

REGIONAL DEVELOPMENT APPROACHES IN THE DRY ZONE OF SRI LANKA: SOME OBSERVATIONS ON THE MAHAWELI DEVELOPMENT PROJECT

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Introduction

From the early years of this century, the development of the Dry Zone was among the favoured strategies adopted to foster social and economic growth in the country. The share of capital invested for the development of agriculture and irrigation by successive governments has always been high and exceeded 44 per cent of total government expenditure in the period 1979–1985. (Colombage and Karunaratne 1986). Early attempts to develop the Dry Zone took the form of government-aided colonization established under restored irrigation schemes (Farmer 1956, Eilman 1976, Fonseka 1963, Peiris 1989). Later, settlements were established under multi-purpose river valley development projects where emphasis was given to power generation as well as to the diversification of economic activities to include manufacturing and service functions (e.g. Gal Oya, Uda Walawe, Lunugamwehera, and Inginimitiya river valley development projects). Here, too, traditional paddy-based agriculture persisted as the main economic activity. The Mahaweli Development Programme, the latest project aimed at the development of the Dry Zone, is the largest and the most ambitious venture and involves a massive development effort encompassing a large segment of the northern Dry Zone (Master plan of the Mahaweli Development Project 1969, Accelerated Mahaweli Development programme 1977, Karunathilaka 1988). See Fig.1.

The Mahaweli Development Project: The Conceptual Background.

Unlike in previous development planning of agricultural settlements, the Mahaweli Development Project adopted a comprehensive planning approach based on modern regional development planning concepts that have been tried out in other Third World contexts. This planning approach has made use of theories and concepts including 'River valley Development' (Tennessee Valley Development Project 1938), the 'Growth Centre Strategy' (Perroux 1955, Boudeville 1966, Hansen 1976, Kuklinski 1973), the 'Central place Theory' (Galpin 1915, Christaller 1933, Lošch 1940, Johnson 1970, King 1984) and the concept of 'Agropolitan Development' (Friedmann and Weaver 1979).

In Sri Lanka, river basin development such as the development of the Galoya valley and the Uda Walawe basin, was the next stage of evolution of the old colonization schemes. At that stage, river basins were adopted as the unit for development planning as against the earlier 'colony' which was then the unit of development. River basin development planning followed the concepts evolved for the Tennessee Valley Authority Project of the USA which was replicated in other river basin development programmes attempted elsewhere. In these, the significant feature was that an entire river basin was considered as an independent unit for purposes of development planning.

The Growth Centre Strategy, where the development of a region is attempted through the establishment of leading industries that induce overall economic and social growth, does not appear to have made much of an impact on the Dry Zone planning

process. The establishment of some leading industries such as sugar, distilleries, paper and tile manufacturing may be seen as an embryonic stage of Growth Centre based development. However, these industries did not lead to extensive development of surrounding regions but, at best, were able to survive merely as 'enclaves' of economic growth.

The Mahaweli Development Project, which was initiated in the early seventies and witnessed an accelerated development after 1977, was based on economic growth through agricultural settlement supported by a service delivery system dependent on a hierarchy of strategically established central places (Mendis 1982, Dayaratne 1986, Harischandra 1989). This strategy followed the ideas embodied in the Central Place Theory. Central Places, by providing the necessary basic needs to the surrounding agricultural population, were expected to generate a dynamism within the region as a whole by the activation of rural-urban relationships and by establishing linkages both at the regional and national levels.

But the Mahaweli Development Project may also be seen as something more than an attempt to develop the Dry Zone through the hierarchical development of central places. It appears to have some resemblance to the concept of Agropolitan Development (territorial integration), an idea which was prevalent among regional development planners for sometime and enunciated by Friedmann and Weaver (1979) as an appropriate development procedure for Asian agricultural economies. The basic premise of this approach is the balanced urban-rural development of predominantly agricultural regions. Such a balanced development is achieved through the maximum use of resources available within the region. Popular participation in this process also enhances regional self-reliance.

The Objectives of the Mahaweli Development Project.

The main objective of the Mahaweli Development project may be described as an attempt to minimize the weaknesses of the earlier development efforts. Specifically, the Mahaweli Development Project recognized, among others, the need for more integrated policies of rural development that included the promotion of non-agricultural activities to generate income and employment, the development of rural towns, provision of social services and encouragement of peoples' participation in decision-making concerning development (Mahaweli Reports).

The Purpose of the Present study

An attempt has been made in the past two years to investigate the success of the project in achieving the above objectives of regional development, with specific emphasis on

1. The changes in agricultural productivity.
2. The effectiveness of the service delivery system.
3. The growth of Mahaweli townships.
4. Expansion in non-agricultural activities.
5. Implications of population growth.

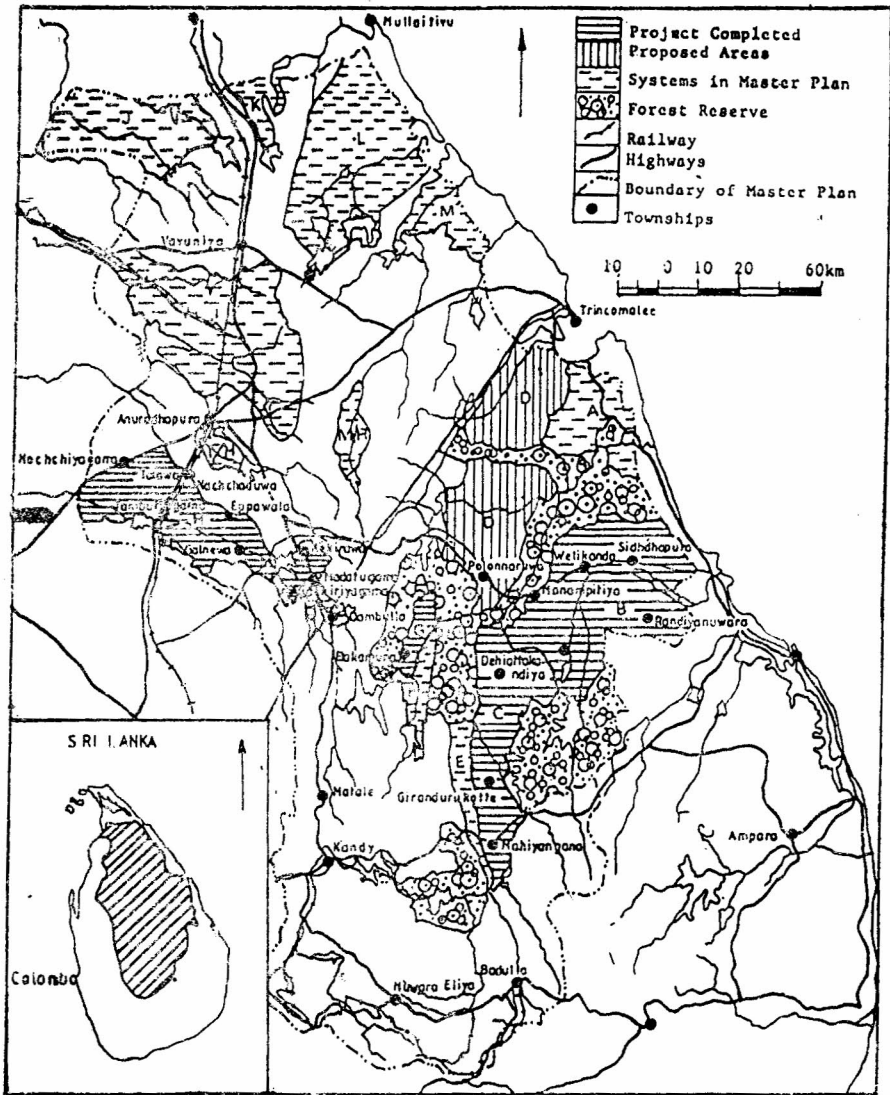


Fig. 1 Mahaweli Development Project (Irrigation and Settlement Systems)

