Assessment on the Rural Roads Activity in Agriculture Productivity with a Case study

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Abstract- The Rural road donates more to our nation's development. In general, it includes 59% of the overall country road length. Rural road is the foremost aspect to be considered in overall Agriculture productivity. Many recent studies and statistics clearly reveals about the association between the rural road density and agriculture output. As far as agriculture productivity is concerned, the road density plays a major role. Top Agriculture producing state in India like Tamilnadu, Punjab, Himachal Pradesh, Uttarpradesh and Gujarat shows good road density with increased agricultural productivity. This paper mainly focus on the present condition of Rural Roads, Road Density and Agriculture Production, Thrust on Farmers and the ways to improve the overall agriculture productivity. This paper also conveys a special focus of study in the areas of Uthiramerur and Madurandagam Taluk which incorporates both National and State Road density. A systematic literature review with expert opinions from developing countries with remarks through which Rural road contribute more to agriculture productivity is taken care. Survey questionnaire which consist of various factors that influence the agriculture productivity and the survey was conducted with farmers in the village of Uthiramerur and Madurandagam Taluk. It is inferred that the present scenario of rural condition was not in appreciable condition. The road density established in Uthiramerur and Madurandagam are more than the National and state average road density. However it is the fact that government provides more attention to agriculture development and Rural road maintenance. Also the good road density paves way for improved agricultural productivity.

Key terms: *Rural roads, Road density, agriculture production.*

1. INTRODUCTION

Agriculture is the Back bone of Indian Economy. Agriculture and its allied sector with no doubt, is a major livelihood contributor of Indian people, however 70% of the population earnings is based on agriculture only. Also it contributes major part towards Gross Domestic Product (GDP) growth. It is essential to analyze the reason for migration of farmers from agriculture to other fields. Lot of funds allotted by the Center and State government to agriculture industry are used for Fertilizer subsidies. The small portion is not enough to develop the infrastructure of the agriculture. Compare to the other fields the Civil Engineers attention and contribution to agriculture infrastructure development is found to be very less. Hence it is essential to find a

solution for the farmers' problem like a Water management, Transportation management, Ground Water and Channel improvements etc.

Hence we dealt with one such problem called transportation of agriculture product from field to marketing center. We all know that the underground water is going down every year. Under this prevailing situation, improving the agriculture output is the challenging task in front of farmer in India. Transporting the agriculture product from field to nearby marketing is also difficult in our country and it consumes more agriculture profit cost. In the part of this project, we analyzed the current status of village road which are used as a prime source for transporting the agriculture product like Paddy, Sugarcane, Ground nuts and pulses etc. The study is conducted at Madurandagam and Uthiramerur taluk in Kancheepuram District. The questionnaire survey carried out in Mangalam, Thimmapuram and Kattukaranai villages in Madurandagam Taluk and Azhisoor, Perunkozhi and Poonthandalam in Uthiramerur Taluk. The survey was conducted only in farmers' family. In each village 10 families was chosen for questionnaires survey and 30 factors are analysis in this survey. In another part of the project, we collected all categories of road details from Madurandagam and Uthiramerur Taluk. From the collected road details we have found that the density of road for each Taluk and then the density of road compared with average agriculture production of respected Taluk. Therefore, we have inferred that the road density is a main aspect for the development of any country. Japan road density is the highest in the world that is 3.20 km/sq.km. The Indian road density is 1.42 km/sq.km compare to other country and it is the best average in the world. It is projected that the small countries having higher road density compared with larger countries. The statistics shows that India's highway network with a worth of 1.42 km road length per square km is denser than USA, its road length is 0.67 km per square km and greatly superior to China, its road length is 0.40 km per square km and Brazil, 0.21 km per square km. The study about rural road network is very important compare to other road network because rural roads with about 59 % share in the entire road length continues to constitute its major share. However, National Highways represents small proportion of total road length, runs across the length and breadth of the country and brings considerable (40%) road traffic. In road transportation, state highways and other PWD roads occupies secondary system. In national level Kerala has the highest road density of 390km/100sq.km,the second place got by West Bengal with 249km/100sq.km.The position of our state in sixth place with 141km/100sq.km. The national top five agriculture production state such as 1.Maharastra 2.Uthirapradesh 3.AndraPradesh 4.WestBenga 5.Rajastan, Tamilnadu got the Eighth place in the productivity. Hence we conduct more study for increase our agriculture production. The top five state posse's good road density. In this project we found the deficit of road density in Uthiramerur and Madurandagam taluk in Kancheepuram district and also the analysis based on current situation of rural roads with suitable remedial measure are discussed.

