

# Kurukshetra

A JOURNAL ON RURAL DEVELOPMENT

Vol. 62

No. 05

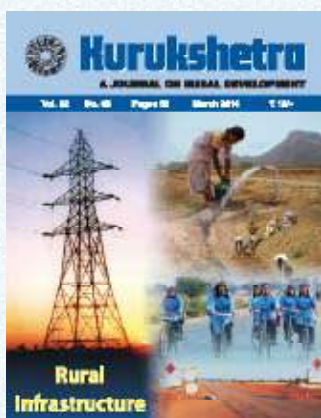
Pages 52

March 2014

₹ 10/-



**Rural  
Infrastructure**



**CHIEF EDITOR**  
**RAJESH K. JHA**

*Senior Editor*  
**KAPIL KUMAR**

*Editor*

**MARUF ALAM**

*Subeditor*

**WASEEM MUSHTAQ**

*JOINT DIRECTOR*  
**VINOD KUMAR MEENA**

*COVER DESIGN*  
**SANJEEV SINGH**

**EDITORIAL OFFICE**

ROOM NO. 661, NIRMAL BHAVAN  
A-WING (GATE NO.5),  
MINISTRY OF RURAL DEVELOPMENT,  
NEW DELHI-110011  
TEL. : 23061014, 23061952  
FAX : 011-23061014  
E-MAIL : kurupage@yahoo.co.in  
FOR SUBSCRIPTION ENQUIRIES,  
RENEWALS AND AGENCY  
INFORMATION  
PLEASE CONTACT:

Business Manager  
EAST BLOCK-IV, LEVEL-VII, R.K. PURAM,  
NEW DELHI-110066  
TEL. : 26100207  
FAX : 26175516  
E-MAIL : pdjuicir@gmail.com  
WEBSITE : publicationsdivision.nic.in

**SUBSCRIPTION :**

**INLAND**

1 YEAR : ₹ 100  
2 YEARS : ₹ 180  
3 YEARS : ₹ 250

**ABROAD (AIR MAIL)**

ONE YEAR  
₹ 530 (SAARC COUNTRIES)  
₹ 730 (OTHER COUNTRIES)



**The Monthly Journal**

# Kurukshetra

**MINISTRY OF RURAL DEVELOPMENT**

**Vol. 62 No. 5 Pages 52**

**March 2014**

## CONTENTS

Review of Rural Infrastructure under Bharat Nirman	Dr. K. K. Tripathy	3
Boosting Rural Development through Agri-infrastructure	Dr. Parveen Kumar	7
Rural infrastructure key to inclusive growth	R.C. Rajamani	11
Growth of financial infrastructure in rural india	Dr. Kameswari Peddada	14
Corporate Initiatives in Improving Rural Retail Formats	Dr Jitendra Rathore	18
Growth of Indian Telecom Infrastructure	Dr. Arpita Sharma	21
Kisan Choupal: Widening Access	Aditya, Abhay Mankar, R.K Sohane	25
Improving Infrastructure- Changing Rural Landscape	Dr. Kartick Das	29
Rural Infrastructure Development Fund-Genesis, Performance and Impact	Dr Amrit Patel	32
Agricultural Infrastructure in Bihar - An Assessment	Dr. Chanchal Charan	36
Bharat Nirman - The Journey So Far	Subhashree Sanyal	40
Rural Infrastructure Development- A Tool For Rural Poverty Alleviation	K. Baby	42
Toxicity Caused by Pesticides	Reena Chauhan, M.K. Rana	45

Sales Emporia : Publications Division: \*Soochna Bhavan, CGO Complex, Lodhi Road, New Delhi -110003 (Ph 24365610) \*Hall No.196, Old Secretariat, Delhi 110054(Ph 23890205) \* 701, B Wing, 7th Floor, Kendriya Sadan, Belapur, Navi Mumbai 400614 (Ph 27570686)\*8, Esplanade East, Kolkata-700069 (Ph 22488030) \*A' Wing, Rajaji Bhawan, Basant Nagar, Chennai-600090 (Ph 24917673) \*Press road, Near Govt. Press, Thiruvananthapuram-695001 (Ph 2330650) \*Block No.4, 1st Floor, Gruhakalpa Complex, M G Road, Nampally, Hyderabad-500001 (Ph 24605383) \*1st Floor, 'F' Wing, Kendriya Sadan, Koramangala, Bangalore-560034 (Ph 25537244) \*Bihar State Co-operative Bank Building, Ashoka Rajpath, Patna-800004 (Ph 2683407) \*Hall No 1, 2nd floor, Kendriya Bhawan, Sector-H, Aliganj, Lucknow-226024 (Ph 2225455) \*Ambica Complex, 1st Floor, above UCO Bank, Paldi, Ahmedabad-380007 (Ph 26588669) \*KKB Road, New Colony, House No.7, Chenikuthi, Guwahati 781003 (Ph 2665090)

Kurukshetra seeks to carry the message of Rural Development to all people. It serves as a forum for free, frank and serious discussion on the problems of Rural Development with special focus on Rural Uplift.

*The views expressed by the authors in the articles are their own. They do not necessarily reflect the views of the government or the organizations they work for.*

*The readers are requested to verify the claims in the advertisements regarding career guidance books/institutions. Kurukshetra does not own responsibility. Maps used are for illustration & study purpose and may not strictly conform to the official map.*

# INSIDE

**G**ood quality infrastructure is critical to sustainable growth, especially for rural areas. As over 60 per cent of the population lives in rural areas, with low levels of per capital income, there is need to impart greater attention in improving rural infrastructure.

Currently the rural infrastructure is inadequate to support over 600,000 villages. Investment in rural transport infrastructure stimulates the rural economy and hence acts as a tool for poverty reduction.

The services in the rural sector, like market access, education, health, and communication depend on the availability of infrastructure. A common observation has been that the rural areas with better connectivity also lead on the development scale. Inadequate transport infrastructure in rural areas cause lack of mobility and constraint to rural development.

However, providing infrastructure entails huge dose of capital investment. Rural infrastructure growth is thus dependent on financial resources.

Improved transportation infrastructure and services undoubtedly contribute to reduced costs of transport, market expansion, improved productivity and competitiveness. Still, within the economic function of transport, the sector contributes to pro-poor growth patterns by targeting transport interventions to support the development of markets and businesses that serve and employ the poor.

To address the issue of rural infrastructure the government launched the Bharat Nirman programme and there are independent schemes to boost Road building, Irrigation, Housing, Water Supply, Electrification, and Telecommunication Connectivity. In this issue we focus on the relevance of rural infrastructure in raising economic development in rural areas.

There has been a virtual telecom revolution in the last ten years connecting all villages. In fact the growth of rural teledensity is remarkable and is growing at a much faster rate than urban teledensity.

Information Communication Technology, (ICTs) is known to be a facilitator of socio-economic development. Rural areas which lag behind facilities by way of health, education, financial services and employment avenues are using the benefits of ICT.

Certainly, the growth of rural telephony, especially mobile telephony has brought improved connectivity and this has contributed significantly to socio-political and economic mainstreaming of rural India in the past decade. □

# REVIEW OF RURAL INFRASTRUCTURE UNDER BHARAT NIRMAN

Dr. K. K. Tripathy

Around 83.5 crore (70 per cent) of India's population lives in rural areas. The large magnitude of the rural population, their prevailing socio-economic conditions and the quality of life calls for an all-round development in rural infrastructure to achieve the long-cherished objectives of equitable and inclusive growth with social justice. During the last six decades of the planning period, the country's economists and planners have identified the potential of a vibrant rural India and advocated for the improvement and the expansion of rural socio-economic infrastructure. While the Eleventh Five Year Plan (2007-2012) noted a direct and significant causal relationship between infrastructure and the incidence of poverty in states, the approach to the Twelfth Five Year Plan (2012-2017) laid a renewed emphasis on the creation of physical infrastructure like roads, railways, ports, airports, power and telecommunications.

Considering the importance of infrastructure in the sustenance of economic growth, the

Government of India (GoI) had launched a programme on rural infrastructure called '*Bharat Nirman*' as a time-bound business plan for implementation in four years (2005-2009). The six components included under the programme were irrigation, drinking water, electrification, roads, housing and rural telephony. The initiative had sought an active and transparent public-private partnership for immediate execution of various infrastructure related development projects in a mission mode. Although *Bharat Nirman* registered considerable progress by 2009, non-achievement of goals set under the programme prompted GoI to expand the time line for the completion of targeted activities to 2012.

## Water Resources - Irrigation

Indian agriculture is primarily rain-fed. The goals of agricultural plans in India have aimed at food and fodder availability, growth in agriculture, sustainable agro-practices and easy access to agro-inputs. Creation of irrigation potential in the



country and expansion of installed capacity of various irrigation projects have also been important policy objectives of India's development planning. By 2005-06, a large number of irrigation related projects were facing financial constraints and the investment already made in these projects were treated as 'sunken investment'. In 1951, the irrigation potential from major and medium irrigation was about 10 million hectares and from minor irrigation projects was 13 million hectares. By 2006-07, the total irrigation potential created was 103 million hectares.

*Bharat Nirman* ambitiously targeted the creation of an additional 10 million hectares irrigation potential by 2009-10. At the end of March 2010, the country could achieve the creation of an additional irrigation capacity of 73 lakh hectares, thereby leaving a gap of 27 million hectare irrigation potential. It was during the second phase of *Bharat Nirman* (i.e. 2010-11 and 2011-12), in which the creation of irrigation potential surpassed the original target fixed for this component by 1.16 million hectares. From 2005-06 up to 31<sup>st</sup> March 2012, irrigation potential of 1.18 million hectare has been created under this initiative. This has been achieved by either completion of various on-going major and medium irrigation projects, extension, modernization and renovation of major and medium irrigation projects.

While the achievement of targets on creation of additional irrigation potential is praiseworthy, it is desirable that the irrigation potential so created over the years should be utilized fully and the gap between the potential created and the actual utilization be narrowed. The full utilization of irrigation potential requires actions like (i) timely completion of field channels and drains; (ii) appropriate land leveling and shaping; and (iii) involvement of farmers in taking decisions on usability of such created potential.

### Rural Water Supply

The target for providing access to safe drinking water to identified habitations was achieved well before March 2012. Against 55,067 uncovered habitations to be covered during the Phase-I of *Bharat Nirman* period (2005-09), 54,477 habitations were covered by March, 2009. The remaining habitations, of which many were in difficult areas

lacking sustainable sources of drinking water, were covered by March 2012. The strategy adopted to cover uncovered habitations which include both Not Covered and Partially Covered habitations is to ensure that the rural population gets at least 40 litres per capita per day of safe water from sources lying within the village or nearby. Now the focus has shifted to improving the quality of water supplied to targeted habitations.

Studies indicate that the ever-growing dependence on groundwater and its unsustainable over-extraction are lowering the ground water table and adversely impacting the rural drinking water supply. Planning Commission has found that between 1995 and 2004, the proportion of unsafe districts (semi-critical, critical and overexploited) has grown from 9 per cent to 31 per cent, the proportion of areas affected grew from 5 per cent to 33 per cent and population affected from 7 per cent to 35 per cent (Planning Commission, 2010).

The major challenge before the government is now to ensure (a) safe drinking water in the slipped back habitations through vigorous restoration of defunct bore pumps, carrying out repairs to water supply pipelines, augmentation of supply wherever required; and (b) sustainability of quality water supply to areas covered under *Bharat Nirman*. The Eleventh Five Year Plan (2007-2012) called for convergence of various rural development programmes of the government (such as Mahatma Gandhi National Rural Employment Guarantee Act, Backward Region Grant Fund, watershed development, restoration of water bodies, etc.) backed by a need-based village-level water planning. This issue was also re-emphasized in the Twelfth Five Year Plan (2012-17).

### Electrification

Power infrastructure plays a vital role in sustained economic development of a country. The quality of power supply and power accessibility has been a matter of concern in rural India as capacity addition in this sector has been falling short of its targets/demand. For example, the actual capacity addition during the Tenth Five Year Plan (2002-07) was only 19,092 MW against a target of 41,110 MW. The Eleventh Plan (2007-12) has an ambitious target of 62,374 MW against the actual capacity addition as on 31<sup>st</sup> March 2010 was 22,301 MW.

The policy of privatization of power sector in various States has not reaped the desired results in raising the efficiency in generation, distribution and transmission of electricity. Keeping in view the power availability and accessibility situation and the importance of electricity in rural agriculture and allied sector, *Bharat Nirman* vowed to supply electricity to 2.3 crore households in 1.25 lakh un-electrified villages within four years i.e. 2005-2009.

Accordingly, the Rajiv Gandhi Grameen Vidyutikaran Yojana (RGGVY) focused to provide electricity to rural unelectrified villages. This programme, by March 2012 from 2005-06, could ensure intensive electrification in 2.9 lakh already electrified villages. Works in about 1.07 lakh un-electrified villages have been completed and free electricity connections were provided to nearly 2 crore below poverty line (BPL) households in rural areas.

To ensure quality and sustained power supply in rural areas, we now need to switch-over from free or subsidy-driven power distribution system to a competitive user-based revenue collection and sharing model. The Mid-Term Appraisal of Eleventh Five Year Plan calls for active involvement of grassroot institutions like Panchayati Raj Institutions (PRIs), Non-Government Organisations (NGOs), Cooperatives, etc. in revenue collection, local management, operation and maintenance of power infrastructure in rural areas.

## Rural Roads

*Bharat Nirman* entailed providing connectivity to all habitations of 1,000 and above (500 and above in the case of Hill States including North East, Tribal and Desert Areas) by 2012. The programme envisaged to provide connectivity to 63,940 habitations till the year 2012. Up to March 2012, projects to connect 58,387 habitations were sanctioned. Out of this, 44,089 habitations were connected by constructing 1,41,095 kms of new roads (Table 1). Systematic District Rural Roads Plans were prepared, listing out the complete network of all roads in the districts i.e., Village Roads, Major District Roads, State Roads and National Highways and the construction and allocation of resources were prioritised. To ensure quality in construction of rural roads, vigorous quality control measures were followed, backed by independent quality checks

**Table 1: Progress of Rural Road Infrastructure under *Bharat Nirman***

Activity	Target (2005-12)	Achievement (cumulative)	
		March 2009	March 2012
1	2	3	4
Habitations (in Nos.)	63,940	31,924 (58%)	58,387 (69%)
New Connectivity (Length in km.)	1,89,897	85,405 (58%)	1,41,096 (74%)
Upgradation (in kms.)	1,94,131	1,55,019 (80%)	2,35,903 (122%)

**Sources:** (1) Mid-Term Appraisal for Eleventh Five Year Plan 2007-12, Planning Commission  
(2) Twelfth Five Year Plan 2012-17, Planning Commission

**Note:** Figures in the parentheses are per cent to total as indicated in col. 2

Table 1 : indicates that as many as 69 per cent of the target habitations have been provided connectivity under *Bharat Nirman* initiative as on March 31, 2012. The achievement in case of new connectivity and upgradation of road infrastructure were 74 per cent and 122 per cent, respectively.

and measurements. The inbuilt clause of five years maintenance within the construction contract also helped in the maintenance of the newly created assets.

## Rural Housing

Under Phase I of the Rural Housing component of *Bharat Nirman*, 60 lakh houses were to be constructed through Indira Awas Yojana (IAY) during 2005-06 to 2008-09. Against this target, 71.76 lakh houses were constructed. During 2009-10, as against the target of construction of 40.52 lakh houses, 33.87 lakh houses were constructed. It was proposed to double the earlier target and to construct 120 lakh houses during the next five-year period starting from the year 2009-10. Against this, 65.87 lakh houses were completed by 31<sup>st</sup> March 2012.

While the physical progress in the provision of rural housing is much more than the *Bharat Nirman* target, the involvement of beneficiaries in the construction of a house under the scheme was not found to be satisfactory. For effective implementation of the scheme, the beneficiaries need to actively participate throughout the

construction process i.e. making own arrangements for procurement of construction material, engaging skilled workmen and also contributing family labour. The beneficiaries should also take their own decisions about the manner of construction of the house. The active participation of beneficiary in the housing project like IAY will result in economy in cost, ensure quality of construction, lead to greater satisfaction and acceptance of the house by the beneficiary himself/herself.

