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INDIAN SCENARIO OF RURAL INNOVATION, DIVERSITY, AGRICULTURAL DEVELOPMENT AND POVERTY REDUCTION

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ABSTRACT

The objectives of the Study are: 1) to study the implications of rural livelihood diversity for agriculture and innovation policies. 2) To discuss about strategic development of the regions in the long run is determined not only by the growth of gross regional product, but also by maximization release of innovative products. 3) It also reviews the various roles, direct and indirect, that agricultural innovation can play in rural poverty reduction. 4) It also describes the role innovation plays overall in sustainable and economic development of the Indian Economy.Findings: 1) Despite advancements in science and technology, and availability of both public and private funding bodies Indian economy still lacks behind in term of quality sustainable development in the Global Market. 2) The central government is disorganized and not transparent. The policies implemented are beyond the reach of an average ordinary Indian citizen specially residing in poor squalors and regions of India. 3) The basic needs of life are not fulfilled and eachand every citizen is deprived of it. 4) The pillars of a strong nation lies on the background of a well-educated and trained population. To provide education to all citizen is the first and foremost priority of Indian government. 5) A well-educated working population will be able to find better jobs and opportunities especially the poor farmers and contribute to improve production in the agriculture sector and in turn an acerbated GDP and economic growth in future.

KEY WORDS: *-Innovation, poverty, agriculture, development economy, rural livelihood.*

JEL classification: *F36, O31, I32*

Introduction

Innovation has emerged a clear winner within the development discourse in India. It is used widely in development planning, social and natural science research, investments and trade debates. Be it in the establishment of the National Innovation Council (NIC), efforts to promote innovation in specific sectors like electronics, the creation of innovation funds, a Working Group for the XII Five Year Plan, grassroots innovation promoted by the National Innovation Foundation (NIF),While innovation takes on different meanings and operational procedures as used by various actors, the expectation is that innovation will fuel economic growth, promote national competitiveness, increase export earnings and make India a true knowledge economy. These in turn will get the country out of the current impasse of jobless growth, rural poverty and distress. With increasing investments in production and technology generation, the national innovation strategy focuses on technological change, mainly capital intensive and export oriented production technologies.

The main withdrawal that this attitude makes from the previous approaches for economic development and technology adoptions is in the liberalization of the economy and possibly as significance, in the policy opinions about employment and investment. Labor, the national human capital, under this production and trade command becomes a resource that can be used to yield goods and services using technologies and investments or monetary capital, mainly global.

Determining rural development has anticipated worldwide consideration specifically some of the developing countries. It has extraordinary importance for country like India where maximum number of the population, around 65% peoples, living in rural areas. the prevailing method of development in India in particular focuses on removal of poverty, good livelihood prospects, availability of primary amenities and infrastructure facilities through pioneering plans of wage and self-employment. India is in the main an agriculture-based country.

Agriculture underwrites nearly one-fifth of GDP in India. as a way to growth of agriculture, the government has deliberate numerous activities relating toward development. Agricultural productivity may be a foremost aspect in poverty-alleviation practice, or it can play no function at all. The position of agricultural innovation in poverty minimization should be primarily based on an examination of the possessions and framework of rural poverty in distinctive locations and on a consideration of each the direct and the indirect effects of growths in agricultural productivity on poor society.

Background – India's development paradox

For several developing countries, the mid-20th century was a era of key choices. They were all dependent on agriculture, both in terms of share of the sector in GDP and in employment.

