



Support to the competitiveness of the rice sector in the Caribbean

Technical Assistance for the
EU/CARIFORUM project 9 ACP-RPR 006 – REG/7461/000

AN EXTENSION PROGRAM FOR THE PADDYGROWERS' ASSOCIATION IN
NORTHWEST SURINAME

Ing. A. Zalmijn M.Sc.
March 2006

Content

1	INTRODUCTION AND CURRENT STATE OF AFFAIRS IN THE RICE SECTOR	3
2	CONTRACT OBJECTIVES AND EXPECTED RESULTS	4
2.1	The overall objectives.....	4
2.2	Specific Objectives.....	4
3.	REPORT ON SPECIAL ACTIVITIES.....	7
4.	THE NEED FOR TRAINING.....	9
5	THE FRAMEWORK FOR TRAINING MANUALS.....	11
5.1	Introduction.....	11
5.2	Cultivation Practices, Farm Management and Marketing.....	11
6.	CONCLUSIONS AND RECOMMENDATIONS	31
	Literature reviewed	34
	Annex 1. Terms of reference.....	35
	Annex 2 List of Persons consulted	40

1 INTRODUCTION AND CURRENT STATE OF AFFAIRS IN THE RICE SECTOR

Introduction

In conformity with the contents of the Joint Declaration on Rice, attached to the Cotonou Convention, the European Commission financed a feasibility study of the CARIFORUM rice industry to define contents of a sector specific program in the first place for the development of the ACP exporters of rice during the preparatory period. Afterwards it was decided to also focus on other rice producing countries in the entire Caribbean region. A contract for the provision of Technical Assistance (TA) for the conduct of such a Diagnostic Study was signed between the CARIFORM and Agrotec SpA of Rome, Italy (hereby the consultant).

In 2003 AGROTEC SpA released three studies in the above mentioned context namely:

1. Suriname Action Plan
2. Guyana Action Plan
3. Regional Action Plan

The estimated investment for the revitalization of the Suriname rice sector is 86 million euros. The initial amount approved by the European Union is 9.255 million euros.

The estimated cost of the program in euro is presented in the next table:

Table 1: The estimated cost of program in euro

Components	Budget (in €)
Technical Assistance	1.815.000.-
Training and seminars	140.000.-
Water rehabilitation (including equipment and expertise)	3.800.000.-
Financial facility	3.500.000.-
Total	9.255.000.-

In the context of the short-term Technical Assistance CARIFORUM appoints the Consultant and the Consultant hereby agrees to perform the services described in clause 3 of the Agreement in accordance of the terms and condition of this Agreement.

The objectives of this consultancy is to provide the services for implementation of the Program Estimate 1 for the Suriname component of the Project N0.9 ACP RPR 006, Support to the Competitiveness of the Rice Sector in the Caribbean.

More specifically the assignment deals with the strengthening of the Paddy Growers' Association. Inadequate organization structures have been weakening the Suriname rice industry for quite some time now. This is most evident in the poor organization of the paddy growers. This group is very important and the success of the investment made available to the project depends to great extent on the degree of organization in the paddy grower's environment.

Current State of Affairs in the Rice Sector

Suriname lies on the North Coast of the South American Continent between 2 and 6 Latitude and 54 and 58 longitudes. Rice was brought to Suriname during slavery and after abolition of slavery Asian immigrants introduced rice cultivation under wet condition.

Rice occupies approximately 60,000 hectares of land. The sector counts 5,520 farms

which are being operated in seven farm-size categories, varying between 0.1 and 9,700 hectares.

Suriname has been able to create and develop a significant rice industry, but due to internal and external factors affecting the industry negatively during the past 15 years, the cropping intensity decreased from 1.5 in 1986 to 0.9 in 2004. The national production of paddy almost doubled in the period between 1975 and 1986 and reached a level of 327,000 ton in 1985. Between 1987 and 1994 the paddy volume decreased with more than 25%. In 2004 only 49,020 hectares of land were cultivated resulting into a production of 174,490 ton of paddy.

Strategies to reverse the declining trend should include improvement of the performance of the extension service of the ministry of Agriculture, farmer's organizations and individual key-farmers. This should be achieved through the implementation of training programs with regard to communication skills and technology transfer.

2 CONTRACT OBJECTIVES AND EXPECTED RESULTS

2.1 *The overall objectives*

The overall objectives of the project of which this contract will be part are as follows:

- The development of the competitiveness of the Caribbean ACP Rice Industry and thereby contributing to the region's social and economic development and preventing the socio-economic deterioration which might occur as a result of the ongoing process of trade liberalization.
- To enhance the competitive position of producers, processors, millers and other actors in the industry. By improving productivity, management, research, training and marketing.

2.2 *Specific Objectives*

2.2.1 The Current Level of Organization in the Rice producing Sector

Introduction

The factors, land, marketing, seed, extension, education and research are important instruments in the encouragement of agricultural development. In the rice sector key-stakeholders came to realization that taking into consideration the conditions at macro-level and the changing condition on the export market, it was necessary to cater for more collaboration between the various parties within the rice chain. Organizations of paddy growers, processors and exporters which have been established played an important role, but collapsed after a while. The Government controlled institutional framework has weakened considerably and is fragmented. The situation with regard to non-government bodies is also weak and fragmented.

Illustrative for decline are the following facts:

- Seasonal negotiations which are considered to take place between farmers and processors/exporters, do not occur.
- Representatives in some cases are forced to switch from farming to small business actions.

- Enforcement of policy by farmers and processors/exporters has not shown any significance in the past twenty years.

The Surinamese rice sector is characterized by a significant number of organizations. During the seventies the Ministry of Agriculture (Region West) was very active in supporting farmers to organize themselves and form cooperatives. Although the point of departure is not very positive, the vicious situation needs to be eliminated. The existing operational private organizations which are operating in the rice sector are the following:

- Input suppliers
- Paddy farmers
- Service providers (tractor owners and operators, combine owners, paddy and rice transporters)
- Rice millers/exporters
- The banking system
- Government (ministries of Public Works, Regional Development, Agriculture and Animal Husbandry, Finance and Land resource).

There is awareness amongst all stakeholders, that co-operation between strategic groups within the stakeholders chain is necessary, however there is some doubt whether the Government is seriously willing to change the status quo. Many scientific publications indicate that the failures in development programs and co-operatives were caused by the existing traditional sub-culture, the apathy for new technology and the mentality of the farming population. The central theme was, there do exist resistance to change.

As a result of research done during the sixties in Mexico and Chili respectively by Gerrit Huizer and Bart Galjart it can be stated that resistance to change exercised by peasants, is mainly a reaction to self-defence against the resistance of change of the traditional elites which fear to lose their domination over the peasants. Peasants can be mobilized quite well if the purpose of the mobilization is to change the existing status quo for a system under which the peasants can reasonably expect effective improvements. Mention has to be made of the fact that several researchers studied the level of organization in the rice chain in Suriname.

In 1974, Lammerick and Oldewelt did research in the district of Nickerie under rice farmers in the Europolder. These researchers concluded that if co-operation amongst farmers has to be undertaken successfully, all negative factors have to be eliminated.

V. Timmer (2003) did research in Nickerie and found that 36% of the population studied, was member of a temple or mosque. Only 5% was member of a farmer's organization. The majority has been a member of OKPP(Organisatie van Kleine Padie Producenten), de VPP (Vereniging van Padie Producenten) and of the FAL (Federatie van Agrariers en Landarbeiders). De VGL(Vereniging van Groot Landbouwers) has been established in the nineties but did not reach a stage of effective functioning.

The main factors hampering co-operation amongst farmers are:

- Fraud committing members of the Board of Directors
- The absence of clear organizational objectives
- The economic decline in the rice sector, which has been creating a climate for a future without any positive perspective. This in its term contributes to an inward lifestyle imbedded in selfishness.
- The concept of governing the country in the sense that centralization of power is manifest
- Members of the Board of Directors are traditionally less educated
- Government is not making any investment in organizational development

These were the reasons why in 2001 the late W. Kalloe came to realize that it was necessary to establish the SPBA (Surinaamse Padie Boeren Associatie) as an umbrella organization to the sector. The SPBA began its work very motivated and dedicated but experienced right from the start, a great deal of difficulties with the minister of Agriculture who was not operating in the same political environment as Kalloe did. Because of the study undertaken by Timmer, it appeared that the farmers support the idea that it is necessary that a farmer's organization make provisions to the farmers such as:

- Import of fertilizers and chemicals and disposal to farmers at reasonable prices
- Provision of machineries and spare parts to farmers at reasonable prices
- Well maintained water management infrastructure including access roads
- Implementation of extension programs in favour of farmers
- Making use of sowing schemes
- Farm-gate prices for paddy should be well taken care of

Farmers mostly tend to favour provision of input and maintenance of water management infrastructure.

Millers and Exporters

The number of rice mills in Suriname is 63. Out of this amount, some 21 millers and exporters have formed the Rice Millers and Exporters Association. This Association is targeted at qualitatively and quantitatively enhancement of the rice production and export. In terms of their ability to function well, it leaves a lot to be desired.

Government

The ministry of Agriculture bears responsibility for policy concerning production and processing. Region west is the main division of the Ministry of Agriculture dealing with the rice sector. The Ministry of Trade and Industry deals with policy concerning export, domestic supply and prices. The Ministries of Regional Development and Public Works take responsibility for primary and secondary infra-structure.

2.2.2 Recommendations for Organizing Producers

This chapter deals with information with regard to activities already undertaken in the context of this document and some recommendations.

Under the Technical Assistance for the Foundation for Rice Research in Suriname, EDF Project 7/ACP/SUR/13/14 April 2000, a mission was undertaken to study the vertical linkages in farmers and millers/exporters organization and between these types of organizations.

Since then, the link between rice research and the paddy and rice producers has improved considerably, but there is still plenty room for improvement of the knowledge of the producers through adoption of the knowledge provided by ADRON.

