

PERSPECTIVES FOR RURAL ROAD DEVELOPMENT IN RELATION TO CURRENT NATIONAL PROJECTS

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The final goal of development is the improvement in all sectors of human welfare. This can be achieved by providing increasing opportunities for human participation in development programmes. In the less developed countries a high proportion of the people live in rural areas and it is as much as 80% in Sri Lanka. The rural areas however lack good housing, social and health services and specially public utilities like roads, water supply, electricity and sewerage disposal. Sri Lanka is attempting to use its physical and human resources for promoting activities in the rural areas in order to improve the income levels and living conditions and make the people effectively participate in the socio-economic development of the nation as a whole.

During the last so many years investments have been made in developing agricultural settlements based on restorations of ancient 'tanks' and river diversion schemes. These projects, the growth of small-sized towns, cheap travel and welfare services have helped to contain the rural folk in such areas. New land reforms, the integrated development of river basins are all tending towards rural migration. These economic and social developments activate an increasing incidence of personal travel. But Public Transport in the rural sector is sometimes the only mode of travel. It is not only a means of person movement but also a means of moving commodities from farm to market. There are other competing forms of intermediate transport namely lorries, converted buses, vans and tractors. However the overall ratio of buses per 1000 of the population is still less than half that in the developed countries where the main mode of mobility is the car. Hence the demand for varied types of transport is large.

We are facing a serious basic problem and the need therefore for study and research now is greater than ever before. What is this problem? *It is that two-thirds of our people continue to live on one-third of the land while the other two-thirds of the land capable of development continues to be sparsely populated by one-third of the population.* Most of the highways, railways, port facilities, airports, development areas, new industries are concentrated in one-third portion of the country. The other two-thirds of the land comprising of a large proportion of the rural sector contain three major river basins development schemes undertaken by the government in recent times—namely: the Gal Oya Basin Development, the Walawe Basin Development and the Mahaweli Basin Development. In these areas we know very little of the relationship of traffic generation, travel characteristics of passengers who go to work, to shop, to market, etc., in relation to their socio-economic conditions. We know still less of how accessibility affects the welfare and service facilities already provided. The bullock cart is still being used in a large measure by certain ethnic groups even in the so-called developed areas, the two-wheeled tractor and the bicycle are used both for

person as well as goods transport. It would be useful to know when rural folk change from one mode to another, from walking to cycling, to use of intermediate transport or the alternative of public transport in terms of his income growth. The development of these river basins will make a most significant contribution to the economy of the country. These schemes will provide both large-scale employment to about a million people as well as make the country self-sufficient in its food requirements.

The Study Areas

2.1 General

The recorded history of our country dates back to the 6th century B.C. when a prince from India, Vijaya, landed in this country. He is said to have found the primitive peoples engaged in agricultural pursuits supported by a rudimentary system of irrigation. From there onwards, human settlements developed. This ancient civilization was entirely dependent on agriculture and irrigation became a pre-occupation of these people. The early immigrants settled along the coastal belt and in the north and easterly region known as the dry zone. This area received water from the North-East monsoon for only four months of the year. With increasing populations and the need to have adequate sources of water for paddy cultivation they began to pay greater attention to water storage. They adopted two methods of storage.

- (a) forming embankments on the upper reaches of the river valleys.
- (b) constructing causeways and anicuts across large rivers, diverting water into excavated channels and conveying them for many miles into large reservoirs.

The people developed high skills in the science of irrigation. The high level of the development of this technology can be seen from one such work known as the Jaya Ganga. This is a trans-basin diversion canal which conveys water for 57 miles. It has a gradient of half a foot per mile for the first 17 miles and an average of one foot per mile for the entire length.

This early civilization came to an end by the 12th and 13th centuries due to internal wars, foreign invasion and diseases. The Portuguese arrived in the island in the 16th century and the Dutch in the 17th and 18th centuries. They engaged themselves in trade in spices, gems, etc., and occupied the maritime areas. The British came in the 19th century and after complete occupation of the country developed an extensive plantation economy in coffee, tea, and rubber and an infrastructure of roads, railways and ports. They restored some of the ancient irrigation works. New construction however commenced immediately after obtaining independence in 1948.

2.2 Gal Oya Development Area

The Gal Oya Scheme was conceived as a multi-purpose project and to provide for irrigation facilities to 120,000 acres of new land which could be double-cropped during an year and also to protect the area from seasonal floods. The work was done by an American Firm in 1949 - 1951 using high technology.