2. OBJECTIVE OF THIS PAPER

- To Collect data about the current situation of rural roadway network and agriculture Production details at Uthiramerur and Madhuranthakam Taluk in Kancheepuram District by collecting road maps and road details.
- To find the adequacy and density of road for Uthiramerur and Madhuranthakam taluk by conducting questionnaire survey and using collected road details.
- To Analyse the survey report and prepare suitable recommendations.
- To Compare the Density of road with National and State average of road density and to find the short fall in Madhuranthakam and Uthiramerur taluk.
- To Compare the Density of road with Agriculture production and to prepare the comparison chart.
- To find the peoples' opinion about the present road maintenance system and the reason for failure of village roads.
- To find the need of farmers to improve the agriculture productivity.
- Compare the Density of road with National average and State average road density and find the short fall in Madhuranthakam and Uthiramerur taluk.
- Compare the Density of road with Agriculture production and prepare the comparison chart.
- Find the people opinion about the present road maintenance system and reason for failure of village roads.
- Find the need of farmers to improve the agriculture productivity.

3. STUDY OF RURAL ROAD NETWORK IN AGRICULTURE PRODUCTIVITY

Transportation has long been recognized as strategic factor in agriculture and rural development. It acts as a bridge between agriculture fields to marketing centre. The agriculture product should be transported to marketing centre at right time and also the low cost is absolutely necessary to increase the profit of farmers. Improvement in rural roads is very essential for agriculture productivity. Indeed numerous studies powerfully propose that the investment in rural road construction and maintenance can make significantly positive impact on rural income and Quality of life.

3.1 LITERATURE REVIEW

The concept for study of rural roads Network in agriculture productivity is conceived from literature of the following journals. The capacity for literature review is a vital skill for any student. It offers with a context in which to place your project regardless of the module you are studying.

3.2 REVIEW FROM VARIOUS COUNTRY

Nigeria- The study based on the road infrastructural development focused on agricultural output and income standards of people in Delta State, Nigeria, the results shows a massive positive effect on rural roads that have a more agricultural output, reduced transport cost, cultivated more demand for rural labor and improved overall standard of people through income generation. Better road quality brings a better positive result on total output in case of income 10% increase in road quality and caused 12% and 2.2% improvement in agricultural productivity and total income generation correspondingly. In addition, road transportation supports inter-sectoral oral linkages between the agricultural and non-farm sector that enhances income diversification strategies among rural households. Therefore we could definitely infer that the poor road quality reduces household income, investment in transportation cost and it should be studied thoroughly by both the state and local government authorities in collaboration with private sector so as to cut down rural poverty and accelerate the process of rural transformation.

Yu Qin and Xiaobo Zhang (2012) - In this paper we found that the access of roadways facilitate the market integration of the agricultural economy, therefore enlarging the production scale of products with comparative advantage is essential. For example, in Natural Village 4 of Administrative Village II, the natural endowment is suitable for growing peaches. Before improvements in road connections, peaches were often damaged by being carried by shoulder for a long walk to the nearest market. After road construction, farmers can sell their peaches at a collection point right in their natural village. As a result, peach production has boomed in this area.

Uganda's rural City- In this paper, Static general equilibrium model is applied to investigate the high transportation costs and low productivity relationships. Also our results clearly indicates the population of quasi-subsistence agriculture and how far its impact on agricultural productivity and Cost of Transportation. Also, this model brings the positive side of improving the agricultural productivity and transportation in general. Our paper focuses on the transportation cost incurred by rural households in Uganda and also documents the cost involved in moving goods from Uganda's rural areas to its cities.