### Rural Telephone Connectivity

India has witnessed a rapid expansion of the telecommunication sector in the last decade. This has led to an intense competition amongst various service providers which ensured quality services at affordable prices. The revolution in the field of communication has the potential in supporting the rural folk in improving their quality of life and livelihood. As in 2005, as many as 66,822 villages were without telephone connection. *Bharat Nirman* was expected to provide every Indian village with telephone access by end-2007. The successful implementation of this programme registered an increased tele-density in rural areas. Rural tele-density in 2009-10 was 15.11 and rose by 17.88 percentage points to 32.99 as on February 28, 2011. During phase II of *Bharat Nirman*, the target was fixed for connecting 2.47 lakh village panchayats with broadband. By March 2011, as many as 1,10,695 village panchayats were connected with broadband facility. Out of 5.93 lakh inhabited villages in the country, about 5.81 lakh villages have been provided with Village Public Telephone (VPTs). Out of 3.5 lakh targeted village panchayats, 1.57 lakh have been connected through broadband as in March 2012. It is expected that the National Optical Fibre Network (NOFN) project of the government of India would take broadband connectivity to 2.5 lakh villages by 2014.

### Concluding Remarks

Infrastructure provides the basic framework for economic and social progress of a country. Physical infrastructure strengthens the economy, boosts

investment, attracts prospective entrepreneurs, helps alleviate poverty and reduces the incidence of unemployment through numerous positive forward and backward linkage effects on the primary, secondary and tertiary sectors of the economy. Similarly, social infrastructure helps in improving the quality of life of millions of rural inhabitants. Considering these, the country's economic reform measures of 1990s envisaged, *inter alia*, the improvement of infrastructure for enhancing the country's productive capacity and for enabling the gradual reduction in poverty and the related deprivation. The initiatives of *Bharat Nirman* during 2005-2012 and the related central sponsored plan schemes envisage enhancement of socio-economic status of our rural people.

A considerable part of the total expenditure under the programme is considered as development expenditure. Many projects aiming at enhancing rural infrastructure are also routed through the National Bank for Agriculture and Rural Development which is the apex financial body for agriculture and rural infrastructure.

As a follow up action to the *Bharat Nirman* programme, a synchronized approach is required to converge the infrastructure-building initiatives of *Bharat Nirman* components with various other development oriented programmes already in operation like programmes for alleviating poverty, generating gainful employment, ensuring social security, enhancing standard of health, hygiene, sanitation and education. Ministries/Departments of Panchayati Raj, Rural Development, Drinking Water and Sanitation, Water Resources, Agriculture, Information Technology and Land Resources, etc. This endeavour would not only enrich the rural economy by creating productive and durable infrastructure but also would be able to narrow down the gap between rural and urban India by spreading growth benefits uniformly.

***[The author is Director in the Ministry of Rural Development. Views are personal. E-mail id: tripathy123@rediffmail.com]***

**India has witnessed a rapid expansion of the telecommunication sector in the last decade.**

# BOOSTING RURAL DEVELOPMENT THROUGH AGRI-INFRASTRUCTURE

Dr. Parveen Kumar

**W**hat a tragedy it has been for the agriculture sector in India. While we celebrate the agricultural production in the country reaching an all time high, at the same time the country is unable to store the excessive produce. Along with land, labour and capital the income emanating from agriculture is being directly linked to the quality of infrastructure. The agricultural infrastructure includes all of the basic services, facilities, equipment, and institutions needed for the economic growth and efficient functioning of the food and fiber markets. Infrastructure is basically supporting both physical and organizational structures needed for the operation of a society or enterprise, or the services and facilities necessary for an economy to function.

Infrastructure has been one of the much neglected aspects of Indian agriculture. Agriculture in India lacks minimum necessary infrastructure and this is holding India back. A recent statement of minister of Agriculture in the Rajya Sabha confirmed the loss due to lack of inadequate infrastructure to the tune of rupees 44,000 crore. Of this the value

of annual wastage of fruits and vegetables was estimated at rupees 13,309 crore. The Saumitra Chaudhari committee constituted by the planning commission in 2012 had put the total cold storage capacity requirements in the country at 61.3 million tonnes as against the present annual capacity of around 29 million tonnes. There is thus a gap of 32 million tonnes.

**Infrastructure and development:** The investment in infrastructure impacts positively the economic development, Rostow (1960) while discussing the different stages of growth of economy argued that expansion and improvement of the transport and the infrastructure is a necessary precondition for capital formation and increase in the production and productivity. It should be noted that the infrastructure in the agricultural sector enhances the comparative advantage of that region in which the infrastructural investment is made. When the region gains comparative advantage in the agricultural activities, the net result is increase in the production and productivity of various agricultural goods and services in general. An empirical study by Binswanger





et al (1993) revealed that increased marketing infrastructure that includes components such as road facilities in India enhanced the total agricultural output with the elasticity of 0.20. Similarly a study by Ahmed and Hussain (1990) concluded that the fertilizer use in the agricultural sector increases with the improvement in the quality of road. An important benefit derived from the agricultural infrastructure is that it helps to increase the level of value added products in the region. Similarly the construction of a bridge over river Mahanadi in Jagat Singh Pura in Orissa connected 80 villages with four strategic markets and the bridge also resulted in diversification and mechanization of agriculture. Similarly an Asian Development Bank report in 2010 also highlighted that the rural roads resulted in 20 per cent increase in visits by farmers to nearby markets and 13 per cent decrease in incidence of agricultural produce getting spoiled or damaged in transit. An IFPRI study revealed that enhanced returns from agricultural production could be obtained by giving more thrust to agricultural research and development (13.45%), roads (5.31%), education (1.39%) soil and water conservation (0.96%).

**Multiplier effect:** The major focus of infrastructural investment has been on irrigation, transportation, electric power, agricultural markets, etc and these not only contributed to the agricultural growth at the macro level but also to wide disparity between different regions in terms of agricultural growth. The introduction of a resource conserving technology such as the drip or sprinkler in dry land areas lessens the ground water exploitation in that area. This would result more ground water available for farmer fields downstream. Another important aspect of the introduction of this technology will be that the expenses on digging wells or arranging for tanks for irrigation will be saved which the farmer can use for other social functions. When the water is available to the farmers he can also go for change in his cropping pattern; he can now grow high value crops earn more income and thus improve his social status. Similarly the dams have the primary aim of electricity generation and irrigation can also be used for fishing. The additional area of land brought under cultivation due to construction of an irrigation dam would lead to increased consumption of inputs like fertilizer, weedicides etc. To match to the demand of this increased consumption we would have to either increase the capacity of the existing or establish new units. This would provide employment to many.

**Agri marketing infrastructure:** The agri marketing infrastructure is another important component. Agri marketing infrastructure includes infrastructure for collection, drying, grading, labeling and packaging of the produce. This needs market yards, offices and platforms for loading and unloading of the produce. Rural markets and that too well regulated are a core component of the agri market infrastructure. These help in preventing the exploitation of the farmers at the hands of middlemen and brokers. Information regarding provision of timely information is also essential. For that we need to set up e-kiosks through which timely information could be sent to the farming community. They can also go for e-trading and futures trading. In the country most of the agriculture produce is marketed in open yards and to some extent regulated markets. A few states have specialized markets for fruits and vegetables. Now direct marketing is also initiated by some states. The direct marketing eliminates the middle men share and has the advantage of bringing producer in direct contact with the consumer. The Apni Mandi in Punjab, Rythu Bazaar in Andhra Pradesh and Shetkooori Bazaars in Maharashtra are some of the emerging concepts of direct marketing.

**NABARD's initiative:** NABARD has also been providing Rural Infrastructure Development Fund (RIDF) since 1995. This RIDF finances the states for creation of rural infrastructure like rural roads, minor and medium irrigation projects, agricultural market yards etc. It has also supported watershed development in about 2 million hectares of land around the country investing about rupees 1600 crores to demonstrate people centered approaches of conserving soil and water.

**Government Intervention:** The government of India now provides financial assistance in the form of grant in aid at the rate of 50 percent of the total cost of plants and machinery and technical civil works in general areas and at the rate of 75 per cent in difficult areas including north eastern states for creation of cold chain infrastructure with a ceiling of rupees 10 crore. The government has also formulated a scheme called as PEG for creation of additional storage capacity for guaranteed hiring by the Food Corporation of India. In this scheme against a target of 60 lakh tonne capacity creation in the year 2013-14, 3.36 lakh was completed up to July 2013. Today in India cold storage facility is used only for ten percent of the produce and over 3500 of existing cold storage warehouses have only around 13 million tonnes of storage capacity. Collection centers with pre cooling

facilities, refrigerated vans and terminals for holding cold storages with pre cooling facilities can definitely help in preserving the perishable produce.

The government of India has already taken some initiatives for safety of farm produce. India's first horticulture train started operation in June last year carrying onions from Nashik farmers to Kolkata. This has proved very successful for small farmers who do not have to become victim of middlemen and commission agents. This horticulture express will deliver consignments to Chitpur near Kolkata covering 1800 km in 36 hours. Currently onions are transported by Trucks that need 120 hours for the journey. The train has been jointly introduced by the National Horticultural Board and the container corporation of Railways. The government has also started setting up of National Center for Cold Chain development in the wake of mounting post harvest losses. As many as 39 cold chain projects were approved during 2011. Ten mega food parks have been approved in Andhra Pradesh, Punjab, Jharkhand, Assam, West Bengal, Uttarakhand, Tamil Nadu, Karnataka, Bihar and Tripura. These Mega Food Parks are aimed at accelerating the pace of food processing in the country backed by an efficient food supply chain. Besides this the parks will provide employment opportunities for so many peoples.

**What to do:** Most of the perishable items are produced in the villages which remain confined to these due to the absence of road networks. The existing road and rail facilities are inadequate. Most of the areas which produce good quality fruits are still inaccessible. This coupled with the rough terrain of the area and lack of regulatory markets make the farming community to suffer a lot at the hands of the local traders. Farmers have no information about the market price. There is an urgent need to establish suitable infrastructure like the use of information communication technology (ICT) for benefit of farming community. The technology like e-kiosks and e-choupals of Indian Tobacco Company in Madhya Pradesh and other states of the country are doing a great job. Each electronic kiosk is connected to a number of villages. The villagers can obtain any information easily from these kiosks regarding various aspects of crop production. Communication with different markets and among different stakeholders is also possible through the use of ICT.

Irrigation is another area which requires infrastructure upgradation. With suitable infrastructure the irrigation potential can be increased. The utilization of available water for agriculture too is far from

efficient. Wastage of water is huge in surface irrigation systems. The inability to conserve adequate water and curb its indiscriminate utilization, including rampant wasteful exploitation of water is also a cause of concern. The problem is more severe in dry land area of the country which accounts for more than 60 percent of the total cultivable area. Suitable water conserving infrastructure like the drip irrigation and sprinkler irrigation should be installed in these areas. Water conservation techniques like water sheds, rainwater harvesting and other measures can bring additional area under irrigation in these water scarce regions.

Similarly we can also invest in creating community grain storage Banks where the farmers can store their excessive food grains. This will also prevent them from distress selling as they can wait for the right time to sell their produce. To meet the energy needs of farming sector solar energy can be used and for that solar panels should be set up jointly in the villages to cater to the energy requirements of the farmers. There is a need to invest in developing infrastructure of agricultural supply chain. Moreover, the government has emphasized on increasing investments of private sector in marketing, transportation and storage facility of fast degradable agricultural products. The private sector should also come forward and invest in creating agriculture assets. They can use it on a built operate transfer basis.

At the same time greater emphasis has to be laid on research infrastructure by establishing a number of new institutes, national research centers for several crops and livestock to address the local problems and come out with site specific solutions. To conclude, infrastructure potentially can influence rural economic performance through three ways. These are (i) individual development by the increased use of existing resources-land, labor, capital, etc. (ii) bringing additional resources to rural areas and (iii) socio-economic development by creating assets and making rural economies more productive. P. I Suvrathan, Secretary in the ministry of Food Processing has rightly said, " Opportunities given to farmers to run post harvest facilities all by themselves in a professional way will empower them, as farmers can hold on to their harvest more than 24 hours and have a say in fixing price for their produce."

*[The author is a Senior Research Fellow who writes on agricultural and social issues E-mail : pkumar6674@gmail.com]*



In Association with



India's largest IAS Coaching Network

## UPSC CIVIL SERVICES EXAM 2014

**PRELIMS 2014: GENERAL STUDIES & CSAT  
MAINS, OPTIONAL (Geog, Pub Ad)  
MOCK TEST SERIES & INTERVIEW**  
(English & हिन्दी माध्यम)

### INDIA'S BEST IAS MENTORS

**MR. JOJO  
MATHEWS**



**MR. MANISH  
GAUTAM**



**MR. SHASHANK  
ATOM**



**MR. MANOJ  
K. SINGH**



## 1464 RANKS IN LAST 12 YEARS

161 successful candidates in 2013



### ADMISSION OPEN. LIMITED SEATS.

Call: 9654200517/23 | Toll free: 1800-1038-362 | Email: [csp@etenias.com](mailto:csp@etenias.com) | Website: [www.etenias.com](http://www.etenias.com)

**ETEN IAS CENTRES:** Ahmedabad, Allahabad, Bangalore, Bhopal, Bhubaneswar, Bilaspur, Chandigarh, Chennai, Cochin, Dimapur, Guwahati, Hyderabad, Imphal, Jaipur, Jammu, Jodhpur, Kanpur, Kohima, Kolkata, Lucknow, Nagpur, Patna, Pune, Raipur, Shillong, Srinagar, Vijaywada, Trivandrum

ALWAYS LEARNING

PEARSON

# RURAL INFRASTRUCTURE KEY TO INCLUSIVE GROWTH

R.C. Rajamani

The recurrent theme of public discourse during the last one decade has been 'inclusive growth.' Inclusive growth is essential for social and economic equity. Since India's majority of people live in villages, it is easily seen that rural infrastructure is a major component for ensuring inclusive growth.

Development of Infrastructure envisages creation of values through engineering consultancy. Rural development entails structural changes in the socio-economic situation to achieve improved living standard of low-income population and making the process of their development self-sustained. It includes economic development with close integration among various sections and sectors; and economic growth, specifically of the rural poor. In fact, it requires area based development as well as beneficiary oriented programmes. No wonder, rural development is one of the main and important tasks of development planning in India.

Development of rural areas is slow due to improper and inadequate provision of

infrastructure with compare to urban areas. That's why rural share in GDP is always less. The planning and development of human settlements and provision of required infrastructure are much better in urban areas. Rural population migrates to urban cities for employment opportunities and better facilities. Besides, the limited capacity of rural economy to accommodate the increasing population sends the labour force as surplus to migrate large cities. There is then a need to encourage reverse migration to rural areas through proper development of rural infrastructure and basic amenities by creation of income generation avenues and improving the quality of life

Rural infrastructure is not only a key component of rural development but also an important ingredient in ensuring any sustainable poverty reduction programme. The proper development of infrastructure in rural areas improves rural economy and quality of life. It promotes better productivity, increased agricultural incomes, adequate employment and so on and so forth.

Hence the "Bharat Nirman" time bound



business plan for action in rural infrastructure. It envisages action in the following areas:

- Irrigation
- Rural Roads
- Rural Housing
- Rural Water Supply
- Rural Electrification
- Rural Telecommunication Connectivity, etc.

Development of Infrastructure in rural areas is a thrust area to create values through engineering consultancy that consultancy can provide technical, managerial and on-site consultancy from conceptualization to final implementation of the projects. Various infrastructure projects under Bharat Nirman have become lifeline to new markets, new business, new incomes, and above all, to new opportunities. Even a narrow road can be a highway to prosperity. Similarly each infrastructure project has its own advantages particularly rural connectivity Yojana ensure that every village in India has access to markets, to services, to opportunities, indeed, to prosperity.

Infrastructure development has a key role to play in both economic growth and poverty reduction. Failure to accelerate investments in rural infrastructure will be a stumbling block to achieve the Millennium Development Goals. Further, it also severely limits opportunities to benefit from trade liberalisation, international capital markets and other potential benefits offered by globalisation, point out development watchers. No doubt, the creation of infrastructure in emerging 'rural-urban' clusters remains a "major challenge". To meet this challenge, the Rural Development Ministry is optimistic that its revamped project for developing amenities in such areas will yield results soon. The country's experience thus far with the landmark scheme Mahatma Gandhi National Rural Employment Guarantee Act (MGNREGA) has certainly given a special fillip in this regard.

