

## **The Development of Rural Road Transport Network in Baraka-Enrekang Regency, South Sulawesi-Indonesia**

Non Magdalena Rachman<sup>1</sup>, M. Yamin Jinca<sup>2</sup>, Rosady Mulyadi<sup>3</sup>

<sup>1</sup>Postgraduate Student, Master Engineering of Infrastructure Planning, Hasanuddin University <sup>2</sup>Professor, for Infrastructure and Transportation Planning, Hasanuddin University

<sup>3</sup>Lecturer, Department of Architecture, Hasanuddin University Makassar-Indonesia,  
Corresponding Author: Non Magdalena Rachman

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**Abstract:** A good road transport system stimulates to improve of movements to improve accessibility and inter-regional mobility. This research aims to determine the potential of the region, the priority of road infrastructure and concept of rural road transport network development of farming product for distribution of potential areas in Baraka-Enrekang Regency. This research is a qualitative and quantitative descriptive, research using Location Quotation (LQ) and Destination Matrix Analysis (DMA) to determine road transport network and development strategy. Development of road transport network based on accessibility index and mobility is still low, Baraka Sub-district is a fast growing and potential area in agropolitan-based agriculture sector which has been supplying its superior commodities to various regions both regional and national scale, to support the availability of adequate facilities and road infrastructure, should be upgraded its construction and addition of road capacity.

**Keywords:** Agropolitan, Rural Transport, Farm Road, Agricultural Production

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### **I. Introduction**

Transportation is very important in the development of a region. A good road transport network will stimulate the rise of population movement to conduct socio-economic activities. The availability of various types of infrastructure and means of transportation is one of convenience and convenience for the population and plays an important role in the distribution of potential commodities [1,2]. Transportation infrastructure should be able to provide broad benefits and impacts, both accessibility and mobility for basic needs services as well as ease of movement of people, goods and services that are easy to achieve, fast and cheap to support the community economy. Transportation services are one of the input factors of production, trade, agriculture and other uses [3,4].

Baraka Sub-district is a fast growing area, consisting of fifteen villages and sub-districts, population density of 140 people/km<sup>2</sup>, percentage of paddy field 8% and non-rice field 92%. Baraka market and Banti are the centers of trade nodes [5]. The existence of agriculture, plantation, animal husbandry, mining and tourism sector is expected to become the driving force of regional economy.

The condition of the main roads in the subdistrict should be considered in order to support the smooth flow of land transportation, from the fifteen villages and sub-districts in Baraka sub-district, there are several villages covered with long travel time and high cost to transport the crops to the collector. Therefore, it is necessary to research the concept of development of rural road network of farming to improve accessibility and mobility in distribution of potential of village.

### **II. Methods**

This research is classified as non-experimental, qualitative and quantitative descriptive[4], aimed to describe the condition, desire and symptom of the society, by identifying the availability and need of infrastructure and transportation facilities and socio-economic condition of society, and conducted in five twelve villages and sub-districts within the sub-district of Baraka.

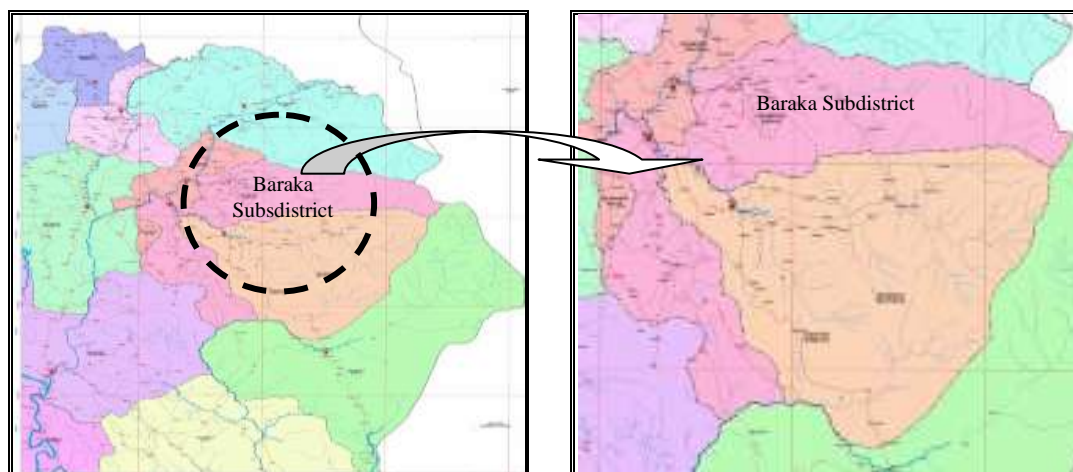


Figure 1. Baraka Subdistrict in Enrekang

The sampling technique was done randomly. The respondent is the head of the family who lives in the Baraka sub-district with a livelihood as a farmer, breeder, trader, civil servant, police or military, self-employed and others according to the conditions of the local community.