The investigations were conducted mainly in systems 'H' and 'C' of the Mahaweli Project and in an old colonization scheme - the Mahakanaderawa Scheme - for comparison. Some preliminary investigations were also carried out in the Upper Mahaweli area relating to the service centres there.

Mahaweli Development Project

Under the Mahaweli Development Scheme considerable extents of land have been opened up in the downstream areas in systems B (Left Bank), C, G and H, for the settlement of farm families and agricultural development. The total irrigable area under these schemes at the end of 1990 was 92,140 hectares which would allow the settlement of 87,613 farmer families. However, at the end of that year, only 56,716 farmer families had been settled and more families have still to be settled especially in systems 'B' and 'C'. These Mahaweli lands (together with system 'L' which is being upgraded and the Uda Walawe which is being managed by the Mahaweli Authority) produced about 17 per cent of the country's paddy harvest in addition to producing a substantial share of several subsidiary food crops. The share of production of paddy and of other crops would increase progressively with the expansion of land settlement and development of agriculture in other areas of the scheme.

Mahaweli Scheme, apart from the hydro-power development component, is largely a scheme for the settlement of farm families in new, planned settlements. It anticipates both rural and urban development based on high agricultural productivity and the expansion of secondary and tertiary activities within the region. Land development and settlement of families is the first step which would lead to the progressive growth of these areas. The planning aspect of agricultural settlements has therefore received a great deal of attention, more so than was the case with early colonization schemes.

In the Mahaweli Scheme, each farm family received $2\frac{1}{2}$ acres of irrigated low land for paddy cultivation and $\frac{1}{2}$ acre of highland as a homestead garden unit. Homesteads are located in village settlements while the paddy lands lie alongside the irrigation channels to receive constant supplies of water in both *yala* and *maha* seasons. In addition, some land has been alienated in $\frac{1}{3}$ acre lots to the non-farm category of settlers engaged in various activities. The extent of land distribution among the farm and non-farm families in some of the Mahaweli systems is shown below (Table 1, Land settlement in Mahaweli Schemes).

Table: 1. Land Settlement in Mahaweli Schemes (Upto End of September 1990)

PROJECT	Unit	FARMER FAMILIES				Percentage of Project Target	OTHERS		TOTAL
		Target Farmer Families	Progress Upto End 1989	Progress Within 1990 (Jan-Sep)	Cumulative Progress Upto 30.09.1990		Non-Farmers Families Upto 30.09.1990	Sub-Families Upto 30.09.1990	Selected Families 30.09.1990
Settlement of Families									
System B (Left Bank)	Nos.	22,703	11,106	779	11,885	52	411	1,719	14,015
System B (Right Bank)	Nos.	13,347	0		0				0
System C	Nos.	23,400	15,376	803	16,179	69	841	1,245	18,765
System G	Nos.	4,230	3,984		3,984	94			3,984
System H	Nos.	23,678	23,678		23,356	99	7,616		30,972
System L	Nos.	3,364	3,364		3,364	100			3,364
Uda Walawe	Nos.	32,562	21,075	2,193	23,268	71	3,979		27,246
Upper Mahaweli Re-Settlement	Nos.	5,502	5,364		5,364	97			5,364
Sub Total	Nos.	128,686	83,625	3,775	87,400	68	12,647	2,964	103,211

- Project deferred.

- 6,172 Encroachers including 3,979 Non - farmers have been regularized upto April 1989 and another 5,315 remain to be regularized.

(Source : Monthly Progress Reports, Planning and Monitoring Unit, Mahaweli Authority of Sri Lanka)

Agriculture in the Mahaweli Settlements.

Mahaweli settlements, like all other colonization schemes of the Dry Zone, are designed primarily for the production of paddy and appear to conform to the old concept of the 'preservation of the peasantry' as individual, self-sufficient farm families. The holdings at the time of settlement appear to be able to yield an income adequate to provide a reasonable level of living compared to other parts of the Dry Zone. Recent yield data (Table 2) show that per acre production of paddy in the Mahaweli areas is substantially higher than the national average. System 'H' is the most productive, accounting for 61 per cent of the total paddy production of the Mahaweli scheme. Contribution from System 'C' is lower and in this area the yields are the lowest among the Mahaweli systems. However, even here, the yield is higher than the national average. System 'C' is still in its early stages of development and the yields may go up with the passage of time.

Table 2. Yield of Paddy in the Mahaweli Systems Maha 1990/91.

System	Average Yield/Bushels per Acre.
H	91.88
B	104.98
C	83.85
G	106.36
Uda Walawe	98.77
Mahaweli Average	91.98
National Average	69.54

(Source : Mahaweli Economic Agency)

Mahaweli areas also contribute significantly to subsidiary food crop production of the country (Table 3). In the production of subsidiary crops, system 'H' leads all others with an output of 91 per cent of chillies, 81 per cent of cowpea, 95 per cent of black gram, 74% of red onions and 94 per cent of B onions. In terms of value, the subsidiary food crop production of system 'H', accounts for 77.6 per cent of that of the Mahaweli area while system 'C' contributes only 3.76 per cent.

The data from field surveys conducted in Systems 'H' and 'C' (Table 4) broadly confirms the patterns suggested by official data. Field data were similar in respect of average yields of paddy in systems 'H' and 'C' for the year 1990/91 though there was considerable variation in yields within settlements and between the two systems. The average yield of paddy per acre according to the field survey was 83.13 bushels

Table 3: Agricultural Performance - Paddy & Other Field Crops. Summary: Mahaweli Projects - System B C. G. & H

Month Ended February 1991

CROP	90 YALA			90/91 MAHA S		91 YALA	
	Extent cult ha	Production mT*	Value Rs.thous	Target ha	Extent cult Est: ha	Product mT*	Plan Extent ha
Paddy	32,270	111,191	722,738	62,205	58,805	273,399	33,920
Chillie	9,942	13,351	734,305	1,314	641	442	8,538
Cowpea	443	613	9,105	410	531	460	1,001
Green Gram	1,209	2,007	40,140	335	210	136	1,721
Black Gram	58	53	1,020	48	6	6	259
Maize	9	32	126	2,206	4,102	7,097	—
Soya Bean	211	227	2,270	151	28	21	1,168
Redonion	80	723	6,507	105	15	144	447
B-onion	750	6,770	98,070	14	1	6	1,412
Ground Nut	432	882	7,938	86	81	96	944
Gingelly	3	2	24	0	1	1	358
Vegetables	838	4,526	18,104	805	390	1,736	604
Gherkin	70	504	7,560	60	0	0	73
Other	30	0	0	252	99	45	—
Total	14,075	29,690	925,169	5,786	2,582	10,190	16,525

* -- Estimated production S--- Provisional mT— Metric tons
(Source: Monthly Progress Reports, planning and Monitoring Unit, Mahaweli Authority of Sri Lanka.)

