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**AGRICULTURE PRODUCTION AND  
EXTENSION PROGRAM  
IN  
MAHAWELI SYSTEM B**

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**MARD PROJECT  
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## SUMMARY

A major priority item of the policies of the Mahaweli Authority of Sri Lanka (MASL) has been crop diversification, which, in the Mahaweli System is referred to as the cultivation of Other Field Crops in addition to paddy. The objectives of the policy aim at increasing settlor farmers' incomes through cultivation of high value crops; employment generation in commercial nucleus farms linked to settlor outgrowers and contribution to increase foreign exchange earnings. In regard to this, the MASL has made much headway in the different systems although some of the latter programs are saddled with inherent constraints.

In line with the MASL objectives the Mahaweli Agriculture and Rural Development (MARD) Project of System B, placed emphasis on dissemination of crop diversification concepts and made headway towards implementing the same.

As at date, there are around 16,500 settlor families and the settlement program is on-going. Each settlor family is allocated with 1 hectare of paddy land and 0.2 hectare homestead. Crop diversification is aimed at diversifying sections of their units, to increase real incomes as that generated from paddy alone is meager.

A logical approach to disseminate diversification techniques that emerged from preliminary studies and observation was to formulate production programs at turn out (T.O) and Unit level, continued at Block level and finally implemented as an overall program for System B. Formulation of production programs were carried around identifying specific crops at T.O. level through farmer meetings and informal discussions. Topics of importance discussed also included input supplies and cultural practices.

During the course of implementation of this program from 1992 and thereafter, significant increases were made in crop diversification in terms of the number of farmers particularly throughout System B. In terms of increases in area diversified, significant programs were made only in some specific units. They are discussed in Section 2.0. Major cause to this disparity was the fact that in some units settlers arrived from areas where there were very little agricultural activity or from areas characterized by plantation agriculture. Further some settlers had no agricultural background. Other constraints identified included:

1. Lack of accessibility to financial resources
2. Limited or non-availability of high quality seed material for planting

3. Adhering to traditional planting seasons and failure to recognize the need to schedule planting to meet market demands
4. Inherent limitations imposed by physical characteristics of soil (low fertility) and also chemical conditions of the Agro-ecological zones of System B (high velocity winds, high temperature etc.)
5. Lack of a well organized system of agricultural extension which would facilitate information transfer from the MASL/Mahaweli Economic Agency to farmers and a re-flow of information back to the authority reporting specific issues.
6. Lack of an organized system of marketing on one hand and market demand and need on the other.

These constraints are spelt out and discussed in Section 3.1.

In order to alleviate the above listed constraints and also to extend production in homesteads together with specific program of training/demonstration and women participation in agricultural activities, remedial measures such as improved credit and seed availability and supply of inputs, a seed commercialization fund, mixed cropping and adjustment in planting times, consolidation of cropping patterns, improvement in soil fertility and land and water management, storage facilities, proper marketing systems along with implementation of programs for Farmer benefits, Homestead Production, Women's farms, Agricultural Extension, Demonstration and training were recommended.

The above is detailed and discussed in Sections 3.2 and 4.0.

## 1.6 INTRODUCTION

This report embodies the professional activities of the author during the last five years as an Extension Agronomist of the Mahaweli Agricultural and Rural Development (MARD) Project in System B of Mahaweli Agricultural and Rural Development Project of Sri Lanka. The author joined the MARD project in November 1990, by which time, MARD had completed its first two years of operation.

The Primary objective of the Mahaweli Economic Agency (MEA)/MARD Project in its efforts to help the farmers of System B, is to increase their incomes and the quality of life through the development and dissemination of technology for the production and processing of new crops, new varieties of known crops and new techniques for improving yields and reducing costs of production.

In keeping with the said main objectives, the agronomy section of the MEA/MARD developed its strategy to extend the technology required by settlers and commercial farmers to earn better incomes from the limited extent of land available. The strategy adopted emphasized on crop diversification including both new and traditional high value crops. The main methodological approach adopted was farming systems research and extension.

The main task was to increase the land area under crops other than Paddy in System B and seek strategies to maximize profit from crop production. To achieve the first task, it was required to gather knowledge about the physical resources available (mainly land) and climatic conditions prevailing including limitations; crop diversification in System B; constraints farmers are faced with and means to obviate these conditions.