Currently, there are around 3,900 such clusters in the country which do not fall either in

rural or urban category. Government has said it will undertake projects such as water supply, sanitation, street lighting, tourism and improvement of roads through public-private partnership mode in such areas. The Project is re-christened as new PURA (Provision of Urban Amenities in Rural Areas). According to Rural Development Minister Jairam Ramesh, PURA marks a major departure in the way, we approach development strategy. He is confident that in the 12th Five Year Plan, it will be one of the important elements for creation of physical infrastructure in the rural areas. Just as MNREGA has become synonymous with the Ministry of Rural Development, in the next ten years the Ministry should be known for PURA projects in the country, he says,

When PURA-2 is launched, the Centre will select the developers, while the state governments will choose the clusters for creation of infrastructure. The Ministry is committed to the grounding of good PURA projects across the country to ensure people in rural areas do not feel deprived of urban amenities and do not have the urge to migrate to cities in search of good living. According to the ministry, there are 4 Ps in the model as this is not only about Public Private Partnership, but also about involvement of People and communities at Gram Panchayat level.

**Rural infrastructure is not only a key component of rural development but also an important ingredient in ensuring any sustainable poverty reduction programme.**

The year 2013 witnessed stirring events in the area of rural development. One of them was The Right to Fair Compensation and Transparency in Land Acquisition, Rehabilitation and Resettlement Act. With its notification, it has replaced an archaic law of over a century-old.

During the year, government came out with its phase II of the Pradhan Mantri Gramin Sadak Yojana (PMGSY) to upgrade rural roads constructed under the programme. The Union Cabinet gave its approval for a proposal for launching the PMGSY-II. While the existing PMGSY scheme will continue, under PMGSY phase II, the roads already built for rural connectivity will be upgraded to enhance village infrastructure. Another significant initiative was granting approval for setting up of an

independent society for 'transforming livelihoods and lives of rural households, with an emphasis on women' in tribal areas.

The Rural Development Ministry's proposal to set up the Bharat Rural Livelihoods Foundation (BRLF) with a corpus of Rs 500 crore in partnership between the government and private sector philanthropic organizations was approved by the Cabinet.

The Ministry, at the fag-end of the year, also announced significant changes to its flagship MNRGA programme seeking to ensure permanent and durable asset creation and introduction of penalty for delayed wage payments. It launched a new skill development scheme called 'Roshni' for rural youth from 24 most critical left-wing extremism affected districts in the country. The initiative aims at imparting skills and placement of 50,000 youth from these districts. The ministry selected six districts each from Jharkhand and Odisha, five from Chhattisgarh, two from Bihar and one each from Andhra Pradesh, Uttar Pradesh, West Bengal, Madhya Pradesh and Maharashtra for the scheme.

The programme will be implemented at a cost of Rs 100 crore over the next three years. The government which initiated various programmes to deal with the challenge of Maoism has said that at least 50 per cent of the candidates covered under the scheme should be women and special efforts will be made to proactively cover Particularly Vulnerable Tribal Groups on a priority basis. The year also saw an ambitious programme 'Himayat' launched by the Rural Ministry in Jammu and Kashmir to train and give jobs to over one lakh youth from poor families evoking positive response from the youth.

Mahatma Gandhi's words that India lives in its villages rings true even today. The majority of its 1.2 billion people still live in villages and have agriculture as their means of livelihood. Any plan for the country cannot but have its particular focus on the development of the vast rural areas and the people inhibiting them. Successive budgets have taken

care of the rural region by allocating liberal funds to improve the lot of the rural population.

As expected, the rural development was given its deserving priority in the union budget 2013-14. The rural development ministry, which carries out many of the government's pro-poor programmes, received a 46 per cent hike in its allocation. The budget proposed to allocate to the ministry Rs.80, 194 crore in 2013-14.

### Food Security

Food security is as much a basic human right as the right to education or the right to health care. The National Food Security Bill was a promise of the Government which it kept during the year.

### NABARD

NABARD operates the Rural Infrastructure Development Fund (RIDF). RIDF has successfully utilised 18 tranches so far. A sum of Rs.5000 crore was made available to NABARD to finance construction of warehouses, godowns, silos and cold storage units designed to store agricultural produce, both in the public and the private sectors.

Infrastructure development has a key role to play in both economic growth and poverty reduction.

### Road Construction

The road construction sector has reached a certain level of maturity. But it faces challenges not envisaged earlier, including financial stress, enhanced construction risk and contract management issues that are best addressed by an independent authority. Hence, Government has decided to constitute a regulatory authority for the road sector. Bottlenecks stalling road projects have been addressed and 3,000 kms of road projects in Gujarat, Madhya Pradesh, Maharashtra, Rajasthan and Uttar Pradesh will be awarded in the first six months of 2013-14.

With a plethora of schemes benefiting rural economy under way, it is hoped the next government after the April-May Lok Sabha elections will continue the task with missionary zeal.

*[The author is Delhi based senior journalist. E-mail id: rajamanirc@gmail.com]*

# GROWTH OF FINANCIAL INFRASTRUCTURE IN RURAL INDIA

Dr. Kameswari Peddada

**F**inancial inclusion in India was the most important goal sought to be achieved when nationalization of scheduled commercial banks was done in 1969. In the post-1991 liberalization period the goal was given a short-shrift. Inclusive economic growth is the main objective of 11<sup>th</sup> Five Year Plan. Inclusive growth presupposes financial inclusion. For the last few years financial inclusion has become an imperative for the governments. Microfinance, financial inclusion and 'Aam Aadmi' have become the catchwords among the Government, Reserve Bank of India (R.B.I.), commercial banks, Regional Rural Banks (RRBs) and cooperative banks. The theme of the approach paper to the 12<sup>th</sup> 5-Year Plan (2012-2017) is "faster, sustainable and more inclusive growth". Overall financial inclusion will bring social harmony and political stability in the country. The advent of technology, especially the information technology, has provided the means to achieve that goal in a cost-effective manner.

## Definitions

**Infrastructure** : The basic physical and organizational structures and facilities needed for

the operation of a society or enterprise. A country's or a region's development can be judged from the status of its infrastructure.

**Financial Infrastructure:** It comprises the underlying foundation for a country's financial system, including all institutions, information, technologies, rules and standards that enable financial intermediation. Poor financial infrastructure in many developing countries poses a considerable constraint upon financial institutions in expanding their financial services to the underserved segments of the society. It also creates risks to financial institutions and resultant lack of adequate credit facilities leads to financial crises.

**Inclusive growth:** It is a concept which advances an equitable allocation of resources during the process of economic growth with benefits incurred by every section of society.

**Financial Inclusion:** It is an important aspect of inclusive growth.

"The process of ensuring access to financial services and timely and adequate credit where



needed by vulnerable groups, such as weaker sections and low-income groups, at an affordable cost.”- Dr. C. Rangarajan Committee, 2008.

“The process of ensuring access to appropriate financial products & services needed by vulnerable groups (weaker sections and low income groups) at an affordable cost in a fair & transparent manner by main stream institutional players.”-Dr. K.C. Chakrabarty, 2009.

### Extent of Financial Exclusion in India

- 70,000 bank branches and 1.5 lakh post offices for about 600,000 villages.
- 51.36% of rural households are financially excluded.
- Only 44.9% of total earners have bank accounts.
- Only 28.3% of total earners (earning less than Rs. 50,000) have bank accounts.
- Only 54 persons per 100 have savings account.
- Only 13.0% of total earners (earning less than Rs. 50,000) take credit from banks.

### Barriers to Financial Inclusion

- Wide geographical spread posing problems of out-reach and scale.
- Multiplicity of languages.
- Illiteracy (especially, financial illiteracy).
- Lack of personal and financial identity for vast sections of society.
- Infrastructural inadequacies.
- Limited man-power resources.
- Lack of effective business models.
- Structural constraints of traditional commercial banks.
- Economic sustainability.

### Interventions for Achievement of Financial Inclusion

Goal of Financial Inclusion (F.I.) is difficult, but not unattainable:

1. State Driven Interventions by Central, State and Local Governments.
2. Voluntary Interventions by Banks, Micro-finance Institutions (MFI), Cooperatives, Self Help Groups (SHGs) and other social organizations.

### Measures

1. Harnessing advances in the Information & Computer Technology (I.C.T.), like Smart Cards, Internet Kiosks and Cell Phone Messaging.
2. Developing, testing and implementing appropriate products and suitable delivery channels for financial services to be extended.
3. Attention to the 5 Ps of marketing-Product, Price, Place, Process and Promotion.

### Present Concerns of the Union Government

- Scaling up of Financial Inclusion Plan (F.I.P.) to cover all of 6 lakh odd villages.
- Nationwide awareness on F.I. (Swabhiman Project) by banks.
- Disbursement of all social security benefits through Electronic Benefit Transfer (E.B.T.) to all rural areas.

### Andhra Pradesh Smart Card Project-A Case Study

#### Salient Features:

- A State Government driven intervention.
- Last mile banking with a banking outpost at each Gram Panchayat (G.P.).
- Disbursement of pensions, wages and other benefits without delay.
- Bank authentication to eliminate bogus beneficiaries.
- Disbursement of benefits at G.P. level by Banking Correspondents (B.C.).
- Branchless Banking model – a major step towards F.I.
- Entire infrastructure laid by Bank.
- Government committed to pay 2% as commission on the total amount disbursed.

#### Project Implementation:

Pilot: One Bank–One Mandal (August, 2006)

- Started in 6 Mandals in Warangal & 2 Mandals in Karimnagar Districts.
- Six banks (S.B.I., S.B.H., A.B., U.B.I., A.P.G.V.B. & Axis) participated one for each Mandal.
- Enrolment started in March, 2007 and payments started in April, 2007 and are continuing



**Figure I- Smart Card (Technology from Financial Inclusion Network & Operations Ltd.)**



Source: Presentation on Smart Card (Jan., 2012) By Commissioner of Rural Development, Govt. of A.P.

**Phase I: Bank-led Service Area Approach (S.A.A.) (August, 2007)**

- Review of pilot in August, 2007 & decision to upscale to other districts.
- G.Ps in 6 Districts (Warangal, Karimnagar, East Godavari, Medak, Chittoor and Mahaboobnagar) allocated to 12 different banks based on S.A.A.
- Enrolment started from March, 2008.
- Failed to enthuse any stakeholder & progress was tardy.

**Phase II: One Bank - One District Model (August, 2008)**

- One District allocated to one single bank, irrespective of service area.
- Enrolment started in November, 2008.
- 17 districts brought under this phase.
- 7 banks operating in this model.

**Figure II - Use of Smart Card**



Source: AP Smartcard Impact Evaluation Project Policy Report, May 2013

R.B.I. has recommended *one district – many banks – one leader bank model* to be adopted for EBT implementation to avoid overlap and achieve convergence between Phase I & Phase II models. In this model, all the banks present in the district participate in EBT, though for administrative convenience the State Government deals only with one leader bank.

**Table-I: Overall Progress by January, 2012 (from 2008-2009)**

Number of districts	22
Total number of G.P's	21812
Number of G.P's where enrolment effected	21490
Number of G.P's where payments commenced	17888
Target (number of beneficiaries)	190.08 lakhs
Number. of beneficiaries enrolled	144.59 lakhs
Number of cards issued	127.91 lakhs
Amount paid (since inception)	3313.22 crores

Source: A.P. Smart Card Project (2012 Presentation): Commissioner, Rural Development, Govt. of A.P.

**Key Learnings from AP Smart Card Project:**

- Fast payments to real beneficiaries (in 4 days of fund transfer).
- People satisfied by banking services at door step.
- Fool-proof identification & elimination of bogus beneficiaries.
- Simple technology for trained rural literates to operate banking outpost.
- Transaction records for effective monitoring, tracking & recovery of the unspent.
- Potential for incorporation of other financial services.
- Biometric authentication for control of fraud & misuse.

Various initiatives taken by Banks/Govt./ NABARD in the last few years have resulted in expansion of coverage of services by formal banking agencies in the State. Against the all India average of exclusion of 57% of rural households from formal banking system, the exclusion is less than 25% in Andhra Pradesh.

If one were to go by the satisfaction levels of beneficiaries in the use of smart cards, the future of smart cards does seem bright. There is a great potential for use of smart cards in rural India, since a range of applications can be incorporated into a smart card. Having a bank account encourages the savings habit among the poor. It also has a potential to bring a plethora of banking and financial services to the doorstep of the poor.

### Challenges in Nationwide Extension of Smart Cards

- Financial viability is the key to success of any business model.
- Technology enabled models (including smart cards) are not viable as of date for banks & customer service providers.
- Success of the models in achieving financial inclusion depends on the volumes of transactions, diversity of products and profitability in the long run.

The A.P. Smart Card Project has aimed to promote financial inclusion by ensuring the reach of Government benefits to the targeted groups through the use of smart cards. It has been a kind of test-bed to evaluate the potential of smart cards and of the processes involved in marrying technology to financial inclusion. Though the project undertaken has proved successful, up-scaling the same to the entire state and the nation has its own challenges. The very fact that many of the smart card projects undertaken in various parts of the country have not gone beyond the pilot stage is a pointer to the daunting task ahead for the banks and the Government.

### Recommendations

The following are the key recommendations

for a successful nationwide financial inclusion through technological innovations.

- Integrated Point of Service (POS) terminal is preferred.
- Current enrollment process needs refinement.
- A.P. Rural Employment Guarantee Scheme process needs to be revisited due to short disbursement cycle.
- Multi-vendor, multi-zonal, phased approach to be explored for scaling up.
- Spread the disbursement period over the month when scaling-up.
- Vendors to implement Service Management Processes based on standards and guidelines.
- Vendors should be ISO 27001 certified (Information Security Standard).
- Proper Management Information System for better management & analysis.
- List of pending enrolments.
- List of false acceptance and false rejection cases.
- List of rejected or incomplete enrollments.
- Date-wise, CSP(Customer Service Provider)-wise transaction details.
- Policies & Procedures established for exceptions like manual over-ride.
- Provision of a range of financial services to make the business financially viable.

To sum up: "Generation of a good business ground linked to philanthropy alone ensures sustainable success".

*[The author is H.O.D. & Professor, MBA, JBIET Group, Hyderabad. E-Mail id: thuppal2000@yahoo.com]*



# Kurukshetra

## FORTHCOMING ISSUES

Agribased Industries in Rural Development	:	May 2014
New Technologies in Agricultural Development	:	June 2014

# CORPORATE INITIATIVES IN IMPROVING RURAL RETAIL FORMATS

Dr Jitendra Rathore

In the past decade or so the focus of corporate on exploring the hinterlands has seen a steady surge. Apart from companies dealing in agriculture and related products, fast moving consumer goods (FMCG), Durables, Telecom Companies, Banks and a few others have also made a significant investment in the rural India and have begun to reap the benefits. Although exploring and exploiting the rural India came with its own share of challenges. From the perspective of companies these challenges can be understood better in terms of marketing mix: product, price, place and promotion or more specifically, in context of rural marketing mix; acceptability, affordability, availability and awareness. According to Pradeep Kashyap, known as the father of rural marketing in India and founder of MART (India's leading rural consultancy organization), the physical distribution of products continues to

pose an immense challenge to marketers because reaching 7.8 million retail outlets spread across 600,000 villages and feeding a retail network of village shops is a distribution nightmare.

Bharat Nirman, a time bound business plan for action in rural infrastructure proposed action in the areas of irrigation, roads and bridges, rural housing, rural water supply, rural electrification and telecommunication facility. Apart from these aspects related to infrastructure development, the changing face of retail formats in rural areas also signifies infrastructure development; directly or indirectly; indirectly because in order to increase and improve the reach to rural areas, government and corporate, in partnership or otherwise support the development of infrastructure by building roads and improving railroad access or through coming up with cold storages or warehouses and ensuring consistent supply of power etc.



Long-term programs and projects like Bharat Nirman, MGNREGA and NRHM have brought a promise of sustainable and social development of rural India, bringing rural markets to the centre-stage of the corporate world (Kashyap, 2012).

