

**CONTRIBUTION TO THE
STUDY OF THE FARMING SYSTEM
IN THE KALOUNAYES REGION
IN THE LOWER CASAMANCE
SENEGAL**

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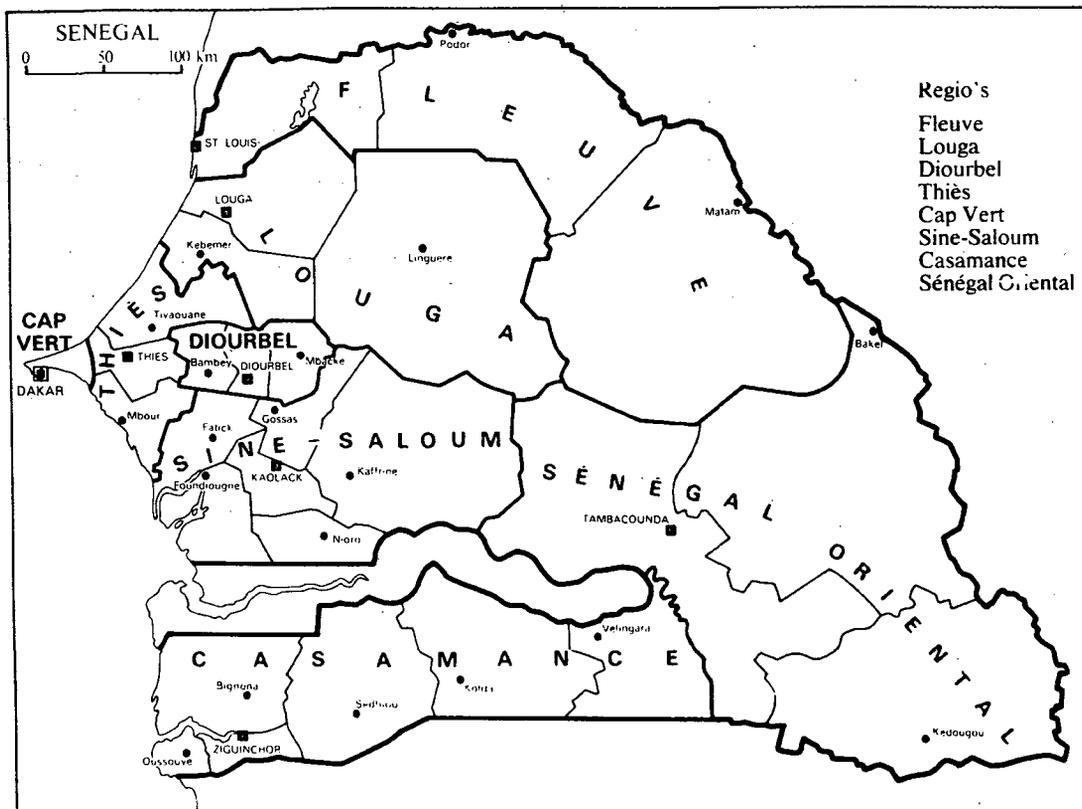
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SUMMARY



Introduction

Groundnuts, Senegal's main crop and its main export product, is the dominant crop in nearly the whole country. Even in the lower Casamance, traditionally a rice growing region, groundnut is of importance. The research conducted in the region until now is mainly concentrated on paddy rice. Only in recent years some attention is given to upland crops. Development actions in the region are coordinated by SOMIVAC (Société pour le Mise en Valeur de la Casamance), its programmes pay attention to both crop and livestock production.

The study area

The Kalounayes region is situated in the North-East of lower Casamance. It is a plateau bordered to the East and South by the Soungrougrou and Casamance river.

The soils of the plateau are rather coarse textured, deeply weathered soils, with a low fertility. The soils in the river villages are mainly heavy, swelling and shrinking clays with a higher fertility but more difficult to till and has localised salinity problems.

The rainfall distribution is unimodal, with a 4 to 5 months rainy season (June to October). The average rainfall is 1400 mm (60 year's average). Since 1970 average rainfall declined to about 1000 mm.

The Kalounayes covers about 500 km² and in 1976 had a population of about 15.000.

Social structure

The most important ethnic group are the Diola who are influenced by the Mandingo tribe. This influence finds its expression mainly in the distinct sexual division of labour. The head of the family is the oldest active male member. He has the final decision on cultivation, consumption of products, the use of money and credits, reflecting the interest of all family members, according to the principle of consensus.