4. SCOPE OF THIS PROJECT

- The study is used to understand present condition of road network in Uthiramerur and Madurandagam, Taluk in Kancheepuram district.
- Find the road density in Madurandagam and Uthiramerur taluk in Kancheepuram district.
- To understand the correlation between road density with agriculture productivity.
- To understand the requirements for improving agriculture production other than roads.
- To understand the present road maintenance system and remedial measures.
- To understand the reason for loss in agriculture.

5. METHODOLOGY

It provides way to identify areas of rural road network in agriculture productivity and determine the various factors involved in the development of better rural roads, through better data collection and perfect data analysis. It also identifies the questionnaire design, mean content, and reliability.

5.1 STRUCTURE OF THE PROJECT

This project is organized into two sections. One section deals with current situation of rural road and essential factors that contributes for the improvement of agriculture productivity was identified by conducting Questionnaires survey from randomly selected villages in Uthiramerur and Madurandagam Taluk. Second section deals the density of road in the above two taluk by collecting road and area details. The density of road compares with state density of road and related with agriculture productivity of two taluk.

5.2 METHODOLOGICAL APPROACH

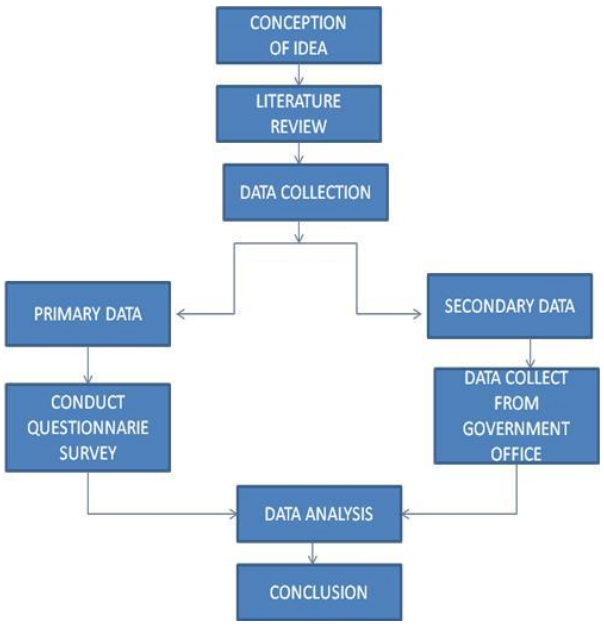

Fig.1. Methodology of Cost Overrun

In the Fig.1 the study approach involved through literature review, Field work for questionnaires survey about village roads and data collection for road details and agriculture production for last three years in the selected Taluk in Kancheepuram District from various government offices.

6. DATA ANALYSIS

The research instrument used to identify present condition of village roads and find the density of road and relate with agriculture productivity by questionnaire survey and data collection. The questionnaire was designed in such a way as to get high response rate from respondents. Only optional questions and tick options were used so that responding was easier.

6.1 QUESTIONNAIRE DESIGN

The survey starts with questionnaire, comprises of three parts, Part A, Part B and Part C. In Part A the personal information of the respondent (for e.g. Educational Qualification, Mode of agriculture, Area used for agriculture work) was asked. Part B was aimed to obtain information about village road (for e.g. present condition of road, Type of road, width of road). In order to frame the questionnaire, a total of 6 categories of factors were analyzed. Each of the categories consisting of factors which were found to be responsible for village road status and agriculture productivity. A total of 30 factors were taken as shown in the Table 1

Table.1. Overview of the Factors considered for the Questionnaire survey

S. No	Description of factors	No. of factors
1	Factors related to participant	4
2	Factors related to mode and Area of cultivation	3
3	About village road	5
4	Transportation of agriculture product	7
5	Infrastructure of agriculture / Other factors	11
	Total Number of Factors	**30**

The research population was drawn from six villages from Uthiramerur and Madurandagam taluk. The information regarding the respondents was obtained from the questionnaire survey. The respondents were asked about personnel information, details about their village roads and General opinion about transportation of agriculture product, Road maintenance method.