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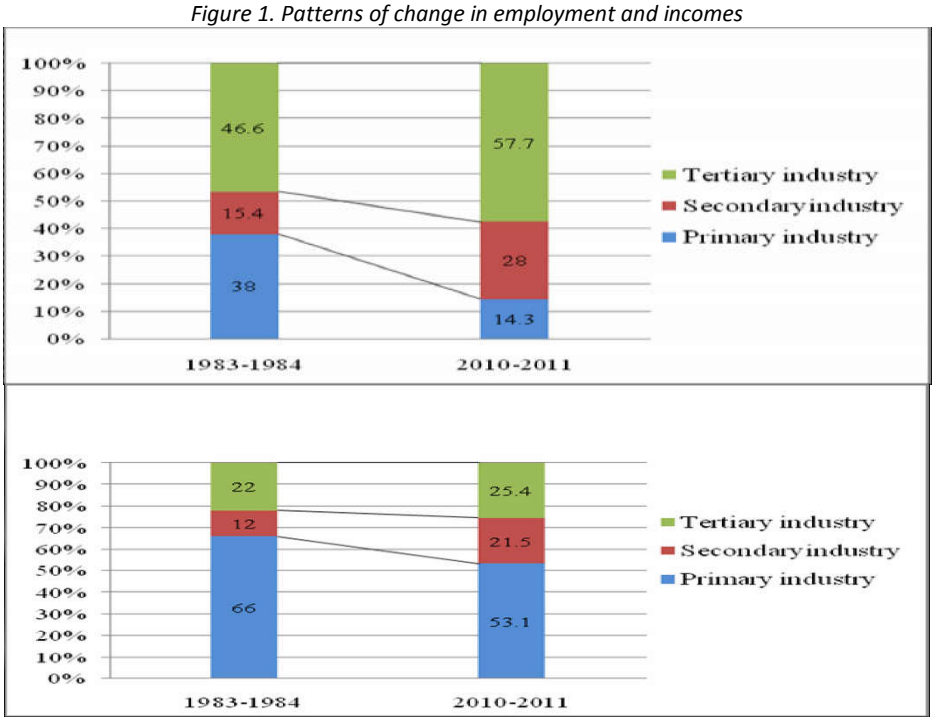
Table 1. India is rural and agrarian

Emerging economies	Share of agriculture in GDP (%)		Agriculture- value added per worker (constant US$ 2000)		Share of industry in GDP (%)		Rural population in total population (%)	
	1980	2010	1980	2009	1980	2010	1980	2010
Argentina	6	10	6615	9987	41	31	17	8
Brazil	11	6	1179	3760	44	27	33	14
China	30	10	191	525	48	47	80	55
Egypt	18	14	1366	3024	37	38	56	57
India	36	19	313	468	25	26	77	70
Malaysia	23	11	2791	6544	41	44	58	28
Mexico	9	4	2247	3231	34	34	34	22
South Africa	6	3	2012	3641	48	31	52	38
Thailand	23	12	399	725	29	45	73	66

Source: World Bank (WDI), various years).

Figure 1. Patterns of change in employment and incomes



Source: Ministry of Finance 2011 and CSO data.

The hypothetically predictable shrinking of the primary sector in the economy has happen – down from 50% of GDP in 1950-51 to 15 % in 2009-10. The changes in the share of agriculture in national GDP and in employment (about 50 –12%) make known that the decline has not been appropriate, and that a huge segment of the rural population is still dependent on this segment (Figure 1). In the situation of (i) the nature of and comparatively enhance in share of national income and employment in the secondary and tertiary sectors, and (ii) the growing number of (young) unemployed people in rural areas, particularly increasing subsidiary and small outfitted assets in agriculture field that frequently endure on family labor on and off farm, the structural alter and rural employment questions are fairly frightening. The tertiary sector seems to have done improved in employment growth rates and share in the national GDP. Industrialized expansion seems to have provided further opportunities for employment.

Investing in knowledge for innovation

In the recent scenario, the R and D wing of India has revolutionized the field of Industrial growth and manufacturing; but, despite these technical innovations it lacked behind in terms of utilization of these technological innovations to their maximum potential. It pointed out towards a loophole in the R and D wing in background of utilization of resources and manpower. However, these innovations were launched at a low scale, thus failing to create a profound impact. Once these innovations were laid at a high scale, with the R and D wing implementing knowledge and other programs to suit the

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demand of the technological counterparts needed for advancement and development in the industrial and non- industrial sector.

