries offer generous grants, incentives and credits. To make the R&D investment cost effective for individual Industries, there is a necessity for governments to step in and support R&D efforts in specific areas. These can yield significant benefit to the nation as a whole. The rationale for governments participation in R&D is to benefit for the stake holders and companies. As a pace of Technology is accelerating and newer Technologies and processes are becoming important, R&D is becoming a crucial factor in a success of companies and economies in a globalized and competitive world. Through R&D is generally undertaken by Industry and academia, the Public Research institutions, the Government plays a key role in developing policies that foster R&D and its sustainability.



Innovation is an application of New knowledge in the production system, and realization of the benefit of the new application from the market. S&T driven Innovation and knowledge are the key drivers of growth in 21 st century. Recognizing this 2010-20 as the decade of Innovation and a new policy focusing on science and Technology and Innovations has been declared. Innovation is widely accepted as a complex process having Feedback mechanism and involves interactive relations among science, technology, learning Production, institutions, Organizations, policy and markets. Over the last few years NSTMIS, DST had involved various stakeholders in evolving an appropriate framework to measure the innovation and knowledge

creation capabilities in Indian context. We presently identify the following areas of Institutional intervention that can help promote Innovations. The identified areas are :

1. Technology Generation: Mainly R&D Organizations as a source of new knowledge.
2. Technology Diffusion/Marketing: Organizations responsible for marketing on shelf Technologies.
3. Technological consultancy: Organizations providing consultancy services related to choice of Technology, New technology and also technology Up gradation.

4. Tools & Equipment, Prototype Development: Organizations imparting skill, R&D and also designing capabilities.

5. Common facilities/testing centers: Organizations providing facilities for testing, standards, calibration etc.,

-6. Raw material, machine and Equipment supply: Particularly important for SMEs and also for a few strategic, Industries arrangements for supply of raw materials is an essential support of Innovation. Like of Raw materials, access to required machine and equipment is a critical issue for Innovation.

7. Finance, refinance, venture capital: Since an innovation bears certain degree of risk, Financing, and refinancing are important support systems for Innovation.

8. Infrastructure development: Basic Infrastructure facilities are the most important support system for innovation.

9. Training and skill development: This helps innovation in two ways-skilled manpower is the prerequisite for any enterprise on the innovation path: again skilled manpower themselves can bring in new innovations.

10. Entrepreneurship Development :Innovation is about enterprises. In a modern world of business and industries an Enterprise has to face complex issues related to management. Entrepreneurship Development program are for making Budding entrepreneurs confident in assessing the business environment and accessing various facilities and opportunities for making new innovation successful.

It concentrates on surveying innovation activities in the Industrial sector, which would later be scaled up to the basket of the sectors namely public and private Research institutions, tiny and unorganized sector including the grass root innovations.

Schemes Promoting Innovations by Public research Organizations;

1. Techpreneur promotion program (TEPP)
2. Technological Incubation Centre under S&T Entrepreneurship.(TICUS&TE)
3. Drugs & Pharmaceutical Research.(DPR)
- 4, Innovation clusters.(IC)
5. Small Business innovative Research initiative(SBIRI).
6. Bio-Technology Industrial partnership program(BTIPP).
7. Open house Drug Recovery projects (ODPRP).
8. Gross root innovations through National innovation Foundation (GRINIF).

Objectives:

1. To describe the frame work of innovation is the innovations eco-system.
2. To examine the relationship between Economic development and innovation Eco-system.
3. To Examine the Global Entrepreneurial & Innovation development Index which depends on Innovator Attitudes, aspirations, interest and activities?
4. To examine the youth unemployment as a problem of Eco-system.
5. To examine the growth & Development of promotion of Innovation and Entrepreneurship among the manufacturing sectors of the Economy.
6. To Examine about the direct relationship between Employment Rate among the youth workforce and economic growth.
7. To develop the Innovative activities sponsored from the Universities students.
8. To invite the students & Budding entrepreneurs putting their ideas in to Practice by developing partnerships with other organizations causing cooperative strategies.

Innovative Eco-system includes-A conducive culture, enabling policies and leadership, Availability of appropriate finance, Quality human capital and venture friendly markets for products, a range of institutional and infrastructural supports.

