The Agriculture Sector and Agro Industrial Development Potential In the Southern Province

By Ariya Abeysinghe

Mr. Ariya Abeysinghe, a Development Economist with wide experience in the Public Sector, has been publishing papers on Development issues since late 1960's. He has published six books and a number of Research Studies in several International Journals/ Quarterlies. He has served in several public sector positions. He has also served as a Consultant to Commonwealth Fund, FAO, UNIDO, IMPSA and is currently a consultant to ILO, ITC. He was also an Advisor to the Prime Minister of Solomon Islands Solomon S. Mammaloni. He was at one time a visiting Lecturer in Economics at the Kelani Campus, Sri Jayawardanapura and the Colombo Campus. He is now the Director of Agricultural Planning at the Ministry of Lands, Irrigation and Mahaweli Development. The writer feels that the development of the Southern Province must be carried out under a Southern Province Development Authority (SPDA) with wide powers like the Mahaweli Authority, with a Director General and a seperate Project Ministry.

The Galle, Matara and Hambantota districts constituting the Southern Provincial Council area has similarities and striking differences in agriculture. In this paper the Galle, Matara and Hambantota districts will be discussed in relation to food crops, plantation crops, livestock and forestry. Preliminary broad discussions on the three districts in that order would be done and where relevant a brief discussion on the main issues and development strategies would be made.

Galle District

Introduction

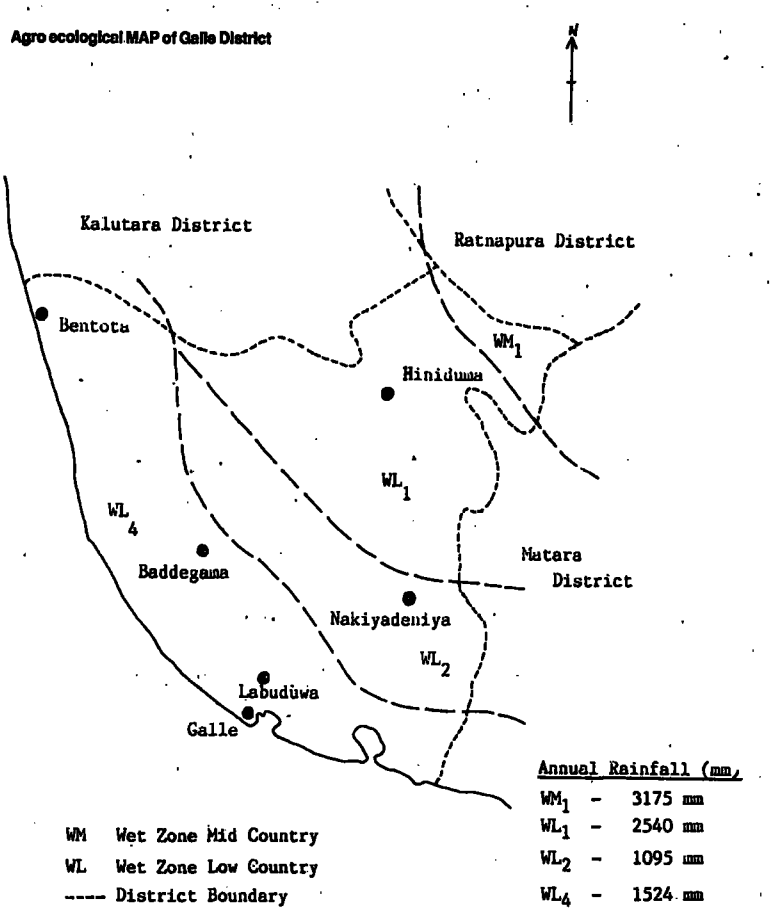
The Galle district covers an area of 637.6 sq. miles (163,560 ha) (i.e. 2.75% of the total land mass of the country). The population density is 498 persons per square km which is more than double the island's average. The unemployment rate is 27.4% as against an average of 13.6% for the island.

The Galle district lies entirely within the wet zone. On the basis of the physical features, the Galle district can be divided into the Western lowlands and the Southern Coastal belt and the highlands in the interior or North-East. The district has also been divided into three agro-ecological zones. The district gets the major portion of its rainfall from the south-west monsoon. The average rainfall varies from 40-120" (1,016-3,048 mm). Storms and floods occur from April to June and in November and December.

The drainage basin of the Gin Ganga and its tributaries covers over 50% of the district. Gin Ganga is 113 miles (181.86 km) long of which 74 miles (119.09 km) is within the Galle district and has a catchment area of about 340 sq. miles (95,829.63 ha) Bentara Ganga is located in the Northern boundary of the district. It drains mainly the Galle district. Polwatte Ganga situtated in the Eastern end of the district, flows across the district for about 9 1/2 miles (15.29 km). These rivers are not used economically.

The Gin Ganga Flood Protection Scheme was initiated in 1974 with the technical assistance from the People's Republic of China. Under this scheme 70 bunds, 10 pumping stations and 20 channels have been constructed to drain excess water. But the scheme has not benefitted the people very much because though the lower reaches are protected from floods, the water is trapped for long spells in the upper reaches, thereby aggravating the flood problems of the farmers in the upper areas of the river.

Agro ecological MAP of Galle District



Land Use Pattern

Land use pattern in the Galle district reveals the following picture:

Crop	Hectares	Percentage
Tea	16,192	10
Rubber	18,192	11
Coconut	12,922	8
Oil Palm	1,378	1
Cinnamon	8,818	5
Paddy	23,756	15
Other crops including home gardens	12,732	8
Forests	16,041	10
Other Lands	53,130	32
	163,560	100

Source: IRDP Report Galle, August 1987

35% of the total land area is under tree crops and Paddy occupies only 15% of the total land area.

Soil Types

The principal soil types in Galle district are red yellow podzolic soils, alluvial soils, acid swamp soils (bog and half bog soils) and regasols. The red yellow podzolic soils cover 90% of the district. Alluvial soils are confined to valeys and flood plains of Gin Ganga, Bentara Ganga, Madu Ganga and Hikkaduwa Ganga. Patches of acid swampy soils are found in the flood plains of Madu Ganga and Hikkaduwa Ganga and around the Koggala lagoon. Regasols occur in few places along the Bentota – Gintota coastal areas. The red yellow podzolic soils and their sub groups are ideal for tree crops like tea, rubber, coconut, oil palm and cinnamon and the bog and half bog soils are ideal for commercial market gardening. The sandy regasols are suited for coconut. Rice is grown in the alluvial soils.