A few corporate giants like ITC, Godrej, TATA, DCM Shriram etc have taken an initiative that is leading to emergence of modern (organized) retail in rural India. The increase in average rural shop size is also indicative of the fact (Table 1). With the increasing footprint of big companies in rural India, the impact is also visible in development of related infrastructure.

**Table 1: Rural shop size**

Size (in sq ft)	Year	
	1999-2000	2008
Up to 100	71	53
101-250	25	37
>250	4	10

Source: A.C. Nielsen Shop Census 1999/2000; RMAI 2008

Some of the initiatives that have brought about a marked change and signify the transition of rural markets from conventional to contemporary retail formats are briefly discussed:

- Murugappa Mana Gromor Stores
- ITC Choupal Saagar
- TATA Kisan Sansar
- Godrej Aadhaar
- DSCL Hariyali Kisaan Bazaar

### Murugappa Group Mana Gromor Stores

Coromandel International Limited, a part of the INR 225 billion Murugappa Group took an initiative and opened two modern stores in rural Andhra Pradesh in the year 2007. Unlike conventional small retail formats that offered a limited assortment, these stores offered more than minerals, fertilizers and seeds etc. The stores provided expert guidance to the farmers on adopting right practices, crop diagnosis, soil testing and other measures to increase the yield. The stores offer the entire range of agri inputs like fertilizers, crop protection products, secondary and micronutrients, seeds, sprayers, mechanized farm services, veterinary feed etc. The establishment of these stores was faced

with challenges like unavailability or dearth of basic infrastructure like power, internet access, banks at various locations. A. Vellayan, Executive Chairman of Murugappa Group expressed his concern over infrastructural challenges that rural stores face in terms of frequent and long power disruptions and weak communication infrastructure. In order to face up to these infrastructural challenges the company is making its own efforts as otherwise the future of its rural venture will be bleak.

### ITC Choupal Saagar

ITC's Choupal Saagar is one of the first retail ventures in rural India that followed after the success of e-Choupal. Choupal Saagar is a physical infrastructure hub that comprises collection and storage facilities and a unique rural hypermarket that offers multiple services under one roof. The mall having shopping area of about 7000 square feet (which is quite small for a mall if compared to the urban areas) offers attractive merchandise displayed in open shelves. The premise has high ceiling as the building is a warehouse for storing the farm produce that the company buys through its popular e-choupals. The mall (store) constitutes only a part of this warehouse. Choupal Saagar focuses on selling mostly the Indian brands. The product mix at Choupal Saagar comprises a wide range of categories: from footwear to toys, toothpastes to televisions, mixer grinders to water pumps, food items to fertilizers and even bikes and tractors. The prominent presence of Choupal Saagar is in Madhya Pradesh, Uttar Pradesh and Maharashtra. The landmark infrastructure has improved the life of inhabitants in nearby villages as it acts as a marketing hub by supporting the presence of e-Choupal. The Choupal Saagar outlets are strategically located to be easily accessible from the nearby e-Chupal centers.

ITC's pre-eminent position as one of the India's leading corporate in the agricultural sector is based on strong and enduring farmer partnerships that has revolutionized and transformed the rural agricultural sector. A unique rural digital infrastructural network, coupled with deep understanding of agricultural practices and intensive research, has built a competitive and efficient supply chain that creates and delivers immense value across the agricultural value chain.

## Tata Kisan Sansar (TKS)

Tata Kisan Sansar, an initiative of Tata Chemicals, came in to being with the objective of empowering and supporting the Indian farmer and community in creating more value for their produce. TKS follows a hub and spoke model. TKS centers are franchised retail outlets and each centre caters to about 30-40 villages in the vicinity.

Apart from providing generic as well as store brands of fertilizers, seeds, pesticides, cattle feed and farm implements, TKS provides services relating to soil and water testing, contract farming, seed production and application and advisory services. TKS also supports and promotes relationship building through farmer memberships, farmer meets and crop seminars. The initiative is a network of about 600 farmer resource centers and caters to more than 3.5 million farmers across 22,000 villages in northern and eastern parts of India.

## Godrej Aadhaar

Adhaar, a joint venture between the Future Group and Godrej Agrovet Ltd, focuses on retail distribution of agricultural and consumer products for personal and household use in rural and semi-urban areas. It is positioned as a supermarket and has a presence in Maharashtra, Gujarat, Punjab and Haryana. Adhaar offers more than 1500 stock keeping units (SKUs) across broad product lines like processed food, personal care, general merchandise and appliances etc.

Adhaar has tie up with HDFC Bank for delivering financial services to rural people and also with Eicher Motors for providing commercial vehicles.

At present the Adhaar outlets cater to over 50,000 farmers every month. The company is planning to improve and increase its presence and work towards providing conducive environment for retail.

## DSCL Hariyali Kisaan Bazaar (HKB)

DCM Shriram Consolidated Limited (DSCL), a rural retail business initiative was established to create a long term relationship with the farmers and establishing one-stop-shop for catering to their needs. HKB is by far the largest rural retail chain in India and caters to the household as well as the agricultural needs of the people living in semi-urban and rural areas. The products and services offered by the company include FMCGs, households, food items, grocery, apparel, personal care durables, agri-inputs, financial services, fuel, agri-advisory services and output linkages. A range of agricultural products are also available on the shelves of HKB stores: seeds, pesticides, fertilizers, farm implements, veterinary and irrigation items etc. HKB can be considered as an important and instrumental link in retail value chain.

The retail initiatives discussed above undoubtedly call for good connectivity across urban, semi-urban and rural areas as otherwise such ventures cannot become successful and may not sustain for long. The Government of India understands this is the need of the hour and building infrastructures in rural India will ensure inclusive growth. The retail ventures such as discussed above have not only garnered government's support in terms of improving infrastructure but has also paved the way for private public partnership.

Ten years from now, the landscape of rural retail in India will change considerably and with it, the habitat that will strongly support it, that is, the rural infrastructure with marked improvement in roads, railroads and bridges, power supply, electricity, cold stores and warehouses, housing, water resources and telecommunication etc. The two are related.

*[The author is Associate Professor, JIMS, Jaipur. E-mail id: jitendra.rathore@gmail.com]*

**Bharat Nirman, a time bound business plan for action in rural infrastructure proposed action in the areas of irrigation, roads and bridges, rural housing, rural water supply, rural electrification and telecommunication facility.**

# GROWTH OF INDIAN TELECOM INFRASTRUCTURE

Dr. Arpita Sharma

Rural infrastructure may be defined as those wide ranges of public facilities or infrastructural arrangements designed exclusively for the betterment of rural life and initiated mostly by the Government and made available within rural areas. For example, provisioning of all-weather road connectivity to rural areas, electricity distribution facilities, and telecommunication networks will act as a catalytic intervention for the rural population by ensuring their access to a vast range of economically gainful activities, regulated and fair market, health, education and other public services; availability of warehouses and godowns in rural areas can ameliorate food security concerns; irrigation facilities can boost up agricultural productivity, reduce vulnerability to drought, and stabilize yields. Thus, a concerted effort towards building rural infrastructure, to a great extent, can bridge the rural-urban development gap by accelerating the growth of rural economy.

## Government initiatives for the growth of the Telecom Sector

The Government has taken following main initiatives for the growth of the Telecom Sector:

**[1] Liberalization of the telecom sector [1991]:** The process of liberalization in the country began in the right earnest with the announcement of the New Economic Policy in July 1991. Telecom equipment manufacturing was delicensed in 1991 and value added services were declared open to the private sector in 1992, following which radio paging, cellular mobile and other value added services were opened gradually to the private sector. This has resulted in large number of manufacturing units being set up in the country. As a result most of the equipment used in telecom area is being manufactured within the country.

**[2] National Telecom Policy [1994]:** In 1994, the Government announced the National Telecom Policy which defined certain important objectives,



including availability of telephone on demand, provision of world class services at reasonable prices, improving India's competitiveness in global market and promoting exports, attractive FDI and stimulating domestic investment, ensuring India's emergence as major manufacturing /export base of telecom equipment and universal availability of basic telecom services to all villages.

**[3] Telecom Regulatory Authority of India (TRAI) [1997]:** The entry of private service providers brought with it the inevitable need for independent regulation. The Telecom Regulatory Authority of India (TRAI) was, thus, established with effect from 20th February 1997 by an Act of Parliament, called the Telecom Regulatory Authority of India Act, 1997, to regulate telecom services, including fixation/revision of tariffs for telecom services which were earlier vested in the Central Government. TRAI's mission is to create and nurture conditions for growth of telecommunications in the country in manner and at a pace, which will enable India to play a leading role in emerging global information society.

**[4] New Telecom Policy [1999]:** The most important milestone and instrument of telecom reforms in India is the New Telecom Policy 1999. NTP-99 laid down a clear roadmap for future reforms, contemplating the opening up of all the segments of the telecom sector for private sector participation. It clearly recognized the need for strengthening the regulatory regime as well as restructuring the departmental telecom services to that of a public sector corporation so as to separate the licensing and policy functions of the Government from that of being an operator.

**[5] National Long Distance [2000]:** National Long Distance opened for private participation. The Government announced on August, 13 2000 the guidelines for entry of private sector in National Long Distance Services without any restriction on the number of operators. The DOT guidelines of license for the National Long Distance operations were also issued.

**[6] International Long Distance [2004]:** In the field of international telephony, India had agreed under the GATS to review its opening up in 2004. However, open competition in this sector was allowed with effect from April 2002 itself. There is now no limit on the number of service providers in this sector.

**[7] Universal Service Obligation Fund [USOF] [2002]:** Universal Service Obligation Fund was set up on April 1, 2002. Subsequently, the Indian Telegraph (Amendment) Act, 2003 giving statutory status to the Universal Service Obligation Fund (USOF) was passed by both Houses of Parliament in December 2003. USOF launched a Wire line Broadband scheme in 2009. Under this scheme, 360,000 connections had been provided till April 2012. USOF is also to fund the National Optic Fibre Network (NOFN) now christened Bharat Broadband Network Ltd (BBNL) which shall soon connect 2,50,000 village panchayats and co-located *Bharat Nirman Kendras*) with Optic Fibre thereby providing high speed broadband facilities.

**[8] Unified Access Services [2003]:** Unified access license regime was introduced in November 2003. Unified Access Services operators are free to provide, within their area of operation, services, which cover collection, carriage, transmission and delivery of voice and/or non-voice messages over Licensee's network by deploying circuit, and/or packet switched equipment. Further, the Licensee can also provide Voice Mail, Audiotex services, Video Conferencing, Videotex, E-Mail, Closed User Group (CUG) as Value Added Services over its network to the subscribers falling within its service area on non-discriminatory basis.

**[9] Internet Service Providers (ISPs) [1998]:** Internet service was opened for private participation in 1998 with a view to encourage growth of Internet and increase its penetration. The sector has seen tremendous technological advancement for a period of time and has necessitated taking steps to facilitate technological ingenuity and provision of various services.

**[10] Broadband Policy [2004]:** Recognizing the potential of ubiquitous Broadband service in growth of GDP and enhancement in quality of life through societal applications including tele-education, tele-medicine, e-governance, entertainment as well as employment generation by way of high-speed access to information and web based communication; government has announced Broadband Policy in October 2004. The main emphasis is on the creation of infrastructure through various technologies that can contribute to the growth of broadband services. These technologies include optical fibre, Asymmetric

Digital Subscriber Lines (ADSL), cable TV network; DTH etc.

**[11] Telecommunication Tariff Order (TTO) [1999]:** The Indian Telecom Sector has witnessed major changes in the tariff structure. The Telecommunication Tariff Order (TTO) 1999, issued by regulator (TRAI), had begun the process of tariff balancing with a view to bring them closer to the costs.

**[12] Foreign Direct Investment (FDI):** In Basic, Cellular Mobile, Paging and Value Added Service, and Global Mobile Personal Communications by Satellite, Composite FDI permitted is 74 per cent (49 per cent under automatic route) subject to grant of license from Department of Telecommunications subject to security and license conditions.

**[13] 3G & Broadband Wireless Services (BWA) [2008]:** The government has in a pioneering decision, decided to auction 3G & BWA spectrum. The broad policy guidelines for 3G & BWA have already been issued on August, 1 2008 and allotment of spectrum has been planned through simultaneously ascending e-auction process by a specialized agency.

**[14] Mobile Number Portability (MNP) [2009]:** Mobile Number Portability (MNP) allows subscribers to retain their existing telephone number when they switch from one access service provider to another irrespective of mobile technology or from one technology to another of the same or any other access service provider.

**[15] National Telecom Policy-2012:** Telecommunication has emerged as a key driver of economic and social development in an increasingly knowledge intensive global scenario, in which India needs to play a leadership role. National Telecom Policy-2012 is designed to ensure that India plays this role effectively and transforms the socio-economic scenario through accelerated equitable and inclusive economic growth by laying special emphasis on providing affordable and quality telecommunication services in rural and remote areas. Thrust of this policy is to underscore the imperative that sustained adoption of technology would offer viable options in overcoming developmental challenges in education, health, employment generation, financial inclusion and much else.

## Telecom infrastructure projects and conferences

**[1] Mobile Value Added Services:** A good example of mobile services is the recent USOF pilot project scheme for mobile value added services (m-VAS) for rural women's Self Help Groups (SHGs). This is a part of USOF's *Sanchar Shakti* programme. In this scheme, SHGs' information needs are identified based upon their main entrepreneurial income generation activities and relevant information is then delivered in local language through mobile phones. It could be through SMS (if the women are literate) or otherwise through unbound Dialers (OBDs) and Integrated Voice Response Systems (IVRS). The focus is on skill building and income enhancing information (training, market opportunities, input and output prices, weather, crop/livestock care etc), but information is also provided on health, education, women's empowerment and local government schemes. Even in its early days this scheme has demonstrated that rural women are extremely responsive to information.

**[2] World Conference on International Telecommunications [2012] (WCIT-12):** The International Telecommunication Union is a specialized agency of the United Nations that is responsible for issues that concern formation and Communication Technologies. The ITU is active in areas including broadband Internet, latest-generation wireless technologies, aeronautical and maritime navigation, radio astronomy, satellite-based meteorology, convergence in fixed-mobile phone, internet access, data, voice, TV broadcasting, and next-generation networks. In December 2012, the ITU facilitated the World Conference on International Telecommunications 2012 (WCIT-12) in Dubai. WCIT-12 was a treaty-level conference to address International Telecommunication Regulations. International rules for Telecommunication, including international tariffs. In August 2012, ITU called for a public consultation on a draft document ahead of the conference. It is claimed the proposal would allow government restriction or blocking of information disseminated via the internet and create a global regime of monitoring internet communications



including the demand that those who send and receive information identify themselves.

**Telecommunication growth [2009-2012]:**

The telecommunications sector has witnessed phenomenal growth during the last decade. Growth of mobile telephony has been the most visible indicator and catalyst to economic growth. Coverage in terms of number of subscribers has reached 951.34 million in March 2012. The most encouraging feature has been the growth in coverage and increase in the number of subscribers in rural areas powered by low tariffs. More than 555,000 villages out of more than 600,000 villages in the country have the benefit of mobile coverage and the remaining villages are likely to be covered very soon, either by the Telecom Service Providers (TSPs) on their own, or with support from the Universal Service Obligation Fund (USOF).

**[a] Broadband subscription:** Broadband subscription was only about 14 million in March 2012, much below what is needed.

**[b] Telephone connections:** Total telephone connections were increased from 205.86 million in March 2007 to 951.34 million in March 2012.

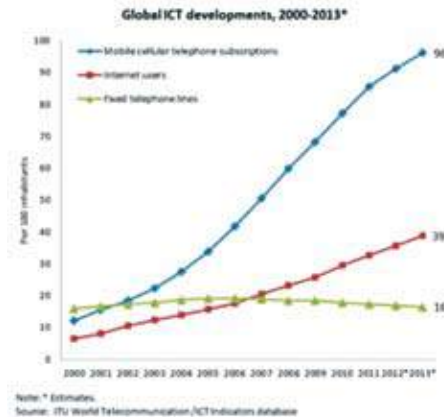
**[c] Rural teledensity:** The overall teledensity has also increased from 18.31 per cent to 78.66 per cent during 2012. However, the subscriber base for telecom services in India is skewed in favour of urban areas. Urban teledensity is around 4.4 times more than that of rural teledensity.