Review of literature:

National

The Innovation activity is traced through Education, motivation and interest to engage in Innovative freedom of action in Business and the innovators aspirations are played by production and technological innovations and funding availability Business. Many Definitions of R&D are given by various organizations. The UNESCO Defines R&D as – ‘R&D is any creative systematic activity undertaken in order to increase the stock of knowledge, including knowledge of man, culture & society, and the use of this knowledge to devise new applications’. The United Nations statistics division defines R&D as –Research and Development by a market producer is an activity undertaken for the purpose of discovering or developing new products, including improved versions or qualities of existing products, or discovering or developing new or more efficient process of production. Hence, for R&D to grow and sustain many countries offer generous grants incentives and credits to make R&D as a innovative sector there is a necessity for governments to step-in and support R&D efforts in specific areas.

International

With Globalization, many of the technology resources once limited to advanced economies such as U.S., Japan, and Europe are being indigenously developed in emerging economies such as India, china and korea, Brazil, and eastern Europe. These countries are now able to compete with the leading countries in R&D for development of the sophisticated and complex new products. More than 30 countries offer specific R&D Tax incentives related to development activities manufacturing process

improvements, production trials, software integration and laboratory research. These incentives create an immediate cash benefit and reduce effective tax rates. The Indian government has taken many initiatives through formulating innovative policies that are comparable to many nations to boost R&D Levels in the country. These initiatives have created many opportunities for Public sector and Institutions to participate Innovative programs and increase their innovative & R&D expenditure. With new R&D policies, India is on the brink for massive upsurge in Economic and social growth and is on a path to becoming a technology driven superpower in the coming years to come.

Policy Implications:

1. The STI policy 2013 Document envisages an Innovative Eco-system that emphasizes the R&D led Dynamism to push the production frontier to an internally competitive higher Economic Value. It is Identified that there must be good support to execute the Innovation activities of the Indian Enterprise to attain Global Heights.
2. When seen from the perspective of NIS, RIS, SIS, a micro level scenario emerges where the Innovative systems requires to be rejected to be more inclusive to accommodate the SSI.
3. One way to introduce the outcome audit of the fund allocated and spent for various programs related to innovative support.
4. At the RIS level it reveals that, the infrastructure physical, Educational has the ultimate role on innovation dynamics of the state.
5. The SIS can provide a short cut route to trigger innovations by initiating by high tech, high innovation levels LED industries at the states.
6. RIS and SIS together indicate the areas of interventions to be guided through state innovation counsels.

Methodology:

1. Target population and sample size to be covered:

- A. 25 Undergraduate in S&T between 19 to 25 years age.
- B. 25 Budding Entrepreneurs.22-30
- C. 25 mentors, Age group of 25 to 30.
- D. 25 members of Researchers & Professors.

2. Method of data collection: It is important to know how well net worked a firm is in terms of accessing resources that contributes to strengthening of Innovation activities. Innovative firms reported Internal and market sources as most important for information on Innovation. It appears that they are dependent more on their own resources coupled with networking with clients and customers, and consultants of External technology and also with competitors. Very few have reported accessing Institutional

source of knowledge which shows weak linkages between them. External sources are accessed mainly acquire Technological competencies.

