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YALA 1993
DIVERSIFICATION
&
CULTIVATION CENSUS
REPORT

by

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(Report No. 219)

MARD PROJECT
PIMBURATTAWA

NOVEMBER 1993

TABLE OF CONTENTS

	Page
Summary	i
PART I	
REPORT ON CROP DIVERSIFICATION IN SYSTEM B; YALA 1993	
INTRODUCTION	01
Gains from diversification	02
Tables and figures on changes in income from diversification	05
Cost and returns to crop production	07
Tables and figures on gross and net returns to crop production	10
Tables and figures on average yield, standard deviation, minimum and maximum yields	13
Tables and figures on cost of production	15
Crop production in System B; Review of opportunities and constraints	17
Table on review of opportunities and constraints of System B crops during Yala season	18
Extension program in System B; Descriptions and recommendations	27
Conclusion	32
Annex, Description and results of the Yala 1993 gherkin production program	33
PART II	
REPORT ON THE CULTIVATION CENSUS; YALA 1993	
INTRODUCTION	01
Changes in diversification in Zone 1 and 5 Yala 1990 to Yala 1993	02
MARD extension and diversification	04
Tables and figures on changes in diversification;	

Yala 1990 to Yala 1993 05

Tables and figures on changes in diversification; Maha 1990/91 to Maha 1992/93 05

Summary of System B cultivation 09

Tables and figures on crop cultivation census; Yala 1993 System B 11

Summary of Aselapura block 16

Tables and figures on crop cultivation census; Yala 1993 Aselapura block 17

Summary of Damminna block 22

Tables and figures on crop cultivation census; Yala 1993 Damminna block 23

Summary of Dimbulagala block 28

Tables and figures on crop cultivation census; Yala 1993 Dimbulagala block 29

Summary of Ellewewa block 34

Tables and figures on crop cultivation census; Yala 1993 Ellewewa block 35

Summary of Senapura block 40

Tables and figures on crop cultivation census; Yala 1993 Senapura block 41

Summary of Sevanapitiya block 46

Tables and figures on crop cultivation census; Yala 1993 Sevanapitiya block 47

Summary of Wijayabapura block 52

Tables and figures on crop cultivation census; Yala 1993 Wijayabapura block 53

EXECUTIVE SUMMARY

This report is divided into two parts. Part I presents information on the costs and returns to crop production in System B during Yala 1993. Part I also provides 13 recommendations for MEA/MARD during the final phase of the project. Part II is the results of the Yala 1993 cultivation census. Following is a summary of the Yala 1993 cultivation season.

1. Diversification of crop production remains an important source of added income for settler farmers in System B. Crop diversification means more than one other crop (OC) in addition to paddy. Record keeping farmers who cultivated more than one OC on average obtained higher income than those who cultivated only one OC.

2. Production risk associated with chilli is high. MEA/MARD will discourage Yala chilli plantings.

3. Big onion had the highest net return, and baby corn (from cultivation of one crop) had the lowest net return.

4. High value crops are generally higher risk crops than crops such as grain legumes and certain vegetables. Promoting less costly grain legumes as companion crops to the higher valued but higher risk crops is a good method of managing production and marketing risk.

5. The model unit program resulted in high increases in income for participating farmers. Farmers diversifying in Kalingwila, the model unit in Aselapura Block, increased income 78 percent over production of paddy alone. This was the greatest increase of any unit in System B.

6. The number of farmers diversifying crop production during Yala 1993 increased sharply over that of Yala 1992. About 4,200 farmers diversified crop production, up from 3,400 in Yala 1992. The number of farmers diversifying crop production increased in every block except Sevanapitya.

7. The area cultivated to OCs increased to 590 hectares in Yala 1993. Increases were reported in Damminna, Ellewewa and Wijayabapura Blocks. The area cultivated to OCs in Wijayabapura Block almost doubled from Yala 1992 to Yala 1993.

8. Total income from crop production during Yala 1993 is estimated at Rs 164.5 million. Ellewewa Block provided the highest crop income.

9. Overall, increases in income from diversification were modest in Yala 1993. This was due to the poor net returns from chilli production (only about Rs 7,200/ha). For System B as a whole, the increase in income over production of paddy alone was Rs 6.9 million.

10. The average increase in income per farmer was Rs 1,652, or 13 percent above production of paddy alone.

11. The changes in income resulting from crop diversification were not evenly spread throughout the system. Those units with a high percentage of chilli fare less well than those which exhibited greater diversification with more OCs.

PART I

REPORT ON CROP DIVERSIFICATION IN SYSTEM B; YALA 1993

INTRODUCTION

The Mahaweli Agriculture and Rural Development Project (MARD) is entering its final phase. The project promotes crop diversification with a myriad of programs in agricultural research and extension, farmers' organizations, water management, and homestead cultivation. MARD has conducted a full range of investigations, covering agricultural, social and economic aspects; searching for the combination of factors which can accelerate crop diversification in this most newly settled area of the Mahaweli.

MARD has introduced numerous new crops and new technologies to System B. New crops are for export and domestic markets include: cantaloupe, baby corn, groundnut, okra and brinjal. Okra and brinjal, for example, though not new to Sri Lanka, were not extensively grown in System B before MARD, and have been introduced as both export and local market crops. Cantaloupe was been introduced as an export crop, though it appears to have a significant local market.

During the last season, MARD staff worked with local companies on the production of crops for export. A large Colombo-based agribusiness company launched a program for production and export to Europe of baby corn. MARD assisted with the extension of this crop in two villages in System B. TESS Agro had three contracts with farmers' organizations (FOs) for production and export of cantaloupe. Sunfrost, Ltd. continued its program in gherkin cultivation during Yala 1993. Commenced in Yala 1989, Sunfrost's program has expanded from 89 farmers to over 400 farmers. MARD extension staff also assisted with this program in three villages.

MEA/MARD extension staff instituted the "model unit" program during Yala 1993. The basis of the program is a financial grant to FOs for the purchase of seed for cultivation of other crops (OCs). The grant is to be used as a revolving fund, and farmers are required to pay back the value of seed at the conclusion of the season. A more thorough discussion of the model unit program and other extension activities will be presented later in this report.

The purpose of Part I of this report is to discuss various salient aspects of crop cultivation in System B during Yala 1993. The coverage will include increases in income from crop diversification and costs and returns to crop production, paddy

and OCs, in the System. Specific reference will be made to Yala chilli production, and its effect on farm income. There will also be a discussion of three production programs which are connected with MARD: the "model unit" program; the Sunfrost-type outgrowers program; and the export production buy-back contracts program.

The data for Part I were acquired through the farm record keeping program. This program, which was first carried out in Yala 1989, collects data on all production costs and returns. The program has expanded to 99 farmers in Yala 1993 from 41 farmers in Yala 1989. Data collectors in 11 villages[1] visit each farmer in the program every three days to assist them with data collection forms. These data collectors, all of whom are unemployed youth in System B, are managed by MARD's agricultural economics unit.

A key objective of this paper is to recommend programs for Yala 1994, which based on past experiences and results of experiments, should consolidate the diversification program for sustainability of project benefits.

GAINS FROM DIVERSIFICATION

The record keeping farmers cultivated an average of 16.6 percent of their irrigable lands to OCs during Yala 1993. The extent allocated per farm ranged from 50 percent to a mere 5 percent.

The gains from diversification are shown in Table 1. Compared with income derived from production of paddy alone, diversification resulted in an average net increase in income of 16 percent. Average total income per farm was Rs 14,605, an increase of Rs 2,017/farm.[2]

The average increase in income during Yala 1993 was lower than expected. Crop diversification during Maha 1992/93, for example, increased income of the record keeping farmers over 18 percent on just 12.6 percent of the irrigated field. Lower income gains during Yala 1993 resulted from a low average return

[1] The villages in the Yala 1993 record keeping program were Kandegama, Damminna, Kalukele, Pahala Ellewewa, Aralaganwila, Medagama, Ginidamana, Thispanegama, Ellewewa, Galthalawa, and Weheragama.

[2] Changes in income are noted on a farm basis, not per hectare. Most farmers cultivated about one hectare of land, but in certain areas, for example, Kandegama, the average irrigated field is about 1.2 ha.

to chilli production, which was cultivated by 41 of the 99 farmers. Chilli production suffers from severe pest problems during Yala.[3]

Table 1 shows the effect of chilli cultivation on System B incomes during Yala 1993. Farmers who cultivated chilli and paddy had average total income per farm of Rs 12,340, a decrease of Rs 1,449, or 10.5 percent, compared with production of paddy only. Of the 31 farmers who cultivated paddy and chilli only, 27 had net decreases in income compared with paddy production. Farmers who cultivated chilli and paddy only had lower than average areas devoted to OCs, about 11 percent.

Recommendation 1

Promote Diversification on Farms

The data from the record keeping farmers show the importance of diversification. Those farmers who grew more than one OC had greater incomes and were less likely to lose in comparison to paddy cultivation than those who grew paddy and one other crop.

Diversification is more than simply planting one other crop. Diversification should be viewed as a risk management system. There are two good reasons for diversification: 1) generation of higher incomes for farmers; and 2) management of production and marketing risk.

The MEA/MARD extension program should recommend that farmers diversify with cultivation of more than one OC. Crops with differing labor and capital requirements, such as greengram and big onion, or cantaloupe and cowpea, should be promoted as "companion crops". This will ensure increased income and sustainable gains from crop diversification.

[3] The net return to chilli was only Rs 9,342/ha, below that of paddy, and less then one-third the average net return of less costly OCs such as greengram, groundnut or local vegetables. The costs and returns to chilli are discussed further in the next section of this paper.

Greater levels of diversification resulted in larger increases in income (also Table 1). Farmers cultivating other OCs (including chilli, but not only chilli) and paddy increased incomes 30 percent over production of paddy alone. Average income per farm was Rs 15,637, an increase of Rs 3,596/farm over paddy alone. This increase in income resulted from 19.3 percent of the cultivated area planted to OCs. Twelve of 68 farmers had net decreases in income in relation to paddy.[4]

Recommendation 2

Discourage Production of Chilli during Yala and Encourage Production during Maha

Chilli production is risky during Yala. Of the 31 record keeping farmers who cultivated chilli and paddy, only four increased income compared with production of paddy alone. Chilli yielded an average net return of Rs 9,342.

Maha chilli production, on the other hand, shows promise, especially homestead cultivation of chilli. Figure 1 compares the gross and net returns of chilli during Maha 1992/93 and Yala 1993. The difference is significant. Yala yields were much lower than Maha yields, as shown in Figure 2. Homestead chilli yields and returns were even higher than those shown in Figures 1 and 2.

The MEA/MARD extension program should use the evidence gathered from the record keeping farmers to encourage farmers to cultivate crops other than chilli during Yala, and cultivate chilli on homesteads during Maha.

[4] Those with net decreases in income compared with paddy cultivated the following: 6 cultivated gherkin; 2 cultivated snakegourd; 1 cultivated chilli and gherkin; and 2 cultivated baby corn; and one cultivated greengram.

Table 1. Changes in income from diversification (99 farmers)

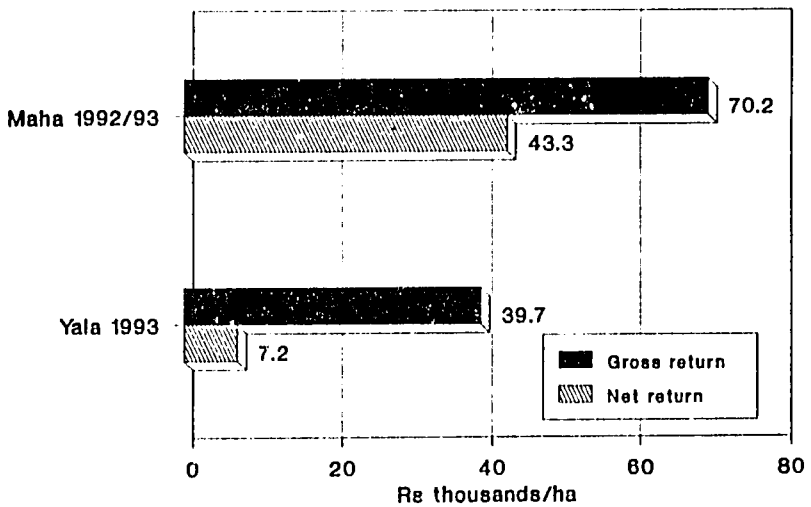
	Total income (Rs)	Income if only paddy*** (Rs)	Change in income (Rs)	Percent change (%)	Percent OCs (%)
1. All farmers	14,605	12,588	2017	16.02	16.6
2. Farmers cultivating chilli and paddy*	12,340	13,789	-1449	-10.51	10.8
3. Farmers cultivating OCs and paddy**	15,637	12,041	3596	29.86	19.3

* 31 farmers grew paddy and chilli only

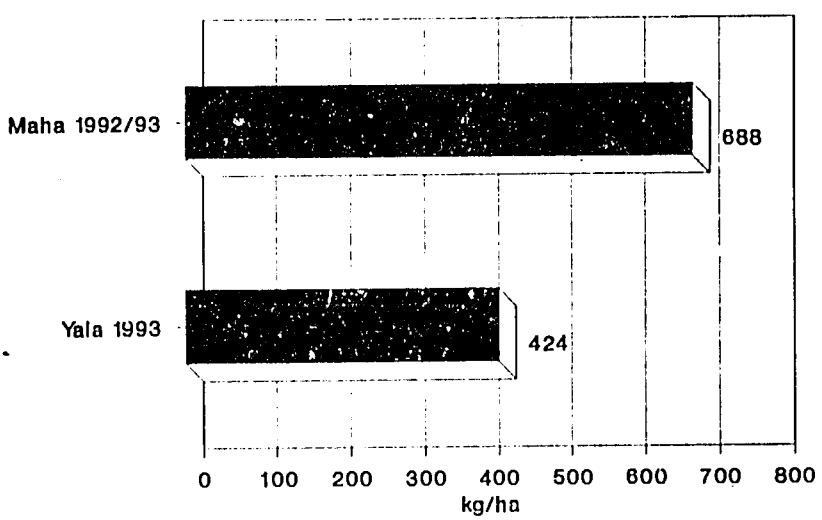
** 68 farmers cultivated paddy and OCs, including perhaps chillis, but not chilli alone as an OC.

*** Income is given on a farm basis and not hectare basis. Farmers cultivating paddy and chilli had slightly larger farms. The income if only paddy was therefore slightly above the other categories of farmers.

Gross & net returns; Chilli production
Maha 1992/93 and Yala 1993



Chilli Yields
Maha 1992/93 and Yala 1993



COSTS AND RETURNS TO CROP PRODUCTION

The gross and net returns to crop production in System B are given in Table 2 and shown in Figures 3 and 4. Big onion (Rs 80,980/ha) and tobacco[5] (Rs 78,784/ha) gave the highest net returns per hectare. Paddy, with a net return of Rs 12,733/ha, was the third lowest, ahead of baby corn (Rs 5,302/ha)[6] and chilli (Rs 7,181/ha).[7]

Brinjal (Rs 45,210/ha), butternut (Rs 50,320/ha), bittergourd (Rs 35,290/ha) and cantaloupe (Rs 55,016/ha) yielded fairly high returns, at least 3 or 4 times that of paddy. Grain legumes gave returns approximately 1.5 to 2.5 times the net return of paddy (Cowpea - Rs 18,139/ha; greengram - Rs 20,318/ha; long bean - Rs 24,295/ha, soya - Rs 28,740; and groundnut - Rs 31,946/ha). Gherkin performed disappointingly during Yala 1993, providing farmers with an average net return of Rs 13,410/ha.[8]

Returns to labor and capital are shown in Table 2 and Figures 5 and 6. Only 9 of the 17 crops listed in Table 2 provided returns to labor that exceed the wage rate (Rs 75/day). Tobacco's return to labor was the highest of all crops, over Rs 500/day[9], followed by cantaloupe at Rs 200/day. Paddy's return to labor was also fairly high, ranking fourth of the 17 crops at Rs 136/day.

Tobacco also provided the highest return to capital, almost Rs 6.00/Rs. Big onion, groundnut, soya, cowpea, and greengram had returns to capital exceeding Rs 2.00/Rs. Paddy had a return to capital of Rs 0.86/Rs. Baby corn (Rs 0.35/Rs), chilli (Rs 0.27/Rs) and gherkin (Rs 0.36/Rs) are the crops with the lowest returns to capital.

[5] Tobacco is not a MARD promoted crop. Ceylon Tobacco Company operates an outgrowers program in System B.

[6] Two crops of baby corn are to be promoted each season.

[7] Gross and net returns do not include the value of family labor.

[8] Data on gherkin and baby corn were provided by Sunfrost, Ltd. and Chemical Industries (Colombo), respectively. These two firms operated outgrowers programs for these two crops.

[9] Tobacco is a new crop in System B. Data collected from tobacco farmers in Ellewewa Unit were verified by Area Manager of Ceylon Tobacco Company at Alutharama/Girandurukotte, Mr. Rohan Tennekoon.

Table 3 shows average yield, its standard deviation, the coefficient of variation of yield, and minimum and maximum yields.[10] A proxy for production risk is variation in yield as shown in Figure 7. Note that baby corn, chilli and gherkin, the three OCs with the lowest returns during Yala 1993 also had the highest levels of yield variance (as measured by the coefficient of variation (CV).[11],[12] Big onion and cantaloupe, two highly profitable crops, had CVs which were fairly high, but below 50 percent. All other crops, including red onion, cowpea, greengram, paddy and groundnut had low CVs, indicating stable yields and low production risk.

The range of yields and the position of average yield within that range for a given crop is shown in Figure 8. Cantaloupe shows the average yield in the middle of the range, indicating that there is a fairly even distribution of yields across the continuum. Paddy exhibits this same characteristic, with the yield at approximately the mid-point of the range. Chilli on the other hand shows extreme skewness, with the average yield in the bottom one-quarter of the range. Gherkin and baby corn also have average yields that are far to the left of the mid-point while big onion, which also shows this tendency, is not as pronounced as the other crops. Average yields to the left of the mid-point indicates that a high percentage of farmers produced poorly.

Grain legumes, cowpea, greengram and groundnut show the opposite tendency. Average yields are to the right of the mid-point of the range, indicating consistently good yields by growers.

Production costs are shown in Table 4. Red onion had the highest average cost of production, Rs 53,573/ha, due to the high cost of seed (over Rs 30,000/ha). Cantaloupe, gherkin and chilli also had high costs, due to heavy use of chemicals. The cost of cultivating big onion was above Rs 30,000/ha because of relatively high costs of seed material, fertilizer and chemicals. Baby corn and paddy each had production costs around Rs 15,000/ha. The lowest costs were those of the grain legumes,

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[10] The discussion of yield and costs of production is on a smaller set of crops. Sample sizes for some of the vegetable crops were too small for meaningful analysis, and have thus been eliminated from this section of the paper.

[11] The coefficient of variation is the standard deviation divided by the mean. It is expressed as a percent of the mean.

[12] While production risk is often defined as variation in yield, one must bear in mind that yields of baby corn and gherkin are also affected by grades. Variation in grades also contributes to overall production risk.

cowpea, greengram and groundnut. All three had production costs of about Rs 8,500/ha.

Unit costs of production are also shown in Table 4. Average unit costs, defined as average total cost (in this case, excluding the value of family labor) divided by average yield, is the amount of money required to produce one kilogram of product.

Comparing average unit costs with average price is an indicator of the level of profitability and the level of risk attached to a given crop. The second to last column of Table 4 does this by showing average unit cost as a percentage of average price. It is not surprising that average unit costs as a percentage of average price for chilli, baby corn, gherkin and red onion are high. This implies that even slightly below average yields could result in losses. Conversely, for grain legumes and big onion, average unit costs as a percent of average price are low, implying even below average yields can remain profitable.[13],[14]

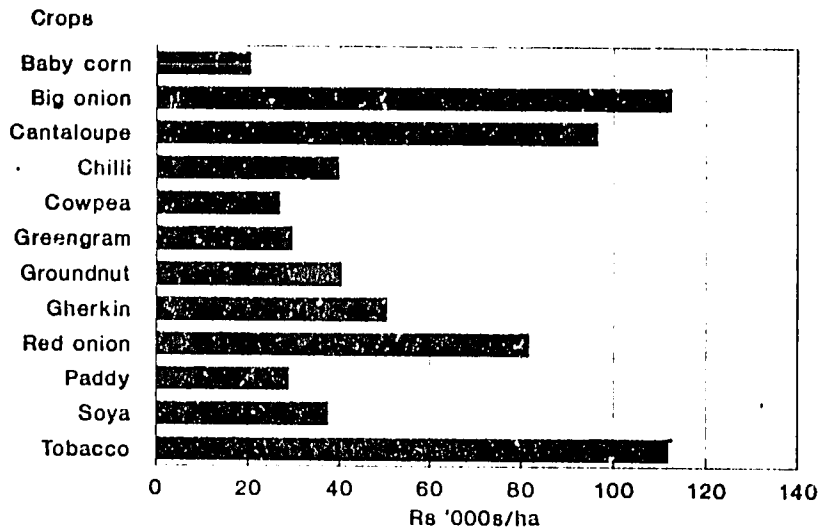
[13] At the time of this writing, many farmers in System B had not sold harvested red onion and prices have risen considerably since these data were collected. Thus good profits were possible for farmers with below average yields.

[14] Average unit cost as a percent of average price is equal to breakeven yield (the yield required to cover all costs) as a percent of average yield. The higher the percent, the riskier the crop, unless the variation in yield is very small.

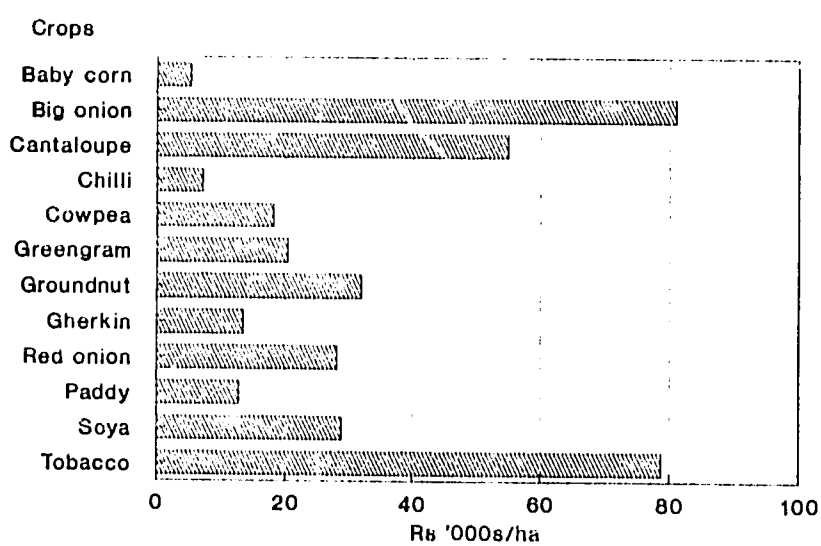
Table 2.. Gross and net returns to crop production, returns to labor and capital. Yala 1993. Mahaweli, System B.

Crop	Gross return (Rs/ha)	Net return (Rs/ha)	Return to labor (Rs/day)	Return to capital (Rs/Rs)
Baby corn	20,415	5,302	11.9	0.35
Bittergourd	71,090	35,290	49.7	1.19
Butternut	81,760	50,320	93.8	1.60
Big onion	112,570	80,980	152.6	3.96
Brinjal	67,017	45,210	126.9	2.15
Cantaloupe	96,564	55,016	204.3	1.26
Chilli	39,688	7,181	13.3	0.27
Cowpea	26,735	18,139	47.1	2.17
Greengram	29,535	20,318	99.3	2.36
Groundnut	40,410	31,946	104.3	5.06
Gherkin	50,435	13,410	11.8	0.36
Long bean	39,192	24,295	36.9	1.60
Okra	40,575	25,125	54.0	1.66
Paddy	28,787	12,733	135.7	0.86
Red onion	81,711	28,138	52.4	0.78
Soya	37,558	28,740	108.4	3.48
Tobacco	111,800	78,784	536.0	5.95

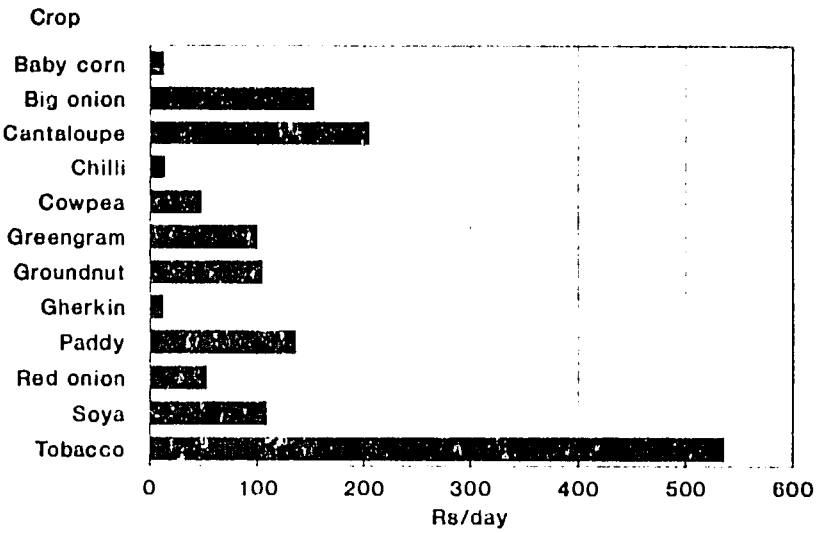
Gross Returns to Crop Production
Mahaweli, System B; Yala 1993



Net Returns to Crop Production
Mahaweli, System B; Yala 1993



Returns to Labor; Mahaweli, System B; Yala 1993



Returns to Capital; Mahaweli, System B; Yala 1993

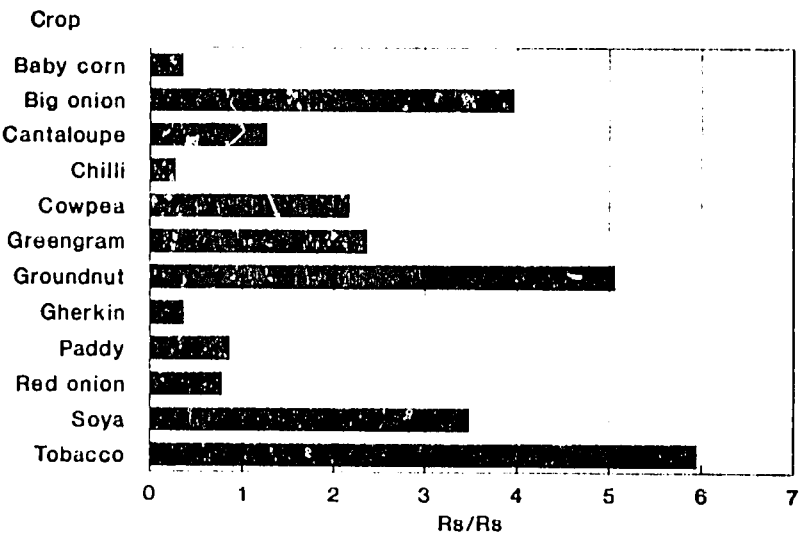


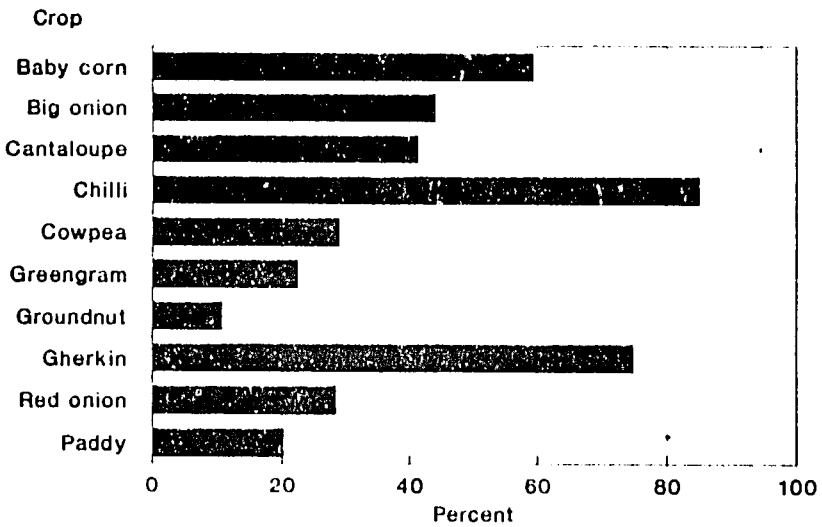
Table 3. Average yield, standard deviation, minimum and maximum yields.

Crop	Average yield (kg/ha)	Standard deviation	C.V. (%)	Minimum yield (kg/ha)	Maximum yield (kg/ha)
Baby corn*	2956	1754	59.34	160	8235
Big onion	6868	3017	43.93	3100	13750
Cantaloupe	7849	3240	41.28	2670	12880
Chilli	424	359	84.67	0	1640
Cowpea	1367	395	28.90	547	1800
Greengram	1325	297	22.42	850	1600
Groundnut	2258	241	10.67	1780	2600
Gherkin**	4406	3294	74.76	0	19740
Red onion	4513	1282	28.41	2000	7750
Paddy	3823	773	20.22	1588	5600

* Average yield for baby corn is taken from 107 crops in Kalukele, Weheragama and Kudawewa Units.