The first colonists were settled in 1950/51 consisting of 296 families displaced from villages. During the next 15 years 12000 families were settled in new village units. They were allotted 4 acres of irrigated paddy land and 3 acres of highland. In 1953 these were reduced to 3 acres of paddy and 2 acres of highland and still later to 2 acres and 1 acres respectively. Paddy and sugarcane were the main crops grown. Hydro-power was generated with an installed capacity of 10 M.W. and served several industries like brick and tile factories, woodworking complex, workshops and paddy mills.

2.3 Walawe Basin Development

The Walawe Ganga (river) rises in the central hill country of the Adam's Peak range 7,000 ft. above sea level. It traverses in its course low-lying plains covering an area of about 500 sq. miles out of a total of 954 sq. miles of the total basin before discharging in the sea in the South. To the east of this river lies the so-called "dry zone" and to the west the "wet zone" where the rivers are perennial.

The Walawe Project was designed to cover 60,000 acres of new land on both banks of the river. Originally the settlers were to be given an 5 acre unit—2½ acres of irrigated land, 2 acres of highland and a half acre for a homestead. This was later reduced to 2½ acres per family from which it was expected to obtain a net annual income of Rs. 5,000/- for a two season cultivation.

The first phase of development brought 27,500 acres of new land under irrigated cultivation. Paddy, cotton and subsidiary food crops were grown on the right bank and 8,000 peasants were settled. A youth settlement scheme was established with 2,000 acres laid off for subsidiary food crops.

The next phase of the project scheduled for development during 1977-87 envisages the cultivation of sugarcane on 15,000 acres, cotton on 15,000 acres and paddy on 3,000 acres, all on the left bank of the river. A total of 6,000 farmer families are to be settled during a 5 year period. The estimated cost of the left bank programme is Rs. 120 million. The cost of the first phase including headworks, left and right banks main channels and the whole of the right bank system is Rs. 600 million.

2.4 Mahaweli Ganga (River) Basin Development

Like most of the other rivers, the Mahaweli river rises in the Central Adam's Peak range 7,000 ft. above sea level and flows northwards towards Kandy. After encircling

this hill-capital it flows southwards and then to the sea across the vast plains of the north-eastern dry zone and discharges to the sea close to the famous port of Trincomalee.

The Mahaweli Basin encompasses 4,030 sq. miles out of the 25,000 sq. miles area of the island. The Mahaweli river is said to discharge approximately 1/4 of the total flow of all the rivers—a 7 million acre feet of water. This basin has been exploited in ancient times by a network of anicuts and canals.

A Master Plan was prepared between 1965/68 by a UNDP/FAO team in collaboration with Sri Lanka experts for the multi-purpose development of the land and water resources of Mahaweli and the adjacent river basins. The estimated cost (1968) was Rs. 6,700 million and the works were to spread over a period of 30 years. Of the total 7 million acre feet, 4.7 million acre feet were to be utilized for irrigating 900,000 acres. The area of 250,000 acres presently cultivated during one season was to be supplied with water for double cropping, while 650,000 of new land were to be brought under cultivation. Maximum use is to be made of the existing large and medium-sized ancient storage reservoirs in the area. This water is to be supplied by storage reservoirs. A diversion tunnel has brought water to 132,000 acres of existing land under major and medium-scale irrigation projects.

The Master Plan also envisages the installation of several new hydro-power plants with an installed capacity of 500 M.W. for producing 2,000 KWH of energy annually. Several flood control measures are also to be brought into play.

Owing to the enormity of the scheme it has been divided into three phases and each phase into several stages. Phase I of the project is divided into 3 stages, Stage I to benefit 132,000 acres of existing cultivated land, Stage II for 71,000 acres with 28,000 families to be settled and Stage III, 20,000 acres of new land.