There are over 16,500 farmer families settled as at date in System B and the settlement program is on going. These settlers have their origins from various parts of the country. Priority in selection is given to landless people rather than their agricultural background. Most of the settlers brought in during the recent past were less agriculturally oriented. Their families constitute an average of 3 to 5 members. MEA has estimated that these settlers should earn over Rs. 8,000/= per month per family to sustain themselves, but recent observations indicate that their income levels are far below the expectations.

Settlers are expected to earn this income from their allocated one hectare of irrigated land and the quarter hectare of upland homestead. Paddy cultivation, the main economic activity of farmers in System B, is not consistent with sustainable economic development. The value of one hectare of paddy production does not permit farmers to participate in the economic activities required for development of markets and other commercial oriented activities. Over the years, paddy prices have declined in real

terms. Increased cost of inputs resulted in reduced net income, proving that farmers could not achieve expected benefit by taking to paddy cultivation alone. A strategy has therefore to be worked out in order that farmers may reap economic benefits from their unit of land to suffice their own needs as well as provide a commercially saleable output.

MEA and MARD in keeping with its objective have introduced crop diversification to System B as a means of raising farmer incomes. Crop diversification in this instance refers to the diversification from paddy to cultivation of other crop combinations which include vegetables, high value crops (HVC) such as chilli, onion, okra and legumes for both the domestic and export markets.

## **2.0 INCREASE IN OFC PRODUCTION : PRELIMINARY STRATEGIES**

At the time of the author's joining the MARD Project in November 1990, the MEA\MARD had already started their activities in crop diversification. MARD's Research Agronomists with the help of the Regional Agricultural Research Center (RARC), Aralaganwila had conducted on-farm trials where a number of crops, different varieties and cultural practices were tested. The results of these trials confirmed that many crops other than paddy could be cultivated successfully in System B. This information had to be disseminated to the farmers in a more convincing manner.

A pragmatic approach to disseminate crop diversification concepts was to organize Production Programs. Some important crops as well as farm techniques and cultural practices were first identified. Once these were selected, an extension program was planned to give farmers information and help them in their decision making, so that at least they could grow a small plot of other field crops (OFCs) in their irrigated lands. It was decided to organize production programs at turn-out (T.O) level. A special team visited units<sup>1</sup> to assist them in their farmer meetings. In these informal meetings, discussions were held as to how farmers should select their crops, how they could have access to inputs, land preparation, planting, and post planting care and harvesting. These discussions were mainly to help the farmers prepare their production programs.

Once the T.O programs were prepared, based on this data, Unit Level Programs were prepared. Combining the Unit Level Programs, the Block<sup>1</sup> Level Programs were prepared and finally consolidating of all these programs, the Project Level Programs were finalized.

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<sup>1</sup> A unit is a geographical area demarcated for the purpose of administration and community services, consisting of physical resources of approximately 250 farm families.

Attention was concentrated on selection of crops and varieties which would grow well in the area, and were acceptable to the farmers and which would also generate higher incomes than from paddy. Joint nurseries for chilli and onion were laid in each unit. A considerable number of training classes were conducted to train farmers on nursery management. Emphasis was given for nursery bed preparation and management.

These strategies led to an increase in crop production in System B during Yala 1991 compared to Yala 1990. The increase in percent hectares was from 2.3% to 4.7%. During Yala 1991, 478 hectares of irrigated land were cultivated with other crops while in Yala 1990, only 362 hectares were grown with other crops. MEA's and MARD's strategy had not only worked but had also revealed major problems for which remedial measures had to be adopted if significant increases in OFC production was to be achieved in the future.

The percentage of farmers who diversified crop production during Yala 1991 also increased. Approximately 36% of all farmers in System B cultivated OFCs during Yala 1991 compared to 28% during Yala 1990. Thirteen of fifty four units had more than 50% of the farmers participating in the diversification program. However, increases in incomes were disappointing due to serious problems faced by two major cash crops and by general problems for all crops. They are detailed in Section 3.0 below.

### **3.0 EXPANSION IN OFC PRODUCTION : CONSTRAINTS AND REMEDIAL MEASURES**

A number of problems that surfaced during Yala 1991 cultivation program where new strategies were applied (vide: section 2.0 Paras 2, 3 and 4) showed that more effective administrative organizational capability was needed to overcome them. Other problems of inherent limitations in physical resources (eg- drainage, soil fertility, etc.) could only be ameliorated to some extent. These constraints and measures to remedy/ameliorate them are discussed below.