** Average yield of all gherkin cultivators in Ellewewa Block. Data supplied by Mr. Prasad Senadeera of Sunfrost, Ltd.

Coefficient of Variation of Yield
Mahaweli, System B; Yala 1993



Average Yield and Yield Range;
Mahaweli, System B; Yala 1993

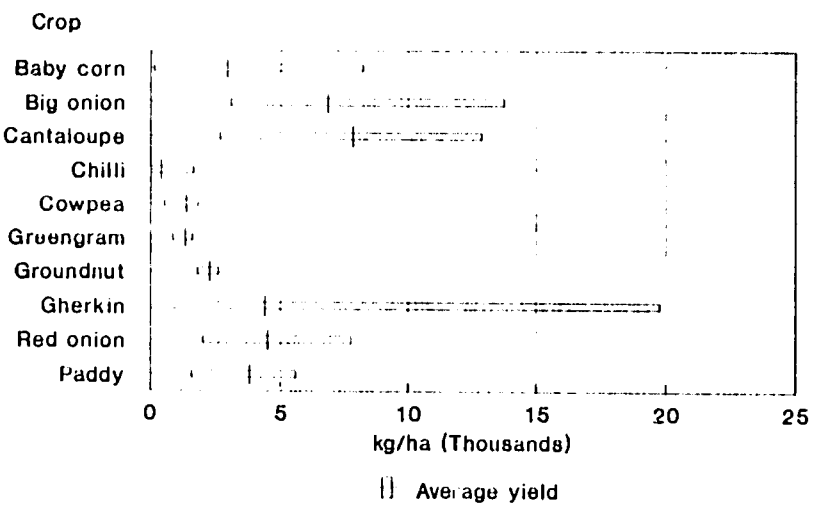
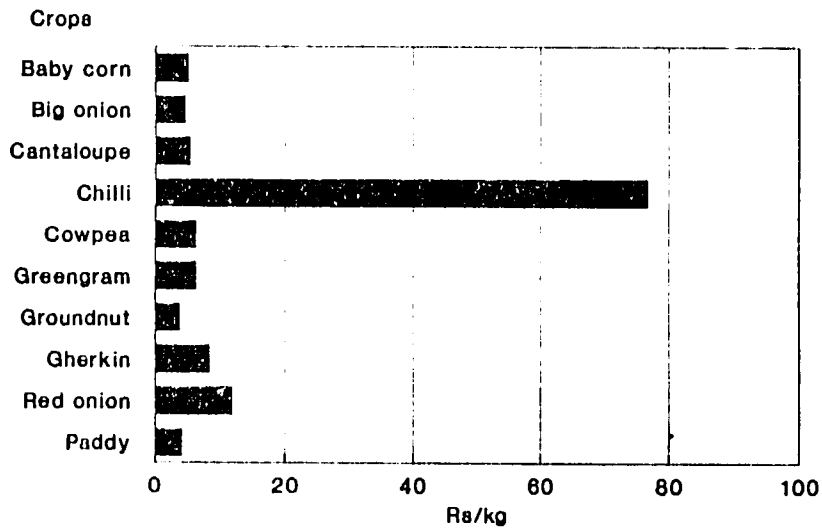


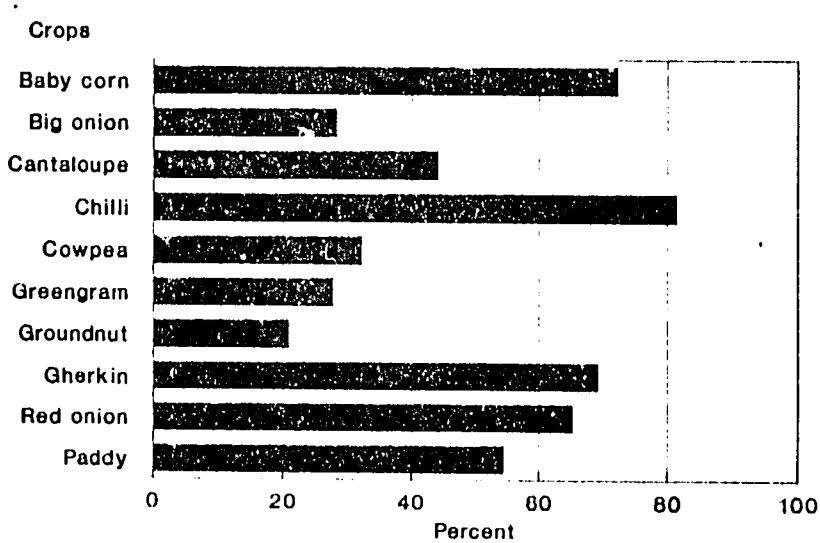
Table 4. Cost of production; Yala 1993
Mahaweli, System B.

Crop	Average total cost (Rs/ha)	Average cost of fertilizer (Rs/ha)	Average cost of chemicals (Rs/ha)	Average unit cost (Rs/kg)	Average unit cost as percent of price	Average Price (Rs/kg)
Baby corn	14930	6230	0	5.05	72.15	7.00
Big onion	31591	4943	4426	4.60	28.25	16.28
Cantaloupe	41574	16133	12158	5.30	44.14	12.0[illegible]
Chilli	32507	6147	9342	76.67	81.37	94.22
Cowpea	8595	940	1408	6.29	32.24	19.50
Greengram	8392	1790	1532	6.33	27.78	22.80
Groundnut	8463	818	372	3.75	20.82	18.00
Gherkin	37025	3000	17638	8.40	69.11	12.16
Red onion	53573	5899	2443	11.87	65.22	18.20
Paddy	15689	2860	1538	4.10	54.43	7.54

Average Unit Cost of Production; Mahaweli, System B; Yala 1993



Average Unit Cost as Percent of Price; Mahaweli, System B; Yala 1993



CROP PRODUCTION IN SYSTEM B; REVIEW OF OPPORTUNITIES AND CONSTRAINTS

A summary of opportunities and constraints to other production in System B is presented in Table 5. In the following section, each crop, or in one case, group of crops, are assessed and recommendation included.[15]

1. Baby corn

Baby corn is a new crop in System B. The first commercial production occurred during Yala 1993. This crop presents some unique opportunities for System B farmers, provided MEA/MARD and the private sector are able to overcome some of its more serious production problems.

The opportunities are: 1) an export market, which could be easily exploited, and a nascent domestic market which could be developed; 2) the system of buy back contracts can be established; and 3) few if any applications of agro-chemicals, an environmental advantage. In addition, baby corn may also be semi-processed in brine or vinegar, as is gherkin.

The constraints to baby corn are: 1) yields are low compared to Thailand, and thus production returns are low. Even two crops do not provide an income equal to that of paddy. 2) Baby corn requires high levels of labor for production, especially harvest and processing. Costs of the latter are high relative to the value of the raw cob.

In spite of the disappointing first season, baby corn production should not be discontinued after one season. However, it is important that good agronomic trials, both on-farm and on-station, be done to determine the agronomic and economic viability of this crop.[16]

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[15] This summary must be considered at least partially subjective, though it is based on the best evidence currently available on crop production in System B.

[16] A report on baby corn, published by Martin West, presents yields and costs of production from two on-station trials. Since these were not replicated, statistical analysis was not possible.

Table 5. Review of opportunities and constraints of System B crops during Yala season.

Crop	Opportunity	Constraint	Remarks
Baby corn	1. Export market 2. Buy-back contract system can be used 3. Low chemical use	1. Low yields and returns 2. High labor use 3. Intensive processing required. 4. Not competitive with other OCs	1. MARD agronomist will conduct trials during next two seasons to determine agronomic and economic viability. 2. Exporter needs to improve management.
Big onion	1. New storage facilities should help manage marketing risk.	1. Quality of seed should be improved. 2. Market gluts at Yala harvest lower returns.	1. With reliable seed supply and storage capacity, could be most important crop during Yala season. 2. Recommend hybrid red varieties.
Cantaloupe	1. Production risk low. 2. Domestic market develop ment is likely.	1. High chemical use 2. Export market not reliable.	1. Private sector input supply (including seed procurement) is important for sustaining production programs after MARD. MARD intervention should be reduced from Yala 1994. 2. Extension of cantaloupe should be done by private sector.
Chilli	1. High price	1. Risky production during Yala. 2. High chemical use.	1. Production during Yala should be discouraged until good IPM program is established.
Cowpea	1. Stable price 2. Fair income 3. Nitrogen fixing 4. Low input 5. Low chemical use	1. Returns lower than other OCs.	1. Good in rotation and as companion crop to other more expensive OCs. 2. Should be encouraged with crops such as big onion or red onion.
Greengram	1. Stable price 2. Fair income 3. Nitrogen fixing 4. Low input 5. Low chemical use	1. Returns lower than other OCs. 2. Generally better than cowpea.	1. Good in rotation and as companion crops to other more expensive OCs. 2. Should be encouraged with crops such as big onion or red onion.
Groundnut	1. Soils of System B appropriate for g'nut 2. Steady market 3. Low input and chemical use	1. Seed procurement unreliable. 2. High labor use at harvest.	1. Good in rotation and as companion crops to other more expensive OCs. 2. More profitable than other grain legumes.
Gherkin	1. Well managed production and marketing system 2. Input supply and exten sion reliable 3. Strong export markets	1. Production risk high 2. Income fluctuates from very high to low 3. High chemical use 4. Labor use high	1. Strong well managed company in System B maintains continuity of the production program.
Red onion	1. Strong market 2. Storability	1. High seed cost 2. Production risk high in Yala	1. Improved seed procurement and needed.
Vegetable crops (okra, brinjal, and gourds)	1. Stable demand 2. Fairly low cost 3. Frequent harvesting aids cash flow	1. Labor intensive 2. Moderately high chemical use	1. Good as companion crops to grain legumes. 2. Market gluts unusual but possible (Yala 1992, for example).

Recommendation 3

Conduct Baby Corn On-farm and On-station Trials

For better understanding of the agronomic and economic potential of baby corn, trials during Yala and Maha seasons should be carried out. Monitoring of the extension program should be improved in order to determine factors which caused low yields and returns during Yala 1993.

2. **Big onion**

Big onion has become an important crop in System B since MARD began. Its net return during Yala 1993 was high, and while this has not always been the case, big onion presents System B farmers with profitable opportunities, though some obvious constraints exist.

Big onion storage is now possible in System B, and has been identified as the main opportunity for increased profits. The low cost structures designed by Dr. K. Srivastava allow farmers to store onion and take advantage of the price increases that occur during the off season.

The greatest constraint to big onion cultivation is lack of good quality seed. Profitable production is dependent on good seed, and procurement of seed has been the responsibility of the MEA and DOA. MEA/MARD should consider procurement of hybrid seed which performed well in the Yala 1992 on-farm trials.

3. **Cantaloupe**

Cantaloupe, introduced through the MEA/MARD export production program with buy-back contracts with TESS Pvt., Ltd., has been grown successfully during Yala 1992 and Yala 1993. Production has been centered in Ellewewa Block.

Cantaloupe offers good opportunities for System B farmers because production risk appears to be low. During Yala 1993, the domestic demand for cantaloupe expanded, and local marketing agents purchased melons directly from farmers in System B.

Constraints to cantaloupe production are high chemical use, high production costs, and an unreliable export market. Sri Lankan producers have not yet been able to penetrate overseas markets, particularly Asian markets, which are dominated by Australia exporters.

Recommendation 4

Conduct a High Profile Extension Program in Big Onion Production and Storage

Make efforts to Procure Good Quality Seed

MEA/MARD should carry out a major extension program, perhaps with the assistance of Dr. K. Srivastava, on onion production and storage. Commercialization funds should be made available to farmers organizations to build large scale storage facilities.

Good seed is critical for successful onion production. Efforts should begin now to procure good seed, and consideration should be given to procurement of hybrid seed varieties which performed well in Yala 1992 trials.

To date, cantaloupe production and marketing has been aided by MARD. Extension, input supply, even the importation of seed, and many of the export marketing activities have been done under MARD management and with MARD funds. With these expenditures, we have shown that System B farmers can grow good quality cantaloupe with high yields. However, the system of cantaloupe production in System B is not sustainable in its present form. MARD should turn these activities over to the private sector in Yala 1994.

Recommendation 5

Increase Private Sector Efforts in Cantaloupe Production

MARD intervention in cantaloupe production has been high. MARD-managed extensionists provide farmers with advice, MARD imports seed, and organizes and distributes all inputs. MARD has also had a high level of intervention in export marketing of cantaloupe. This level of intervention is not sustainable.

In Yala 1994, MARD should turn over many of the activities associated with cantaloupe production to the private sector or farmers' organizations. It is essential that the turnover occur before the end of the project so that MARD professionals can continue to advise farmers and the private sector for at least one season before the end of the project.

4. Chilli

Chilli is the most widely cultivated OC in System B. It enjoys high prices and is traditionally the first choice among farmers wishing to diversify. There is, however, no good economic reason to cultivate chilli during Yala.

The crop suffers from numerous, sometimes unidentifiable, pests and diseases during Yala. Chemical costs are therefore high, and in all likelihood, the effectiveness of spraying is low due to the complex nature of the diseases. While there are cases in which farmers obtained good yields and high income, those cases are rare. Chilli production is too risky during Yala to be promoted by MEA/MARD.

MEA/MARD plant pathologist, Dr. James Burleigh, will carry out a research program in integrated pest management with the purpose of establishing a pest control program for chilli. In the meantime, MEA/MARD should promote chilli only in Maha, and especially on homesteads or other upland areas. It should be discouraged during Yala (see Recommendations 2 and 6).

Recommendation 6

Extension Should Promote Other Crops in Place of Chilli during Yala

Chilli should not be encouraged during Yala because of high production risks. Other less risky and higher valued crops are available. MEA/MARD extension should encourage other crops to replace chilli during Yala and promote chilli on upland areas during Maha.

5. Cowpea and Greengram

These two grain legumes present numerous opportunities for farmers in System B. They have relatively stable prices and incomes that are 1.5 to 2 times that of paddy. They are nitrogen fixing crops and thus good for crop rotations. Input requirements are low, and thus not demanding of farmers' limited resources.

Since Yala 1989, MARD's agricultural economics program has advocated greengram and cowpea as crops, which, because of their low input requirements, are ideal as companion crops to other higher input and, perhaps, higher income crops.[17] This recommendation remains valid today. Greengram and cowpea are highly appropriate for the conditions of System B.

[17] Optimal crop combinations resulting from linear programming modeling invariably included paddy, a high value and high input crop such as big onion and gherkin, and greengram, cowpea or groundnut. It was found that inclusion of a grain legume into the crop mix allowed more resources to be applied to higher valued crop. See 1990. Gleason, J.E. Report on Optimization Models; System B; Yala 1989 and 1990. Gleason, J.E., N.P. Tittagalla and W.H.A.S. Dinatissa. Report on Optimal Crop Combinations; Maha 1989/90; Mahaweli System B. Both reports are available at the MARD office in Pimburuttewa.

Recommendation 7

Promote Greengram and Cowpea as Companion Crops

MEA/MARD extension should encourage production of cowpea and greengram during Yala. These two crops are agronomically and economically stable. As crops with low input requirements, they compliment the higher cost OCs such as cantaloupe and onion. They should be viewed as "companion crops" to other OCs.

6. Groundnut

Most well-drained soils of System B are appropriate for groundnut production. The market for this crop is steady and its input requirements, including chemicals are low. Profits from groundnut are generally higher than greengram and cowpea. These are the opportunities presented by groundnut.

One further opportunity, though not mentioned in Table 5, is the potential for export of groundnut. There is an international market for confectionery-type groundnut. Peanut, in the form of snack foods, are imported into some of Sri Lanka's best known markets in the Middle East and Maldives.

Seed procurement is not reliable, though this could be overcome by a seed multiplication program. High labor demands at harvest are a constraint to production if it coincides with paddy harvest.

Groundnut has the potential to become a leading crop in System B. During Yala 1993, groundnut was promoted in some of the "model units", with good success. It should be placed high on the list of crops to be encouraged by the MEA/MARD extension program during Yala 1994.

Recommendation 8

Encourage Yala Production of Groundnut
Institute a Seed Multiplication Program

MEA/MARD extension should include groundnut in its Yala 1994 program. Groundnut could be the crop to replace chilli in the production program.

A seed multiplication program, perhaps with outside assistance, should be instituted with some FOs. This will ensure sustainability of the groundnut production program.

7. Gherkin

Sunfrost, (Pvt) Ltd. began its outgrowers program in System B in Yala 1989. The program has expanded from 89 to over 400 farmers during Yala 1993. The presence of a strong and well-managed outgrowers program in System B is an opportunity for System B farmers. The company arranges credit, supplies inputs, extension and purchases the crop at pre-arranged fixed prices. Grading is done at collection centers in the units.

Constraints to production include high chemical use, a heavy demand for labor, and seasonal fluctuations in revenue. Production risk is relatively high. A summary of the Yala 1993 gherkin production program is attached as an annex to Part I of this report.

8. Red onion

Red onion is a good crop for System B if good quality seed material is planted. During Yala 1993, red onion production was profitable, though yields were far below potential.

Farmers are presented with good production opportunities with red onion because of its strong market and consumer preference. While prices may fall sharply at harvest, this crop is highly storable giving farmers the opportunity to gain good profits from rising off season prices.

The cost of seed material is very high and procurement is difficult. During Yala 1993, seed costs exceeded Rs 30,000/ha, and constituted major component of total input costs. As with groundnut, seed procurement could be overcome with a good seed multiplication program.

Recommendation 9

Institute Red Onion Seed Multiplication Program

Red onion is a highly profitable crop in System B if good seed material is available and if the cost of seed material is lowered. These two constraints to production could be overcome with a seed multiplication program.

A seed multiplication program could be conducted as part of a MARD commercialization fund grant to some FOs. MEA/MARD extension and the FO business managers could work with the FOs for implementation, perhaps with the support of outside (Sri Lankan) technical assistance. If begun in Maha 1993/94, seed material could be available for a fairly large production program during Yala 1994.

Traditional vegetable crops (okra, brinjal, butternut, snakegourd and bittergourd)

Vegetables are generally high priced in Sri Lanka offering farmers the opportunity to obtain good revenues from their production. During Yala, production of vegetables not as risky as big onion or gherkin, and input requirements are fairly low. Frequent harvest and marketing of vegetables contribute positively to cash flow, and aid farmers in managing risks associated with other crops.

Like gherkin or cantaloupe, vegetable crops have high labor demands and depending on the time of year, moderately high chemical applications.

Two or three commercial farmers in System B have opted recently to cultivate large areas of okra and brinjal for local market. Brinjal was successfully cultivated as part of the model unit program during Yala 1993. A Colombo exporter has signed contracts with FOs for production of okra for export during Maha 1993/94.[18] These are indications that production of okra and brinjal may spread rapidly in the near future.

[18] Mr. Earl Guise of the MED Project and Dr. Shanti Wilson of CISIR conducted research on the technical feasibility of producing okra for an export market. The work established certain pre- and post-harvest procedures needed to export okra.

Recommendation 10

Encourage Marketing of Vegetables through FOs by MEA/MARD

Domestic marketing has long been a constraint to vegetable production. This constraint could be diminished to a large extent if farmers' organizations produced vegetables on a large scale to provide incentive for marketing agents to operate from System B.

Through the MEA/MARD model unit program with the assistance of the MARD marketing unit, large scale production of vegetables could be grown by FOs. Marketing agents from Colombo, Kandy, Dambulla or Polonnaruwa could be contacted for collection of produce. This would reduce marketing risks associated with vegetable production, and further integrate System B farmers into the country's overall marketing system.

EXTENSION PROGRAMS IN SYSTEM B; DESCRIPTIONS AND RECOMMENDATIONS

During Yala 1993, three distinct extension programs[19] were conducted in System B. Following is a discussion of the programs and recommendations regarding changes needed to ensure their sustainability. A summary of this discussion is presented in Table 6.

1. Sunfrost, Ltd. - Outgrowers Program

Sunfrost has been conducting its outgrowers program since Yala 1989. This program was successful in recruiting farmers to cultivate gherkin, and though may fall short of targets during some seasons, the program is generally sound, well-managed and highly sustainable.

Credit is supplied to farmers by Sunfrost for seed, fertilizer and chemicals. Contracts are entered into with individual farmers stipulating grades, prices and pay-back schedules. The company supplies inputs and extension. A team of extensionists based at Sunfrost's commercial farm and processing center in Ellewewa Block provides the necessary technical know-how to farmers.

Sunfrost's gherkin outgrowers system is similar to contract growing schemes conducted by the Ceylon Tobacco Company in Sri Lanka or programs in other parts of Asia (processing tomato in Taiwan or Thailand, for example), and can stand as a successful model for Sri Lanka.[20]

Sunfrost exports gherkin to the European Union, North America and Australia, and is one of a few local companies that has made Sri Lanka the single largest exporter of gherkin to the EU. This fact creates the conditions for program sustainability, as Sunfrost, wanting to maintain or perhaps increase its market share, will need continued procurement of gherkin.

[19] Not including the regular MEA extension program which focuses on paddy production.

[20] See 1992. Jones, Taisha M. The Gherkin Industry of Sri Lanka. USAID/Sri Lanka, Colombo (Unpublished manuscript). Ms. Jones, a USAID intern, who worked with MARD during Yala 1992, conducted an extensive survey of the gherkin outgrowers programs in the Mahaweli. She concluded that the programs were generally well-managed and farmers benefitted from participation in them. While disagreements over grading sometimes occurred, they were considered fairly minor when compared to the overall advantages of the programs.

Sunfrost's program has two drawbacks: 1) its total reliance on one crop; and 2) because it has programs in other parts of Sri Lanka, and does not rely solely on System B for gherkin, it could leave System B if farmer performance is not adequate.

As is, Sunfrost's outgrowers program is successful and sustainable. But the reach of the program is limited to a few units in Ellewewa Block because of the difficulty entering into contracts, distributing inputs to individual farmers, collecting and transporting gherkin to the processing center in Ellewewa, and then paying the farmers from more remote blocks. MARD can assist Sunfrost in extending its reach through contracting with FOs rather than individual farmers, which will reduce transactions and accounting costs to the company. MARD's extension assistance also can work with FOs in grading gherkin in the units. This reduces Sunfrost's processing costs in Ellewewa, and increases revenues for the FO (Sunfrost pays the FOs Rs 0.50/kg to grade gherkin).

Recommendation 11

Work with Sunfrost to Increase
Scope of the Outgrowers Program

Sunfrost's program benefits System B farmers. It creates employment at its commercial farm and provides farmers with the opportunity to achieve high revenues from gherkin production. It is the most sustainable extension model in System B.

Limited MARD intervention in the Sunfrost program can expand the program by assisting FOs instead of individual farmers to enter into contracts with the company. This could cut down significantly on Sunfrost's transactions costs. Farmers in more remote areas of System B can also receive revenue from Sunfrost for grading gherkin in the units.

If MARD intervention occurs, Sunfrost personnel in System B should manage the MARD extensionists. It is recommended that a bonus system be instituted by Sunfrost or MARD based on the incentive structure already in place for Sunfrost extension personnel.

2. Model Unit Program

This is an MEA/MARD program which began in Yala 1993. The basis of this extension program is a commercialization fund grant to FOs for purchase of seed. Farmer's who participate in the program obtain seed in the form of a loan from the FO and are required to repay its value at the end of the season. During the season, FOs participate in an intensive extension and training program, organized by MEA and targeted at the crops for which seed was made available.

Inputs other than seed are purchased by farmers from local input stores. There is no provision in the program for credit to obtain fertilizer and chemicals, relying instead on the ability of farmers to finance the crops.

Local buyers purchase the produce at prevailing market prices. Marketing is facilitated by the concentrated nature of production, allowing buyers to purchase in bulk.

The program was instituted in 6 units during Yala 1993.[21] Farmers who participated in the program had incomes substantially above those who did not participate.[22] This was especially true in Kalingawila, Aselapura Block, where Dr. K. Srivastava also worked with the FO on community storage of big onion.

Sustainability of this program is dependent on farmers' repayment of the value of seed to the FOs. If FOs are strong enough to demand repayment from their members, and the fund is able to revolve from season to season, little MARD intervention will be needed for program continuity. The model unit program relies on local input suppliers and local marketing agents, and has the potential to expand marketing activities in System B because of the possibility of bulk purchasing.

Recommendation 12

Expand the Model Unit Program

MEA/MARD extension, FO business managers and FO officials should work together to strengthen FOs to maintain high rates of seed loan repayments. This is the key to sustainability of this program.

Expansion of the program should occur in Yala 1994 and the concept of "companion crops' should be continued. It is highly recommended that an explicit marketing component be incorporated into this program, as marketing plays a role in crop decision making. Contact with marketing agents will be important for program continuity after MARD.

[21] Model units were: Thispanagama, Medagama, Mahadamana, Kalingawila, Ihalawewa, and Magulpokuna. The crops cultivated were: big onion, greengram, groundnut, chilli, red onion, brinjal, and okra. The program followed the concept of "companion crops" which have differing inputs levels, for example big onion (high input) and groundnut (low input) and are thus complimentary in a production system.

[22] Increases in income over production of paddy alone for the model units were as follows: Kalingawila - 78 percent; Ihalawewa - 10 percent; Thispanagama - 11 percent; Mahadamana - 15 percent; Magulpokuna - 52 percent; and Medagama - 40 percent. For more details see Part II of this report.

3. Buy-back contract extension

Buy-back contracts have been used for a number of crops, most notably cantaloupe. It is a program requiring high levels of MARD intervention. Activities now managed by MARD must be turned over to the private sector or FOs during Yala 1994 (if not sooner) if the program is to be sustainable.

Buy-back contracts are contracts between a private company, such as TESS or Consolidated Business Systems (CBS), and FOs. With the signing of the contract, Seylan Bank in Manampitya extends credit for production inputs to the FO (not to individual farmers). When the crop is harvested, the private company which purchases the produce deposits its value into the FO's Seylan Bank account. The bank then deducts all or a portion of the loan, and pays the balance to the FO. The FO is responsible for ensuring that the value of the produce is distributed to the participating farmers.

Extension is provided solely by MARD. The extension program is intensive, as thirty-five extension personnel are assigned to less than twenty hectares. Inputs are also organized and distributed by MARD, by-passing local input agents. Seed for many of the crops is imported by MARD or the private company.[23]

The potential for sustainability of this program after MARD is low. MARD intervention in extension and input supply, bypassing local agents and MEA extension, offers no mechanism for continuity after MARD. The program will continue only if it is turned over to the private sector.

The system of extending loans should also be reevaluated. MARD and the Seylan Bank have assumed that joint responsibility of loan repayment would compel individual farmers to repay. This assumption has not always been valid. During Yala 1993, for example, some cantaloupe farmers sold cantaloupe to other marketing agents, thereby breaking the contract, and bypassing the bank's repayment mechanism. Some farmers have yet to repay fully the FO for the production loan.

[23] Seed for cantaloupe and okra was imported by MARD. Baby corn seed was imported by CIC.

Recommendation 13

Reduce MARD Intervention to Advisory Role

Reevaluate FO Production Loans

For sustainability of production for export, the buy back contract extension program should be handed over to the management of private sector companies during Yala 1994 at the latest. MARD should also end its intervention in input supply, allowing local agents in Aralaganwila and elsewhere in the System to furnish and distribute inputs. MARD's role with regard to input supply should be limited to verifying that the correct inputs are purchased. MARD should maintain an advisory role to the private sector company or FO that takes over these responsibilities.

MEA/MARD should reevaluate the method of granting FO loans for export production. At present, in the absence of strong FOs, the financial integrity of FOs is at risk. There should be mechanisms for the FO to discipline members who default and individual production loans should also be considered.

CONCLUSION

Yala 1993 production program was a season of continuity of already established programs and a season of innovation. Production of OCs was generally successful, obtaining good profits from all crops except chilli, baby corn and gherkin.

Continuity was maintained with the export production program. Cantaloupe, baby corn and gherkin were cultivated as part of this program, with varying degrees of success. Innovation was evident in the "model unit" program. Using the seed commercialization fund, this program aided a large number of farmers to diversify into traditional OCs.

Part I of this report contains 13 recommendations for Yala 1994. These recommendations are designed to consolidate the gains made during the past seasons, and place the System B diversification program on the course to sustainability. MARD's intervention must be carefully targeted, especially with regard to extension, and there must be an emphasis on development of the systems required for continued progress after the end of the project.

ANNEX

Description and Results of the Yala 1993 Gherkin Production Program

The Yala 1993 gherkin program in System B was divided into two parts described as follows.

1) **Program one:** In six villages of Ellewewa Block in which the traditional outgrowers program operated, Sunfrost, Ltd., the buyer, supplied agricultural inputs on credit, operated an extension program, graded the output, and paid farmers. The six villages where this program was implemented were Kalukele, Palatiyawa, Maguldamana, Pahala Ellewewa, Ellewewa, and Mahadamana; and

2) **Program two:** Three villages, Bimpokuna and Mahaulpotha in Dimbulagala Block, and Galthalawa in Wijayabapura Block, in which MARD extensionists worked. In these three villages, Sunfrost, Ltd. contracted with the farmers organizations. The FOs received production credit from Seylan Bank and MARD provided six extensionists. The extensionists were seconded to Sunfrost and worked under the management of the Sunfrost personnel at its nucleus farm in Ellewewa.

The planting dates for the nine villages are listed in the farm right column in Table 1. Five of the six villages in program one planted during May and the sixth village, Kalukele, planted over the period beginning in end of April until the end of June. The MARD villages, planted later, towards the middle or end of June until mid-July.

The differences in planting dates do not seem to affect average yield. The overall average yield was 4.3 tons per hectare. The highest yield was Mahadamana with 5.3 tons/ha and the lowest was in Galthalawa (a MARD village), 2.9 tons. The two other MARD villages, Bimpokuna and Mahaulpotha, were above the average yield with 5 and 4.6 tons per hectare, respectively. Table 1 and Figure 1 show average yields.

Table 1 also includes gross return per hectare from gherkin production. The average gross return was Rs 50,435/hectare. The highest was Rs 68,644/ha in Mahadamana (which corresponds to Mahadamana's highest yield), followed by Pahala Ellewewa, with Rs 63,766/hectare. In Program two, MARD villages, gross return per hectare was below the overall average, in spite of higher than average yields in Bimpokuna and Mahaulpotha. Galthalawa, which had low yields, had the lowest average gross return per hectare at slightly more than Rs 31,000 (Figure 2)

Lower than expected average gross returns in Bimpokuna and Mahaulpotha resulted from a larger than average percentage of grade three and grade four gherkin. In Bimpokuna, Mahaulpotha, and Galthalawa, 41, 38.6 and 35.5 percent of harvested gherkins were graded as three or fours. 'In Ellewewa Block as a whole, only 19.2 percent of the gherkin harvest was graded as three or four.

