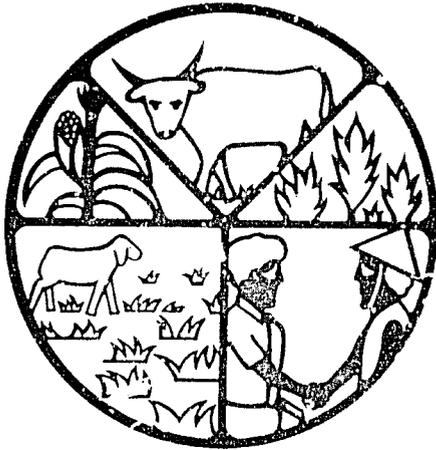


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Mixed Farming Technical Report



GAMBIAN MIXED FARMING AND RESOURCE MANAGEMENT PROJECT

Ministry of Agriculture and
Natural Resources
Government of The Gambia
Consortium for International Development
Colorado State University

FOOD PRODUCTION/CONSUMPTION LINKAGE

by

Melanie Marlett
Marie Sambou

Technical Report No. 4

Food Production/Consumption Linkage
Final Report

by

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Mixed Farming and Resource Management Project

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Ministry of Agriculture
Government of The Gambia

and

Consortium for International Development
with
Colorado State University as Lead Institution

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July 1985

PREFACE

This is the terminal report of the Mixed Farming Project Womens Program Coordinator. From 1982-1984, I was a Peace Corps Volunteer working in the Mixed Farming Project Maize Program concentrating on maize production, processing and preparation. Upon completion of my Peace Corps assignment in May 1984, I was hired for 14 months as the Womens Program Coordinator to further extend maize production, processing and cooking to rural women. My counterpart, Marie Sambou, Agricultural Assistant joined the Project in March 1984 and will continue MFP Womens Program activities for the duration of the Project and later continue these activities within the Department of Agriculture.

DISCLAIMER

Prepared with support of the United States Agency for International Development. All expressed opinions, conclusions or recommendations are those of the authors and not of the funding agency, the United States Government or the Government of The Gambia.

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FOOD PRODUCTION/CONSUMPTION LINKAGE

Introduction

The Gambia Mixed Farming Project (MFP) is a five year project which started in 1981 and will end in 1986. The Project is a Gambian Government Project funded by the U.S Agency for International Development (USAID) under a contract with the Consortium for International Development (CID) with Colorado State University having lead responsibility. The objective of the Project is to promote intensification and integration of livestock production within existing Gambian farming systems in order to increase the well being of rural families. To accomplish this the Project has worked toward increasing the supply of livestock feed during the dry season and to promote maize as a supplement to rice, the major food crop.

The MFP Womens Program is a sub-component of the Maize Agronomy Component. The objective of the Womens Program is to work with Gambian Women Societies in all aspects of maize production, processing and preparation. Traditionally, coarse grains such as maize and millet were primarily grown by men with rice production by women. In the past few years women have realized that maize is much easier and less time consuming to grow and has a more attractive market price than rice. The MFP Womens Program is attempting to expand this new awareness by encouraging Womens Societies to grow maize on a larger scale and not just as a backyard crop. After growing maize, women are taught new methods of processing and preparation for human consumption. With this information, the Gambian woman is able to use maize as a supplement to the family's rice-dominated diet and able to market maize for a sizable profit.

Organizations and Individuals Involved

Department of Agriculture (DOA)

Goals of the Womens Program would never be realized if the Gambian Agriculture Extension Service were not involved. Male and female extension workers have been trained by the DOA In-Service Training Unit with assistance from the MFP in the "Maize Technology Package" developed by the MFP. The package includes recommended cultural practices for growing maize. A second package has just recently been developed entitled "The MFP Womens Society Maize/Cowpea Intercropping Technical Package" (see Appendix I). Extension workers have been familiarized with these packages along with the MFP Maize/Cowpea Cooking and Nutrition Program which was introduced to Gambian women in 1982 and has been repeated and reinforced for four years. Village-based workers in the Community Development, Education and Health Departments have also been involved in the promotion of maize as a food crop.

Because of extension workers involvement and their continual support, the Womens Maize Program has received widespread coverage and acceptance.

Food and Agricultural Organization/The Gambia (FAO)

The FAO/Gambia has also been working with the MFP through the FAO Fertilizer Revolving Fund Credit Scheme. Seventy-eight Womens Societies received maize fertilizer inputs on a credit basis for the 1984 growing season. Twenty-eight societies repaid their loan allowing them to purchase fertilizer from FAO for the 1985 cropping year.

The FAO is also assisting Gambian villages with diesel grain mill projects which the MFP Womens Program has been asked to help supervise. A pilot project in 1984 included seven mills in seven villages. The next project will bring in 25 mills to 25 villages in 1985.

Women Farmers

The enthusiasm for maize generated by the women during the first years of the MFP, made it possible for a special Womens Program to emerge in the later years. Since June 1984, the MFP has allocated some of their efforts to womens activities by creating the MFP Womens Program, dealing with Women Societies and maize/cowpea production, processing, preparation and consumption.

Nutrition Concerns

The need for a nutrition program in The Gambia is illustrated in the following estimation by Robert L. Adams, Nutritional Planning Consultant, USAID, The Gambia:

"In an average year, at least one-third of the children in The Gambia under five and one-half of pregnant and lactating women are seriously undernourished". (Adams Report on Nutritional Planning, 1983).