Table 4: Field Survey Data on Average Yield of Paddy in Selected Hamlets of Mahaweli-1990/91 Maha season

Hamlet	System C		Hamlet	System H	
	Total Yield Bushels	Bushels per Acre		Total Yield Bushels	Bushels per Acre
Wevamedagama	135.0	54.0	Maliyadevapura	196.0	78.4
Ihalagama	160.3	64.1	Telhiriyawa	211.5	84.6
Salpitiyagama	117.8	47.1	Botalayagama	215.8	86.4
Average	137.7	55.1		207.8	83.13

(Source : Field Survey)

for system 'H' as against 91.8 given officially (Table 2). While it is difficult to arrive at definite conclusions relating to the yield of subsidiary crop production, field data for the 'C' area were lower than those available officially. Unlike in paddy, there was considerable difficulty in getting reasonably accurate information on amounts of production of subsidiary crops and it is possible that there is some under-reporting.

In System 'C' there was greater variation in the yield of paddy. According to the field data for Maha 1990/91, yields varied from 250 bushels to 38 bushels among paddy holdings. The higher yields were not uncommon but the lowest yields were caused by specific factors affecting some holdings and may be disregarded as being unusual. Even so, the information is that the average yields in System 'C' are lower than in System 'H'. This is in agreement with the official data given in Table 2. Field data on subsidiary food crops in System 'C' are not sufficiently detailed but the indications were that subsidiary crops do not contribute much to the income of the 'C' area as a whole. There were, however, some holdings where farmers were compelled to rely more on subsidiary crops because of the failure of irrigation and the income of these farmers was therefore more dependent on subsidiary crops. But such instances were few.

Table 5 is a detailed estimate of expenses incurred in paddy production and Table 6 an estimate of the cost of production of chillies in the *Yala* season. In System 'H', the average cost of production of paddy per acre is approximately Rs. 7000/- per season and when allowances are made for expenses not specifically stated (e.g. meals supplied) the average cost may be as high as 7,500 rupees. The cultivation expenses of both *Maha* and *Yala* seasons are similar though the *Yala* yields are frequently much lower. The farmer explains the low yields in *Yala* as being due to the variety of paddy being grown, the *Maha* varieties taking 4 to 4 1/2 months to mature while the *Yala* varieties are early maturing 3 to 3 1/2 month types. There may also be other factors at work to lower the yields in the *Yala* season but whatever the reasons are, the significant fact is that the average annual yields are lowered substantially. Most farmers estimate the *Yala* yields to be only slightly higher than half that of the *Maha* season. It was also frequently stated that paddy cultivation is more difficult in the *Yala* and farmers are switching over to subsidiary crops.

Using only the data relating to the *Maha* season of 1990/91 in System 'H' the gross income derived from paddy calculated at the guaranteed purchase price of Rs.6.50 per Kg., was 30,000 rupees per holding of 2½ acres. When expenses are deducted This leaves the farmer family with 11,250/- Rupees for the season. Yields in system 'C' were substantially lower while the costs of cultivation were similar.

Table 5. Cost of Production of Paddy per Acre in the Mahaweli Systems C and H - Maha Season 1990/91.

No.	Item	Cost/Rupees **		
		I	II	III
1.	First ploughing by tractor	1400.00		
	Cost if Buffalos are used			750.00
2.	Preparation field bunds: 2 man-days	150.00	meals	
3.	Second plough and muddying by tractor	1500.00		
	If buffalos are used second			
	ploughing			500.00
	muddying			250.00
4.	Field bunds, Stage ii: 1.5 man-days	150.00	meals	
5.	Seed paddy (2 bushels)	500.00		
6.	Sowing (broadcast) : 1.5. man-days	150.00	meals	
	If transplanted (10 women per acre)		meals	500.00
7.	Weedicides (one bottle)	125.00		
8.	Spraying after 12 days of sowing(.5 man-days)	100.00		
9.	Fertilizer, i. (Urea 50kg)	540.00		
	Labour .5 man-days	50.00		
10.	Fertilizer, ii. (TDM 50kg)	540.00		
	Labour .5 man-days	50.00		
11.	Harvesting and transport to Threshing floor (6 man-days)	450.00	meals	
12.	Threshing by tractor	300.00		
	If buffalos are used payment in kind			3bushels/ paddy
13.	Fanning paddy	50.00		
14.	Transport to residence by tractor	75.00		
TOTAL RUPEES		6130.00		

** Cost II Not estimated or included in total.
 Cost III. Relevant only if those methods are employed. Not included in total.
 (Costs in both Yala & Maha are similar)
 (Source: Field Survey)

Table 6. Chillie Cultivation - Cost of Production per Acre (Yala season 1991)

No.	Item	Cost/Rupees
1.	Cost of labour - Four persons working daily throughout three months	27,000.00
2.	Agro-chemicals and fertilizer	5,000.00
Total		32,000.00

(Source : Field Survey)

Maha income of the average family in the System 'C' was therefore lower. Using official data for the Maha season 1990/91 (Ariya Abeysinghe 1991) for system 'H' the estimated gross income of the average farm was Rs. 33,500/- and this is not much higher than the survey estimate to be of major significance. The official data for system 'C' gave a gross income per farm of about Rs. 30,000/- for Maha but the survey data gave a considerably lower average gross income estimated at Rs. 18,500/-.

In actual practice, the money income in recent years has been somewhat higher than is indicated in the above estimates because the purchase price of paddy by the private trade has been rising and is now higher than the guaranteed price. The purchase price offered by the private trade is near 7 to 8 rupees per Kg. and in some instances it is as high as 10 rupees per Kg. for special varieties of paddy. Using the high official estimate of yield and the higher purchase price offered by the private trade, the total income is higher but still the profit margin is low leading to the conclusion that paddy is a low income crop. It cannot enable the farmer to rise above the present low levels of living.

This weakness of paddy based farming has been known for years and the Mahaweli authorities are encouraging the farmers to diversify their agriculture. In system 'H', for example, it is recommended that farmers cultivate subsidiary food crops such as chillies and onions which have the potential to give a higher income. The survey indicated that there is, in fact, an increase in the cultivation of these subsidiary crops in the Yala season in both systems 'H' and 'C'. A conservative estimate of income from the cultivation of chillies in Yala per acre based on survey data is about Rs. 43000/-. The actual income, assuming weather conditions and market situation to be satisfactory, can be as high as Rs. 75,000/- per acre.