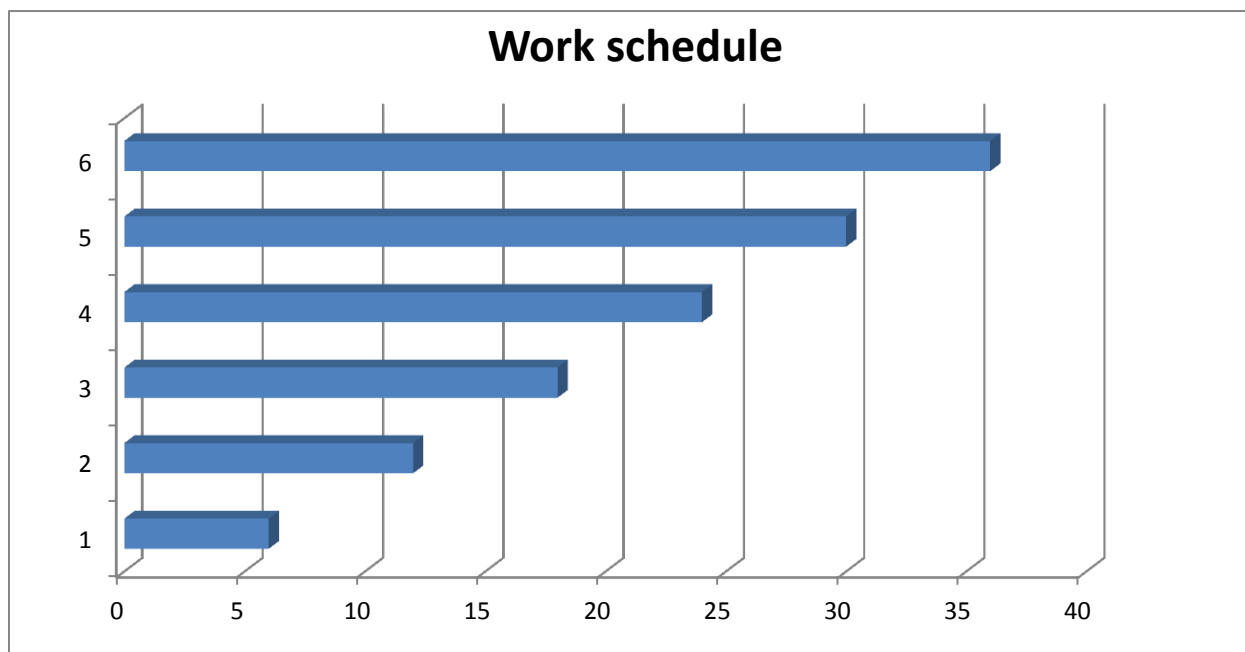
3. Sources of Data: Data was collected from the Universities, Public research organizations and Engineering colleges to make an important contribution to the smart Regional specializations and acts as a Intermediate bodies for the implementation of several marketing tools of scientific research results obtained. Universities and public research organizations are the centers of knowledge with the role of implementing local authorities' strategies.

4. Reference of the data period to be covered; 2017-2020(3Years)

5. Method of processing and analyzing: To Analyze the data we mostly can use the statistical tools like Anova , Mathematica,SPSS-17, Chi-Square, Data Analysis Management software, F-test and T-Tests.

6. Time schedules of activities giving milestones:

Work	1	2	3	4	5	6
Duration	6	12	18	24	30	36



205. Expected benefits:

Successful implementation of the concept of innovation depends upon the constant concern of improving the organizational procedural system by considering the needs of all categories of the stakeholders & researchers of the university. Formulation of the objectives of the universities so that their fulfillment to increase competitiveness reputation & Effectiveness of Higher education.

Global R&D scenario

In terms of R&D spending, United States is the largest of the global spenders on R&D followed by Japan and china. In Europe the major spenders are Germany, France and the UK. Table-1 shows a snapshot of the share of the global R&D spending and the R&D spending as a percentage of GDP for Year 2012.

TABLE 1
SHARE OF GLOBAL R&D SPENDING

Share of Total Global R&D Spending				R&D Spending as % of GDP
	2011	2012	2013	2013
Americas	34.80%	34.30%	33.80%	2.04%
U.S.	29.60%	29.00%	28.30%	2.66%
Asia	34.90%	36.00%	31.70%	1.79%
Japan	11.20%	11.10%	10.80%	3.48%
China	12.70%	13.70%	14.70%	1.65%
India	2.80%	2.80%	3.00%	0.90%
Europe	24.60%	24.00%	23.40%	1.88%
Rest of World	5.70%	5.70%	5.70%	1.77%
Source: Battelle, R&D Magazine				