The 650,000 acres of new land are to be settled on the basis of 2½ acres per family. This will mean that nearly 260,000 families representing a million people will have to be settled. The construction and development works are to be accelerated to be completed within the next five years in order to provide employment to a million people and make the country self-sufficient in food

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SRI LANKA

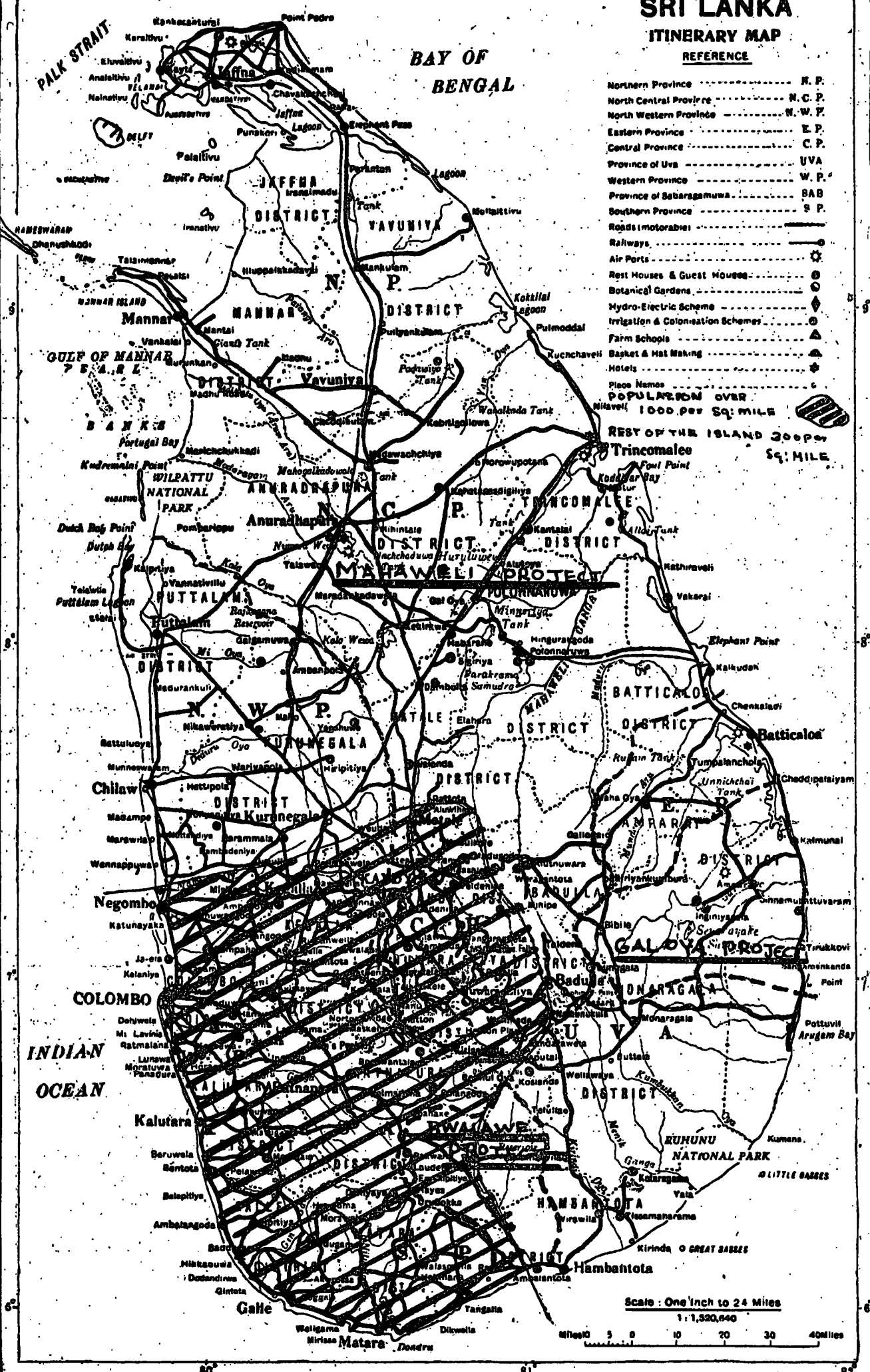
ITINERARY MAP

REFERENCE

Northern Province	N. P.
North Central Province	N. C. P.
North Western Province	N. W. P.
Eastern Province	E. P.
Central Province	C. P.
Province of Uva	UVA
Western Province	W. P.
Province of Sabaragamuwa	SAB
Southern Province	S. P.

