C I L S S

COMITE PERMANENT INTER-ETATS DE LUTTE CONTRE LA SECHERESSE DANS LE SAHEL

PERMANENT INTERSTATE COMMITTEE FOR DROUGHT CONTROL IN THE SAHEL

SECRETARIAT EXECUTIF

PROJET DIAGNOSTIC PERMANENT

PERMANENT DIAGNOSIS PROJECT

CROPPING SEASON MONITORING
AND HARVEST ESTIMATES

PRESENTATION OF EXISTING SURVEY APPARATUS
IN THE MEMBER COUNTRIES FOR COLLECTING
CURRENT AGRICULTURAL STATISTICS

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IN THE SAHEL (CILSS)

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INTRODUCTION

In the light of the diagnosis of the information systems existing in the member countries and in response to the priority needs expressed by the National Components (N.C) the Permanent Diagnostic Project (PDP) has been lending since the 1985-86 agricultural season, its support in setting-up agricultural survey systems or improving on these (where they already exist).

For this reason, the national programs of the PDP third phase had envisaged the start of his action in the States where this had not yet been done and continuing it in the others where it had had start.

PDP's action consisted in giving technical support and financial complement needed for the realisation of the operations.

The technical support whose results are contained in the present report was translated by consultation missions in the member countries where the latter attempted on the basis of a diagnosis of the situation, to set up survey methods or to improve on them where they existed.

The present report shall attempt to describe in a succinct if not over simplified manner the different systems as they were conceived in the Member-States either by the PDP or by other projects.

It is made up of two parts of which the first shows through a presentation of the common architecture the harmonization concern that prevailed in the different approaches, and the second brings out each country's specificities.

Following of the creation of these systems during the 1986-87 agricultural season has in face been conducted in an evaluation report in which proposals were made to better the situation in readiness for the next season.

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It is to be noted that regarding both aspects more technical details can be found in the reports prepared by PDP consultation missions for some countries.

GENERAL PRESENTATION

I - I STRATEGY DEFINED BY THE PDP

It aims at instituting in the Member States a unified system of collecting current agricultural statistics that is based on an evolutive process and which would ensure a progressive technical enrichment. In other words, it is a question, once the system is put in place, evaluating it at the end of each season to determine the shortcomings so that the necessary adjustments could be made there on in preparation for the following campaign.

1-2 INSTITUTIONAL ASPECT

In the majority of Member-States, the survey is carriedout by the Agricultural Statistics Departments (Divisions) which-are in general attached to a Directorate of the Ministry of Agriculture and for Rural Development. To do this, these Services either create their own decentralised structures or they lean heavily on those ones already existing (Agricultural Services, Agricultural Development Componies or Projects...) and which quite ofthen fall on under the same Directorate.

1-3 OBJECTIVES AND AREA COVERED

The objectives vary from one country to the other. For all Member Countries, it is a question of estimating the surface areas and the annual productions of the main crops and for some to monitor, on the basis of certain indications (rainfall, the phenological phytosanitary state of crops etc...) the farming season and or the prices of products in the market as well as the food situation.

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The surveys take into consideration all the farms that are situated in the rural areas excepting the developed or irrigated areas whose statistics are provided by the companies responsible for them (like ONAHA in NIGER, SONADER in Mauritanie and SAED in Senegal). It excludes market-garden crops (with the exception of CAPE VERDE), off-season crops and these grown in the urban and semi-urban areas.

1-4 GEOGRAPHICAL SIGNIFICATION LEVEL RETAINED

Generally, this concerns the administrative subdivision to which the villages are attached and whose nomenclature differs from one State to another. The survey therefore covers all these subdivisions within the same country.

1-5 SURVEY METHODOLOGY

Everywhere the methodology used is the sampling system at varying levels and stratified at the top level based on a single criterion which is the size of the village populations (the most frequent case) or of several criteria (the rarest case). The size of the samples at different drawing levels and within each stratum is determined on the basis of a compromise between the scientific exigencies and the human and material means available (1)

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(1) In several instances, having limited means, they are the ones that are the most determining.

1-6 SAMPLING PLAN

It is carried out in an independent way for each area (administrative subdivision retained) within which are generally constituted three village strata (1).

- At the first level and in each stratum are drawn the sample villages with probabilities that are proportionate to a size (population) measurement.
- At the second level is drawn in the first place a list of farms within the sample-villages and there after are drawn the village-samples with equal probabilities.
- At a third level is prepared in the first place the list of plots with crops on them in the farms of the sample-farms of each sample-village and then are drawn the sample-plots percrop and in which the density-yield plots are placed (2).