Methodology

Three surveys were conducted, each with its specific objectives

- A reconnaissance survey, to get a broad view of the farming system
- A global survey, with a written questionnaire, to obtain statistical information on main elements of the system and
- An in-depth survey (n = 19), by interview, to get a more qualitative understanding of certain aspects of the system.

For the global survey (n = 93) a two staged, stratified sampling method was used. Stratification was done geographically.

Description of the farming system

The most outstanding characteristic of the farming system studied, is the distinct sexual division of labour. The women are concerned with the rice growing in the valleys whereas the men cultivate the upland crops: groundnut maize, millet and sorghum. Hence, two types of production units can be identified: the "male" and the "female".

The two production units do not necessarily form a consumption unit (fig. 1). Besides the cropping activities, animal husbandry and non agricultural activities are the other important components of the farming system (fig. 2).

Upland crops: two types of fields can be distinguished

- . the upland fields where groundnut, millet, sorghum and maize are grown, mostly in rotation.
- . the compound field where maize is grown, sometimes associated with cassava.

The average size of holding is 5.5 ha with a labour force of 4 Man Equivalent. 64% of the farmers use ox-drawn ploughs for land preparation. Ridging is a general practice. Only few farmers have a cultivator (for weeding). The survey revealed that there were no significant differences in area sown or yield per ha between farmers with or without a plough.

Yields as recorded through interviews, were extremely low, even when taking into account some underestimation.

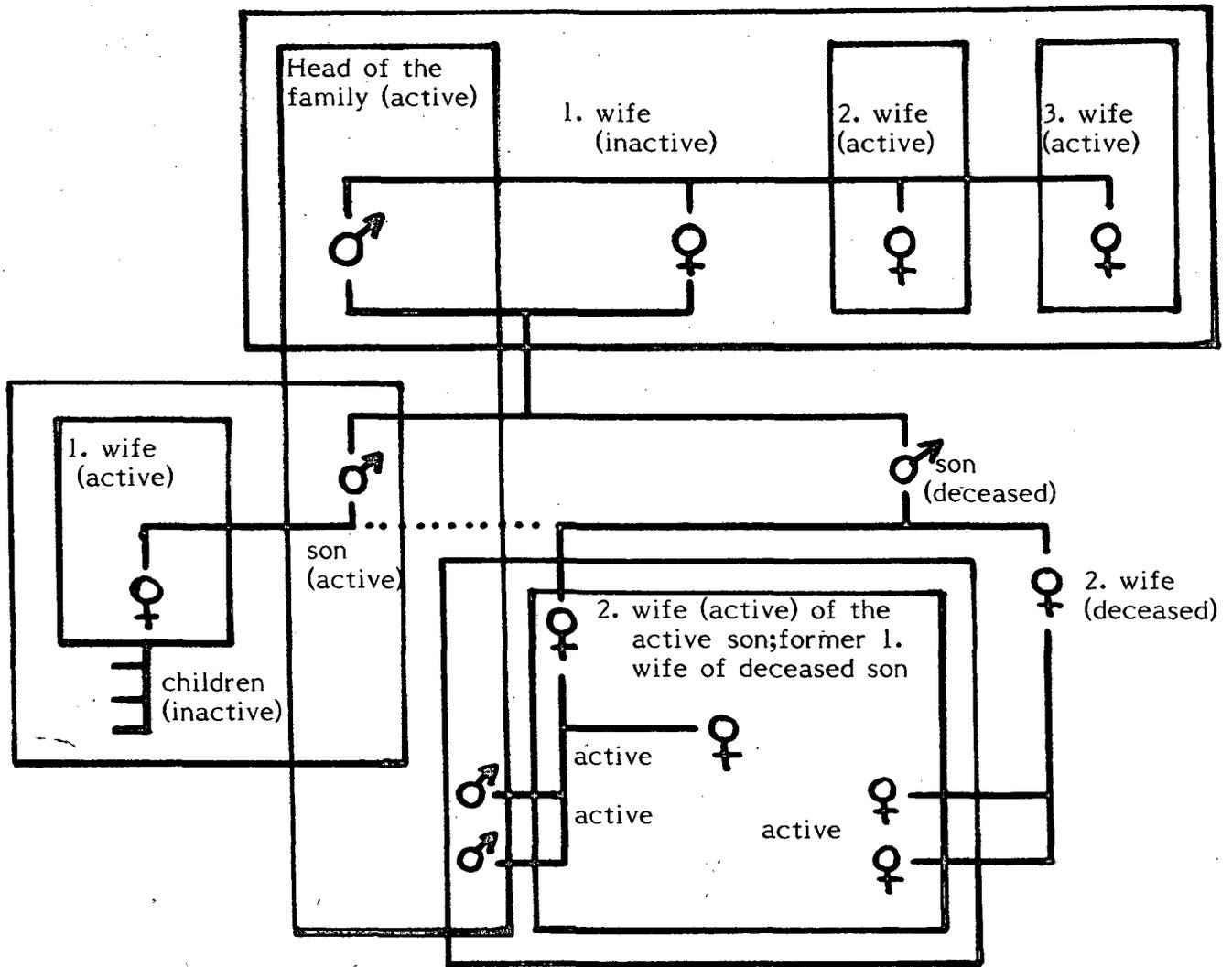
Soil fertility, timeliness of field operation and pests and diseases are the main constraints. The soils of the plateau are of low inherent fertility. At present fertilising practices are minimal. The land use is extensive: the limited amount of available labour is "spread" over a large area resulting in a delay in field operations: both land preparation/sowing and weeding take one month each. For the areas cultivated by the farmer the existing equipment seem mal-adapted. Farmers reported large losses due to pests and diseases. Existing varieties apparently are susceptible to these prevailing plant hazards.