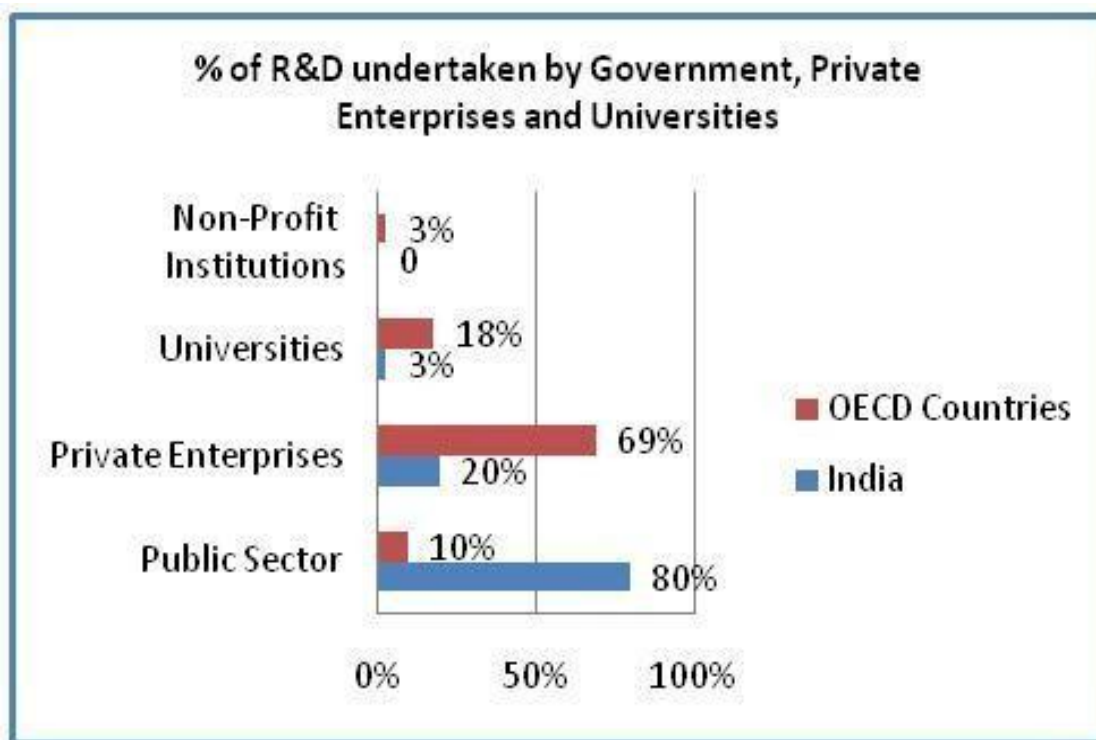
Indian R&D scenario

The Indian R&D system is still in its nascent stage. As shown in Figure-1, around 80 percent of the domestic R&D is taken by the public sector, 20% by private enterprises and 3% by universities compared to 69 % by private enterprises, 18 % by universities, 10% by government R&D labs and 3% non-profit institutions in countries belonging to OECD.

Though the investments for R&D in India lagged behind that of China, the EU and the U.S until recently, the Indian government has made efforts to drive investments in S & T that is reflected in India's five- year plans. The government has plans to rise the overall spending on R&D to minimum 2% of the GDP by the end of the 12th Five-Year Plan (2012-2017). It has also felt the requirement of greater participation from the private sector.

The key driver of R&D activity in India is large multinational companies (MNCs). MNCs are setting up dedicated and independent R&D centers for taking up R&D activities in new and emerging research in high tech areas. This is a major driving force behind India becoming an R&D powerhouse. The flow of foreign R&D is mainly concentrated in areas such as electronics and telecommunication, software, automobile,

drug and pharmaceuticals, hardware and product design (Table- 2). More than 300 MNCs have setup their R&D centers in India. Though many MNCs like GE, Astra Zeneca, Texas Instruments, Motorola, DuPont, Intel etc have set up R&D centers in India, the domestic players such as Tatas, Birlas, Biocon, Godrej, and others have also participated largely.



206: Limitations of the study:

1. In India the linkages between academia and private industry are still weak compared to Europe and America.
2. Private research and development does not have a long tradition.
3. Venture capital is growing but underdeveloped sector in India.
4. Qualified staff is still a limited resource. Small Indian vendors have a limited International Exposure
5. Indian research is mostly skewed towards basic research and lacks in application oriented R&D. The vast majority of organizations would rather go for quick acquisition of technology rather than invest in internal R&D.
6. Inadequate enforcement of intellectual property (IPR) while India has improved its IPR regime, the protection of intellectual property remains weak in some areas owing to inadequate laws and ineffective enforcement.
7. Despite the growing talent pool, Indian Innovation & R&D remains globally non-competitive.

Conclusion: This study revealed the fact that Innovation strategy in the public institutions is implementing at an early stage to overcome. Today there is needed to strengthen the Indian research with International exposure. The vast majority of the organizations would rather go for quick acquisition of Technology rather than invest in Internal R&D. Indian innovation R&D remains globally competitive by opening the doors to all the International countries to participate to make strengthening of the power of innovation strategies. The Public & private Organizations are having the responsibility to overcome all the pitfalls in the areas and see that they support to the maximum extent to contribute the research thrust areas.

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Endorsement from the Head of Institution* (To be given on letter head)

Project Title: The Innovation challenge for Non-fare Revenue Identifying New sources for Indian Railways.