The Government of Suriname has given an assignment to a consulting firm to design a model for organizing rice farmers, millers/exporters, input suppliers, service providers, bankers, rice research into one structure (Rice Board). This report has been completed in draft already. It is known that the final report is to be released on shortly. Besides the necessary legal framework which has to be implemented and the organizational steps which have to be taken, quite a bit of fieldwork has to be executed. It is understood that some preliminary work has to be done in particular amongst farmers and millers, before the sector reaches the stage where all identified and relevant stakeholders will be found prepared to cooperate in a Rice Board. In paving the way to this moment

several meetings have to be organized with separate organizations where the importance of membership of the single structure can be promoted along the lines of qualitative and quantitative information on benefits. These activities attune very well to the developments taking place on the export market. It is quite evident that only strengthened and strong member organizations make a strong and sustainable Rice Board. It means that serious efforts have to be put in strengthening the current organizations of farmers and millers who are going to be the key organizations running the Surinamese Rice Board.

2.2.3 Horizontal Collaboration and Vertical Integration of Producers, Millers and Exporters

Horizontal collaboration and vertical integration of producers, millers and exporters could be reached if the Ministry of Agriculture takes action to hold meetings with these stakeholders and concentrate on subjects related to the advantage of cooperation amongst the various parties operating in the rice chain.

3. REPORT ON SPECIAL ACTIVITIES

See the Terms of Reference in Annex 1

Activity 1

This activity has been implemented.

Activities 2 and 3

Farmers, millers/exporters and other stakeholders have been consulted on their views and their perception with regard to:

- the current position of the rice sector
- the future of Surinamese rice
- their willingness to play an active role in collaboration matters in order to position themselves to address the problems in the sector

First of all, we have to agree that farming has a low status. From a historical point of view, there is a distinction between agricultural rural people and urban. Despite the behavior of community members, farmers and in this case rice farmers would like to continue their farming activities as long as they think that they can cover their out of pocket expenses. This thinking has to be considered a threat to the rice sector. From a point of view of farmer's interest, the sector has to be operated efficiently, so that all costs, including fixed, calculated and out of pocket costs can be covered.

Some farmers and particularly those in management roles in the Association are aware that these achievements require a chain management approach. The question why this awareness has not resulted in a process of change could not be answered easily.

The declining situation in the rice sector has not been brought to an end yet. Farmers stated that one of the most frustrating factors is the Government's land distribution policy, which is excluding small scale farmers from expansion of their acreage. Taking into account that some 85% of the farms are positioned in the farm-size category 0.1- 12 hectares, not enough farm income is being generated, thus farmers have to look for off-farm activities in order to earn additional income. In general terms, this circumstance justifies the high figure for hired labour (80%) of the farms.

The use of family labour appears to be closely connected with technical conditions

and the use of complimentary inputs (Luning and Sital, 1979). They argued that the most recent innovations displaced labour. The counter balancing effect of the larger cropping intensity did not compensate for the labour displaced by the new technology. Although the cropping intensity has decreased, due to factors already known, this situation continues to last in the Nickerie district, because many sources of income were explored.

The question arises whether this situation stimulates efforts to make investments in quantity and quality improvements. The latter leads to the question, does the small rice farmer in Suriname have a future.

The question whether the Surinamese rice farmer particularly the small farmer has a future is not in doubt.

John Harris (1982) characterized smallholders as follows:

Smallholders are rural cultivators practicing intensive, permanent, diversified agriculture on relatively small farms in area of dense population. The family household is the major corporate social unit for mobilizing agricultural labour, managing productive resources and organizing consumption. The household produces a significant part of its own substance and it generally participates in the market, where it sells some agricultural produce as well as carrying on cottage industry or other off-farm employment.

Choices of allocating time and effort, tools, land and capital to specific uses, in a context of changing climate, resource availability and markets must be made daily and these economic decisions are intelligible in utilization terms.

In general the characteristics of the smallholder as presented by Harris, does apply for the Surinamese small-scale farmer, except for the population density per square mile and the farm-size, which is relatively larger in Suriname than smallholdings situation elsewhere.

Of course, power structures are a determining factor as regards the position of rice farmers as electors of policy makers. Regardless of the power structures within the country, smallholders in particular, are much occupied with their off-farm activities. Consequently, there is no pressure on the Government to change land distribution policy.

Looking at the current farm turnovers, it is unlikely to think that the small-scale farmer will make a profit. From surveys undertaken, it is known that off-farm incomes tend to be higher than the on farm incomes.

During consultations held, Surinamese small scale rice farmers indicated they will continue rice farming and produce a good quality rice, but they referred to requirements such as: Government policy aiming at land distribution in favour of smallholders, improved supply of irrigation water, improved maintenance of water management infra-structure, intensified extension activities including information on the rice market and last but not least, improved accessibility of credit.

Activity 4

Usually Producers groups depending on what their objectives are, have their by-laws formulated and designed in such a manner that they can operate as an organization performing various functions and roles. These functions and roles are to be categorized as follows:

- Agricultural supply
- Agricultural credit
- Agricultural insurance
- Cooperative use of machinery
- Cooperative agricultural services
- Cooperative farming

- Purchases or sales in the context of real estates and movable properties
- Horizontal integration

As a result of evaluation of the by-laws of the Farmers Association (SPBA) it can be stated that the by-laws of this association allow for:

- cooperative purchase and distribution of input, machinery and related equipment
- cooperative purchase or sales of produce generated by members
- doing business in real estates and movable properties
- other business

Activity 5, 6 and 7

These activities have been implemented. (See Chapters 4, 5 and 6).

4. THE NEED FOR TRAINING

One of the main contributors to the declining situation in the production and distribution chain is the deteriorating quality of paddy and rice. Therefore improvement of the quality should be an essential part of extension programs. In Suriname agricultural extension work goes back to the fifties. Government agricultural extension is organized on three levels. At the national level, the Deputy Director of Agriculture holds responsibility for all agricultural extension work of the Ministry. Within the Ministry of Agriculture, there are four units carrying out extension activities. At the regional level the country is divided into three regions namely Region West, the Center Region and Region East. Regions are further divided into resorts. Each region is headed by a Regional Coordinator, who is responsible for all agricultural activities in the region and who reports to the Deputy Director of Agriculture. In the region, the extension unit provides training and support in methods and technology transfer to the field officers. The Home Economic/4 H Unit, introduced in the context of the SABTS period (Surinaams-Amerikaans Bureau voor Technische Samenwerking) provides training activities to rural women and youth.

In many publications, the Ministry of Agriculture has referred to performance of the extension services, which then is said to have been successful. However, taking into account the internal changing macro-economic conditions and the changing conditions on the export market, the concept of extension has to be approached differently. Gradually the awareness developed that the Ministry of Agriculture had to implement strategies for change and it should be noted that the ministry took actions to improve extension. In the course of time, a number of scientists studied the extension work done in Suriname.

Jan Morenc (1984) stated in its dissertation entitled "Surinaamse Kleinlandbouw en Landbouwbeleid" (Smallholders and Agricultural Policy in Suriname) that in general the main focus of the extension service was to produce a technically skilled farmer, rather than a combination of an educated farmer and an entrepreneur.

On request of the Surinamese Government a joint mission of IICA and the Dutch Ministry of Agriculture, visited Suriname in 1989 to investigate the performance of the extension and the research division of the Ministry of Agriculture. It has been estimated that only 15% of the extension workers activity is educational oriented. According to the same survey, seventy five percent of the extension worker's time, is spent on non- educational activities, while ten percent goes into staff meetings. This outcome is in accordance

with other evidence found by sociologist Kalshoven in 1970. The assumption can be made that those figures in terms of time spent on real extension issues have not improved.

Special reference has to be made to the period 1969-1976 in which the Surinamese and Dutch Ministries of Agriculture agreed upon the development of courses for improvement of cultivation practices as regards, rice, peanuts, maize, vegetables and fruits.

The extension service is working under difficult conditions. Apart from budgetary limitations, the service is operational in an environment where she has to deal with capitalistic vertically integrated rice estates, larger farms and family wise organized farms of various farm-size categories. Heterogeneity of target groups poses serious constraints to the extension worker and the extension agency. Another constraining factor is related to policies, because in general there has been a limited continuity to coherence in policy making and implementation.

In the seventies, the size of an economically viable rice farm was determined to be approximately 18 hectares. Under the pressure of changing macro conditions on the domestic and the export market, the idea was to increase farm-size, but this was never realized. The extension activities are not conceptualized from the point of view of management of production and distribution chains. For many years the rice industry was incorporated into labour and capital markets. If the cost of capital goes up, due to high interest rates being maintained by commercial banks. It is quite evident that the vulnerability of the rice industry increases. The cost of capital has its impact on the accessibility to credit. Besides that, planted acreage and the profitability of the industry will reduce, because of the incorporation of the entire rice sector into the market economy. Commerce, traders and the banking system are in a position to skim the surpluses disproportionately. Because of the in-equal power relations between the market parties concerned, the actors of the dominating levels are in a position to roll off the costs inefficiencies on the third categories. The subsequent process of increasing market incorporation reproduced a number of striking structural changes for example the transformation of the indigenous smallholder's position into a marginal role within the rice sector dominated by large estate farms and milling and distribution chains.

Regardless of the question if the extension service is capable of providing the necessary educational and training packages to the farming population, it is quite evident that the farmers themselves need to be educated and updated in such a manner that they can deal with the challenges they have to face as a result of the globalization process.

If quantity, quality and profitability become important issues in the education and training of farmers, it requires the use of participatory approaches, integrated chain analysis techniques linked with other actors in order to facilitate a mix of interventions so overcoming the constraints in the production chain.