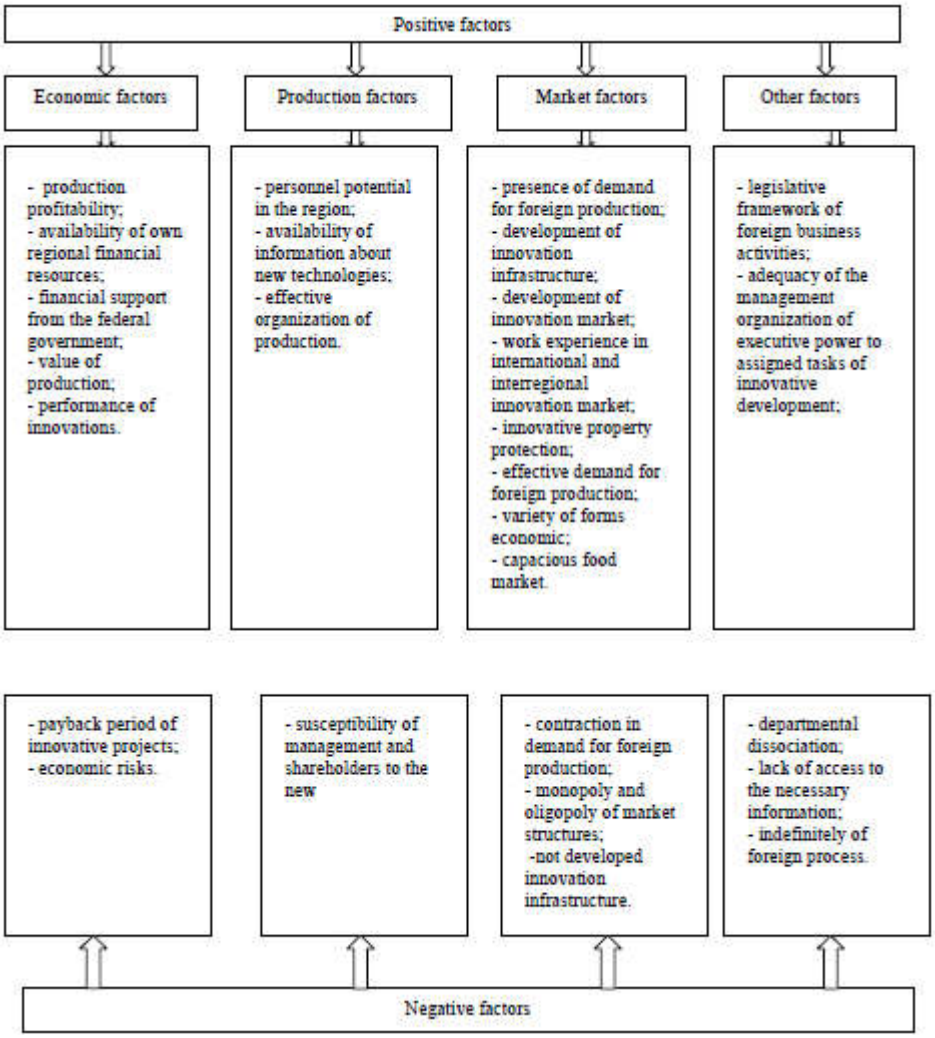

Fig. 1. Factors influencing the development of innovative potential of the region

The above figure describes the factor that limits the innovative potential growth of a region. These factors can have an effect both in the positive and negative way .

The Government of India's Role in Promoting Innovation

India has many public and government funding bodies as well as well-established infrastructure despite that its innovative potential is restricted and limited. The government has established many governing policies and bodies to function the R and D development and to monitor the state of art technology like for instance; the National Innovation Council and new science Innovation and policy 2013, which provides support for new science and sustainable entrepreneurship growth and development.