The systematic drawing is used at each drawing level.

1-7 ESTIMATION AND EXTRAPOLATION METHODES

Based on the sampling plan and the drawing pattern at different levels, estimation and extrapolation formulas are drawn-up to enable the passage of data collected on the sample with results sought at the level of the province. Estimates at the level of higher subdivisions and of the country are obtained by simple summation of the results obtained at the level of the province.

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(1) The limits of these strata are fixed identically for all the areas, what would amount to highly imbalanced strata as far as their numbers in certain areas go, whereas in others certain strata are not at all represented.

(2) This is only done in the states where the human and material means used are insufficient enough to cover all the plots of the sample-farms.

Estimates of surface areas are done by speculation and they concern, in most cases, the areas sawn and not the ones harvested. Indeed, the mesurements are generally carried immediately after sowing and in general they are done again after harvests. These measurement are for all plots of the sample-farms and the accepted closure error is often 5%.

The forecast and observed yields are guessed by plot. But since sometimes each plot of the sample-farms does not receive a square of yied, an average yield per an average village sample is determined and defined as the arithmetical average of yields taken by the surface areas of the plots concerned; the estimated yield for the plot is obtained by multiplying the number of potential ears counted in the yield plot by the average weight of a given ear by weighint a few ears of the previous year's harvest and deducting from it a certain loss rate which generally falls between 20 and 30%, the yield observed per plot is determined through weighing the production of the square yield at its dry state.

Production estimates is obtained from the product of these two variables (surface area and yield).

II SPECIFITIES OF EACH MEMBER STATE

II. BURKINA FASO

There exist a unified methodology which was elaborated following a survey-test done during the 1985-1986 agricultural campaign and which was made available to all ORDS (1) of the country since the 1986-87 season.

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(1) Regional Development Organ

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Howener in the ORD of the Centre North (KAYA) it was the object of limited implementation named "large-scale survey Test" which was made possible from funds provided by the Netherlands and this simultansously with the test of the Early Warning Sysytem (EWS) financed by the PDP (1).

Its objective is to estimate on the one hand the variables area and yield-concerning the main wrops of the zone which are sorghum (white and red), rice, maize, groundnuts and cowpea in pare farms and in mixed farms and on the other the animal populations. The apparatus in place at the Centre-North ORD was placed under the Agricultural Statistics Service of the Department of Research and Programming of the Ministry of Agriculture and Livestock and includes a staff composed of 73 surveyors 14 controlers and 3 regional supervisors who were recruted specially for the operation and supported by a central team and a Technical Committee.

A staff of 73 surveyors, 14 controlers and 3 regional supervisors recruted specially for the operation and supported by a central team and a Technical Committed (2).

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(1) The EWS methodology has been the object of a document which was presented at the 3rd Regional Consultation and Technical Committee Meetings. A document has, besides, been evaluating its implementation on the strength of the results obtained.

(2) It is worth while noting that the methodology was applied in the other ORDS with their own human resources although with material support from the project.

.../...

The province is the sub-sector (agricultural subdivision of the ORD territory which totals on the average some fifteen of them) and the methodology is based on a survey at two levels with stratification at the second level which was implemented as follows:

- At the first level: on the basis of the villages fact sheet in each subsector with its population, a random choice of one village out of 5 was done, in a systematic manner with proportionate probabilities to the population
- At the second level: after counting the homes and households in the sample-village, three household strata were constituted per village (1-5 persons, 6 to 10 persons and morce than 10 persons) from which 8 households were chosen on the basis of a sharing that is proportionate to the number of each stratum.

Area mesurements per plot gathering concerned all the plots of the household-sample and a plot (1) of density-yield and they were placed in each plot for the estimation of projected yields and of real yields.

A computer processing of the data collected is planned.

11-2 CAPE VERDE

The methodology defined by the PDP during the 1985-1986 (2) agricultural compaign was improved on during the present compaign thanks to the technical assistance given by the FAO/ICP/4504 project.

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(1) In the Centre-Norht ORD 2 squares were placed per plot

(2) It has been the subject of a document examined at the 3rd Regional. Consultation meetings of the Technical Committed and found to be insufficient.

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The survey is under the GEP (1) and is being executed by the staff of the agricultural statistics service which at the central level is composed of 2 extention workers, 2 technical assistants of whom is a statistician and 4 supervisors in the field out of 19 surveyors.