He further states some of the causes for malnutrition in The Gambia, i.e.:

1. Intrafamilial food distribution - women and children consume far less and poorer quality food than adult males and older boys,
2. Lack of potable water,
3. Lack of sanitation,
4. Disease,
5. Ignorance - mothers are often unaware of how to prepare nutritious foods for consumption,

6. Food storage/preservation - lack of knowledge in this area reduces food availability during the hungry season,
7. Women's workload - an extremely heavy workload expected of women has a severe effect on their own nutritional status and of their children for whom they have little time during peak work periods.

Low calorie intake of Gambian women and children leads to nutrient deficiencies in protein, iron and vitamin A (Adams). Pregnant and lactating women frequently fall far below standards in their caloric intake, particularly during the planting season when food is most scarce and the workload is particularly burdensome (Adams). Pregnancy and lactation increases the need for iron. Diets of the Gambian women are high in cereal content, low in animal protein and green leafy vegetables and therefore tend to be low in iron content. All of the above mentioned factors are leading causes of anemia in Gambian women.

Poor nutrition of the mother during pregnancy and lactation leaves the growing child at a great disadvantage. Food taboos restrict women and children from eating foods which could contribute to solving the nutritional problems (e.g. if a mother eats eggs during pregnancy her baby will not be able to talk early; a child who eats eggs will not be able to talk and he/she will steal; children who eat fish will get worms).

The growing child is also subjected to varying combinations of energy and protein deficiencies resulting from inadequate food, poor sanitation, early weaning or late introduction of solid foods which leads to protein-energy malnutrition (Charlton, p. 113). Children are customarily weaned on starchy paps without additional or adequate animal or vegetable protein. The Gambian infant obtains generous carbohydrate calories with a relative deficiency of other nutrients, especially protein, which may lead to Kwashiorkor (protein malnutrition).

For these reasons and the fact that there is a high incidence of disease, life expectancy of the Gambian was 32 years for males and 34 years for females in 1976. Out of every 1,000 born, 285 died during their first two years of life. If they survived to five years, both sexes had a further expectation of life of 45 years (data from Land Resource Study, 1976). Later statistics from the 1982 World Book Atlas indicate that the life expectancy in The Gambia is the lowest in the world at 36 years and the infant mortality is also among the highest at 194 deaths per 1,000 births. From these statistics it can be seen that the years between birth and age five are the most crucial in a Gambian's lifetime. Proper nutrition for both the mother and child are of utmost importance during this time.

For these reasons, the MFP has focused its efforts on trying to solve some of these problems. The Women's Program of the MFP addresses the causes of malnutrition, i.e., low food intake; ignorance of proper nutrition; food storage/preservation; sanitation and the women's workload. The first step towards solving these problems was to increase the family's food supply. The second step was to improve the quality of food consumed and educate the women in good nutritional practices, especially those practices concerning women and children.

Production Component

The production component of the MFP Womens Program looks at increasing the amount of food available within the village and at decreasing the workload of women both in production and processing.

Gambian women growing maize for the first time were not aware of new cultural practices which had been introduced recently in The Gambia. Extension workers and MFP staff have helped these women in understanding various cultural practices such as time of planting and weeding, rate of planting and spacing of the seed, rate and time of fertilizer application, methods of intercropping maize and cowpeas, time of harvest and method of storage. All of these were explained to women with the goal in mind of increasing productivity per unit of labor. Maize has the advantage of being the first crop during the hungry season to mature and thereby providing food for the family during those critical months. Maize also stores well and can be used during the next hungry season if stored until that time.

During the 1984 cropping season, 78 women's societies grew maize. The societies grew between one and three hectares of maize and estimated yields were between 1.5 to 3 tons/hectare. The women were advised to grow maize as stated in Appendix I. Some societies were discouraged with their maize crop because of the effect of the drought. Other societies in non-drought areas were very pleased with their crop. In the majority of the societies, women saved part of their maize crop for use in maize cooking demonstrations and the rest was stored and sold within the villages during the hungry season when the price for maize was high.

From experience in other parts of the world, integration of cowpeas into the maize cropping system has proved to be a valuable practice not only because of its protein complementarity with maize when eaten together in the same meal, but also for agronomic reasons. When planting cowpeas and maize together in the same field the following benefits can be realized; (1) women can get two crops from one piece of land, (2) cowpeas may supply some nitrogen to the maize plant, important when fertilizer is in short supply, (3) maize and cowpeas are both high value cash crops, and (4) maize stover and cowpea vines can be harvested and bundled

together and used by women to feed their sheep and goats during the dry season. For these reasons and from the successful results of the MFP Maize Agronomists' maize/cowpea trials held at Yundum in 1984, the MFP Womens Program decided to introduce cowpeas into the 1985 maize cropping season (see Appendix I).

As traditional rice growers, Gambian women are involved in time-consuming and tedious work. After growing maize, women have realized the ease with which they can grow a grain crop and still have time left over to do something else. The workload is decreased if women grow maize instead of rice, but processing of maize into an edible form takes longer than rice processing.

Before cooking, maize must be shelled, cleaned and washed, dehulled and then pounded into a meal or flour. This is a difficult task using traditional methods and it sometimes discourages women from preparing maize. In trying to make this task an easier one for women, the MFP has distributed 50 hand shellers and 39 hand mills to villages throughout the country. These mills help to facilitate the process but it has been found that capacity of the hand mill is relatively small and it may take several passes through the mill before the grain is ground to the desired texture. Diesel mill projects have been implemented by the FAO. These mills make the task of milling much easier. However, other problems arise such as the initial cost of purchasing the mill, high cost and poor availability of diesel fuel, expense and lack of spare parts, etc. Milling of grains into an edible form remains a serious problem although the hand mills and few diesel mills available are helping to alleviate the problem.