Growing chilli, a high income crop, became a high risk crop because many fields were affected by Narrow Leaf Disease (NLD), mites and virus complexes, some of which are yet to be identified. It was difficult to tackle the problems identified. All attempts made to solve them gave no feasible solutions, which was disappointing.

Onion, another high income crop faced two major problems. Firstly, due to poor quality of seed material, the crop did not establish properly. Secondly, where there was a good harvest,<sup>1</sup> A block comprises about 05 to 08 units.

Farmers could not obtain a good price since the production reached the market at the glut period. Those unfavourable experiences were setbacks for the OFC program.

In 1990-1991, other than the serious problems with the two major cash crops, there were also general constraints to all OFC production.

### **3.1 Constraints**

#### **3.1.1 Financial Resources**

The main sources of cash availability for farmers for cultivation operations were through formal and informal credit sources. Formal credit facilities are available through various banks operating in the rural sector, whereas informal sources operate at village level through various modes. All formal credit facilities available are oriented for paddy production. Farmers who had obtained paddy loans were already in debt because paddy crop had become uneconomical. They are thus unable to negotiate with banks for any further loans. Therefore, due to lack of capital at the planting season, farmers either delayed start in cultivation or refrained from cultivation.

#### **3.1.2. Availability of Seed Material**

There is no regular system yet for farmers to obtain seeds of acceptable quality in System B. Few traders bring seeds from outside areas and sell them without any guarantee or a proper system and in general the private sector support is weak. Further, the Department of Agriculture has reduced its intervention as seed suppliers. On the other hand, MEA financial regulations do not permit them to handle this aspect satisfactorily. The need for high quality seeds and planting material well in advance of the planting time is of top priority, being a major constraint in OFC production.

#### **3.1.3 Production Period**

The cultivation seasons of System B falls in line generally with the usual seasons adopted in other areas within the same agro-ecological zone. Therefore, farmers find it difficult to compete with established areas like System H and Dambulla due to the distance from main markets and the cost of transport involved in this regard. Also during glut periods the prices will be low. Therefore to overcome this problem, the cultivation pattern should be shifted so that production will not coincide with the peak period.

#### **3.1.4. Marketing**

More often than not, vegetable production in System B could not fit in to a suitable market and the produce was either sold at a lower price or else perished . At times, farmers even brought their produce to a 'pola' (local fair) and managed to sell at a lower price. Basically there was no marketing structure to accommodate a rapid and expanding crop production program. There may not be any ready-made solutions for such problems, but this aspect should be considered as a key factor for any expansion in field crops or vegetable crop production in System B.

#### **3.1.5. Soil Fertility**

Majority of soils of System B are reported to be low in fertility. Crop production data of 1991 clearly showed that, wherever green manure and cowdung were used, production was high. Specially with chilli crop, the vegetative growth and the yield, registered a marked increase. This is true for all other crops as well. Since the soils in System B are coarse textured, organic manure such as rotted cattle manure and/or use of green manures like sunhemp should be incorporated as part of the OFC cultivation program.

#### **3.1.6. Poor Drainage**

The landscape of System B is almost flat to gently rolling, which makes the overall drainage of water difficult. In addition, a considerable extent of soils have a semi-impervious layer closer to the surface. Both these factors result in high ground water table with the slightest rain. In addition, the poor drainage conditions on irrigable allotments where OFCs are grown due to seepage of water from paddy fields, is also a problem. Proper land preparation with raised beds, collector drains and ex-farm drainage canal maintenance were also major causes of drainage problem.

#### **3.1.7. Monocropping**

Most of the OFC farmers opt far for a monocropping system when they grow OFCs, which results in a high risk on income, if the crop failed. Such a failure is more damaging for crops which needs costly inputs. As mentioned at the beginning, some farmers even had to undergo losses on their investments.

### **3.1.8. Low Utilization of Homesteads**

System B has about 19,000 homesteads of 0.2 hectare each, with some having even the facility of year-round irrigation. However, these homesteads are hardly utilized for either commercial purposes or as a source of supplemental income. Considering the total area of all the homesteads and the facilities available in the vicinity, this can be considered as a good potential for increasing the productivity of the area.

## **3.2 Remedial Measures and Special Programs**

### **General**

The eight major constraints identified in the preceding section could to a great extent be remedied and the adverse effects of some (limitations in soil-site characteristics) mitigated to a somewhat lesser degree. Measures are presented below which have been implemented and/or need modification for further implementation. In addition special programs were commenced and also discussed.