The survey aims at estimating the surface areas and productions of the main crops (Maize, all varieties of Beans, Groundunts, Angel peas, cassava, sweet potaloes and potatoes), to make forecast test as regard production for maize and Beans (the major crops) and to gather information on the charactiristics of cultivated areas (farming and irrigation methods in particular).

It covers the four main agricultural islands of the country (FOGO, SANTIAGO, SANTO-ANTAO and San Nicolau) and is realized either at the farms (agricultural families) where there area easy to identify or in the localities or zones where neccessary.

Depending on the island, the province concerned is either the Council (S. Nicolau, Santiago, Santo Antao) or the frequesia (Fogo). In these areas the survey base constituted by the list of localities or agricultural zones of the different islands surveyed is stratified according to 2 crossed criteria which are the dominant agricultural type ("regadio" or "sequeiro") and the eco-climatic situation (humid, sub-humid and semi-arid zones) (2).

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(1) Gabinete du Estudos e Planeamento

(2) This job has already been fone at Fogo by the project entilled "projecto integrato de desinvolvimento di Fogo et Brava" and San Nicolau for the purposes of an agropastoral study carriedout within the framework of the "French Association of Volunteers of Progress.

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Data collection is done through direct interviews with heads of farms inorder to evaluate the surface areas cultvated and the productions hoped for as regard the different speculations since the objective measurements have been made difficult by the Archipelage's very regged landscape. For the experimental operation, the fixing of plots (3 x 5m for the "sequeiro" crops and 2m x 2m for the "regadio" crops and the tubers) is done in a well-thought manner in order to minimize the difficulties.

A computerized processing of the data is planned with the assistance of "The National Institude for support to the Development of Computer Science".

II-3 THE GAMBIA

The agricultural survey entilled "National Agricultural Sample survey (NASS) took off since the 1985-1986 agricultural season under an improved form which has been suggested by the PDP after a diagnosis of what existed then.

The "Planning, Programming and Monitoring Unit " under the authority of the Ministry of Agriculture is the organ responsible for its execution and more specifically the branch there of responsible for Agricultural Statistics and Rural Economy.

N.A.S.S. whose activities are nationwide tires to gather information in almost all areas of the agricultural sector (availability and use of imputs, agricultural equipment, farming techniques, livestock, food situation, surface areas, yields etc...)

For this, the area concerned is the District (an Administrative subdivision) and the methodology is based on a stratified survey at two levels using the villages as primary units and as secondary units the farms known locally as "dabada". The implementation of this methodology as it was conceived shall be done in the following way:

- Ar the first level: having made an exhaustive list of all the "dabadas" in 3 sample-villages, 15 are drawn at random in all three villages after a distribution which is proportionate to the

.../...

number of dabadas surveyed in each village.

Objective measurements of surface areas are carriedout on all the plots of the sample-farmlands with an accepted closure error of 5% as well as the placing of yield squares whose dimensions vary according to crops (generally 1m x 1m for rice and 5m x 5m for other crops).

The extrapolation method can be summed-up in determining an average value of the variable study on the sample-dabadas and multiply this by the theoritical number of dabadas which in the district is estimated on the basis of the total population of the district and of the average population of a dabada. The data thus obtained per district are gathered for the Division (subdivision that is above the district) level.

Data processing has since the 1986-87 season been computerized.

II-4 MALI

The survey dates back to 1963 and has benefitted since 1983 through the PADEM (1) project from financial support of the United Nations which enabled amongst other things to:

- review the methodology by adopting a master-sample which is valid not only for the agricultural surveys but also socio-economic surveys in the rural area.

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(1) African Programme for Setting up Permanent survey systems for Households.

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- realize in 1989 an agricultural survey in place of the agricultural survey that makes available structural data at the circle level (administrative subdivision) to serve as analysis framework for future agricultural surveys.

This annual survey has multiple objectives amongst which are estimating surface areas and yields with a view to determining productions of main crops, and estimating the annual population.

It is under the purview of DNSI (1) and is implemented by its Division which to do this, leans on the Regional Planning and Statsitics Offices.

The area selected is the region(2) and the methodology is based on survey at two degrees which is implemented thus:

- At the first level: the survey base is constituted by the Enumeration Section (E.S.) as defined at the population census of 1976 and which corresponds to a partitioning of the country into zones of equal importance from the demographic point of view, a sample of 431 ES is drawn at this level following a double criteria taking into account the administrative division and the division into homogeneous agro-climatic zones.