The foundation of the Indian Economy can be traced back to the times of the British rule. The British rule established a colonial economic system, in which India served as the headquarters for the import and production of industrial goods for the colonial rulers. However, after independence the system changes but still the laid foundation both for the economy and publicly funding bodies did not change. Only, the economy of India became more closed and centralized and enabled the nationalization of the Indian industries. However, only after the 1991, the Indian economy was opened to international market and exposed to the real competition of import and export. The main problem of India economy is employment. A huge proportion of the Indian youth is unemployed and craves for better working opportunities. Although, the government has established work providing programs; but these programs do not guarantee innovative but just labor intensive jobs. A famous quote by Dutz , 2007 states that in order to achieve an innovatively strong economy India needs to harness its innovative potential by providing innovative jobs and implant strong routes of entrepreneurship .

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Current Challenges

India'sinnovation ecosystem and entrepreneurship in generalare listed and described below:

Poor policy innovation and implementation:

In India, there no existing policies for strengthening the skills of entrepreneurship and innovation- based jobs. There are some existing policies and law but they are not strong enough to bring the real desired effects. There are lot of gaps in making and implementing the policy.

Inadequate funding of the R and D: The R and D wing of India has not good enough funds to sustain research and development both at the academic and commercial R and D institutes. The total R and D expenditure given by country, of which 63 % proportion is used up by the country and the industrial R and D expenditure is equivalent to the amount one MNC company invests for its own R and D development.

Difficult and length funding process:

The government has set up public bank and other sources to get money for the R and D development, entrepreneurship and research process. However, the procedure to obtain these bank loans is very time consuming and tedious. As, the legal formalities are very much cumbersome. And also most of the innovative jobs have no guarantee for returns.

Angel, venture capital, and seed funding:

Despite having many source of venture capital and revenue in term of angel in India like in Mumbai the deal between these angels is very low and poor compared to the other foreign countries.

Weak linkages between stakeholders: The communication between medium and small scale industries and R and D academic institutes is not transparent. Industries needs technologies, but they are provided just at early stages not bought to the market

Non- conduces education system:

The Indian education system is poor and its background is based on career and grades not on innovative and entrepreneur skills. To the support the ongoing academic research projects there are not enough funds and the teaching infrastructure is poor just based on achieving high grades not on polishing thinking and creative skills.

Poor infrastructure facilities in villages:

Villages are still very backward in India. They do not have access to basic amenities like electricity, internet, good roads etc. Because of the poor facilities no innovation can take place in the villages and it lags in terms of development.

***Risk aversion among entrepreneurs*:**

To establish a successful business, the new entrepreneurs depend on technology rather than innovative ideas. The return from innovative idea takes time and requires higher money for investment. However, they fail to realize that return from innovation is higher than technology although it may be time consuming.

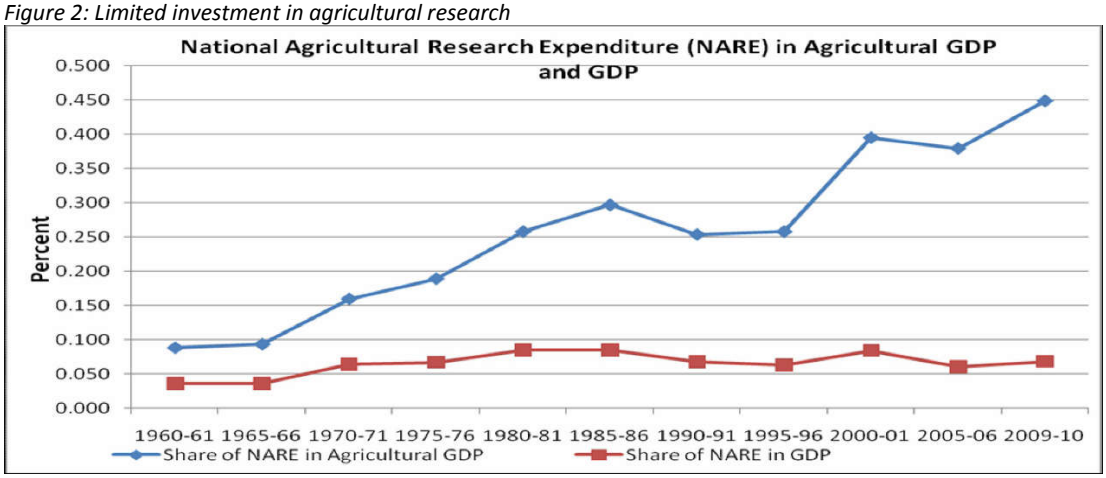
***Inadequate protection of intellectual property rights*:**

The patent law and protection is poor in India and it takes time to get protection for the patent law. The intellectual property in India is not protected and many innovative entrepreneurs fail to get it.