There are many extension definitions. Choosing one of the extension definitions it can be stated that extension can be described as the conscious use of communication to help people formulate sound opinions and make good decisions. Having said this, it is agreed that agricultural extension policy being a part of national development policy in general and agricultural and rural development policy in particular, has to be seen as one of the instruments, which Government can use to stimulate agricultural production and therefore development. The question is how to put into practice this definition for the Surinamese reality. The extension services in Suriname that have achieved many of their goals aiming at increase of agricultural production have been operating along the lines of Transfer of Technology (TOT) and still show this type of performance. In the past five years, the Ministry of Agriculture used the Good Agricultural Practice (GAP) approach.

With reference to the threats described on page 95 of the Suriname Action Plan on

Rice it can be stated that for survival and further development reasons the sector needs a broad training, education and extension program in the next two years. The subjects identified are the following:

- Cultivation practices:
 - Land preparation and land levelling
 - Seed quality
 - Sowing
 - Water management
 - Pest and disease control
 - Weed control
 - Fertilizing
 - Harvesting
 - Drying and Storage
- Farm Management
- Trade Issues and Marketing
- Communication and Extension Theory

5 THE FRAMEWORK FOR TRAINING MANUALS

5.1 *Introduction*

Chapter 4 mentions the subjects for training and education of rice farmers. This chapter deals with the guide on teaching and learning in the context of rice farming. The topics will be slightly touched upon, because they will serve only as guidelines to the Technical Assistance expert who will make its contribution to the course, not exactly as teacher but as educator/facilitator.

5.2 *Cultivation Practices, Farm Management and Marketing*

Cultivation Practices

Land Preparation and Land Levelling

- Land preparation lays the foundation for rice growing. It affects not only paddy yield but also the quality of milled rice. There are two stages of land preparation: dry or primary land preparation and flooded or secondary land preparation.
- After harvesting burn the remaining straw and stubble to remove excess vegetation and prevent the immobilization of nitrogen during the early stages of crop development due to the decomposition of straw, which uses up the oxygen and nitrogen in the soil. This excess straw also hinders ploughing and levelling of the land and serves as a hiding place for pests and diseases.
- The land should be ploughed to a depth of 4 to 6 inches along the length of the field. Ensure that the distance between the two rear tires of the tractor and the spacing covered by the plough are the same to eliminate unploughed spaces.
- The first cut should be straight and no soil should be left unturned, especially along the borders and corners of the field. Be careful not to turn the subsoil to the surface, overlap the plough slice with each other or skip or run over. Allow the field to bake for at least five to seven days before making the second cut. This will allow the fields to weather, clods to disintegrate and weeds and other

organic matter to decompose.

- The second cut should be done across the field or perpendicular to the first cut to further break up clods and assist in levelling the field, which can best be done under dry conditions.
- About 7-15 days before sowing the field should be flooded to a shallow depth. Be careful not to over-flood the field as this will, prevent you from seeing the high and low spots. Use a back blade to remove soil from the high spots to the lower spots so support levelling activities.
- Allow enough time for weeds and drop seeds to germinate and then kill these by harrowing.
- Make sure that Bunds and Meres are in place to prevent the wave action from destroying seedlings at the early stages of root development.
- After harrowing, the surface of the field should be levelled by dragging a beam across the field to produce a smooth puddled surface.

After proper land preparation a field should be clean, loose and levelled. A field is clean when it is free of trash, stubble and weeds. Cleanliness of the field supports in the control of weeds and reduces the likelihood of infestation of pests and diseases. A field that is loose permits root of the plant to grow and develop quickly and vigorously, the soil and fertilizer combine readily to provide maximum nutrients to the plant. A field that is levelled permits even distribution of water and fertilizers and the uniform emergence of seedlings leading to higher field yields and a significant reduction in the cost of production. Seedlings will not take root in low spots and the sun will kill those that do grow in high spots.

With the increased emphasis on lowering costs of production, the most important investment a farmer can make is the perfect levelling of the land. The most effective system for doing this is with laser levelling. This equipment is not readily available in Suriname, but farmers should check with ADRON or private companies having this equipment. Laser levelling of fields can contribute to a significant improvement in yields.

Seed quality and sowing

The use of good seed paddy is essential in order to obtain maximum yield and the best quality of rice. Use only seed obtained from ADRON or from registered seed growers in the area. Preparation of seed paddy consists of selection, soaking and germination.

Selection

Basic seed is used to produce certified 1 paddy which is then used to produce certified 2 seed. Use only certified 2 seed to produce grain. Good seed is well matured, clean and dry, free from weed seeds, dockage, pests and diseases and of high purity. Generally speaking, good seed should provide 95% germination.

Soaking

- Soaking enables the seeds to absorb enough moisture to swell and burst the paddy shell.
- Place about 35 kg of seed paddy into a jut bag and tie the top loosely.
- Soak the bag in clean water for 24 to 36 hours.
- Remove the bags of seed from the water and allow them to drain on a dry place for 12 hours.

Germination

- For sowing by aircraft, flatten the bags and leave them for the time required to

allow germination. This period allows just enough time for the bud to just peep out and prevent the seedlings from tangling or sticking together during sowing.

- For sowing by hand remove the seeds from the bags and spread them in a clean dry shady place about 2-3 inches thick. To prevent them from taking root ensure that they are not spread directly on the earth.
- Cover the seeds with damp jute bags that should be sprinkled with clean water at 12 hours intervals to keep them damp.
- Turn the seeds thoroughly at 12-hour intervals to ensure uniform germination.

Sowing

- Spray for water weevil one day before sowing.
- Sow seeds in water 3-4 inches or drain the fields and sow on the puddle surface at this permits the seeds to take root better.
- Sow about 140-150 kg per hectare depending on the variety taking care to shy seeds equally and in as straight a row as possible.
- Sow right up to the meres or dams at slightly higher amounts.

Water-management

In Surinamese rice cultivation the soil is covered with fresh water to a variable depth over a period which may extend to cover the whole of the rice cycle. Proper use of water will inhibit the development of major weeds such as Muraina and Jussia. This is accomplished by gravity feed where water is readily available or by pumping mechanically.

- Fields must be constructed in such a way that flooding and drying are possible as it is necessary to release the water prior to harvesting or application of fertilizers.
- As far as possible ensure that the field is perfectly levelled as this is the most economical way of controlling the use of water. If available, the use of laser levelling equipment should be employed to provide a perfectly levelled surface.
- Always use clean water uncontaminated by floating seeds etc.
- Make sure that fields are constructed with an out/inlet to drain off water or add water as the needs arises.
- Build bunds and meres to cover the highest spots after the field has been levelled.
- Flood fields after two weeks after ploughing and levelling.
- Allow the field to soak for at least one week after flooding.
- Keep the water level above the highest spots during the soaking period.
- Floating stubble or weed seeds may gather at the corner of fields depending on wind direction. Remove these by hand or by partially draining fields.
- Add water to compensate for losses due to absorption or evaporation.
- Keep fields under water until sowing
- Sow in water 3- 4 inches in depth and maintain this level until fertilizing time.
- If it is possible to drain the field and sow on a puddled surface, the field must be re-flooded between 4 to 7 days after sowing to prevent the growth of weeds.
- Look out for the development of duck weeds at this indicates too much water in the fields.

The need for water at the different growing stages

Seedling Stage

A shallow depth of water should be kept in the field at this stage to support the control

of weeds. If there is too much water the roots grow slowly and the plants develop weak and slender, also duck weed may develop. If there is un-sufficient water, weeds may quickly crowd out the seedlings

Tillering Stage

Keep a shallow depth of water to retain oxygen thus allowing the plant to develop strong stems and good root systems.

Heading or Head Forming Stage

At this stage the plant is extremely sensitive to a lack of water because the plant has developed large leaves which are exposed to the sun and evaporation of water is very quick. Water is essential for the formation of heads and supports in flowering also.

Pest- and disease control

One of the major problems facing rice farmer's world over and in Suriname is the damage caused by pests in the field. These pests attack the crop at all stages of growth from the time the crop is sown until it is ready for harvesting.

In Suriname quite a number of species of insects have been identified as pests of the rice plant. Of these snails (*Pomacea glauca* and *P. dolioides*), water weevil (*Helodytus foveolatus*), leaf miner (*Hydrellia sp.*), caterpillars (*Spodoptera frugiperda* and *Mocis punctularis*), stemborers (*Rupela albinella* and *Diatraea saccharalis*), Delphacid planthopper (*Sogatodes orizicola*), grasshoppers (*Neoconocephalus spp.* and *Caulopsis spp.*) and the paddy bug (*Oebalus poecilus*) are considered the most important.

The field rat (*Holochilus braziliensis*) can also cause serious damage to the rice crop. Though fungi may seriously affect rice plants, they are less a problem in Suriname than in other rice growing areas. *Helminthosporium* the most important fungus is usually associated with poor soil tillage and poor application of nitrogen or other mineral deficiency. The incidence of *Piricularia* and *Cercospora* is rising in Suriname. The use of chemicals will control the most of these pests listed here.

Weed control

Grasses and weeds reduce the yield and quality especially when conditions for cultivation of rice are poor. The major weeds (grasses and broad leaf grasses) are Saramaccagrass (*Ischaemum rugosum*), Grote kropaar (*Echinochloa crus-pavonis*), Kleine kropaar (*Echinochloa colonum*), Paragrass (*Brachiaria purpurascens*), Padigrass (*Luziola spruceana*), *Fimbristylus miliacea*, Pankoekoe (*Nymphaea amazonum*), Bies (*Cyperus articulatus*), *Eleocharis mutata*.

Propanil and 2,4-D amine control most of the weeds in the fields.

Fertilizing

About 16 elements are necessary for the nutrition of the rice plant. Nitrogen, Phosphorus and potassium are the most important. Nitrogen encourages tillering and its absence in small plants with yellow and brittle leaves. Phosphorus encourages growth of the roots and its absence results in dark green or purplish green leaves with yellow spots and red tips. Potassium causes the plant to retain water and makes it resistant to lodging.

Its absence results in poor tillering and yellowing of the tips of older leaves and of the central vein. The different fertilizers play different role in the development of the rice plant and are not interchangeable. Nitrogen is normally supplied as Urea or Sulphate of Ammonia, while Phosphorus is supplied as T.S.P.

