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A Study of IAY and PMGSY in India: A Regression Approach

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Abstract:- Rural areas in India constitute around 60 percent of the country. The backwardness of the rural areas has hindered the progress of the nation. The basic occupation of rural area is agriculture which is the highest sector to contribute to the overall GDP of the country.Since Independence, the Government has been focusing on the development of rural areas by introducing different programs and amending them from time to time. These programs have helped the people of rural areas to gain basic amenities like food, shelter, clothing, education, etc. The rural infrastructure plays a major role in developing the rural areas and to combat the rural economy. Here, infrastructure refers to the physical structures and facilities, namely, houses, roads, electricity, water supply, telecommunications. Various initiatives have been undertaken to enhance the rural infrastructure so that the rural economy can shoot the peak while providing better living standards to the people. Also, it focuses to bridge the gap between urban areas and rural areas on the basis of infrastructure development. This paper aims to understand the role of rural infrastructure programs in rural development of India. The researcher has confined to monitor the financial and physical progress of two rural infrastructure programs namely, Indira AwaasYojna and Pradhan Mantri Gram SadakYojna. The analysis of the progress of these schemes will draw a conclusion of the impact that the utilization of the allocated fund has over the construction of houses and roadsrespectively. This study will be beneficial for the academicians as well as government officials to understand the importance of rural infrastructure programs, not only on the development of rural areas, but also on the overall economy of India.

Keywords: Rural development, Rural infrastructure, IAY, PMGSY

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I. INTRODUCTION

With respect to India, the rural development holds significance for two basic reasons. First, around 66% of the population still lives in rural areas with negligible advancement. Second, the backwardness of the rural parts would be a noteworthy hindrance to the economic progress of the country. India, being a developing nation, is an agricultural-based country, thus, agriculture being the main occupation. As far as production techniques, social organization and political interference are considered, rural area is relatively backward. Adding to it, specialized advancements in field of agriculture have expanded the gap between the rich and poor. The farmers with advanced technology are happier and are prospering at a great pace as compared to those who are still using traditional ways. The All India Rural Credit Review Committee (2003)in its report cautioned " If the fruits of development continue to be denied to the large sections of rural community, while prosperity accrues to some, the tensions social and economic may not only upset the process of orderly and peaceful change in the rural economy but even frustrate the national affords to set up agricultural production." Thus, it was felt important to take proper actions for the development of rural areas.

The rural infrastructure can help to provide basic facilities to rural people by which their living standards can be enhanced. For instance, the advancement in rural infrastructure can provide improved access to market centers for the people involved in agri-business, better accessibility of resources and raw materials at reasonable prices. The different segments of rural infrastructure which contribute to the increase in rural economy include roads, electrification, irrigation, and housing.

The significance of infrastructure for economic development and improvement in rural areas need to be overemphasized to develop a progressive economic growth for a developing country like India. By developing the rural infrastructure, even a minor improvement in its amount and quality could altogether improve the economic growth and living standards of rural people. Improving the infrastructure, from roads, transport, electricity, telecommunications, housing, healthcare, water supply, and sanitation, can lead to the overall development of well-being of the rural people. The improved infrastructure could lead to advancement of

economic development, as well as cause decline in the poverty rate by providing employment opportunities to people involved in agricultural as well as non-agricultural occupations.

Since infrastructure is considered as a public property and the private sector does not want to make any investment, the investment from public sector is the sole source to build as well as develop the rural infrastructure. The government has been undertaking various initiatives to improve and develop the rural areas by improving the rural infrastructure. Some of these initiatives-cum-programs include Pradhan Mantri Gram SadakYojna (PMGSY), Indira AwaasYojna (IAY), Rajiv Gandhi Grameen VidyutikaranYojna (RGGVY), and Integrated Watershed Management Program.