### **3.2.1 Improved Credit and Seed Availability**

During planning sessions farmer groups expressed a great interest to grow other crops. However, during the implementation stage, the numbers fell. The main reason given for not planting is the inability to purchase seeds in time. To overcome this situation, it was decided to organize a credit program that will help farmers to purchase their seed requirements in time, but at the same time making certain that the loan is paid back. Individual loans were not encouraged as there was no mechanism for recovery. After careful consideration, it was decided to make available a Commercialization Fund Grant for selected farmer organizations (FOs), so that they could provide loans to their members. In this respect, 9 FOs were selected and Rs.1.8 million was granted. Farmer Organizations signed an agreement with their members before giving them seeds as requested. As shown below 1,042 farmers were benefitted under this program.

Simultaneously, special training and extension programs were implemented to educate the farmers under the supervision by the extension staff. Agricultural Officers (AOs) and Field Assistance (FAs) visited their fields at least once a week. Table 1 shows the extent increased.

TABLE 1 : Comparison of Crop Diversification during Yala 1992 and Yala 1993

Model Unit	OFC Extent (ha) Yala 1992	OFC Extent (ha) Yala 1993	Percent Increase
Medagama	14.47	42.60	194.40%
Ihalawewa	13.49	32.60	141.66%
Mahadamana	14.93	16.00	7.17%
Thispanegama	6.86	42.00	512.24%
Kalingawila	26.35	31.95	21.25%
Muthuwela	6.25	16.25	160.00%
Diggalapitiya	22.04	36.50	63.63%
Orabendisiyabalawa	54.07	107.10	93.75%
Magulpokuna	11.68	12.39	6.07%

The table indicates that the extents have increased with the new program introduced, in all the selected units. In Mahadamana and Maguldamana units, extents increased by 200%. Crops promoted were big onion, ground nut, vegetables and pulses. At the end of the season, farmers have paid back the loans to FOs as agreed. Recovery rate was over 90%. Except one organization, all the other organizations repaid in time. Officers and farmer leaders closely monitored this program. With the experiences of a successful Yala season in 1993, similar programs were extended to another 27 organizations, in Yala 1994 where Rs. 2.7 million was granted. In these units too, extent increased and 2,098 farmers received loans. However, recovery rate was poor compared to Yala 1993. Reasons identified are as follows:

- .1 In some farmer organizations the criteria for selection was not fully adhered to, owing to difficulties in selection faced by farmer organizations.
- .2 MEA officers and FO officers did not get actively involved in the required period. Recovery should have been started immediately after harvest when farmers had cash at hand.
- .3 Farmer Organizations complained on the low quality of the seed supply. In some instances, the seeds did not reach the farmer in time. Due to above problems, the program was re-organized.

The same grant was extended to another 10 organizations and the FOs decided to make seeds available in time. In the revised program FOs brought their own requirements of seeds and sold it direct to their members. The result of this program is yet to be evaluated.

Through this program nearly Rs. 3.5 million had been granted to farmer organizations. If this money is to be properly utilized for the purpose for which it is meant, this could serve as a revolving fund to meet the entire requirement of seeds in System B. However, the past experiences indicate that such revolving of money has not happened as expected. In most instances, FOs have used this money for various activities other than for purchasing seeds and as a result there were no funds available when it was required for the purpose of purchasing seeds. However, this program needs more attention from both MEA and FOs.

### **3.2.2 Adjustment of Planting Times**

In the dry zone, generally, plant nurseries for Yala season are laid out in late-April or early-May due to water scarcity during other periods. Farmers have to wait for Yala rains which are experienced during mid-April. However farmers in System B do not have to wait for the rains even though they are accustomed to start cultivations after rains. It is only in System B that irrigation water is available throughout the year and this advantage should be utilized to gain better markets for the produce. For example, big onion production comes to the market during August-September period, and shortages occur during either side of this period resulting in very high prices. If farmers prepare their nurseries in early March, the produce could be harvested during late July or early August when the prices are higher. Further if they start the nurseries late as June, harvesting could be done during late-October.