Potassium is normally supplied as Muriate of potash.

Changing the application rate for nitrogen under various weather conditions is a must.

Therefore understanding of the photo- synthese process is very important. ADRON provides the following advice for nitrogen application.

Table 2: Application of Nitrogen

#	Growth duration 100 days		#	Growth duration 120 days	
	Two applications	Three applications		Two applications	Three applications
First	27 DAS	25 DAS	First	27 DAS	28 DAS
Second	56 DAS	40 DAS	Second	70 DAS	50 DAS
Third	-	55 DAS	Third	-	72 DAS

DAS = days after sowing

Total application: 300 KG (75-100-125 KG)

Source: ADRON

Harvesting

The time of harvesting depends on whether the rice will be used for milling or seed paddy. For milling purposes the rice must be harvested at its technological maturity while for seed purposes it must be harvested at its physiological maturity.

Technological Maturity:

This is attained when the yellow coloration covers two-thirds of the length of the axis of the panicle. A second and more precise method is to measure the moisture of the grain which should be around 20-22% at the time of maturity.

Physiological Maturity:

When the grain is to be used for seed paddy it must be harvested at physiological maturity which corresponds to the maximum germination capacity and energy. This occurs roughly seven to ten days after technological maturity. The moisture content is then around 16%.

Draining of fields:

Fields have to be drained 17- 21 days before harvesting.

Drying and Storage:

Traditionally farmers are selling their paddy to millers off farm, which means on a wet basis. In that case drying and storage becomes the responsibility of the miller.

In the event a farmer prefers to take responsibilities in this context, then he or she needs to possess some knowledge about drying and storage.

Drying of the harvested paddy is very important. If the rice is to be preserved without problems and to avoid discoloration of the grains. This is particularly important when most of the rice is being exported and therefore has to be preserved for long periods before it reaches the eventual consumers. At the time of harvesting the grain is still wet, with about 20- 22% moisture. This must be reduced to 13-14%.

- Paddy should be dried within 24 hours of harvesting to prevent the grain from becoming discolored. Properly dried paddy keeps better than milled rice.
- Paddy should be dried to 14% moisture content for storage and milling. As most farmers do not have drying facilities the paddy should be delivered to millers as soon as it is harvested.

- Prior to drying remove all dockage and foreign matter as the drying equipment performs better on clean grain.
- Dry paddy to remove 1 to 2% moisture in a single pass. Thereafter attempt to remove no more than 1.5% moisture at one time.
- When drying before milling, dry in two passes down to 12% and allow at least four hours of tempering between drying passes and before milling.
- The key point in good drying is to gently remove moisture. Do so with a maximum grain temperature which should not exceed 42 degrees C.

Storage:

It is essential that rice be stored carefully from water and insects. It is preferable to store grains in well aerated silos but as they are not available the following guidelines should be used.

- In preparation to storage, thoroughly clean the warehouse's floors, walls roof, doors and ventilation openings. Take care to brush the roof beams as insects may hide there.
- Make sure that any damage to the warehouse is repaired including roof leaks, broken windows and doors, cracks and crevices.
- Clean the area surrounding the warehouse and remove any left over grains, rubbish so as not to give vermin and pests any shelter or chance to develop.
- Treat the empty warehouse with contact insecticide
- Always stack bags on pellets. Do not allow the bags to come into contact with the walls or floor as they will absorb moisture.
- Leave enough space between the walls and pellets to reduce condensation and permit inspection and cleaning.

Farm Management:

Farm management is a very important issue in farming and it includes all necessary activities with regard to administration in general and financial administration on the basis of which financial and economic analysis of the particular farm could be made.

This means that farmers have to keep track of all expenses and incomes.

A simple but appropriate bookkeeping system has to be developed for the operators in rice farming.

This will help rice farmers to implement an evaluation and monitoring process for their farms and it will contribute to decisions with regard to interventions geared to improvement of profitability.

Marketing:

In general it can be stated that 60% of the paddy produced on the fields is milled into rice and rice products which enter the export market and the remaining 40% is being consumed locally.

Farmers have little or no knowledge of the factors and forces influencing Supply and Demand including related market prices on the export market.

Although making calculations from market price on the export market to farm-gate prices is a complicated matter, because of its importance for decision making at farm level, farmers need to be trained in these exercises.

Departing from a conceptual framework, it has to be stated that consumer preferences, demand and supply in an international context are important local points. The international environment is determined by actors, (countries, economic blocks,

institutions etc.) within the international trade. But it is also determined by aspects such as improved communication technology, strategic location, cultural and time differences.

A business is most likely to achieve its goal when it organizes itself to meet the current and potential needs of customers more effectively than competitors do. The increase of Suriname's share on the export market in general and the EU market in particular, depends on the quality of the product delivered, the price of the product, the availability of the product and the awareness regarding all necessary requirements. Understanding of all the relevant factors in rice trade and marketing including the significance of a Marketing Information System for rice is therefore a must.

5.3. Communication and Extension

5.3.1. Introduction

It can be stated that the farm managers are aging, because in 1998 approximately 51% was 45 years old while only 25% was about 35 years old.

With regard to education 77 % of the farmers had attended primary school. Nineteen percent had attended secondary school, but less than 10% had completed this type of education. Three percent had not attended school at all.

The attendance rate for primary education is a good starting point for the design of training programs. In general the figure for farmers attending training courses at that time was low. On the one hand it is a reflection of the performance of both the extension service and the Farmer's Organizations. On the other hand the low figure deals with the perception of the farmer.

It is recommended to have the course designed in such a manner that it interrelates communication and educational theory, knowledge and practice. So participants can improve their effectiveness as communicators and educators.

In the past twenty years there has been a rapid expansion in participatory methods and approaches. One of these methods is the Rapid Rural Appraisal (RRA). This method is characterized by data gathering, cost-effective trade-offs between the quantity, timeliness of information. By the late 1980's RRA users had been inspired by agro-ecosystem analysis, applied anthropology and participatory action research.

RRA makes use of a rich menu of visualization, interviewing and group work methods.

It should be stated that methods are being used not just for local people to inform outsiders, but also for people's own analysis of their conditions. The interactive involvement of many people in differing institutional contexts has promoted innovation and ownership, with many variations in the way that systems of learning have been put together

5.3.2. Orientation, Self introductions and Learning Environment.

Course orientation

Educational objectives

1. Participants will learn the importance of communication knowledge and skills in their operation
2. Participants will learn that they cannot be passive listeners in a group setting and derive all the possible benefits

Activities

1. Have participants fill out a sheet with personal information
2. Explain how communication is important to all their profession. Technical knowledge is only important if one can communicate it to others.
3. Review the course objectives and outline the course content and what is expected of participants.
4. Explain that in this course the teacher and participants will swap sender and receiver roles many times. The educator/facilitator will be often the listener and the participants the sender of messages.

Self introductions

Educational objectives

1. Participants will learn what they, as well as others feel when speaking before a group. They will understand that most people have anxieties that make them feel threatened.
2. Participants will learn that differences are interesting to others and that diversity is a positive factor.

Activities

1. Ask each participant to introduce him or herself at the front of the room
2. After all have spoken, ask them how they feel when speaking in front of a group. Explain that fear of public speaking is common, but it can be overcome through practice, knowledge, skills, success and confidence.
3. Ask how they felt about the others as they spoke. Discuss their responses and focus how they all want everyone to succeed.

Establishing a Positive Learning Environment with Group Interaction

Educational objectives

1. Participants will learn and appreciate how their own actions can assist or detract from a group or classroom learning experience. They should learn how to become a positive contributor, placing the group's objectives before their own.
2. Participants will be able to identify their own individual strengths and weaknesses in communicating.
3. A framework will have to be developed in order to encourage quiet participants to speak up and alert assertive participants to avoid monopolizing discussions.

Introducing Someone Else

Educational objectives

1. Participants will learn to quickly interview someone to gather and organize certain specific information.
2. Participants will introduce someone and discover positive and negative techniques of introduction from each other, with classroom or group discussions.

Activities

1. Have participants interview each other for at least 5 minutes
2. Have participants go to the front of the room in pairs to take turns introducing themselves
3. Following the introductions, lead a discussion on what they liked and disliked.

4. Ask who were nervous or frightened.
5. Discuss how everyone in the room supported the speaker and did not want to see him or her fail.

5.3.3. Teaching that Enhances Learning

Educational objectives

1. Participants will be able to identify six important educator's/facilitator behaviors that contribute to participant's achievement.

There is a close parallel between an educator/facilitator's concern for participant learning and retention and a communicator's concern for message reception. There is an interrelationship between teaching-learning and communication expertise.

Educators understand their role to be that of an educational facilitator and employ techniques that are related to participant achievement. The following is a partial list that contains the more valid points of facilitator's behavior.

- Maintaining clarity in presentations and explanations: Deliver focused well organized presentations, using words, language and examples the participants understand.
- Using a variety of teaching styles and instructional support methods
- Maintaining enthusiasm and excitement with the subject matter
- Being task-oriented, encouraging further study and monitoring learning.
- Making sure participants have an opportunity to learn the material
- Utilizing participant's ideas, along with praise and encouragement: involve participants in the learning process with classroom discussions, questions and answers, collaborative projects and exercises. Receive their responses in a good manner, as being worthwhile, though it may be necessary to follow up by steering the conversation in a more acceptable or accurate direction.

The S-M-C-R Communication Model

Educational objectives

1. Participants will be able to identify the four elements of the communication model.
2. Participants will be able to describe why communication is an indirect process
3. Participants will be able to explain several forms of two-way communication
4. Participants will be able to describe two gatekeepers.

Activities

1. Describe the sender-message channel receiver (S-M-R-C) model.

The **sender** is the source of information, such as a teacher or an educator, writer, a friend or you.