In this study, an attempt has been made to collect the secondary data regarding the rural infrastructure development programs in the post-reform period in India (that is, the period after the year 1991). To make an analysis of the rural infrastructure development programs at the national level, the data is basically collected for two active programs, IAY and PMGSY.The two variables which have been taken into consideration for analysis of the financial and physical progress of the country. For IAY, the variables used are fund utilized and the number of houses constructed while for PMGSY, the variables used are fund utilized and the number of roads constructed. Time series data has been collected. The financial and physical performance has been evaluated through regression.

The study is classified into five sections. The Section-2 discusses previous studies related to rural infrastructure, in general, narrowing to Indira AwasYojna and Pradhan Mantri Gram SadakYojna. The Section-3 discusses the research methodology adopted for the study. Further, the Section-4 deals with the analysis of the data collected. Finally, the Section-5 draws the conclusion of the study.

II. LITERATURE REVIEW

This section provides an overview of previous studies related to rural infrastructure and its programs. This section is further divided into 3 subsections: previous studies related to rural infrastructure. Further, the second subsection provides the previous literature of Indira AwasYojna (IAY) while third subsection deals with previous literature of Pradhan Mantri Gram SadakYojna (PMGSY), in particular.

2.1. Rural Infrastructure

Like general infrastructure, rural infrastructure also contributes to rural economic growth and poverty alleviation by enhancing agricultural productivity, increasing rural farm and non-farm employment and improving living standard of the rural population. It is argued that 'Roads, electricity supplies, telecommunications, and other infrastructure services are limited in all rural areas, although they are of key importance to stimulate agricultural investment and growth' (FAO, 1996). It is also argued that human well-being in terms of education and health depends crucially on infrastructure services, such as safe drinking water and sanitation to prevent disease, electricity to serve schools and health centers and roads to access basic necessities for human life (Datt&Ravallion, 1998). The lack of infrastructure is considered a major barrier to sustainable human development. An excellent and comprehensive overview of the various aspects of rural infrastructure in India is available in Satish (2007).

According to Sullivan &Sheffrin (2003), infrastructure could be defined as organizational structure and physical amenities that are needed by the community in general. These infrastructures include industries, buildings, roads, bridges, health services, governance, and many others. Sullivan and Sheffrin argue infrastructure development is needed as economically it affects the demand and supply as well buy and sell activities.

Alleman, Hunt, Michaels, Muellers, Rappoport& Taylor (1994) view infrastructural investment as an investment that can contribute the increase of economic growth. Infrastructure development is none other than a mechanism that increases the living quality of a society. In terms of economy, infrastructure development can impact the employment rate, productivity, and income as well as give an added value. Infrastructure development can also boost political integration and reduce societal geographical gaps.

Calderon (2008) found that the basic infrastructure is an integral part of the rural development strategies because the infrastructure development is integrated with all other aspects, including agriculture, education, health, nutrition, electricity and clean water, which subsequently be developed as well. The development of the basic infrastructure in the rural areas is seen as a holistic approach where it could be the solution for the problems of inequality and social justice for rural areas in general.

Aziz (2015) who did a study on the relationship between the infrastructure and the economic growth in India revealed that the basic infrastructure is essential for a good quality of life especially in the socioeconomic aspect. The lack of basic amenities in the rural areas has direct negative impacts on the village residents such as increasing the rate of poverty, declining the agricultural products and hindering the ability to continue living a good life. All these negative impacts will definitely affect health services and halt access to education for the village communities.

Shariff Abd Kadir (2013) who examines the impact of land transport infrastructure development on Malaysia's economy growth found that the investments in the land transport infrastructure give a significant impact on the country's long term economic growth. The study also emphasised the importance of the development in infrastructure in thriving several important sectors in the country such as manufacturing, service, international trade, production and agriculture sectors. This shows that the development of basic infrastructures like road infrastructure is essential in order to increase the rural communities' life well-being through the provision on amenities for the community use.