Investing in agricultural production and technology

In this sub section, we study the investment done by the government in the agriculture sector in terms of irrigation facilities, chemical, and other agricultural equipment and study the relationship between investment and output of investment in terms of agriculture development.

Figure 2: Limited investment in agricultural research



Source: Estimated from CAG and CSO (various years), based on share of research in total agricultural research and education expenditure.

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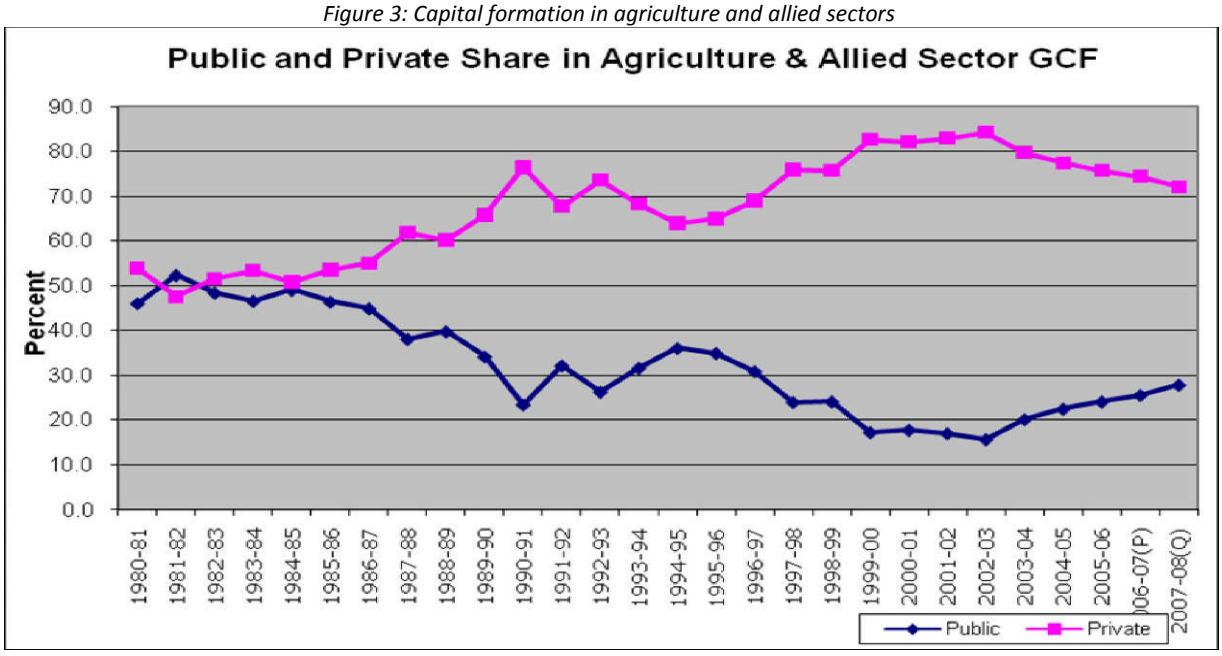
All the public and private sector established since the middle of 1960s, mandated to provide the policy aim of improved production of cereals to provide assurance for food security, maintain the existing quality and obtain support either directly as public research institutes, line departments (for irrigation, soil conservation, animal husbandry, extension offices, etc.), thus, the components of the current agricultural innovation system (AIS) consist of a substantial state policy and organizational element, a extremely diverse production or enterprise element ranging from 410 million individuals (cultivators, main and marginal workers in agriculture), industrial and service sector organizations (fertilizers/chemicals, agri-machinery, banking, transport, etc.), similarly different and complex system of conciliator actors ranging from expansion employees in line departments to build market and co-operatives, a powerful public sector (and some private sector) research and technology generation component, and a large population of consumers (mainly rural and unskilled)constitute the demand factor.