Minor Irrigation Schemes in the Galle District

The minor (or village tank based) irrigation schemes are important in the Galle District. There are nearly 502 such schemes with a command area of 31,578 acres benefitting 12013 farmer families.

Since 1970, government sought to reclaim the low lying lands in the South West coastal belt for agricultural purposes. This was hampered by such factors as environmental hazards, insufficient irrigation, management shortcomings in the programme and ineffective institutionalization of irrigation and drainage facilities constructed at large costs. The existing irrigation systems are mostly confined to anicuts, sluices and small channels, that divert water to paddy lands. Often the water courses are at lower levels than the paddy fields. Therefore anicuts are constructed across the streams to hold water and raise the water level to the bund level and then divert it through sluices into channels which take water to paddy fields by gravitational flow. This pattern is widespread in the district. In some areas flood irrigation is practised. Under this pattern instead of permitting water to flow through the channels to the paddy field below the anicut, water is allowed to submerge the area up stream covering a large extent of paddy land. The grave hazards of paddy cultivation under this system of irrigation are:

(a) Water can be supplied only as long as the streams are not dry.

(b) These streams are themselves rainfed and during dry spells, paddy fields may not get the required quantity of water as the streams dry up.

(c) Heavy rainfall may cause inundation of paddy fields and when the rivers and streams overflow the low lying paddy fields may be submerged for several days.

The salt water exclusion and drainage schemes in the coastal belt such as those associated with Koggalla Oya, Madu Ganga, Hikkaduwa Ganga and Madampe Ganga have helped crop cultivation to some extent, but the problems of drainage, flooding, short flash floods and periods of drought undermine the irrigation system in the district, especially for paddy cultivation.

TABLE I

Minor Irrigation Schemes in the Galle District

Galle District		No of Schemes	Area benefitted (Acres)	No. of Dependent Families
Bentara–Elpitiya	...	67	8,191	2,060
Hiniduma	...	126	6,505	2,137
Balapitiya	...	14	508	498
Rathgama	...	56	2,349	1,050
Habaraduwa	...	54	4,775	1,203
Baddegama	...	49	2,767	900
Karandeniya	...	37	2,144	1,650
Ambalangoda	...	42	2,946	1,350
Akmeemana	...	50	3,187	1,060
Galle	...	07	206	105
		502	31,578	12,013

Source: Assistant Commissioner of Agrarian Services – Galle

Paddy

The extent of assweddumized **paddy lands** in the Galle District is 23,572 ha. producing about 41000 mt. (89/90) of paddy. The paddy production per ha is low compared to production levels in the major paddy producing areas of the island. The per hectare yield levels during the Yala season are also generally lower than during the Maha season because of inadequate water supply. The maintenance of paddy fields and drainage systems are very poor because farmers do not like to invest in land shaping and drainage maintenance due to the high risk involved. Therefore a project of crop diversification in rice land is needed.

In the Maha, bunds could be used for growing vegetables. There are a number of vegetables which could be introduced into the paddy fields of Galle district in the Yala based on a study of market demand and agronomic possibilities. Roots and tubers, onions, green gram, cowpea, soya, sweet and baby corn, gherkins, asparagus, mushrooms, melons, Japanese egg plant, okra, cantalopes are few items with a domestic and foreign market that could be considered as Yala crops. **If greens like gotukola can be grown on a commercial scale they can be sued to make herbal tea. This can be marketed locally and internationally as G-Cola.** Another possibility is to grow grass on a commercial basis to stall feed dairy cattle.

Transplanting in paddy cultivation is not considered worthwhile in the district. No weeding is done in about 50% of the cultivated area whilst chemical weed control and hand weeding is adopted in the other areas. About 60% of the cultivated area is ploughed by mammoty whilst tractors are used in another 24%. 16% of the area is buffaloe ploughed. The number of 4 wheel tractors (owned by operators) per 1000 acres of agricultural lands in the small farmer sector in the Galle district is 1.2 and 2.2 compared to 3.3 and 4.9 for the whole island.

The rice breeding programme has been able to breed special varieties such as BW 100, BW 2673, BW 78 for fields affected by iron toxicity and BW 450, BW 451 for acid/saline soil conditions. It is reported that the Department of Agriculture has broadly classified the paddy land into tthree categories.

(a) High potential areas –
Yield average is 2.84-3.36 MT/ha (55-60 bushels/acre). High potential to reach 3.87 MT/ha (75 bushels/acre)

(b) Medium potential areas–
Yield average is 1.81–2.32 MT per hectare (35-45 bushels/acre) but with a potential to rise to 50 MT h.a.

(c) Low potential areas–
Affected by flooding, salinity, bog soils closer to coastal areas of the district. Here the average yield is below 1.55 MT (30 bushels) per acre.

On the basis of this, 30% of the assweddumized paddy lands in Galle district are identified as high potential, 40% as medium potential and 30% as low potential areas.

The cultivation of food crops other than paddy, is very marginal. There is some vegetable cultivation on home garden basis and as well as a few cases of concentrated market gardens. Horticultural crops include banana, passion fruit, and mango. There are roughly 116,235 agricultural small holdings in the Galle district with an operational area of 173, 202 acres (70,091.83 ha). There are 476 estates with an operational area of 59602 acres (14123.33 ha) (i.e. an agricultural area of over 8.09 ha or more is considered an estate). Small holdings of less than 20 acres predominated in the Galle district. The farm size and the land tenure scenario in the Galle district reveals that:

(a) There are 116,538 small holder operators owning 148,223 acres (59,983.77 ha).

(b) 46.1% (53660) of the small holders operate only home gardens which is around 24,000 acres of the agricultural land.

(c) The average size of the small holding is 1.48 acre (0.6 ha) compared to the national average of 1.94 acres (0.78 ha).

(d) 52.7% of all holdings are less than 1.0 acres (0.405 ha). 34.6% are between 1.0-3.0 acres (0.405-1.21 ha) and only 5.2% of holdings exceeds 5.0 acres (2.02 ha).

(e) 55% of paddy holdings are below 1.0 acres (6.405 ha) and these account for 22% of paddy holdings.

(f) Size of home garden in the Galle district averages 0.44 acres (0.18 ha).

(g) 57% of paddy extent in Galle district are owned by operators and of this 63.3% are paddy holdings.