**[d] Wireless phones:** The sector has been dominated by a preference for wireless phones, as confirmed from the rising share of wireless phones, which increased from 80.19 per cent (165.09 million) in March 2007 to 96.62 per cent (919.17 million) in March 2012. On the other hand, there had been continuous decline in the number of wireline telephones in the country from 40.77 million in March 2007 to 32.17 million in March 2012.

**[e] Mobile Phones:** As on March,31 2012, rural teledensity was 39.26 per cent and this is almost entirely made of mobile phones. As on 2011 over half of rural households own phones. There are of course regional disparities.

**[f] International Telecommunication Union (ITU):** International Telecommunication Union has estimated that one per cent investment in

telecommunication results in 3 per cent increase in gross domestic product (GDP) which confirms the linkages between tele-density and GDP. The tele-



denisty in India- the number of telephone lines for every 100 people is abysmally low. Teledensity



in rural India is only 0.5 and one third of India's 600,000 villages area still without a village public telephone (VPT) which can save transport costs,



fuel and time. The VPTs have several benefits such as reducing migration from rural to urban areas and providing communication assistance in disaster, relief and rescue operations.

*[The author writes on social issues and is teaching at G.B.P.U.A&T., Pantnagar. Email-sharmaarpita35@gmail.com]*

# KISAN CHOUPAL WIDENING ACCESS

Aditya, Abhay Mankar and R.K Sohane

Since times immemorial, the villages of our country were unique in having rich tradition and cultural heritage besides being self-sufficient in fulfilling the basic needs of villagers and problem solving. Kisan Choupal is also a traditional heritage of the past in which groups of farmers assembled under the shade of tree in summer and near bone fire during the winter season to share their activities/ events/problems and to find out suitable solutions. The whole scenario of villages is changing very rapidly in the present times mainly due to the pressure of urbanization and adoption of western culture rapidly. A need to revive such valuable tradition of the past was felt by the university in the current era which led to the initiative Kisan Chaupal.

Bihar Agricultural University, Sabour, Bihar started Kisan Choupal on April 28, 2012 in collaboration with 20 Krishi Vigyan Kendras (KVKs) and colleges of the university. The Chaupal is since then organized every Saturday with the theme “Bihar Krishi Vishwa Vidyalay Kisano Ke Dwar-Kisan Choupal”. (Bihar Agricultural University at the

doorstep of farmers: Kisan Chaupal). Kisan Choupal completed a year on April 27, 2013 and has proved to be a boon for the farming community in several districts across the state. Kisan Choupal is being conducted in the identified villages on the basis of need assessment of the farmers by the scientists on agriculture and allied enterprises. It is helping the farmers to solve their problems along with the dissemination of scientific know-how of the university.

The prime feature of Kisan Choupal is to facilitate better interaction with the farmers in discussing their problems and to provide instant solutions together with imparting need based training on orchard management, vegetable farming, food processing, animal husbandry, fisheries etc. by a group of subject experts from the colleges/ KVKs. Over the past year, this forum has also focused on creating awareness among farmers regarding various central and state-sponsored schemes in agriculture and allied sectors. With the help of farmer friendly publication distribution, farmers are getting benefit of varsity’s know-how.



## Objectives of Kisan Choupal

- To revive the tradition of Kisan Choupal existing in the ancient times to help farmers solve their problems on their own at their places.
- To strengthen the linkages between scientists and farmers
- To solve the farmers' problems by experts in their own villages.
- To collect feedback and/or researchable issues from farmers' fields and communicate to the researchers at the university.
- To make convergence with different agencies working for extension work at grass root level.
- To motivate the people with the use of scientific and technical videos on cropping practices and allied activities.

## Unique Features of Kisan Choupal

The venue is selected by a team of scientists who visit the village a day before the date of the Chaupal to ensure active mobilization/participation of the villagers. The villagers are motivated to get their problems regarding farming solved at their doorsteps. The motivational activities are planned to ensure maximum participation. Also, the linkage with state agriculture department and line departments is ensured to connect to the villagers better.

The dialogue/discussion/problems solving is facilitated with the display of technical videos/movies at the beginning of the Chaupal. In addition to these, the distribution of farmer-friendly publication of the university during the Choupal is ascertained to increase awareness on cropping practices and new techniques for the literate farmers. The documentation of farmers' feedback is put to practice together with regular reports to the University which is utilized as an input for future research problem setting. It is proved of immense importance not only for the farmers but for the students as well who have gained immensely from this platform by getting real-life field exposure in the villages.

## Salient Achievements

Over the past year, it left indelible print in the history of extension and/or transfer of technology. Deputy Director General, Agriculture Extension, ICAR was so impressed with this innovative process adopted by the university through Kisan Chaupal forum that all the KVKs of the country were advised

to implement it in their respective areas. The Chaupal enables the farmer to directly interact with the expert scientists and get solution to their agricultural problems. In addition to it, more than one lakh farmer friendly publications of the university such as Krishak Sandesh, Kisan Samachar, booklets on mushroom cultivation, orchard management etc. were distributed during the past year through this forum.

Kisan Chaupal was organized by all the Krishi Vigyan Kendras linked to the university together with four affiliated colleges. A total of 1600 Kisan chaupals have been organized which have benefited 71409 farmers comprising 56316 male farmers and 15093 female farmers. The extension functionaries have played a vital role as well with the participation of 3277 functionaries working for the farming sector through Kisan Chaupal forum.

## New initiatives/innovations in Kisan Chaupal

The scientists have recognized several new innovations and have incorporated it in the "Kisan Chaupal" to make it more lively and interesting for the farmers so as to fulfil the needs and requirement of maximum farmers in its jurisdiction. Some of the new initiatives are discussed below:

### a) Krishak Sandhya

Krishak Sandhya is an innovative attempt made in this initiative to teach the basics of agriculture through entertainment. It was generally observed that farmers were mainly interested in their work in fields and other family work during day time. Hence, they were reluctant to undergo training and avail the service of scientists, who are available only during office hours. The concept of starting a programme named as "Krishak Sandhya" (An evening with farmers) was felt in which farmers could be enlightened via entertainment. Folk artists are explained techniques of modern and remunerative farming and are asked to prepare folk songs. The farmers are educated by the scientists in the middle of the programme. The main benefit of the programme was that it enabled better rapport building with the farmers as they became familiar with the scientists through "Krishak Sandhya" and started to consider them as their friends. Local women also participated actively. The farmers' enthusiasm is a positive sign which was recognized through this initiative.

**Table: Chaupal held and participation of farmers and extension functionaries**

KVK/ College	No. of Kisan Choupal	Farmers' Participation			Extension Functionaries Participation	Grand Total
		Male	Female	Total		
MBAC, Saharsa	53	1826	318	2144	36	2180
COH, Noorsarai	56	1592	384	1976	41	2017
BPSAC, Purnea	56	1670	305	1975	226	2201
COA, Dumraon	50	1286	480	1766	22	1788
Araria	70	2464	406	2870	66	2936
Arwal	71	2583	288	2871	86	2957
Aurangabad	74	2708	212	2920	228	3148
Banka	76	2964	1806	4770	66	4836
Bhagalpur	75	7289	3102	10391	210	10601
Gaya	60	1450	288	1738	46	1784
Jehanabad	72	2143	361	2504	105	2609
Katihar	69	1710	411	2121	80	2201
Khagaria	69	2034	381	2415	105	2520
Kishanganj	67	2109	504	2613	62	2675
Lakhisarai	63	1294	477	1771	61	1832
Madhepura	67	2456	374	2830	328	3158
Munger	75	2684	804	3488	216	3704
Nalanda	66	1982	306	2288	98	2386
Patna	77	1966	284	2250	182	2432
Purnea	70	2182	306	2488	86	2574
Rohtas	62	2050	806	2856	72	2928
Saharsa	64	2902	1608	4510	81	4591
Sheikhpura	67	2276	496	2772	380	3152
Supaul	71	2696	386	3082	394	3476
<b>Total</b>	<b>1600</b>	<b>56316</b>	<b>15093</b>	<b>71409</b>	<b>3277</b>	<b>74686</b>

## b) Mahila Chaupal

It was experienced in the Kisan Chaupal initiative that women farmers were normally hesitant to ask questions on agricultural practices in a gathering dominated by men. The scientists of the university planned to implement a separate forum exclusively for the women farmers in which the participation of women scientists will be ascertained. The "Mahila Chaupal" has proved to be a popular initiative which has created a lot of success stories in such a small span of time in the form of women agri-entrepreneur with expertise on mushroom cultivation, vegetable cultivation to name a few.

## Conclusion

Kisan Chaupal has left indelible footmarks in the way extension activity needs to be practiced to reach the farmers efficiently. The initiative has facilitated better reach and access to the modern

technologies in farming and improved cultivation practices among the farmers. Also, it has enabled the scientists to create better rapport with the farmers who have helped to make the Krishi Vigyan Kendras and agricultural colleges of the university a place to visit by the farmers to get their problems resolved immediately. The university has also provided better support to the farmers in the form of quality plating material, seeds and so on in order to maintain the interest of the farmers and be helpful at all times to make agriculture a better option for the farming community.

*[Aditya is Assistant Professor-cum-Junior Scientist, Department of Extension Education, Abhay Mankar is Assistant Professor-cum-Junior Scientist, Department of Horticulture (Fruit) and R.K. Sohane is Director, Extension Education, Bihar Agricultural University, Sabour. Email-id:inc.aditya@gmail.com]*



## Civil Services Aspirants

Test Series Notice No. 2014 - 15

February 2014

# The Prelims of the CIVIL SERVICES EXAMINATION, 2014 will be conducted 13\* times

This is true if you join CL's Test Series for Civil Services Prelims (CSP). This test series replicates the CSP day experience 12 times while others barely offer 2 to 3 such experiences. Thus, with CL's CSP test series, the actual Prelims will appear to be your 13th attempt at it. Here are a few more reasons why you should join CL:

	UPSC	CL	Others
1. National presence	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
2. More than 10,000 aspirants	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
3. GS Papers I & II on the same day	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
4. Paper in English and Hindi	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
5. OMR sheet	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
6. School as a test centre	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
7. All India rank	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
8. Paper discussion	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
9. Personal feedback	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
10. Answer key/Solutions	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

\*(12 tests by CL, 1 by UPSC)

CL students have a 6 times<sup>#</sup> higher success rate in Civil Services Prelims

**30.07%**  
CL's success rate

**4.7%**  
Average success rate

Test Series starts on March 23, 2014. Special offers for PT '13/ Main '12 qualifiers.

**742** CL students were eligible for Civils Main '13...



**CL** | Civil Services  
Test Prep

www.careerlauncher.com/civils

f /CLRocks

Classroom batches will start soon, contact your nearest CS centre for New batch details!!

**Old Rajendra Nagar:** 18/1, 1st Floor, opp. Agarwal Sweet Corner, Ph- 42375128/29  
**Mukherjee Nagar:** 204/216, 2nd Floor, Virat Bhawan/MTNL Building, opp. Post Office, Ph- 41415241/46  
**Ber Sarai:** 61B, opp. Old JNU Campus, behind Jawahar Book Depot, Ph- 26566616/17  
**South Campus:** 283, 1st Floor, opp. Venkateswara College, Satya Niketan, Ph- 24103121/39  
**Ahmedabad:** 26561061 | **Allahabad:** 9956130010 | **Bengaluru:** 41505590 | **Bhopal:** 4093447 | **Bhubaneswar:** 2542322  
**Chandigarh:** 4000666 | **Chennai:** 28154725 | **Hyderabad:** 66254100 | **Indore:** 4244300 | **Jaipur:** 4054623  
**Lucknow:** 4107009 | **Nagpur:** 6464666 | **Patna:** 2678155 | **Pune:** 32502168

\*as per the data available with us

# IMPROVING INFRASTRUCTURE CHANGING RURAL LANDSCAPE

Dr. Kartick Das

A nation's infrastructure development plays a significant role in its economic growth. A fast-growing economy warrants an even faster development of infrastructure. It is generally recognized that lack of infrastructure is one of the major constraints on India's ability to achieve 9 to 10 per cent growth in Gross Domestic Product (GDP), which is the rate required to make growth more inclusive and make a significant difference to living conditions of 800 million strong rural population of the country. For the balance growth of any economy, rural sector needs equal attention if not more than that of its urban counterpart.

## Rural Mural: At a Glance

- The growth in India's rural areas is spurred by improved infrastructure that enables reach, awareness of brands and a steady growth in household income that in turn grows consumption.
- Rural India accounts for 55 per cent of India's total income.
- The rural market is bigger than urban for FMCG, durables, two-wheelers companies and several services as well.
- Rural India contributes 40 per cent auto sales
- Women in rural India have got empowered through five million micro finance groups with 50 million women members.
- Traditional rural income sources from farming now changing to non-farm sector.
- Healthcare, education and construction are the fastest growing sectors in rural India.
- Studies conducted by Planning Commission and elsewhere have shown that because of Pradhan Mantri Gram Sadak Yojana (PMGSY), roads have resulted in significant benefits to rural households because of better connectivity to markets and also easier access to health and educational facilities.
- PMGSY is one of the most successful programmes under Bharat Nirman which



provides all weather road connectivity to rural habitations with a population of 500 persons and above in respect of hill states, the tribal and the desert areas with an all weather road

- Dramatic improvement has also been evident in sanitation through Accelerated Irrigation Benefit Programme. The coverage of rural households provided with individual latrines has improved sharply from 27.0 per cent in 2004 to 62.0 per cent in 2011.
- Under Rajiv Gandhi Grameen Vidyutikaran Yojana, Ministry of Power has sanctioned 568 projects for 540 districts to electrify 118,533 villages and to provide free electricity connections to 2.46 Crore BPL rural households. As on 31st August 2009, 64,331 villages have been electrified and 68.97 lakh free electricity connections have been released to BPL households.
- Under National Rural Drinking Water Programme, 55,067 habitations uncovered and about 3.31 lakh slipped-back habitations and 2.17 lakh quality-affected habitations have been covered with provisions of drinking water facilities by end of 2011.
- Telecom connectivity constitutes an important part of the effort to upgrade the rural infrastructure. Cellular mobile telephone revolution has connected urban as well as rural India. Tele density has increased from 0.7 per cent in 2001 to 23 per cent in 2011. Telephone subscribers in India increased from 0.5 million in 1991 to 862 million by June 2011.
- A total of 2.4 crore families have been covered under Rashtriya Swasthya Bima Yojana and over 8,600 health care providers are enrolled in the selected districts across 29 States and Union Territories.

#### Improving Infrastructure (Changing Landscape)

Infrastructure	2001	2010
Tele density	0.7	21
Road connectivity in villages	40	70
Electrified Households	44	60+
Permanent Houses	41	56

Figures in percentage, Source: Economic Survey FY11

#### Issues of Concern

India's current rural infrastructure deficit is alarming. Despite the aggressive growth in the last few years, India's basic infrastructure is ranked 86 in the Global Competitive Rank.

- The rural electrification programme, launched in 1951, has succeeded in bringing electricity to more than 5 lakh villages. However, 80,000 villages are yet to get electricity connections.
- RGGVY focuses only on household supply and does not address the need for providing electricity for agriculture.
- In spite of a significant expansion of telecom sector, however, India's rural tele-density remains appallingly low.
- India possesses 16 per cent of the world's population but just 4 per cent of its water resources. A large number of rural habitations remain without any identified source of safe drinking water.
- Along with water quality, poor sanitation is one of the factors contributing to malnutrition.
- A major weakness of the IAY has been the quality of housing. There have been complaints about weak foundations, poor roofing materials and incomplete constructions.
- There are significant regional imbalances in the connectivity of villages. Lack of maintenance of roads is a major problem in India.

India's GDP was \$1.4 trillion at the end of March 2011. Today India is the second fastest growing economy of the world, yet ranks low in comparison to world standards in infrastructure financing, spending only about 8 per cent of GDP as compared to China where they spend as high as 20 per cent of the GDP. During the 11<sup>th</sup> Five Year Plan, investment in infrastructure sector fell short of its target of \$500 billion. In order to maintain sustainable growth, investment in infrastructure would need to increase further. The government of India has identified infrastructure investment as route to sustained economic recovery and the key driver of economic growth. The government has announced a serous of measures for infra-

financing, including an \$11 million debt-fund, in line with its target to doubling investment to \$1 trillion over the 12<sup>th</sup> Five Year Plan (at 2006-07 prices). To generate \$1 trillion for infra-financing by 2012-17, roughly the size of its current GDP, this would imply an annual infrastructure investment of \$200 billion – a truly challenging one.