Another aspect in maximizing is by increasing plant intensity and harvesting early so that the crop can be sold as a green vegetable, which is in high demand. The same pattern could be followed in the case of other vegetables. For instance, a farmer from Bimpokuna unit started his egg plant nursery in early September and harvested during December and January. He used the upper areas of his irrigable lands for cultivations and he was able to purchase a water pump and other accessories from the income he received by selling his produce. Some farmers who did similar cultivation of vegetables during the off-season, received a substantial income from their crops.

### **3.2.3 Cropping Pattern Consolidation**

During the Maha-season farmers cultivated paddy in irrigable lands and during Yala season selected areas were brought under cultivation of other crops. These fields were again subjected to land preparation techniques (ploughing, harrowing and puddling) for a follow up paddy crop. The need for operations on fields to re-convert them for OFC planting (destroying field dykes, bed preparation, drainage drains etc.) causes a delay in their other essential agricultural activities and additional cost have to be incurred. If farmers select upper areas of the irrigable lands wherever possible and set apart for continuous OFC production during both seasons, that would save them money and time.

### **3.2.4 Improving Soil Fertility**

The approaches to soil fertility improvements can be at the field itself or at homestead level as well. The crop residues such as straw, which are abundantly available in System B can be made into organic manure like compost, cattle and green manure. Knowledge on importance of application of organic manure and the skills on methods of developing such manures in a short time, are already imparted to officers and farmers of the area, through demonstrations.

### **3.2.5 Improved Land and Water Management**

Improved land preparation methods are necessary for OFC cultivation to minimize damage to crops from poor drainage. In addition, rain water should also be drained off as soon as possible with the least damage to the soil. For this purpose, a number of demonstrations were held on the irrigation and drainage layout as recommended by the Department of Agriculture for OFC cultivation.

## **FARMER BENEFICIAL PROGRAM**

### **3.2.6 Homestead production programs**

This was another area of emphasis where MEA and MARD realized that homesteads were production units where the farmers could increase their family income. The objective is to improve the productive capacity of the homestead in System B.

This could be promoted in two ways viz.

- Growing for domestic consumption;

- Commercial production to earn additional income for the family.

To meet the above objectives the following programs were implemented.

- .1 The cultivation of permanent tree crops
- .2 Short term crops cultivated for the market (medicinal crops, vegetables and pulses)
- .3 Rearing of poultry, ducks, goats, and other dairy animals
- .4 Small scale agro based cottage industries such as pickling, production of dried vegetables, and packeting of rice and fresh vegetables.
- .5 Introducing a new system of compost preparation - Compost heap instead of compost pits.

The above programs were introduced in order to increase the income level of farmers as the households are not uniform in nature, with respect to land holding size, soils, access to water, labour, capital and inputs. Even though it is .2 ha per family, when the entire area under homestead in System B is taken into consideration, it forms a large extent which could be utilized for commercial purposes.

In implementing this program, 50 homesteads were selected as model homesteads during 1991. As long term crops - coconut, mango, jak and other fruit trees and also trees with timber value were supplied. As short term crops - ground nut, chilli, potato, egg plant and capsicum were introduced. With the technical assistance from CISIR, three medicinal crops were introduced. They were Katuwelbatu, Senehekola and Kapukinissa. It was not difficult to find the market for these medicinal crops as already there was a demand locally. During field days and in training sessions the farmers felt that homesteads could be used as production units with a greater potential, especially for the seed production program. In Bimpokuna and Weheragama units, 40 homesteads participated in a seed production program for ground nut and red onion. The seed produced was used in the following season.

For the second generation of settlers who were unemployed and landless, pullets were supplied, as a pilot project in Pimburattewa and Damminna. Even though the farmers took a keen interest at the initial stages where some of them could gain profits. On the whole, the program did not yield the expected results due to marketing problems, cost of poultry

feed and inadequate veterinary care. If the said constraints are overcome, the program could be worked out to benefit the settlers.

During this period various other activities were initiated to promote various aspects of homestead development. Green manure, compost preparation, soil conservation, fuel efficient stoves, food preservation etc. are some of the activities conducted. According to reports the estimated income from homestead was over Rs. 39.9 million. An average income per family cultivating homestead was Rs. 2551/=. Also the average homestead income per family was 31% of the income of 1.0 ha. of paddy production. With the recognition this program commanded and the income which was generated from homestead as well, women's groups in particular responded actively to this program.