7. CALCULATION OF ROAD DENSITY

The road density calculated in Uthiramerur and Madurandagam from data collected from various government offices.

$$\text{Road density} = \frac{\text{Total length of road in km}}{\text{Area of taluk in sq, km}}$$

Table.2 Calculation of road density in Uthiramerur taluk

S. No	Classification of roads	Length in km	Uthiramerur Taluk (area in Sq.km)	Density of road(km/sq.km)
1	State Highways	30	376.58	0.08
2	Major District Roads	23.2	376.58	0.06
3	Other District Roads	171.38	376.58	0.46
4	Panchayat Union roads	170.3	376.58	0.45
5	Village panchayat road	193.01	376.58	0.51
Total density of road in Uthiramerur Taluk=**1.56 Km/Sq.km**				

Table.3. Road density in Madurandagam taluk

S. No	Classification of roads	Length in km	Madurandagam Taluk overall area in Sq.km	Density of road(km/sq.km)
1	National Highways	41.6	543.1	0.08
2	State Highways	45.8	543.1	0.08
3	Major District Roads	77.8	543.1	0.14
4	Other District Roads	240.88	543.1	0.44
5	Panchayat Union roads	267.85	543.1	0.49

6	Village panchayat road	259.75	543.1	0.48
Total density of road in Madurandagam Taluk =**1.72 Km/Sq**.km				

7.1 PERFORMANCE ANALYSIS

A pilot study was conducted with an experienced person in the agriculture industry who was asked to critically review the design and structure of the questionnaire, to ensure that the questionnaire will serve its purpose when distributed to farmers. For the questionnaire survey, the respondents were randomly selected from village.

7.2 AGRICULTURE PRODUCTIVITY DETAILS

The analysis of the data obtained from the questionnaire was done by using the ordinary arithmetical calculation of Agriculture productivity details.

Table.3. Agriculture productivity details in Madurandagam taluk

The performance of the agriculture productivity of the Madurandagam taluk as to be shown in the below fig2.

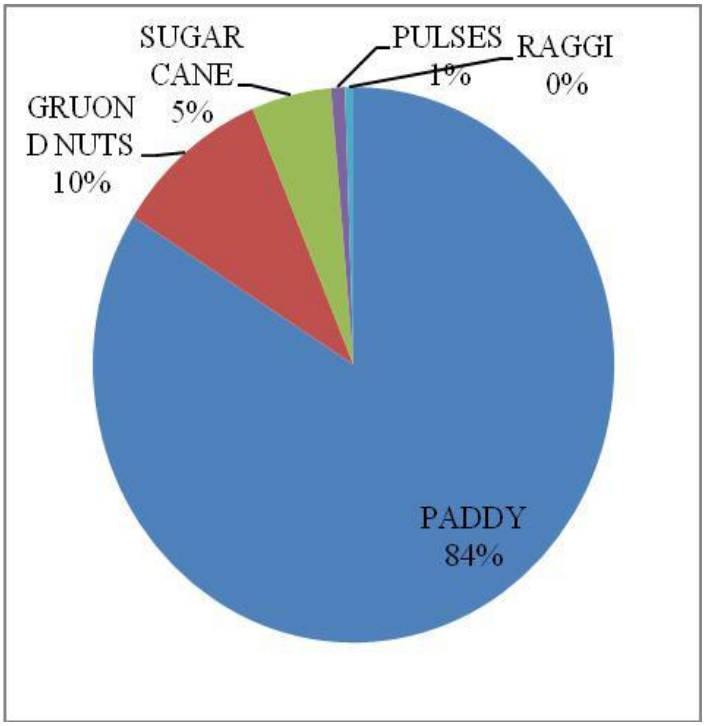

Fig. 2 Performance of Madurandagam taluk

Table.4 Agriculture productivity details in Uthiramerur taluk

Year	Paddy (MT)	Ground Nuts (MT)	Sugar cane (MT)	Pulses (MT)	Ragi (MT)
2009-10	28750	3756	42360	83	275
2010-11	32670	2564	32625	155	370
2011-12	38998	4406	43828	142	398
2012-13	32340	2546	-	149	264
2013-14	16776	4194	-	73	194
Average	29907	3493	43828	120.40	300.20