During the green revolution period, with the arrival of the irrigation-fertilizer-seed technology based production paradigm, output price policy and public policy for market creation, supply of critical modern inputs and capital formation in agriculture came to spearhead agricultural policy. With technological options shaping production investments, it was irrigation that accounted for almost all the public-sector capital formation (Fan, Hazell and Haque 2000; Vaidyanathan 2007). Rice and wheat gained the most from these forms of policy and administrative support (Barker and Herdt 1985; Rao and Gulati 1994), the unique convergence of technological and production capacities. Technological capacities, embodied in the national agricultural research system (NARS) – mainly in the public sector Indian Council of Agricultural Research (ICAR) and over 48 State Agricultural Universities (SAUs), and in several private (fertilizer, chemicals, seed and machinery) and co-operative (generally commodity specific) sector organizations has grown steadily since the mid-1960s, when the state decided that a central line of authority and control was necessary to generate technologies for the green revolution (Raina, 2011). During 1990-2009, the formal knowledge generation (agricultural research) component received less than 0.4 percent of agricultural GDP (Figure 2 above), while the subsidy for inputs ranged from 8 to 11 percent of agricultural GDP .Even with Having invested in a particular kind of production capacity, the state does not seem to want new technological capacities to transform or sustain this production capacity. Technology generation and capacity development for the same, having shaped these production capacities at the outset, seem to have become subservient to the production capacities instead of pushing the technology frontiers. Today, agriculture survives on the two key domestic policy planks of output price support and input subsidies (Ray, 2007).

Figure 3: Capital formation in agriculture and allied sectors



Source: CSO, various years.

Within the production element of the AIS, the agricultural society and contribution business have been the two main beneficiaries of the domestic agricultural policy and public asset. Agricultural labor has not figured in any of the tactical credentials or policies for technology development and manufacturing shore up. By the turn of the century, it was conspicuous that with the low and declining employment elasticity of the sector, agriculture will not be able to generate enough jobs for the rapidly growing rural populations (Palanivel 2006: Bhalla 2005). Except during the decade 1961-71, throughout the period 1951-2010, the number of agricultural workers and agricultural labor within this category kept increasing. Since the 1990s, there is an increasing number and share of agricultural labor in the agricultural workforce (a 44

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% increase in the one decade 1991-2001) (Labor Bureau, 2009). This is partly a consequence of limited non-farm rural employment and increasing proportion of marginal and small farm holdings (accounting for 84 percent of the total operational holdings and 48 percent of the total area operated) – the latter being laborer's as well as cultivators

Issues and Priorities for Indian agriculture sector

The share of the agricultural sector has declined to 15 % because of increase in the share of the industrial sector. However, the agricultural sector tends to be very important in thee social-economic sector of India. Many families in India are dependent on the agricultural sector for income and livelihood. Also, the major source of food production in India is agriculture is cereal crops, meat, fruits and vegetables.
India is the powerhouse of agricultural production. It is largest producer of pulses and spices and host the largest herd of cattle's mainly the buffaloes. It is also the highest produces of milk, rice and cotton and the second largest producers of rice,cotton,sugarcane, goat meat. A large area of land in India is under agricultural production, 63 % are ratified while 37 % are irrigated. Forest also cover a large proportion of land in India.

Challenges

Three agriculture sector challenges will be important to India's overall development and the improved welfare of its rural poor:
Increasing the producing per unit area of the land. Most of the available cultivable land is not adequately productive and has limited water and irrigation sources. Hence, to increase productivity per unit hectare of the land.
Reducing rural development. Many people still live in the poor rain fed area such as the Indo-Gangetic plains. Reaching these people with the basic sources as not been easy. Hence to eliminate poverty alleviation and increase the rural development has been the main concern.
Ensuring proper agricultural growth and food production. The green revolution increased the production of cereal crops and food availability during the time of food scarcity. Also, agricultural intensification saw a increase in employment of people in the rural sector and the rural wages.