Figure 1
Small Hand Grain Mill



Figure 2
Large Hand Grain Mill

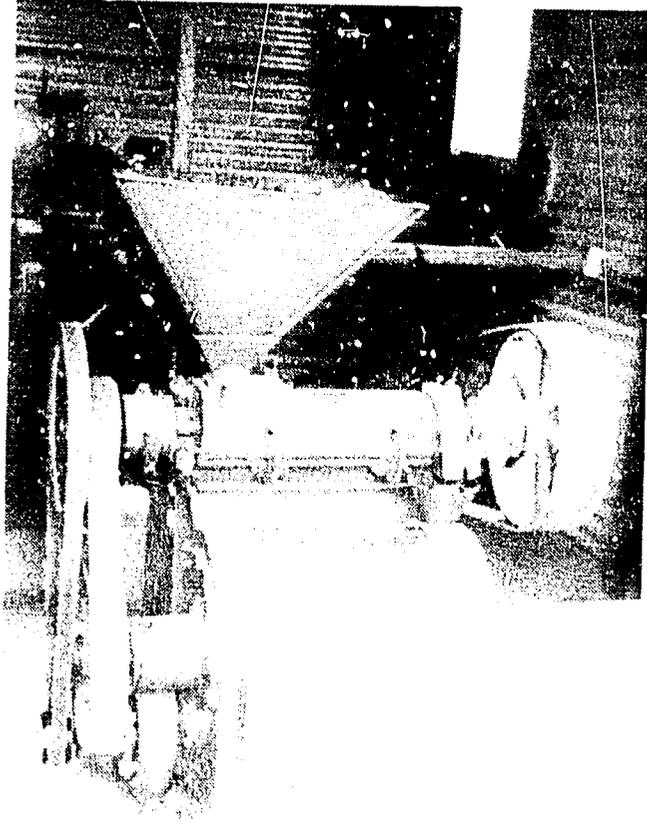


Figure 4. Diesel Powered Grain Mill

Consumption Component

Following production and processing is the consumption part of the program. The objective of this component is to use the foods grown and improve the quality of foods consumed along with educating women concerning good nutritional practices. Even though women may grow an abundant supply of maize and cowpeas, they are not always fully utilized because the women are neither aware of their nutritive value nor proper methods for preparing them.

Before starting to train village women, female extension workers working in the DOA were trained in proper nutrition practices and principles. They were shown how to prepare and demonstrate to village women 11 maize/cowpea recipes. Traditionally, there were only two or three ways of preparing maize for food. These recipes were developed by female staff (with the lead taken by Amie Jallow, Agricultural Superintendent in charge of Women's Programs) within the DOA and MFP Women's Program to provide a nutritionally balanced meal which is inexpensive and easy to prepare (see Appendix II). After female extension workers were trained in nutrition and preparation of maize recipes, 55 village cooking demonstrations were held throughout the country in 1984-85 (30 had been carried out during the previous three years).

During the demonstrations, each extension worker was assigned to 10-12 women to teach methods of preparing a specific maize dish. When the dish was ready she would take her group to the ten other cooking sites and explain how to prepare the dish, the importance of sanitation in food preparation and the nutritional benefits of the dish. Village women expressed amazement at the number of different ways in which maize could be prepared and often felt them to be preferable to traditional dishes made with rice.

In every one of the dishes prepared, there was a protein food ingredient which was used in conjunction with maize. The importance of combining a carbohydrate with a protein in a dish was stressed to village women. Each dish contained one or more of the following ingredients: eggs, milk, fish, meat, groundnuts, cowpeas. Iron content of ingredients used was also emphasized for prevention of anemia. Vitamin A and C content and importance of fruits, vegetables, palm oil, etc. in the diet were explained to the women. Importance of a balanced diet, with sufficient calories, protein and iron was particularly stressed for pregnant and lactating women. However, the recipe given the most attention by extension workers was the maize weaning food.

The maize weaning food was developed due to a need for adequate nutrition during this critical time of a child's life. It was formulated so that it was affordable, nutritionally balanced, easy to prepare, palatable and could be prepared using common cooking practices and ingredients readily available to village women. Importance of breast milk was emphasized to the women and that the weaning food is a

supplement to breast milk, not a complete substitute. Female extension workers were trained to advise mothers to provide maize weaning food to the child at six months of age to complement breast milk. Since maize weaning food is a multimix, the mother can start with plain maize pap at four months of age, to accustom the child to solid food. Mothers are told to make certain that the young child gets these additional foods so that he/she continues to have enough energy, protein and other nutrients to grow normally. The mother is advised to feed the child small amounts of food many times during the day. The importance of sanitation during preparation is also stressed.

The maize weaning food contains the following: staple-fine maize meal; protein food supplement - groundnut butter and tinned milk or cows/goats milk; vitamin and mineral food supplement - ripe mashed mango, banana, pumpkin or papaya (depending on what is in season); and energy supplement - sugar (Appendix II).

Along with the maize weaning food recipe, a maize pancake recipe was also developed aimed at providing village women with an extra source of income by selling pancakes to school children who would in turn get nutritional benefits from the pancake. The pancake contains eggs, milk, sugar, maize and white flour. Dishes traditionally made with rice were introduced by substituting maize (large-sized meal) for rice. A maize cake recipe (similar to corn bread) was developed by using the local cooking pot as a Dutch Oven for baking the cake. This has now become quite a profit-making venture for many village women.

After conducting 85 cooking demonstrations which included some 8,500 women participants, it was realized that there was a need for an evaluation of the program to see if the dishes were in fact being prepared by village women. Preliminary results of evaluations from previous demonstrations (those conducted in early 1984) indicate that out of the 11 recipes, on the average (1) five dishes were remembered, (2) two dishes were prepared frequently by the women, (3) weaning food and a traditional rice dish, made with maize, were among the top three recipes most frequently prepared.