Rice: until 10 years ago, all rice was transplanted. Since the decrease in rainfall however, certain parts of the valley are no longer inundated long enough to make transplanting possible. These parts are now direct sown. Direct sown rice is predominating in the North of the region. Improved short-cycle varieties are mostly grown, adapted to the new rainfall conditions. Land preparation and weeding in direct sown rice are the major constraints. The women are not able to till the heavy soils properly with their light hoe and delays are considerable. With declining rainfall, salinity is affecting more rice plots than before.

Livestock is kept for many purposes: animal traction being the most important one. The repartition of livestock between households is very unequal, 5% own 50% of the cattle, 30% have no animals at all. The main constraint was feeding and watering of the cows, the existing resources were used for the draught animals.

fig 1

The family structure with specific regards to the crop production and the consumption units; an example from Fangome, May 1983

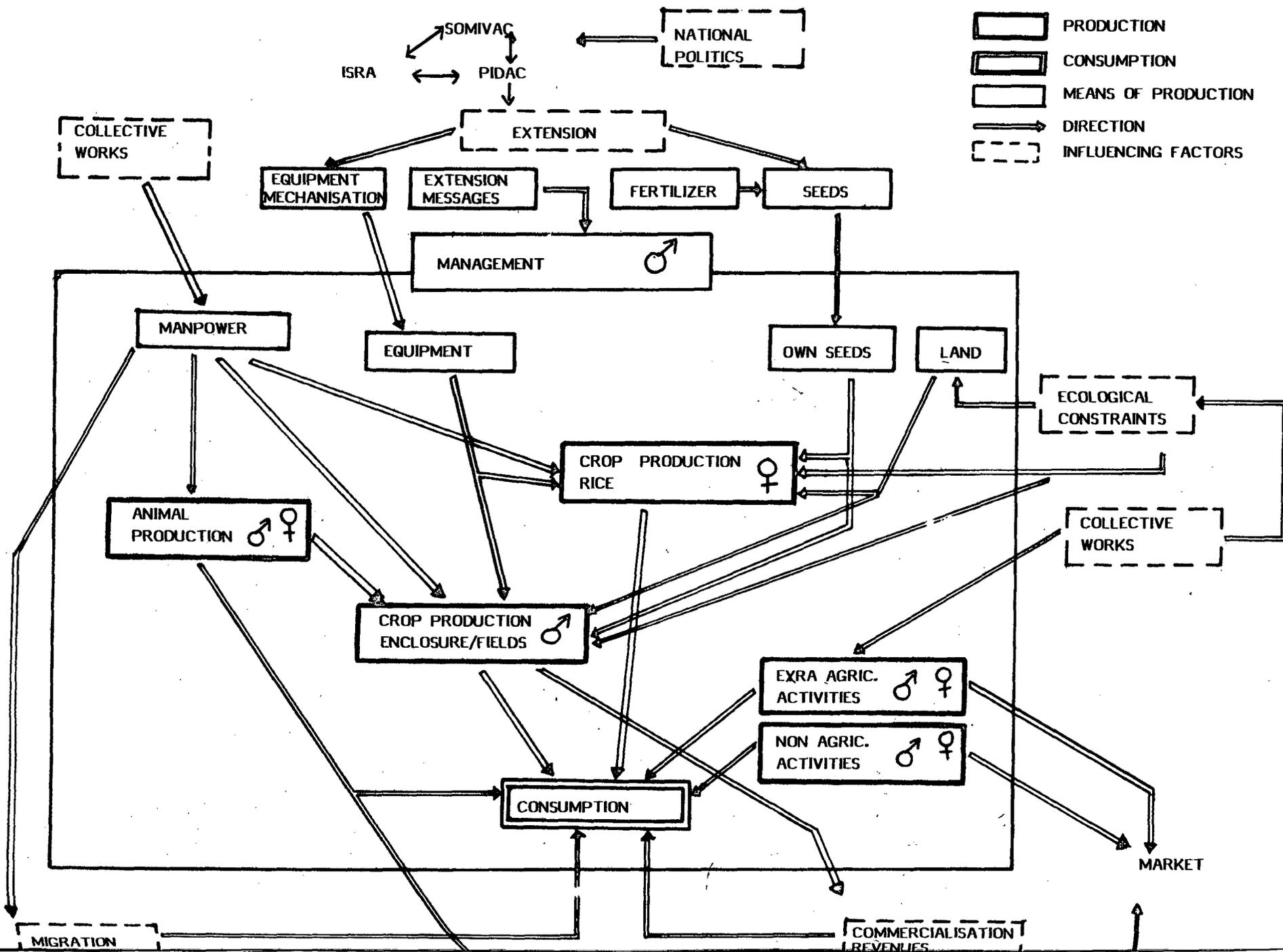


The money of the groundnut harvest is evenly divided between father and son.
The father gives also money to his daughter-in-law, former wife of his deceased son.

-  Production unit
-  Consumption unit
-  Intra-family-relationships

fig 2

MODEL OF THE FARMING SYSTEM IN THE KALOUNAYES REGION



ACTION AND RESEARCH PROGRAMME

The general strategy for the recommendation:

- to augment the degree of nutrition
- to maintain the degree of diversification of the cropping pattern
- the improvement should be possible mainly with the local means available for the farmers.

1. Land preparation and weeding (upland)

Hypotheses

- land preparation and weeding are main bottlenecks
At present they take too much time.
- the tools actually used are not adapted.

Experiments

Experimental station and on-farm trials: comparison of the effectiveness of plough and cultivator for both land preparation and weeding (with and without ridging). Measurements: yields, weed development, influence on soil characteristics, labour input.

2. Fertility

Hypotheses

- under actual cultural practices organic matter content of the soil is declining leading to lower soil fertility
- existing manuring practices are not very efficient. On the upland field they are nearly totally absent.

Experiments