(Source: Census of Agriculture – 1982)

PLANTATION ECONOMY IN THE GALLE DISTRICT

Galle district has 16,000 ha under Tea and of this 13,603 ha (85%) is small holder tea (36,479 small holdings managed by 29,967 operators). 40% of tea small holders in Sri Lanka are in Galle. 70% of land under tea in the Galle district is unregistered therefore they do not benefit from the various subsidies given to tea smallholders. 57.26% of tea land holdings are sole owned, 4.73% co-owned, 14.94% colonist/allotists, 18.75% leases, 2.96% encroached. In the Galle district the average size of tea small holdings is 0.37 ha. 90.75% of the holdings in the Galle district is less than 0.81 ha (2 acres). Tea is grown as a mono crop in 90% of the total tea areas in the Galle district.

Tea Area by Cropping Pattern

1.	Mixed Area		%
	Spice/Beverage Crops	101.04	0.75
	Coconut	814.28	6.05
	Other Crops	429.40	3.19
	Total	1371.72	10.19
2.	Tea only	12087.33	89.98
3.	Total tea area	13459.05	

Source: TSHDA

In the Galle district almost 100% of tea holdings are of the low grown category (13,600 ha). The yield of tea in the Galle district average 1,235 kgs/ha. There are 90 tea factories in Galle. Some of these factories were destroyed by the subversives and needs rehabilitation.

The Galle district produces 20.88 million kgs of tea. 60% of low grown tea exports come from the Galle and the Matara districts.

Consignment of tea manufactured in the Galle and Matara districts (80-85 million kgs per annum) though the Galle Harbour would trigger direct and indirect employment in the service sectors. A tea packeting plant in the Galle area could offer new employment avenues.

Rubber is grown in the Galle district mainly on an estate basis. Of the total extent of 19,928 ha of rubber, 13,795.2 ha are in estates and 6,132.8 ha are in small holdings. In Galle there are 3,593 small holdings and 286 Rubber estates.

Size	*Size of Holding in the Galle District*	
0–4 ha	6,254 ha	(31.1%)
4–40 ha	4,310 ha	(21.4%)
Over 40 ha	9,545 ha	(47.4%)
Total	20,109 ha	

Total Extent (ha)	9,765.6
Extent in tapping (ha)	6,824.4
% extent in tapping	69.8%

Source: Census of Rubber Lands – 1984

The average annual production of RSS Rubber for the Galle district was 13950.125 Kgs. Only 1% of the total production is used in the region (i.e. for rubber tovs, tyres, footwear).

Rubber cultivation offers limited employment opportunities. But there's **great potential in developing rubber based industries in the district.** Rubber wood based industries, rubber based manufactures for exports, rubber seed oil for paints, rubber seed meal for feedstock, rubber seed oil for washing soaps – some of the many possibilities which could be developed in Kalutara - Matugama, Ingiriya, Horana, Bentara - Elpitiya, Galle areas. The Free Trade Zone to be established in Koggala should be heavily biased towards the manufacturing of automobile tyres. Soles and heels, cycle tyres and tubes, foam rubber products, latex ruber products, rubberized fibre products, toys and baloons and other miscellaneous items.

A study of the rubber industry in the Southern Province reveals the need for a restructuring of the rubber industry by establishing a Rubber Development Authority with a Rubber Research Board, Cultivation Board and an Industrial Board. Instead of directing the industry from Colombo, it is worth shifting all officers dealing in the rubber industry to Elpitiya or Galle. There is also a need to

establish a proper extension service for rubber, to overcome the problems associated with poor standards of management.

Coconut

According to data avilable there has been a reduction of the coconut acerage in the Galle district from 13090 has (1982) to 12772.4 ha (1986) due to development activities such as new housing road construction, rural electrification and tourist development. Nearly 64% of the coconut trees in the Galle district are between 16-60 years of age and 34% are over 60 years of age.

The average annual coconut production in the Galle district is 70.0 million nuts which is 2.3% of the national crop. Galle district has the highest number of aged coconut palms in the province and marginalizing will take place over the next decade if no replanting is done. The average yield in Galle district is 2000 nuts per acre.

There are two coconut oil mills in the Galle district. There are several agro based coconut industries in the Galle district - like copra, coconut oil, coir rope making, carpets, brushes, brooms etc. These industries predominantly employ women.

Cinnamon is the major export spice grown in the district. It is mainly concentrated in the Elpitiya, Ambalangoda, Balapitiya and Galle areas. There are 11,700 acres (5,320 ha) of cinnamon in the Galle district. (A. Abeysinghe: Problems of Marketing of spices in Sri Lanka: 1989) Cinnamon Leaf oil and Back oil industries are well developed agro industries in the areas. Coffee, cloves and pepper are the other minor crops of importance in the Galle district.

Livestock

Milk production (cow and buffalo) is an important economic activity in the district. Average milk production in the district vary between 325,000-600,000 litres.

The milk collection network is ineffective. The milk yields of animals are low. Only 10.0% of the milk production in the Galle district is collected. There is much to be done in this field, especially by developing milk based agro-industries like yoghurt, ice cream, flavoured milk, cream (to tourist hotels), cheese, ghee, butter and bread spreads. Flavoured

	1982	1983	1984	1985	1986	(In litres) 1987
Cow	220350	222300	277575	296250	306525	378700
Buffalo	114000	102750	179250	176700	188700	219500
Total	334350	325050	456825	472950	495225	598200
Mn collection		550000	635000	664000	682000	785000

Source: Dept of Census & Statistics Milk Board/MILCO

Poultry, mainly for eggs, is popular in the Galle district. The average monthly egg production for the Galle district is given below.