This information indicates that one year following maize cooking demonstrations, women still remembered what had been taught and were in fact using the information in their homes. The reason for continued use of maize recipes by village women may be due to the follow-up efforts of extension workers in trying to further promote maize recipes and the realization that maize can be a very feasible substitute for rice in the Gambian diet.

Conclusion

Introduction of the MFP Womens Program in The Gambia has helped to bring women and food production and consumption together in one program with the major goals of the program being to increase food production and decrease malnutrition. In trying to achieve these goals the following steps were taken: (1) Introduction of a maize/cowpea intercrop system which focused on increasing food production, (2) Education of rural women in nutrition principles and practices and demonstration of proper methods of maize/cowpea processing and cooking in order to help decrease malnutrition. Integration of production and consumption within the same program has the advantage of being able to complete the family food production cycle and in turn improve the family's welfare.



Figure 4. Maize Cooking Demonstration



Figure 5. Mixing the Maize Pancake Batter

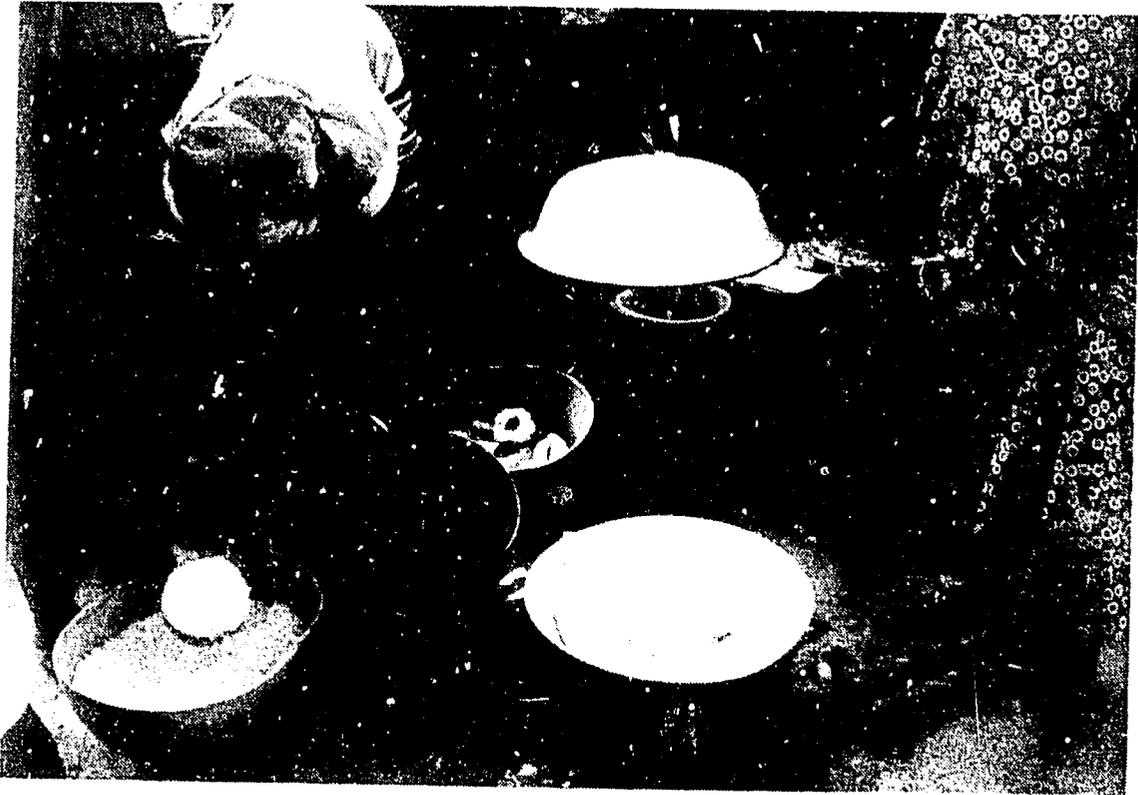


Figure 6. Preparing Traditional Rice Dish with Maize

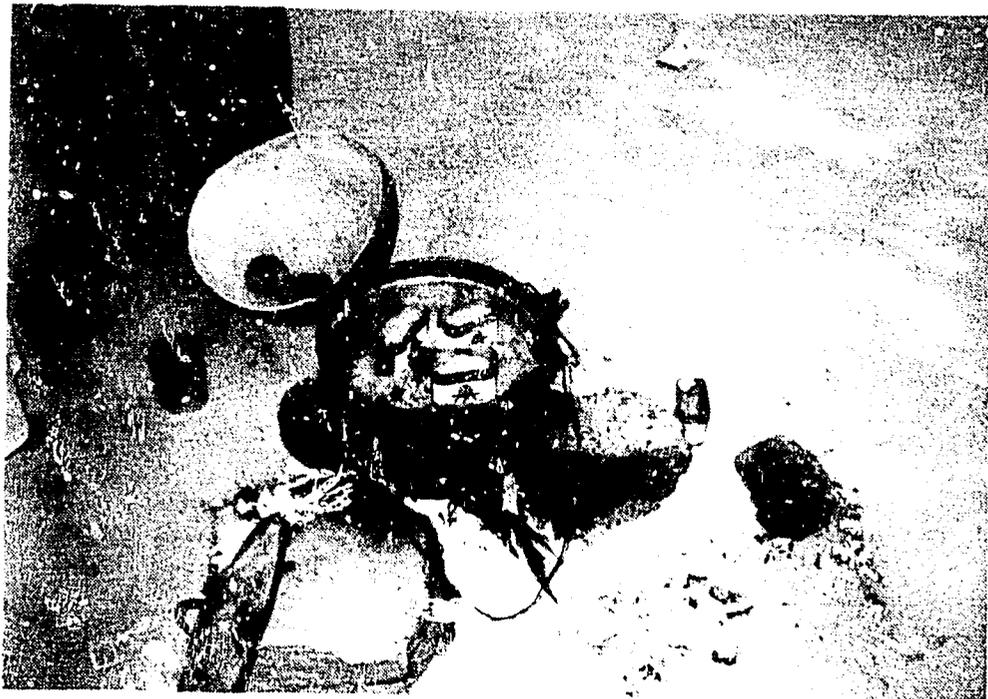


Figure 7. Maize Cake in Dutch Oven

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APPENDIX I

INSTRUCTIONS FOR EXTENSION WORKERS

WOMENS SOCIETY MAIZE/COWPEA
INTERCROPPING TECHNICAL PACKAGE

1985

Approved as Exploratory Trials by:
Department of Agriculture
Assistant Director in Charge of
Research and Special Programs
Sampe Ceesay

Maize Component - Womens Program

Melanie Marlett
Marie Sambou
Sandra Russo

PREPARATION:

1. Society Selection: Select one hardworking and cooperative Womens Society within walking distance from your posting which would like to grow a maize/cowpea intercrop.
2. Society Cooperation: Discuss with the Society involved that the work should be taken seriously and with full cooperation within the society, i.e. planting, weeding and fertilizer application should be done on time.
3. Inform Society: Start to inform women ahead of time about how they will be planting, weeding and applying fertilizer, so they get some idea of what they should be prepared for. If they want to find someone to help them with ox-plowing and machine planting, they should prepare for this far ahead of time. They should have yellow maize seed available and ready for planting, preferably 20kg. maize seed/hectare.
4. Site Selection: Have society select a flat, treeless, well-drained, fertile field of 1 hectare. The field should preferably have been planted to groundnuts last season. Measure field with tape measure and include measurements on the data form attached here.