However, because of the poverty of the farmers and the relatively high costs of cultivation of this crop (Table 6) the change to chillie and other subsidiary crops is slow. The risks of crop failure and price fluctuations are also relatively high in subsidiary food crops. Subsidiary crops are also intensive in their labour requirements which are often beyond the ability of the farm families to provide. Nevertheless, a change from the present paddy-based agriculture to other more productive forms of landuse is urgent and essential and attempts to diversify agricultural production need, to be pursued vigorously.

Basic services in the Mahaweli Systems.

The Mahaweli Plan lays a great deal of emphasis on the provision of basic services to the settlers. The main services provided include Education, Health Care, Postal and Telecommunication services and a basic infrastructural network of roads irrigation and power supplies.

The field survey investigated the government-sponsored services of education, health and postal services and their accessibility to settlers in Systems 'H' and 'C'. The distribution of these services is shown in Figures 2 to 7.

Education

The Systems 'H' and 'C' are served by a large number of educational institutions. An examination of the maps shows that these institutions are well distributed. Most village centres have a primary school while junior and senior secondary schools are located in area centres and townships. In terms of distance, educational services are easily accessible to the majority of the population (Table 7. Distance to Government Schools in Systems 'H' and 'C'). The higher grade schools which teach upto the Advanced Level Examination in Arts, Science and Commerce are located in the major towns.

However, our information is that the majority of the rural children do not proceed beyond the junior secondary level of education (year 11) and the large majority drop out even before reaching this level. There are 12 Senior Secondary

Table 7. Distance to Government Schools in Mahaweli Systems C and H. Per Cent of Families.

Distance miles	Families per cent			
	System C		System H	
	%	Cumulative %	%	Cumulative %
0. — .25	11.42	11.42	9.85	9.85
.25 — .5	27.14	38.56	23.48	33.33
.5 — .75	13.57	52.13	25.00	58.33
.75 — 1.00	7.85	59.98	15.15	73.48
1.00 — 1.25	20.00	79.98	6.06	79.54
1.25 — 1.5	3.57	83.55	—	79.54
1.5 — 1.75	12.88	96.53	6.06	85.60
1.75 — 2.00	1.43	97.86	—	85.60
> 2	2.14	100.00	14.40	100.00

(Source : Field Survey)

Schools in System 'H' and 2 in System 'C'. The numbers reaching the Advanced level classes of these schools are low. In system 'C' for example, the number of students in the Advanced Level classes in 1991 was 104. Significantly, the majority of these were the children of salaried workers residing in the towns. (Detailed data for System 'H' were not available at the time of writing). That a large number of students do not continue beyond the 'O' levels is closely related to the low level of income discussed in the earlier section. Fig. 2 and 3).

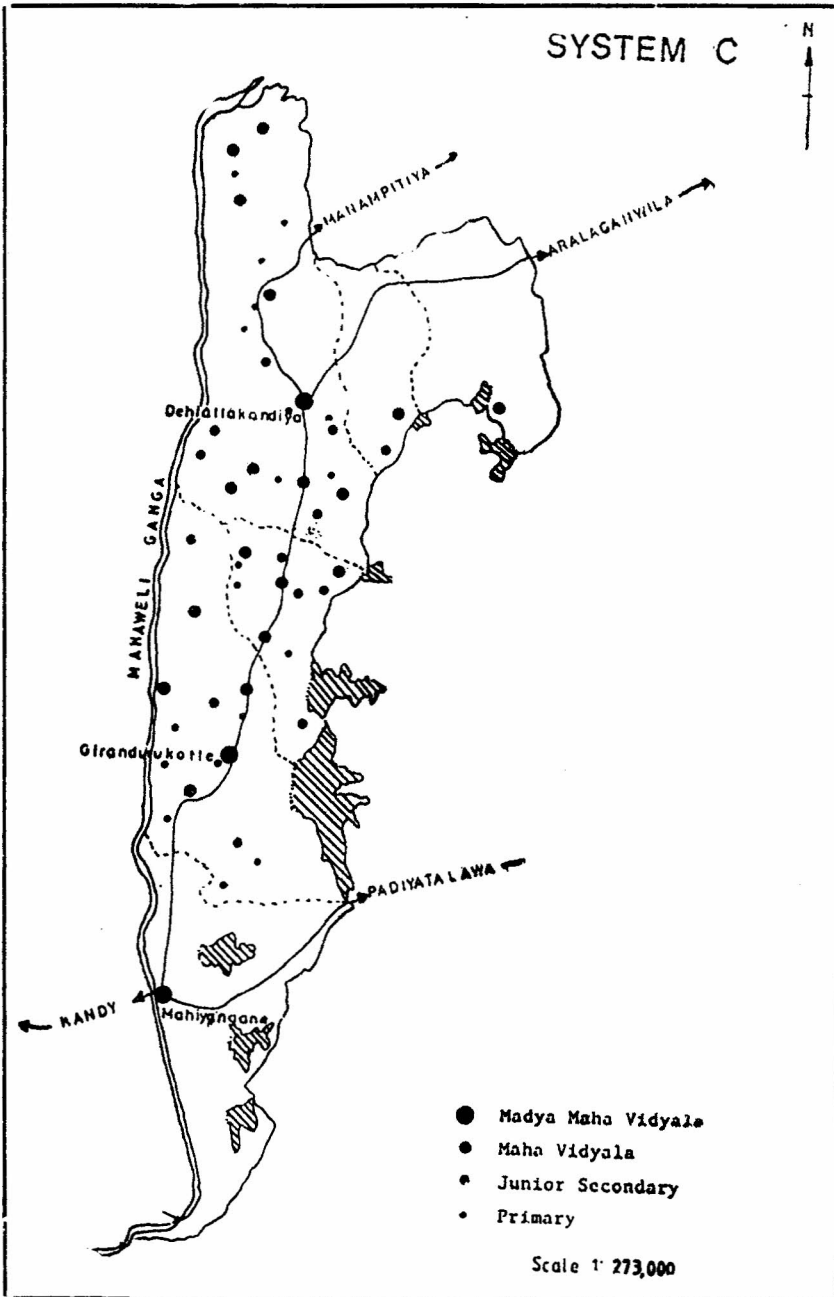


Fig. 2. Educational Services in System 'C'