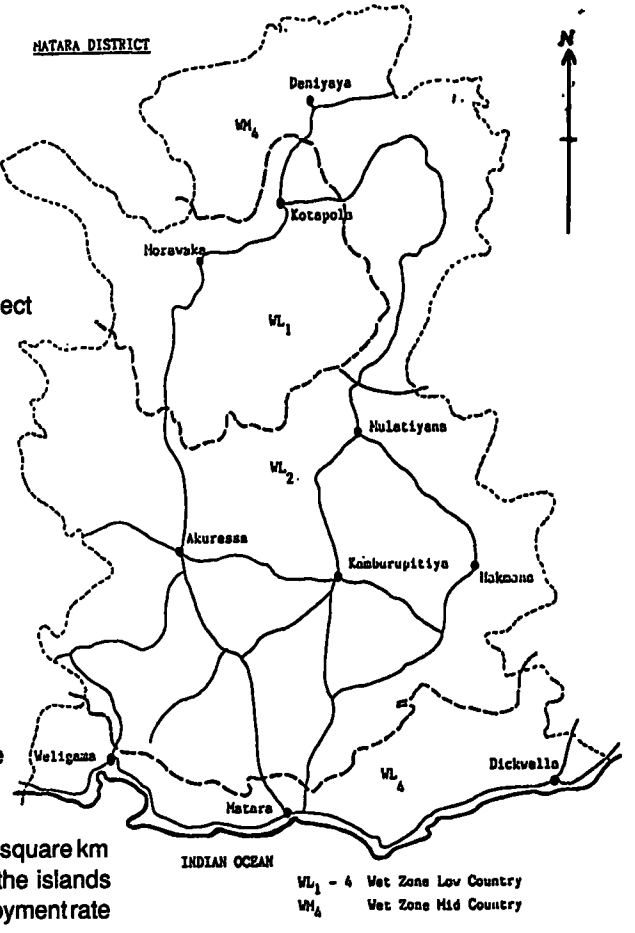
1982 – 1,757,000 eggs
1983 – 1,682,800 eggs
1984 – 1,897,800 eggs
1985 – 1,822,900 eggs
1986 – 2,037,100 eggs
1987 – 2,411,300 eggs

There is a loan scheme available under the SL/ADB Livestock Development Project for the Galle district. There are 4 veterinary officers and dispensaries and 3 milk collecting centres with chilling facilities in the district.

Matara District

The Matara district has an area of 128,795 ha which is about 1% of the island's total land area. The district is one of the most densely populated in the country with 599 persons per square km which is about 2 1/2 times the islands average. The current unemployment rate is reported to be about 30% as against 20% for the island. Underemployment too is high in the district.

Most of the district is in the Wet Zone and receives two monsoonal and two intermonsoonal rains. There are five agro ecological zones namely WL 1, WL 2, WL 4, WM 1 and an intermediate zone within the district. (Map). The major river in the district is the Nilwala Ganga.



	Estate Sector	(Number) Small Holdings	Total	% of the District of the Island total
Cattle	907	18,122	19,029	1.4
Buffaloes	194	5,866	6,060	1.1
Goats	559	1,841	2,400	–
Sheeps	144	–	144	–
Pigs	420	77	497	–
Poultry	13,296	73,955	87,251	–

Source: Census and Statistics

Soil Types

The predominant soil type in the district is red yellow podzolic soils. Bog soils occur in depressed sites and in certain areas there are half bog soils which are easier to manage. Humic alluvial soils occur in the poorly drained valleys and

flood plains. Regasols occur in the coastal plain. The red yellow podzolic soils are used for a wide variety of crops including tea, rubber, coconut and cinnamon. Bog and half bog soils are suitable for market gardening. Paddy is grown on alluvial soils while coconuts are grown in regosols. Poor land management in the district needs attention.

Nearly 9,000 ha of land gets submerged by perodic floods. The Nilwalaganga flood protection scheme provides for the construction of bunds to channel the flood waters to the sea rapidly. The protected area is about 5,500 ha. It is expected that about 3,000 farm or families will benefit from Stage I of teh scheme.

In the Matara district surface irrigation is available for some of the paddy lands. Some of the irrigated paddy lands receive water from small village tanks such as Kekanadurawewa, Denagama wewa, Ellawala wewa, Hali ela, Suttangoda wewa. Other paddy areas are irrigated from anicuts along the Nilwala Ganga and its tributaries. Irrigated paddy can be cultivated in both seasons. However, the greater part of the paddy lands are rainfed. Paddy lands in the WL2 and WL4 agro-ecological zones do not have sufficient moisture for paddy cultivation under purely rainfed conditions. Periodic droughts also affect the highland crops.

Land Use in the Matara District – 1989

	Total Extent (ha)	Extent as % of total area of district
1. Settlement and associated non-agricultural lands	1,045	0.8
2. Horticulture (including homesteads)	25,770	20.0
3. Perennial tree crops	45,030	35.0
4. Food crop lands (paddy)	18,560	14.4
5. Unimpeared pasture lands	2,190	1.7
6. Market garden annual crops	150	0.1
7. Woodlands	22,680	17.6
8. Water bodies	960	0.7
9. Unproductive lands	12,410	9.6
	128,795	100.0

Source: Census & Statistics

Paddy acreage in the Matara district is 21323. Major part of the area is rainfed. 57% of the paddy holdings are below 1.0 acres. The average size of a paddy holding in the district is 0.4 ha. About 35% of the paddy area account for 42% of the paddy holdings owned by operators. The majority of paddy lands are under tenancy.

Matara – Distribution of Asweddumized Paddy Lands

Source of Water	Extent (Ha)	% of Total
Major tanks	3587	16.8
Minor tanks	4855	22.8
Rainfed	12881	60.4
	21323	100.0

Extent Under Paddy Cultivation and Production: 1983-1989/90

Year	Maha Season			Yala Season		Seasonal Variations	Yields
	Ext. (Ha)	Prod. (mt)	Yield (mt/Ha)	Ext. (Ha)	Prod. (Mt)	(Ha)	(Mt/Ha)
1983	20151	42690	2.9	13471	23661	6880	2.4
1984	20007	42899	2.8	18668	35074	1339	2.4
1985	19236	39682	3.1	17696	33945	1540	2.5
1986	18893	37304	2.6	18211	37743	682	2.7
1987	19211	42759	3.3	15043			
1989/1990	19213	49000	–	–			

Source: Ministry of Agriculture & Research Census and Statis

The yield level in the Yala is generally lower than during the Maha season because of the inadequate water supply. Vegetables and yams are grown in some paddy fields during the Yala. The maintenance of paddy fields and the drainage systems are very poor due to low investment due to the risk of flooding etc.

Paddy husbandry practices in Matara reveals:

* 85% of the sowing is through traditional broadcasting method
* About 4500 ha are hand weeded or rotary weeded. About 70% of the paddy lands are chemically weeded.
* About 40% of the cultivated area is ploughed by mammoty, 15% by the use of buffaloes and about 45% by tractors.
* There are 1.7 + 6.7 four wheel tractors and two wheel tractors per 1000 acres of agricultural land in Matara district.