Senders express their thoughts through the human senses- mostly sight and sound. They encode and send messages based upon their past experience. Their success depends on having:

- Good communication skills-teaching, writing, speaking or drawing
- Knowledge of and ability to relate to the audience speaking in terms they understand
- A positive attitude towards the audience, the topic and the current educational situation

- Excellent knowledge of the subject and the present circumstances

The **message** is the idea/concept and how it is presented, including:

- Hard data , the idea or subject content
- Soft data, communicated through facial expressions, eye movement, body movement, posture, dress, gestures, voice variations and inflections.

Channels are related to the human senses- sight, sound, touch, taste and smell.

Channels can also be associated with the voice, expressions, gestures, real items, models, visuals, speech, audio visual presentations, print, radio, TV, computer, photograph, music, dance and acting.

The **receiver** is one who acquires a message. Messages are interpreted by receivers related to their past experiences and are received through their perception screen.

Messages reception is influenced by the receiver's:

- Ease of obtaining the message
- Communication skills, such as the ability to read, listen and interpret symbols
- Motivation to receive information and to learn
- Attitude toward the sender and his or her organization, the topic and the present situation
- Knowledge of the subject and if he or she can relate the information to reality.

Senders must encode a message and send it by using words, gestures or visual aids etc. Receivers must then decode the message. Since the sender and the receiver have different backgrounds and experiences, there is almost always some level of encoding-decoding deficiency.

Developing a Promotional Strategy

Educational objectives

1. Participants will gain an understanding of how to develop a promotional strategy

Activities

1. Have the participants choose promotional strategy projects that have special interest to them. Projects may be hypothetical.

Examples of typical promotional projects are, but are not limited to:

- A. an extension educational program
- B. an agricultural field day
- C. some new practice or technology
- D. an agricultural input supply store
- E. a farm equipment dealership
- F. a new organization or cooperative
- G. a private school or college
- H. other items

2. Have participants address these aspects of their project as a beginning promotional strategy exercise.

- a. Describe the promotional problem, such as gaining attendance at a local small-scale Farmer rice production field day.

- b. Describe the characteristics, knowledge and attitudes of potential audiences you wish to influence or relate to, for example poor rural rice farmers, male and female within a 30 kilometer radius of the village that have potential to benefit from small-scale rice production.
 - c. Clearly state all objectives and desired audience responses, for instance:
 - To increase farm profits of small- scale farmers
 - To increase the image of the cooperative
 - To have a sizeable attendance of the field day
 - To have more small-scale rice farmers earn money rice production and
 - To improve farm/household income and standard of living
 - d. List your basic messages
 - e. Describe the farmer's possible resistance to the message
 - f. List possible educational approaches
 - g. Explain the possible sequence and timing of implementing the strategy
 - H. Explain the cost-effectiveness of your methods/media choices
 - I. Describe who will perform the various promotional tasks
 - j. Suggest some means of evaluating your promotional strategy in terms of the number of farmers that attend the field day, the expression of interest in growing rice improving production.
3. Have the participants complete the promotional strategy by discussing the results

5.3.4. How the Brain Functions

Participants will learn that there are several communication methods used such as:

- Individual techniques
- Group methods
- Mass media
- Projects
- Politics
- Promotional items

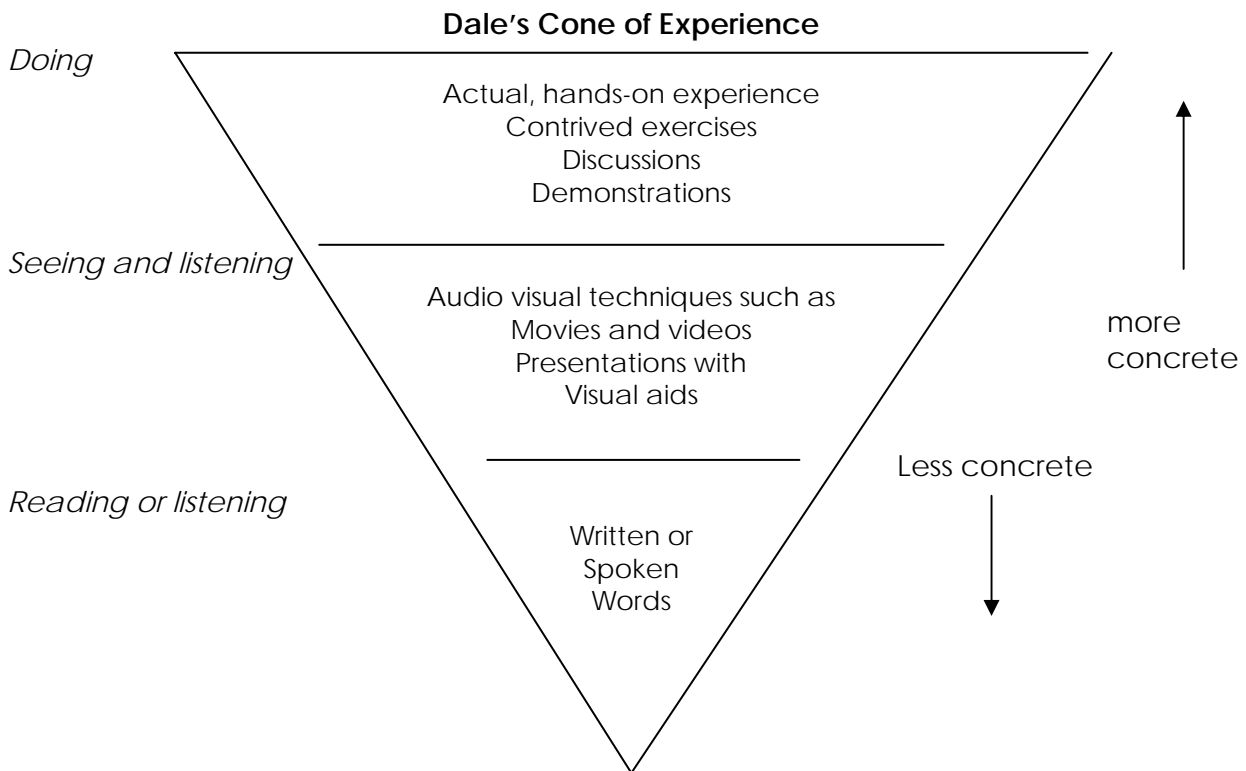
Participants have to be brought in a situation where they understand the most effective and concrete learning method of **Dale's Cone of Experience**.

Participants will be also able to identify the side of the brain that deals mostly with symbolic information.

They will also identify the side of the brain that deals mostly with pictorial information.

The left side of the brain attends to symbolic communication and the right side deals with pictorial images.

Learning and recall are improved significantly when information is stored in both sides of the brain.



Adoption of Knowledge and Information

Educational objectives

1. Participants will be able to align media and methods with the steps of the adoption process
2. Participants will be able to describe differences between those who adopt early and those who adopt later
3. Participants will be able to describe the term Information System.

Activities

Describe to the participants the process of adoption of information

The process of adopting information offers insight into the methods media, timing one uses to affect change. Some educational processes promote new ideas and encourage adoption. While specific methods and media vary among cultures, the same principles can serve as a basis for looking at other situations and identifying pertinent methods for media and for each stage. The following stages represent the mental process that people go through to learn about evaluate, and adopt a new idea.

- Awareness –the first encounter with the idea or product
- Interest- curiosity to seek more information
- Evaluation- using what has been learned to appraise the possible value to his/her situation
- Trial-trying out the new idea or product on a small scale or closely observing the results of the use in situations similar to his/her own situation
- Adoption –sold on an idea or product, integrating it into his/her own operation

Table 3: Sources of information by adoption stages

Awareness	Interest	Evaluation	Trial	Adoption
First learns about a new idea or product	Becomes interested and gathers details	Mentally examines it for possible use	Small-scale trial to minimize risk	Large scale use an ongoing practice
Mass media	Mass media	Government Agencies	Local salespeople	Personal experience
Government agencies	Government Agencies	Salespeople	Design of publications	Friends and neighbours
Salespeople	Salespeople	Trusted farmers	Friends and neighbours	
Other farmers	Other farmers	Friends and neighbours		

The characteristics of people according to when they adopt new practices varies under various conditions.

- Innovators- above average in wealth can afford to take risks, have large farms read publications, attend meetings, have a wide range of contacts
- Early adopters- tend to be younger and better educated than the average and are the most active in the community.
- Early majority -compared to the first two categories, have fewer resources, participate less, have fewer contacts and read less.
- Majority-have less education, participate less, have fewer contacts and read less
- Laggards- similar to the majority, but are older
- Non-adopters-are the oldest and the least educated and participatory.

5.3.5. Rapid Rural Appraisal

Educational objectives

1. Participants will be able to describe what Rapid Rural Appraisal (RRA) is and its relative position in in-depth analysis.
2. Participants will be able to describe at least six field data gathering techniques.

Activities

The educator/facilitator should present the following information about RRA methods.

RRA methods and techniques focus on obtaining grassroots knowledge, which the farmers have. They are inter-disciplinary, interrelating, livestock, cropping, economic, household/family, social and cultural information. RRA approaches are more effective when they are tailored to the local situation and specific objectives; they need not follow a standardized methodology. The objective of the RRA should be clearly identified at the beginning and the design of the RRA strategy and process should be aimed at accomplishing those objectives.

RRA techniques are especially useful when:

- Resources are too limited for an in-depth study
- Results are needed in a short time frame
- Descriptive information is desired, like organizational assessment, identifying economic conditions of an area, determining cultural patterns
- It is important to learn about the motivations and attitudes that affect a population behavior
- A study's purpose is to generate recommendations to solve problems or provide directions

- There is a need to develop new proposals for formal, more elaborative studies
- Project staff, agency personnel sees a need for increased teamwork.

Although this method is not a very easy one to be discussed with farmers in the context of the Nickerie district, it is recommended to include this in the training program because of its significance for understanding the way to go in order to develop the association.