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(1) National Statistics and informatics Department

(2) This area has been brought to the circle for the 1986-87 season.

.../...

At the second level: after surveying farmland in each sample ES., 5 sample-farmlands are drawn in a systematic manner and in equal probabilities (1).

At the third level: after counting the cultivaled blocks and plots yield plots of sample-farmlands, out of .is drawn for the placing of whose sides are fixed at 5 m for all crops.

The survey gives priority to objective measurements ands thus all cultivated plots of sample-farmlands are measured with a tolerant closure error of 5% and the yield plots harvested and weighed by bag.

Howener the survey tries at the sametime to quantify the opinions of farmers at the level of yield plots.

The processing of data has been computarized with the help equipment belonging to DNSI.

11-5 MAURITANIA

The agricultural survey entilled "Harvests Monitoring, Evaluation and for ecasting (MEF) started during the 1985-1986 season with the financial assistance of PDP and a UNDP/FAO/UNSO project "Development of Agricultural statistics", the latter having enabled already in 1984-1985 the realisation of an agricultural survey.

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(1) The methodology differentiates at this level between the sedentary milieu and the nomad milieu whilst basing itself however on the same principles.

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Its objectives are the monitoring of the manner in which the agricultural campaign is progressing by the use of certain indicators and make forecasts and estimates of harvest early enough to enable the political authorities to take in good time appropriate measures to quarantee food supply for the people.

It is executed by the Agricultural Statistics Service (ASS) which is attached to the General Secretariat of the Ministry of Rural Developement. This Service which continues to be supported by the CTP (1) of the UNDP/FAO project relies on its own structures which is composed of a central team and three regional offices (2) in which the surveyors-observers play a major role in data collection.

It is of a national scope and it covers the six agricultural regions of the country namely:

- River zone: Guidimaka, Gorgol and Brakna
- Other zones: the 2 Holdh (El charbi and El chargui), Assaba and Trarza.

The methodological approach is quite complex and resemble a sampling at several levels presented thus:

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(1) Principal Technical Adviser

(2) There are now four of them since the 1986-1987 agricultural campaign.

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At the first level: the sampling basis constituted by the divisions is divided into two strata on the basis of the existence or otherwise of wale (1) crops; then:

- in stratum 1 (non existence of wale) 9 departments are drawn in a systematic manner with probabilities that are proportionate to the surface area cultivated according to the survey. In fact 3 out of the 9 are ret retained a priori and termed as "self-represented".

- in stratum 2 (existence of walo), the 8 divisions concerned of the country are all chosen.

At the second level: the introduction of the notion of "observation zone (OZ)" constitutes the originality of this approach.

The O.Z. corresponds to a group of 100 farmers as defined by a systimatic drawing starting from a "starting point" farmer and following a given orientation. Thus 70 OZs area retained for the entire country, 45 for stratum 1 (drawing in a systematic way of 5 per division) and 25 for stratum 2 (distributed amongst the 8 divisions proportionately to the area sown with walo following the survey.

At the third level: at the level of each sample-observation a systematic drawing is made of 10 farmers from the 100 chosen on the basis of the sizes of their families.

In the final analysis, it is a matter of a drawing at 3 levels for stratum I and at 2 levels for stratum 2.

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(1) Fall cultivations done in released zones generally located on Senegak River border.

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II-6 NIGER

Agricultural survey exists since 1982 and follows an FAO project which has enabled the realisation of agricultural inquiry. It underwent some methodological modifications during the 1985-1986 season, relating to sampling and it is in its new version that it is presented here.

It is a survey with multiple objectives (nodoubt the most complete in the subregion) which aims in particular at estimating surface areas, projected and actual yields with a view to determining productions of the main yields, as well as monitoring the products on the market as well as the populations food self-sufficiency level (1).

It is executed by the Agricultural Statistics Department which is attached to the Research and Programming Division of the Ministry of Agriculture. This Department relies on its own staff not only at the central level but also in the fields, where it is placed under the control of the decentralized structures of Agriculture.

It covers 6 agricultural Departments comprising 31 districts which are chosen as the area and it implements a survey plan at two levels and executed in the following manner:

At the first level: on the basis of a villages fact sheet issuing from the administrative census, 3 strata per district are defined in the first place on the basis of the demographic criterium (less than 500hts, between 500 and 1000hts, + 1000hts). Then 12 villages are drawn per district in a systematic way with proportionate probabilities to their resident population.