- Experimental station - design composting techniques adapted to the region and with available inputs (for compound fields)
 - try out the possibilities of using crop residues as organic manure (avoid burning before land preparation).Measurements; labour input, yields, affects on soil characteristics.
- Long term observation and monitoring: planting of *Acacia albida* on a limited scale in farmers' fields. Trials with different planting patterns. Measurements: observing effects on yields, soil characteristics, pest incidence.

3. Crop association

Hypotheses

- The existing millet is not adapted to the changed environmental conditions
- The existing millet variety is not suitable for mixed cropping
- Pests and diseases play an important role in harvest failures.

Experiments

Experimental station: variety trials, selection on yield, yield stability etc., followed by mixed cropping trials.

4. Rice: land preparation

Hypotheses

- the tools presently used in preparing the rice fields for direct sown rice are not suitable to till the heavy soils.
- as a result of this, land preparation is done inefficiently and takes a lot of time
- the existing sexual division of labour inhibits an effective use of the existing ox-drawn equipment in the rice fields.

Experiment

To equip a limited number of villages with a plough and oxen, to be used only in the rice fields and to be handled by some young men in the village. Measurements: labour input, impact on cropping calendar, yields.

5. Livestock

Hypotheses

- cows are neglected
- groundnut vines are underused
- during dry season cows, goats and sheep suffer from water shortage.

Experiment

A study to the existing use of groundnut vines and to assess potential availability; study of the supplementary feeding of animals. Measurements: effects on yield and performance.

Priorities

To increase the degree of self-sufficiency and maintain the degree of diversification we want to give priority to the propositions on rice and millet (3) and (4).

As to mechanisation and fertility (1) and (2) to give priorities is difficult. The possibilities to improve the mechanisation seem promising but it needs considerable financial support (credit!).

Moreover long term improvement of the system doesn't seem possible without improving soil fertility. The problem of the proposition on fertility is that farmers at present don't seem to be very motivated to devote much time to this improvement measures. Much efforts of the extension services are therefore needed.