5.4. Extension Theory

5.4.1. Extension and Extension Education

What is Extension?

The meaning of the word extension is well known and accepted by people who work in extension organizations, but it is not well understood in the wider community.

Extension involves the conscious use of communication of information to help people form sound opinions and make good decisions. Generally speaking extension is an effective policy instrument only when it is combined with others, such as research provision of inputs, credit and marketing. In Suriname maintenance of water-management infrastructure has to be included.

Extension and Government Policy

The government will invest in extension when it believes it has value as a policy instrument which helps to achieve government goals of increase of agricultural production, guaranteeing food security, earning foreign exchange and keep continuing providing jobs.

Agricultural Research and Extension

Investments in research will support the extension activities, when there is a sound link or collaboration between these two institutions or activities.

The Importance of Communication

Traditionally extension messages are based on farmer experience and research findings and normally Government agencies through extension services communicate these messages. As already understood the country is lacking resources to perform the extension task adequately.

Government policies are of increasing importance for decision-making by farmers.

Some basic elements for decision making are:

- Development policy with input from the farmers
- Education for the farmers
- How to solve specific problems
- The process of problem solving
- The Agricultural Knowledge & Information System (AKIS) involved
- The Extension Organization
- Changes in a direction which is desirable for the farmers.
- The agricultural return to investments is high only when extension and research are well organized and there is a structural collaboration between them.

Agricultural extension has much to learn from experiences with changing conditions on both the domestic and the export market. Also changing human behavior in other areas such as health education will support strategic decisions which have to be made

in an extension organization.

5.4.2. Methods of Influencing Human Behavior

There are different methods which can be used to influence human behavior. Under certain conditions some of them are feasible, others are not.

The following methods can be identified:

- Compulsion or coercion
- Exchange (services, goods)
- Advice
- Openly influencing a farmer's knowledge and behavior
- Manipulation
- Providing services
- Changing the socio-economic structure

Application of coercive power means that the people applying power are responsible for the behavior of the people they are trying to change. In general it can be stated that power is exerted by an authority, forcing somebody to do something.

Methods of influence vary according to the degree of harmony or conflict of interest between those who influence and those who are influenced.

5.4.3. Some Important Elements in Farmers' Use of Extension

Perception, communication, learning and decision-making are related.

In this context we would like to focus only on perception.

Perception is the process by which we receive information or stimuli from our environment and transfer it into psychological awareness. Perceptions are relative rather than absolute. Perception may be also selective. Sometimes we are receiving a lot of information and our system is not always capable of making sense of the stimuli available. This is where selectivity starts. Our perception is organized and has a direction. Our individual perceptions will differ markedly from another's in the same situation because of different cognitive styles.

An extension message is useless to farmers if they do not receive it. Therefore it is necessary to consider the different perceptions when programming an extension activity.

5.4.4. Communication and Extension Methods

Referring to paragraph 4.2. and 4.3. The following additional remarks can be made.

Communication in extension is very important. A number of methods can be used.

These are:

- Mass media
- Group methods
- Individual extension
- Media combinations and use of audio-visual aids
- Folk media
- Use of modern information technology

These methods can be used under certain conditions, each of them isolated or in combination with others. The discussion group's method is mostly favored because it makes direct interaction possible between agent and farmers or educator/facilitator and farmers and between farmers themselves.

The following table shows advantages and disadvantages of different extension methods.

Table 4: Functions, Advantages and Disadvantages of Different Extension Methods.

Medium is suitable for or Has the characteristic	Mass media	talks	demonstrations	Folk media	Group discussion	Dialogue
Creating awareness Of innovations	xxx	x	xx	xx	0	0
Creating awareness of own problems	0	x	xx	xxx	xxx	xxx
Knowledge transfer	xxx	xx	xx	xx	xx	x
Behavioral change	0					
Using other farmers' knowledge	0	0	x	xx	xxx	xx
Activating learning Processes	0	0	x	xxx	xxx	xx
Adjustment of farmers' problems	0	0	x	xx	xx	xxx
Level of abstraction	xxx	xx	0	0	x	x
Cost per farmer Reached	0	x	x	xx	xx	xxx

0= unsuitable. The number of crosses indicates suitability, except where marked with an asterisk which indicates the level of abstraction or cost.

Table 5: The matter of effectiveness of methods used approached from the point of view of educational goals.

Nature of learning goal	Strategy	Preferred method
Knowing (cognitive)	Transfer of information (from outside)	Publications and recommendations in mass media, lectures, leaflets directive dialogue
Attitudes (affective)	Learning by experience (information from inside)	Group discussions, non directive dialogue simulation certain types of films
Action (psychomotoric)	Exercises in skills	Method which encourage action=training, preparation by demonstration films

It is evident that for the condition in the rice industry and particularly the strengthening of the Rice Producers Association should focus on the Learning by experience method with group discussions on a non-directive dialogue basis.

5.4.5. Planning Extension Programs

In teaching the Association how to plan an extension program, they have to be taught that decision has to be made about:

- The goals that they want to realize
- The target group analysis
- Selection of the extension content and extension methods
- Organization of activities

Decisions about goals, target group, messages, methods and organization influence each other. Taking into account that it is not easy to consider all implications as a result

of the interaction between these elements, organizations who will undertake these activities have to concentrate strongly on the goal and the target group analysis.

In one way or the, when we talk of program development, we talk of some kind of planned change, that is deliberate efforts to change a given state of affairs. Social, economic, cultural, or technological changes are commonly assumed to be the purpose of planned and systematic extension actions.

Extension authors and professionals strongly support planning. Some authors underline that program planning helps justify budget appropriations and brings understanding among public and in this particular case under members of the Association.

Planning is a risk taking exercise, subject to unexpected and to failure.

Talking about extension program development, it is being assumed that:

- Planned change maybe an important factor for the social and economic progress of rural communities and families
- People responsible for extension activities must not act mechanically and without a vision
- Extension programs can contribute significantly to learning, educational improvement and development
- Extension educators, as change facilitators can help individuals, families and communities to reflect upon their realities and build relevant, programs thus improving the quality of rural life.

Managing people effectively in an extension program is a skill that requires constant planning and development. Planning is the key management function of any extension worker. It is the process of determining in advance, what should be accomplished, when, by whom, how and at what cost. Regardless of whether it is planning long-term program priorities or planning a two-hour meeting, the planning aspect of management is the major contributor to success and productivity.

5.4.6. Management of Organizational Development

The optimal organization of an extension service and its management depends to a large extent on the tasks it has to perform and the environment in which it operates.

If the environment changes, the task of the extension organization has to change to.

Major changes include:

- The demand for agricultural products
- Economic liberalization
- Many present farming practices not being sustainable
- New farming systems
- Information from other sources
- Strong forces towards change in the finance of extension organizations

As a result these organizations have to be organized and managed in a different way.

What is needed is:

- An analysis of the environment in terms of the domestic market and the export market
- An analysis of the internal structure of the organization

It is quite evident that the job to be done is not just to provide the organization with extension knowledge; it is also about an in-depth analysis of the internal structure in order to cater for strengthening.

5.4.7. General Principles concerning Objectives, Strategies, Means, Finance Monitoring and Evaluation

The definition of objectives is a key aspect in extension program development and objectives are seen as project guides; they provide direction, a basis for selecting activities and a framework for evaluation and making decisions explicit.

The issue of developing appropriate content is critical to the extension process.

The more appropriate the message, the better will be the extension clientele relationship and the more likely extension's program will be supported.

Appropriateness should be defined within the scope of:

1. technically feasible
2. economically feasible
3. socially acceptable
4. environmentally safe and sustainable

Within the each zone, there will be wide variety farmers because of socio-economic factors. These factors explain the differences which exist in terms of **access** to the factors which facilitate production, land, labor, capital, input, tenure, information and market.

These factors predispose farmers to adopt certain types of innovations.

These facilitating and impeding factors which should be considered in developing appropriate technology for extension's clientele are the following:

1. Land .Size of holding; small, medium, large, type of tenure, owner operated, family land
2. Water. Irrigation and Drainage
3. Labor. Family, hired
4. Inputs. Availability of improved seeds, agricultural chemicals, fertilizers
5. Markets.
6. Capital. Sources and cost of credits
7. Information. Availability of extension
8. Influence

Although extension workers say that they favor evaluation, they are not enthusiastic about evaluation. Major elements in evaluation are:

1. focus questions
2. objects or events to be evaluated
3. data or evidence
4. analysis or interpretation
5. Judgment conclusions or findings.

The financing aspect of extension activities is not an easy subject to deal with particularly when it comes to a farmer's organization. This is why planning of the activities is so important, because it enhances the identification of possible funds.

The use of evaluation to determine whether an extension program has achieved its goals and whether these goals have been achieved more effectively in a different way.

It enables extension workers and farm managers to learn more effectively from their experience and to present appropriate extension programs for implementation.

Before we go into the process of evaluation we have to be clear about what we hope to achieve. In this regard eight levels have to be identified.

1. The content of the extension program

2. Manpower and resources in place
3. the extent to which farmers participate
4. Farmers opinion about extension activities
5. Knowledge measurement
6. Adoption research. Who apply them and who did not and why
7. Hierarchy of goals
8. Changes in target group behavior

Several approaches to extension monitoring are available. All of them advocate simplicity and timeliness, essential requirements of good monitoring. Monitoring is a specialized, dynamic semi-autonomous and institutionalized management resource. Monitoring helps to ensure the implementation of extension programs in accordance with their design and it takes into account the interests of the various stakeholders.

5.4.8. Agricultural Supply, Price policy and Calculations

With the advance of modern farming techniques the farmer becomes increasingly dependent on outside supplies. For instance, the supply of artificial fertilizers.

It is important that the farmers should have at his or her disposal an efficient and economic supply system which meets this growing demand. The private trader especially in developing countries, also in Suriname has often proved unable to carry out this task adequately. Apart from charging often unjustifiable high margins on the supplies, he or she usually does not have technical knowledge for the extension work which should accompany the selling of farming supplies. As alternative farmers could turn to a co-operative society as their source of supply, or organize the supplies within their own association.