### **3.2.7 Women's Farms**

On the lines of the MEA/MARD the production program detailed earlier, the MEA set apart selected reservation land for youth and women who showed interest to cultivate these lands on a collective basis. They formed women's groups and youth groups and initiated on their program. MEA/MARD assisted them technically and financially. Cash crops like big onion, chilli, ground nut and pulses were cultivated. After three seasons of continued assistance, youth groups abandoned their farms but women's groups are still continuing successfully. One such group at Ellewewa block was selected as the best women's group in the Island at a competition conducted by Agromart. The Aluthwewa women's farm have initiated a credit scheme for their members with the money they earned from the farm. Sustainability of these farms largely depends on the support and the encouragement forthcoming from MEA.

As a result of the continued efforts made by MEA/MARD, extent and the number of farmers who took to the cultivation of other crops have increased.

### **3.2.8 Agricultural Extension Program**

To implement a production program as that envisaged and designed, an effective extension program is necessary. The responsibility of implementing such a program largely falls on the shoulders of the MEA extension division.

The extension division is responsible for the informal out-reach education in which the knowledge generated from research as well as on-farm trials are made available through extension to farm families.

From the project level to the grass root level there is a hierarchy of officers whose responsibility is to implement this program. At the unit level there is a Field Assistant (FA) for approximately every 250 farmer families. At this level the needs and problems are identified according to the production program. Based on the production program, extension messages were prepared. During planning sessions with Field Assistant (FA), detailed discussions were held by Agricultural Officer (AO) in order to highlight the points to be stressed in their farm visits. Since farmers were new to the crops and/or started with little experience, all the details had to be worked out carefully. During those sessions everyone agreed to give priority for cultural practices and management of crops. After finalizing the stress points, the details were worked out and the extension program prepared. The prepared program was a stable guidance but flexible enough to meet the mixed farming audience.

However, the implementation of the program appeared to be ineffective at times, apparently because the reciprocal communication with respect to importance among various implementing stages does not take place as expected. The required guidance was also not effective.

MEA officers are good in their planning of extension programs, at the grass root level. However during the implementation stage, there are setbacks due to lack of supervisory management. This is a serious problem specially where agricultural extension is concerned. Present MEA agricultural extension structure is not based on a vertical line of command. It needs a proper management system in order to implement the program effectively. If this continuity lapses at any stage, the entire program will not achieve the desired results. For example, if AOs are unable to actively supervise the FAs and take necessary corrective measures, extension activities in the field may not take place as planned.

Some of the problems identified are presented below.

- .1 Logistic problems - Project Agricultural staff complains of the inadequacy of transport facilities to perform their field visits effectively. Until recently, they were left with only one vehicle for five SMOs, while they had different tasks to perform in the field. As a result very often they are confined to the office.
- .2 Bi-weekly training - Two training programs are conducted fortnightly, one at Mahaweli Research and Training Center (MRTC) and the other at Welikanda. The arrangements were to provide transport to FAs and AOs

to come for these programs. During the past, at least 30% of the programs either had to be cancelled or conducted with less participants than expected, due to non availability of transport.

- .3 Even at the block level, AOs were without regular transport as most of them do not use motor cycles and the only four wheel vehicle available at the block is more often than not, unavailable to them.

Theoretically they should visit the field at least 3 days during a week. Some AOs said that they are unable to visit fields at least 3 days per month.

Due to this situation in most of the units FAs, are left on their own with the field programs. As such there is a tendency for some FAs to work, but majority may not. Past experiences show that wherever effective supervision is prevalent, results were encouraging.

- .4 There is hardly any incentive program available for officers who would make an effective output. There should be a clearly defined incentive program which needs to be communicated to all categories of officers.

Supervision is perhaps the area that needs immediate attention. The above problems are more or less related to performance issues than to skill development. An officer who has a performance problem, may not benefit from training on technical subject matter.

### **3.2.9 Demonstration Program**

Production and extension programs have always to be supported by a demonstration program. Crops introduced as well as cultural practices are new to the farmers, and as such, they need special attention and should be demonstrated to the farmers in their fields. In 1991 over 300 demonstrations were conducted in six blocks in which chilli, big onion and vegetable crops were included. Field days were organized and the results showed an impressive impact during that season. However, during the subsequent seasons, when continuing the program, it was found that due to inadequate supervision the quality of demonstrations were not up to expectations. Apparently, in some instances it had given a negative effect rather than a positive one.

Owing to the above situation field staff agreed to reduce the demonstration number and increased the plot size where they could supervise the demonstrations effectively. After identifying the suitable crops, large demonstrations (half-acre) with those crops were organized during 1994 Yala.