#### Projected Investment under 12<sup>th</sup> Plan (\$ Billion)

2012-13	2013-14	2014-15	2015-16	2016-17
155	178	202	229	260

Source: Approach Paper, 12<sup>th</sup> Five Year Plan, GOI

#### Priorities: The Task Ahead

In the above context, this investment has to be divided into centre, states and private sectors. Despite continued emphasis on public-private partnership (PPP) model as an alternative route of developing and financing infrastructure, participation of public-private investment has been dismally low. Private investment could be improved if investors find it profitable and reasonable since infra-projects are typically characterized by non-recourse or limited-recourse financing and low and risk-adjusted returns. Keeping user charges low is only feasible way to improve infra-financing and therefore government have to bear some of the capital cost in the form of a capital subsidy as in road project where government allowed up to 40 per cent of the capital cost as a subsidy. Infrastructure development has been localized to an extent and needs to spread all over to provide a holistic growth to India's economy.

For realizing Vision 2020 in infrastructure sector, reforms are needed at various levels. The Government of India should emphasize policies to revitalize flow of capital in infrastructure like initiating tax free bonds, encouraging public-private partnership, by liberalizing the country's FDI policy, by increasing FII investment limits in

corporate bonds, etc. With these, other obstacles such as delay in land acquisition, environmental clearances, slow approvals from government departments are to be addressed precisely.

- A PPP model seems to be the way out to meet challenges of increasing demands of rural infrastructure. The state, the industry and private entrepreneurs working together through PPP model will be ideal way out to upgrade and modify rural infrastructure as it would be unrealistic to completely rely on public or private investments.
- India would require developing a rupee-denominated long-term bond market for funding the infrastructure sector.
- There is a need to reduce over-reliance on the banking system for infrastructure funding. For this, a strong focus is required to develop a deep and robust corporate bond market. Companies should be allowed to float and trade corporate bonds for infra-related project purposes. The India Infrastructure Debt Fund with an initial corpus of Rs. 50,000 crore dedicated to infrastructure makes ample sense, given the sheer shortage of long-term project finance.
- The relevance of the India Infrastructure Financial Company Limited (IIFCL) set up to provide long-term financial assistance, needs to be reviewed. IIFCL is an enticing but flawed financial engineering mechanism.
- To accelerate growth, India needs to create a pipeline of PPP project and create long term sources of financing with pension funds flowing into infrastructure instead of only bank funds

*[The author is Assistant Professor, Department of Political Science, Mathabhanga College, Coochbehar District, West Bengal. E-mail id: profkartick@gmail.com]*

The growth in India's rural areas is spurred by improved infrastructure that enables reach, awareness of brands and a steady growth in household income that in turn grows consumption.



# RURAL INFRASTRUCTURE DEVELOPMENT FUND-GENESIS, PERFORMANCE AND IMPACT

Dr Amrit Patel

**R**ural infrastructure has direct and strong relationship with farmers' access to institutional services, finance and markets, thereby improving efficiency of agriculture and productivity of crops, livestock and fish farming, reducing farming costs and enhancing farmers' income. Availability of adequate infrastructure accelerates agricultural growth rate and plays a strategic role in producing larger multiplier effects in the economy. It is estimated that 1% increase in the stock of infrastructure is associated with a 1% increase in GDP across the country. Rural infrastructure can be broadly categorized as under.

- Input based infrastructure: Seed, Fertilizer, Pesticides, Farm equipment and machinery etc.
- Resource based infrastructure: Irrigation, Farm power etc.
- Physical infrastructure: Road connectivity, Transport, Storage, Processing etc.
- Institutional infrastructure: Agricultural research, extension & education, Information &

Communication, financial services, marketing, etc.

Infrastructure, such as irrigation, electrification, roads and markets supported by formal credit, agricultural research & extension and rural literacy determines the nature and the magnitude of agricultural output. Level of physical and institutional infrastructure significantly influences the spread of proven yield enhancing agricultural technology.

## Genesis of Rural Infrastructure Development Fund (RIDF)

Rural infrastructure has the potential to transform traditional agriculture/subsistence farming into a most modern, commercial and dynamic farming system in India. The Ninth Plan [1997-2002] acknowledged the importance of infrastructure in critical sectors to step up agricultural growth rate at 4.5%. Rural infrastructure projects have distinct features, viz. huge capital investments, high risk



and sunk cost, commitment of a large proportion of the cost before the project becoming operative, long gestation periods, slow and low returns on investment, sensitive to local political environment. Lack of adequate financial resources, *inter alia*, with the State Governments is primarily responsible for creation, development and maintenance of infrastructure. Union Ministry of Finance in 1995 observed that many of the infrastructure projects were found languishing for want of adequate financial resources on one hand and on the other many commercial banks, which have a mandate to provide 18% of the net bank credit to agriculture are not able to meet their commitments. The Government of India, therefore, thought of a unique innovation to create a *Fund*, by way of deposits out of the shortfall in commercial bank's lending to agriculture, as "*Rural Infrastructure Development Fund*" to be operated and managed by NABARD. Thus, commercial banks since 1995-96 have been the important additional source of finance for State Governments, on liberal terms including lower interest rate, to create rural infrastructure. NABARD has crystalized implementation process for RIDF projects which, *inter alia*, involves project identification, area survey, project design, preparation of detailed project reports, mid-term appraisal both technical and economic, monitoring and evaluation, quality testing. NABARD has, therefore, been emphasizing training and capacity building aspects for implementing staff.

The RIDF was set up in NABARD with an initial corpus of Rs.2000 crore as announced in the Union Budget for 1995-96 [RIDF-I]. RIDF scheme with its localized approach, wider national coverage, operational flexibility, social focus, community's involvement in planning, designing, managing and execution of works, among others, marks a watershed in the participatory planning process in the country. The Fund was primarily created to extend loans at lower interest rates to State Governments to help them complete infrastructure projects of irrigation, flood protection, rural roads and bridges, which were started in the past but could not be completed for want of funds.

### Performance

As on March-end 2012 the RIDF completed 17 years of its operation. Starting with allocation of Rs.2000 crore in 1995-96, RIDF has now accumulated

corpus of Rs.1,52,500crore. This included a separate window introduced in 2006-07 for funding rural roads component of Bharat Nirman Program, with allocation of Rs.18,500 crore till 2009-10 with contributions from domestic banks which had not achieved their target in lending to the priority sector and/or agriculture as on the last reporting Friday of March 2007.

### Sector-wise

Agriculture and allied sector covered 2,70,831 projects of irrigation and agriculture related accounting for 58.59 % in the total, followed by 1,01,932 projects of rural bridges & roads [22.1%], whereas 89,464 projects for social sector and power sectors shared 19.4%. In terms of sanctioned amount, bridges & roads had a significant share of 43.18% in the total as against 40.55% share for irrigation and agriculture related.

### Activity-wise

During 17 years, out of 47 activities under five major sectors, significant number of projects have been supported in respect of activities, viz. minor irrigation, micro-irrigation, soil conservation, watershed development, rainwater harvesting, seed/agriculture/horticulture farms, rural markets & warehousing, animal husbandry, riverine fisheries, flood protection & drainage, forest development, comprehensive infrastructure, fishing harbors, village knowledge centers, rural roads & bridges, drinking water, primary/secondary schools/rural service centers, anganwadis, public health, pay & use toilets.

### Region-wise & State-wise

Aggregate disbursement of Rs.94,665 crore under the RIDF [1 to XVII] as on end-March accounted for 85.5% of the phased amount of Rs.1,10,750 crore. Across regions, the Western region had the highest disbursement [92.3%] followed by Northern [86.9%] and Southern region [85.9%] whereas North-Eastern [80.2%], Eastern [80.5%] and Central [83.9%] regions had lower percentage of disbursement than that of national average. Among 29 States, 10 States [Kerala, Tamil Nadu, Goa, Maharashtra, Haryana, Uttarakhand, Chhatisgarh, Mizoram, Manipur and Meghalaya] had more than 90% disbursement ranging from 91% to 132%, whereas six States [Puducherry, Bihar, Madhya

**Table 1**  
**Sector-wise Cumulative Number of Projects, Amount Sanctioned, Phased & Disbursed**  
**[I to XVII] Rs. Crore**

Sector	Cumulative as on 31-03-2012		% increase over 31-03-2010	
	No. of Projects	Sanctioned	No. of projects	Sanctioned
Irrigation	237137 [51.30]	42586.38 [29.89]	09.93	27.77
Rural Bridges	15560 [03.37]	16756.14 [11.76]	15.72	45.23
Rural Roads	86372 [18.68]	44766.42 [31.42]	18.35	33.01
Social Sector	88698 [19.19]	20923.25 [14.69]	21.27	53.71
Power	766 [00.16]	2273.68 [01.60]	02.13	14.43
Agri-related sector	33694 [07.29]	15164.80 [10.66]	22.02	43.82
Total	462229 [100.00]	142470.65 [100.00]	14.78	37.48

Figures in parentheses indicate % share in the total

**Table 2**  
**Activity-wise number of projects, sanctioned amount and percentage achievements**  
**[Cumulative as on end-March 2012] Rs. Crore**

Activity	Projects	Amount	Activity	Projects	Amount
<b>Irrigation</b>	<b>2,37,137</b>	<b>42,586.38[29.89]</b>			
Micro-irrigation	2039	2032.31[1.43]	Rural library	41	2.55[0.00]
Minor	2,34,463	21,517.80[15.10]	Vill. Know. cent	3,621	428.04
Medium	322	5,808.54[4.08]	Citizen inf. cent	98	126.05[0.09]
Major	313	13,227.73[9.28]	Forest dev.	2,633	604.44[0.42]
<b>Agriculture</b>	<b>33,694</b>	<b>15,164.80[10.66]</b>	Inland waterway	01	10.00[0.01]
Soil conservation	5,633	1,520.89[1.07]	Compr. infrast	249	83.87[0.06]
Watershed devt.	2,420	1,924.91[1.35]	Rural ind.estat	08	116.40[0.08]
Rural markets	1,623	720.00[0.51]	<b>Roads &amp; Bridges</b>	<b>1,01,932</b>	<b>61,522.56[43.18]</b>
Rainwaterharvtng	4,034	468.70[0.33]	Roads	86,372	44,766.42[31.42]
CADA	29	438.94[0.31]	Bridges	15,560	16,756.14[11.76]
Seed, Hort farm	1,544	197.68[0.14]	<b>Social sector</b>	<b>88,698</b>	<b>20,923.25[14.69]</b>
Cold storage	07	17.19[0.01]	Drinking water	10,887	12,625.19[8.86]
Rubber plant.	22	27.07[0.02]	Pri/Mid schools	19,986	1,393.10[0.98]
Warehousing	1,118	1,493.82[1.05]	Sec/colleges	17,474	3,578.83[2.51]
Animal husb.	7,071	1,033.51[0.73]	Public health	12,904	1,680.01[1.18]
Meat processg	12	49.72[0.03]	Anganwadis	24,189	1,321.68
Riverinefishery	297	73.13[0.05]	Toilets [P&U]	3,528	324.44[0.23]
Fishg harbors	165	412.25[0.29]	<b>Power sector</b>	<b>766</b>	<b>2,273.68[1.60]</b>
Flood Production	2,382	3,968.78[2.79]	System imprvt	687	1,195.44[0.84]
Drainage	683	1,405.59[0.99]	Mini Hydel	79	1,078.24[0.76]
Food park	05	41.37[0.03]	<b>Total</b>	<b>4,62,229*</b>	<b>1,42,470.65[100]*</b>

Figures in parentheses indicate % share in the total sanctioned amount

\* indicates number of projects and sanctioned amount excluding Bharat Nirman

Pradesh, Nagaland, Tripura and Sikkim] had very low percentage of disbursement ranging between 57% and 77%.

Southern region had the highest share [26.7%] of disbursement in the total followed by the modest share of four regions, viz. Central [19.5%], Northern [18.6%], Eastern [15.7%] and Western [15.5%] whereas North-East region had meager share of 4.0%.

### **Impact**

Implementation of RIDF became a significant instrument to unlock sunk investments already made by the State Governments, create additional irrigation potential, improve connectivity between villages and marketing centers, generate additional employment for rural households, contribute to the economic wealth of the rural economy, enhance quality of life through provision of facilities in education, health, drinking water supply, among others. RIDF supported projects facilitated creation of critical infrastructure, expansion of the production base, increased credit disbursement and generated additional employment opportunities [recurring and non-recurring]. Thus, RIDF directly contributes to creation of physical infrastructure and capital formation in rural areas.

### **Concern & Commitment:**

With NABARD's putting in place effective system for better coordination, monitoring, training and capacity building of the implementing staff, the performance has been progressively improving. RIDF being a substantial and low-cost source of funds for the State Governments for investments in rural infrastructure, the demand always surpasses its supply.

Since April 1989, NABARD has been formulating annual potential linked credit plan for each district in India sharply focusing, among others, gaps in infrastructure that needed to be addressed with serious concern & commitment by Governments and Panchayati Raj Institutions of the respective States at block & district level.

It is high time now that the Agriculture & Rural Development Ministry of State Governments in coordination with all stakeholders [rural

households, Government departments, PRIs, NABARD & Banks] should address all critical issues of rural infrastructure & formulate a road map to complete the development by end of Thirteenth Five Year Plan. For this purpose, a perspective comprehensive Block & District level Rural Infrastructure Development Plans for five years should be formulated and integrated into State's & country's Twelfth and Thirteenth Five Year plans, with strategic action plans to implement within a time-frame and mechanism to monitor, review & evaluate the implementation process to yield expected results.

Government and RBI can consider the recommendation of the Nair Committee to calculate the amount of shortfall in achieving priority sector credit to be eligible for RIDF and interest rate on depositing the shortfall amount with NABARD.

The budgetary resources of the State Governments along with the RIDF cannot bridge the huge gap in rural infrastructure in view of their limited resources and organizational structure. It necessitates evolving an integrated approach in planning for rural infrastructure across the country, based on shared concern and collaborative leadership structure, whose scope would comprise setting-up both program and project-based institutional arrangements, for taking up projects in commercially feasible/viable PPP format and achieving the same through conceptualization and implementation of workable frameworks and processes.

### **Conclusion**

It is time that rural households identify their needs for infrastructure and place demand as a matter of right on elected representatives; Governments must allocate adequate resources in their annual budgets and implementing agencies must have concern, commitment and accountability to put in place infrastructure in each village in a time bound program. Performance of each and every program/scheme should necessarily be available to the public half yearly through local print and electronic media, as a part of right to information.

*[The author is former Deputy General Manager, Bank of Baroda and has worked as Agriculture & Rural Credit Consultant. E-mail id: dramritpatel@yahoo.com]*

# AGRICULTURAL INFRASTRUCTURE IN BIHAR AN ASSESSMENT

Dr. Chanchal Charan

**A**gricultural infrastructure is the most essential input for the development of agriculture in Bihar as one third population of the state depends on agriculture sector directly or indirectly. Agricultural infrastructure includes agricultural inputs, irrigation agricultural credit position and agricultural marketing, etc.

## Review of Literature

The importance of good infrastructure for agricultural development in developing economies is an important issue of discussion today. Food Agricultural Organization of the United Nations (FAO) 1996, stated that “Better communications are a key requirement because they reduce transportation cost, increase competition, reduce marketing margins and in this way can directly improve farm income and private investment opportunities.

According to the World Bank, a one per cent increase in the stock of infrastructure is associated with a one per cent increase in GDP across all

countries. A sectoral study by Deichman et.al for Mexico shows that a lot of increase in market access leads to an increase in labor productivity by 6%. Studies on this issue prove that development of rural infrastructure increases productive efficiency, employment opportunities and thus provide more earning opportunities to the rural poor. But in India the State Government because of the precarious nature of its finances has not been able to maintain even the existing infrastructure. Similarly, World Bank studies (1993) observed that the growth of farm productivity and non-farm rural employment is closely linked to infrastructure position. Morton in 1995 stated that the development of infrastructure leads to the commercialization of agriculture and rural sector.