The objective should be:

1. to keep the prices of farming supplies at a reasonable level by exercising collective bargaining power based on bulk buying; by shortening the supply lines through direct purchases from wharf or warehouses and by efficient handling to avoid losses and waste.
2. to supply goods and services of a type and quality which are to the best advantage of the farmer? This of course requires the association if they want to take that direction to have a sound technical knowledge of the supplies offered and the association needs to educate the farmers about the use of the supplies.

Functions of agricultural supplying associations are:

- a. Purchasing supplies
 - assortment
 - size order and time
 - sources of supply
- b. storage, marketing and distribution

The price policy, which an agricultural supplying association adopts, depends largely on the mode of operation.

An association acting as a buying agent for its members does not usually pursue a price policy on its own. The prices charged to member directly reflect the prices on the wholesale market, less the commission.

An association, which buys on its own responsibility, however, has to decide its own prices. It can do this either by following a passive price policy, i.e. following the trend of

the local market by generally keeping in line with the prices charged by the competitors or by adopting an active price policy, i.e. underselling competitors by lowering prices to the minimum.

Only an association with an experienced management and solid financial resources should adopt an active price policy. or with backing from a secondary association or institution, as underselling often results in a fully fledged price war in which the competitor with the best financial reserves survives.

In its price policy the association has to consider also if it should charge uniform prices to all members, or differential prices according to order size, order time or-in the case of delivery- distance. Many associations gives discount for bulk buying, e.g. wagon load and make additional charges for extra small quantities, or allow a rebate for early orders.

The price calculation can take the form of:

$$\text{Mark-up in per cent} = \frac{\text{estimated cost} \times 100}{\text{Estimated turnover at purchase cost}}$$

An ex-post calculation to check whether the margin between sales and purchase price has been really sufficient to cover the operating cost of the previous period.

$$\text{Gross margin in per cent} = \frac{\text{cost} \times 100}{\text{Total sales}}$$

An association with a passive price policy will often limit itself to an ex-post calculation while an active price policy requires ex-ante calculation to establish the minimum prices to which the association can go.

Prices can be calculated on the assumption that all goods sold should be charged with the same percentage of mark-up or commission or that there should be a differentiation between different groups of goods.

The differential rate can be based on:

An objective cost distribution which takes account of the differing relative cost by distributing the total among commodity groups. The difficulty is to find a suitable key to allocate the cost to these groups.

A subjective cost distribution according to what the traffic can bear i.e. commodity groups which allow high margins are charged with the main bulk of expenditure regardless of the true cost structure. This system allows low margins or even losses in some lines by compensating for them with high margins in other lines.

- The aim is to cover the total cost of operation but not in the individual commodity groups. The later system gives a greater flexibility to the price policy. A proper cost distribution chart might however be necessary to keep control over the cost structure within the association.

5.4.9. Cost recovery Performance

The problems involved in financing co-operative enterprises or associations are threefold.

1. The assessment of the financial requirements of an association according to their quantity and quality.
2. The search for sources to secure sufficient funds to fulfill these requirements
3. The subsequent application and control.

One should adopt a definite financial policy which sets the targets to be achieved and

outlines the approach and the methods the association is going to employ in pursuit of this target.

This will of course involve a certain amount of financial planning.

An assessment of the financial requirements of an association must determine the amount and the type of capital needed to operate maintain and expand the association.

If the association is in possession of buildings, machineries and other facilities, without which the association can not operate, the association needs capita costs, which enables it to cover cost of depreciation. In addition to fixed capital the association needs working or operating capital to cover expenses emerging from the operational activities.

Generally speaking, if the output or volume of the business does not fluctuate excessively the minimum amount of working capital required would be approximately half the total expenses for the established period.

There are various methods which the association can employ to shorten the time-lapse between outlay of expense and receipt of revenues.

- Buying raw material and other commodities on credit terms
- Buying goods on consignment, payable only after sales
- Requesting customers for prepayment or payment with order
- Insisting on cash sales only
- Reaching an agreement with commercial banks, credit banks or other financial institutions
- Individual share contribution
- The share contribution being an advance payment for the right of future service.

In its financial policy an association has to determine which ways and means should be employed to co-ordinate finance requirements with the available resources, which of course is part of the total planning of the association?

Costs are the measurement of the factors used in the production of goods or the provision of services by the association expressed in terms of money.

Cost recovery performance of the association means that cost recovery is part of the financial plan. The association can not do without a cost recovery plan.

6. CONCLUSIONS AND RECOMMENDATIONS

In Chapter 3 some findings deriving from consultations held with farmers, were presented including some reflections of the consultant on these matters.

It appeared that the position of smallholders in rice farming rural areas is threatened.

It is not the purpose to elaborate on theories of social and economic change in rural areas or to engage in an extensive discussion of concepts. However no innovative strategy can do without making explicit its vision of social and economic change which lies at the root of the intervention, nor can it dispense with a certain amount of conceptualization, failing which chances of misunderstanding and misinterpretation will be great.

The economy of Small Farmers (SF) self- defense is a protective device. Its basic concern should be geared to maximizing the chances of survival of the SF household's and its members at a decent level of welfare. The concept enters into a theory of co-operative promotion which purposely enhances the SF household's defensive capacity against the hazards caused by climate, unstable markets, and political, ecological and technological changes. It takes into consideration that the patron-client relationships of

the traditional village society no longer offer the subsistence security they used to give to the poorer sections of the rural population.

A development program consciously promoting the economy of SF household self-defence in rural population is urgently needed.

One of the tools to achieve this goal is to include knowledge concerning the major functions of co-operation in the training program to be provided to these farmers. This support the process of strengthening of the SF society.

The specific functions of co-operation within this framework are the following:

1. To provide a forum for discussion of, and collective decision-making on ongoing and planned development activities.
2. To mobilize available easily accessible local monetary resources for setting up or participating in insurance or banking systems at a level accessible to all household members. This could take the form of a savings- and credit society.
3. To build up bargaining power on trade and financial markets. As well as claim making power to facilitate access to goods and services administered and distributed by governmental and non-governmental agencies.
4. To widen the options for income generating activities, which become attainable through economies of scale resulting from pooling of resources and business?
5. To enhance local control over factors of production and strengthen the SF's ability to stand against pressure from development agents which push the rural population to produce export surpluses without receiving much in return.

SF co-operation is certainly not a panacea to solve all SF problems, because the scope of SF action is too small to neutralize the ill effects of various forces, which affect negatively their situation. Therefore, the promotion of the economy of the SF defence must go together with systematic intervention at higher levels in order to create a more SF sympathetic atmosphere.

A policy of supporting SF economy of self-defence should not be misconceived as a policy of isolation aiming at autarky, but as one of selective integration into the rural regional, national and international economy.

From the information presented in this document it is to be expected that taking into account the level of education and experience available within the SPBA, the document would be easily made supportive to the design of a farmer's training course. It is strongly recommended to split the course in 3 parts en start with communication and extension. The reason is that communication skills and extension knowledge are the basic factors accelerating the process of change. In that respect they can be considered essentials in the revitalization process. The provision of information can only be made available to all segments in the farming population if the right concepts and tools are being utilized. This will result into innovative behavior, which will form the solid basis of the strengthened organization.

From survey work done under members of the SPBA, it can be stated that the numbers of farmers who will be willing to attend courses has been targeted at 90 persons.

It is not be expected that adult farmers being in charge of the management of their farms will make themselves available for attending the training course on a daily basis.

Therefore it is recommended to hold sessions on three locations in New Nickerie, Western Polders and Eastern Polders.

Per location 18 sessions with duration of two hours and a half each, will be held. Farmers think that two sessions per week would be reasonable, but maybe the number of sessions can be fixed at three instead of two.

The SPBA is able and willing to make participants available to the training course.

The course has to be divided in three parts namely communication and extension, cultivation practices, farm management and marketing. For further details, see the inception report.

The course has to be promoted via contacts with local and opinion leaders from the religious organizations, livelihoods, important shops and others. A much more detailed program can be developed when the Technical Assistant arrives.

Table 6: Training courses for rice farmers

Courses	Duration in weeks
Communication and Extension	24
Cultivation practices	22
Farm management and marketing	8

Literature reviewed

1. Suriname National Action Plan; Agrotec Spa, 2003
2. Rice Market Research in the EU, Larenstein, 1997
3. Boeren en Boerenorganisaties; Ir . Timmer 2003
4. Agricultural Extension; A.W. van de Ban & H.S. Hawkins, 1985
5. Training Manual for Rice Production IRRI 1972.
6. Communication in Extension , A teaching and learning guide; FAO 1999
7. Improving Agricultural Extension; FAO 1997
8. Onderzoek naar Bedrijfsomgevingsfactoren waaronder Kostprijsontwikkelingen in de Rijstsector in 1999-2000; Rijst Instituut, Stichting Planbureau, Ministerie van LVV
9. Rural Development, Theories of peasant economy and agrarian change; John Harriss1982
10. Handleiding voor de Rijst Teelt; Ministerie van LVV, Regio West, 1972.
11. Co-operation for Survival; Koenraad Verhagen; 1984
12. The Social Organization of Innovation; P.G.H. Engel,1997
13. Agricultural Mechanization Sub-sector Review and Investment Requirements; FAO 1996
14. Naar een Solide Draagvlak voor de Rijst sector , Communicatie verbetering in de rijst sector, 2000
15. Rijst onderzoek en Boeren, Naar een sector gestuurde communicatieverbetering; Drs J. Brand & A. Zalmijn 2000.
16. Urgentie Programma Rijstsector, Rijst Instituut 2000
17. Studie Landbouwtraining, Onderwijs en Voorlichting; International Management and Agricultural Consultancy; 2003
18. Impact Analysis Of The European Rice Market Reforms On The Suriname Rice Industries; Proplan Consultancy, 2004
19. Boeren en Boerenorganisatie: V. Timmer; 2003

Annex 1. Terms of reference

BACKGROUND INFORMATION

Beneficiary country

Suriname

Contracting Authority

The Caribbean Forum of ACP States (CARIFORUM)

Relevant country background

Suriname is located in the northern part of South America and has an area of 163,820 km². The population in 2005 was estimated at 485,000 of which most live in the coastal zone including about 200,000 in the capital of Paramaribo. The main constraints to Suriname's economic growth and development are institutional and policy-related. The agricultural sector contributes an average of 9% to Gross Domestic Product (GDP), employs about 15% of the labour force and is a major contributor to Suriname's food supply. Agriculture also accounted for about 15% of total exports in 2000.