Paddy cultivation in Matara is fraught with such problems as flash floods, droughts, erratic rainfall, poor soils, iron toxicity, acidic and saline soil conditions in certain areas.

The Department of Agriculture has broadly classified the paddy lands in Matara district into three categories identified as high potential, medium potential and low potential. Data on distribution of paddy lands on this basis along with the present average yields and potential yields are presented below.

Land Category	Distribution as % of total Paddy lands	Present Yield (Bu/Ac)	Acreage (Mt/ha)	Potential Yield (Bu/Ac)	Av. (Mt/ha)
High potential	50	75	3.9	75	3.9
Medium potential	20	40–45	2.1	50	2.6
Low potential	30	30	1.5	–	–

In the Matara district, 50% of all employed persons are engaged in agriculture, hunting, forestry and fishing (the figuers of 90% for the Galle district.)

It is evident that in the Matara district the highest percentage of the employed is in tea cultivation Paddy is next, followed by

	Total	%
All Industries ...	145989	100
Agriculture, Hunting, Forestry, Fishing	73248	50.17
Agricultural and Livestock Production	69773	47.79
Rice Cultivation ...	24164	16.0
Other field grains ...	613	0.0
Vegetables and Fruit Gardening ...	567	0.0
Tea Cultivation ...	36013	24.66
Rubber Cultivation ...	4311	2.95
Coconut Cultivation ...	748	0.0
Cinnamon ...	1655	1.13
Coca, Cardamom, Pepper Cultivation	4	0.0
Tobacco Cultivation ...	22	0.0
Citronella ...	5	0.0
Cultivation/other crops ...	1430	0.0
Toddy tapping ...	59	0.0
Livestock production ...	182	0.0
Agricultural Services ...	243	0.0
Hunting, Trapping and Game Progagation	1	0.0
Forestry ...	15	0.0
Logging ...	61	0.0

Source: Census of Population and Housing, 1981 Vol. 1. Part VII, VIII

rubber and cinnamon.Therefore, export oriented cash crop agriculture is the major source of labour absorption in Matara district. Matara will remain a paddy deficit area and cultivation could be primarily for domestic consumption. Since returns on low potential paddy areas will not Be worthwhile, it is best to develop water logged saline, unfavourable soil areas for inland fisheries and for urban development. Developing home gardens in livestock, food and spice crops is also possible. Agro-industrial possibilities exist in fruit canning, vegetable and yam processing.

Matara district has 20130 ha under tea an of this 66% or 13,342 ha are small holder tea. There are 27,964 tea holdings with 22075 operators, 65% of tea lands in

the Matara district is unregistered. Of the tea holdings 60.42% are sole owned, 18.41% colonist/allotee owned, 12.11% leased, 4.49% coowned, 2.99% encroached. The highest concentration of tea gardens are in Kotapola/Morawak Korale West, Urubokke/Morawak Korale East and in Akuressa/Morawak Korale North.

97.13% of tea holdings in Matara district are owner operated. Nearly 86.20% is less than 0.81% ha.

Matara: Size Distribution of Small Holdings – 1989

	Holding	%
< 1 AC	17843	63.80
1 – < 2 AC	6263	22.40
2 – < 3 AC	2385	8.53
3 – < 5 AC	595	2.13
5 – < 10 AC	460	1.64
10 – < 20 AC	246	0.88
20 – < 50 AC	154	0.56
50 AC & over	18	0.56
Total	27964	100.00

Source: TSHDA

Tea is grown as a monocrop in 90% of the total area in the district. Mixed crops includes cloves as shade crop with black pepper, coffee, jak and other crops including coconuts. In the district 91% of the tea is low grown; 8% is medium grown. In the Matara district 67.62% of holdings uses fertilizers-which is the highest usage in the Province.

The total tea production in the district is 24.15 million kgs. TRI are servicing small holders through two Assistant Regional Managers.

Rubber; There are 8.8154.8 ha. of rubber cultivated in the district with 5532 ha in estates and 2622.8 ha in small holdings. There are 2828 small holdings and 202 estates in Matara District.

30.8% of the holdings in the Matara district are over 40 ha in extent.

Size Class	Extent	%
0 – 4 Ha	2661 Ha	32.6%
4 – 40 Ha	2985 Ha	36.5%
Over 40 Ha	2515 Ha	30.8%
	8161 Ha	100.0

Source: Rubber Statistics, Rubber Control Dept.

Coconut; There are 36,777 coconut holdings of 17373.6 ha with an average holding size of 0.175 ha. This consists of 45560 small holdings of 14618.4 ha and 251 estates of 2755.2 ha.

The annual coconut production in the Matara district is 74 million nuts i.e. 2.5% of the national crop. The average yield per acre is 2000 nuts. The yields are low and fertilizer usage is only 10.6% of the total requirement. Coffee black pepper, are preferred intercrops. Most coconuts are consumed in the district. there are 4 coconut oil mills in Matara.

Minor Export Crops; grown in Matara district includes Cinnamon (16200 Acs), Citronella (1500 Acs), Nutmeg (3 Acs), Coffee (360 Acs), Black Pepper (100 Acs) and Cloves (60 Acs). Cinnamon Dark oil and Citronella oil are known agro-based industries.

Livestock

	Estate Sector	*Small Holdings*	*Total*	*% of the islands*
Cattle	1050	30467	31517	2.3
Buffaloes	234	6309	6543	1.1
Goats	421	2374	2795	–
Sheep	39	–	39	–
Pigs	03	80	83	–
Poultry	5243	120095	125338	–

Source: Dept. of Census & Statistics

The average monthly milk production vary from 177,600-420,000 litres, mainly from cows.

Monthly Average Milk Production -Litres

Matara	1982	1983	1984	1985	1986	1987
Cows	118575	114600	137175	140550	136950	298800
Buffaloes	63525	63000	70125	89400	70275	121200
Total	182100	177600	207300	229950	207225	420000

Source: Dept. of Census & Statistics

Milk Collection – In '000 liters

	1983	1984	1985	1986	1987
Matara	180	163	168	151	158

Source: National Milk Board– MILCO

Thus, it is clear that all milk produced is not collected.

A poultry hatchery exists at Kekanudara in the Matara district to develop the poultry development programme. The average monthly egg production is as follows:

1982 – 609,200 eggs
1983 – 752,600 eggs
1984 – 824,200 eggs
1985 – 795,800 eggs
1986 – 994,700 eggs
1987 – 1,337,900 eggs

Source: Census & Statisctics Dept.