However, the program needs close attention.

The author's recommendation for the demonstration program, is to obtain the active participation of farmers who are directly involved in a specific activity for which a demonstration is desired. These farmers should be helped with only the technical guidance. Subsequently, these fields could be used as demonstration plots. This type of package of practices was implemented as a trial by MEA where inputs were not supplied but only the training of farmers was imparted. This strategy adopted in a few locations have shown encouraging results.

It was observed that some times field days were not conducted even for better demonstrations. If it is not possible to organize field days for bigger groups, they may be organized for even smaller groups like the turnout groups, to discuss the impact.

Banana demonstration in irrigable lands were introduced during late 1994. Initially farmers were given all the inputs required and two demonstrations per block. It was a very successful program where the farmers showed greater interest and the extent increased in all these blocks.

The author is of the view that with little support, banana extent in irrigable lands will increase appreciably. One problem identified was the lack of quality suckers to be purchased within System B. Often planted suckers are not of the expected variety due to difficulty in identifying them during early stages. It is suggested to have a mother plant selection program and established nurseries in blocks for use in the future.

### **3.2.10 Training**

There were a large number of training programs conducted for both farmers and officers on all subjects pertaining to agricultural extension. From the inception of the project till end of June, 1995 over 75,000 person days have been spent on training.

In these training programs, officers were trained on extension methodology, crop husbandry, development of training material, Integrated Pest Management (IPM) and other relevant subjects with view to improving knowledge and skills of the officers who were the trainers for farmers.

In officer training, they were trained bi-weekly on subject matter, extension methodology and communication. Various in-service training programs were organized at different training institutes. Special audio visual training programs

were conducted and training materials prepared. Available booklets and leaflets on crop husbandry were introduced and set of plant protection information were made available.

With the officer training, simultaneously, farmer training at turnout level was also organized. In most of these training programs, audio-visuals were used. For these training classes the following training material were prepared.

- Booklets on chilli, onion, potato and nursery management was prepared and published (over 5000 copies on each).
- Various slides, transparencies and flip charts were prepared and some were brought from Department of Agriculture, Peradeniya.
- Posters to highlight the relevant events
- A video film was prepared on crop diversification

Officers were equipped with relevant training accessories, such as flip charts, portable chalk boards, slides, flannel boards, leaflets and stationery.

It was observed that the officers have the required knowledge and skills for agricultural extension programs. What needs to be strengthened is the field application of such acquired knowledge and skills.

In this regard supervision and guidance have to be strengthened both at project level and block levels. At the end of the MARD project, due to lack of adequate funds, training programs may not take place, to the same degree. To overcome this situation, effort should be made to utilize the knowledge they have already acquired to put into practice in the field.

#### **4.0 CONCLUSIONS AND RECOMMENDATIONS**

Sixteen thousand five hundred settlers have been settled in System B and more settlers will be brought into the area in the near future. For sustainable development it is important to introduce a cropping program which should give them a better income. At present their main crop is paddy. However it has been proved that paddy alone could not hold farmers in System B. This does not mean that attempts made to improve paddy yields should be overlooked. During the recent past, the trend has been a decline in the paddy yields. For example, while in 1992 production was 5 MT/ha, in 1994 it has come down to 4.3 MY/ha. Of the factors that have contributed to such low yields, late cultivation has been a major factor. Even though early water issues have been scheduled, farmers have not made use of this opportunity to do a timely cultivation in keeping with the season. To overcome this situation both the MEA and farmer organizations have to make a determined effort to organize farmers to commence land preparation before end March and planting to be done for long term varieties by the end of April, and short term varieties accordingly. With this said requirements, the extension program for weed control, integrated pest management, fertilizer application and other cultural practices should take off the ground simultaneously.

To strengthen the other crops program, the following areas need greater attention.

##### **4.1 Seed Availability**

At present there is no proper and regular supply of seed materials to the farmers. Availability of quality seeds in time has to ensure to implement a successful other crops program. In this regard introducing reliable and suitable seed importers to Farmer Organizations, needs to be taken up. For instance, seeds for crops such as b'onion should reach the farmer by mid-February. In the case of locally available seeds it is desirable to promote a seed production program at the homestead level. Red onion and ground nut are outstanding examples in this category. At the same time the commercial farmers in the system have to be encouraged and persuaded to get into the production of vegetable seeds. Already a few commercial farmers have ventured out into this sphere of activity.