Current state of affairs in the relevant sector

Rice occupies approximately 60,000 hectares of land. The sector counts 5,520 farms which are being operated in seven (7) farm-size categories, varying between 0,1 and 9,700 hectares .

Suriname has been able to create and develop a significant rice industry, but due to internal and external factors affecting the industry negatively during the past 15 years, the cropping intensity decreased from 1.5 in 1986 to 0.9 in 2004. The national production of paddy, that almost doubled in the period between 1975 and 1986 and reached a level of 327.000 ton in 1985, decreased with more than 25% between 1987 and 1994. In 2004 only 49,020 hectares were planted resulting into a production of 174,490 ton of paddy.

Strategies to reverse the declining trend should include improvement of the performance of the extension service of the ministry of Agriculture, farmer's organizations and individual key-farmers. This should be achieved through the implementation of training programs with regard to communication skills and technology transfer.

CONTRACT OBJECTIVES & EXPECTED RESULTS

Overall objectives

The overall objectives of the project of which this contract will be a part are as follows:

- The development of the competitiveness of the Caribbean ACP Rice Industry, and thereby contributing to the region's social and economic development and preventing the socio-economic deterioration which might occur as a result of the ongoing process of trade liberalisation;
- To enhance the competitive position of producers, processors, millers and others actors in the industry, by improving productivity, management, research, training and marketing.

Specific objectives

The objectives of this contract are as follows:

- Make an assessment of the current level of organization in the rice producing sector.
- Out of the assessment make recommendations for organizing producers into an effective association.
- Make recommendations for promoting horizontal collaboration and vertical integration of producers, millers and exporters.

Results to be achieved by the Consultant

- Report on the current level of organization of the rice producers
- Details of training course(s) or changes in competencies required, including general description of subjects to be included, training method, required training material (training manual).
- A report on the promotion of horizontal collaboration and vertical integration of producers, millers and exporters.

ASSUMPTIONS & RISKS

Assumptions underlying the project intervention

World prices for rice do not decline further in next years.

- Agriculture trade negotiations at WTO offer larger opportunities to developing countries.
- US does not use aggressively PL 480 as food aid.

Risks

- World prices for rice decline.
- Prices for input e.g. fuel and fertiliser keep rising, which could lead to decline in paddy production.

SCOPE OF THE WORK

General

Project description

The project consists of three parts. Firstly, assessing the current level of organization in the rice producing sector. Secondly, investigate the need for training and make recommendations (training manuals etc). Finally, make recommendations for horizontal collaboration and vertical integration of producers, millers and exporters.

Geographical area to be covered

The activities shall be conducted in the Nickerie district since more than 80% of the total rice producing area is located in this district.

Target groups

The groups of this study will be paddy producers being small and large.

Specific activities

Note that some activities may be conducted concurrently and that these listing are a guide and can be modified during the inception phase which is during the first week of engagement.

Activity 1

Consult with management of existing farmers organizations and assess the level of organization.

Activity 2

Conduct a survey among farmers to investigate among other things their perception, expectation and needs with respect to a producer's organization.

Activity 3

Consult other stakeholders (millers, ministry of agriculture etc) to get their view on the paddy producing sector.

Activity 3

Conduct a workshop with management of existing producers groups to discuss the need for a more professional approach of running an organization. Also it is a good opportunity to implement an upstream downstream planning approach.

Activity 4

Investigate if the bylaws of the producers groups need to be amended.

Activity 5

Propose and describe training courses for different levels of the organization (management and organizational development, strategies, planning, means, finance monitoring and evaluation, agricultural supply, price policy and calculations, etc.)

Activity 6

Consult producers, millers and exporters and make recommendations for horizontal collaboration and vertical integration.

Activity 7

Prepare reports and draft training manuals.

Project management

Responsible body

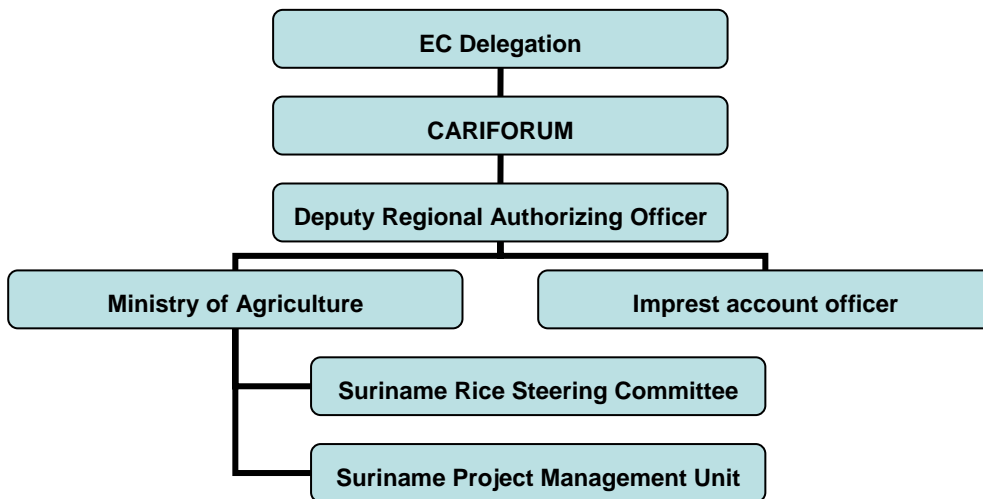
The Suriname Programme Management Unit (SPMU) will be responsible for supervising the consultant.

Management structure

The following is a flow of information in the system in which the consultant will report directly to the SPMU.

Facilities to be provided by the Contracting Authority and/or other parties

The Contracting Authority shall bear the costs of workshops and/or training courses.



LOGISTICS AND TIMING

Location

The study shall primarily be conducted in the Nickerie District.

Commencement date & Period of execution

The intended commencement date is 1 November 2005 and the period of execution of the contract will be completed within 3 months from the date of signature.

REQUIREMENTS

Personnel

Key experts

All experts who have a crucial role in implementing the contract are referred to as key experts. The profiles of the key experts for this contract are as follows:

Expert 1 and team leader must possess specialised knowledge in cooperative development.

Key expert 1: Team Leader

Qualifications and skills

- At least a M.Sc.-degree in organization and management theory
- Fluent in Dutch

General professional experience

Experience in organizational behaviour and management

Specific professional experience

- Experience in cooperative development
- Experience in compiling training manuals

Other experts

CVs for experts other than the key experts are not examined prior to the signature of the contract. They should not have been included in tenders.

The Consultant shall select and hire other experts as required according to the profiles identified in the Organisation & Methodology. These profiles must indicate whether they are to be regarded as long-term/short-term, international/local and senior/junior so that

it is clear which fee rate in the budget breakdown will apply to each profile. For the purposes of this contract, international experts are considered to be those whose permanent residence is outside the beneficiary country while local experts are considered to be those whose permanent residence is in the beneficiary country. The Consultant should pay attention to the need to ensure the active participation of local professional skills where available, and a suitable mix of international and local staff in the project teams. All experts must be independent and free from conflicts of interest in the responsibilities accorded to them.

The selection procedures used by the Consultant to select these other experts shall be transparent, and shall be based on pre-defined criteria, including professional qualifications, language skills and work experience. The findings of the selection panel shall be recorded. The selection of experts shall be subject to approval by the Contracting Authority.

Note that civil servants and other staff of the public administration of the beneficiary country cannot be recruited as experts.

Support staff & backstopping

The costs of support staff must be included in the fee rates of the experts.

Office accommodation

Office accommodation of a reasonable standard and of approximately 10 square metres for each expert working on the contract is to be provided by the SPMU.

Facilities to be provided by the Consultant

The Consultant shall ensure that experts are adequately supported and equipped. In particular it shall ensure that there is sufficient administrative, secretarial and interpreting provision to enable experts to concentrate on their primary responsibilities. It must also transfer funds as necessary to support its activities under the contract and to ensure that its employees are paid regularly and in a timely fashion. The consultant shall provide his own computer.

MONITORING AND EVALUATION

Definition of indicators

1. Within one week the consultant shall submit an inception report indicating in detail how he intends to fulfil this consultancy. Approval of the inception report is not required for further work to be completed. The inception report is simply an understanding on the process of implementation of the work that will be agreed upon by both parties.
2. Just in time reports on activities will be helpful to prevent rejection of the final report. The final report will become due no later than 3 months after the start of the consultancy. Four signed copies and a copy in CD or memory stick (to be provided by the SPMU) must be submitted. The SPMU will have 1 week after submission to review, accept or reject before making the final payment.

Special conditions

The consultancy is a complete task and does not in any way suggest any future engagements, written or implied.

This contract is a lump sum price contract.

Annex 2 List of Persons consulted

Names	Organization/Institution
H. Oemraw	SPBA
J. Hooplot	SPBA
L. Mahawatkhan	SPBA
G. Birdja	SPBA
G. Pahlad	Millers and Exporters Association
N. Soechit	Millers and Exporters Association
G. Fitz Jim	SURMAC
S. Jairam	Ministry of Agriculture
H. Kariokromo	Multi Purpose Corantijn Beheer
O. Dewanchand	Streek Ziekenhuis Nickerie