There is a credit scheme for dairy development, covering the Matara and the Hambantota districts, operated by the Bank of Ceylon **and the People's Bank.**

Issues and suggested development strategies for the Galle and Matara districts.

Unlike Galle, the Matara district will remain a paddy deficit area and cultivation will be carried out primarily for domestic consumption. There is no need to make any further investment in the potentially low yielding paddy areas in Galle and Matara districts because they will not bring any worthwhile returns. Therefore, it is suggested that these low potential tracks affected by water logging, slinity and unfavourable soil conditions be converted into off season market gardens, growing short term, off season vegetables exotic export vegetables like okra, japanese egg plant, gherkins: or convert them to organized commercial inland fisheries to breed prawns, Crabs, ells, milk, fish, fresh water fish for local and export markets. The proposed international airport at Eraminiyawa can be used to export these products to international markets. Duck farming to meet the needs of Singapore and Hong Kong would also be a useful project.

It is better to concentrate on the high potential and medium potential paddy areas to improve yields. But on the basis of the cost of production and the cost of living of farmers, (which would increase), the net returns will not be attractive. Therefore, alternative crops with high return like Okra, Capsicum, industrial tomatoe, japanese egg plant, and off season red and large onions, chillies, pulses, oil seeds could be grown. Efforts should be concentrated on the planned and intensive development of home gardens with horticultural crops of selected varieties of mango, avacadoe, mangoostens, guava, citrus, jak, breadfruit, passion fruit, pineapple, and with spices like black pepper, cloves, nutmeg, allspice, beverages like coffee. The introduction of small dairy units and also some poultry along with the crop mix suggested would absorb the increasing labour force. The income generated through the better utilization of the home gardens may not be very much, but still it can improve the income levels of those households engaged on these activities. Agro-based industries would offer better prospects at village level.

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Packeting of low country tea and bulk export of tea from the Galle harbour must be pursued because it could create direct and indirect employment in the informal and the formal sectors. The Ruhunu University should be integrated into the development process of the Southern Province. An Agro based industrial and scientific institute should be established in Matara to service Southern Province development.

Hambantota District

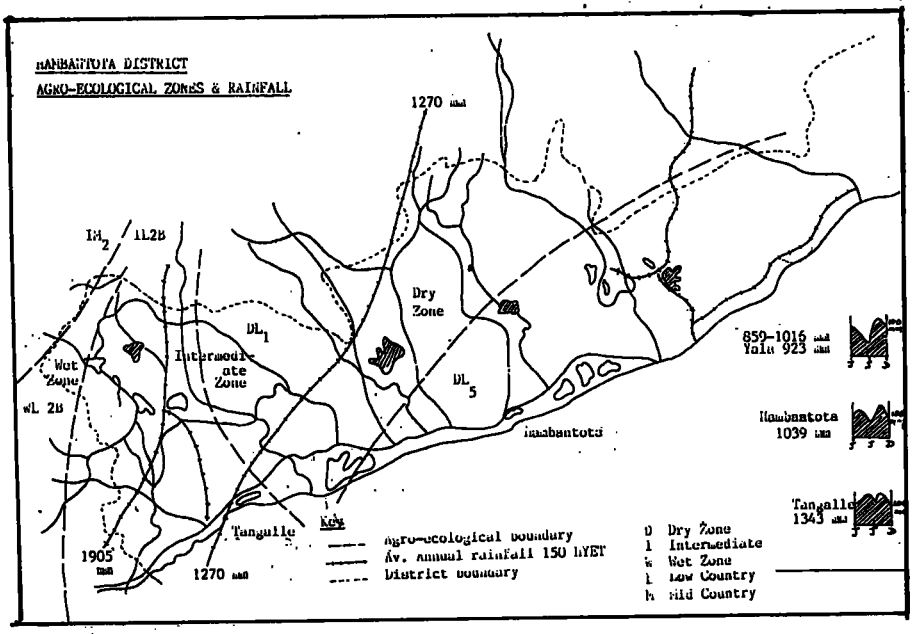
The Hambantota district, located in the South west of the island, occupies and area of 262,413 ha (1620 sq. km) which is equivalent to 4% of the total land area of the island. Just over 1% of the total area of the district (11.5 sq. miles) is covered by major inland water bodies. The balance 99% (1001.25 sq. miles) consist mainly of land. Hambantota contains all the major climatic zones of the island. Nearly 19 rivers run through the Hambantota district, enter the sea from its South West Coast. There are also a large number of abandoned tanks. There are several lagoons in the coastal area with brackish water. The total catchment area of these 19 rivers and streams is 31335 sq. miles (8115.1 km2). The largest catchment area (2470.7 km2) belongs to the Walawe Ganga.

Principl River by Length, Catchment Area and Runoff – Hambantota District

Name	Length Km	Catchment Area Km2	Maha cu.m.	Run off Yala cu,m.	Total cu.m.
Seenimodera Oya	8	38.8	29603.5	27137.6	56740
Kirama Oya	32	225.3	12334.8	83876.6	207224.7
Rekawa Oya	6	76.4	39471.4	28370	67841.4
Urubokka Oya	42	352.2	176387.6	77709.2	254096.9
Kachchigal Ara	21	222.7	90044	33303.9	123348
Walawe Ganga	137	2470.7	1388921	811629.9	2200528.3
Karagam Oya	7	59.6	13568.3	11101.3	24669.6
Malala Ara	55	404	129515.4	32070.5	161585.9
Emblilkala Oya	14	59.6	18502.2	4933.9	23436.1
Kirindi Oya	118	1178.4	540264.2	122114.5	662378.8
Dambawe Ara	5.6	80.3	25903.1	6167.4	32070.5
Mahasilawa Oya	13	12.9	3700.4	0	3700.4
Buthawa Oya	13	38.8	13568.3	3700.4	17268.7
Manik Ganga	114	1287.1	539030.8	107312.8	646343.5
Ktupila Ara	12	88.1	37004.4	7400.9	44405.3
Kurunda Ara	26	132	53039.7	11101.3	64140.9
Nemadagas Ara	6	108.8	43171.8	9867.9	53039.6
Karambe Ara	5	46.6	32070.5	8634.4	40704.9
Kumbukkan Oya	114	1232.8	636475.7	86343.6	722819.3
		8115.1	3933567.7	1472775.1	5406342.8

Source: S. Arumugam – Water Resources of Ceylon District Survey Office. Hambantota

Ridiyagama Tank is the largest of these inland reservoirs. The Muruthawela reservoir has the biggest storage capacity. The village tanks are not being used to the maximum benefits. There are 94 lagoons, bays and harbours. Most of these lagoons and bays function as fishing centres. Some of the laggons are used for the production of salt. Certain lagoons in the District like Karagan levaya dry up during the dry season. These lagoons are ideal for the development of acquaculture or even as tourist centres. Hambantota and Tangalle are the two fishing harbours in the District. Underground water resources also are available in the district.