1. Certified that the Institute welcomes participation of Sri Dr.V.Venkateswara Rao as the Principal Investigator and sri B.Rajesh as the Co-Investigator(s) for the project and that in the unforeseen event of discontinuance by the Principal Investigator, the Principal Co-Investigator will assume the responsibility of the fruitful completion of the project.
2. Certified that all basic facilities such as library, office equipment and other administrative support etc. will be extended to the Investigators throughout the duration of the project.
3. Institute assumes to undertake the financial and other management responsibilities of the project.
4. Certified that staff salaries proposed in the project proposal is in accordance to the approved norms of the institution.

Name and signature of Head of Institution

Date: 12-04-2017

Place: Valluru.

* Co-Investigator(s) from a different institution may also provide a similar certificate from their Head of Institute.

Budget Estimates (Rupees)

Staff Required: 1.JRF = Rs.25,000 x 24 months = Rs.6,00,000

DTP Operator: 1(one) = Rs.6,000 x 36 months = Rs.2,16,000

Item	Budget (in Rupees Year Wise)			
	1 st Year	2 nd Year	3 rd year	Total
A. Recurring				
1.Salaries/Wages (Category – Wise)	2,00,000	2,00,000	2,00,000	6,00,000
DTP Operator	72,0000	72,000	72,000	2,16,000
2.Consumables (please specify)	30,000	30,000	30,000	90,000
3.Travel	75,000	75,000	75,000	2,25,000
4.Other costs (Please specify, also attach justification)	1,00,000	100,000	1,00,000	3,00,000
B. Permanent Equipment (please specify, also attach justification)	1,00,000	1,00,000	1,00,000	3,00,000

Total(A+B)	5,77,000	5,77,000	5,77,000	17,31,000
C.Overhead Charges(**) (add 10% of total cost from educational institutions & NGO's and 8% for laboratories and institutions under central government department/agencies)	57,700	57,700	57,700	1,73,100
Grand Total(A+B+C)	6,34,700	6,34,700	6,34,700	19,04,100
<p>*Justification for all the items under various heads has to be given for (Recurring A&B permanent Equipment)</p> <p>** Subject to change</p>				

Justification:

JRF:

The study planned in the proposed research project will be carried out by the investigator with the help one research scholar like JRF (sample collection and processing and data computation) Therefore, I propose to recruit one JRF.

Consumables (Journals subscription etc.):

Our institute is a affiliated engineering college at rural area of Andhra Pradesh regular requirement of papers, printer cartridges, floppies, CDs, etc.,

Justification for travel intensive:

Regular trips are envisaged to discuss the problem with the people working in this area, visit places having similar set-ups, and attending conferences/symposium for the dissemination of

the result.

Certificate from the Investigator

Project Title: Shaping the Waves through Innovation Eco-systems Approach- The contributions of public Research organizations,- Impact of policies with Global Experiences.

1. I / We agree to abide by the terms and conditions of the grant set forth by DST including time submission of annual Audited Statements of Accounts and Utilization Certificates.

2. I/We did not submit the project proposal elsewhere for financial support.

3.I/We have enclosed the necessary documents as required. The list of documents enclosed is given below:

Item	No. Of Copies
A. Proposal format for submission of projects	5 No's
B. Budget Estimates (301)	5 No's
C. Certificate from the Investigator	5 No's
D. Endorsement from the Head of the Institution (With letter head)	5 No's
E.Guidelines for Preparation of project completion report	5 No's
F. Check List for new projects	5 No's

Date: 8-03-2017
Name and Signature of Principal Investigator

Place: Valluru.
Name and Signature of Co-Investigator

Endorsement from the Head of Institution* (To be given on letter head)

Project Title: Shaping the Waves through Innovation Eco-systems Approach- The contributions of public Research organizations,- Impact of policies with Global Experiences-A study.

1. Certified that the Institute welcomes participation of Sri Dr.V.Venkateswara Rao as the Principal Investigator and SmtT.Sravanthi as the Co-Investigator(s) for the project and that in the unforeseen event of discontinuance by the Principal Investigator, the Principal Co-Investigator will assume the responsibility of the fruitful completion of the project (with due intimation to DST).

Certified that all basic facilities such as library, office equipment and other administrative support etc. will be extended to the Investigators throughout the duration of the project

Institute assumes to undertake the financial and other management responsibilities of the project.

2. Certified that staff salaries proposed in the project proposal is in accordance to the approved norms of the institution

Name and signature of Head of Institution

Date: 1-04-2017

Place: Valluru.

* Co-Investigator(s) from a different institution may also provide a similar certificate from their Head of Institute.