### III. Results

#### Regional Potential and Development of Road Network

Based on the potential and natural conditions including the highlands with the local community *teknokultur*. Commodities of cultivation of food crops, horticulture and plantation sector become the leading sectors in supporting strategic areas of economic growth. This sector has contributed to the economy locally, regionally and nationally. Based on the analysis of Location Quotion (LQ) indicates that LQ 'more than' 1, so it becomes the base sector, as in Table 1.

Table 1. Central production (LQ> 1) types of food crops, horticulture and plantations

No.	Village	Crops Production base	Horticultural Crops Production base	Plantation crops Production base
1	Baraka	Corn	onion	cocoa, pepper
2	Balla	Rice, Sweet Potatoes	Onion, chili	cocoa, pepper
3	Tomenawa	Corn	Onion, chili	cocoa, pepper
4	Bontongan	Corn, Sweet Potatoes	Chili	cocoa, pepper, clove
5	Parinding	Rice	Onion, cabbage	Cocoa
6	Banti	Rice, Peanut, Cassava	Onion, chili	Cocoa
7	Janggurara	Peanut, Sweet Potatoes	Tomato	Cocoa, pepper
8	Kadingeh	Rice, Sweet Potatoes	Cabbage, tomato	pepper
9	Perangian	Corn, Peanut	Cabbage, chili	Clove
10	Pandung Batu	Corn, Cassava, Sweet Potatoes	Onion, cabbage	Coffee
11	Tiro Wali	Rice, Cassava, Sweet Potatoes	Chili, salad	cocoa, pepper, clove
12	Salukanan	Rice	Cabbage, salad	Clove
13	Pepandangan	Corn	Cabbage	Coffee, clove
14	Kendengan	Rice, Peanut	Cabbage, Chili, tomato	Coffee
15	Bone-Bone	Corn, Peanut, Cassava	Onion, cabbage, Chili, tomato	Coffee

Source: Results of the Analysis of References[6].

The crops planted, horticulture and plantation commodities produced by this region have become a nationally consumptive need, traded between islands, and between provinces in the South Island. Production of wetland paddy species in Kendenan and Salukanan villages specifically for red glutinous rice under the name of *Beras Pulu Mandoti*. Particularly in Bone-Bone Village, Arabica Bone-Bone coffee production is a home industry production that smells and flavor is very unique because it is planted in Cigarette Sign Area (CSA).

Limited human resources (HR) becomes an obstacle in the development of the region. The population density of Baraka sub-district is 140 peoples per km<sup>2</sup>, the dominant occupation type is farmers, 43% own 1 hectare up to 2 hectares farmland and 41% have less than 1 hectare resistant. The distance of the resident's house to the workplace of the 48% farmland is 2-4 km, 32% is less than 2 km, is 4-6 km 17% and is 6-8 km 3%.

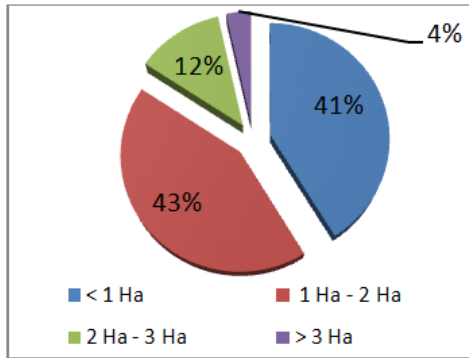


Figure 2. Area of Agricultural Land

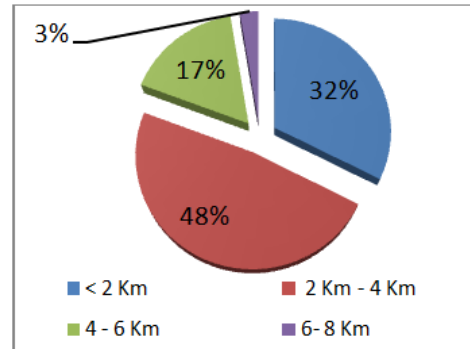


Figure 3. Distance of the population with the farmland

The availability of regional transportation services is not yet equitable and affordable. The development of road infrastructure is crucial to the smooth movement and marketing of commodity products, assisting the distribution of necessities that can not be produced by itself, and reaching the production centers [7,8,9] without adequate road infrastructure, commodities produced by the community can not have high economic value and affect the cost of transport of people and goods high to the market, and risk factors for commodity damage, vegetables decompose due to the late sale to the market[10]. The result is that the production of agricultural land is not yet optimal because the cost of production and transport costs is relatively high, unbalanced by the selling value of farmers.