Since gherkin prices are based on grade, the average price of gherkin the MARD villages was lower than the overall average, and in fact, lower than all other gherkin growing villages, except Palatiyawa. The average price of gherkin in Mahaulpotha and Galthalawa was about Rs 1/kg lower than the overall average. The average price in Bimpokuna was about Rs 2.5 below the overall average. Average prices by village are shown in column three in Table 1 and Figure 4, and the percentage of gherkin yield by grade is shown in Table 2 and Figure 3. Note that the farmers in Hungamalagama, an adjacent area in System C, provided a very high percent of first grade gherkin, showing that much higher average prices are possible.

Lower grading of gherkin may have been the consequence of two separate issues: 1) insufficient extension; and 2) coincidence of the gherkin harvest with paddy harvest.

Mr. Prasad Senadeera, the local area manager for Sunfrost, reported that he emphasized with the MARD extensionists the importance of harvesting first grade gherkin. He felt, however, that because MARD extensionists are not employees of Sunfrost, he was unable to provide an incentive structure, that is, bonuses or reprimands, that would sufficiently compel the extensionists to work harder. This, in spite of the fact that the extensionists were seconded to Sunfrost for the season, and under its management. Recommendation 11 in the main part of this report suggests establishing an incentive system for MARD extensionists similar to that currently used for Sunfrost's own extension personnel.

Prices of gherkin by grade are as follows:

Grade 1 - Rs 25/kg
Grade 2 - Rs 12/kg
Grade 3 - Rs 5/kg
Grade 4 - Rs 1/kg
Crookeds - Rs 0.50/kg

During Maha 1993/94, the price of grade 1 will increase to Rs 27/kg.

The coincidence of the gherkin harvest with the paddy harvest may have caused farmers to ignore their gherkin fields in favor of paddy. Thus, first and second grade gherkin became grade four gherkin with its associated low price. Better planning in future could prevent this from recurrence.

During Maha 1993/94, Sunfrost is planning for about 40 hectares of gherkin in System B. The company will institute an incentive plan for farmers in order to increase the percentage of grade 1 gherkin. The price of grade 1 gherkin will increase by Rs 1/kg during any seven day period, if the percentage of grade 1 gherkin exceeds 60 percent of the total yield.

Table 1: Average gherkin yields, gross revenue/hectare and price; Nine villages; Mahaweli, System B. Yala 1993

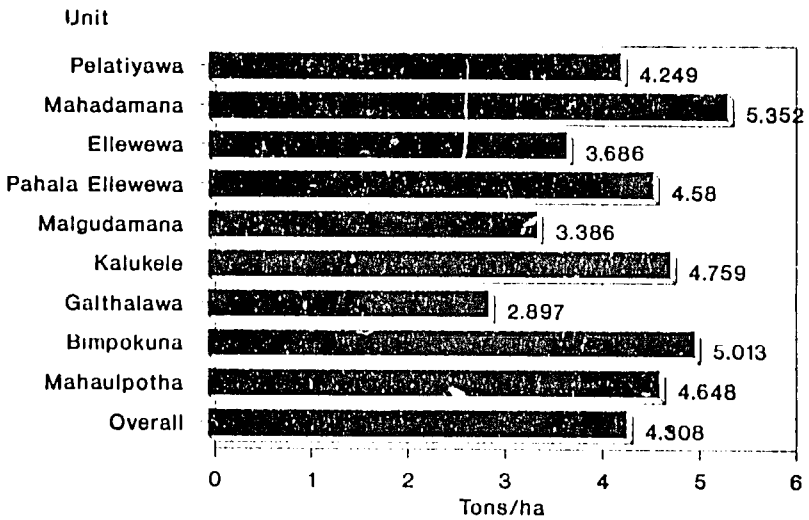
Village	Average yield	Gross revenue/ha	Average price	Date of planting
Kalukele	4,759	57,790	12.15	End April to end of June
Pelitayawa	4,248	46,294	9.79	May
Malgudamana	3,386	40,536	11.76	May
Pahala Ellewewa	4,580	63,766	13.48	May
Ellewewa	3.686	43,413	11.75	May
Mahadamana	5,352	68,644	12.85	May
Bimpokuna	5,013	45,971	9.17	June 22 to early July
Mahaulpotha	4,648	50,062	10.76	June 22 to early July
Galthalawa	2,897	31,239	10.78	Mid June to mid-July
Overall	4,308	50,435	11.70	

Table 2: Percentage of gherkin yield by grade; Mahaweli, System B. Yala 1993

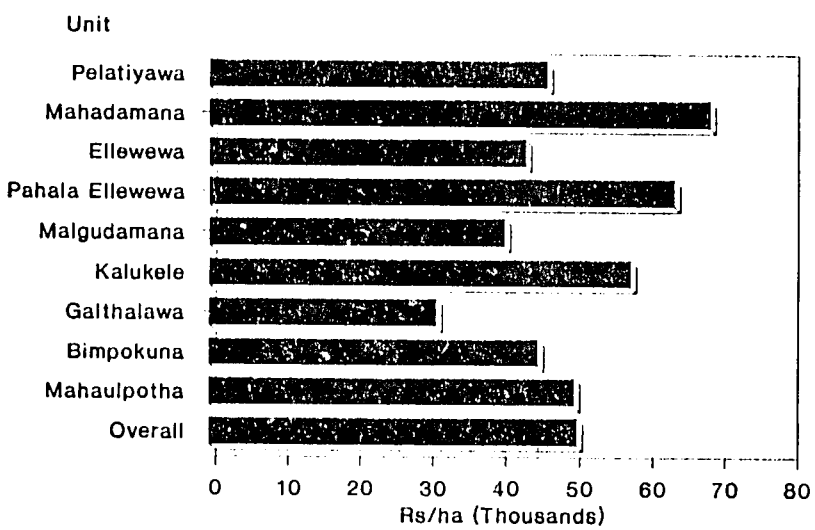
	Grade 1	Grade 2	Grade 3	Grade 4	Crooks
Ellewewa Block	36.0	22.1	12.6	7.0	22.3
Bimpokuna	**24.3**	**16.3**	**15.7**	**25.3**	**18.3**
Mahaulpotha	**30.0**	**17.7**	**16.7**	**21.9**	**13.5**
Galthalawa	**28.7**	**21.7**	**14.3**	**21.2**	**15.1**
Hungamalagama	46.5	17.6	11.6	8.6	15.6

Breakdown of al units in Ellewewa Block was not available.
Hungamalagama is adjacent to Kalukele in System C.
Source: Sunfrost, Ltd.

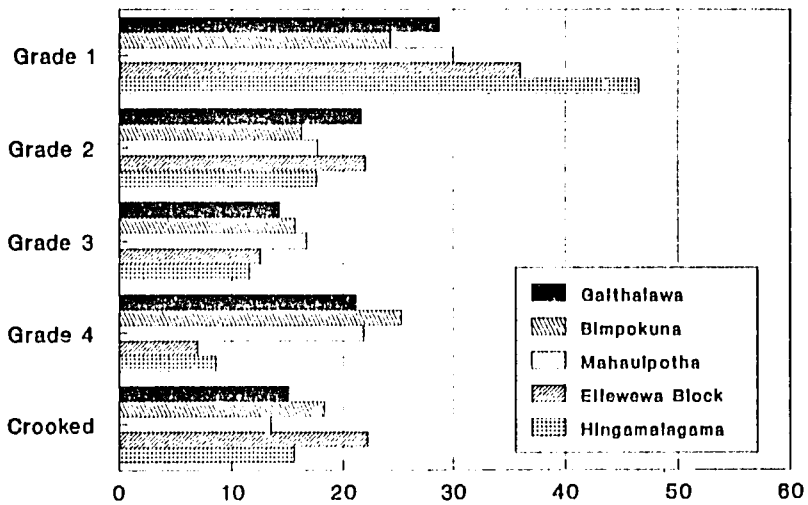
Average Gherkin Yields; Yala 1993
Nine Units; Mahaweli, System B



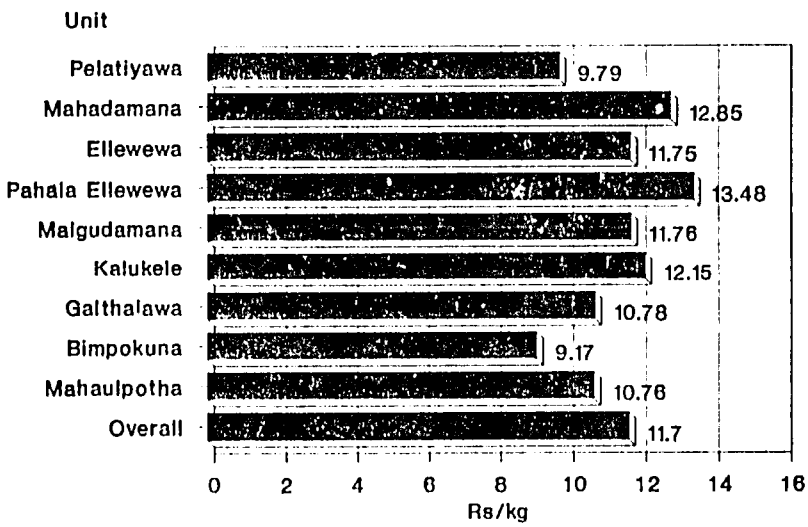
Gross Return/Ha from Gherkin; Yala 1993
Nine Units; Mahaweli, System B



Percentage of Yield by Grade; Yala 1993
Gherkin Production; Mahaweli, System B



Average Gherkin Price; Yala 1993
Nine Units; Mahaweli, System B



PART II

REPORT ON THE CULTIVATION CENSUS; YALA 1993

INTRODUCTION

The MEA/MARD agricultural economics unit has the responsibility of reporting on project progress in the area of crop production and diversification. In the first full year of the project (1989) this reporting relied on two sets of data: the farm record keeping data on production costs and returns; and MEA or PMU data on hectares planted to various crops in the System.

During the second full year of the project, the agricultural economics units was advised by Dr. Susan Exo, Monitoring and Evaluation Specialist, to conduct a complete census of crop cultivation, involving measuring each field of other crops (OCs) in System B. She felt that the project itself should institute a data collection procedure to track progress towards crop diversification to ensure seasonal continuity and accuracy. The method chosen for the cultivation census was the perimeter squared-area ratio method.[1] The cultivation census, first done in Yala 1990, has become a routine activity of the agricultural economics unit.

Implementation of the cultivation census employs about 50 youth, one in each unit of System B. These youth are recommended by Unit Managers, and are trained and managed by MARD staff. They are assigned to consult with each farmer in System B, measure fields of OCs, and report the measurements to MARD staff. All these young men and women would otherwise be unemployed.

Raw census data from each unit are tabulated in the MARD office and summarized to show the changes in crop diversification yearly and seasonally. These data are also combined with the record keeping data (described in Part I of this report) to estimate total income from crop production in System B and the changes in income arising from crop diversification.

Part II of this report gives the results of the Yala 1993 cultivation census. Significant progress was made relative to Yala 1992 in terms of increasing the numbers of farmers who diversify crop production. The area cultivated expanded only

[1] This method is fully described in the first cultivation census report. See 1990. Tittagalla, N.P. and J.E. Gleason. Report on Cultivation Census; Mahaweli, System B, Yala 1990. MARD/MDS Projects, Pimburattewa. This report is available at the MARD office in System B.

slightly. Changes in the numbers of farmers diversifying and the area cultivated to OCs were not evenly distributed throughout the 7 blocks the census. Those changes are discussed in detail.

The first section of this paper discusses the changes in diversification in Zones 1 and 5 since Yala 1990. The four blocks in Zones 1 and 5, Ellewewa, Limbulagala, Damminna, and Wijayabapura, are the areas in which MARD works most intensely, and thus provides a glimpse at the effectiveness of the MARD program.

Following section one, results of the census will be given, first for System B as a whole, and then block by block. A comprehensive picture of System B crop production is given including: hectarage devoted to each crop, the number of farmers cultivating OCs, and the income from crop production and diversification. Tables and graphs accompany written summaries.

CHANGES IN DIVERSIFICATION IN ZONES 1 AND 5 YALA 1990 TO YALA 1993

MEA/MARD has focused a large portion of its work in Zones 1 and 5. In the early years of the project, Farming Systems Extensionists (FSEs) worked primarily Zones 1 an 5; the on-farm trials were conducted in all blocks (except Sinhapura), but follow-up and continuity was difficult in areas where security was a problem; and the earliest export promotion program was conducted in Damminna Block during Yala 1990.

The Yala 1990 cultivation census report contains two analyses on the effectiveness of MARD extension programs. The analyses show that diversification was significantly higher in units with MARD sponsored extension activities than in those without. Diversification was higher both in terms of the area cultivated to OCs and the numbers of farmers diversifying.[2]

MARD's focus has expanded beyond the few units in which the project worked in Yala 1989 and Yala 1990. The export production programs expanded, whole farm trials were conducted in 12 units each year for two years, and the on-farm trials program also grew. More recently, the MEA/MARD extension program has initiated a program of "model units".

[2] See pages 15 and 16 of 1990. Tittagalla, N.P. and J.E. Gleason. Report on Cultivation Census; Mahaweli, System B, Yala 1990. MARD/MDS Projects, Pimburattewa.

41

While all these programs are not strictly confined to Zones 1 and 5, the model unit program for example had two very successful units in Senapura and Aselapura, the emphasis has generally been the four blocks in these two zones. The reasons for this include: 1) better security than in Zones 2, 3 and 4A (except for certain areas of Damminna); 2) settlers have been resident for a longer period than those in the other zones and are thus more stable financially; 3) farmers in these zones have more experience farming (OCs and paddy); 4) lands are more suitable for OC cultivation; and 5) close proximity to the MARD camp.[3]

Now that MARD is coming into its final phase, it is appropriate to look at the changes in diversification from the initial year of the cultivation census Yala 1990 to the present (Yala 1993). An assessment of the accomplishments of the MEA/MARD overall agricultural program, including research, extension, training, and special programs, should concentrate on the changes in diversification in Zones 1 and 5. This includes four blocks: Damminna, Dimbulagala, Ellewewa and Wijayabapura.

Table 1 shows that the area cultivated to OCs in the four blocks increased about 80 percent over the four years, to 486 hectares from 270 hectares. The area cultivated to OCs in Ellewewa and Wijayabapura more than doubled, while it increased by about 50 percent in Damminna and slightly decreased in Dimbulagala, Figure 1 and 2 show these changes also.

The concept of diversification has two dimensions to consider: 1) the increase in the total area devoted to OCs, which as noted increased by 80 percent; and 2) the large increase in the number of OCs cultivated in System B. In Yala 1990, only 11 OCs were cultivated in System B.[4] In Yala 1993, 32 OCs were cultivated in System B. System B is far more diversified now than in Yala 1990 if viewed from the second dimension of diversification.

Extension efforts are best evaluated by the number of adopters as opposed to an area measure. Thus, changes in the number of farmers diversifying should be viewed as a key measure

[3] See 1993. Gleason, Jane E., W.R.B. Lalith, and P.W.A. Perera. An Investigation into the Factors Associated with Crop Diversification in Irrigable Lands in System B. MARD Project, Pimburuttewa. This report is available at the MARD Project office.

[4] Those OCs were: big onion, red onion, cowpea, greengram, gherkin, chilli, groundnut, vegetables (including okra, long bean, bittergourd and snakegourd), corn, butternut, and zucchini (tested as an export crop in Damminna).

of the effectiveness of the MEA/MARD extension programs. The number of farmers diversifying crop production in the four blocks of Zones 1 and 5 increased about 50 percent, to 3,279 farmers in Yala 1993 from 2,210 in Yala 1990. Wijayabapura had the largest increase in farmers diversifying crop cultivation, with an increase of over 90 percent.

Table 2 and Figures 3 and 4 show changes in diversification during Maha. The percent changes are larger than those for Yala. From Maha 1990/91 to Maha 1992/93 the area cultivated to OCs increased almost 300 percent, from 37 to 141 hectares. Wijayabapura witnessed the largest increase, almost 500 percent, and the area cultivated to OCs in Ellewewa increased over 400 percent. Unlike Yala season, Dimbulagala farmers increased total area cultivated to OCs by 171 percent. The area cultivated to OCs in Damminna also increased substantially.

The number of farmers cultivating OCs during Maha also increased, though not as dramatically as the increases in area. For the four blocks, farmers who diversified crop cultivation rose to 1,624 from 1,004, or an increase of 72 percent.[5]

MARD EXTENSION AND DIVERSIFICATION

The export program during Yala 1993 accounted for about 35 hectares of OCs, or 7 percent of the area cultivated to OCs in Zones 1 and 5.[6] The area cultivated to OCs in the "model unit"[7] program was 131.25 hectares, or 27 percent of total area cultivated to OCs. It is difficult to determine to what degree these programs added to the area cultivated to OCs, as some of the farmers in both programs would have grown OCs without the special program. The incremental increase in diversification is probably highest with the "model unit" program, as seen by past

[5] Cultivation of OCs during Maha primarily occurs on homesteads or upland areas. During Maha 1992/93, MEA/MARD conducted a cultivation census of homestead and upland areas for the first time. While anecdotal evidence indicates that homestead cultivation is increasing yearly, we, as yet, have no hard evidence to substantiate this.

[6] This includes cantaloupe and baby corn cultivation in Kalukele (cantaloupe and baby corn), Thispanagama (melon trials), Weheragama (baby corn) and Kudawewa (baby corn). I have not included gherkin even though MARD extension worked with Sunfrost on about 6 hectares in Wijayabapura and Dimbulagala Blocks.

[7] Model units were: Thispanagama in Dimbulagala; Medagama in Wijayabapura; Mahadamana in Ellewewa; and Ihalawewa in Damminna.

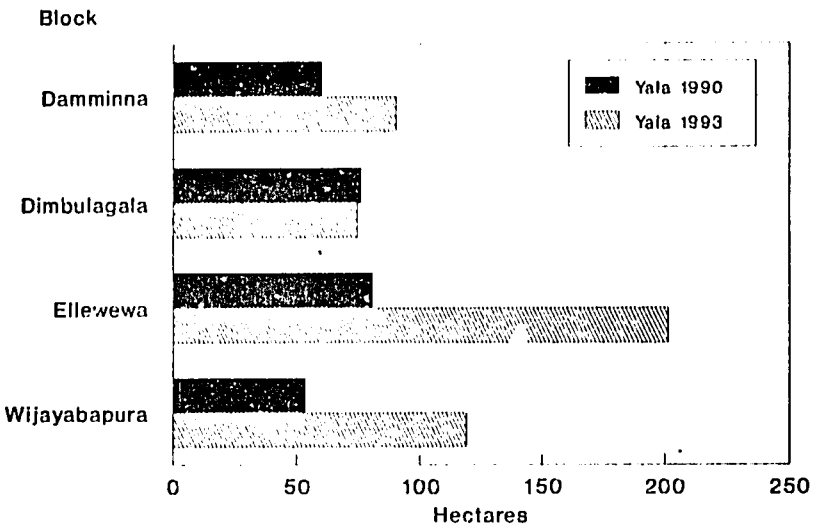
Table 1.
Changes in Diversification; Yala 1990 to Yala 1993
Damminna, Dimbulagala, Ellewewa and Wijayabapura Blocks
Zones 1 and 5

	OC Hectares		Percent	OC Farmers		Percent
	1990	1993	increase	1990	1993	increase
Damminna	59.77	90.29	51.06%	435	670	54.02%
Dimbulagala	76.14	74.68	-1.92%	781	882	12.93%
Ellewewa	80.72	201.49	149.62%	673	1110	64.93%
Wijayabapura	53.24	119.15	123.80%	321	617	92.21%
Total change	269.87	485.61	79.94%	2210	3279	48.37%

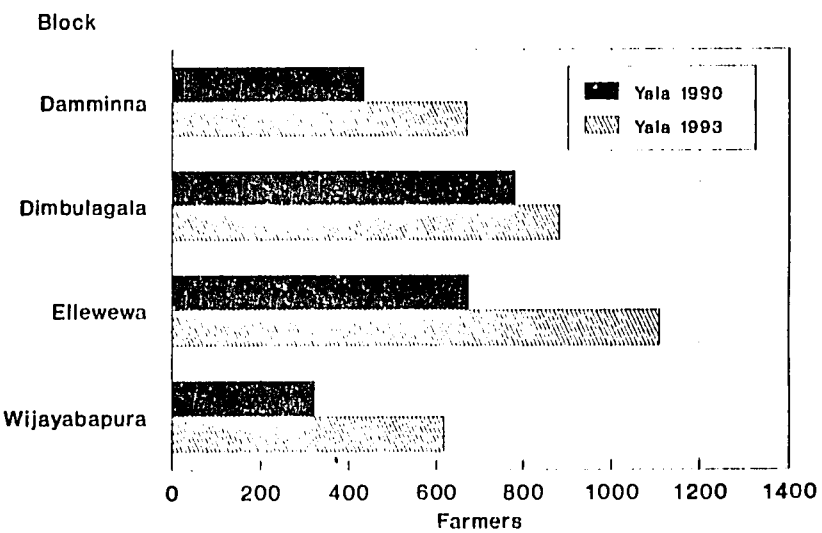
Table 2.
Changes in Diversification; Maha 1990/91 to Maha 1992/93 (Irrigated lands)
Damminna, Dimbulagala, Ellewewa and Wijayabapura Blocks
Zones 1 and 5

	OC Hectares		Percent	OC Farmers		Percent
	1990/91	1992/93	increase	1990/91	1992/93	increase
Damminna	8.15	15.342	88.25%	135	188	39.26%
Dimbulagala	12.02	32.688	171.95%	385	671	74.29%
Ellewewa	14.312	77.63	442.41%	422	623	47.63%
Wijayabapura	2.699	16.179	499.44%	62	142	129.03%
Total change	37.181	141.839	281.48%	1004	1624	61.75%

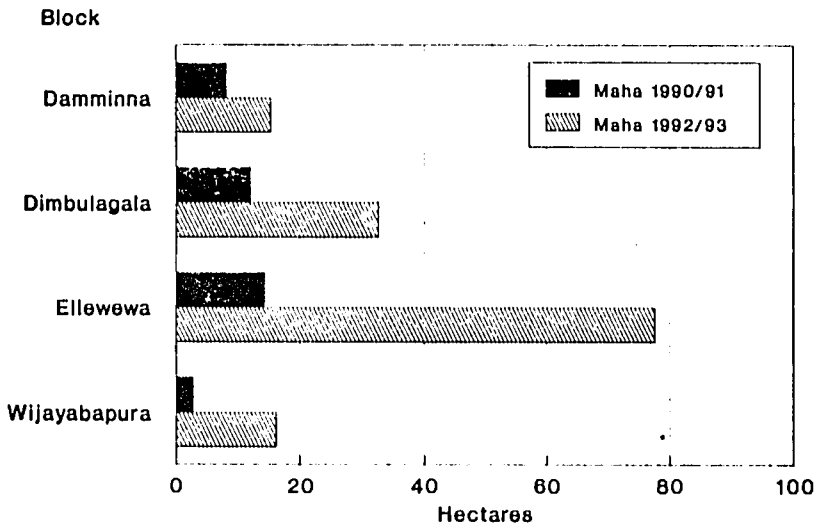
Changes in Diversification; Zones 1 & 5 Yala 1990 to Yala 1993; Hectares



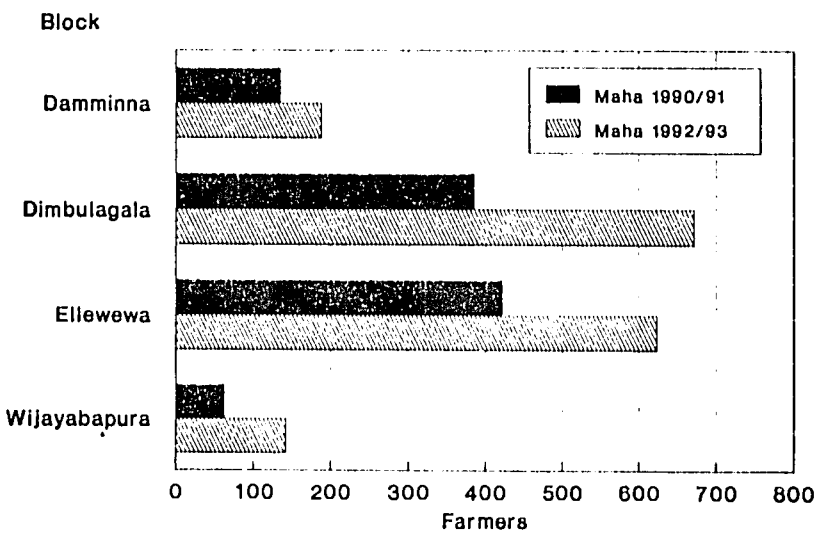
Changes in Diversification; Zones 1 & 5 Yala 1990 to Yala 1993; No. of Farmers



Changes in Diversification; Zones 1 & 5
Maha 1990/91 to Maha 1992/93; Hectares



Changes in Diversification; Zones 1 & 5
Maha 1990/91 to Maha 1992/93; Farmers



performance of some of the model units. For example, Thispanagama increased the area devoted to OCs to over 21 hectares in Yala 1993, from 6.9 hectares in Yala 1992. The number of Thispanagama farmers diversifying crop production in Yala 1993 was 179, up from 100 in Yala 1992.

It is incumbent on MEA and MARD staff in the final phase of the project to ensure the sustainability of these programs. Some recommendations regarding sustainability have already been discussed in Part I of this report. The model unit program will be successful only if strong FOs maintain the revolving seed fund, and insist that members repay seed loans. And the export production program will continue past the life of the project only if the private sector takes a more active role in extension and input supply.

SUMMARY OF SYSTEM B CULTIVATION

The number of farmers diversifying crop production in System B during Yala 1993 increased significantly over that of Yala 1992. The area cultivated to OCs increased slightly. Changes in crop diversification were not evenly spread across the System, with some blocks and units making large gains, while others actually decreased the amount of land devoted to OCs.

Total area cultivated to OCs was 590 hectares. This total was concentrated in the four blocks of Zones 1 and 5; Ellewewa had 201 hectares of OCs; Wijayabapura, 119 hectares; Damminna, 90 hectares; and Dimbulagala, 75 hectares. These four blocks accounted for 82 percent of the total.

The most common OC was chilli. Farmers in System B cultivated 188.5 hectares of chilli during Yala 1993, an increase of 18 hectares over Yala 1992. Greengram (55.3 ha), red onion (49.8 ha), gherkin (49.7 ha), big onion (44.3 ha), and cowpea (43.3 ha) were the next most common crops. These six crops accounted for about 75 percent of the total area allocated to OCs during Yala 1993.

Almost 4,200 farmers cultivated OCs during Yala 1993, 758 more than in Yala 1992, and increase of 22 percent. In Damminna, Dimbulagala, and Ellewewa Blocks more than 40 percent of the total number of farmers diversified crop production. In Wijayabapura, 33 percent of the farmers cultivated OCs. These four blocks account for almost 80 percent of the total OC farmers in System B.

Total income from crop production was Rs 164.5 million. Paddy production accounted Rs 150 million of this total. Big onion contributed the most income of OCs, over Rs 3.5 million, more than double that of any other OC.

Increases in income from production of OCs (compared with production of paddy only) were modest during Yala 1993. The high percentage of farmers growing chilli off-set gains that were made with production of other OCs such as big onion. System B income from crop production rose almost Rs 7 million due to crop diversification. The largest income gain was recorded in Ellewewa with an increase of Rs 2.5 million or almost 9 percent over production of paddy alone. This was followed by Wijayabapura (an increase of Rs 1.5 million) and Aselapura (Rs 1.3 million).

The average increase in income during Yala 1993 per farmer who engaged in crop diversification was Rs 1,652, a 13 percent increase over production of paddy. Aselapura recorded the highest increase in income per farmer, Rs 4,775, or 37.5 percent. This high increase was due to the high incomes achieved by farmers in Kalingawila, Aselapura's model unit. Wijayabapura, Ellewewa and Senapura Blocks has per farm increases exceeding 10 percent. Increases in the other blocks were lower.

Certain units had very high increases in income. For example, while an average paddy farmer in System B netted Rs 12,733 for one hectare of paddy, Kalingawila farmers who engaged in crop diversification through the model unit program received almost Rs 23,700/ha, or a 78 percent increase. OC farmers in Medagama Unit gained an additional Rs 5,100/ha due to participation in the model unit program. The goal of MARD's remaining seasons is to use these examples to spread further the benefits of crop diversification.