2.2. Indira AwaasYojna (IAY)

An evaluation of IAY has been conducted by the Ministry of Rural Development besides other institutions. The evaluation study revealed that the scheme has been able to provide shelter benefits to a significant proportion of the marginalized groups. In general, all beneficiaries are satisfied with the constructed houses. But there are a number of areas of concern, which have emerged from the evaluation. As per the guidelines of the scheme, all the beneficiaries should be below the poverty line, but the evaluation study revealed that as many as 36.99 percent beneficiaries were from families living above the poverty line (Verma, Singh & Singh, 2008).

According to Gandotra (2009) shelter at least should provide protection against the stresses of the physical environment as well as satisfy psychological requirements of people for a place of their own. Over and above these purposes, the housing should provide protection against hazards of health arising from the physical and social environment. Also, appropriate housing should promote physical and mental health. It should provide families with psychological security, and a means of expressing their individuality. Housing is intimately related to health. The structure, location, facilities, environment and uses of human shelter have a strong impact on their physical, mental and social well-being. Poor housing conditions and uses serve as weak defenses against diseases, injury, and death. Adequate and appropriate housing on the other hand not only protects people against health problems but also help to promote good physical health, economic productivity, psychological well-being and social vigor.

Lal (1989) has conducted a study in district Rae Bareli. It was discussed by the author that living conditions in rural houses of the study region were far from satisfactory. The study exhibits that the average number of rooms per household was only 2.4. The condition becomes appalling when the same room was used for a number of purposes. About 23.3 percent of houses have mixed uses, 18.2 percent of them were used for keeping cattle and animals also. The keeping of animals under the same roof was very unhygienic exposing the people to the risk of diseases and health hazards. As many as 19.2 percent of the rural households have a separate provision for the kitchen, 10.3 percent for bathrooms and toilet facilities were lacking and open fields around the settlement site were used as open-air lavatories. The unhygienic practice pollutes the village environment. Village footpaths and lanes remain dirty and unclean.Bad housing leads to unhealthy social habits, unsanitary conditions, pollution of homes, streets, and wells, increasing the risk of diseases and infection. In order to improve the rural housing conditions in the region, it was essential to encourage the construction of new houses especially cheap anddurable houses for weaker sections of the village society.

Sharma (2004) has also reportedthat housing problem was not peculiar to big cities and towns only, but these problems wereexistent in villages also. He has highlighted that if we undertake a survey of housing conditionsin the village, we shall find that the facilities of housing and accommodation were much worsein villages than in towns. It has been found that in small towns the problem of housing wasdisproportionately low in relation to the needs, but whatever houses were available they wereof good quality. In industrial towns, the problem of housing was in the form of growing slums, but in the villages, the problem of housing was not in the condition that no houses wereavailable, butwhatever houses were available were unhygienic and their construction washaphazard and unsatisfactory.

Veena (1985) has realized from the findings of his study that wemust see housing as a key to overall community development, economic growth, and social justice. The Government must give top priority to the housing construction in the plans andmust allocate more finance to build more houses. Other public agencies should be asked tocome forward in finance, plan, research and actual construction task of the housing.

Rao(1999) in this work has talked about the condition of rural housing in India. Hehas made it clear that housing was recognized as a productive activity which stimulates employment and economic growth. It has also provided the base for increased access to health, education, water supply and sanitation especially for the poor and the vulnerable groups. To a man, the house was a physical, social, economic and psychological security. A house to a man was a symbol of prestige and identity. Creating this identity for the rural poor was a necessary step for improving their life. Rural housing increases economic activities, raises the quality of life and creates substantial employment opportunities for the rural poor.