5. Inputs: On the data form, fill out the number of bags of fertilizer received and the amount of cowpea seed received. The women themselves should supply their own yellow maize seed (20 kg/ha). One hundred dalasis for each hectare should be collected within the society prior to the arrival of fertilizer and seed. Seventy four dalasis being for the fertilizer (4 bags at D18.50/bag) and D26.00 for the cowpea seed, making a total of D100.00. This will be collected by the MFP Nutritionist before delivery of inputs.
6. Input Storage: Once inputs are received they should be stored properly until ready for use, i.e. in a dry, secure building.

N.B. - Their empty fertilizer bags should be saved for storing their harvest of cowpeas.

TECHNICAL PACKAGE

1. Clearing: Clear field in preparation for tilling. After the ground has become sufficiently moist, i.e. after 3-4 heavy rains (hopefully the middle to the end of June) the women should broadcast the 4 bags of fertilizer/hectare evenly over the entire field. After broadcasting, the ground should be immediately tilled. Make sure the ground is damp when doing this.
2. Planting: Immediately or within the next few days when the ground is moist, 20kg/ha. of yellow maize should be planted either by hand or machine. The maize seeds should be planted 90 cm. between the rows and 4 plants per meter (with 2-3 seeds/hole) within the row.
3. First Weeding and Cowpea Planting (refer to diagram): Two weeks after planting the maize, the crop should be weeded, being careful not to damage any of the small plants. If the plants are too many, the excess plants should be thinned out to one plant/stand. These excess plants can be fed to sheep and goats. Immediately after weeding, the cowpea seeds should be planted between the maize rows and 2 seeds should be put in each hole with a distance of 25 cm. between holes. With this method of planting, the cowpeas will be able to supply nitrogen to the roots of the maize plant during the important stages of maize growth. After harvest an excellent forage for sheep, goats and cattle will be supplied by the maize stover and cowpea vines.
4. Second Weeding: Two to four weeks after the first weeding the crop should be weeded a second time, being careful not to damage the cowpea plants.
5. Insect and/or Disease Problems: If it is observed that insects or disease begin attacking either the maize or cowpeas, immediate action should be taken to get in touch with CPS. DO NOT DELAY, it is very important that this is seen early and taken care of early.
6. Harvest and Storage:
 - a. Maize - The maize should be harvested as soon as it reaches maturity i.e. when a black mark can be seen inside the maize kernel. It should be dried on the cob (minus the husk) in a place protected from harmful pests and where air can move freely among the drying ears. Usually, about 3 weeks of drying will reduce the moisture content of the grain to the point that is safe for shelling, marketing and storage (about 14% moisture). After the maize has been harvested, seed should

be selected out by choosing the largest and most uniform cobs. The seed should be hung in a safe dry place. If the rest of the maize is to be sold, it should be husked, shelled and stored in bags, in a clean, dry building until ready for sale.