##### **4.2 Producing for Market Windows**

The normal pattern that exists at present is to produce vegetables during a season where the production is widespread throughout the country mostly in the main growing areas. However in the case of System B as water is available throughout the year, in order to overcome the glut period, cultivation could be staggered to cater for more profitable markets. To encourage the

farmers, the market information system should be made readily available to them to produce according to demand. There are already successful programs conducted for future guidance.

#### **4.3 Mixed cropping**

It was found that various crops could be grown successfully in System B. Our past experience shows that it is desirable to promote mixed cropping pattern rather than monocropping. By following the former patterns, farmers could obtain cash benefits from at least one or two crops, even if the others failed. Crop combinations suitable for higher net income have been identified and documented.

#### **4.4 Input Supply**

When input supply is considered, there are over 200 chemical dealers operating in System B. Their turn-over is over 20 million rupees per year. It is often observed that these dealers sell out-dated, unsuitable and restricted chemicals in the area. Therefore, it is opportune now to encourage farmer organizations to take over the aspect of input supplies and provide a better and reliable services to the community. MEA should coordinate, train and assist the farmer organizations in implementing the program. Other inputs such as fertilizer also could be organized on similar lines.

#### **4.5 Marketing System**

As far as marketing is concerned, there is a lack of a proper and dependable system operating in System B. This should not be a hindrance to implementation of production programs. If there is substantial production, the traders will be attracted. For example, during the paddy harvesting season traders are attracted from other areas because there is substantial production of paddy. This clearly shows production and marketing should go together and that it is difficult to promote one without the other. At the initial stages, it is desirable to promote traders from nearby towns such as Kaduruwela and Mahiyanganaya. This aspect needs immediate attention and the MEA should play a key role in intervening between local traders and the farmer organizations. Weekly "polas" in all the blocks could serve as another catalyst to promote marketing.

#### **4.6 Storage Facilities**

In promoting the production program, the storage facilities also need to be improved. A good example for this, is the onion storage program conducted in Block G that gave the farmers better cash returns than if they did sell during harvesting time. There is every possibility of System B becoming the onion belt in the future. To meet this challenging situation, provision of

suitable seed material in time, and improving facilities for storage also are necessary. The newly introduced Onion storage structures should be made popular among the farmers.

#### **4.7 Homestead Program**

As there are many variations and differences in the homestead, a special program has to be launched, taking into consideration each individual setting. The demonstrations conducted have shown the possibility of developing the allotments to give an economical benefit to the settler community. This program needs special attention.

#### **4.8 Banana Cultivation**

Another crop that was found suitable for System B is Banana. During recent past, banana extent on irrigable lands increased considerably. Demonstrations conducted showed, farmers could earn a good income from banana. To promote this program, suitable planting material have to be provided along with the launching of an effective extension program.

#### **4.9 Seed Commercialization Fund**

Farmer Organizations have received a sum of Rupees four million as a Commercialization Fund to purchase seeds. This money is adequate to meet the entire seed requirement in System B, if it is properly managed for the purpose. This investment could serve as a revolving fund if MEA and FO closely monitored the program.

#### **4.10 Extension Program**

Agricultural extension program needs revamping in order to cater to the present demand. Due to logistic constraints, there is a need to identify priority areas and concentrate more on them, while not neglecting the other areas. Systematic and regular supervision system needs to be evolved for the field staff and an incentive scheme also needs to be devised so that genuine effort is recognized and rewarded.

#### **4.11 Demonstration Program**

It is observed that properly managed demonstration programs have to be implemented in the farmers' fields accompanied by field training. This has also been the request of the farmers. Rather than following the present system of providing all the inputs for demonstrations, it is desirable to obtain support of a good farmer and provide only the technical assistance.

#### **4.12 Training**

According to the data available, nearly 75,000 person days have been spent by both farmers and officers on training. Crop census also reveal that even though only 6% (% expressed as area under OFC/total area of all allotments) of the area has gone under diversified crops, approximately, 60% of all farmers have taken upto other crops even in a small way. This position indicates that the farmers have acquired the required knowledge on crop diversification, but due to other reason they are reluctant to cultivate on a large scale. What is required at present is to overcome the constraints and implement well-organized and realistic programs. So far, the agricultural program has not received required priority when compared with other programs like housing and sports etc.