Munshi (2001) in this work has made an attempt to analyze the condition of rural housing and sanitation environment of a rural economy which is situated in one of the poorest districts of West Bengal, a

state that has remained very backward among the Indian states in rural housing. The study includes a socio-economic analysis of the level of housing and sanitationbased on primary data collected from nearly 600 households of two blocks. The resultsobtained give a very dismal picture of the rural healthenvironment of the area. Nearly 70percent of the households live in houses which cannot be considered fit for human habitation.The village level sanitation and personal arrangement of latrines were abnormally poor. Only6.54 percent of the households have any latrine facility. The village level self-Governments, Panchayats, which were found to be very actively participating in the decentralized planning process in West Bengal, have not included these problems into the domain of their works.

2.3. Pradhan Mantri Gram SadakYojna(PMGSY)

Ministry of Rural Development, "Impact Assessment Study of Improved Rural Road Maintenance System under PMGSY (October 2015)" findings of the study are "Significant improvements were found in increased employment and income amongst households engaged in other occupation than their own farms. In the habitations where roads have not been maintained a marginal decrease in the gains achieved due to better connectivity was noticed. The savings in travel time to the place of employment was found higher in case of sample habitations where the roads are maintained as compared to control habitations. Better availability of transport facility had an impact and poor maintenance of roads has adversely impacted them".

Jain, Preeti (2014) discussed the impact of PMGSY, stating that the construction of roads would help to improve the employment conditions of rural areas. Under the survey conducted, a number of housewives stated that due to connectivity between rural and urban areas, they have been successful in starting up small scale industries. Further, it was revealed that road connectivity has declined the poverty rate and increased the development rate.

Ghosh (2017) inferred that among different infrastructure development markers, electricity, irrigation and roads have been most significant for agrarian profitability and yield development, decline in poverty and increase in the rate of health care and education being provided. Since access to the well-maintained roads can bring socio-economic changes in rural areas, it is important to have good quality of roads. The study was conducted in 16 States to examine the physical as well as social infrastructure. The data was analyzed with the help of indexing. With the help of regression coefficients of the composite indices and individual indicators of rural infrastructure, it was revealed that improved physical and social infrastructure and livelihood opportunities can enhance the agricultural productivity, improve literacy rate and reducing poverty. It was suggested by the author that the government should encourage more investments in the development of rural areas.

Biswas, Rentu and A K M Anwaruzzaman(2018) conducted a survey of 250 respondents from 10 PMGSY roads connecting 10 villages of Murshidabad District, West Bengal. The respondents expressed that there is a positive effect on business cycle as well as employment growth by the PMGSY roads as 78% respondents agreed to it while about 22% of respondents stated that PMGSY has no effect. At the same, no respondent distinguished any negative effect of the road with respect to economic and employment rate. The study revealed that improved PMGSY roads helped in improving connectivity while reducing the physical distance by 16 percent. Further, the travel time tend to be reduced by 40 percent.

III. DATA SOURCES AND RESEARCH METHODOLOGY

For conducting the study, secondary data is collected from the website for various publications of the Government of India. The most commonly referred websites include the official websites of Planning Commission of India, Central Statistical Organization, IndiaStats, while the most commonly referred magazines include Census of India, Economic and Political Weekly's various issues, Yojana magazine, Kurukshetra magazine, etc. The study tries to summaries the current state of knowledge about the rural infrastructure development programs in India with special reference to Indira AwasYojna and Pradhan Mantri Gram SadakYojna.

The analytical and descriptive methodology has been used to study the physical and financial progress of these schemes with respect to the overall rural development. Simple linear regression has been employed to check the impact of funds utilization on number of houses constructed and kilometres of roads completed.The time period taken for the study of IAY is from 2005 to 2016 and for PMGSY is 2007 to 2017. The variable taken for financial performance of the schemes is funds utilization and funds allocation whereas for physical performance of IAY and PMGSY is number of houses constructed and kilometres of roads completed respectively.