Crop Cultivation Census; Yala 1993
System B

Unit	Total area (ha)	Paddy	Chilli	B'onion	G'gram	L'bean	R'onion	C'pea	Okra	Brinjal	Gherkin	B'nut	Tomato	Luffa	Soya	B'gourd	S'gourd	Banana	Beet	B'corn	Tobacco
Asalapura	1317.001	1275.644	12.425	17.283	1.124	0.686	3.685	2.121	0.328	0.507	0.000	0.000	0.157	0.539	0.000	0.478	0.491	0.000	0.000	0.000	0.000
Damminna	1354.002	1263.708	49.559	1.426	7.483	2.747	10.684	9.608	0.151	1.193	0.000	2.058	0.088	0.691	0.000	0.611	0.385	0.000	0.065	0.000	0.000
Dimbulagala	2124.005	2049.325	26.166	4.208	7.877	1.949	8.541	3.830	1.122	0.877	4.507	0.173	0.556	0.184	0.095	0.143	0.169	0.000	0.006	4.399	0.000
Eliewewa	2116.290	1914.797	40.954	4.957	21.530	8.142	10.010	6.851	1.986	3.002	43.725	1.181	0.437	1.374	5.548	0.891	0.990	0.040	0.043	14.215	17.844
Senapura	1675.002	1636.434	20.869	6.377	0.635	0.794	1.718	2.508	0.386	0.929	0.000	0.171	0.254	0.219	0.016	0.713	0.015	0.000	0.011	0.000	0.000
Sevanapitya	1930.995	1876.844	9.682	1.052	3.088	0.621	0.754	1.492	0.601	1.020	0.000	0.000	0.049	0.419	0.000	0.336	0.075	0.113	0.000	0.000	0.000
Wijayabapura	1853.001	1763.853	28.733	7.000	13.567	3.065	15.358	16.835	5.551	7.847	1.442	2.152	1.825	4.287	0.000	2.549	1.185	0.150	0.188	0.000	0.000
Total	12370.296	11780.605	188.409	44.315	55.304	18.244	49.780	43.256	10.135	15.375	49.674	5.735	3.366	7.713	5.659	5.779	3.314	3.313	0.318	18.614	17.844
Percent of total		95.239	1.523	0.358	0.447	0.131	0.402	0.350	0.082	0.124	0.402	0.046	0.027	0.062	0.046	0.047	0.027	0.027	0.003	0.150	0.144
Percent of OCs			31.950	7.515	9.378	2.755	8.442	7.335	1.719	2.607	8.424	0.973	0.571	1.308	0.960	0.980	0.562	0.562	0.054	3.157	3.026

Unit	Cabbage	Knolkhol	Pumpkin	Maize	G'nut	Capsicum	C'melon	Bean	G'leaves	Radish	W'bean	Yam	Cucumber	Total OCs	% OCs	Total farmers	OC farmers	% OC farmers	OC hafarmers
Asalapura	0.000	0.000	0.011	0.000	1.474	0.049	0.000	0.000	0.000	0.000	0.000	0.000	0.000	41.357	3.140	1317	265	20.137	0.155
Damminna	0.000	0.000	0.339	0.000	0.700	0.000	0.000	0.000	0.175	0.062	0.000	2.252	0.001	90.294	6.669	1353	670	49.522	0.135
Dimbulagala	0.120	0.050	0.518	0.005	8.954	0.025	0.968	0.090	0.110	0.031	0.000	0.915	0.072	74.680	3.516	2124	882	41.525	0.085
Eliewewa	0.073	0.080	2.153	0.000	0.951	0.568	12.651	0.061	0.145	0.015	0.000	2.868	0.198	201.493	9.521	2394	1110	46.356	0.182
Senapura	0.000	0.028	0.353	0.024	0.197	0.038	0.000	0.047	0.061	0.026	0.004	0.059	0.056	38.566	2.303	1675	382	22.806	0.101
Sevanapitya	0.000	0.013	0.886	0.000	0.462	0.000	0.000	0.000	0.000	0.132	0.000	0.083	0.000	24.151	1.270	1901	253	13.836	0.092
Wijayabapura	0.081	0.362	0.504	0.257	3.197	0.241	0.000	0.009	0.517	0.451	0.000	0.343	0.362	119.148	6.328	1853	617	32.757	0.193
Total	0.274	0.553	4.764	0.286	15.935	0.921	13.619	0.207	1.008	0.717	0.004	6.540	0.719	589.691	4.767	12647	4190	33.130	0.141
Percent of total	0.002	0.004	0.039	0.002	0.129	0.007	0.110	0.002	0.008	0.006	0.000	0.053	0.006	4.767					
Percent of OCs	0.046	0.094	0.808	0.048	2.702	0.156	2.310	0.035	0.171	0.122	0.001	1.109	0.122						

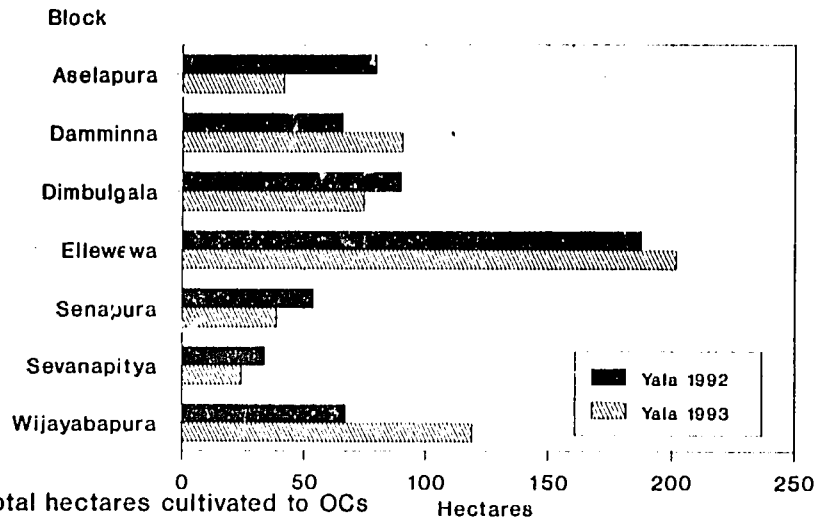
Crop Cultivation Census; Yala 1993; Income from paddy and OC cultivation
System B

Block	Paddy	Chili	B'onion	G'gram	L'bean	R'onion	C'pea	Okra	Brinjal	Gherkin	B'nut	Tomato	Luffa	Soya	B'gourd	S'gourd
Aselapura	16,242,775.1	89,231.1	1,399,577.3	22,837.4	16,666.4	103,588.5	38,472.8	8,241.0	22,921.5	0.0	0.0	3,925.0	13,475.0	0.0	16,798.0	12,275.0
Damminna	16,090,794.0	355,883.2	115,639.4	152,039.6	66,738.4	300,626.4	174,279.5	3,793.9	53,935.5	0.0	103,558.6	2,200.0	17,275.0	0.0	21,562.2	9,650.0
Dimbulagala	26,094,055.2	187,898.0	340,753.8	160,044.9	47,536.9	184,050.7	69,472.4	26,190.3	39,649.2	60,438.9	8,725.4	13,900.0	4,600.0	2,730.3	5,046.5	4,225.0
Elewewa	24,381,110.2	294,090.7	401,417.9	437,446.5	149,219.9	281,561.4	124,451.7	49,698.3	135,720.4	586,352.3	59,427.9	10,925.0	34,350.0	159,449.5	31,443.4	24,750.0
Senapura	20,836,714.1	150,003.9	573,369.5	12,901.9	19,290.3	48,341.1	45,492.6	9,698.3	42,000.1	0.0	8,604.7	6,350.0	5,475.0	459.8	25,161.8	375.0
Sevanapitya	23,897,854.7	69,525.4	56,000.8	62,742.0	19,946.2	21,215.1	27,063.4	15,100.1	46,114.2	0.0	0.0	1,225.0	10,475.0	0.0	13,974.9	1,250.0
Wijayabapura	22,459,140.2	206,331.7	566,860.0	275,554.3	74,950.1	461,125.5	305,370.1	139,720.1	354,762.9	19,337.2	108,288.6	45,625.0	107,175.0	0.0	59,954.2	29,625.0
Total	150,002,443.5	1,352,965.0	3,588,628.7	1,123,566.7	334,648.0	1,400,709.6	784,502.4	254,541.9	695,103.8	666,128.3	288,585.2	84,150.0	192,825.0	162,639.7	203,940.9	82,850.0

Block	Cabbage	Knolkhol	Pumpkin	Maize	G'nut	Capsicum	C'melon	Bean	G'leaves	Radish	Yam	Cucumber	Tobacco	Banana	Beet	B'corn
Aselapura	0.0	0.0	275.0	0.0	47,088.4	1,225.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Damminna	0.0	0.0	8,475.0	0.0	22,362.2	0.0	0.0	0.0	4,375.0	1,550.0	56,550.0	25.0	0.0	0.0	1,700.0	0.0
Dimbulagala	3,000.0	1,250.0	12,350.0	125.0	286,044.5	625.0	53,255.5	2,250.0	2,750.0	775.0	22,875.0	1,800.0	0.0	0.0	150.0	23,323.5
Elewewa	1,825.0	2,000.0	53,825.0	0.0	30,380.6	14,200.0	596,007.4	1,525.0	3,625.0	375.0	71,700.0	4,950.0	1,405,821.7	1,000.0	1,075.0	75,367.9
Senapura	0.0	700.0	3,825.0	500.0	6,293.4	950.0	0.0	1,175.0	1,525.0	650.0	1,725.0	2,150.0	0.0	0.0	275.0	0.0
Sevanapitya	0.0	325.0	22,150.0	0.0	14,759.1	0.0	0.0	0.0	0.0	3,300.0	2,075.0	0.0	0.0	77,825.0	0.0	0.0
Wijayabapura	2,025.0	9,550.0	12,600.0	6,425.0	102,131.4	6,025.0	0.0	225.0	12,925.0	11,275.0	8,575.0	9,050.0	0.0	4,000.0	4,700.0	0.0
Total	6,850.0	13,825.0	119,100.0	7,150.0	509,059.5	23,025.0	749,252.9	5,175.0	25,200.0	17,925.0	163,500.0	17,975.0	1,405,821.7	82,825.0	7,900.0	98,691.4

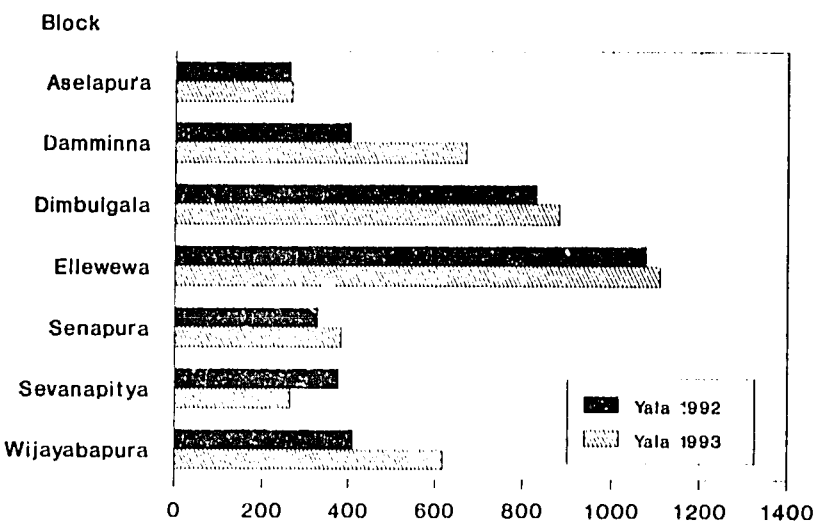
Block	Total income	Total income if only paddy	Increase in income	% increase in income	Increase in income per farmer	% increase per farmer
Aselapura	18,039,472.6	16,769,373.7	1,270,098.8	7.6	4,774.8	37.5
Damminna	17,563,012.8	17,240,507.5	322,505.3	1.9	481.4	3.8
Dimbulagala	27,662,780.8	27,044,955.7	617,825.1	2.3	700.5	5.5
Elewewa	29,525,392.7	27,044,904.7	2,480,487.9	9.2	2,234.7	17.6
Senapura	21,914,106.4	21,327,800.5	586,305.9	2.7	1,534.8	12.1
Sevanapitya	24,393,622.7	24,205,369.3	188,253.4	0.8	715.8	5.6
Wijayabapura	25,433,426.3	23,976,251.7	1,457,174.6	6.1	2,361.7	18.5
Total	164,531,814.2	157,509,153.1	6,922,661.1	4.4	1,652.2	13.0

Hectares Cultivated to OCs; by Block Mahaweli, System B; Yala 1992 and 1993



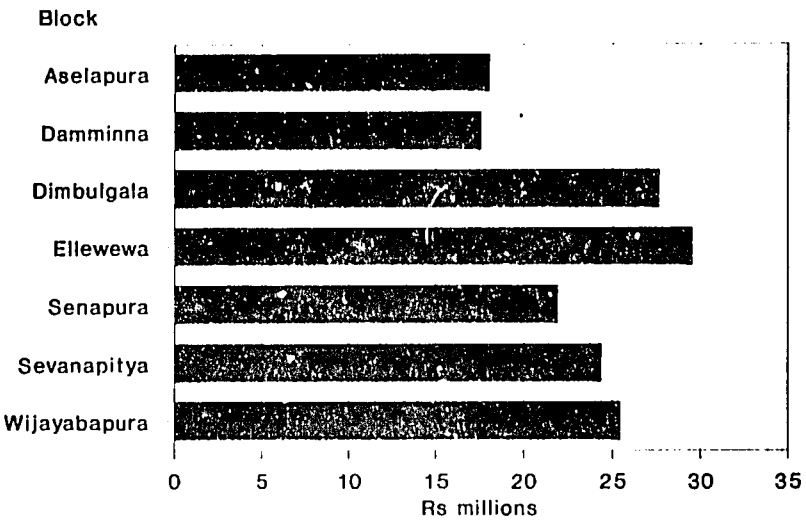
Total hectares cultivated to OCs increased from 577 to 590.

Number of Farmers Cultivating OCs; Mahaweli, System B; Yala 1992 and 1993



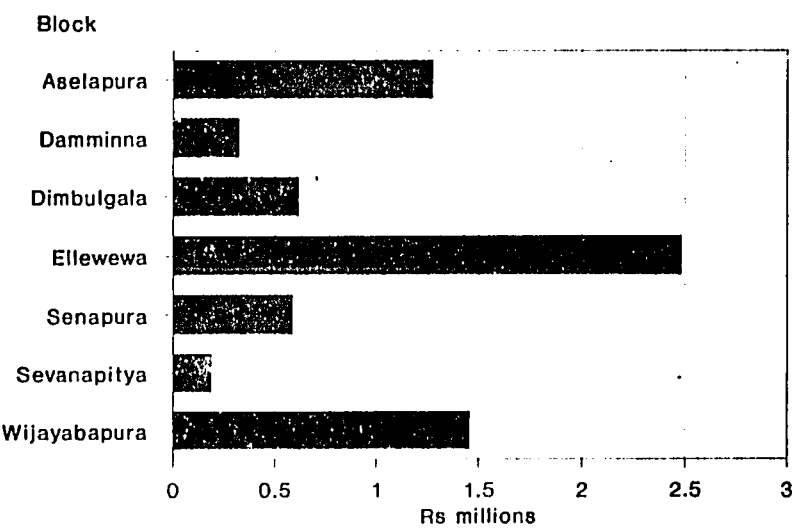
Total number of farmers increased from 3423 to 4190.

Income from Crop Production; by Block
Mahaweli, System B; Yala 1993



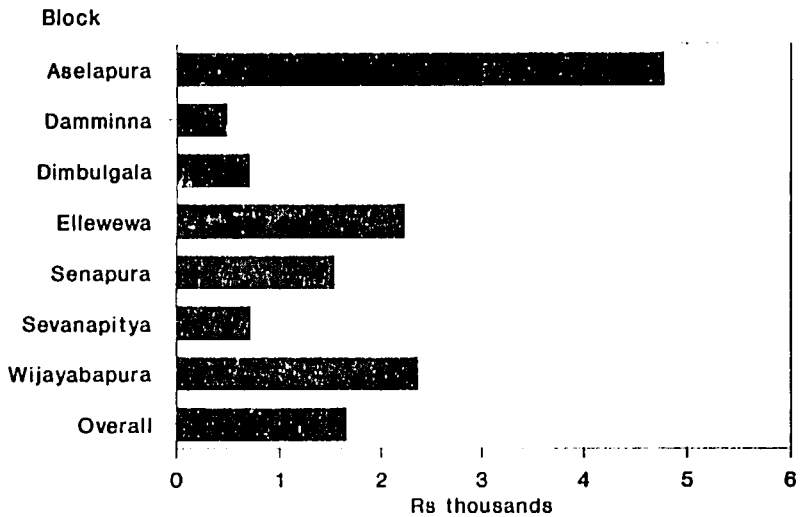
Total income from crop production exceeded Rs 164.5 million

Increase in Income from OCs; by Block
Mahaweli, System B; Yala 1993

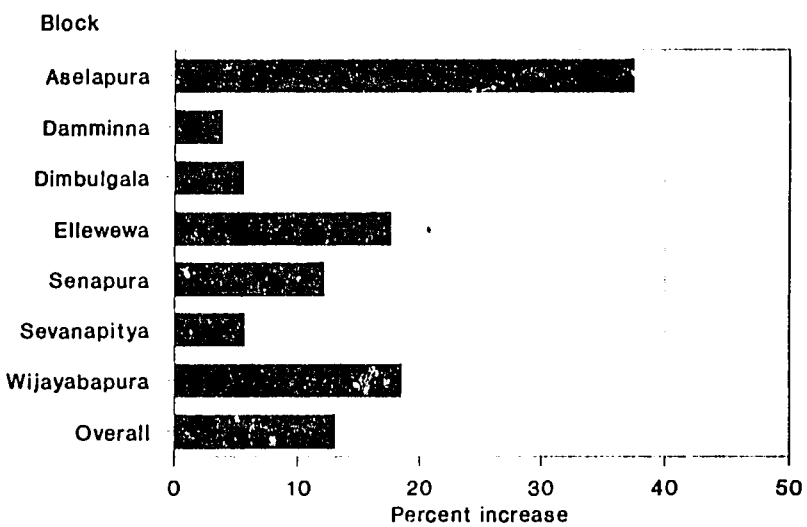


Increase in income over paddy production was Rs 6.9 million.

Increase in Income per Farmer from OCs Mahaweli, System B; Yala 1993; by Block



Percent Increase in Income per Farmer from OCs, Mahaweli, System B; Yala 1993



SUMMARY OF ASELAPURA BLOCK

Settlement in Aselapura Block continued to expand during 1993. The Yala 1992 census counted 633 farmers in 5 units. The number of farmers reporting crop cultivation during the Yala 1993 census more than doubled to 1,317 in 8 units.

Crop diversification in Aselapura Block did not expand with the addition of settlers or cultivable land. The number of farmers diversifying crop production in Yala 1993 remained about the same as Yala 1992 (an additional 4 farmers), but the area devoted to OCs declined. Total area allocated to OCs decreased to 41.3 hectares from 79.5 hectares in Yala 1992.

Crop diversification in Aselapura was not evenly spread throughout the block. Kalingawila, one of MEA/MARD's model units, had a high percentage of farmers, 63 percent, engaged in crop diversification. This was almost 50 percent of total OC farmers in Aselapura Block. Of the 41.35 hectares of land allocated to OCs in Aselapura Block, 28.2 hectares were in Kalingawila. About thirty percent of the farmers in Aselapura and Nagastenna Units cultivated OCs. Smaller percentages were found in Mithreegama (17.4 percent) and Mahindagama (about 10 percent). Two units in Aselapura Block only grew paddy in the irrigated lands, Menikdeniya and Rideetenna.

Big onion (17.3 hectares) was the most commonly grown OC in Aselapura. Most of this, 16.5 hectares, was cultivated in Kalingawila. Chilli was the next most common crop with 12.5 hectares and there were smaller areas of red onion, grain legumes, and small patches of vegetable crops.

Total income from crop production in Aselapura Block was estimated at Rs 18 million. The increase in income from production of OCs was Rs 1.27 million. The majority of this additional income was in Kalingawila, due to its emphasis on big onion production. Besides Kalingawila, only Mahindagama and Namalgama gained in comparison to paddy production, and Aselapura, Mithreegama, and Nagastenna lost relative to production of paddy only.

The estimated gain per Kalingawila farmer was Rs 9,926, or 78 percent above production of paddy only. This gain was the highest of all units in System B. Namalgama farmers increased income 20 percent from production of OCs, and Mahindagama, 7.5 percent. The losses taken by the other units were low, only about 1 percent.

Crop Cultivation Census; Yala 1993
Aselapura Block

Unit	Total area (ha)	Paddy	Chilli	B'onion	G'gram	L'bean	R'onion	C'pea	Okra	Brinjal	Pumpkin	G'nut
Aselapura	143.000	139.325	2.818	0.000	0.458	0.398	0.000	0.000	0.000	0.000	0.000	0.000
Kalingawila	202.000	173.806	1.813	16.507	0.618	0.268	3.452	1.466	0.328	0.507	0.011	1.474
Mahindagama	152.000	150.535	1.160	0.305	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Mainkdeniya	141.000	141.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Mithreegama	190.000	188.302	1.191	0.000	0.000	0.000	0.000	0.507	0.000	0.000	0.000	0.000
Nagastenna	137.000	131.904	4.643	0.257	0.000	0.000	0.061	0.115	0.000	0.000	0.000	0.000
Namalgama	83.000	81.771	0.800	0.214	0.042	0.000	0.152	0.014	0.000	0.000	0.000	0.000
Rideetenna	269.000	269.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Total	1317.000	1275.644	12.426	17.283	1.124	0.666	3.665	2.121	0.328	0.507	0.011	1.474
Percent of total		96.860	0.943	1.312	0.085	0.052	0.280	0.161	0.025	0.038	0.001	0.112
Percent of OCs			30.045	41.791	2.719	1.658	8.910	5.128	0.792	1.225	0.027	3.564

Unit	Tomato	Luffa	Capsicum	B'gourd	S'gourd	Total OCs	% OCs	Total farmers	OC farmers	% OC farmers	OC ha/farmers
Aselapura	0.000	0.000	0.000	0.000	0.000	3.674	2.569	143	42	29.371	0.087
Kalingawila	0.157	0.539	0.049	0.476	0.491	28.194	13.957	202	127	62.871	0.222
Mahindagama	0.000	0.000	0.000	0.000	0.000	1.465	0.964	152	15	9.868	0.098
Mainkdeniya	0.000	0.000	0.000	0.000	0.000	0.000	0.000	141	0	0.000	ERR
Mithreegama	0.000	0.000	0.000	0.000	0.000	1.698	0.894	190	33	17.368	0.051
Nagastenna	0.000	0.000	0.000	0.000	0.000	5.096	3.719	137	44	32.117	0.116
Namalgama	0.000	0.000	0.000	0.000	0.000	1.229	1.481	83	5	6.024	0.246
Rideetenna	0.000	0.000	0.000	0.000	0.000	0.000	0.000	269	0	0.000	ERR
Total	0.157	0.539	0.049	0.476	0.491	41.356	3.140	1317	266	20.197	0.155
Percent of total	0.012	0.041	0.004	0.036	0.037	3.140					
Percent of OCs	0.380	1.303	0.118	1.151	1.187						

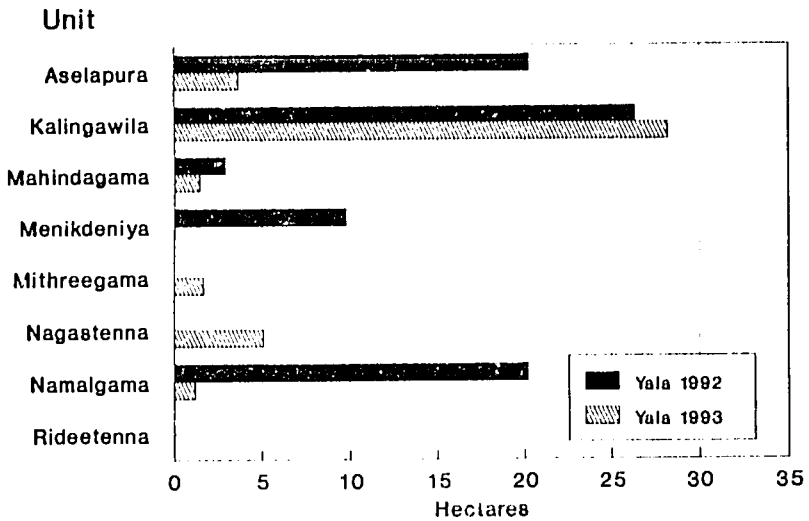
Crop Cultivation Census; Yala 1993; Income from paddy and OC cultivation
Aselapura Block

Unit	Paddy	Chilli	B'onion	G'gram	L'bean	R'onion	C'pea	Okra	Brinjal	Pumpkin	G'nut
Aselapura	1,774,036.7	20,236.8	0.0	9,301.6	9,674.3	0.0	0.0	0.0	0.0	0.0	0.0
* Kalingawila	2,213,073.1	13,015.6	1,336,745.0	12,548.4	6,984.8	97,140.8	26,945.5	8,233.5	22,898.9	280.0	47,091.6
Mahindagama	1,916,759.6	8,331.4	24,898.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Mainkdeniya	1,795,353.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Mithreegama	2,397,651.9	8,554.7	0.0	0.0	0.0	0.0	9,187.4	0.0	0.0	0.0	0.0
Nagasterna	1,679,538.7	33,344.3	20,771.4	0.0	0.0	2,273.6	2,084.2	0.0	0.0	0.0	0.0
Namalgama	1,041,168.9	5,744.8	17,362.1	995.6	0.0	4,268.5	253.9	0.0	0.0	0.0	0.0
Rideeterna	3,425,177.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total	16,242,778.9	89,227.5	1,399,577.3	22,845.5	16,659.1	103,682.9	38,471.0	8,233.5	22,898.9	280.0	47,091.6

Unit	Tomato	Luffa	Capsicum	B'gourd	S'gourd	Total income	Total income if only paddy	Increase in income	% increase in income	Increase in income per farmer	% increase per farmer
Aselapura	0.0	0.0	0.0	0.0	0.0	1,813,249.3	1,820,819.0	(7,569.7)	(0.4)	(180.2)	-1.42%
Kalingawila	3,930.0	13,467.5	1,225.0	16,798.0	12,275.0	3,632,652.6	2,572,066.0	1,260,586.6	49.0	9,925.9	77.95%
Mahindagama	0.0	0.0	0.0	0.0	0.0	1,949,789.9	1,935,416.0	14,373.9	0.7	958.3	7.53%
Mainkdeniya	0.0	0.0	0.0	0.0	0.0	1,795,353.0	1,795,353.0	0.0			
Mithreegama	0.0	0.0	0.0	0.0	0.0	2,415,394.0	2,419,270.0	(3,876.0)	(0.2)	(117.5)	-0.92%
Nagasterna	0.0	0.0	0.0	0.0	0.0	1,738,012.1	1,744,421.0	(6,408.9)	(0.4)	(145.7)	-1.14%
Namalgama	0.0	0.0	0.0	0.0	0.0	1,069,813.8	1,056,839.0	12,974.8	1.2	2,595.0	20.38%
Rideeterna	0.0	0.0	0.0	0.0	0.0	3,425,177.0	3,425,177.0	0.0			
Total	3,930.0	13,467.5	1,225.0	16,798.0	12,275.0	18,039,441.7	16,759,361.0	1,270,080.7	7.6	4,774.7	37.50%

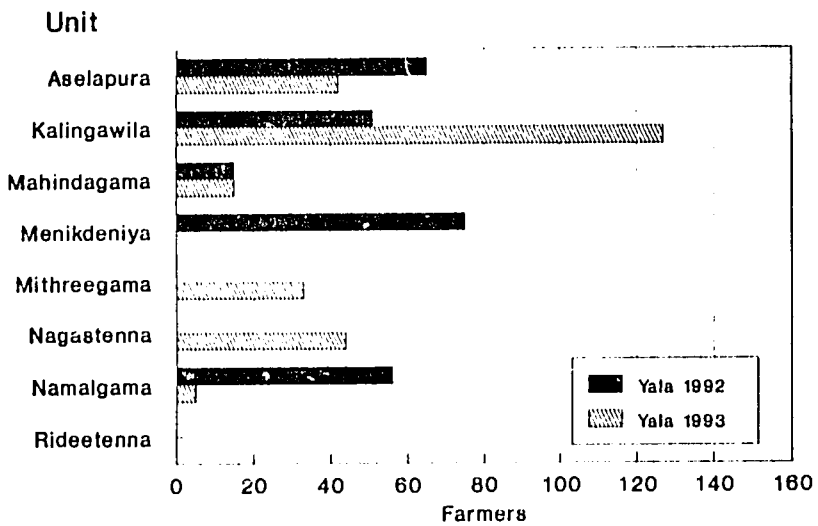
* Indicates model unit

Hectares Cultivated to OCs; Aselapura Block; Yala 1992 and 1993

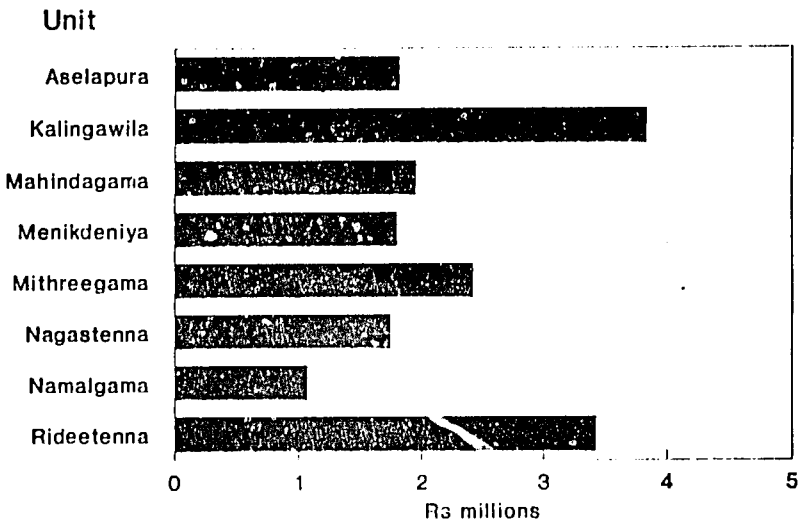


Total hectares cultivated to OCs decreased from 79 to 41.