The analysis of the performance for the productivity of agriculture in Uthiramerur taluk details as to be shown below in the fig. 3.

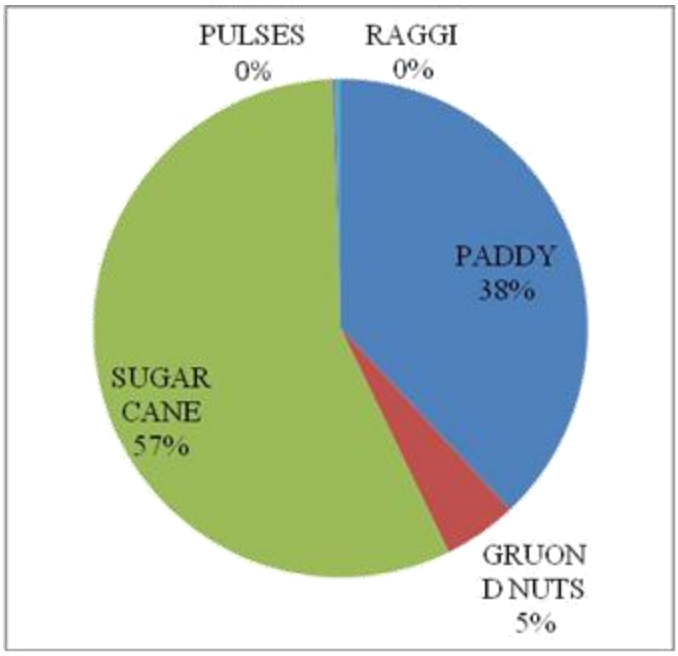

Fig.3. Performance of Uthiramerur taluk

8. CONCLUSION

The rural roads contribution for our economy is very significant. Rural road share is 59% in overall length of road in Our Nation; hence we should focus to keep in good condition. However, it is directly linked with agriculture productivity without improving rural road network we could not achieve improvement in the agriculture production. The questionnaire survey conducted in three villages, each in Madurandagam and Uthiramerur Taluk, the result clearly show the current situation of rural roads is not appreciable. But more than 60% of people still believe the government maintenance is good in compared with private maintenance. It is right time that government must take appropriate action to keep the belief of people. In survey 77% of people the present maintenance system. Government should setup Technical committee to modify the maintenance method want to change.

We know that the agriculture productivity is directly proportional to water resource. In the survey, result show the 49% of people want to improve the Rain water Harvesting system. The questionnaire survey shows that the other major problem faced by farmers is low market rate for their agriculture product 42% of people registered their worries. Governments should take appropriate policy decision to purchase all agriculture production from farmers more than present market value. 82% of people feel that the government should provide more attention to improve the agriculture, so the present contribution of government in the agriculture field not fulfils the people expectation. 37% of people lost their belief on government for the present road maintenance approach. Hence the government should take absolute action to keep and increase the people trust on government.

Road density plays main role in the agriculture productivity. In this project the road density of Madurandagam and Uthiramerur was found and compared with the average agriculture productivity of the respective taluk. In the comparison analysis we find the more density of road give more production. Uthiramerur taluk road density is 1.56 which is greater than National average road density of 1.25 km/sq.km and slightly more to state average road density of 1.41 km/sq.km. In Madurandagam taluk road density 1.72 is greater than 0.47 km of national average and 0.31 km greater than the State average. Compare to Uthiramerur taluk Madurandagam road density 10.25% greater in position.

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