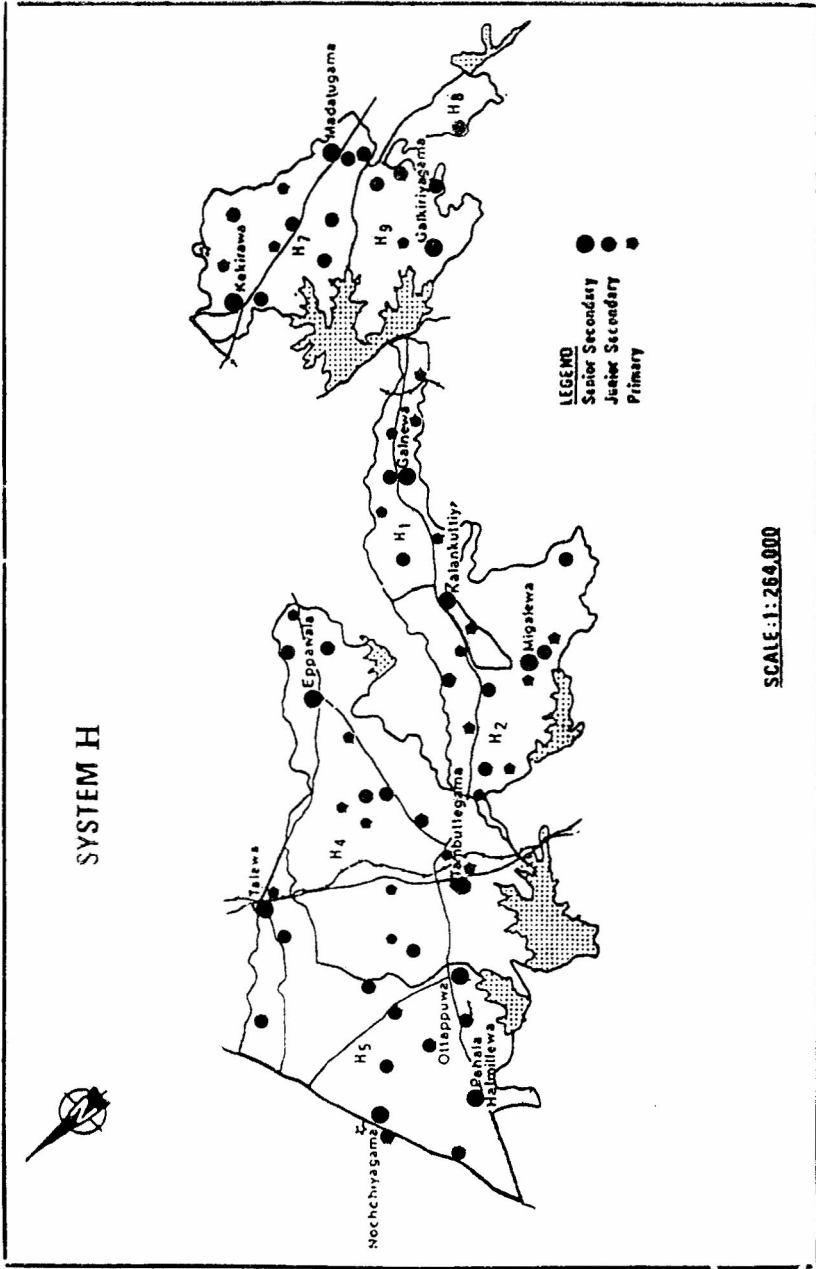


Fig. 3. Educational Services in System 'H'

Health Services

As in other parts of the country, the Mahaweli systems 'C' and 'H' have been provided with a network of health services by the state. The health service institutions range from the District Hospitals with many facilities including the treatment of indoor patients to the smaller units in the area centres with out-door patient care only. The distribution of these services is shown in Figures 4 and 5.

In System 'C' there are 02 major hospitals at Girandurukotte and Dehiattakandiya with 126 hospital beds. System 'H' has 10 hospitals with 459 beds. Most area centres have smaller health service units. In addition to these government health service units there are a fairly large number of both western and Ayurvedic private practitioners in the township areas. The accessibility of the health service is therefore good and compares favourably with the service in many other parts of the country. The survey showed that settlers have access to a government health centre within a distance of ten miles though in some parts of both Systems 'H' and 'C' the poor means of transport poses a problem. The survey indications are that the settlers themselves did not perceive any serious deficiencies in the health service.

Postal Services

All towns are served with 'high grade' post offices. The locations of these and post boxes are shown in Figures 6 and 7. The service is adequate and, in any event, the demand for postal services is low.

Considering the overall development of the Systems 'C' and 'H' and using education, health and postal services as indicators of the availability of services, the government has succeeded in supplying a reasonably adequate network of services for the settlers. Though, one may suggest that there is a need for the quality of these services, especially of education and health at the area centre level, to be improved it is a suggestion that could apply equally well to most other parts of rural Sri Lanka.

Mahaweli Townships

The Mahaweli Programme has within it a planned integrated network of rural and urban centres under each of the systems such as 'H' and 'C'. In each system there are hamlets which form the lowest order settlements and at the other extreme are the relatively large towns with diverse functions. The overall settlement pattern within each system is organized in a hierarchical order following the concepts of the Central Place Theory. This hierarchy comprises the hamlets followed by village centres, the area centres and the townships which are progressively higher-orders of central places with increasingly complex and higher order functions. Figure 8 shows the distribution of large towns.

Towns are of two different types. There are new planned towns, established to serve the agricultural settlements growing up in the newly developed areas. The morphology of these towns is based on modern town planning concepts and shows different urban land use functions spatially separated. Thus each town has its own residential, commercial, industrial, transport and administrative functions assigned to specified areas. These towns constitute a novel feature in the settlement schemes and is an experiment in Dry Zone settlement planning and development.

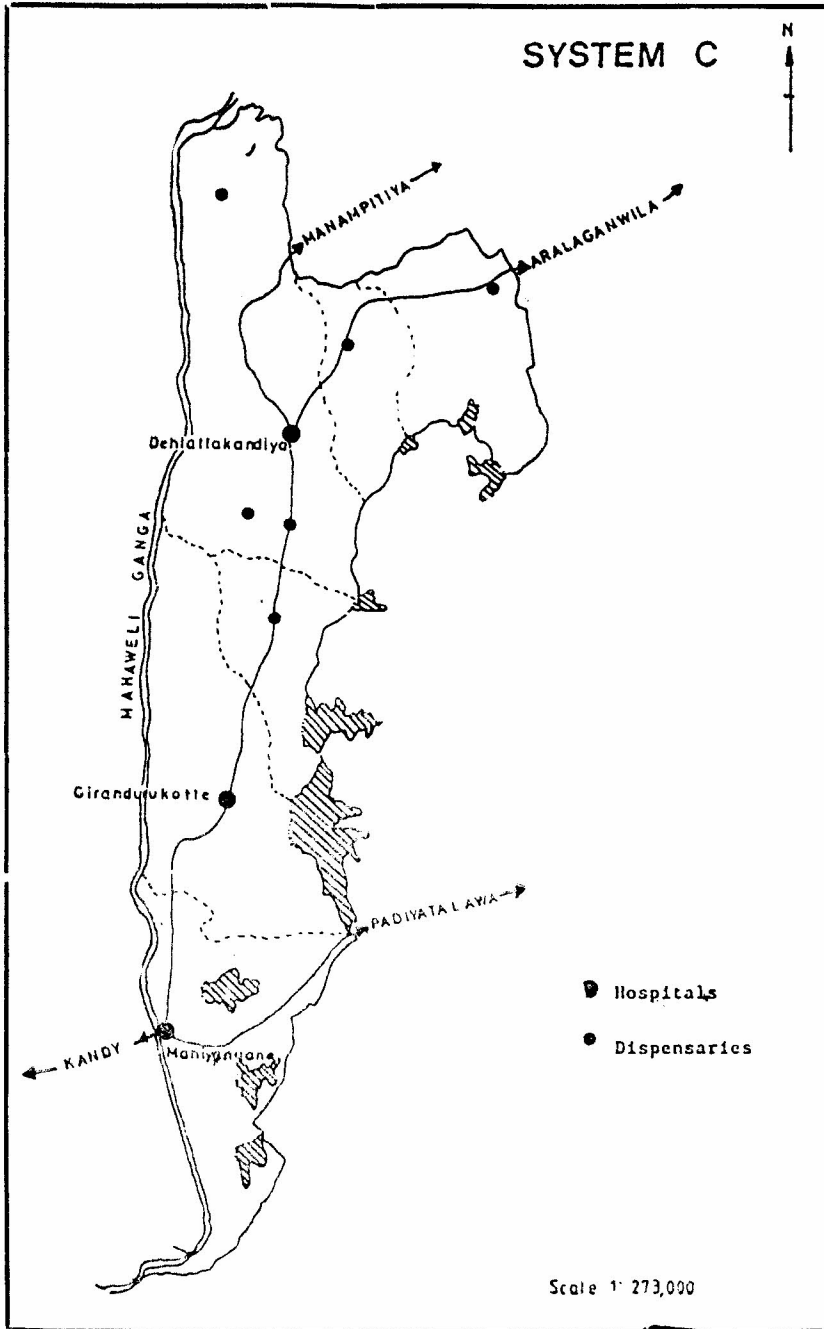
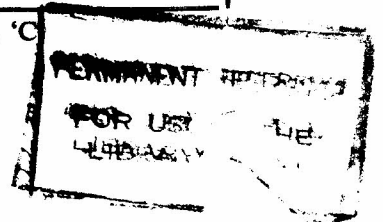