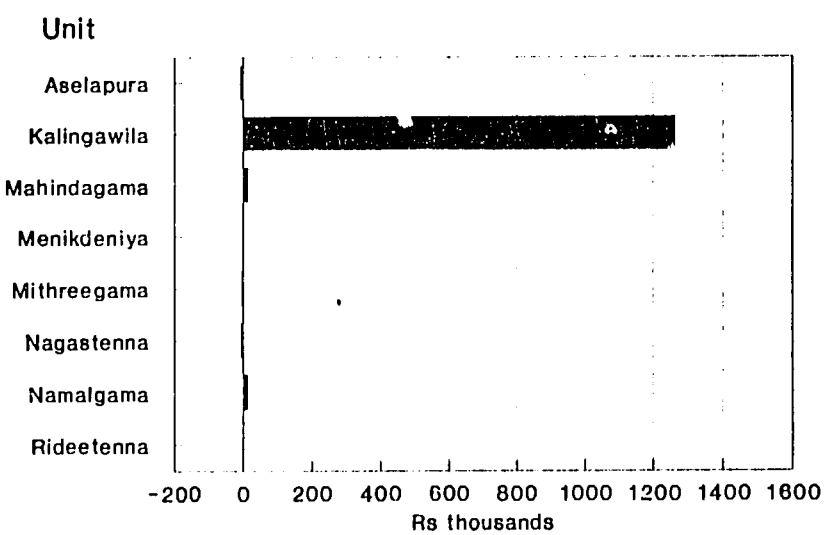
Number of Farmers Cultivating OCs; Aselapura Block; Yala 1992 and 1993



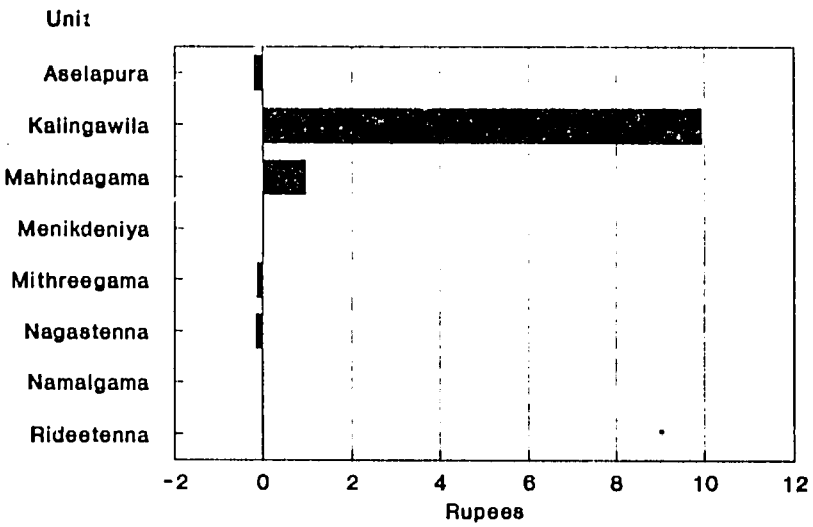
Income from Crop Production; Aselapura Block; Yala 1993



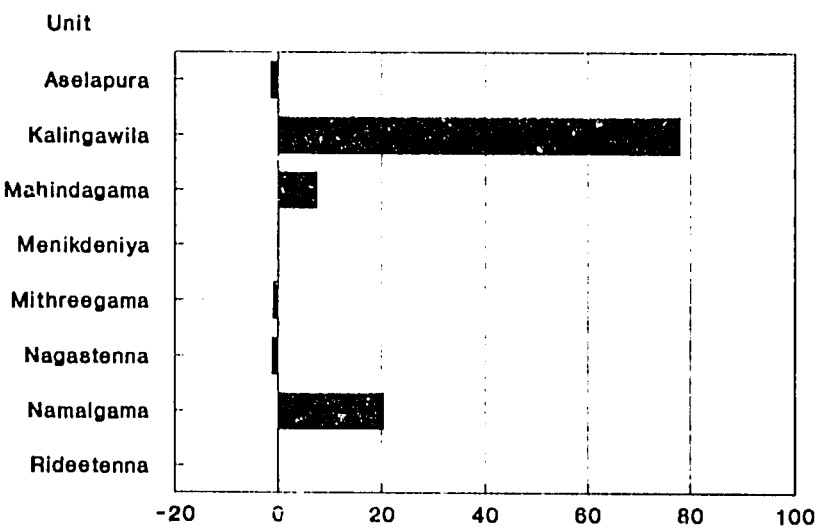
Change in Income from OC Production Aselapura Block; Yala 1993



Change in Income per Farmer from OCs Aselapura Block; Yala 1993



Percent Change in Income per Farmer from OCs, Aselapura Block; Yala 1993



SUMMARY OF DAMMINNA BLOCK

Crop diversification expanded during Yala 1993 in Damminna Block. All units increased crop diversification relative to Yala 1992 in terms of the number of farmers, and 6 of 7 units increased the area allocated to OCs.

Six hundred seventy (670) farmers cultivated OCs in Damminna Block during Yala 1993, 49.5 percent of the total number of farmers. In three units, more than 50 percent of the farmers diversified crop production: Ihalawewa with 81 percent; Nidanwela with 75.5; and in Kandegama, 55 percent of the farmers diversified crop production. The largest increase in farmers diversifying was in Arunapura. In Yala 1993, 56 Arunapura farmers diversified crop production, 52 more than in Yala 1992.

The total area cultivated to OCs was 90.3 hectares, up from 58.5 hectares in Yala 1992. All units except Kandegama increased area allocated to OCs. The greatest increase was in Ihalawewa. The area allocated to OCs in Ihalawewa was 47.1 hectares, up from only 7 hectares in Yala 1992. Ihalawewa was a "model unit", and thus benefitted from the seed commercialization fund and extension program in OCs.

Chilli accounted for more than 50 percent of total OCs with 49.5 hectares. Red onion, cowpea and greengram were the next most common OCs. Unlike Aselapura, big onion cultivation was low, only 1.4 hectares.

Total income from crop production in Damminna Block was Rs 17.57 million. Because of the preponderance of chilli among OCs, the increases in income were disappointingly small. Ihalawewa Unit had the largest increase in income, Rs 252 thousand, or 8 percent. Increases in income relative to production of paddy only were positive but below 2.5 percent in Arunapura, Damminna, Kandegama and Nidanwela Units, and small negative changes were estimated for Aluthoya and Divuldamana.

Income for farmers who cultivated OCs increased Rs 1,265 or about 10 percent in Ihalawewa Unit. This was the highest per farmer increase in Damminna Block. Overall, income increased an average of only Rs 490 per farmer, or almost 4 percent compared with production of paddy only.

Crop Cultivation Census; Yala 1993
Damminna Block

Unit	Total area (ha)	Paddy	Chilli	B'onion	G'gram	L'bean	R'onion	C'pea	Okra	Brinjal	B'nut	Tomato	Luffa	B'gourd	S'gourd	Beet
Aluthoya	164.000	176.957	5.056	0.000	0.783	0.155	0.355	0.363	0.040	0.009	0.000	0.012	0.024	0.023	0.000	0.000
Arunapura	247.000	244.001	2.436	0.239	0.014	0.005	0.304	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Damminna	140.000	132.407	3.310	0.000	0.766	0.549	0.004	1.826	0.043	0.268	0.501	0.002	0.034	0.027	0.010	0.000
Diuldamana	215.000	209.108	5.053	0.000	0.188	0.073	0.262	0.182	0.000	0.041	0.029	0.000	0.013	0.013	0.000	0.040
Ihalawewa	247.000	199.890	23.697	1.050	2.201	1.901	9.361	3.399	0.035	0.205	1.049	0.065	0.595	0.542	0.376	0.028
Kandegama	145.000	135.497	3.422	0.039	1.832	0.064	0.111	3.563	0.026	0.057	0.069	0.009	0.026	0.006	0.000	0.000
Nidanwela	176.000	165.848	6.586	0.100	1.699	0.000	0.266	0.274	0.007	0.613	0.409	0.000	0.000	0.000	0.000	0.000
Total	1354.000	1263.708	49.559	1.428	7.483	2.747	10.684	9.608	0.151	1.193	2.058	0.088	0.691	0.611	0.386	0.068
Percent of total		93.331	3.660	0.105	0.553	0.203	0.789	0.710	0.011	0.088	0.152	0.007	0.051	0.045	0.029	0.005
Percent of OCs			54.887	1.581	8.287	3.042	11.832	10.640	0.167	1.321	2.279	0.098	0.766	0.676	0.426	0.075

Unit	Pumpkin	G'nut	G'leaves	Cucumber	Raddish	Yam	Total OCs	% OCs	Total farmers	OC farmers	% OC farmers	OC ha/farmers
Aluthoya	0.183	0.010	0.000	0.000	0.029	0.000	7.043	3.628	183	76	42.623	0.090
Arunapura	0.000	0.000	0.000	0.000	0.001	0.000	2.999	1.214	247	56	22.672	0.054
Damminna	0.079	0.176	0.000	0.000	0.000	0.000	7.593	5.423	140	66	47.143	0.115
Diuldamana	0.000	0.000	0.000	0.000	0.000	0.000	5.892	2.740	215	57	26.512	0.103
Ihalawewa	0.000	0.503	0.000	0.000	0.000	2.083	47.110	19.073	247	200	80.972	0.236
Kandegama	0.078	0.012	0.175	0.001	0.000	0.013	9.503	6.554	145	80	55.172	0.119
Nidanwela	0.000	0.000	0.000	0.000	0.031	0.167	10.152	5.768	176	133	75.568	0.076
Total	0.339	0.700	0.175	0.001	0.062	2.262	90.292	6.669	1353	670	49.520	0.135
Percent of total	0.025	0.052	0.013	0.000	0.005	0.167	6.669					
Percent of OCs	0.376	0.776	0.194	0.001	0.068	2.505						

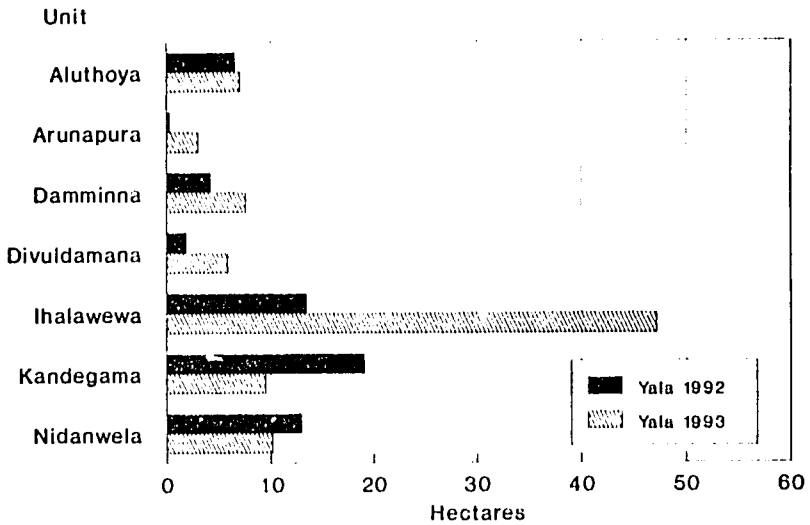
Crop Cultivation Census; Yala 1993; Income from paddy and OC cultivation
Damminna Block

Unit	Paddy	Chilli	B'onion	G'gram	L'bean	R'onion	C'pea	Okra	Brinjal	B'nut	Tomato	Luffa	S'gourd	S'gourd	Beet
Aluthoya	2,253,198.6	36,309.3	0.0	15,900.9	3,773.0	10,000.2	6,566.3	1,015.1	411.4	0.0	290.0	597.5	822.3	0.0	0.0
Arunapura	3,106,662.2	17,495.1	19,362.3	284.5	111.8	8,559.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Damminna	1,585,940.9	23,766.2	0.0	15,567.7	13,328.2	121.0	33,129.1	1,067.8	12,093.7	25,225.4	42.5	842.5	952.8	250.0	0.0
Diuldamana	2,562,573.4	36,282.0	0.0	3,817.8	1,773.5	7,372.2	3,303.1	0.0	1,844.6	1,439.2	0.0	312.5	441.1	0.0	1,000.0
* Ihalawewa	2,545,194.3	170,165.3	65,029.0	44,709.8	46,187.2	263,968.2	61,659.9	869.3	9,272.5	52,805.8	1,635.0	14,885.0	19,130.7	9,402.5	700.0
Kandegama	1,725,280.8	24,571.9	3,133.9	37,222.6	1,562.2	3,109.2	64,631.1	653.3	2,577.0	3,492.2	235.0	645.0	204.7	0.0	0.0
Nidanwela	2,111,738.8	47,294.8	8,089.9	34,526.4	0.0	7,484.7	4,961.0	183.4	27,727.3	20,570.8	0.0	0.0	0.0	0.0	0.0
Total	16,090,758.9	355,884.6	115,615.1	152,029.4	66,735.9	300,615.1	174,270.4	3,788.9	53,926.5	103,533.4	2,202.5	17,282.5	21,551.6	9,652.5	1,700.0

Unit	Pumpkin	G'nut	G'leaves	Cucumber	Raddish	Yam	Total income	Total income if paddy only	Increase in income	% increase in income	Increase in income per farmer	% increase per farmer
Aluthoya	4,562.5	400.1	0.0	0.0	730.0	0.0	2,334,597.0	2,342,872.0	(8,275.0)	-0.35%	(106.1)	-0.83%
Arunapura	0.0	0.0	0.0	0.0	25.0	0.0	3,152,700.4	3,145,051.0	7,649.4	0.24%	136.6	1.07%
Damminna	* 962.5	7,092.0	0.0	0.0	0.0	0.0	1,821,382.3	1,782,620.0	38,762.3	2.17%	587.3	4.61%
Diuldamana	0.0	0.0	0.0	0.0	0.0	0.0	2,720,159.3	2,737,595.0	(17,435.7)	-0.64%	(305.9)	-2.40%
Ihalawewa	0.0	20,322.2	0.0	0.0	0.0	52,067.5	3,398,004.3	3,145,051.0	252,953.3	8.04%	1,264.8	9.93%
Kandegama	1,960.0	484.9	4,382.5	30.0	0.0	312.5	1,874,488.7	1,846,285.0	28,203.7	1.53%	352.5	2.77%
Nidanwela	0.0	0.0	0.0	0.0	782.5	4,170.0	2,267,529.6	2,241,008.0	26,521.6	1.18%	199.4	1.57%
Total	8,465.0	28,299.1	4,382.5	30.0	1,537.5	56,550.0	17,568,861.5	17,240,482.0	328,379.5	1.90%	490.1	3.85%

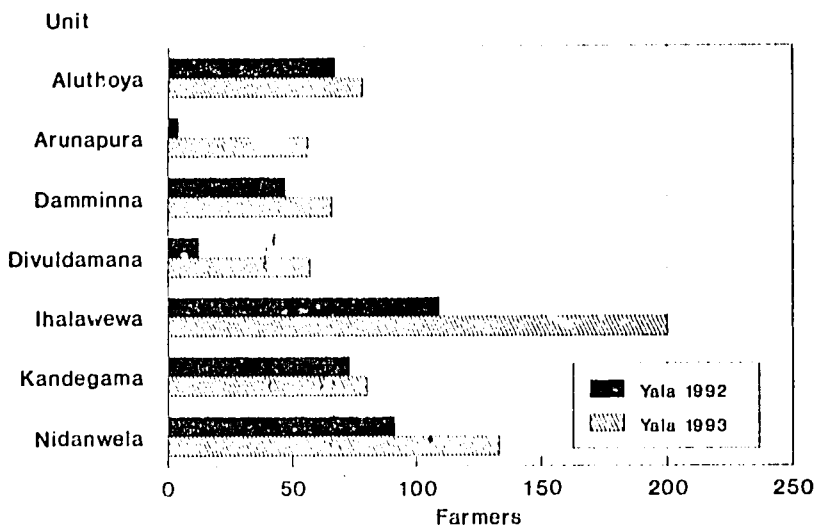
* Indicates model unit

Hectares Cultivated to OCs; Damminna Block; Yala 1992 and Yala 1993



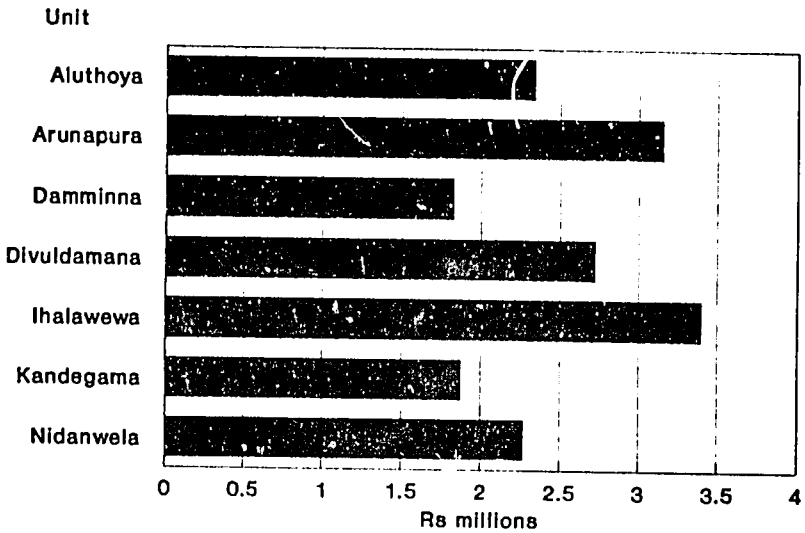
Total hectares cultivated to OCs increased from 58 to 90.

Number of Farmers Cultivating OCs; Damminna Block; Yala 1992 and Yala 1993

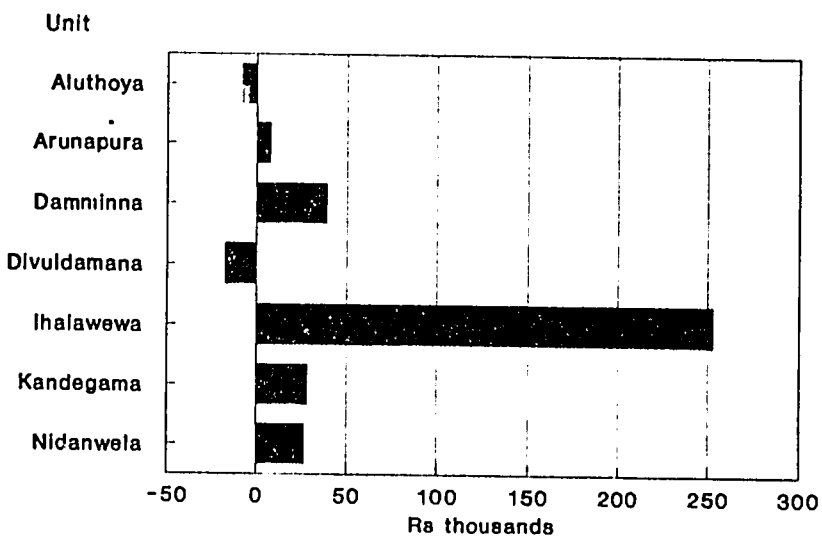


Farmers cultivating OCs increased from 403 to 677.

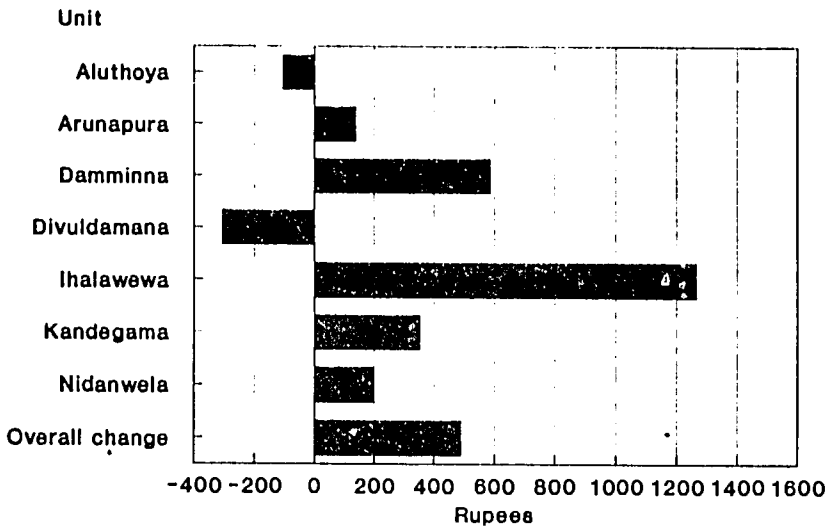
Income from Crop Production; Damminna Block; Yala 1993



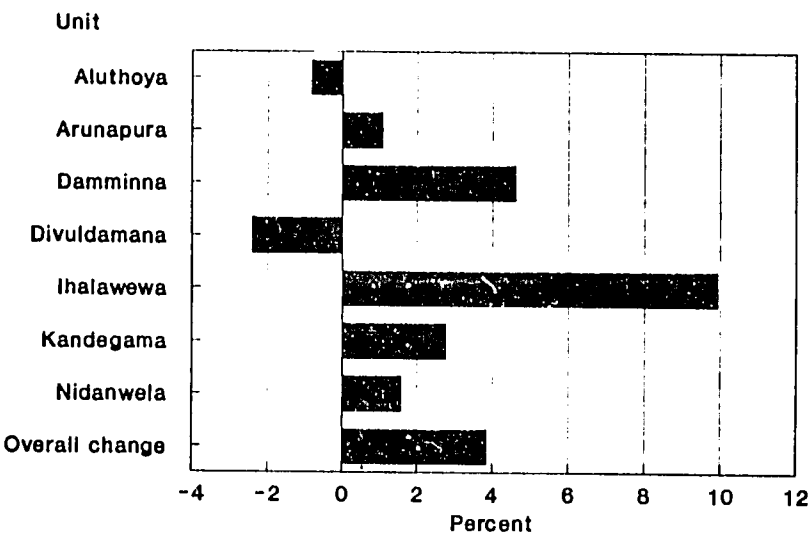
Change in Income from OC Production Damminna Block; Yala 1993



Change in Income per Farmer from OCs Damminna Block; Yala 1993



Percent Change in Income per Farmer from OCs; Damminna Block; Yala 1993



SUMMARY OF DIMBULAGALA

The crop diversification program in Dimbulagala Block has progressed more slowly than other blocks in Zones 1 and 5. During Yala 1993, there was in increase in the number of OC farmers compared with a year before (882 in Yala 1993 versus 830 in Yala 1992), but the area allocated to OCs declined slightly.

Thispanagama, the model unit in Dimbulagala, cultivated 21.3 hectares of OCs during Yala 1993, and increase of almost 15 hectares over that of Yala 1992. Almost 60 percent of the farmers in Thispanagama cultivated OCs. One hundred seventy nine farmers diversified crop production during Yala 1993, up from 100 during Yala 1992. In two other units, Kudawewa and Millana, more than 50 percent of the farmers cultivated OCs. Very high percentages of farmers cultivated OCs in Weheragama and Bogaswewa, also.

As in Damminna, chilli was the most common crop in Dimbulagala with over 26 hectares, or slightly more than one-third the total. Groundnut, greengram, red onion, cowpea and big onion were also important crops. Over 4 hectares of baby corn was planted in Kudawewa, Bogaswewa and Weheragama.

Total income from crop production was Rs 27.66 million. Thispanagama, the model unit, obtained the highest income of any unit, over Rs 4 million. All other units received between Rs 2.2 and Rs 2.8 million.

The increase in income over paddy production was Rs 617.8 thousand. Almost 40 percent of this increase, Rs 246.6 thousand, was accounted for by OC production in Thispanagama, and almost Rs 192 thousand benefitted OC farmers in Weheragama. Three units, Bimpokuna, Mahaulpotha and Manampitya has slight losses from OC production in comparison to cultivation of paddy only.

Weheragama OC farmers benefitted most from crop diversification. They raised incomes Rs 1,956 per farm family, or 15.4 percent above production of paddy only. Thispanagama farmers had 11 percent increases in income, or Rs 1,378 per family. Overall in Dimbulagala, the increase in income per farmer cultivating OCs was Rs 700, a 5.5 percent increase over production of paddy only.

Crop Cultivation Census; Yala 1993
Dimbulagala Block

Unit	Total area (ha)	Paddy	Chilli	B'onion	G'gram	L'bean	R'onion	C'pea	Okra	Brinjal	Gherkin	B'nut	Tomato	Luffa	Soya	B'gourd	S'gourd	Maize	Beet
Bimpokuna	226.000	220.174	2.127	0.000	0.025	0.106	0.033	0.215	0.453	0.000	2.857	0.000	0.000	0.003	0.000	0.003	0.000	0.000	0.000
Bogaswewa	204.000	196.113	2.104	0.445	0.677	0.120	0.634	0.462	0.025	0.085	0.000	0.004	0.114	0.019	0.055	0.007	0.051	0.000	0.005
Dalukana	172.000	168.831	1.481	0.000	0.000	0.144	1.185	0.000	0.142	0.149	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Dimbulagala	196.000	188.556	2.326	0.206	4.211	0.313	0.048	1.056	0.131	0.168	0.000	0.017	0.011	0.047	0.000	0.012	0.095	0.000	0.000
Kudawewa	204.000	197.996	1.420	0.131	0.794	0.076	0.378	0.367	0.000	0.247	0.000	0.143	0.103	0.000	0.000	0.000	0.000	0.000	0.000
Mahaulpotha	184.000	180.196	1.838	0.000	0.044	0.016	0.004	0.203	0.006	0.013	1.650	0.000	0.000	0.014	0.000	0.006	0.006	0.000	0.000
Manampitiya	220.000	217.517	1.861	0.000	0.073	0.126	0.000	0.215	0.052	0.031	0.000	0.000	0.036	0.014	0.020	0.022	0.006		0.000
Millana	215.005	210.077	1.487	0.313	1.252	0.229	0.257	0.529	0.001	0.024	0.000	0.005	0.019	0.068	0.000	0.022	0.012	0.005	0.000
Thispanegama	300.000	278.713	8.550	0.915	0.454	0.000	1.228	0.499	0.045	0.020	0.000	0.003	0.036	0.000	0.020	0.000	0.000	0.000	0.001
Veheragama	201.000	189.152	2.974	2.199	0.347	0.840	2.774	0.206	0.176	0.142	0.000	0.000	0.238	0.000	0.000	0.072	0.000	0.000	0.000
Total	2124.005	2049.325	26.166	4.208	7.877	1.969	6.541	3.830	1.122	0.877	4.507	0.173	0.556	0.184	0.095	0.143	0.169	0.005	0.006
Percent of total		96.484	1.232	0.198	0.371	0.093	0.308	0.180	0.053	0.041	0.212	0.008	0.026	0.009	0.004	0.007	0.008	0.000	0.000
Percent of OCs			35.037	5.635	10.547	2.636	8.759	5.129	1.503	1.174	6.035	0.231	0.745	0.247	0.127	0.192	0.226	0.007	0.009

Unit	Cabbage	Knolkhol	Pumpkin	B'corn	G'nut	Capsicum	C'melon	Bean	Cucumber	Raddish	G'leaves	Yam	Total OCs	% OCs	Total farmers	OC farmers	% OC farmers	OC ha/farmers
Bimpokuna	0.000	0.000	0.005	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	5.826	2.578	226	62	27.434	0.094
Bogaswewa	0.120	0.050	0.070	0.749	0.019	0.000	0.000	0.011	0.000	0.008	0.022	0.031	5.687	2.686	204	101	49.510	0.058
Dalukana	0.000	0.000	0.000	0.000	0.066	0.000	0.000	0.000	0.000	0.000	0.000	0.000	3.170	1.843	172	21	12.209	0.151
Dimbulagala	0.000	0.000	0.113	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.692	9.444	4.770	196	65	32.828	0.145
Kudawewa	0.000	0.000	0.065	2.030	0.057	0.000	0.000	0.000	0.053	0.000	0.080	0.062	6.004	2.943	204	105	51.471	0.057
Mahaulpotha	0.000	0.000	0.006	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	3.804	2.067	184	52	28.261	0.073
Manampitiya	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.006	0.000	0.000	0.000	0.021	2.483	1.129	220	59	26.818	0.042
Millana	0.000	0.000	0.080	0.000	0.322	0.025	0.005	0.027	0.017	0.023	0.005	0.093	4.528	2.292	215	140	65.116	0.035
Thispanegama	0.000	0.000	0.000	0.000	6.488	0.000	0.963	0.044	0.002	0.000	0.003	0.016	21.267	7.096	300	179	59.667	0.119
Veheragama	0.000	0.000	0.180	1.620	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	11.848	5.894	201	98	48.756	0.121
Total	0.120	0.050	0.518	4.399	8.954	0.025	0.968	0.090	0.072	0.031	0.110	0.915	74.680	3.516	2124	882	41.525	0.085
Percent of total	0.006	0.002	0.024	0.207	0.422	0.001	0.046	0.004	0.003	0.001	0.005	0.043	3.516					
Percent of OCs	0.161	0.067	0.694	5.890	11.990	0.033	1.296	0.120	0.096	0.042	0.147	1.225						

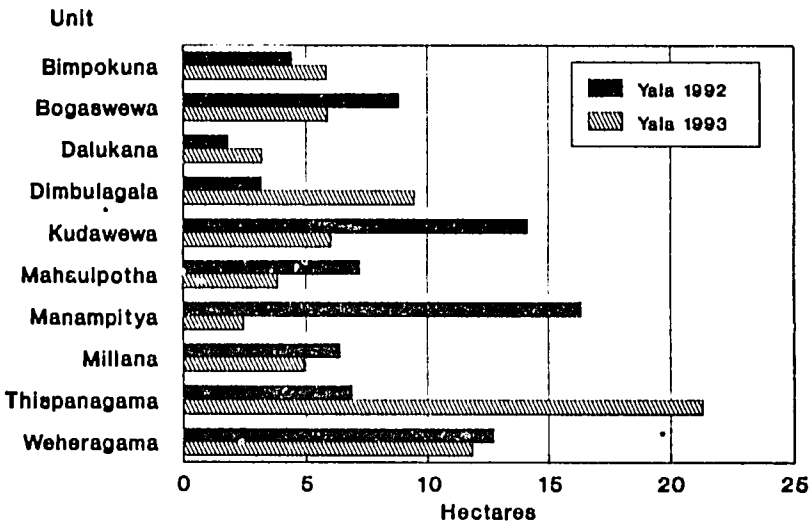
Crop Cultivation Census; Yala 1993; Income from paddy and OC cultivation
Dimbulagala Block