There are 12 major tanks and inland reservoirs with a total storage capacity of 96010 acre feet (124765266.25cm) covering a total area of 8224 acres. The

The density of population is 383 per sq mile (148 per km2). 80% of the total population is between 5-54 years and 32.5% are within 5-14 years. The per capita land availability in 1971 was 10.6 acs (4.3 ha) In 1981 it was reduced to 0.5 ha. There are about 100,000 unemployed people is 20% of the total rural population. More women are employed than men in the district.

The economy of the Hambantota district is basically agricultural. The pattern of land utilization shows that 51% of the land surface of the district is covered with forests, National Parks and Sanctuaries 30% of the area is under major crops.

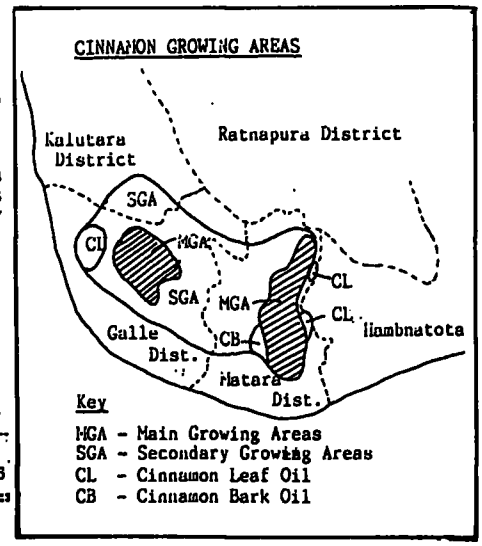
The area under paddy is 10% of the land area. 14% (36683.3 ha) of the lands in the district are state lands.

The Basic Village statistical survey in 1977 revealed that 62,542 families lived in villages. Nearly 33% of the population (i. e. 20449) were landless, and were foundin the AGA divisions of Hambantota, Tissamaharama and Ambalantota. The number of families owning less than 0.5 acres (0.2 ha) were 17% of the rural population. They were mainly found in Beliatta, Tangalle, and Weeraketiya AGA Divisions. Irrigation can be considered as the life blood of the economy of the Hambantota district. Paddy cultivation depends on irrigation to a large extent and the lack of proper irrigation facilities to about 1/8 of the aswaddumized paddy land has caused major difficulties.

Land Use - Hambantota District- 1989

	Ha
Total area	262310.35
Area under inland waters	2978.59
Total land area	
(a) National Parks and Sanctuaries	106400.48
(b) Forests and jungles	24898.38
(c) Asweddumized paddy cultivation	25278.37
(d) Highland cultivation	24021.78
(e) Coconut cultivation	20909.63
(f) Other commercial crops	6688.05
(g) Home gardens	12104.17
(h) Saltens	849.87
(i) Townships	2784.34
(j) Roads, Schools & Public Buildings	2909.79
(k) Lunugamvehera Project area	8405.62
(l) Shrubland, lagoons, marshes, land which could be developed	24083.30
	259331.76

Source: District Planning Unit, Hambantota



The fluctuating rainfall patterns of the District causes floods and droughts. The only possible method for cultivation of land in areas where there is less rainfall is to expand irrigation facilities. The cultivation in 2/3 (1748 km2) of the land area depends on the development of irrigation. Kirana oya basin (2024 ha), Urubokka oya basins (2367 ha), Kirindi oya basin (4504 ha) are important areas for paddy which needs irrigation. Nearly 50,000 acres (20235 ha) of fertile land in central and eastern sections of the district are yet uncultivated due to the lack of irrigation facilities.

Major Irrigation Schemes fall into two categories

(a) Major tanks and anicuts;
(b) Major irrigation development projects and settlement schemes.

There are 12 major tanks, 25 major anicuts, 3 major irrigation development projects and 6 colonization schemes under major irrigation schemes..

Major Tanks

12 large and medium size tanks culti vate 19937 acres 8068.5 ha whilst the cultivable extent is 21967 acres 8890.03 ha. The total capacity of these 12 tanks is 96,010 acre ft at full supply level.

There are 26 major anicuts in the district. The extent cultivable is 12800.25 ha, but extent actually cultivated is 13569.59 ha. These are constructed across the rivers and the waters thus amassed are taken to the paddy fields through canals. There are 16 anicuts linked to the Kirama Oya, 8 connected to Urubokke Oya while 2 are built on the Walawe Ganga and Kirindi Oya.

The Minor Irrigation Schemes

There are 723 village tanks distributed in 10 aga divisions as follows:

Weerawila AGA Division	150	village	tanks
Netolpitiya AGA Division	127	village	tanks
Bellatta AGA Division	121	village	tanks
Weeraketiya AGA Division	108	village	tanks
Janadura AGA Division	68	village	tanks
Lunama AGA Division	47	village	tanks
Walasmulla AGA Division	33	village	tanks
Yodhakandiya AGA Division	30	village	tanks
Meegasara AGA Division	24	village	tanks
Ambalantota AGA Division	15	village	tanks
Total	723		

The **Lunugamwehera** (kirindi Oya Scheme) is the largest irrigation cum human settlement scheme in the Ruhuna, covering the Hambantota, Tissamaharama and Lunugamwehera AGA divisions and the Tanamalwila AGA division in the Moneragala district. Its catchment area is 455 sq. miles (1178 km2). This reservoir feeds 31899 acres (12910 ha) of land. The project was commissioned in March 1986. The total estimated cost was Rs. 560.9 million of which Rs 370.9 million was contributed by the ADB and the rest from IDA.

The Kirama Oya Project is funded by NORAD. Due to an absence of an efficient flood control system, heavy floods and droughts have caused extensive damages to the cultivations in the Kirama Oya basin where 150,000 people live on paddy cultivation. The project would cost Rs.5.5 million and with its completion 2024 ha of paddy land will benefit both in Yala and the Maha.