Roads (motorable)	—
Railways	—
Air Ports	✈
Rest Houses & Guest Houses	○
Botanical Gardens	○
Hydro-Electric Scheme	—
Irrigation & Colonisation Schemes	—
Farm Schools	△
Basket & Mat Making	△
Hotels	✳
Place Names	•
POPULATION OVER 1000 per SQ. MILE	—

REST OF THE ISLAND 3000 per SQ. MILE



Scale: One inch to 24 Miles
1:1,520,640

Miles 0 10 20 30 40

supplies. The revised cost of the works is estimated to exceed to Rs. 20,000 million. The whole scheme has been divided into 12 independently workable schemes. International agencies are to be brought in to expedite work.

With this intensified construction programme there will be vast problems of human settlement. The people will have to be provided with the necessary infrastructural back-up services if the expected productivity is to be obtained within the near future. By the end of 1976 about 2,000 families have been settled on 6,000 acres of newly developed land. Up to the end of April 1977 another 2,000 have been allotted land. The Mahaweli project is thus entering an important phase in its development—that of human settlements. These settlements are being developed on the cluster concept to generate integration and provide cohesiveness. It is expected that these units will increase production, provide effective leadership and initiative and make self management of communities the goal.

3. Research

3.1 Areas and Problems

The foregoing description and the accompanying maps will show that the three regions have differing topographical, climatic, demographic, cultural and traffic patterns. Each of these areas has its own problems and studies are necessary as the results will have implications on regional planning, land settlement, public passenger transport, provision of welfare and extension work.

We need to plan and construct in each area—

1. Access road to new settlements.
2. Feeder roads to markets, towns to fit the existing network using low cost construction techniques.

The Gal Oya and Walawe projects have been in operation for several years and somewhat developed in a sense. Yet we need to construct these roads as pilot and demonstration projects and to monitor their performance on two aspects.

1. Engineering performance
2. Socio-economic impacts

In the planning sphere we need to find answers to questions such as "what are the transport needs of the area? What type of transport system is best suited to the developing regions?

The bullock cart is still a significant factor in goods transport in certain areas. The two-wheeled tractor has been modified for multiple transport functions. There is increasing use of bicycles both for person as well as for certain types of goods transport. Public transport is presently concentrated chiefly on the main roads. Intermediate forms of transport are developing, the converted buses, vans and tractors. The family unit seems to be the more dominant factor in determining journeys to work, for social and cultural purposes. This is important especially in the Mahaweli region where the cluster pattern of

settlement is being adopted to provide for cohesiveness and integration. This has generally been the traditional type of village development. Nevertheless with the younger generation in some new settlement there appears to be preference for isolation.

What factors should be considered in planning the rural road system? To what standards of design and levels of service taking the state of the economy into consideration? These roads are not only meant to be catalytic in increasing productivity, to create a surplus from the primitive economy and provide employment opportunities but to take cognisance of human activities, social needs access to educational, cultural and administrative centres. These will help to contain the rural folk in such areas and mitigate the drift to urban areas and improve their quality of living.

How would these roads fit into the National Highway network? While the rural roads will stimulate agricultural productivity and provide the needed mobility to the farmer it is essential to build new routes and strengthen the existing network to provide for the transport of surpluses to densely populated areas and possible export markets. The market towns and the new towns planned in these regions will have to be connected to other growth centres. The feeder network has therefore to be integrated carefully, into the highway system. We have at this stage to carefully consider the functions of the railway on the development of the transport system.

3.2 A Research Programme

The provision of low cost roads will be in isolated areas for the present with little or no traffic and few settlements. The traffic volumes may range from 50-100 v.p.d. Nevertheless they will soon be connected to activity centres. The social and economic impacts of such roads are not always readily quantifiable. In future selection procedures it will be most useful to have a knowledge of any such measures so that in allocating funds we would know where, when, and in what amounts to use them. Monitoring such roads over a period in varied topographical, climatic and living conditions will make us more knowledgeable so as to enable us to evaluate the engineering and socio-economic performance.

It is suggested that for a collaborative programme—

1. Delineate the likely problem areas within the rural settlement sections where rural road planning requires additional research.
2. Identify specific projects.
3. Construct as pilot and demonstration projects:
 - (a) Access roads to settlements,
 - (b) Feeder roads to market-towns in varied topographic and climatic conditions.
4. Draw up a programme for monitoring:
 - (a) Engineering performance with regard to varied construction technology, productivity of work units, pavement designs, materials used, effects of compaction, drainage and axle loading, frequency of maintenance (rate of deterioration of the pavement).