Thorat and Sirohi in 2002 found that fertilizer, sale points, market, credit and extension facilities are related with the development of transport infrastructure. Dhawan, Sah and Vaidyanathan in their study found that irrigation infrastructure increases the land use and cropping intensity. By





**Table II : Irrigated Area in Bihar**

%age of Irrigated Area by Different Methods	2008 – 09	2009 – 10	2010 – 11 (Up to October 2010)
Canal Surface (Major)	33.86	27.07	27.3
Canal Surface (Minor)	0.59	0.40	0.53
Tank Including (Arhar and Pyne)	6.76	7.49	10.01
Tube well (Private and State)	55.33	61.39	57.54
Other Irrigation Well	2.96	3.28	4.39
Other Sources (L.I and Barge L.I)	0.50	0.38	0.22

Source: Department of Water Resources and Minor Irrigation, GOB

These 8 districts are rice producing districts although irrigation availability is not adequate in Bihar.

Due to recurring shortage of power in the state, tube wells are often run on diesel which is expensive. It increases the cost of irrigation here. The other major problem is the non-completion of major projects. It also increases the cost of irrigation.

During XI Five Year Plan, state government has initiated so many schemes as Micro Irrigation Schemes, Bihar Ground Water Irrigation Scheme (BIGWIS), and water generating ponds for regeneration of ground water utilization, and 'Bihar Shatabdi Neeji alkup Yojna' in Samastipur and Nalanda districts. In 2005 the central government has also sanctioned a national project for repair, renovation and restoration of water bodies directly related to agriculture for covering a large area under irrigation. Its cost of 300 crores will be shared by centre and states in 3:1 ratio.

### iii. Seeds:

Seeds of high quality are a very important infrastructure for increasing productivity in agriculture. Since there is dearth of firms for the supply of certified seeds, the Seed Replacement Ratio (SRR) is often low in Bihar (Economic Survey Report of Bihar, 2012-13) and low Seed Replacement Rates

(SRR) is one of the major causes of low agricultural productivity in Bihar.

**Requirement of Certified Seeds and Seed Replacement Rate (SRR)** for important crops in Bihar for the period 2009-10 to 2011-12 is shown in Table III.

It is clear from the given table that SRR has increased from 26.4% to 38% in 2011-12 for paddy, and for maize also, there is a huge increase from 58% to 82% in 2011-12. Though in Arhar there is a marginal increase, so there is a vast scope for improvement in the supply of certified seeds in Bihar.

State Government has taken some initiatives for providing high quality seeds. Chief Minister's Crash Seed Program, Beej Gram Yojna, Revival of Bihar Rajya Beej Nigam (BRBN) are some of the steps taken by government in this regard. In recent years the scheme called "Mukhyamantri Tibra Beej Vistar Karyakram" has helped the farmers for hybrid paddy cultivation.

### iv. Fertilizer Position in Bihar:

The consumption of fertilizer in Bihar has been steadily increasing in recent years. This has been shown with the help of the given table:

**Table III: Requirement and Supply (in '000 qntl) and SRR (in %age)**

Crops	2009 – 10			2011 – 12		
	Requirement	Supply	SRR	Requirement	Supply	SRR
Paddy	436.6	373.0	26.4	493.6	349.1	38.0
Maize	45.0	44.0	58.0	49.1	41.7	82.0
Arhar	2.1	1.1	9.0	3.0	0.9	11.2
Wheat	600.0	580.7	25.3	840.0	783.2	34.8
Gram	13.8	8.0	10.0	20.8	11.4	15.8
Mustard	2.7	3.5	54.0	3.7	2.9	47.4

Source: Department of Agriculture, GOB

**Table IV**  
**Consumption of Fertilizers in Bihar (kg/ha)**

Period	Kharif	Rabi	Total
2009 – 10	180.80	181.30	181.10
2010 – 11	177.79	187.45	183.38
2011 – 12	138.45	175.47	157.89

The table shows that from the point of view of total consumption of fertilizer the trend is decreasing over the years. Although for Rabi crops the use of chemical fertilizer is comparatively higher than Kharif crops, while Kharif crops are the more important crops in Bihar. In recent years, government has been trying to increase the use of bio-fertilizers at a greater scale. This would have a long term effect on maintenance of soil fertility for crop production.

#### *v. Farm Mechanization in Bihar:*

Mechanization of agriculture and use of farm implements is the most important infrastructure in agriculture. It is not only helpful in efficient labor use but also increasing capital intensity in field operations. The Government is providing subsidy for increasing their use in fields.

This table shows that there is an increasing trend in the distribution of zero tillage while the distribution of pump sets and plant protection equipments on subsidy have decreased. There is a similar trend in threshers. Although it is true that these equipments were very uncommon in rural areas about ten years ago but due to government subsidy they have become the part of agricultural households. Therefore in Bihar, growth in the agriculture sector has shown wide variation. It is from 19.85% in the year 1997-98 to as high as 34.40% in the year 2000-01. The trend growth rate for the period 2004-05 to 2008-09 for the agriculture was 6.8% against the GSDP growth rate of 12.8% (Dasgupta 2010). Still agriculture is the main source of income for rural poor.

In this situation, improvement in the agricultural infrastructure will be an important step for increasing productivity in Bihar. It is all the more pertinent that the government expenditure is made on the creation of infrastructure in agriculture sector in Bihar.

#### **Suggestions & Conclusion**

It is necessary that rural households should identify their needs and then place their demands as a matter of right before the elected representatives.

**Table V**  
**No. of Farm Implements Distributed on Subsidy**

Farm Implements	No. of Implements Distributed		
	2009-10	2010-11	2011-12
Tractors	3672	2744	3848
Combine Harvesters	42	65	109
Zero Tillage	860	301	3787
Pump Sets	37293	30340	28615
Power Tiller	4635	5330	7567
Plant Protection Equipments	48893	55860	49438
Threshers	5723	4316	4857

Source: Department of Agriculture, GOB

Government has sponsored so many schemes for improving infrastructure in Bihar. But rural people will have to be conscious of these facilities. Government will also have to allocate funds and resources in their annual budget but it is our duty to make sure that the fund should go in the hands of right people.

Public private partnership and proper governance will be a more effective tool in this direction. Proper governance needs proper role of Panchayat for improving agricultural infrastructure base in Bihar. Thus, following measures can be adopted for providing better agricultural infrastructure facilities in Bihar:

- Encouraging Public – Private Partnership for the implementation of the schemes. Role of SHGs will be effective in this direction.
- Growing awareness amongst rural people for their rights.
- Raising voices before elected representatives.
- Proper utilization of community resources at different stages of program implementation.
- Increasing role of Gram Panchayat and their effective work regarding distribution of agricultural implements under different schemes.
- Area specific targets should be fixed for controlling the wastage of resources.

The infrastructure sector has both backward and forward linkage with the agriculture and industrial sector. Thus, the development of this sector is a must for overall development of Bihar.

***[The author is Associate Professor, Department of Economics, M.D.D.M College, Muzaffarpur, Bihar. E-mail id: chanchal.charan@yahoo.in]***



# BHARAT NIRMAN—THE JOURNEY SO FAR

Subhashree Sanyal

Infrastructure is regarded as a major indicator of the growth of any nation as it provides the economic and socio-logical strength to the country. Physical infrastructure boosts economy, attracts prospective entrepreneurs and helps alleviate poverty and reduce unemployment through a number of backward-forward linkages in the primary, secondary and tertiary sector and similarly social infrastructure helps provide drinking water, food, sanitation facilities for inhabitants in the county. With this approach in mind the Bharat Nirman programme was launched by the Government during the year 2005-2009 as a time bound programme to boost rural infrastructure in order to alleviate poverty and provide employment to people. Now what we really need to question is whether the programme has been really effective or just an eye wash for the people especially in the rural areas

If we look at different components of the *Bharat Nirman Programme*, we can see where the programme stands compared to its promised goals.

**Rural Roads:** The programme aimed to provide road linkage to every area with population over 1000 people. Till 2010, 34,000 villages were connected

and 96,000 kms of road was connected. The success rate of construction and upgradation was 68.5% and 90.7% respectively till 2011. However it is noted that against the rural road construction target of 50,674.55 kms during 2005-07, only 39,476.55 kms had been achieved which worked out to a shortfall of nearly 22 %.

**Irrigation:** Bharat Nirman ambitiously targeted creation of an additional 10 million hectares irrigation potential by 2009-10. By the end of March 2010, the country could achieve creation of additional irrigation capacity of 73 lakh hectares, thereby leaving a gap of 27 million hectare irrigation potential. It was during the second phase (i.e. 2010-11 and 2011-12), in which the creation of irrigation potential, surpassed the original target fixed for this component by 1.16 million hectares. While the achievement of targets on creation of additional irrigation potential is praiseworthy, it is desired that the irrigation potential so created over the years should be fully utilized and gap between the potential created and the actual utilization narrowed. Bharat Nirman also proposed to create an additional irrigation potential of 4.30 million hectare (mha) in the first two years. Against this, the document pointed out that only 2.587 mha had been achieved till March 2007.



**Rural Water Supply:** Against 55,067 uncovered habitations to be covered during the Phase-I of Bharat Nirman period (2005-09), 54,477 habitations were covered by March, 2009. The remaining habitations, of which many were in difficult areas lacking sustainable sources of drinking water, were covered by March 2012. However the major challenge before the Bharat Nirman project is sustainability of quality water supply to areas covered under the Bharat Nirman programme.

**Rural Housing:** While the physical progress in the provision of rural housing is much more than the Bharat Nirman target, the involvement of beneficiaries in the construction of the house under the scheme was not found to be satisfactory. For effective implementation of the scheme, the beneficiaries need to actively participate throughout the construction process i.e. making own arrangements for procurement of construction material, engaging skilled workmen and also contributing family labour. The programme meant to build 60 lakh houses in two years has also remained way off the target set as only 28.69 lakh houses have been constructed.

**Rural Telephony:** As in 2005, as many as 66,822 villages were without telephone connection. The Bharat Nirman programme was expected to provide every Indian village with telephone access by end 2007. The successful implementation of this programme has registered increased teledensity in rural areas. The rural teledensity in 2009-10 was 15.11 and rose by 17.88 percentage points to 32.99 as on 28.02.2011. As per the Eleventh Plan Document the only sector where the progress has been good is rural telephony. According to the document, 48,704 villages have been connected during the first two years itself as against the target of providing 66,882 villages with village public telephones (VPTs).

**Electrification:** As per the Eleventh Five year plan, the rural electrification programme during the first two years, the progress under both the objectives [electrification of villages and households] has registered an achievement of 34 per cent and 6 per cent respectively. There are however major shortfalls in this sector. Under the programme, the government had set a target to provide electricity to 1.25 lakh villages and 2.3 crore households living the below poverty line (BPL) during the four-year period.

### Way Forward

Though Bharat Nirman as a project has progressed in achieving building social sector infrastructure; yet a lot of gap needs to be filled to help this flagship programme on infrastructure to

reach its true ethos. The Bharat Nirman's successful implementation of its time bound plans and adequate follow up can alone enable rural citizens of the country to utilize rural infrastructure for ensuring their basic amenities and raising their economic and social status. However bringing in certain innovations in implementation of the project would be very effective

- 1. E-Governance Model:** Using E-Governance Model for implementation of the programmes would be essential. Fast track method for payment for NREGA, water projects would help successful and quick service delivery specially in rural areas
- 2. Transparency in money allocation and utilization:** transparency in the amount of money used, where it is used is very important. This means that the middle men approach (through panchayats or blocks) should be avoided especially for payment of new method of direct cash transfer (DCT) can be used so that mis-utilisation in fund delivery may also be avoided.
- 3. Role of volunteers:** Effective communication is important for the success of any programme. For the same purpose a group of Bharat Nirman Volunteers (BNVs) have been created by the Ministry of Rural Development. This is done under the Lab to Land Initiative in 2010- 2011. 40 lakh BNVs have been created and trained. Main role of BNVs is to communicate with the rural people, to explain the flagship programmes and persuade them to participate, to bridge the gap between scheme and its implementation, to act as a link between government agencies and people and to act as a monitoring group.

A proper check on the quality of work – be it the roads built and the water supply projects or rural sanitation needs to be taken into consideration. Use of ICT (Information Communication Technology) in rural areas to make people more aware and participate in the programme would help generate employment and reach the desired targets. Various stakeholders-government, people, delivery mechanisms, and panchayats need to be more conscious about their role so that there is no overlapping of service delivery. A comprehensive mechanism ensuring proper implementation of the schemes and timely execution of the programmes would help the programme reach its true time bound mission.

*[The author is Assistant Professor, Department of Social Work, Palli Samgathan Vibhaga, Visva-Bharati, Shantiniketan, West Bengal. E-mail: subhashreesanyal@gmail.com]*

# RURAL INFRASTRUCTURE DEVELOPMENT-A TOOL FOR RURAL POVERTY ALLEVIATION

K. Baby

*Rural development may be defined as structural changes in the socio-economic situation to achieve improved living standard of low-income population residing in rural areas and making the process of their development self sustained. It includes economic development with close integration among various sections and sectors; and economic growth specifically directed to the rural poor. In fact, it requires area based development as well as beneficiary oriented programmes. That's why rural development is one of the main and important tasks of development planning in India.*

**R**ural infrastructure is not only a key component of rural development but also an important ingredient in ensuring any sustainable poverty reduction programme. The proper development of infrastructure in rural areas improves rural economy and quality of life. It promotes better productivity, increased agricultural incomes, adequate employment; etc. Development of rural areas is slow due to improper and inadequate provision of infrastructure with compare to urban areas. That's why rural share in GDP is always less.

## Infrastructure and Economic Development

Infrastructure is important for the services it provides. It is an important input to the production process and raises the productivity of other sectors. Infrastructure connects goods to the markets, workers to industry, people to services and the poor in rural areas to urban growth centers. Infrastructure lowers costs, enlarges markets and facilitates trade. Thus, infrastructure provides services that support economic growth



Fastening the Growth

by increasing the productivity of labor and capital thereby reducing the costs of production and raising profitability, production, income and employment.

Role of infrastructure in fostering economic growth has been supported by the empirical literature. A number of studies have highlighted the importance of physical infrastructure as a determinant of economic growth. A country's development is strongly linked to its infrastructure strength and its ability to expand trade, cope with population growth, reduce poverty and produce inclusive growth. Although role of infrastructure in economic growth was recognized in the 1970s and 1980s, its linkage with poverty alleviation was examined in 1990s only. The World Bank in its "World Development Report 1994" pointed out that productivity growth is higher in countries with an adequate and efficient supply of infrastructure services. Provision of infrastructure services to meet the demands of business, households and other users is one of the major challenges of economic development. Infrastructure services contribute to poverty reduction and improvements in living standards in several ways. Poverty reduction requires economic growth which, when accompanied by sound macroeconomic management and good governance, results in sustainable and socially inclusive development (ADB 1999). Greater access of the poor to education and health services, water and sanitation, employment, credit and markets for produce is needed. Lack of access to product and factor markets, prevents the rural poor to be a part of growth process. Making markets work

for poor is the key element in reducing poverty. Infrastructure development enables the markets to expand and fall within the reach of the poor, thus making them part of the growth process.

The removal or reduction of poverty and the provision of basic civic amenities to the population, especially those living in rural areas, have been the most important goals in the Plan documents. This was stated as a primary objective by even the National Planning Committee, People's Plan, and Bombay Plan prepared during the period prior to independence. The approach and agency for accelerating rural development have varied across Plans.

### **Need for structural Changes**

Rural areas would have a high concentration of poverty given the existence of disguised unemployment in a big way in agriculture. Access to land and ownership of land is the key to income differences since land is the major productive asset in rural areas. Rural areas may be more usefully viewed as concentration of poor resulting in little value for economic demand for infrastructural services. The fact remains that state interventions, despite their large scale of operations, never aimed at any basic structural changes in the agrarian society. What could have been the simplest and most effective way i.e. through land reform to eliminate poverty was never pursued despite the rhetoric. Governance and infrastructure are secondary to endowments. But without endowments, good governance is a contradiction in terms. The numerous programmes or schemes that included massive interventions such as the Integrated Rural Development Programme (IRDP), Mini-mum Needs Programme (MNP), and Public Distribution System (PDS) etc.