Unit	Paddy	Chilli	B'onion	G'gram	L'bean	R'onion	C'pea	Okra	Brinjal	Gherkin	B'nut	Tomato	Luffa	Soya	B'gourd	S'gourd	Maize	Beet
Bimpokuna	2,803,471.7	15,271.1	0.0	506.0	2,575.3	939.8	3,899.9	11,371.6	0.0	38,315.1	0.0	0.0	75.0	0.0	88.2	0.0	0.0	0.0
Bogaswewa	2,522,574.1	15,107.4	36,060.4	13,755.3	2,903.3	17,839.5	8,380.2	625.6	3,829.3	0.0	221.4	2,860.0	470.0	1,566.3	257.6	1,285.0	0.0	130.0
Dalukana	2,149,718.8	10,635.8	0.0	0.0	3,486.3	33,352.0	0.0	3,572.8	6,736.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Dimbulagala	2,400,887.4	16,700.1	16,641.4	85,551.0	7,606.8	1,350.6	19,145.7	3,291.4	7,572.7	0.0	855.4	262.5	1,175.0	0.0	423.5	2,375.0	0.0	0.0
Kudawewa	2,521,085.6	10,193.4	10,606.4	16,132.5	1,851.3	10,627.7	6,651.6	0.0	11,153.3	0.0	7,200.8	2,562.5	0.0	0.0	0.0	0.0	0.0	0.0
Mahaulpotha	2,294,435.7	13,195.1	0.0	898.1	376.6	112.6	3,673.1	201.0	569.6	22,126.5	0.0	0.0	352.5	0.0	197.6	112.5	0.0	0.0
Manampitiya	2,769,641.4	13,361.7	0.0	1,483.2	3,061.2	0.0	3,896.3	1,293.9	1,401.5	0.0	0.0	900.0	340.0	574.8	769.3	150.0	0.0	0.0
Mileana	2,674,910.4	10,677.4	25,314.3	25,430.0	5,556.3	7,234.3	9,597.3	2,291.4	1,080.5	0.0	256.6	475.0	2,192.5	0.0	779.9	292.5	130.0	0.0
* Thispanegama	3,548,853.9	61,398.3	74,056.2	9,230.5	0.0	34,559.1	9,042.3	1,128.1	890.6	0.0	151.0	900.0	0.0	577.7	0.0	0.0	0.0	30.0
Veheragama	2,408,476.2	21,357.7	178,075.0	7,050.3	20,407.8	78,040.7	5,187.8	4,422.0	6,419.8	0.0	0.0	5,950.0	0.0	0.0	2,540.9	0.0	0.0	0.0
Total	26,094,055.2	187,898.0	340,755.7	160,038.8	47,824.7	184,056.3	69,474.2	28,197.8	39,653.7	60,441.6	8,685.2	13,910.0	4,605.0	2,718.8	5,057.1	4,215.0	130.0	160.0

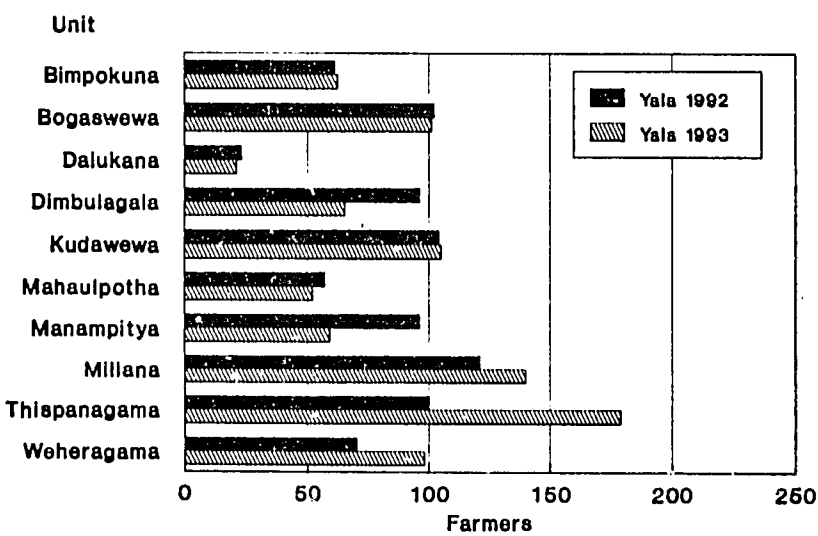
Unit	Cabbage	Knolkhol	Pumpkin	B'corn	G'nut	Capsicum	C melon	Bean	Cucumber	Raddish	G'leaves	Yam	Total income	Total income if only paddy	Increase in income	% increase in income	Increase in income per farmer	% increase per farmer
Bimpokuna	0.0	0.0	125.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2,876,640.6	2,877,658.0	(1,017.4)	−0.04%	(16.4)	−0.13%
Bogaswewa	2,997.5	1,245.0	1,742.5	3,970.7	619.8	0.0	0.0	275.0	0.0	205.0	550.0	770.0	2,640,240.8	2,597,532.0	42,708.8	1.64%	422.9	3.32%
Dalukana	0.0	0.0	0.0	0.0	2,185.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2,209,637.0	2,190,026.0	19,611.0	0.90%	933.9	7.33%
Dimbulagala	0.0	0.0	2,825.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	17,310.0	2,583,973.4	2,521,134.0	62,839.4	2.49%	966.8	7.59%
Kudawewa	0.0	0.0	1,625.0	10,763.1	1,804.9	0.0	0.0	0.0	1,325.0	0.0	2,000.0	1,547.5	2,617,132.6	2,597,532.0	19,600.6	0.75%	186.7	1.47%
Mahaulpotha	0.0	0.0	137.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2,336,388.4	2,342,872.0	(6,483.6)	−0.28%	(124.7)	−0.98%
Manampitiya	0.0	0.0	0.0	0.0	0.0	0.0	0.0	195.0	0.0	0.0	0.0	525.0	2,797,593.3	2,801,260.0	(3,666.7)	−0.13%	(62.1)	−0.49%
Mileana	0.0	0.0	1,995.0	0.0	10,286.6	625.0	286.1	662.5	417.5	575.0	125.0	2,327.5	2,783,518.8	2,737,661.2	45,857.6	1.68%	327.6	2.57%
Thispanegama	0.0	0.0	0.0	0.0	271,160.8	0.0	52,980.4	1,107.5	52.5	0.0	77.5	395.0	4,066,591.4	3,819,900.0	246,691.4	6.46%	1,373.2	10.82%
Veheragama	0.0	0.0	4,500.0	8,589.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2,751,017.6	2,559,333.0	191,684.6	7.49%	1,956.0	15.36%
Total	2,997.5	1,245.0	12,950.0	23,323.0	286,057.3	625.0	53,266.5	2,240.0	1,795.0	780.0	2,752.5	22,875.0	27,662,783.8	27,044,958.2	617,825.6	2.28%	700.5	5.50%

* indicates model unit

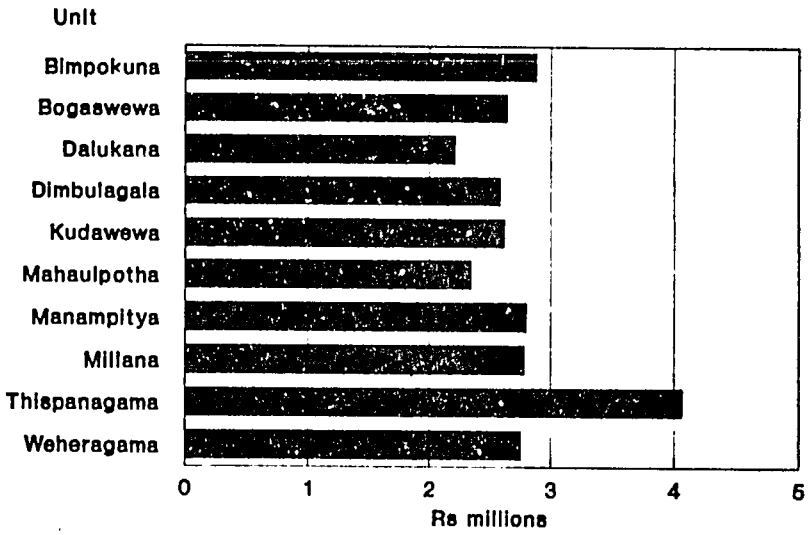
Hectares Cultivated to OCs; Dimbulagala Block; Yala 92 and Yala 93



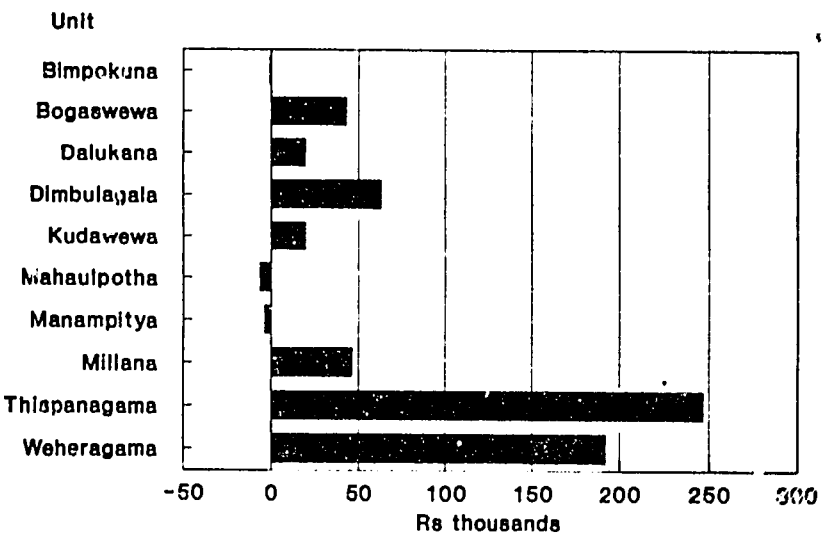
Number of Farmers Cultivating OCs; Dimbulagala Block; Yala 92 and Yala 93



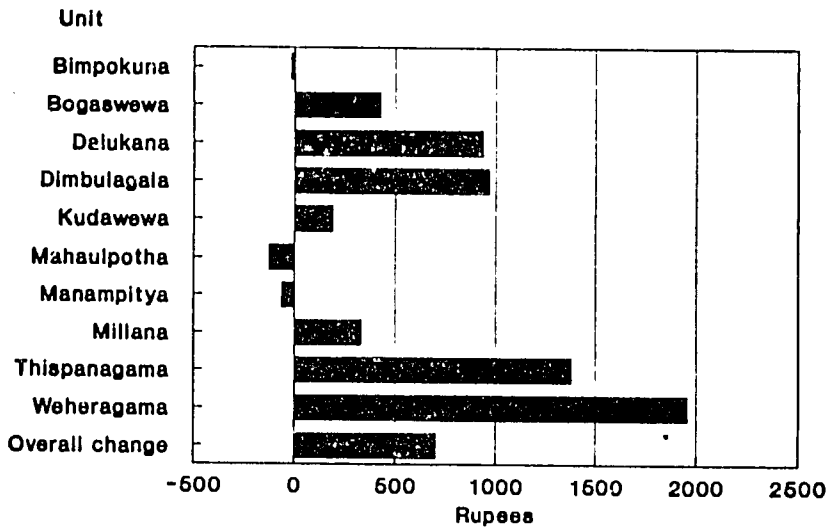
Income from Crop production; Dimbulagala Block; Yala 1993



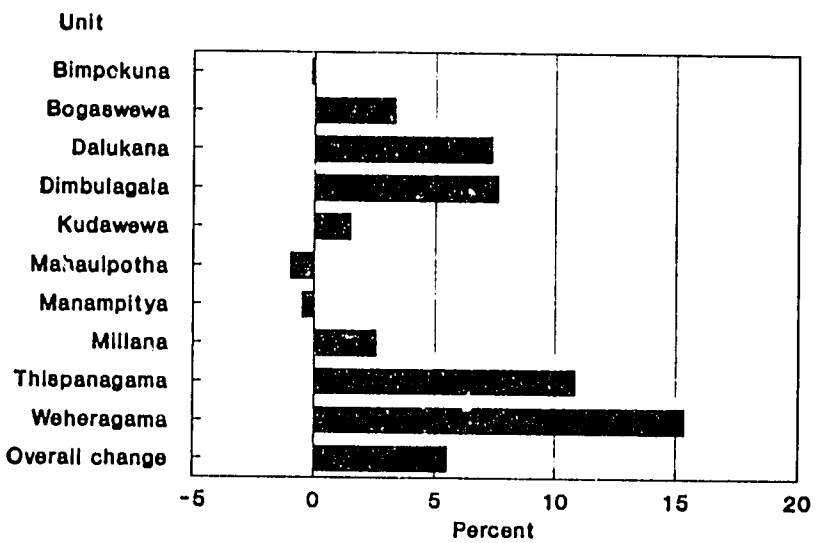
Change in Income from OC Production Dimbulagala Block; Yala 1993



Change in Income per Farmer from OCs Dimbulagala Block; Yala 1993



Percent Change in Income per Farmer from OCs; Dimbulagala Block; Yala 1993



SUMMARY OF ELLEWEWA BLOCK

Ellewewa Block remained the most diversified block in System B during Yala 1993. This distinction arises from the block's high level of land allocated to OCs, almost 10 percent, and in the number of crops cultivated. Ellewewa farmers reported cultivation of 30 OCs during Yala 1993, more than any other block.

Over 200 hectares of OCs were cultivated in Ellewewa Block. Gherkin was the most common crop with 43 hectares. Sunfrost, Ltd. had outgrowers programs in 6 of 8 units. Chilli was cultivated on 41 hectares, and was the second most common crop. Greengram (21.5 hectares), tobacco (17.8 hectares), baby corn (14.2 hectares), cantaloupe (12.6 hectares) and red onion (10 hectares) were also common crops.

Kalukele was the most diversified unit in Ellewewa Block with over 68 hectares, or 25 percent of the land area cultivated to OCs. OC farmers in Kalukele numbered 220, or 77 percent of the total. Ellewewa Unit had 34 hectares devoted to OCs, and 65 percent of the farmers in that unit engaged in crop diversification. Overall, 1,110 Ellewewa farmers diversified crop production in Yala 1993, over 46 percent of the total.

Total income in Ellewewa Block was Rs 29.5 million. The increase in income over production of paddy alone was Rs 2.48 million. Increases in income in Ellewewa Block were higher than Damminna and Dimbulagala because the greater number of crops in the block (that is, the greater level of diversification) lessened the impact of poor chilli production. Overall, the block increased income by 10 percent over production of paddy only.

Farmers in Ellewewa Unit gained the greatest increase in income, Rs 4,577 per farm family, or 36 percent over production of paddy only. Farmers in Kalukele gained about 25 percent over production of paddy, and farmers in three other units, Ihala Ellewewa, Mahadamana and Palatiyawa increased income over 10 percent that of paddy production. The overall increase per farm family in Ellewewa Block was 17.5 percent over production of paddy.

Crop Cultivation Census, Yala 1993
Ellewewa Block

Unit	Total area (ha)	Paddy	Chilli	B'onion	G'gram	L'bean	R'onion	C'pea	Okra	Brinjal	Gherkin	B'nut	Tomato	Lufta	Soya	B'gourd	S'gourd	Banana	Beet
Bandanagala	243.000	236.282	3.972	0.474	1.454	0.062	0.004	0.232	0.070	0.044	0.000	0.012	0.000	0.072	0.000	0.005	0.000	0.012	0.000
Ellewewa	287.000	253.084	4.935	0.361	3.662	1.800	4.101	0.297	0.549	0.135	1.529	0.050	0.023	0.325	2.207	0.149	0.258	0.025	0.013
Ihala Ellewewa	314.000	297.530	5.485	0.135	0.488	0.000	1.769	0.810	0.000	0.145	0.000	0.000	0.000	0.004	0.000	0.000	0.000	0.000	0.000
Kalukele	277.289	208.950	4.254	1.662	3.721	0.179	0.227	1.559	0.062	0.046	31.107	0.206	0.028	0.012	3.321	0.159	0.010	0.000	0.000
Malgudamana	244.000	226.286	7.004	0.490	2.161	1.685	0.051	0.820	0.295	0.787	2.955	0.121	0.175	0.145	0.000	0.000	0.052	0.000	0.000
Mahadamana	224.000	206.069	3.871	1.358	1.219	1.145	2.415	1.405	0.065	0.283	2.200	0.458	0.065	0.153	0.000	0.035	0.035	0.000	0.030
Pahala Ellewewa	256.000	234.108	6.663	0.261	1.830	0.375	0.922	0.560	0.369	1.036	3.334	0.177	0.126	0.315	0.000	0.294	0.196	0.000	0.000
Palatiyawa	271.000	252.469	2.760	0.216	6.995	0.695	0.520	1.080	0.565	0.525	2.500	0.155	0.020	0.350	0.020	0.250	0.440	0.000	0.000
Total	2116.289	-1914.797	40.954	4.957	21.530	6.142	10.010	6.661	1.986	3.002	43.725	1.181	0.437	1.374	5.545	0.891	0.990	0.040	0.043
Percent of total		90.479	1.935	0.234	1.017	0.290	0.473	0.324	0.094	0.142	2.066	0.056	0.021	0.065	0.262	0.042	0.047	0.002	0.002
Percent of OCs			20.325	2.460	10.685	3.048	4.968	3.405	0.985	1.490	21.701	0.586	0.217	0.682	2.753	0.442	0.491	0.020	0.021

Unit	Cabbage	Knolkhol	Pumpkin	Tobacco	G'nut	Capsicum	C'melon	Bean	Cucumber	Reddish	G'leaves	B'corn	Yam	Total OCs	% OCs	Total farmers	OC farmers	% OC farmers	OC ha/farmers
Bandanagala	0.000	0.000	0.080	0.152	0.000	0.000	0.000	0.016	0.004	0.015	0.012	0.000	0.025	6.718	2.765	243	95	39.095	0.071
Ellewewa	0.000	0.080	0.431	11.124	0.000	0.000	0.000	0.000	0.042	0.000	0.013	1.700	0.043	33.916	11.817	267	197	68.641	0.172
Ihala Ellewewa	0.000	0.000	0.000	0.000	0.000	0.000	4.915	0.000	0.000	0.000	0.000	2.720	0.000	16.471	5.245	314	100	31.847	0.165
Kalukele	0.000	0.000	0.086	6.568	0.084	0.054	4.935	0.000	0.152	0.000	0.110	9.795	0.000	68.339	24.646	265	220	77.193	0.311
Malgudamana	0.000	0.000	0.774	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	17.714	7.260	244	123	50.410	0.144
Mahadamana	0.000	0.000	0.093	0.000	0.723	0.040	1.801	0.045	0.000	0.000	0.010	0.000	0.465	17.931	8.005	224	143	63.839	0.125
Pahala Ellewewa	0.073	0.000	0.220	0.000	0.085	0.224	1.000	0.000	0.000	0.000	0.000	0.000	1.735	21.892	8.552	526	127	24.144	0.172
Palatiyawa	0.000	0.000	0.410	0.000	0.060	0.250	0.000	0.000	0.000	0.000	0.000	0.000	0.600	18.511	6.831	271	105	38.745	0.176
Total	0.073	0.080	2.155	17.844	0.951	0.568	12.651	0.061	0.198	0.015	0.145	14.215	2.868	201.492	9.521	2394	1110	46.366	0.182
Percent of total	0.003	0.004	0.102	0.843	0.045	0.027	0.598	0.003	0.009	0.001	0.007	0.672	0.136	9.521					
Percent of OCs	0.036	0.040	1.068	8.856	0.472	0.282	6.279	0.030	0.098	0.007	0.072	7.055	1.423						

Crop Cultivation Census; Yala 1993; Income from paddy and OC cultivation
Ellewewa Block

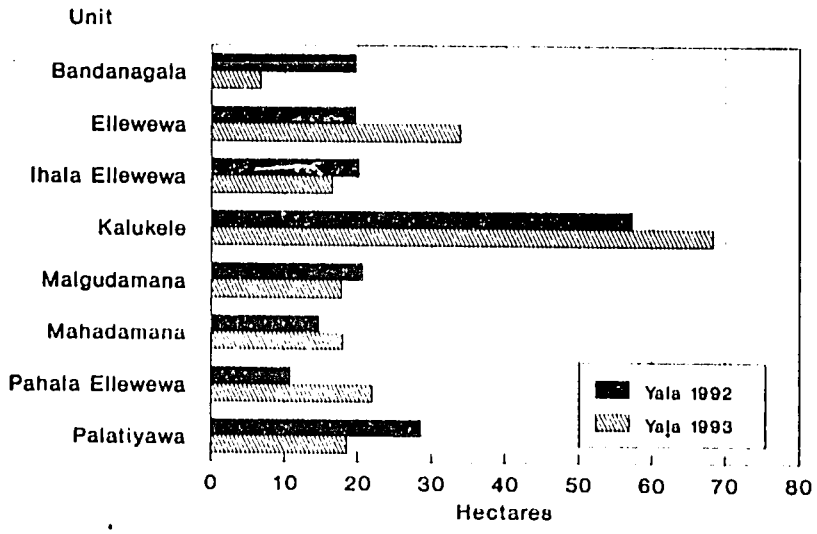
Unit	Paddy	Chilli	B'onion	G'gram	L'bean	R'onion *	C'pea	Okra	Brinjal	Gherkin	B'nut	Tomato	Luffa	Soya	B'gourd	S'gourd	Banana	Beet
Bandanagala	3,008,578.7	26,525.1	38,408.8	29,548.4	1,516.0	121.0	4,202.8	1,751.2	1,993.8	0.0	613.9	0.0	1,795.0	0.0	162.3	0.0	292.5	0.0
Ellewewa	3,222,517.3	35,441.1	29,250.0	74,398.4	13,740.7	115,399.8	5,378.2	13,803.7	6,121.4	20,506.6	2,516.0	580.0	6,115.0	63,434.9	5,256.2	6,445.0	100.0	320.0
**Ihala Ellewewa	3,788,443.1	39,387.6	10,932.3	9,915.2	0.0	49,776.1	14,683.5	0.0	6,555.5	0.0	0.0	0.0	100.0	0.0	0.0	0.0	0.0	0.0
**Kalukale	2,660,554.0	30,616.9	134,621.2	75,509.4	4,358.5	6,390.1	28,259.6	1,316.6	2,079.7	417,147.6	10,461.5	702.5	290.0	95,436.9	5,611.1	242.5	0.0	0.0
Malgudamana	2,881,304.7	50,295.7	39,655.9	43,903.1	45,786.4	1,443.5	14,879.4	7,411.9	35,584.8	39,627.9	6,068.7	4,362.5	3,815.0	0.0	0.0	1,290.0	0.0	0.0
*Mahadamana	2,623,876.6	27,797.7	109,930.4	24,757.3	27,817.8	67,953.3	25,476.2	2,135.6	12,794.4	29,502.0	23,021.4	1,625.0	3,812.5	0.0	1,235.2	875.0	0.0	750.0
**Pahala Ellewewa	2,980,894.6	62,206.1	21,135.8	37,175.8	9,110.6	25,943.2	11,968.1	9,271.1	46,837.6	44,707.8	5,906.6	3,157.5	7,862.5	0.0	10,357.6	4,890.0	0.0	0.0
Palatiyawa	3,214,942.4	19,819.6	17,491.7	142,124.4	16,885.0	14,631.8	19,590.1	14,195.6	23,735.3	34,868.0	7,799.6	500.0	6,750.0	574.8	6,822.5	11,000.0	0.0	0.0
Total	24,381,111.5	294,090.0	401,426.0	437,438.4	149,215.0	281,658.6	124,448.1	49,885.7	135,702.3	586,357.6	59,412.8	10,927.5	34,340.0	159,446.6	31,446.9	24,742.5	992.5	1,070.0

Unit	Cabbage	Knolkhol	Pumpkin	Tobaco	G'nut	Capsicum	C'melon	Bean	Cucumber	Raddish	G'leaves	B'corn	Yam	Total Income	Total Income if only paddy	Increase in Income	% increase in Income	Increase in Income per farmer	% Increase per farmer
Bandanagala	0.0	0.0	2,000.0	11,975.2	0.0	0.0	0.0	410.0	105.0	375.0	292.5	0.0	632.5	3,133,302.8	3,094,119.0	39,183.8	1.27%	412.5	3.24%
Ellewewa	0.0	2,010.0	12,265.0	878,377.5	0.0	0.0	0.0	0.0	1,045.0	0.0	335.0	9,013.4	1,080.0	4,556,049.9	3,654,371.0	901,678.9	24.67%	4,577.1	35.95%
Ihala Ellewewa	0.0	0.0	0.0	0.0	0.0	0.0	270,403.6	0.0	0.0	0.0	0.0	14,421.4	0.0	4,204,618.6	3,998,162.0	206,456.6	5.16%	2,064.6	16.21%
Kalukale	0.0	0.0	2,140.0	517,454.8	2,680.3	1,347.5	271,528.0	0.0	3,800.0	0.0	2,747.5	51,934.2	0.0	4,327,368.2	3,628,905.0	698,463.2	19.25%	3,174.8	24.93%
Malgudamana	0.0	0.0	19,350.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3,194,599.5	3,106,852.0	87,747.5	2.82%	713.4	5.60%
Mahadamana	0.0	0.0	2,312.5	0.0	23,081.0	1,000.0	99,083.8	1,125.0	0.0	0.0	250.0	0.0	11,625.0	3,121,847.9	2,852,192.0	269,655.9	9.45%	1,885.7	14.81%
Pahala Ellewewa	1,825.0	0.0	5,500.0	0.0	2,715.4	5,595.0	55,016.0	0.0	0.0	0.0	0.0	0.0	43,382.5	3,396,438.8	3,259,648.0	136,790.8	4.28%	1,092.8	8.58%
Palatiyawa	0.0	0.0	10,250.0	0.0	1,916.8	6,250.0	0.0	0.0	0.0	0.0	0.0	0.0	15,000.0	3,589,145.5	3,450,643.0	138,502.5	4.01%	1,319.1	10.36%
Total	1,825.0	2,010.0	53,817.5	1,405,837.5	30,393.4	14,192.5	696,029.4	1,535.0	4,950.0	375.0	3,625.0	75,369.0	71,700.0	29,525,371.3	27,044,892.0	2,480,479.3	9.17%	2,234.7	17.55%

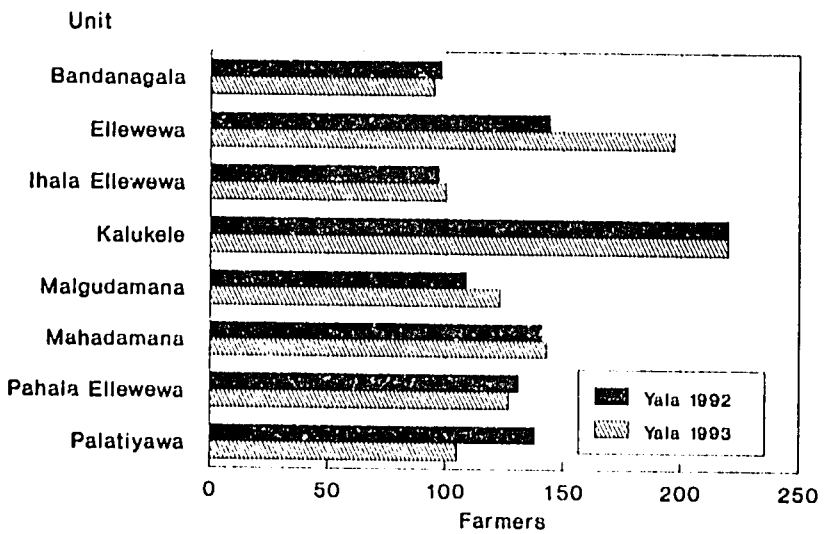
** Indicates export production program

* Indicates model unit program

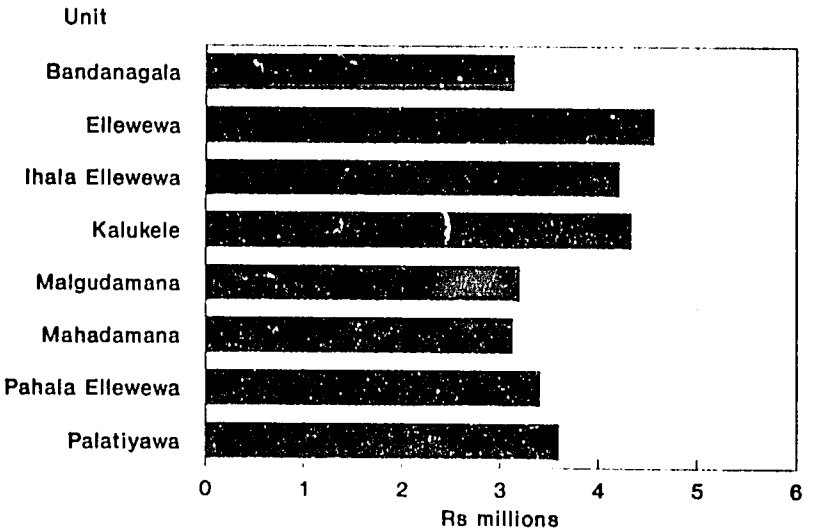
Hectares Cultivated to OCs; Ellewewa Block; Yala 1992 and Yala 1993



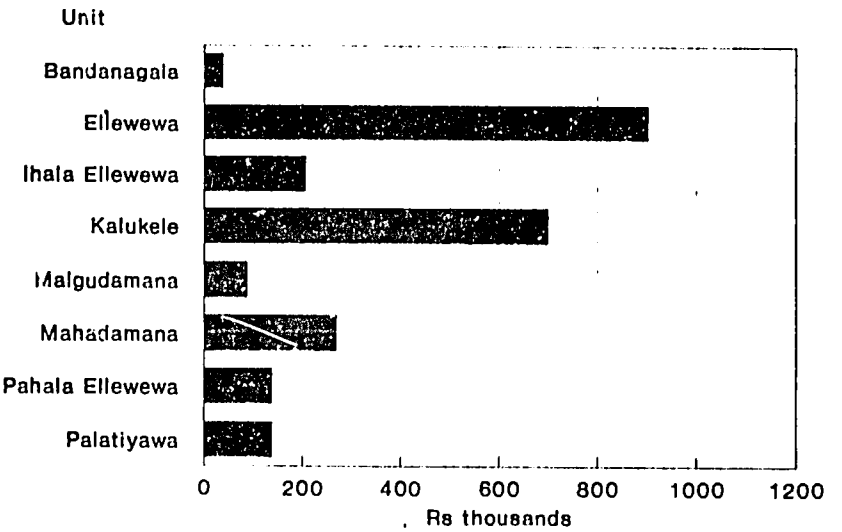
Number of Farmers Cultivating OCs Ellewewa Block; Yala 1992 and Yala 1993



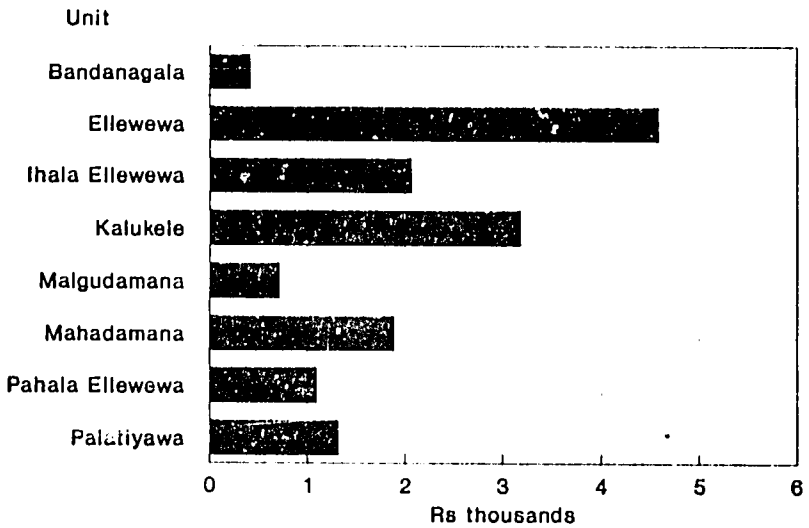
Income from Crop Production
Ellewewa Block; Yala 1993



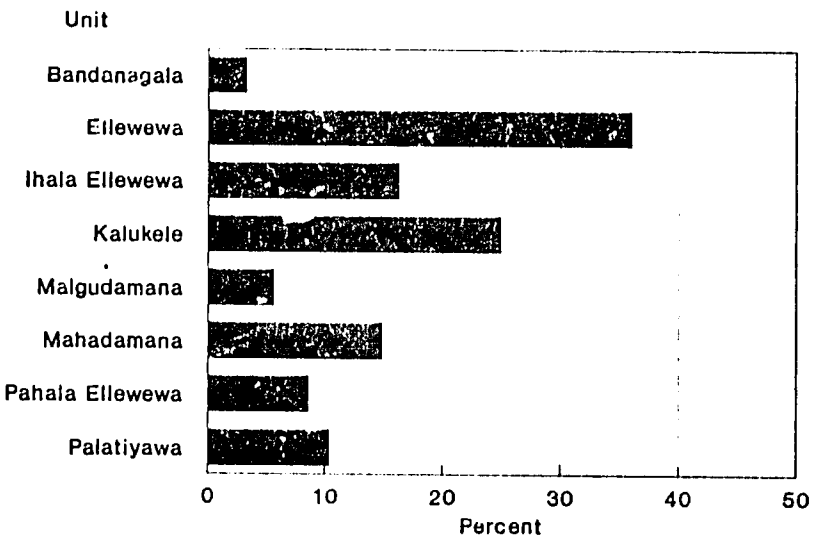
Change in Income from OC Production
Ellewewa Block; Yala 1993



Change in Income per Farmer from OCs Ellewewa Block; Yala 1993



Percent Change in Income per Farmer from OCs; Ellewewa Block; Yala 1993



SUMMARY OF SENAPURA BLOCK

There were 55 more OC farmers in Senapura Block during Yala 1993 than during Yala 1992. Almost 400 Senapura farmers cultivated OCs. Four units, Malwila, Magulpokuna, Ruhunuketta and Sandunpitya had relatively high numbers of farmers cultivating OCs.