#### Priority of Road Network Development

Strong-weak interaction and the potential of natural resources between regions seen from the availability of infrastructure and transportation facilities that serve the movement of the population and goods [7,11]. The results show that network development roads based on the accessibility and mobility index found that there were seven villages and sub-villages with low accessibility, indicating that the qualitative and quantity of road length and road surface conditions were not yet able to serve the accessibility needs and mobility of the community.

Inadequate conditions of infrastructure and transportation facilities are a major cause of the lack of marketing of natural resource commodities. Similarly, the current movement of people between regions and factors of inadequate road network infrastructure that suffered a lot of damage to every village. The transport of agricultural commodities, plantations and other goods from the production centers to the village road axis only uses modified motorcycles on the road of farming or village roads that are less than 2 meters wide with an average speed of 20-40 km/hour or transported manually and so on. Through dirt roads and gravel so it takes a long time and expensive transportation costs. Farmers and traders feel the condition of damaged roads to transport and sell agricultural produce and plantations. This is related to transportation limitations down to the village axis either towards the capital district or to the district capital. In addition to the availability of infrastructure and means of transportation in a region, it should also be considered infrastructure and other supporting facilities such as economic, social and most.



Figure 4. Motor vehicle trail modification

### **The Concept of Rural Road Network Development**

The interaction of the movement of people and goods within the sub-district shows that the highest movement occurs in Baraka Village because there are markets, educational and health facilities as well as the capital of the sub-districts as the center for collecting the products of fourteen villages and sub-districts, before being distributed to other sub-districts, to central districts and other districts even distributed among provinces.

The rural road network that is developed is the farm road is preferred in the area of rice fields and plantations are relatively fertile topographically plains and mountains that allow a variety of agricultural and plantation commodities can be developed, the development of farm roads directed to reach untapped land that has not been processed due to accessibility constraints on the availability of rural transportation infrastructure[12].

The location of scattered farming roads is a productive center for agricultural production requiring the development of a farm road network illustrated in Table 2. The development of farm roads at production centers in some areas can replace human transport means and modified transport vehicles from agricultural land to road axles through trucking that can contain large-scale agricultural products.

**Table 2.** The concept of rural road network development

No.	The concept of Road network development	Description
1	Development of road infrastructure	<ul style="list-style-type: none"><li>• Road pavement structure improved</li><li>• Status of the road changed, the road is still a hamlet road is converted into a village road, and so on</li><li>• Repair damaged roads</li></ul>
2	Road improvement	<ul style="list-style-type: none"><li>• Added road width on village road</li><li>• Increase the type of pavement from the pavement to the pavement or sirtu road to the asphalt/concrete road</li></ul>
3	Accessibility	<ul style="list-style-type: none"><li>• The addition of village transportation and urban transport</li><li>• The existence of additional public facilities such as terminal, Community Health Center Assistant and others</li><li>• The addition of farm roads on possible land points</li></ul>

**Source:** Results of the Analysis of References [13,14]

### **IV. Discussion**

The development of farm roads at each production center in Baraka sub-district is required in transporting production facilities to agricultural land and transporting agricultural products from the field to temporary collection sites of perishable agricultural products that should be handled properly, true and cautious, so that quality degradation and loss of results can be avoided.

The condition of the existing farm road in Baraka Sub-district is damaged by rigans and heavily damaged by the type of 1 meter wide concrete road surface, telford road and dirt road with hilly topographic/mountainous conditions of about 500-1000 to  $\geq 1,000$  meters above sea level, and if it rains down telford roads and soil roads are so slippery that disconnected access to distribution and mobility of the community, serious handling is needed to facilitate the transportation of agricultural products. Improvement of farm road from land to telford road and concrete road is necessary to facilitate the transportation of agricultural products and plantations.

The realization of Baraka Village as a collecting and distribution center of fourteen other villages and sub-districts requires a priority policy to improve the village road network, the path of agricultural production by developing in accordance with the priority of urgency and financing constraints. Improving roads will support the distribution of production products from villages and sub-districts to collecting centers that ultimately increase the income and welfare of rural communities, increasing community accessibility to service centers, economic activity, education, health is a form of rural community in Enrekang, South Sulawesi, Indonesia.

### **V. Conclusions and Recommendations**

Agricultural and plantation products is very potential as the central commodities of food crops, horticulture and plantation and demand generated for rural transportation, and requires the development of farm road Infrastructure. Based on the index of accessibility and mobility as well as the economic potential and the region's superior are the centers of agricultural production and plantations that require distribution to the commodity market area is indispensable to the community. The concept of road network development is directed to increasing the pavement of roads into road construction as well as capacity expansion by widening roads according to norms, standards, guidelines and criteria.

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