**Bridging the Gap**

### **Rural Infrastructure Projects**

The Foundation upholds the principle of decisive participation of the communities. To ensure that the infrastructure development programs are firmly footed and responsive to the actual needs of the people, the micro planning processes were undertaken along with the active participation of the community. There is adequate representation of people in the form of institutions like Village Development Committees. Participation of the VDCs was sought in delineating the scope of the projects planned, consensus and approval of the community for plans drawn, and for ensuring timely implementation and assessment of the projects.

### **Water Conservation Project**

With an objective of preserving rainwater, reducing the impact of salinity, recharging the ground water and facilitating agricultural activities, several water conservation structures have been constructed with the active involvement of the local community. Pond Deepening is assisted by the foundation to increase the capacity of the village ponds. Construction of check dams were done to reduce erosion and gulling, lower the speed of water flow, help in storing the surface water for use, both during and after the monsoon. They also help in ground water recharge and in rising the water table in the area and thus it will help the agricultural development.

### **Rural Drainage Project**

To create clean and hygienic environment, proper drainage facility is essential. Under cluster development programme, series of developmental works have been undertaken like building community halls, bus stops, garden and market, crematorium, solid waste management plants, construction of drainages, ponds, well etc. under the scheme of MGNREGS. The Foundation's cluster based approach invites full participation of the respective stakeholders and help them to access an income yielding employment and thereby their economic development.

### **Energy conservation project**

Harnessing the solar power and setting up

solar street lights has been seen as an initiative to promote the use of renewable energy technology to meet the energy requirements of the community and thereby protecting the environment and fastening the economic development.

### School Infrastructure Development projects

Different activities are undertaken to develop and strengthen the school infrastructure in the form of additional rooms, adequate sanitation facility for boys and girls, multipurpose activity halls, construction of boundary walls, computer rooms, repairing activity, construction of water tanks, setting up of water purification plants in schools, development of basic amenities in the school premises and so on.

### Areas of Rural Infrastructure

- A set of basic facts define the constraints within which the economic growth and development of India's rural population must be addressed. Fundamentally, they relate to resource constraints, the nature of infrastructure, and the future trajectory of the geographical distribution of the population.
- These services include, at a minimum market access, educational, health, financial, entertainment, transportation, and communications. Further, services depend on the availability of infrastructure.
- Infrastructure investment is irregular and inadequate to support 600,000 villages and the average cost of providing infrastructure is inversely related to the scale of the operation.
- Limitations on the financial and other resources available for providing infrastructure made it impossible to provide infrastructure at every village in India. Even if they were provided at every village, it will not be commercially sustainable.
- The basic geographical structure of population distribution will change once India shifts from being agriculture based country to industry based nation. The Government has launched "Bharat Nirman" for the development of



NREGP- A Poverty Eradication Tool

rural infrastructure. Plans proposed for the development of India Rural Infrastructure are -

- Irrigation,
- Roads,
- Housing,
- Water Supply,
- Electrification,
- Telecommunication Connectivity.

### Conclusion

Reliable infrastructure services as an important consideration in their investment decisions. It is pointed out that that "infrastructure capacity grows step by step with economic output – a one percent increase in the stock of infrastructure is associated with a one percent increase in gross domestic product (GDP) across all countries". In an increasingly globalising world, availability of good quality infrastructure is a crucial factor in attracting foreign investments. Availability and accessibility of adequate infrastructure in a country on par with international community is an indicator of the presence of high quality of life. In Millennium Development Goals also the role of infrastructure in reducing poverty has been recognised. It has set increasing access to water supply and sanitation service as targets to be achieved by 2015.

*[The author is Assistant Professor, Economics, Govt. College, Chittur, Palakkad, Kerala. Email. Id: kizhakkekalambaby@gmail.com]*

**Rural infrastructure is not only a key component of rural development but also an important ingredient in ensuring any sustainable poverty reduction programme.**

# TOXICITY CAUSED BY PESTICIDES

Reena Chauhan and M.K. Ran

**A**griculture is the single largest sector of India that provides the principal means of livelihood for over 58.4% of country's population. It contributes approximately one-fifth of the total gross domestic product (GDP). Agriculture accounts for about 10% of the total export earnings and provides raw material to a large number of industries, however, low and volatile growth rates and the recent escalation of agrarian crisis in several parts of the Indian countryside are a threat not only to national food security but also to economic well-being of the nation as a whole. To satisfy the growing demand of fruits and vegetables, farmers in the country utilize pesticides to boost production and to prevent insect-pests and diseases, which pose great threats to vegetable and fruit production. It has also been reported that pesticides are commonly used on periodic basis throughout the growing season at very high concentration. Such a use of pesticides during production often leads to the presence of pesticide residues in fruits and vegetables after harvest. In addition, the usage of these chemicals has occasionally been accompanied by serious risks to both human health and the environment because of their toxic potential, high persistence, bio-concentration, and especially, due to their non-

specific toxicity. Some of the pesticides are persistent, and hence, they remain in the body causing long term exposure.

## Pesticide residues

Pesticides residues have been defined as any specified substance in food, agricultural commodities, animal feed, soil, or water, resulting from the use of pesticide. The term includes any derivatives of a pesticide such as conversion products, metabolites, reaction products and impurities that are of toxicological significance.

## Monitoring of Pesticide Residues

The aim of these programs, *i.e.*, pesticide monitoring, is just to ensure that the pesticide residues do not exceed maximum residue level (MRLs) in fruits and vegetables allowed by the government and no misuse of pesticides that could result in unexpected residues in food and that the good agricultural practices (GAP) are being maintained. For monitoring studies in the general survey, all the samples are monitored for residues for all the applied pesticides. The results of these monitoring programmes are used for future development in setting MRLs and risk assessment exercises for public health.



## Maximum Residue Limit

To regulate the pesticides residues in food to a safe level, a concept was introduced by Joint FAO/WHO Expert Committee on Food Additives in 1955, and Codex Alimentarius Commission was established in 1964. The maximum residue limit (MRL) is the utmost concentration for a pesticide residue on crop or food commodity resulting from the use of pesticides according to good agricultural practice. The concentration is expressed in milligram of pesticide residues per kilogram of the commodity ( $\text{mg kg}^{-1}/\mu\text{g g}^{-1}/\text{ppm}$ ). It should be understood that MRLs are not the safety limits. A food residue can have higher level than MRL but can still be safe for consumption. Safety limits are assessed in comparison with acceptable daily intake (ADI) for short term exposure or acute reference dose (ARfD).

## Pesticides in environment

The environmental impact of pesticides is often greater than what is intended by those who use them. Pesticides can reach a destination other than their target species, including non-target species and contaminate soil, water, turf and other vegetation. Although there can be benefits of using pesticides, but in addition to killing insects and weeds, they can be toxic to a host of other organisms including birds, fish, beneficial insects and non-target plants. Insecticides are generally the most acutely toxic class of pesticides but herbicides can also pose risks to non-target organisms.

## Pesticides in Human body

They can enter the human body through various modes like inhalation of aerosols, dust and vapor that the pesticides contain, via oral exposure by consuming food and water and through dermal exposure by direct contact of pesticides with skin. The pesticides sprayed on the food, especially fruits and vegetables, can leach down into soils and groundwater, and can mix up with drinking water. Pesticide spray can drift and pollute the air.

The effects of pesticides on human health are more harmful based on the toxicity of chemical and the length and magnitude of exposure. Not only farm workers and their families experience

the greatest exposure to agricultural pesticides through direct contact with the chemicals but also every human contains a percentage of pesticides in their body and children are comparatively more susceptible and sensitive to pesticides since they are still developing and have a weaker immune system than the adults do. Children may also be exposed to pesticides due to their closer proximity to floor and natural tendency to put contaminated objects in their mouth, and also because, the children tend to spend more time at home in a potentially contaminated environment. Hand to mouth contact depends on age of the child, much like lead exposure, typically from dust within the home. Children under the age of 6 months are more apt to experience exposure from breast milk and inhalation of small particles. Pesticides may be absorbed through dermal contact, ingestion and inhalation. Pesticides tracked into the home from family members increase the risk of toxic pesticide exposure, which is normally area specific. Also, the toxic residue in food may contribute to a child's exposure to a certain pesticide. The chemicals can bioaccumulate in the body over time.

Exposure to pesticides can cause mild skin irritation, birth defects, tumors, genetic changes, blood and nerve disorders, endocrine disruption and even coma or death. The developmental effects have been associated with pesticides. Recent increases in childhood cancers, such as leukemia, throughout North America may be the result of genotoxic and non-genotoxic pesticides due to somatic cell mutations. Insecticides targeted to disrupt insects can have harmful effects on nervous systems of the mammals because of basic similarities in their system structure. Both chronic and acute alterations have been observed in those who are exposed to pesticides. Pesticides can act in the promotion and proliferation of cancer while causing hormone imbalance.

## Factors Influencing Toxicity to Humans

The severity of any adverse effects from exposure to a pesticide depends on the dose, the route of exposure, how easily the pesticide is absorbed, the types of effect of pesticide and its metabolites, and its accumulation and persistence in the body.

**Table 1: Factors influencing skin absorption of pesticides**

Skin Characteristics	Sores and abrasion Wetness of skin Location on the body (absorption occurs readily though eyes and lips for example) and vascularization
Environmental factors	Temperature and humidity
Pesticide characteristics	Acidity (pH) Vehicle Physical state (solid, liquid and gas) Concentration of active ingredient

The toxic effects also depend on health status of the individual. Malnutrition and dehydration are likely to increase sensitivity to pesticide. Pesticide uptake occurs mainly through the skin and eyes, inhalation, or ingestion. The fat-soluble pesticides, and to some extent, the water-soluble pesticides are absorbed through intact skin. Sores and abrasions may facilitate uptake through the skin. Sores and abrasions may facilitate uptake through the skin (Table 1). Skin absorption is probably of particular importance when used in developing countries, because adequate protective clothing is often not available or worn.

### Aspects of toxicity and risk classification

Ideally, the human dose-effect and dose-response relationships should be known for each pesticide in order to establish safety standards and to classify them according to the degree of health risk. For most pesticides, these relationships are not known and preventive measures have therefore been developed based on  $LD_{50}$  and other

crude measures of the dose response relationship in animals.

The World Health Organization in 1990 and the Council of Europe in 1984 have grouped formulated pesticides by degree of hazard (Table 2) and the *hazard class* of a pesticide has now been incorporated into legislation in many countries.

### Effects of Pesticides

The health effects of pesticides may be acute or delayed in workers who are exposed to pesticides.

#### Acute effects

A large number of reports are available on acute effects associated with occupational exposure to pesticides. These exposures may be accidental, occupational, or intentional. A review on unintentional pesticide poisoning in 35 countries has been already published.

The acute health problems, such as dizziness, headaches, abdominal pain, nausea, vomiting, as

**Table 2: Classification of pesticides according to degree of hazard to human beings**

Hazard Class		$LD_{50}$ (rat) ( $mg\ kg^{-1}$ of body weight) <sup>a</sup>			
		Oral		Dermal	
		Solid <sup>b</sup>	Liquid <sup>b</sup>	Solid <sup>b</sup>	Liquid <sup>b</sup>
I(a)	Extremely Hazardous	5 or less	20 or less	10 or less	40 or less
I(b)	Highly Hazardous	5-50	20-200	10-100	40-400
II	Moderately Hazardous	50-500	200-2000	100-1000	400-4000
III	Slightly Hazardous	Over 500	Over 2000	Over 1000	Over 4000

a- A dosage of  $5\ mg\ kg^{-1}$  of body weight is equal to a few drops ingested or a splash in the eye,  $5-50\ mg\ kg^{-1}$  of body weight up to one teaspoonful and  $50-500\ mg\ kg^{-1}$  of body weight corresponds up to two teaspoonfuls.

b- The terms *Solid* and *Liquid* refer to the physical state of the product or formulation being classified.



well as skin and eye problems, skin conditions, seizures, coma and even death may occur in workers that handle pesticides. Mild to moderate pesticide poisoning mimics intrinsic bronchitis, asthma, and gastroenteritis.

### Long-term Health Effects

**Neurological problems:** Strong evidence links pesticide exposure to worsened neurological outcomes. The risk of developing Parkinson's disease is 70% greater in those exposed to even low levels of pesticides. People with Parkinson's were 61% more likely to report direct pesticide application.

**Fertility:** A number of pesticides like 2,4-D and dibromochlorophane has been associated with impaired fertility in males.

**Reproductive effects:** Pesticides, lethal to dividing cells of genitalia, may cause abnormalities in sperms leading to decrease their ability for fertilization. On the other hand, the ova become defective and not able to implant on the uterine surface, leading to early abortion or miscarriage.

**Hormone disruption:** Some substances cause physical birth defects and others can cause subtle hormonal effects on the developing fetus or can affect a child's functional capacities. Hormone disruptors have been linked to many health problems including reproductive cancers. The drug diethylstilbestrol (DES), which was given to pregnant women to prevent miscarriage between 1941 and 1971 worked as an endocrine disrupting chemical on the developing fetus. Decades later, many of these DES exposed daughters developed cervical cancer. Twenty-four pesticides still in the market, including 2, 4-D, lindane and atrazine, are known endocrine-disrupters.

Steroid hormones, such as oestrogens, androgens (e.g., testosterone) and progesterone, are crucial for primary sex determination, foetal development and acquisition and maintenance of secondary sexual characteristics in adults. Chemicals, including many pesticides, with similar structures to these hormones can interfere with their function and lead to a variety of developmental and reproductive anomalies.

### Alternatives to pesticides

Alternatives to pesticides are available and include methods of cultivation, use of biological pest controls (such as pheromones and microbial

pesticides), genetic engineering and methods of interfering with insect breeding. Application of composted yard waste has also been used as a way of controlling pests. These methods are becoming increasingly popular and are often safer than traditional chemical pesticides. In addition, Environmental Protection Agency (EPA) is registering reduced-risk conventional pesticides in increasing numbers.

Cultivation practices include polyculture (growing multiple types of plant), crop rotation, planting crops in areas where the pests that damage them do not live, change in planting time according to when the pests will be least problematic and use of trap crops that attract pests away from the real crop. In the United States, the farmers control the insects successfully by spraying hot water at a cost, which is about the same as the pesticide spraying. Release of other organisms that fight the pest is another example of an alternative to pesticide use. These organisms can include natural predators or parasites of the pests. The bio-pesticides based on entomo-pathogenic fungi, bacteria and viruses causing diseases in pest species can also be used for controlling the diseases in vegetable crops.

Interfering with insects' reproduction can be accomplished by sterilizing males of the target species and releasing them so that they mate with females but may not produce offspring. This technique was first time used on the screwworm fly in 1958 and since then it has been used with the medfly, the tsetse fly and the gypsy moth. However, this can be a costly and time-consuming approach, which works only on few types of insect. Another alternative to pesticides is the thermal treatment of soil through steam. Raising soil temperature by passing steam through the steel pipes laid down into the soil 45 cm below the surface kills the pests and improves the soil health.

In India, traditional pest control methods include Panchakavya (the mixture of 5 products). The method has recently experienced resurgence in popularity due in part to use by the organic farming community.

*[Reena Chauhan is from the Department of Chemistry and Physics, CCS Haryana Agricultural University & M.K. Rana is from the Department of Vegetable Science, CCS Haryana Agricultural University. Email id: mkrlotus@gmail.com]*

## **HIGHLIGHTS OF THE INTERIM BUDGET 2014-15**

- **Fiscal deficit for current fiscal to be 4.6%**
- **Revenue deficit estimated at 3% for current fiscal**
- **140m people lifted out of poverty in last 10 years**
- **Rs 6000 crore to rural housing fund, Rs 2000 crore for urban housing fund**
- **Minority bank accounts have swelled to 43,53,000 by 2013-14 from 14,15,000 bank accounts 10 years ago**
- **Rs 3711 crore for minority affairs; housing and urban poverty alleviation gets Rs 6000 crore**
- **panchayati raj ministry gets Rs 7000 crore**
- **Foodgrain production estimated at 263 million tons in 2013-14**
- **Expenditure on education has risen from Rs 10,145 crore 10 years ago to Rs 79,251 crore this year**
- **Average growth under UPA-I was 8.4 per cent and UPA-II 6.6 per cent**
- **Rs 2,46,397 crore allocated for food, fertilizer and fuel subsidy**
- **Food subsidy will be Rs 1,15,000 crore for implementation of National Food Security Act**