Fig. 4. Health Service in System 'C'



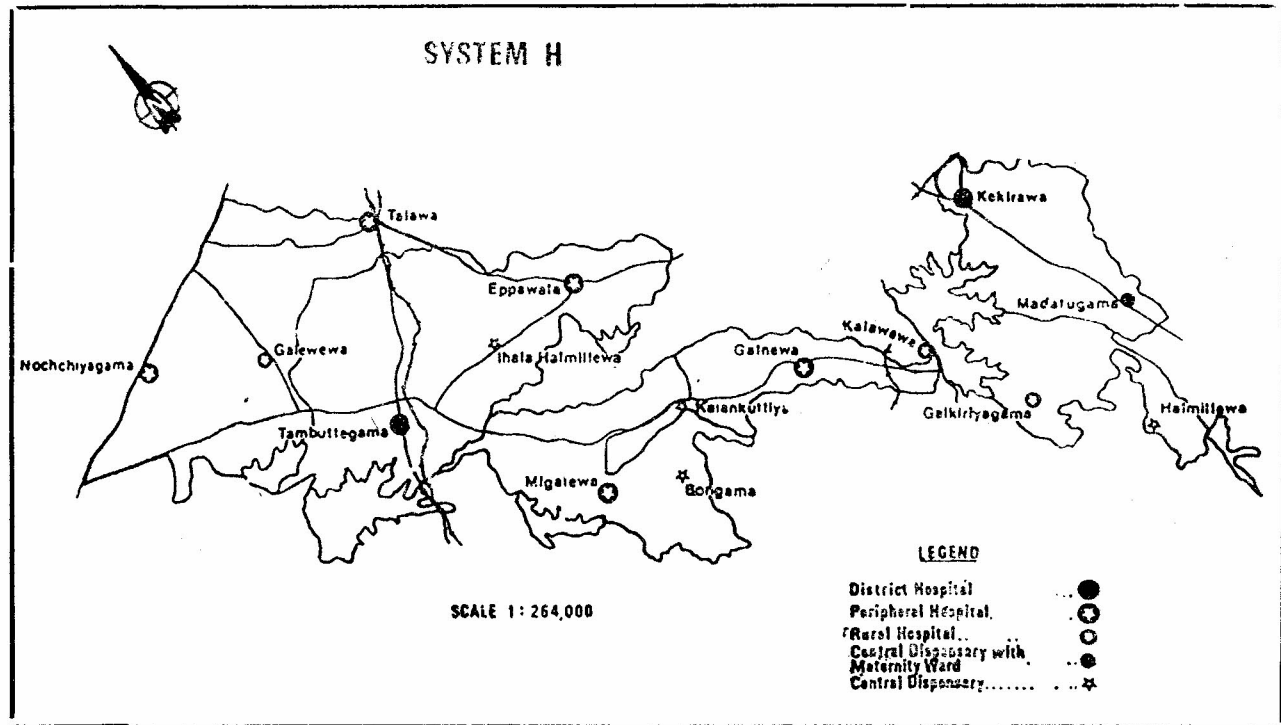


Fig. 5. Health Services in System 'H'