IV. DATA ANALYSIS

4.1. Indira AwaasYojna(IAY)

Indira Awaas Yojana (IAY), from now will be referred as IAY, is a housing scheme by the central government which is having the extension for a far reaching solution for the poor in rural areas. IAY is a lead plan of the Ministry of Rural Development to give houses to the Below Poverty Line (BPL) families in the rural territories. It has been in activity since 1985-86. "Indira Awaas Yojana" (IAY) was propelled by Rajiv Gandhi, the then Prime Minister of India in 1985 and was rebuilt as "Pradhan Mantri GraminAwaas Yojana" (PMGAY) in 2015.

The major idea behind the plan is to give money related help to probably the weakest areas of society for them to upgrade or build a house of good quality for their own living. The vision of the legislature is that all impermanent (kutchcha) houses from Indian villages should be replaced by 2017.

The goal of Indira Awaas Yojana is basically to help development of dwelling units by individuals from Scheduled Castes/Scheduled Tribes, liberated bonded workers and furthermore non - SC/ST rural poor beneath the line of poverty. A definite pattern of funding was used to keep up straightforwardness in every one of the dealings related with the venture and furthermore it had a distinct gender point of view. All the essential units of Local organization, for example, GramaSabhas, Village Panchayats, Zilla Panchayats and DRDA were effectively engaged with the usage of the Program.

The main focus groups for houses under the IAY are beneath poverty line families living in the rural regions, people falling in the category of Scheduled Castes/Scheduled clans, liberated bonded workers, minorities in the BPL classification and non-SC/ST BPL rural family units, widows and closest relative to defense personnel/paramilitary forces who were killed in action & are living in rural zones (independent of their pay criteria), Ex-servicemen and resigned individuals from paramilitary powers satisfying different conditions.

Table 1- Financial and Physical Progress of IAY

	Financial Factors		**Physical Factors**	
Year	**Utilization**	**Allocation**	**Constructed**	**Constructed %**
2005	365399.9	273240	1551923	-
2006	325414.9	290753	1498367	6.409384
2007	403270	403270	1992349	38.69848
2008	834834.3	564577	1988532	39.99975
2009	1329246	849470	3385619	50.46132
2010	1346573	1005370	2608893	18.35262
2011	1292633	949120	2336467	-5.59496
2012	1217725	1051320	2657682	10.76787
2013	1057604	1389490	1642704	32.16627
2014	1383553	1409955	2515108	1.472816
2015	14012	950875	2080530	-32.5599
2016	10351	34513	549714	-96.3704

From 2005 to 2016, it can be seen that the utilization of allocated fund increased between the period 2005-2009 which resulted in the increase of number of houses constructed. From 2010 to 2013, the utilization of allocated fund decreased which resulted in a decline in the number of houses. In 2014, with the increase in the utilization of allocated fund, again the number of houses constructed increased. From 2015, the utilization of the allocated fund under the scheme decreased which resulted in a decline in number of houses constructed.Thus, it can be concluded that with the increase in fund utilization, the number of houses constructed also increases.

Table 2- Regression Analysis of IAY

Variable	**Coef**	**Std Error**	**T-stat**	**Prob**
C	12.03	0.77	15.56	0.00
LnFund	0.18*	0.05	3.16	0.01
R square = 0.50 **F-stat** = 10.00 (0.01)				

The table shows that fund utilization has positive and significant impact on house construction in India. This means that if fund utilization increases by one percent, house construction will also increase by 0.18 percentage points on an average.

4.2. Pradhan Mantri Gram SadakYojna (PMGSY)

Pradhan Mantri Gram SadakYojna (PMGSY) was propelled on 25th December, 2000 as a Centrally Sponsored Scheme with the idea to give road availability in rural regions of the nation. The program conceives the need to connect all homes with a population of 250 people or more in Hill States & 500 people or more in plain territories, the Desert Areas (as recognized in Desert Development Program), Tribal (Schedule V) regions and in the 60 Left Wing Extremism influenced/Integrated Action Plan regions as distinguished by the Ministry of Home Affairs/Planning Commission.