- b. Cowpeas: The cowpeas should be harvested when mature and before shattering, hopefully at the same time as the maize harvest. After harvest, spread in the sun until dry. When dry, they should be shelled and stored in the empty fertilizer bags until ready for sale. Dry chili peppers should be put in the bag with the cowpeas to prevent insect attack. N.B. At harvest and before leaf shattering, the cowpea vines and maize stalks should be harvested, bundled up, stored like groundnut hay and fed to sheep, goats and cattle during the dry season. Cowpea seed must be saved and stored as mentioned earlier.
7. Yields: In order to determine the maize yield of the womens fields, at harvest select at random 5 rows and measure 10 meters in each row. The 5 rows should not be in one location, but should be in different parts of the field. After you have measured the 10 meter for each of the 5 rows, every ear of maize from each of the rows should be put collectively in one bag. N.B. Rows selected should not be on the edge of the field. This should then be stored separately from the rest of the maize in a secure place. This maize will later be weighed by MFP staff to determine the yield from the field. Please inform the women that they will have this maize returned to them after weighing.
8. Field Days: Field days should be promoted. When the maize and cowpeas are in different stages of growth, women society representatives from surrounding villages should be collected and taken to the field so that they can observe the field. The technology used should be explained thoroughly to them so that they will be able to try the intercrop for themselves next season. This can serve as a teaching tool to convince other male and female farmers to accept and adopt recommended crop husbandry practices for higher yields.
9. Bank Account: After the womens societies have sold their maize and cowpeas, they should be urged to take the money received and deposit it into their own account in the Commercial and Development Bank. A sufficient amount of money should be saved until the next rainy season when they can buy fertilizer for their next maize/cowpea intercrop field.

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APPENDIX II

DOA/MFP Womens Program

MAIZE AND BEAN RECIPES
(small peak milk tin used as standard cup measure)

MAIZE BENACHIN

10 people -----	50 people -----	
14 tins	35 tins	maize grits (levelled)
1 kg	2 kg	beef
2 tins	6 tins	groundnut oil
4	10	large tomatoes
2 sm. tin	1/2 med tin	tomato paste
2	8	onions
2	4	large red peppers
2	8	bay leaves
4 pieces	1 whole	garlic
2 tsp.	1 tbl.	black pepper
2	5	bitter tomatoes
2 pieces	1/2	pumpkin
		chillies and salt to taste
2	8	maggi cubes

METHOD

1. Wash maize grits and steam 3-4 times, each time sprinkling water over the grits before being mounted on the boiling pot. Maize grits should be properly cooked.
2. Wash and prepare meat by cutting into even pieces and salted.
3. Wash and pound the large peppers, chillies, onions, black pepper, garlic and tomatoes.
4. Heat oil and fry meat until brown.
5. Add grounded ingredients to the fried meat, together with tomato paste and bay leaves. Fry until brown.
6. Add enough water and add the bitter tomatoes, pumpkin and maggi. Add salt.
7. Cook until the vegetables are properly cooked and the meat is tender. Remove vegetables from the stew. There should be enough water in the pot to cook the steamed grits. If not, add more water and leave to boil. Adjust the salt content if desired.
8. Add steamed maize grits and stir in thoroughly. Leave to boil until the water in the pot has been absorbed by the grits.
9. Reduce heat, stirring occasionally as the grains

swell. Simmer until properly cooked and soft.

10. Serve hot.

N.B. Any vegetables in season can be added the same time as in 6 and remove before steamed grits are added (7). Beans can be added to the Benachin.

MAIZE WEANING FOOD

10 People -----	50 people -----	
2 tins	10 tins	fine maize grits
1 ball	3-4 balls	groundnut butter
1 tin	3 tins	sugar
1 tin	2 tins	milk
1	5	ripe mashed mangoes *
1 slice	3 slices	ripe mashed papaya *
1 slice	3 slices	boiled mashed pumpkin

*

*(optional)

salt to taste

METHOD

1. Bring water to boil in cooking pot.
2. Put maize meal in boiling water, stirring constantly to avoid clumping.
3. Add salt to taste and continue stirring until mixture becomes smooth and thick.
4. Add groundnut butter to the maize after making the groundnut butter soupy by adding water to it and stirring it. This makes it easier for the groundnut butter to be dispersed throughout the maize mixture.
5. Cook until maize particles are soft.
6. Remove from fire and stir in sugar, milk and fruits.
7. Serve warm.

A baby should start getting plain porridge by the spoon when he is 4 months old. Give at first once a day, later 2 to 3 times a day. Once the child is eating the plain porridge well, it can be mixed with protein foods such as pounded groundnuts, mashed skinned beans or eggs. When 6 months old, he must eat porridge with protein 3 times a day and keep breast feeding as long as possible.

Goat or cows milk can be substituted for tinned milk.

MAIZE PANCAKES

10 People	50 People	
-----	-----	
6 tins	15 tins	wheat flour
12 "	30 "	maize flour
4 "	10 "	sugar
5 "	10 "	groundnut oil
2 "	4 "	milk
2	5	eggs
1 tsp.	1 tbl.	baking powder
1 tsp	1 tbl	salt
4 tins	12 tins	water

METHOD

1. Combine all dry ingredients (maize flour, wheat flour, baking powder and salt) and sift in deep bowl.
2. Add sugar.
3. Beat egg and milk together and stir into the flour bowl.
4. Add water to mixture. The batter should drop if lifted from a wooden spoon.
5. Drop batter from spoon into the heated oil and fry until golden brown.
6. Serve hot.

MAIZE AND BEANS DISH

10 People	50 People	
-----	-----	
2 tins	5 tins	cowpeas
4 tins	10 tins	maize grains
1 tin	4 tins	palm oil
2	5	onions
3	5	large tomatoes
2	5	large red peppers
4	10	smoked fish
2	5	maggie cubes
		chillies and salt to taste
		water

N.B. - The maize grains should be dehulled. Soak maize grains overnight. Soak beans a few hours before cooking.