While the number of OC farmers increased, the area cultivated to OCs declined by 15 hectares. Only 38.5 hectares of OCs were cultivated in Senapura Block, reduced from 53.7 in Yala 1992. The combination of more OC farmers, but decreased area resulted in a reduction of OC area per family. During Yala 1993, OC farmers planted an average of 0.10 hectares of OCs, down from 0.164 hectares per family in Yala 1992.

Magulpokuna was the model unit in Senapura Block. This unit cultivated over 12 hectares of OCs, more than any other unit. Farmers in Katuwanwila Unit cultivated 8.8 hectares and Malwila almost 5 hectares. The other 6 units cultivated under four hectares each.

Chilli accounted for over 50 percent of total OC cultivation. Big onion, with over 8 hectares, was the next most common crop, accounting for 22 percent of OC cultivation. Cultivation of other OCs was much lower in scale.

Total income from crop production in Senapura Block was Rs 21.9 million during Yala 1993. Crop diversification resulted in a net increase in income of Rs 586.4 thousand above production of paddy alone. Magulpokuna, with its high level of big onion production, accounted for Rs 356.6 thousand or 61 percent of the net increase. Total income increased 18 percent in Magulpokuna due to OC production. Farmers in Malwila acquired Rs 132.5 thousand over production of paddy only. The increases were small in all other units, and Katuwanwila, due to an emphasis on chilli production, suffered a loss relative to paddy.

Overall, Senapura farmers who cultivated OCs gained Rs 1,535 over production of paddy only, an increase of 12 percent. OC farmers in Magulpokuna received the greatest increase, Rs 6,604, or 52 percent above that of paddy production. OC farmers in Malwila and Sandunpitya increased incomes over 10 percent that of paddy. The increases per OC farmer were much smaller in other units.

Crop Cultivation Census; Yala 1993
Senapura Block

Unit	Total area (ha)	Paddy	Chilli	B'onion	G'gram	L'bean	R'onion	C'pea	Okra	Brinjal	B'nut	Tomato	Lufa	Soya	B'gourd	S'gourd	Beet
Boetta	162.000	181.449	0.325	0.163	0.028	0.000	0.000	0.036	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Katuwanwila	304.000	295.188	7.530	0.000	0.000	0.173	0.150	0.000	0.075	0.740	0.000	0.000	0.095	0.000	0.000	0.000	0.000
Malwila	173.000	168.051	2.008	1.934	0.033	0.059	0.049	0.544	0.009	0.074	0.062	0.065	0.010	0.000	0.000	0.000	0.011
Magulpokuna	155.000	142.608	5.713	5.458	0.249	0.017	0.535	0.082	0.013	0.000	0.016	0.120	0.006	0.000	0.000	0.000	0.000
Monaratenna	177.000	174.704	0.937	0.165	0.192	0.007	0.015	0.699	0.011	0.028	0.000	0.054	0.025	0.000	0.024	0.000	0.000
Ruhunuketta	136.000	133.191	1.240	0.092	0.023	0.043	0.057	0.307	0.094	0.029	0.085	0.000	0.045	0.000	0.675	0.015	0.000
Sandunpitiya	143.000	141.548	0.572	0.221	0.015	0.075	0.033	0.218	0.111	0.013	0.000	0.000	0.033	0.000	0.008	0.000	0.000
Senapura	202.000	198.355	2.103	0.260	0.000	0.050	0.605	0.400	0.026	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Susingama	203.000	201.342	0.462	0.075	0.095	0.369	0.074	0.222	0.046	0.045	0.008	0.016	0.006	0.016	0.005	0.000	0.000
Total	1675.000	1636.434	20.889	3.377	0.635	0.774	1.715	2.506	0.386	0.929	0.171	0.254	0.219	0.016	0.713	0.015	0.011
Percent of total		97.698	1.247	0.500	0.038	0.047	0.103	0.150	0.023	0.055	0.010	0.015	0.013	0.001	0.043	0.001	0.001
Percent of OCs			54.165	21.721	1.647	2.056	4.454	6.503	1.001	2.409	0.443	0.656	0.568	0.041	1.847	0.038	0.027

Unit	Knolkhol	Pumpkin	Maize	G'nut	Capsicum	G'leaves	Bean	Cucumber	Reddish	W'bean	Yam	Total OCs	% OCs	Total farmers	OC farmers	% OC farmers	OC ha/farmers
Boetta	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.552	0.303	162	10	5.495	0.055
Katuwanwila	0.000	0.000	0.000	0.050	0.000	0.000	0.000	0.000	0.000	0.000	0.000	8.812	2.899	304	36	11.642	0.245
Malwila	0.000	0.076	0.000	0.000	0.000	0.000	0.017	0.000	0.000	0.000	0.000	4.949	2.861	173	99	57.225	0.050
Magulpokuna	0.013	0.131	0.000	0.000	0.010	0.000	0.000	0.020	0.000	0.000	0.000	12.392	7.995	155	54	34.839	0.229
Monaratenna	0.000	0.077	0.000	0.000	0.028	0.000	0.000	0.029	0.000	0.004	0.002	2.296	1.297	177	25	14.589	0.086
Ruhunuketta	0.000	0.000	0.024	0.011	0.000	0.006	0.000	0.037	0.017	0.000	0.008	2.809	2.065	136	45	33.088	0.062
Sandunpitiya	0.000	0.000	0.000	0.029	0.000	0.041	0.030	0.000	0.000	0.000	0.053	1.452	1.015	143	57	39.860	0.025
Senapura	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	3.646	1.805	202	12	5.941	0.304
Susingama	0.015	0.069	0.000	0.108	0.000	0.014	0.000	0.000	0.009	0.000	0.006	1.658	0.817	203	43	21.182	0.039
Total	0.028	0.353	0.024	0.197	0.038	0.061	0.047	0.066	0.026	0.004	0.069	38.566	2.302	1675	382	22.806	0.101
Percent of total	0.002	0.021	0.001	0.012	0.002	0.004	0.003	0.005	0.002	0.000	0.004	2.302					
Percent of OCs	0.072	0.915	0.063	0.511	0.098	0.157	0.121	0.223	0.067	0.010	0.179						

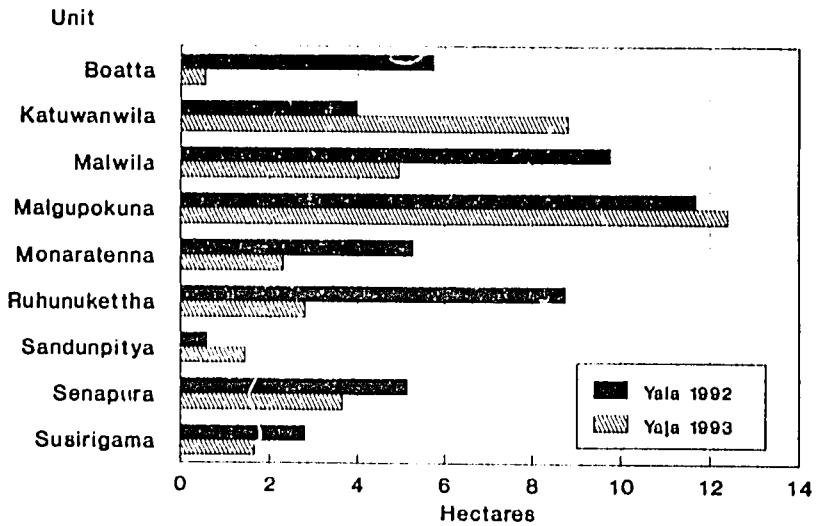
Crop Cultivation Census; Yala 1993; Income from paddy and OC cultivation
Senapura Block

Unit	Paddy	Chilli	B'onion	G'gram	L'bean	R'onion	C'pea	Okra	Brinjal	B'nut	Tomato	Luffa	Soya	B'gourd	S'gourd	* Beet
Boatta	2,310,383.8	2,331.7	13,183.5	568.9	0.0	0.0	653.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Katuwanwila	3,758,626.6	54,069.3	0.0	0.0	4,190.9	4,220.7	0.0	1,884.4	33,455.4	0.0	0.0	2,375.0	0.0	0.0	0.0	0.0
Malwila	2,139,790.8	14,416.6	156,599.1	574.6	1,438.3	1,364.4	9,864.0	221.1	3,336.5	3,129.9	1,615.0	240.0	0.0	0.0	0.0	265.0
* Magulpokuna	1,815,822.6	41,022.2	442,774.3	5,057.2	410.6	15,053.6	1,491.0	325.6	0.0	785.0	3,000.0	150.0	0.0	0.0	0.0	0.0
Monaratenna	2,224,503.5	6,730.8	13,345.5	3,907.2	174.9	410.6	12,666.4	256.3	1,274.9	0.0	1,337.5	612.5	0.0	636.4	0.0	0.0
Ruhunuketta	1,695,922.3	8,905.9	7,450.2	452.3	1,049.5	1,609.5	5,575.9	2,366.8	1,311.1	4,267.1	0.0	1,130.0	0.0	23,620.6	367.5	0.0
Sandunpriya	1,802,330.7	4,107.5	17,896.6	304.8	1,646.4	928.6	3,945.2	2,788.9	587.7	0.0	0.0	812.5	0.0	262.3	0.0	0.0
Senapura	2,525,647.6	15,101.6	21,054.8	0.0	1,214.8	22,651.1	7,255.6	690.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Susingama	2,563,686.4	3,319.8	6,057.3	1,920.1	8,955.1	2,076.6	4,019.3	1,158.3	2,039.0	422.7	390.0	157.5	459.8	204.7	0.0	0.0
Total	20,836,715.7	150,005.3	678,261.4	12,901.9	19,280.5	48,335.5	45,490.6	9,703.3	42,004.6	8,604.7	6,342.5	5,477.5	459.8	25,144.1	367.5	265.0

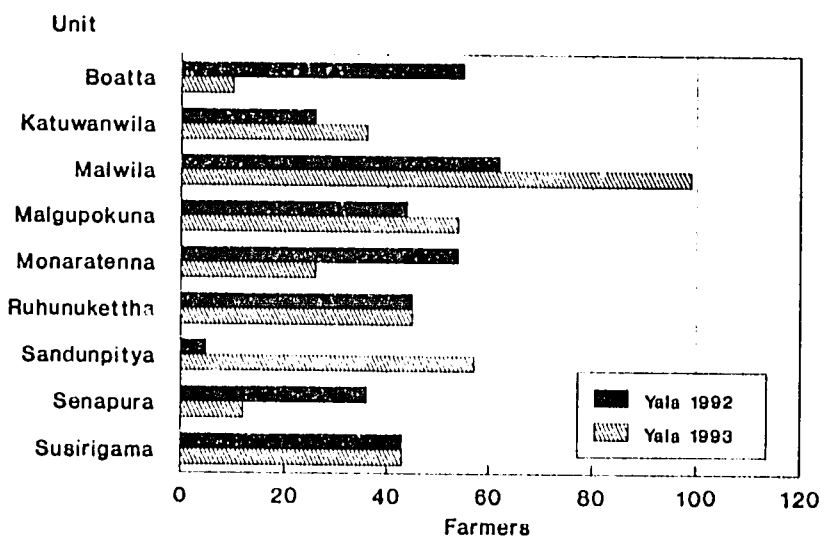
Unit	Knolkho	Pumpkin	Maize	G'nut	Capsicum	G'leaves	Bean	Cucumber	Radish	W'bean	Yam	Total income	Total income if only paddy	Increase in income	% increase in income	Increase in income per farmer	% increase in income per farmer
Boatta	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2,327,120.9	2,317,406.0	9,714.9	0.42%	971.5	7.63%
Katuwanwila	0.0	0.0	0.0	1,597.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3,860,421.6	3,870,832.0	(10,410.2)	−0.27%	(289.2)	−2.27%
Malwila	0.0	1,900.0	0.0	0.0	0.0	0.0	420.0	0.0	0.0	0.0	0.0	2,335,295.2	2,202,809.0	132,486.2	6.01%	1,338.2	10.51%
Magulpokuna	330.0	3,265.0	0.0	0.0	242.5	0.0	0.0	505.0	0.0	0.0	0.0	2,330,255.8	1,973,615.0	356,640.8	18.07%	6,604.5	51.87%
Monaratenna	0.0	1,925.0	0.0	0.0	702.5	0.0	0.0	715.0	0.0	100.0	60.0	2,269,589.2	2,253,741.0	15,848.2	0.70%	609.5	4.79%
Ruhunuketta	0.0	0.0	610.0	338.6	0.0	140.0	0.0	932.5	425.0	0.0	200.0	1,756,892.0	1,731,688.0	25,204.0	1.46%	560.1	4.40%
Sandunpriya	0.0	0.0	0.0	925.4	0.0	1,025.0	750.0	0.0	0.0	0.0	1,325.0	1,839,857.6	1,820,819.0	19,038.6	1.05%	334.0	2.62%
Senapura	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2,593,616.7	2,572,066.0	21,550.7	0.84%	1,795.9	14.10%
Susingama	362.5	1,715.0	0.0	3,437.4	0.0	350.0	0.0	0.0	225.0	0.0	137.5	2,601,094.2	2,584,799.0	16,295.2	0.63%	379.0	2.98%
																	0.00%
Total	692.5	8,825.0	610.0	6,299.8	945.0	1,515.0	1,170.0	2,152.5	650.0	100.0	1,722.5	21,914,143.4	21,327,775.0	586,368.4	2.75%	1,535.0	12.06%

* Indicates model unit

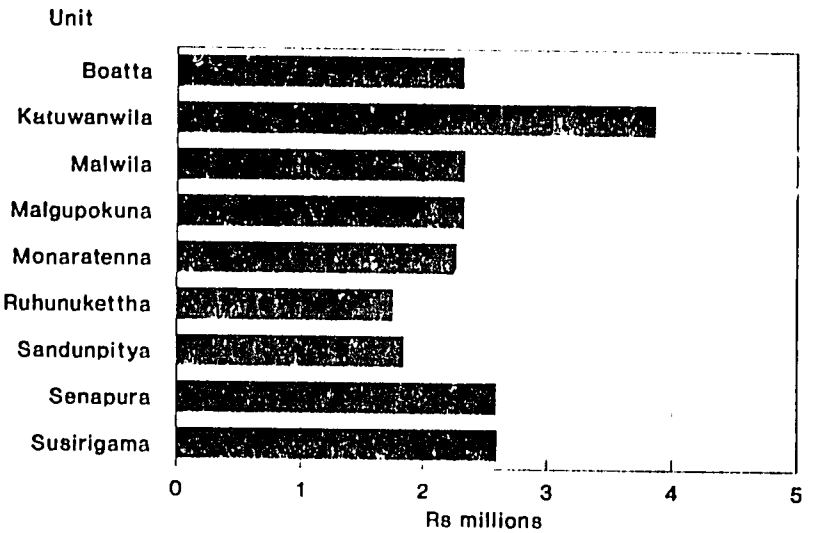
Hectares Cultivated to OCs; Senapura Block; Yala 1992 and Yala 1993



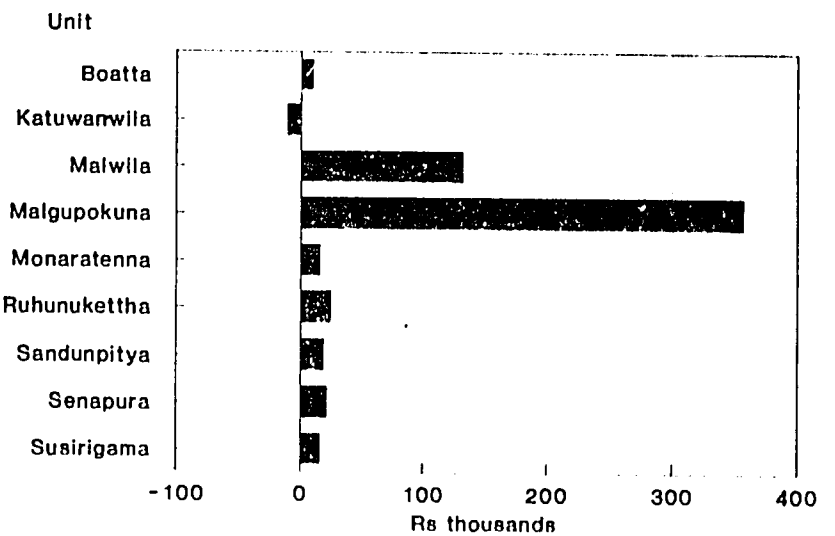
Number of Farmers Cultivating OCs; Senapura Block; Yala 1992 and Yala 1993



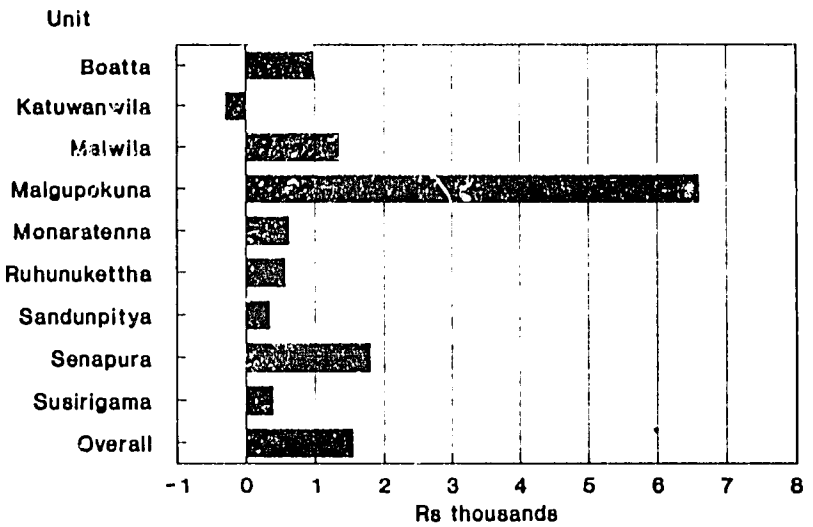
Income from Crop Production
Senapura Block; Yala 1993



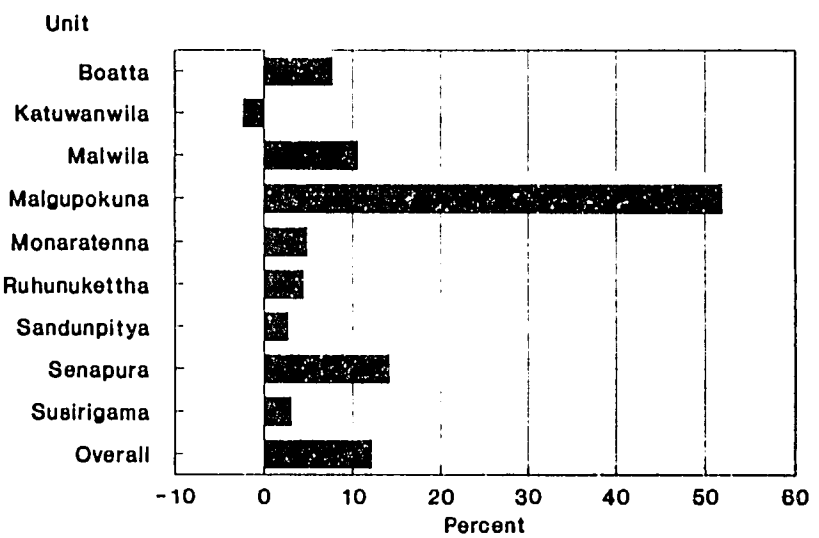
Change in Income from OC Production
Senapura Block; Yala 1993



Change in Income per Farmer from OCs Senapura Block; Yala 1993



Percent Change in Income per Farmer from OCs; Senapura Block; Yala 1993



SUMMARY OF SEVANAPITYA BLOCK

Crop diversification in Sevanapitya Block continues to lag behind other blocks. During Yala 1993, the number of farmers cultivating OCs and the area cultivated to OCs declined. The number of OC farmers decreased to 263 from 376, a reduction of 30 percent, and the area cultivated to OCs declined to 24.2 from 33.7, a 28 percent decrease.

Chilli was cultivated on 9.7 hectares. All other crops were cultivated on 3 hectares or less. There was no model unit in Sevanapitya.

Total income from crop production in Sevanapitya Block was Rs 24.39 million. The increase from production of OCs was only Rs 188 thousand, less than one percent above the production of paddy only. OC farmers in Sevanapitya Block increased income an average of Rs 716, or 5.6 percent above production of paddy. Reedipokuna and Ginidamana increased income per farmer by 16 and 9.3 percent, respectively. OC farmers in Mallinda and Nelumwewa lost revenue relative to paddy production.

Crop Cultivation Census; Yala 1993
Sevanapitiya Block

Unit	Total area (ha)	Paddy	Chilli	B'onion	G'gram	L'bean	R'onion	C'pea	Okra	Brinjal	Tomato	Lufa	B'gourd	S'gourd	Banana
Aluthwewa	241.995	239.186	0.876	0.231	0.720	0.030	0.157	0.159	0.042	0.015	0.014	0.075	0.025	0.000	0.006
Borawewa	192.000	192.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Ginicamana	203.000	196.604	1.404	0.191	1.607	0.052	0.073	0.291	0.042	0.216	0.014	0.013	0.002	0.000	1.860
Madurangala	228.000	226.009	1.356	0.127	0.007	0.027	0.295	0.140	0.022	0.000	0.000	0.000	0.000	0.000	0.000
Mahawewa	198.000	196.292	0.753	0.049	0.111	0.099	0.052	0.241	0.049	0.305	0.000	0.002	0.000	0.019	0.000
Mallinda	160.000	158.541	1.155	0.000	0.004	0.118	0.006	0.083	0.026	0.003	0.000	0.012	0.003	0.000	0.000
Manikwela	205.000	193.159	2.628	0.303	0.249	0.202	0.056	0.559	0.294	0.312	0.021	0.170	0.367	0.060	1.247
Nelumwewa	168.000	167.414	0.513	0.000	0.000	0.000	0.056	0.000	0.006	0.011	0.000	0.000	0.000	0.000	0.000
Reedipokuna	152.000	151.378	0.386	0.163	0.000	0.000	0.056	0.000	0.006	0.011	0.000	0.000	0.000	0.000	0.000
Sevanapitiya	143.000	141.251	0.602	0.000	0.390	0.293	0.013	0.018	0.114	0.147	0.000	0.148	0.000	0.000	0.000
Total	1900.995	1876.844	9.662	1.062	3.088	0.821	0.754	1.492	0.601	1.020	0.049	0.419	0.396	0.078	3.113
Percent of total		98.730	0.509	0.056	0.162	0.043	0.040	0.078	0.032	0.054	0.003	0.022	0.021	0.004	0.164
Percent of CCs			40.091	4.397	12.785	3.398	3.123	6.178	2.487	4.223	0.204	1.734	1.638	0.323	12.890

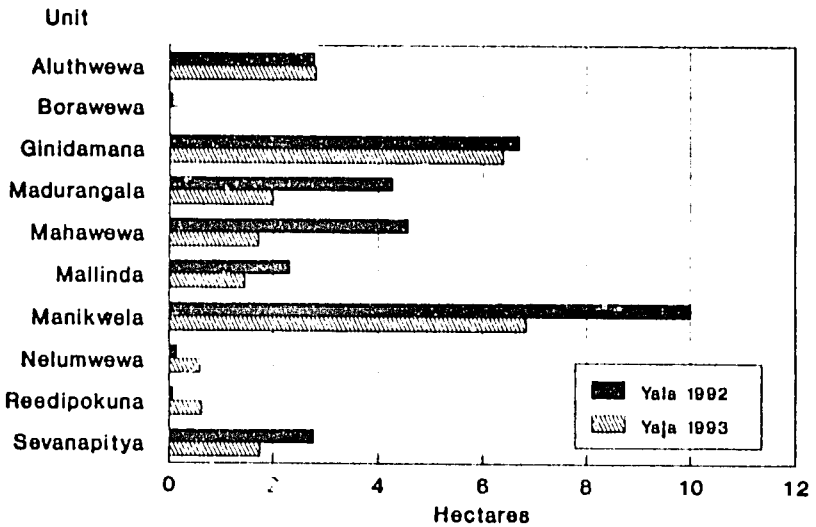
Unit	Knolkhol	Pumpkin	G'nut	Raddish	Yam	Total CCs	% CCs	Total farmers	CC farmers	% CC farmers	CC ha/farmers
Aluthwewa	0.000	0.106	0.318	0.000	0.034	2.809	1.161	242	33	13.636	0.085
Borawewa	0.000	0.000	0.000	0.000	0.000	0.000	0.000	192	0	0.000	ERR
Ginicamana	0.013	0.437	0.134	0.002	0.046	6.396	3.151	203	51	25.123	0.125
Madurangala	0.000	0.019	0.000	0.005	0.003	1.991	0.873	228	34	14.912	0.059
Mahawewa	0.000	0.014	0.011	0.005	0.000	1.708	0.862	198	52	26.263	0.033
Mallinda	0.000	0.021	0.000	0.020	0.000	1.460	0.912	160	32	20.000	0.046
Manikwela	0.000	0.276	0.000	0.100	0.000	6.641	3.337	205	36	17.561	0.190
Nelumwewa	0.000	0.000	0.000	0.000	0.000	0.586	0.349	168	4	2.381	0.146
Reedipokuna	0.000	0.000	0.000	0.000	0.000	0.622	0.384	162	5	3.086	0.124
Sevanapitiya	0.000	0.014	0.000	0.000	0.000	1.739	1.216	143	16	11.189	0.109
Total	0.013	0.886	0.462	0.132	0.083	24.151	1.270	1901	263	13.835	0.092
Percent of total	0.001	0.047	0.024	0.007	0.004	1.270					
Percent of CCs	0.055	3.669	1.914	0.547	0.344						