Priority Areas for Support

- Increasing productivity and sustainability and food availability
- Poverty alleviation
- Future Sustainable development

Rural poverty in India

Poverty id the most important and emerging problem in India. Many people in India continue to live below the poverty line and thrive for basic amenities. Although, the government could reduce the proportion of poverty in India to 55 % from 1973 to 2005 still many people continue to live in rural and poor areas. The majority of people are from schedule castes and other backward classes.

Rural development and poverty alleviation

Alleviation of poverty is one of the primary objective of the Indian government both in the sixth and the seventh developmental plan. However, the impeding growth rate of the population bypasses the policies and laws developed by the government to control the rural population. Alleviation of poverty and rural development go hand in hand. Poverty alleviation involves providing better living prospects and standard to the people, basic amenities like food, clothing, shelter, sanitation etc .
Also, innovative jobs to the rural people to increase the economic rural development. One of the main reasons for poor rural development is low productivity and unemployment rate in the rural sector. According to the reports of the planning commission, although large proportion of the people are working still not able to make a living standard for themselves. This may be attributed to the interstate differences or changes of the rural population. The rural population is demographically and geographically distributed. The government needs to pay attention to people who are concentrated in poorest rural areas.

Poverty in India - the statistics

50% of Indians don't have proper shelter;
70% don't have access to decent toilets (which inspires a multitude of bacteria to host their own disease party);
35% of households don't have a nearby water source;

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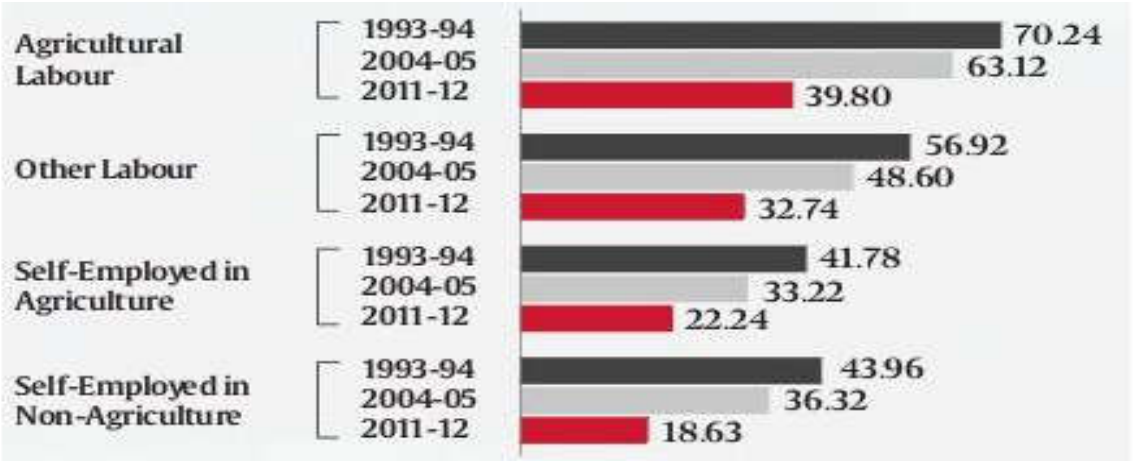
85% of villages don't have a secondary school (how can this be the same government claiming 9% annual growth? Over 40% of these same villages don't have proper roads connecting them.