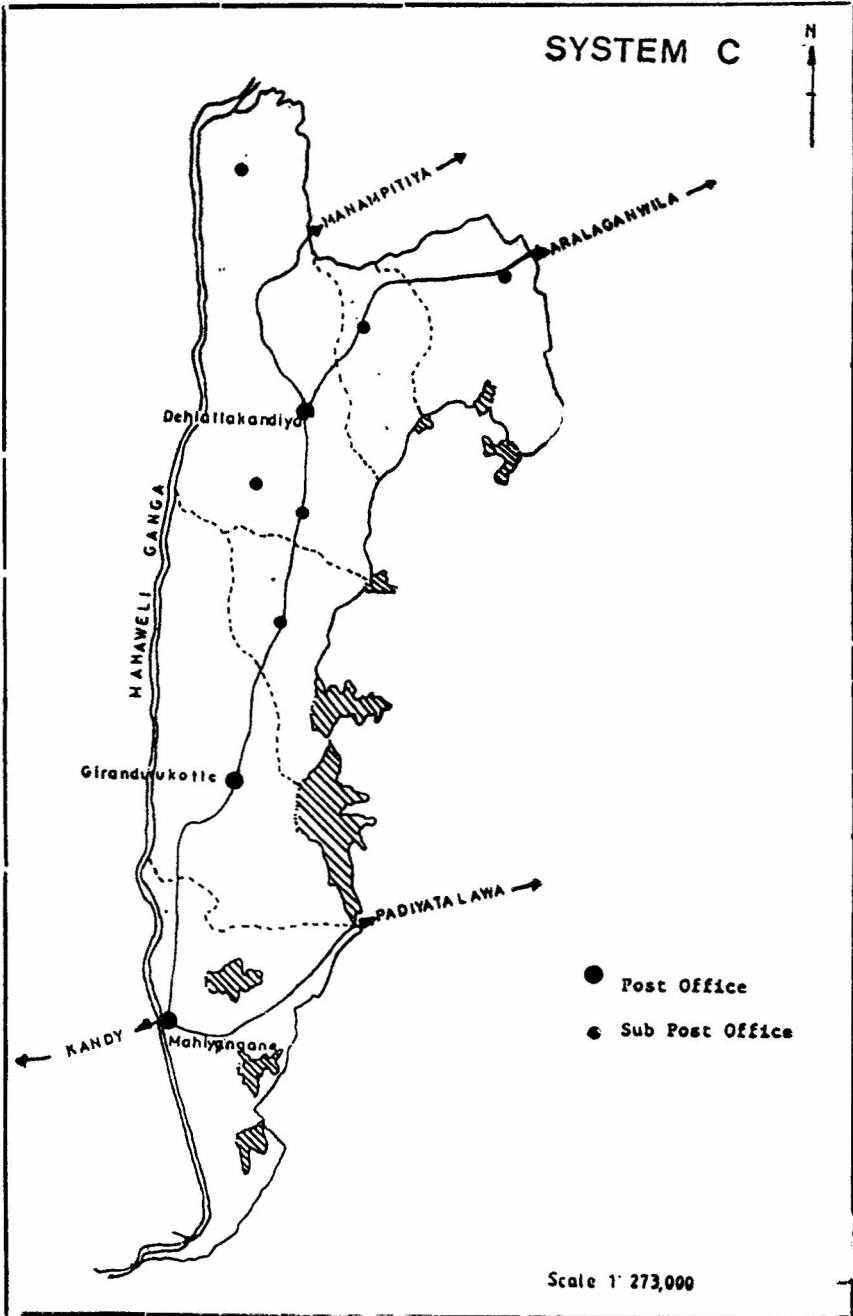


Fig. 6 Postal Services in System 'C'

Small urban centres that were already in existence at the time of the implementation of the Mahaweli Programme constitute the second type of town. These were upgraded by the Mahaweli Authority to include additional urban functions as appropriate and were incorporated into the total settlement plan.

In System 'H' there are several important new towns and some are shown in the map (Fig. 8). The more important new towns of this System are Galnewa, Thambuttegama, Meegalewa and Galkiriyagama. In System 'C' there are only two prominent new towns at Dehiattakandiya and Girandurukotte. The construction work at Dehiattakandiya is still in progress. System 'H' included several old minor urban centres. These are being transformed and are undergoing planned expansion. System 'C' unlike 'H' has no significant old settlements. The only old town of significance in the area is Mahiyanganaya, which does not fall within the Mahaweli Project area.

In the new towns, as noted already, some higher order functions such as district hospitals, central schools, major post offices, police stations and central administrative functions have been provided by the state. The town plans have allocated space and made provision for basic amenities for the growth of trade, industrial and other functions. These were expected to grow spontaneously with private sector participation. Each new town was provided with a market place with trade stalls and other structures, land areas ear-marked for expected growth of industry, bus stands and basic amenities including water supplies, electricity and roads.

Growth of Functions in the New Towns

The survey revealed that in most towns, commercial, industrial and service functions have been very slow in developing and have not reached expected levels of growth. Provisions made under the town plans for expected growth of functions remained unutilized or underutilized at the time of the survey. For example, the growth in trade activities, where one would expect immediate and visible growth to occur, is weak. In the new towns of both Systems 'H' and 'C', trade is largely restricted to essential consumer goods needs of the urban dwellers themselves and the reach of trade functions beyond the urban limits is almost negligible. Space provided for market places, and buildings and stalls constructed for trade purposes remain largely unused especially in the towns of System 'C'. In Girandurukotte and Dehiattakandiya trade is yet to develop. A similar weak growth was also seen in the towns of Upper Mahaweli areas as in Kotmale and Kundasale new towns.

Trade in the new towns is largely seasonal and corresponds to the harvesting seasons of the year when the farmer population creates a demand for various goods available in the town. They do not create a significant demand at other times. Therefore, trade activities for most of the year are restricted and are dependent on the demand created by wage earning town dwellers. The trade turnover is low and the traders interviewed claimed that they manage their affairs with the greatest of difficulty. This view is substantiated by the fact that several business enterprises have had to be closed down and also by the poor visible impression that is created by the majority of shops. The village survey revealed that most of the meagre needs of the farm families are satisfied by the local boutique and the weekly *pola* (village fair).

The '*Pola*' (or the periodic market) is a salient feature in all Mahaweli settlements. These markets are held once every week in a place with good access and in close proximity to village settlements as well as the townships. These markets are the main source of supply of the wide range of goods including textiles and some of the durable goods, for the farm community. The wide range of goods available, the possibility of bargains and lower prices and the ease of access are among their main attractions. A list of these periodic markets in the System 'C' and the days on which they are held is shown in Table 8.

Table 8. List of Periodic Markets in System C (with Days)

Location	Day of the Week
Siripura	Friday
Nuwaragala	Tuesday
Mahiyanganaya	Saturday
Medagama	Monday
Lihiniyagama	Sunday
Dehiattakandiya	Wednesday
Girandurukotte	Friday

(Source : Field Survey)

Considering the population and the significant role, the '*Pola*' plays in the rural life of Mahaweli areas it deserves more attention as an integral element in the marketing process of the village community. The *Pola* as an institution appears to have considerable potential for providing incentives to the local farmers to diversify into cash crop production.

Population Growth and Mahaweli Settlements

The settlement of Mahaweli areas is an attempt to redistribute population from the densely populated parts of the country. It is seen as an answer to the problem of landlessness among farmer families. Under this settlement programme each family is given $2\frac{1}{2}$ acres of land for intensive cultivation with the hope that it would provide an adequate living to the recipient family. The principle involved here is not very different from the settlement of colonists in the Dry Zone which was the major official approach to the development of the Dry Zone from the early years of this century.