Crop Cultivation Census; Yala 1993; Income from paddy and OC cultivation
Sevanapitiya Block

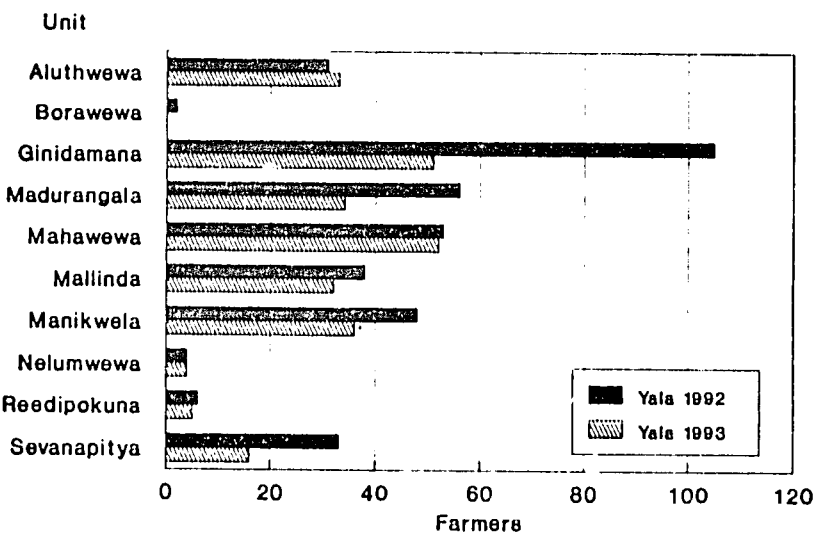
Unit	Paddy	Chili	B'onion	G'gram	L'bean	R'onion	C'pea	Okra	Brinjal	Tomato	Luffa	B'gourd	S'gourd	Banana
Alutnawewa	3,045,555.3	5,292.0	15,698.3	14,535.1	738.6	4,428.9	2,591.4	1,042.7	578.2	347.5	1,865.0	878.7	0.0	150.0
Bomawewa	2,444,736.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Girideniana	2,503,363.8	10,379.3	15,459.1	11,642.9	1,256.1	2,056.9	5,253.9	1,152.7	9,747.3	360.0	335.0	52.9	0.0	46,502.5
Maduranigala	2,677,773.0	9,737.4	10,244.0	146.3	648.7	8,027.8	2,539.5	562.8	0.0	0.0	0.0	0.0	0.0	0.0
Menikawewa	2,499,369.9	5,408.0	3,935.6	2,251.2	2,407.8	1,449.1	4,373.3	1,238.7	13,756.4	0.0	40.0	0.0	462.5	0.0
Nelumwewa	2,018,636.2	8,366.6	0.0	53.3	2,852.0	158.8	1,503.7	643.2	144.7	0.0	390.0	33.8	0.0	0.0
Reedipokuna	2,503,153.5	15,351.8	24,436.5	5,051.1	4,902.7	1,575.7	10,137.9	7,396.8	14,096.5	525.0	4,250.0	12,233.8	1,487.5	31,175.0
Sevanapitiya	2,101,565.3	3,680.3	0.0	0.0	0.0	1,575.7	0.0	150.8	506.4	0.0	0.0	0.0	0.0	0.0
Total	23,837,555.7	19,520.3	35,992.7	42,733.9	19,936.9	21,224.5	27,060.4	15,092.5	45,105.2	1,233.5	10,470.0	13,964.3	1,950.0	77,827.5

Unit	Knolkol	Pumpkin	G'nut	Radish	Yam	Total income	Total income if only paddy	Increase in income	% increase in income	Increase in income per farmer	% increase in income per farmer
Alutnawewa	0.0	2,655.0	10,198.8	0.0	880.0	3,111,675.4	3,081,323.5	30,551.8	0.99%	925.8	7.27%
Bomawewa	0.0	0.0	0.0	0.0	0.0	2,444,736.0	2,444,736.0	0.0	0.00%		
Girideniana	332.5	10,912.5	4,256.0	55.0	1,147.5	2,644,907.5	2,584,799.0	60,108.8	2.33%	1,178.0	9.26%
Maduranigala	0.0	480.0	0.0	120.0	70.0	2,910,350.3	2,903,124.0	7,226.3	0.25%	212.5	1.67%
Menikawewa	0.0	342.5	339.6	132.5	0.0	2,535,536.0	2,521,134.0	14,402.0	0.57%	277.0	2.18%
Nelumwewa	0.0	515.0	0.0	495.0	0.0	2,033,367.3	2,037,280.0	(3,912.7)	-0.17%	(136.5)	-0.84%
Menikawewa	0.0	6,858.0	0.0	2,500.0	0.0	2,669,445.7	2,610,265.0	59,180.7	2.27%	1,643.9	12.91%
Reedipokuna	0.0	0.0	0.0	0.0	0.0	2,137,599.4	2,139,144.0	(1,544.6)	-0.07%	(386.2)	-3.03%
Sevanapitiya	0.0	350.0	0.0	0.0	0.0	2,072,993.8	2,062,746.0	10,247.8	0.50%	2,049.6	16.10%
Total	332.5	22,150.0	14,795.4	3,302.5	2,077.5	1,632,296.8	1,620,819.0	11,477.8	0.63%	717.4	5.63%
						24,393,508.5	24,205,372.6	188,237.9	0.78%	715.7	5.62%

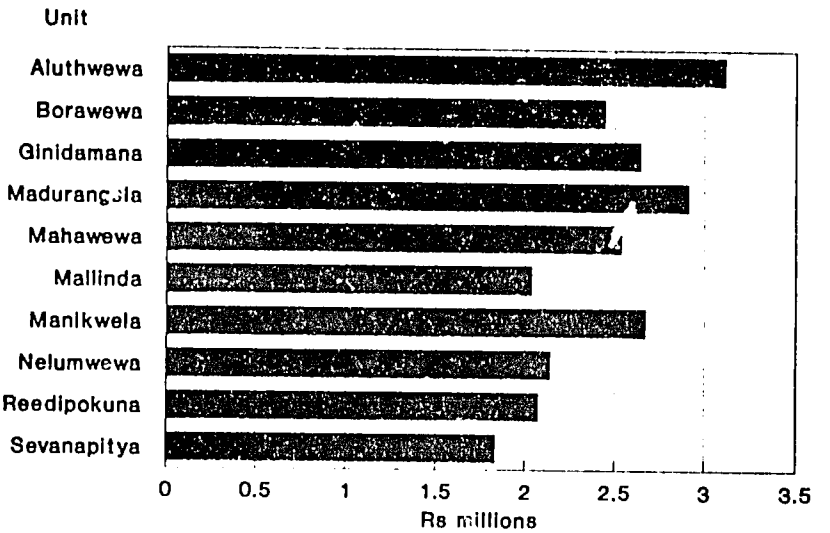
Hectares Cultivated to OCs; Sevanapitya Block; Yala 92 and Yala 93



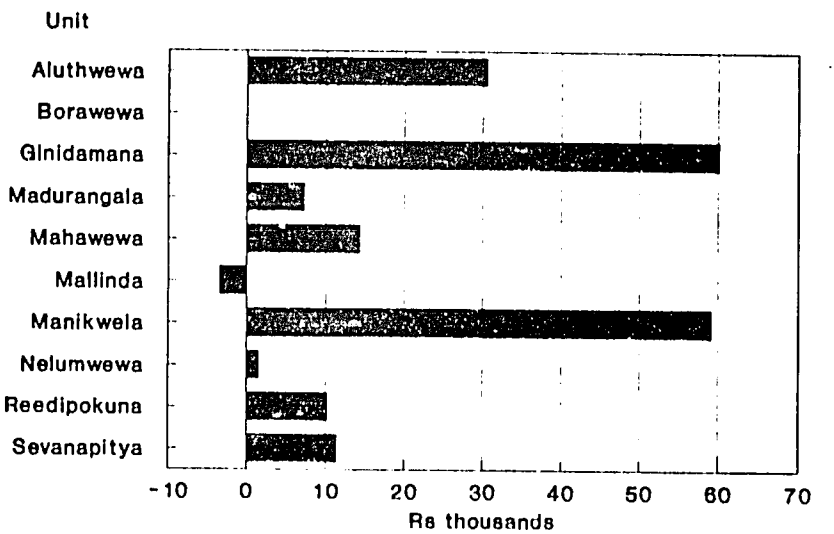
Number of Farmers Cultivating OCs; Sevanapitya Block; Yala 92 and Yala 93



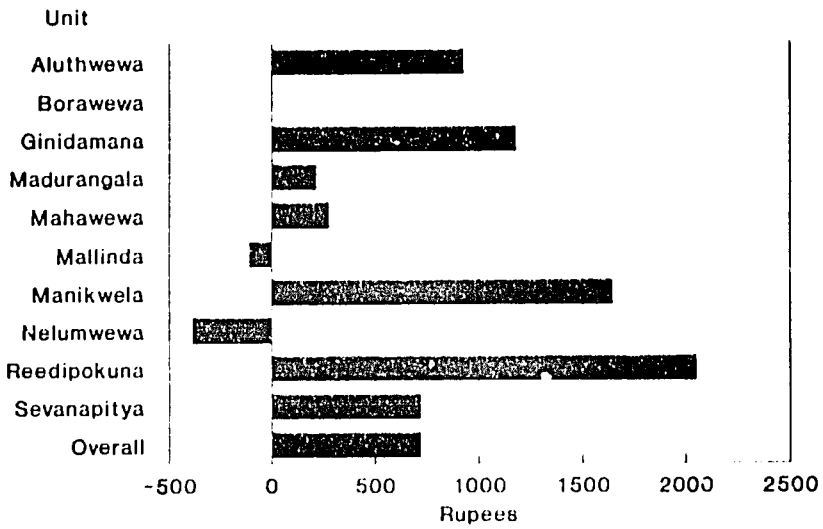
Income from Crop Production
Sevanapitya Block; Yala 1993



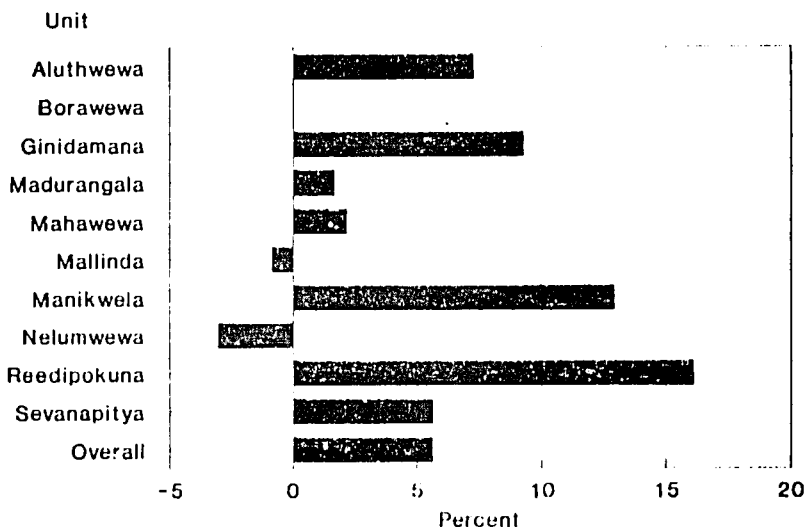
Change in Income from OC Production
Sevanapitya Block; Yala 1993



Change in Income per Farmer from OCs Sevanapitya Block; Yala 1993



Percent Change in Income per Farmer from OCs; Sevanapitya Block; Yala 1993



SUMMARY OF WIJAYABAPURA BLOCK

Crop diversification in Wijayabapura Block showed significant progress during Yala 1993. The number of farmers cultivating OCs increased greatly, as did the area devoted to OCs. Six hundred seventeen (617) farmers cultivated OCs, up from 409 in Yala 1992, an increase of 50 percent. The area cultivated to OCs increased 52 hectares to 119, from 67 in Yala 1992. These increases were made possible by more dedicated extension in Wijayabapura Block generally, and the model unit program.

Medagama Unit, the model unit in Wijayabapura Block, increased the area devoted to OCs to 45 hectares, from 5.1 in Yala 1992. Maduruthenna also witnessed a large increase to 38.4 hectares from 5.3. OC area per farmer was 0.193 hectares, the highest in System B. OC farmers in Medagama and Maduruthenna cultivated on average about 0.30 hectares of OCs.

As in most blocks, chilli was the most common OC in Wijayabapura Block, accounting for 24 percent of the total area devoted to OCs. Following chilli, a group of crops including cowpea, greengram, red onion, big onion, brinjal and okra were also commonly cultivated.

Total income from crop production in Wijayabapura Block was Rs 25.4 million. The increase in income from production of OCs was Rs 1.457 million over income from paddy alone. Maduruthenna farmers received the highest income, almost Rs 5.4 million, and Medagama farmers received Rs 4.4 million.

The increase in income from production of OCs per farmer was Rs 2,362, or 18.55 percent over paddy production. This was the highest increase per farmer of the four blocks in Zones 1 and 5. Farmers in Medagama, cultivating relatively large areas of big under the model unit program, had the highest per OC farm family increase in income, Rs 5,100 or 40 percent above paddy production. Maduruthenna OC farmers increased their incomes an average of 34 percent, or Rs 4,367. Other units had small increases.

Crop Cultivation Census; Yala 1993
Wijayabapura Block

Unit	Total area (ha)	Paddy	Chilli	B'onion	G'gram	L'bean	R'onion	C'pea	Okra	Brinjal	Gherkin	B'nut	Tomato	Luffa	B'gourd	S'gourd	Banana	Beet
Arasaganwila	321.000	311.624	5.460	0.000	0.000	0.375	2.425	0.432	0.305	0.150	0.000	0.210	0.000	0.000	0.000	0.000	0.000	0.000
Dewagama	282.000	276.463	2.523	0.124	1.409	0.000	0.074	1.371	0.013	0.000	0.000	0.000	0.000	0.000	0.019	0.000	0.000	0.000
Gatthadewa	300.000	292.804	2.837	0.000	1.046	0.029	0.011	1.562	0.000	0.053	1.442	0.013	0.000	0.028	0.000	0.000	0.160	0.000
Maduruthenna	376.000	337.595	9.292	2.709	3.947	1.027	1.165	1.252	4.006	5.657	0.000	1.062	0.995	3.068	2.082	1.147	0.000	0.000
Medagama	286.000	241.070	2.895	4.059	5.755	1.309	11.759	10.034	1.236	0.561	0.000	0.454	0.544	0.916	0.295	0.000	0.000	0.071
Pimburattewa	315.000	304.295	5.706	0.106	1.400	0.346	0.954	2.174	0.000	1.067	0.000	0.403	0.186	0.275	0.153	0.038	0.000	0.117
Tota	1883.000	1763.853	28.733	7.000	13.567	3.095	16.388	16.835	5.561	7.847	1.442	2.152	1.825	4.287	2.549	1.185	0.160	0.188
Percent of tota		93.673	1.526	0.372	0.720	0.164	0.870	0.894	0.295	0.417	0.077	0.114	0.097	0.228	0.135	0.063	0.008	0.010
Percent of OCs			24.116	5.875	11.387	2.589	13.754	14.129	4.668	6.586	1.210	1.806	1.531	3.598	2.139	0.995	0.134	0.157

Unit	Cabbage	G'leaves	Pumpkin	Maize	G'nut	Capsicum	Bean	Knolkhol	Cucumber	Raddish	Yam	Total OCs	% OCs	Total farmers	OC farmers	% OC farmers	OC ha/farmers
Arasaganwila	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	9.377	2.921	321	92	28.660	0.102
Dewagama	0.000	0.000	0.000	0.000	0.005	0.000	0.000	0.000	0.000	0.000	0.000	5.537	1.964	282	88	31.206	0.063
Gatthadewa	0.002	0.000	0.000	0.000	0.014	0.000	0.000	0.000	0.000	0.000	0.000	7.196	2.399	300	90	30.000	0.080
Maduruthenna	0.000	0.455	0.150	0.000	0.200	0.000	0.000	0.000	0.130	0.000	0.000	38.405	10.214	376	137	36.436	0.280
Medagama	0.034	0.052	0.207	0.000	2.684	0.181	0.000	0.382	0.232	0.311	0.319	44.930	15.710	286	141	49.301	0.319
Pimburattewa	0.045	0.000	0.147	0.257	0.094	0.060	0.009	0.000	0.000	0.140	0.024	13.702	4.309	313	69	21.698	0.199
Tota	0.081	0.517	0.504	0.257	3.197	0.241	0.009	0.382	0.362	0.451	0.343	119.147	6.327	1883	617	32.767	0.193
Percent of total	0.004	0.027	0.027	0.014	0.170	0.013	0.000	0.020	0.019	0.024	0.018	3.327					
Percent of OCs	0.068	0.434	0.423	0.216	2.684	0.202	0.008	0.320	0.304	0.379	0.288						

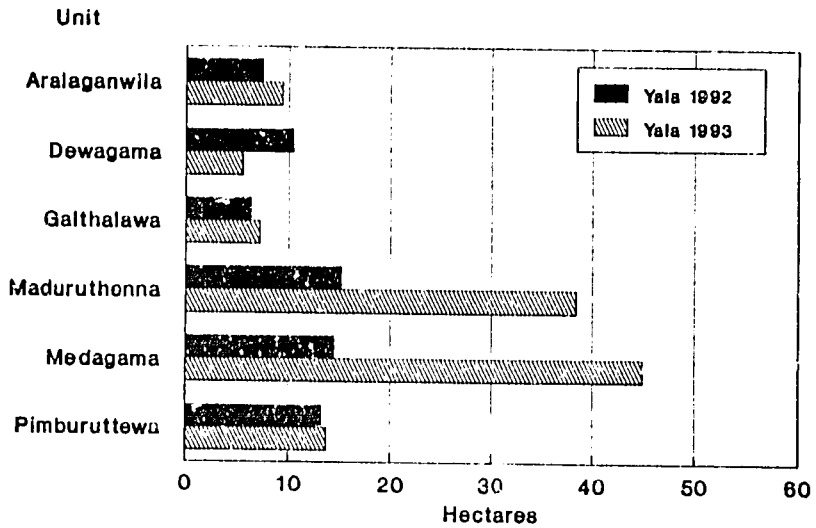
Crop Cultivation Census; Yala 1993; Income from paddy and OC cultivation
Wijayabapura Block

Unit	Paddy	Chilli	B'onion	G'gram	L'bean	R'onion	C'pea	Okra	Brinjal	Gherkin	B'nut	Tomato	Luffa	B'gourd	S'gourd	Banana	Beet
Aralaganwila	3,967,902.0	39,348.3	0.0	0.0	9,110.6	68,234.7	7,836.0	7,563.1	6,781.5	0.0	10,567.2	0.0	0.0	0.0	0.0	0.0	0.0
Dewagama	3,520,198.3	18,115.5	10,049.6	28,622.0	0.0	2,079.4	24,875.8	314.1	0.0	0.0	0.0	0.0	0.0	659.9	0.0	0.0	0.0
Galthalawa	3,728,278.4	20,370.3	0.0	21,258.7	697.3	298.3	28,324.0	0.0	2,405.2	19,334.5	644.1	0.0	697.5	0.0	0.0	4,000.0	0.0
Maduruthenna	4,298,597.1	66,725.9	219,374.8	80,195.1	24,951.0	32,780.8	22,891.4	100,688.4	257,538.8	0.0	53,439.8	24,875.0	76,700.0	73,473.8	28,675.0	0.0	0.0
* Medagama	3,069,543.0	20,797.6	328,565.4	117,129.2	31,802.2	330,874.7	181,999.5	31,064.6	39,830.0	0.0	23,358.5	16,090.0	22,890.0	10,410.6	0.0	0.0	1,775.0
Pimburattewa	3,874,623.1	40,974.8	8,745.8	28,443.2	8,393.9	26,843.7	39,439.6	0.0	48,216.5	0.0	20,279.0	4,650.0	6,887.5	5,399.4	950.0	0.0	2,912.5
Total	22,459,142.8	206,332.4	566,835.7	275,648.2	74,954.9	461,111.5	305,366.4	139,730.2	354,771.9	19,334.5	108,288.6	45,615.0	107,175.0	89,940.8	29,625.0	4,000.0	4,687.5

Unit	Cabbage	G'leaves	Pumpkin	Maize	G'nut	Capsicum	Bean	Knolkhol	Cucumber	Raddish	Yam	Total income	Total income if only paddy	Increase in income	% increase in income	Increase in income per farmer	% increase in income per farmer
Aralaganwila	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4,117,443.5	4,087,293.0	30,150.5	0.74%	327.7	2.57%
Dewagama	0.0	0.0	0.0	0.0	172.5	0.0	0.0	0.0	0.0	0.0	0.0	3,605,087.1	3,590,706.0	14,381.1	0.40%	163.4	1.28%
Galthalawa	55.0	0.0	0.0	0.0	444.0	0.0	0.0	0.0	0.0	0.0	0.0	3,526,807.4	3,519,900.0	6,907.4	0.18%	75.7	0.60%
Maduruthenna	0.0	11,625.0	3,750.0	0.0	6,369.2	0.0	0.0	0.0	3,250.0	0.0	0.0	5,385,921.1	4,787,608.0	598,313.1	12.50%	4,367.2	34.00%
Medagama	850.0	1,225.0	5,162.5	0.0	92,135.5	4,530.0	0.0	9,540.0	5,607.5	7,785.0	7,980.0	4,361,315.8	3,641,638.0	719,677.8	19.76%	5,104.1	40.09%
Pimburattewa	1,125.0	0.0	3,675.0	6,425.0	3,002.9	1,500.0	225.0	0.0	0.0	3,500.0	600.0	4,136,812.6	4,049,094.0	87,718.6	2.17%	1,271.3	9.98%
Total	2,030.0	12,920.0	12,587.5	6,425.0	102,144.1	6,030.0	225.0	9,540.0	9,057.5	11,285.0	8,580.0	25,433,387.5	23,976,239.0	1,457,148.5	6.08%	2,361.7	19.55%

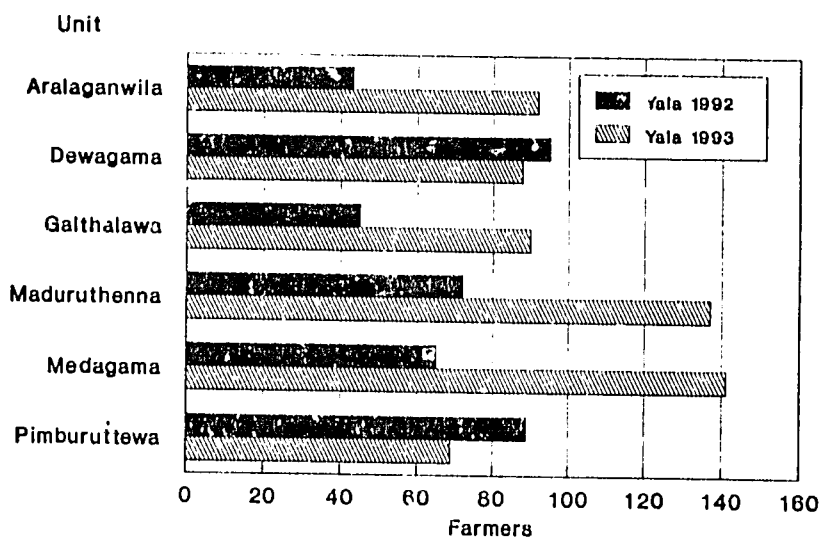
* Indicates model unit

Hectares Cultivated to OCs; Wijayabapura Block; Yala 92 and Yala 93



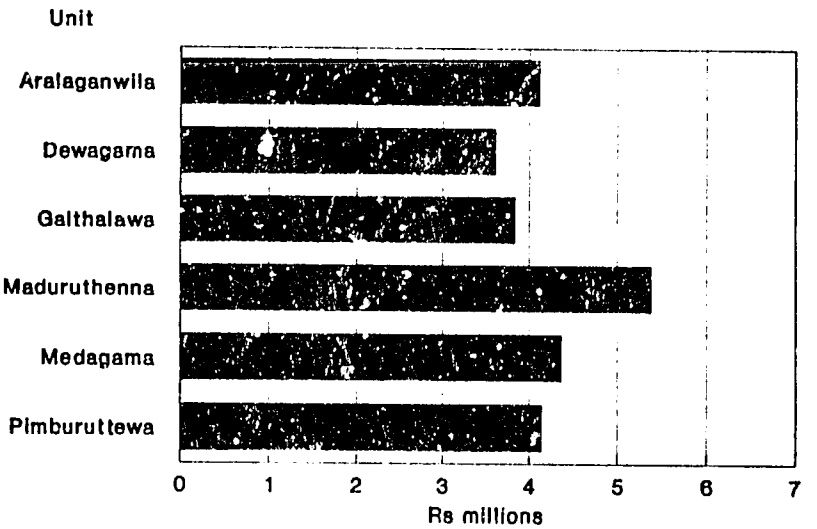
Total area cultivated to OCs increased from 67 to 119 ha.

Number of Farmers Cultivating OCs; Wijayabapura Block; Yala 92 and Yala 93

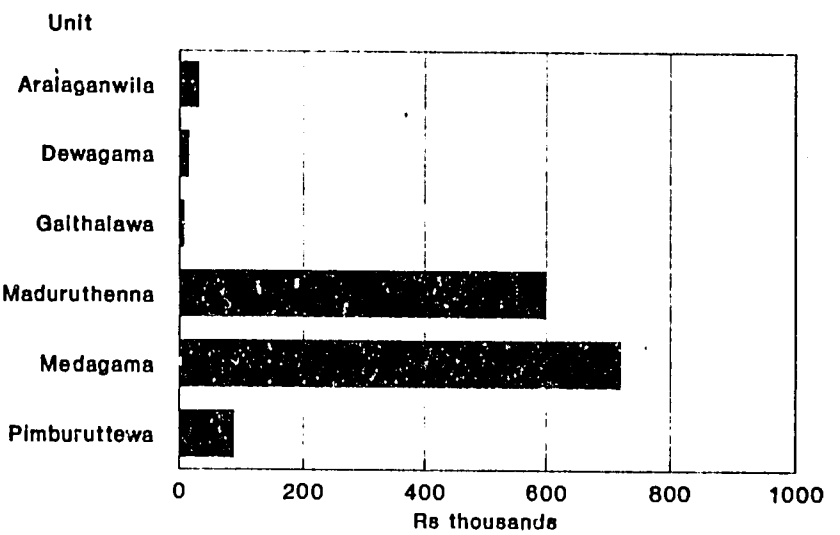


Farmers cultivating OCs increased from 409 to 617.

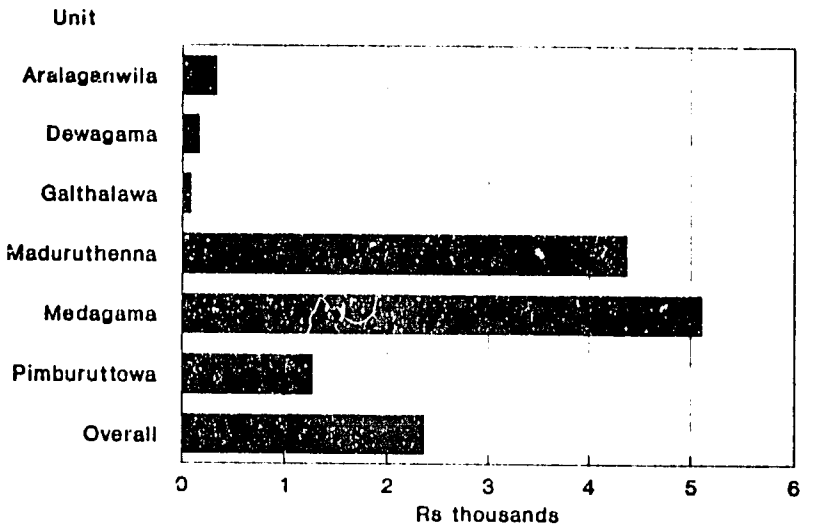
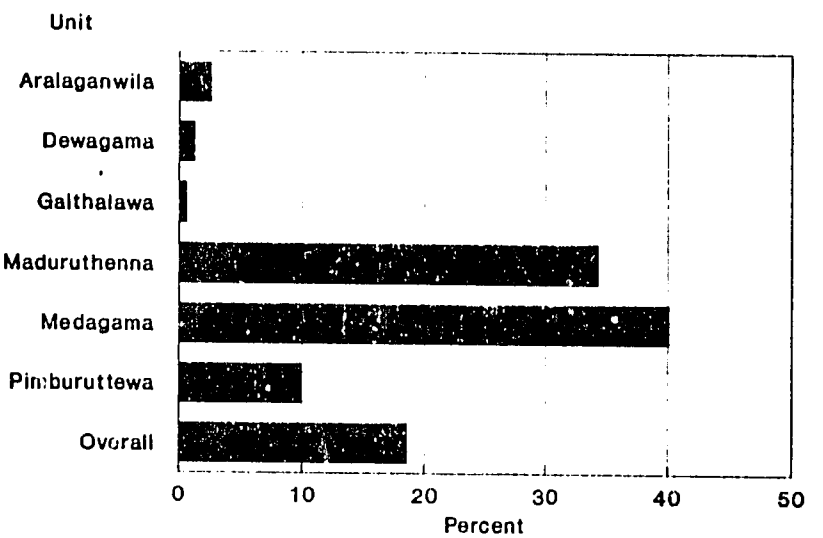
Income from Crop Production
Wijayabapura Block; Yala 1993



Change in Income from OC Production
Wijayabapura Block; Yala 1993



Change in Income per Farmer from OCs Wijayabapura Block; Yala 1993



Percent Change in Income per Farmer from OCs; Wijayabapura Block; Yala 1993