Percentage of rural population living under extreme poverty

2004-05		2011-12	
Odisha	34.3	Chhattisgarh	15.32
Chhattisgarh	24.5	Madhya Pradesh	15.04
Bihar	23.5	Odisha	11.46
Madhya Pradesh	23.0	Bihar	10.45
Maharashtra	22.5	Jharkhand	9.23
Jharkhand	19.4	Uttar Pradesh	8.85
Gujarat	17.3	Assam	8.22
Uttar Pradesh	15.9	Maharashtra	6.68
West Bengal	13.5	NE excluding Assam	5.64
Tamil Nadu	12.4	West Bengal	5.31
All India	16.3	All India	6.84

Source-NSSO unit level data from household consumer expenditure survey 61stround (2004-2005)and 68th round (2011-2012)Rural poverty among occupational groups.



Source- figures of households not qualifying for any of above classification not shown NSSO unit level data from household consumer expenditure survey 50thround (1993-94)61st round (2004-2005)and 68th round (2011-2012)

Role and function of the Government

The Government's policy and programmers have laid prominence on poverty alleviation, creation of employment and income opportunities and stipulation of infrastructure and essential amenities to convene the requirements of rural poor. The Ministry of Rural Development in India is the summit body for formulating policies, regulations and acts pertaining to the development of the rural sector. Agriculture, handicrafts, fisheries, poultry, and diary are the primary contributors to the rural business and economy. The preface of Bharat Nirman, a project by the Government of India in association with the State Governments and the Panchayati Raj Institutions is a major step towards the improvement of the rural sector. The National Rural Employment Guarantee Act 2005 was introduced by the Ministry of Rural Development, for improving the living conditions and its sustenance in the rural sector of India. The Ministry of Rural Development in India is engaged in legislations for the social and economic improvement of the rural populace. The ministry consists of three departments viz., Department of Rural Development, Department of Land Resources and Department of Drinking Water Supply. Under the department of rural development, there are three autonomous bodies viz., Council for Advancement of People's Action and Rural Technology (CAPART), National Institute of Rural Development (NIRD) and National Rural Road Development Agency (NRRDA).

Conclusion

Despite great technological innovations in terms of laws, policies and council bodies India seems to be behind in terms of improved global economic growth and ecosystem. The main reason for this is the disorganized and fragment central

government. Although, the Indian government is implementing new policies it is still beyond the reach of a common Indian citizen residing in the poorest and economical deprived regions of India. The problem lies in the disorganized and fragmented social and economic strata of India. Although, we have funding bodies, research and public institutes but it is not accessible to each and every Indian specially the poorer and socially backward classes. The gap between the socio-economic strata has widened since the colonial rule. The main backbone of the Indian Economy is Agriculture due to these poorer classes became inaccessible to the basic needs of live the rural economic development is poor and lagging behind. The main rule of government is not just to implement the policy but to ensure that it is within the reach of each and every one. The first step is to ensure that each and every one in India is Educated and has the right to education as a strong foundation is laid on a strong base. The base can be made strong only by ensuring education at the base level. If people living in rural areas are well educated and skilled, it will reduce the migration of people from rural to urban areas to work in the industry. This will increase the role of people in the labor market, also educated rural labor will be intelligent and strong to innovate new labor skills and idea for crop, milk, fruit and vegetable production along with government support for chemical and irrigation. Other than providing education, a good internet and communication supply is also needed in poor squalors of India. As, with the power of Internet the poor can get a wider exposure to materials and knowledge for study and innovation. They can communicate to scientists or agricultural exports far way in the international sector to know more about curbing and dealing problems of drought or poor rainfall conditions prevailing in India. Rural development and Poverty alleviation are opposite sides of the coin , poverty will be alleviated if there increase in rural development in term of economic growth, more agricultural growth and its contribution to the GDP, education , living standard , better infrastructure and accessible to road, telephone and internet facilities . An improved rural development will back up the export and import market of India thus not only contributing to the GDP but also increasing the economic standard of Indian economy globally and economically. By investing in education and rural development of rural sectors, the Indian government is on turn investing to increase innovation in Agriculture. As, proving access to newer R and D , scientific techniques and farmers being educated and taught about agriculture techniques like crop rotation , use of bio-fertilizers , organic crops agriculture sector is innovated and automatically increases contribution to GDP and providing more job opportunities and less migration of rural labor to work in industries in urban areas.

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