The Urubokke Oya Project is estimated to cost Rs 7.9 million and is funded by NORAD. The project is to provide irrigation facilities to 3808 ha during Maha and Yala seasons. The **Walawe Ganga Right Bank and Left Bank Scheme** is now partly rehabilitated by the ADB funds and the other bank is being examined by JICA for funding.

Other development projects that have been undertaken in the past few decades are Malay Colony (1931), Beragama Colony (1933), Badagiriya project (1957), Matagalwewa (1958), Udawalawe (1963), Bogahapelessa (1965), and Muruthawela (1967). The other scheme was the Ranmale Kanda scheme (1963).

The agriculture structure in the district is based on two major sectors:
(i) Paddy cultivation and highland cultivation including chena.
(ii) Cultivation of commercial crops.

Paddy Cultivation

Nearly 34495 people are engaged in paddy cultivation of whom 21,925 cultiva tors are owner cultivators. Nearly 46% of the total population in the district (k 179;374) are dependent on paddy cultivation. Thus 3.5% of the land under paddy in the island is in Hambantota district. The total asweddumized area is 25278.37 ha. 67% of this area come under major schemes, 26% under minor schemes and 7% are rainfed. The biggest constraint to agriculture development is the non avilability of proper facilities.

The average yield per acre in the district is 4.2 MT per ha. (1989/90 Maha). The use of fertilizer in paddy is high. 87% of the paddy lands are tractor ploughed showing a high level of mechanisation in ploughing and threshing. Weedicides are also widely used. Broadcasting is popularly adopted in paddy cultivation. There are 2.8 & 18.5 four wheel and two wheel tractors owned by operators per 100-acre of agricultural land.

Paddy milling is an important industry in the district and the majority of the mills are located in the east where paddy cultivation is carried out on a commercial basis.

Cultivated land area by crops – Hambantota District – 1989

	Area under Cultivation (Ha)	% of land under Cultivation	% of total extent in the District
Paddy cultivation	25278.37	33.0	10.0
Chena and Highland Cultivation	24021.78	31.2	9.0
Coconut Cultivation	20909.63	27.1	8.0
Cotton Cultivation	2276.44	3.0	0.8
Minor Export Cultivation	3985.08	5.1	2.0
Others	424.53	0.6	0.2
Total	78895.83	100.0	30

Source: District Statistics Branch – Hambantota Kachcheri

Highland Cultivation and Chena cultivation occupies a very important place in the agricultural pattern of Hambantota. Nearly 24021.78 ha are under this type of cultivation. In areas where irrigation facilities are not avilable, crops such as Kurakkan, maize, sorghum, green gram, cowpea, dhall, groundnut, red onions, chillies, seseme, plaintains and vegetables are cultivated.

Commercial Crops: An area of 26595.68 ha is under commercial crops i.e.35.8% of the total area under the major crops in the district.

Coconut is the main commercial crop with an extent of 20,909.63 ha. More than 75% of the holdings are less than 4 ha in extent. The yield per year is 31 million nuts at 600 nuts per acre. The yields are low due to bad maintenance and inadequate fertilizer use.

Citronella is the major oil yielding grass in the district and covers 53% of the acreage under minor crops. The cultivation declined due to low prices of oil and due to diversification into coconut. Cotton is popular in the Eastern part of the district.

Tea is cultivated in the north western area of the district. **Cinnamon** cultivation is confined to the northern, western area. About 1259.83 ha produces 20046 cwts (1053.9 MT).

Black Pepper is 1.5% of the total minor exports grown in the district covering 600.17 ha producing 3345 kg annually. **Coffee** covers 23.7 ha. and **Cashew** covers 600 acres. **Rubber** and **Mulberry** are cultivated on a small scale. Only 84 ha of rubber is found in the district.

Animal Husbandry: The district has 206,300 heads of cattle producing Rs100 million worth of livestock products annually. Meat cattle and buffaloe comprises 60% of this livestock population. Milk, curd, eggs, wool and beef are the chief products.

Natural conditions favour animal husbandry in the Hambantota district. Western division with a wet humid climate has favourable conditions for cattle farming and the eastern division with a more arid climate is favourable for rearing goats and sheep. 373,020 curd pots valuing Rs. 7.4 million is produced from buffaloe milk. There's also a considerable potential for the manufacture of cream, cheese and spreads.

Livestock Population – 1989

	Estate Sector	Small holdings	Total	% of Island Total
Cattle	709	52964	53673	3.9
Buffaloes	1263	27054	28317	4.2
Goats	46	3039	3085	–
Sheep	1428	–	1428	–
Pigs	105	51	156	–
Poultry	3385	58375	61760	–

Source: District Agriculture Unit

CONCLUSIONS AND RECOMMENDATIONS

The analysis of the agriculture scenario of the Southern Province reveales an excess of water in the Galle and the Matara districts and a scarcity of water in the Hambantota district. There is a wide range of crops from paddy to tea, rubber, coconut, cinnamon to oil seeds, oil bearing grasses, pulses and spices. Livestock also features prominently. The greates hope for the south is in agriculture and not in industry. Therefore irrigation has a major role to play. The expansion of Uma-oya and the **Upper kirindi Oya multi purpose development project** could be of great assistance to the upliftment of the Southern Province economy.

The initial studies for Uma Oya basin development was carried out by the UNDP/FAO under the Mahaweli Master Plan study team proposed a 5 stage development for Uma Oya with a total installed capacity of 166 MW. In 1988, two FRG expers reviewed the above proposals and suggested a two stage development for Uma Oya 500 and Uma Oya 1000 schemes.

The total installed capacity of the proposal is 184 MW. In 1988/90 the Central Engineering Consultancy Bureau examined the possibility of diverting the Uma Oya to Kirindi Oya basin for irrigating a part of the south Eastern Dry Zone and to develop hydropower. This proposal envisages the installation of a 155 MW power plant and releasing 250 MCM of water to irrigate 12500 ha of land in the SEDZ. The cost of the proposed reservoir at Kirindi Oya and other development required for irrigating the land would be US $ 100 million. The overall internal rate of return of the Uma Oya transbasin diversion project including the hydropower and irrigation components would be 16.5 and the B. C. ratio would be 1.62. The contribution to this from the power project 21% and from the irrigation project 10%. Therefore, the Uma Oya transbasin diversion project is justified on economic returns. For Southern Province development the proposed diversion of Uma Oya to Kirindi Oya basin should be seriously examined and implemented.