METHOD

1. Wash maize grains and beans separately.
2. Cook maize in enough water until soft.
3. Add beans and salt to taste. Add more liquid if necessary and cook until soft and pulpy.
4. Wash and prepare large pepper, chillies, onions and tomatoes. These vegetables can be ground or sliced.
5. Add palm oil, ground or sliced vegetables and maggi. Stir well with a wooden spoon and lower the heat to avoid burning.
6. Prepare smoked fish removing entrails and all bones. Break fish into small pieces. Add to mixture and stir.
7. Adjust salt if necessary and cook the mixture until fairly thick.
8. Serve hot.

MAIZE OLELEH

10 People	50 People	
-----	-----	
6 tins	15 tins	maize flour (levelled)
2	5	smoked fish
1 tin	3 tins	palm oil
2	5	onions
1	2	large red peppers
2	5	maggie cubes
1	2	bitter tomatoes (optional)
2-3 tins	5 tins	water
		salt to taste

METHOD

1. Pound or slice large pepper and onions. Pound maggie and mix with pepper and onions.
2. Pick bones and remove entrails from smoked fish.
3. Wash bitter tomatoes and slice thinly.
4. Mix all prepared ingredients. Add water to maize flour.
5. Add salt and palm oil.
6. Mix in all the prepared ingredients to the flour mixture. Stir in until all ingredients are evenly distributed.
7. Spread banana leaves over fire until crisp.
8. Wash leaves and cut into even pieces.
9. Wrap mixture by spoonfuls in banana leaves.
10. Steam over a boiling pot in a steamer until properly cooked.
11. Serve hot.

Variations: Flour mixture can be poured in well oiled tins and steamed in a boiling pot half filled with water and stalks of maize or sorghum. The water in the pot should not cover the stalks or else the tins will submerge.

Maize flour can be mixed with bean paste. Use half maize flour and half bean paste.

MAIZE FRITTERS (SWEET)

10 People	50 People	
2 tins	8 tins	maize grains
2	6	eggs
2 tins	4 tins	maize flour (levelled)
4 tins	6 tins	wheat flour (levelled)
2 tsp	3 tbl	groundnut oil
2 tins	4 tins	milk
1 tin	3 tins	sugar
1/2 tsp	1 tsp	baking powder
1 tin	3 tins	water
pinch	1 tsp	salt
3 tins	6 tins	groundnut oil

METHOD

1. Pound maize grains to remove outer coating.
2. Soak overnight.
3. Boil grains.
4. Strain maize grains when properly cooked.
5. Mix maize flour, wheat flour, baking powder and salt and sift in a bowl.
6. Beat egg until light and fluffy.
7. Add milk, teaspoon oil and sugar. Continue beating until smooth.
8. Pour the mixture into the flour bowl and beat until batter is smooth.
9. Stir in the cooked maize.
10. Drop the mixture in spoonfuls into deep hot oil and fry until golden brown.
11. Drain and serve hot.

MAIZE MBAHAL

10 People	50 People	
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10 tins	25 tins	maize grits
3 "	10 "	cowpeas
2 "	4 "	palm oil
1	2	large red peppers
4 "	10 "	groundnuts
2	5	bitter tomatoes
4	10	smoked fish
4	10	dried fish
3 sm. tins	1 med tin	locust beans
		salt to taste

METHOD

1. Steam maize grits as in Benachin.
2. Soak beans an hour before cooking.
3. Wash locust beans and pound with chillies and large pepper.
4. Roast dried fish in fire for a few minutes and remove all entrails and bone from the flesh. Pound with other ingredients.
5. Pound groundnuts and sieve into a fine flour.
6. Pick out bones and entrails of smoked fish. The flesh can be pounded with the other ingredients or just add in pieces unpounded.
7. Wash beans and bitter tomatoes and boil until soft.
8. Remove bitter tomatoes. Water in the cooking pot must be sufficient to cook the steamed grits. If not, add more water and leave to boil.
9. Add steamed grits and cook until soft.
10. Remove excess water and simmer until properly cooked and the water has been absorbed by the grains.
11. Dig the center of the cooked maize and bury in the pounded locust beans together with the picked smoked fish and groundnut flour.
12. Cover pot and leave to cook under low fire until all the ingredients and grits are properly cooked.
13. Remove from heat and thoroughly mix in palm oil together with the cooked ingredients.
14. Serve hot

MAIZE "CHAKIRI"

10 People -----	50 People -----	
16 tins	40 tins	maize flour (levelled)
1 sm. tins	1/2 med tins	margarine
2 tins	4 tins	sugar
1 tin	2 tins	grated coconut (optional)
2 tsp	1 tbl	nutmeg (optional)
		sour milk

METHOD

1. Put corn flour in a calabash and mix it with a little water. Use hand, rotating the dough around the calabash to form tiny balls.
2. Continue this action of rotation until uniform balls are formed. 2
3. Steam chakiri in a steamer over a boiling pot.
4. Continue steaming until properly cooked. The chakiri can be steamed twice if necessary, sprinkling a little water the second time before being mounted on the boiling pot.
5. When properly cooked, return it to a clean calabash and add margarine and sugar. Stir in with a wooden spoon.
6. Add extra sugar to the sour milk.
7. Add grated coconut and nutmeg to sour milk.
8. Serve.

2 N.B. If flour is too wet, sprinkle more flour. It may be advisable to reserve some of the maize flour in case this happens.

MAIZE DOUGHNUTS

10 People	50 People	
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8 tins	20 tins	maize flour (levelled)
4 "	10 "	wheat flour (levelled)
1 tin	4 "	sugar
4 tins	8 "	groundnut oil
2	6	eggs
1/2 sm. tin	1/2 med tin	margarine
1 tsp	1 tbl	baking powder
1 tsp	2 tsp	salt
1-1 1/2 tins	3 tins	water
1 tin	4 tins	milk

METHOD

1. Sift maize flour, wheat flour, baking powder and salt together in a bowl.
2. Add margarine and sugar together and rub with fingers.
3. Beat eggs until fluffy. Add to the mixture together with the milk.
4. Dough should not be very soft. If after adding the milk and egg you find that the mixture is soft, omit water.
5. Roll dough on a floured table and cut into neat shapes or make dough into small balls.
6. Heat oil and fry doughnuts until golden brown.
7. Serve hot or when cool.