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(1) The latter part is not, in reality, directly taken into consideration in the survey apparatus.

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The execution of the operations makes provision for four passages by the surveyors-observers out in the field inorder to sweep the areas surveyed and also missions by the regional and central teams respectively for quality drecks.

The surface area of the plots sown and where crops did effectively grew is measured after having classified these plots per plot and per typology. It is the only variable that is a subject of actual extrapolation by the formulas used according to different sampling plans adopted.

The reel yield is determined from sample-cuts (150 are envisaged) in some of the density plots (by 10 x 10m for the spacedout crops and by 2x2m or 1x1m for the dense crops) whese positions are fixed by stone-throwing. This consists in harvesting in the plots, the ears of 5 seedholes that succeeded, in counting them and preserving both after beating and drying them, and in calculating the average yield per seedhole which is then brought on to the average density per hectare of the crop at the time of harvest inorder to have the crop yield. The latter is determined in one plot out of 10. Then yields per crop at the zone, division yields obtained.

Estimated yields are obtained through interviews with farmers on the results expected in each plot as compared to the previous year's campaign.

Data processing which is in part done by hand should progressively be heading towards complete computerization.

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At the second level: after surveying the farmers in the sample-villages, 5 farmers are selected per village in a systematic manner and with equal probabilities after having arrenged them in a decreasing manner based on the number of the active population.

For the different estimaties of the variables studied, all the plots of the sample-farmers are measured by pointing and use of the chain with tolerated closure error of 5% and receive a density-yield plot of placed in a hazardous manner.

The estimated yield (Millet, Sorghum) is determined by counting after eaving of potential ears in the squares and the number obtained is multiplied by the average weight of a given ear on the harvests of previous years. The gross figure obtained undergoes a lowering of 20% to take into consideration various losses.

The "prices of products" component is done all year round i: e two observations every month but ensuring that only one is done in any one day. The choice of markets is based on the posting and movements of surveyors.

The "Monitoring of food self-sufficiency" component is executed in alnost all the villages of the country on the basis of qualitative and quantitative informations (where this is possible) provided by the district chiefs with the help of the technicians operating in the field.

The processing which was manual, rapidly be heading to computerized with the assistance of USAID.

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At the 3 level: an inventory of all the plots relative to the crops on the sample-farms is drawn by speculation. For each village these lists are grouped together by speculation inorder to constitute a survey base in which 20% of plots are drawn, in which ones are to be placed the yield plots fixed at 5m x 5m for groundnuts and 10m x 10m for grains.

All the plots of all the sample-farms are measured according to the classical method of pointing and chaining with a tolerated closure error of 5%.

The estimated yields are determined according to two combined methods namely the objective measures and the farmer's opinion. The first is by counting at the earing of potential ears within a sub-plots of a reduced rate and whose measurements are known, defined in the out put plots. After determining the average weight of an ear on the yields of the preceding year, the latter is multiplied by the number of ears estimated within the plot and the gross results suffer a decrease of 20% to take into account losses.

The second one is based on the declarations of farmers during earing concerning the expected production per plot, given their appreciation of certain determining indicators of the agricultural campaign.

A computenzed processingof data was envisaged and the questionnaires were consequently elaborated.

.../...

11-7 SENEGAL

The agricultural survey was started during the 1985-1986 agricultural campaign but the improved version described here only started during the following campaign.

It is intended to estimate the surface areas and yields in order determine the productions of the main crops.

It is under the purview of the Agricultural Statistic. Division (DISA) which falls under the Department of Agriculture of the Ministry of Rural Development and its execution is assured in the field by the decentralized structures of this Division at the grassroots level.

It covers all the districts (area) in which agriculture is the dominant activity and uses the surveying at 3 levels stratified at the 1st level defined thus:

At the 1st level: the survey basis constituted by all the villages of the district (1) is divided into 3 strata and based on the population criterium (- than 200 hts, 200 to-than 500hts and more) and 1/10 of the villages are drawn in each stratum in a systimatic manner with proportionate probabilities commensurate with the size of the populations of the villages.

At the second level: an exhaustive list of the farmers in all the sample-villages (1) is drawn and the drawing of the sample-farmers is also done in a systematic way with equal probabilities based on the different rate by stratum which are: 20% for stratum 1, 10% for stratum 2 and 2% for stratum 3.