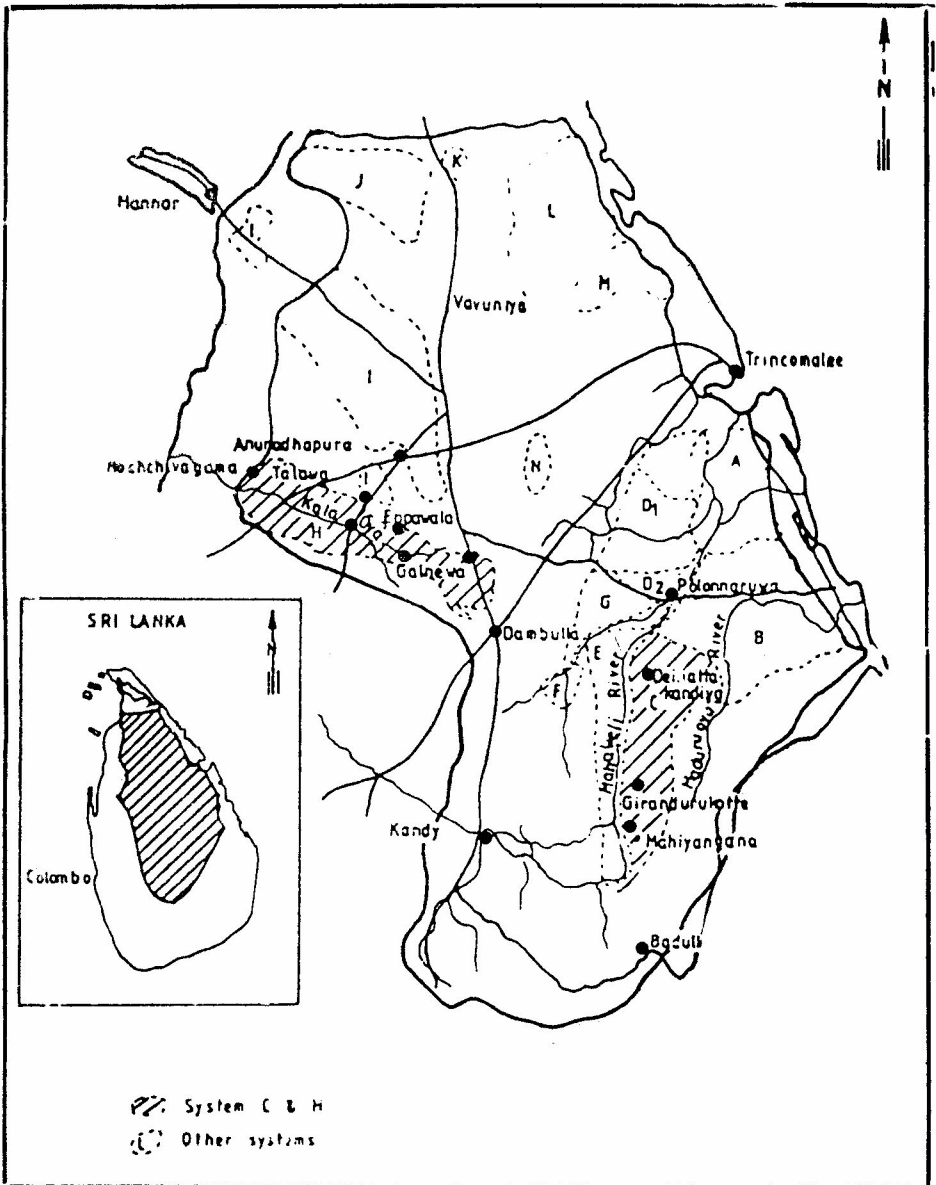


Fig. 8. Systems C & H Showing Large Towns

The early experience of Dry Zone colonization was that the allocation of land to farmers to alleviate the problem of landlessness was at best a temporary solution. With the growth of population the problem re-appeared in the very next generation. We see the same process repeating itself in the Mahaweli settlements. The present survey provided ample evidence of high rates of population growth in the Mahaweli settlements. Most settler families are large, with an average of 5 to 6 children per family, and population pressure on land is already very high. In some areas the Mahaweli Authority is alienating 1/2 acre blocks of land to grown-up children when they marry (to sub-families). Even so, it is obvious that the expanding population will be compelled to fall back on the resources of their parents and their land for survival. New opportunities for employment (non-farm activities) are seldom generated within the settlements or even in the towns to any appreciable extent. The fact that most children receive only a few years of formal education prevents them from leaving their settlements in search of other employment. The alienation of 1/2 acre blocks of land or alienation of land in other settlements cannot continue in the face of scarcity of developable land, with the result that encroachments on reservations and crown land will increase. The growth of population must therefore be viewed as a serious threat to the very survival of the settlements. The adoption of appropriate measures to contain this crisis must be given top priority.

Conclusions

Arising from the above discussion it is clear that the contribution of the Mahaweli to the overall food supply is substantial and the yields are above average for the country as a whole.

There is some diversification in crop production though paddy cultivation dominates in both Systems 'C' and 'H'. However, despite high yields in paddy and the large contribution of the Mahaweli settlements to the food production effort of the country, the costs of production are excessive and paddy can hardly generate an adequate income to maintain the rising expectations or even the existing living standards of the farm families. It appears that paddy-based agriculture, especially in the face of expanding population in the settlements, would lead to a progressive decline of the levels of living. It is therefore imperative that urgent measures be implemented to increase the productivity of agricultural land to produce a substantial surplus for sale. Among the alternative procedures that may be considered for adoption to achieve this end are, primarily a greater intensification of efforts to diversify the crop patterns in the agricultural settlements, weaning the farmers away from their traditional attachment to paddy with incentives to switch over to cash crop production. It is also necessary, wherever possible, to examine the feasibility of evolving farming systems that would induce the growth of agro-based industries. The growth of agro-based industries would attract the excess population in rural settlements. Such alternative farming systems may even include large scale farming ensuring higher returns. The distribution of small units of land among farmers must cease however expedient it may be in the short term. It should be noted that where diversification of cropping patterns is not paractical due to locally significant reasons, methods have to be developed to improve the efficiency of existing agriculture.

The weak growth of Mahaweli towns seen today is very largely a reflection of the low productivity of the surrounding agricultural settlements. The low-level subsistence life style of the farm families hardly provides the stimulus for a sustained expansion of urban functions, associated with trade and mobility. The meagre subsistence needs of settlers are easily satisfied at the village fair.

Poor demand for even the basic consumer durables in the rural settlements and the inability of the local population to invest in non-farm self-employment projects are the direct result of the poverty of the settler population, a noteworthy factor inhibiting growth and preventing external entrepreneurs from investing in employment generating activities in the new towns. The entire Mahaweli settlements scheme and its progress depends largely on the hierarchical 'top down' implementation of the development programme. It appears however, that the establishment of an industrial sector in the new towns has not been an important part of the overall plan. Industrial growth is expected to occur through private sector participation. If the productivity of the farm settlements can be increased substantially, the demand for goods and services from the settlers would attract private investment into the new towns for a diversity of new activities. Growth of such new activities and the increased prosperity of the hinterland also will lead to the overall growth of new towns and expansion of functions in them.

There is reason to believe that, at least in some instances, the new towns are not located in the most appropriate places - or in other words, the theoretically most suitable locations have been found to be not so attractive in practice. This observation is supported by the fact that some area centres in Systems 'H' and 'C' as well as other centres along the main roads are growing as urban centres while some of the planned towns nearby do not show any appreciable growth. Some examples of area centres that are growing faster than new towns are - Bulnewa and Madatugama in System 'H' and Lihiniyagama and Siripura in System 'C'.

Population expansion poses a serious problem for the future leading to farm fragmentation, encroachment on crown land and reservations, progressive impoverishment of farm families and social instability. Redistribution of land among the growing population cannot go on and is hardly a practical solution. Alienation of land to the growing population, practiced in various forms now, must be discontinued as land is scarce. On the other hand, intensification of population planning is now a most urgent necessity. It is also essential that vigorous efforts are made to induce the growth of non-farm activities to siphon off the excess population from the farm settlements.

The Mahaweli Development Programme, then, while deviating from the early colonization practices in that it has depended on modern planning concepts, nevertheless incorporates paddy smallholdings as the basis of settlement and regional economic development. The dependence on paddy smallholdings appears to have worked against generation of adequate surpluses in production to promote sustained growth, which in turn has led to less than anticipated levels of expansion in non-farm activities. In the context of increasing demands made by the expanding population in the settlements

and the dwindling land resources, there is a need for strategies designed to enhance the productivity of all available resources moving away from the conventional paddy-based village economy.

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