MAIZE FUFU AND SOUP
Fufu

10 People

50 People

20 tins

50 tins

maize flour
(levelled)
limes (optional)
salt
water

1

2

Soup

2 tins

6 tins

palm oil

1 kg

2 kg

beef

2

6

maggie cubes

2

5

large red peppers

2

5

onions

2

5

bitter tomatoes

1 sm ball

2 balls

locust beans

2

5

smoked fish

1 tin

3 tins

dried ground okra
(levelled) or greens
chilles and salt to

taste

water

METHOD
(Fufu)

1. Mix maize flour with cold water into a fairly light mixture.
2. Add salt and lime to the mixture.
3. Bring pot to boil with little water.
4. Stir flour mixture into pot with a wooden spoon. Stir well to avoid lumps.
5. Add some more water if required and stir until the color changes to a brownish color and dough becomes stiff.
6. Cook for some few minutes while stirring.
7. Remove from fire and mold into small balls.

(Soup)

1. Wash and cut meat into even pieces and salt.
2. Wash locust beans and pound adding chillies and large pepper until smooth.
3. Skin onions and slice into pounded vegetables. Pound until smooth.
4. Wash and place cooking pot on fire with enough water. Add meat and ground vegetables together. Salt.
5. Wash bitter tomatoes whole and add to pot.
6. Cook until meat becomes tender and bitter tomatoes are properly cooked. Remove the bitter tomatoes and add maggie cubes.
7. Remove entrails and bones of the smoked fish.
8. Sieve the dried ground okra and add to the cooking pot when the quantity of water is fairly low.
9. Add palm oil.
10. Lower heat and cook for some time (about 20 minutes)
11. Add the smoked fish and leave to cook.
12. When the soup becomes thick, leave to simmer until the palm oil emerges to the surface.
13. Remove from the fire and serve hot with fufu.

Variations:

Other leafy vegetables can be used instead of the dried ground okra. Fresh okra can also be a substitute to the ground okra. The leafy vegetables such as cassava leaves, sweet potato leaves and kereng-kereng can also be used as a substitute. It should be noted that care must be taken in the preparation and cooking of the vegetables. In order to retain their nutritive value, they should not be sliced too thinly or overcooked.

Another possible soup for the fufu is as follows:

BEAN SOUP
For Ten People

5	tins beans
2	balls locust beans
3	cups palm oil
3	onions
3	large peppers
	water

METHOD

1. Soak the beans and remove the skin.
2. Boil until very soft.
3. Mash to a paste and pass through a sieve.
4. Return to pot and add a little water and the ground ingredients.
5. Add palm oil and leave to simmer until cooked.
6. Serve.

MAIZE CAKES

10 People -----	50 People -----	
4 tins	6 tins	wheat flour (levelled)
8 "	12 "	maize flour (levelled)
2 "	5 "	sugar
4	8	eggs
1 sm. tin	1 med tin	margarine
1 tsp	2 tsp	baking powder
4 tbl	1/2 tin	milk
1/2 tsp	1 tsp	salt
2-3 tins	12 tins	water

METHOD

1. Beat margarine and sugar in a deep bowl until smooth.
2. Combine maize flour, wheat flour, baking powder, salt and sift in another bowl.
3. Beat eggs and milk separately.
4. Add eggs to the sugar and margarine mixture.
5. Add flour gradually to the mixture.
6. Add water to the cake mixture. The batter should drop from a wooden spoon if lifted. If not, add more water.
7. Grease empty tins with margarine or groundnut oil.
8. Fill greased tins halfway with the mixture.
9. Place tins on sand in a cooking pot and cover tightly.
10. After 15 to 20 minutes, check on the cakes. If they are brown on top, remove from pot. Tap tins on sides with a knife to loosen the cake. The cake should fall out easily.

N.B.

Before cooking begins, fill a cooking pot less than half full with clean sand, place on fire and cover tightly. You can have 2 to 3 such pots. A small bit of oil is needed to grease the insides of the empty milk and tomato paste tins.

BEAN AND SWEET POTATO POTAGE
For Ten People

1/2 kg.	meat
5 cups	cowpeas
1/2 kg	sweet potato
2 cups	palm oil
	pepper to taste
4	onions
4	large fresh tomatoes
	black pepper and salt to taste
	greens (optional)

METHOD

1. Clean meat and put to boil. Add salt.
2. Wash beans and add to pot.
3. Grind peppers, onion and tomato and add to the pot when meat and beans are half cooked. Add the palm oil.
4. Peel, clean and cut the sweet potatoes into medium sized cubes. Add to the almost cooked beans and meat.
5. Leave to cook until all are soft.
6. Serve.

AKARA OR FRIED BEAN CAKES
For Ten People

5 cups	dried beans
5	onions
3	peppers
	groundnut oil
	cold water to mix

METHOD

1. Soak beans and remove skins.
2. Grind until smooth. Put in a bowl and beat well with a wooden spoon, to incorporate cool air and to make mixture light.
3. Add water gradually and continue beating until mixture is light and drops from a spoon.
4. Grind onions, peppers and tomatoes and add to mixture. Add salt to taste.
5. Fry in deep hot oil until cooked and browned.
6. Drain well and serve.