Of around 1.7 lakh residences with a population of over 500 in the plain territories and 250 in the hill zones, all-weather sustaining roads were planned to be associated. Around 55% were associated by March 2014 while 82% were associated by December 2017. The target of 100% network will be accomplished by March 2019 (16 December 2017 update). Pending work included cruel landscape conditions of Assam, Jammu and Kashmir and Uttarakhand also the left-wing Naxalite–Maoist fanaticism prevailed state of Chhattisgarh, a few regions of Jharkhand and Malkangiri region of Odisha.The roads were being developed at an average speed of 98.5 kilometers every day from 2004 to 2014 under the PMGSY, it rose to 130 km for every day in FY 2016-17. The plan has begun to change the way of life of numerous people in villages with new upgrades, and roads, for example, in Manipur. PMGSY has been endeavoring to expand the green spread close to the roads. Varied dimensions of accomplishment have risen up out of these efforts.

Table 3- Financial and Physical Progress of PMGSY

	Financial Factors		**Physical Factors**	
Year	**Utilization**	**Allocation**	**Constructed**	**Construction%**
2008	15162.00	3615	52404.52	
2009	18832.90	3089	60116.99	14.71718
2010	14911.00	1269	45108.53	-24.9654
2011	10946.41	1614	30994	-31.2902
2012	8386.75	19344	24161	-22.0462
2013	14386.43	17047	25316.39	4.782045
2014	16977.62	10151	36336.81	43.53077
2015	16480.26	15186.71	35150.96	-3.2635
2016	15926.87	17584.49	47446.84	34.98021
2017	16998.53	15650.28	48741.96	2.729623

From 2008 to 2009, there was an increase in the utilization of the allocated fund which resulted in the increase number of roads constructed. From 2010 to 2012, the utilization of the allocated fund decreased which resulted in the decline of the number of roads constructed. Further, from 2013 to 2014, there was an increase in the utilization of the allocated fund which resulted in the decrease of the number of roads constructed. From 2015 to 2016, there was a decline in the utilization of allocated fund, thereby decreasing the number of roads constructed. In 2017, there was an increase in the utilization of the allocated fund, there was an increase in the number of roads constructed. Thus, with the increase in the utilization of allocated fund, there is an increase in the number of roads constructed.

Table 4- Regression Analysis of PMGSY

Variable	**Coef**	**Std Error**	**T-stat**	**Prob**
C	1.62	2.99	0.54	0.60
LnFund	0.93*	0.31	2.98	0.01
R square = 0.52 **F-stat** = 8.89 (0.01)				

The table shows that fund utilization has positive and significant impact on road construction in India. This means that if fund utilization increases by one percent, road construction will also increase by 0.93 percentage points on an average.

V. CONCLUSION AND SUGGESTIONS

The purpose of the study was to analyze the financial and physical progress of rural infrastructure development schemes at national level. The selected schemes were Indira AwaasYojna (IAY) and Pradhan Mantri Gram SadakYojna (PMGSY). From the analysis, it can be seen that the analysis at national level shows significant results of the selected schemes. The financial and physical performance IAY and PMGSY shows positive relation with the dependent and independent factors. This can be interpreted in the way that the greater the funds allocated and utilized, the greater will be the number of houses and roads constructed, respectively. Here, the dependent variable is number of house construction and road construction respectively while the independent variable is fund utilization.

It has been observed that whatever fund is utilized for the construction of houses and roads is showing positive results on national level. But it has also been analyzed that the funding by Government is not properly utilized. The funds allocated for enhancing rural infrastructure are mis-appropriately used different stages. Due to this, still the target of development of rural infrastructure has not been achieved. Therefore, it is necessary to take proper actions towards those involved in the corruption process so that the objectives and targets of the programmes are achieved. Further, it is necessary to bring in proper legislation and strict punishment for those indulging in corruption. The need is of an efficient audit system which can monitor if the funds allocated are properly utilized and if the target can be achieved with the proper utilization of the allocated funds.

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