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II-8 TCHAD

The agricultural survey entitled "Monitoring, Forecasting and Evaluation of harvests" was prepared, to be executed during the 1986-1987 agricultural campaign.

It should enable the understanding of certain pertiment indicators for the monitoring of the evolution of the agricultural campaign, making a first forecast of harvests and estimate final productions at the right time.

It is executed by the Agricultural Statistics Division (ASD) falling under the purview of the Department of Agriculture of the Ministry of Agriculture and Rural Development. The ASD to do so relies on its own staff composed at the central level of 2 statistics engineers including the head of Unit and 4 supervisors and in the field 60 controlers and surveyors.

It covers the entire country not occupied, that is 5 prefectures and 2 sub-prefectures in the Sudan zone and 7 prefectures in the Sahelian zone and as province it uses the UNDR (1) sector.

The sampling method defined is a survey at three levels, strafied at the first level according to the dominant crop, distinguishing between the Sudan zone and the Sahelian zone given the basic information existing at level

In the Sudan Zone

The total number of 50 sample districts (2) was maintained given the means available in equipment and personnel and the districts were distributed in the different sectors proportionately to the number of farms.

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(1) National Rural Development Office (main agricultural development body of the country).

.../...

At the third level: 6 sample-farms are drawn in systematic way with equal probabilities after surveying the farms in each sample-village.

In the Sahel Zone and in Salamat

It was decided to limit the primary sample to 40 districts in the Sahel zone and to 5 districts in Salamat distributed in the various sectors proportionately to the number of districts per sector.

Drawings at different levels are done in like manner but this time at equal probabilities and without stratification at the first level for lack of basic information.

Thus in total the survey affected 2850 farms of which 1500 are in the Sudan zone, 1200 in the Sahel zone and 150 in Salamat.

The estimation of surface areas is done with different formulas depending on the zone and based on the drawing method. Extrapolation is done at the stratum level in the Sudan zone and the results at the sector level are obtained through simple addition whereas it is so at the sector level in the Sahel zone. The surface areas are measured at all the plots of the sample-farms through pointing-chaining with a tolerated closure error of 5%.

Yield is obtained through the placing of the aleatory method, the harvest and weighing of yield plots(by 1m x 1m for rice and 10m x 10m for other grains) in all farmlands.

Data processing was to be done by hand.

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REFERENCE DOCUMENTS FOR MORE DETAILED TECHNICAL INFORMATION ON THE METHODOLOGIES

BURKINA FASO:
- Annexe 1 of the Activity Report January to December 1986 of the "large-scale enquiry" project of the Centre-North ORD

CAPE VERDE:
- Survey Manual 1st Phase
  Complementary Survey Manual 2nd Phase (Agricultural survey 1986-1987 CILSS/DIAPER/FAO/TCP/4504)
- Summary methodological document ofthe agricultural survey 1986-1987 (FAP/TCP/CVI/4504 Project)
- Support to the setting-up of a survey system in Cape Verde (MINVIELLE Consultancy Mission for the PDP November 1985)

THE GAMBIA:
- Consultancy report for PDP on surveys done in the Gambia by P.P.M.U (June 1985 MINVIELLE)
- Evaluation of agricultural survey system of the Republic of the Gambia (Consultancy Report for PDP by ZOUNGRANA June 1986)

MALI:
- Handbok for data collection (Padem/18 August 1985)
- Statistical data on agriculture available at the DNSI

(Doc. presented by Oumar COULIBALY at the Seminar of 16 to 20 July 1985)

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MAURITANIA: - Methodology of the survey "Monitoring, Evaluation and Forecats of harvests" (Permanent Diagnostic Seminar CILSS/EDF February 1986)

- Evaluation of the "Monitoring, Evaluation and Forecast of harvests" survey of the 1985-1986 campaign in Mauritania (Consultancy report ZOUNGRANA for the Permanent Diagnostic Project February 1986)

NIGER: - Evaluation of the Monitoring System of the agricultural campaign and the Forecasting of harvests of the Republic of Niger (Mission report by Charroy executed for PDP/CILSS).

SENEGAL: - Consultancy report PDP done to evaluate and enhance the agricultural survey carried out in Senegal during the 1985-1986 campaign (by KEITA-NDIAYE in February 1986).

TCHAD: - Support in setting-up an agricultural survey system in Tchad.

(Consultancy report PDP carried out from 15 - 22 July 1986 by ZOUNGRANA).