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AGRICULTURAL SAMPLE SURVEYS AND CENSUSES IN THE PHILIPPINE DATA SYSTEM

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Introduction

The arduous task of establishing a sound agricultural data system in many developing countries, including the Philippines, is beset with numerous problems, the foremost of which is the funding of statistical projects and activities. In the past, very low priority had been given to investment in this area. With more efforts now being exerted in planning development programs, the agricultural data system in the country has been receiving substantially more attention than before. For instance, the budget of the Bureau of Agricultural Economics in 1978 of about ₱21.0 million is almost five times that of 1974. However, while the BAEcon data system has improved over the years (as more funds became available for statistical operations), the system is still inadequate to provide more comprehensive and better quality output. Good data are costly to acquire and the data system can only be as good as the resources put into it.

The BAEcon statistical programs in the past, largely because of resource constraints, were focused mainly on rice and corn; hence, the system of collecting data on other crops and livestock almost completely rode with the data system on rice and corn. Furthermore, the data output of current agricultural surveys have been limited to the major agricultural characteristics (e.g. area and production of crops, livestock population, etc.) on the regional and national levels. In other words, the present data system in agriculture, because of the constraints mentioned above, cannot fully cater to the demands for information at the desired levels of planning which have seeped down from national to regional and provincial.

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Development of the Philippine Agricultural Data Collection System

The current status of the system and the existence of problems in putting together crop statistics in the Philippines could perhaps be better understood by going over, briefly, a history of the country's agricultural data system. Statistics on agriculture (including livestock resources) have been the concern of all the Philippine agricultural censuses. The first such census was conducted in 1903. Each of the censuses undertaken after that year, the last one of which was in 1971, was characterized by expansion and improvement in the nature of the data collected, including those on livestock and poultry.

Sampling was introduced in the 1960 census; only those farms larger than 10 hectares were completely enumerated, and 1/3 of those below 10 hectares were taken as samples. In 1971, the cut-off area became 5 hectares, while a 10 percent sample was drawn for those 5 hectares. Outside of census activities, collection of agricultural data in the country was an activity that changed hands among government agencies from 1919 to 1953.

With the 1918 census data as the benchmark, current estimate on an annual basis were provided by the Department of Agriculture and Natural Resources starting in 1919 until the function was assumed in 1940 by the Bureau of the Census and Statistics. Twelve years later, the responsibility was returned to the Department of Agriculture and was charged to the newly-created Bureau of Agricultural Extension. Incompatibility between promotional activities in agricultural production and the collection of statistics brought the function to the newly-created Agricultural Economics Division, staff office in the Department proper, in 1953. As this office was the forerunner of the present Bureau of Agricultural Economics which continues to undertake the activity, it can be said that the collection of current agricultural statistics has been undertaken by one office of the government over the past two decades.

Up to 1953 the method employed for annual estimates in agriculture outside of census work was the accomplishment of data forms by local extension agents. Guided by the latest census information as benchmarks, extension workers used no defined techniques; they lack the necessary training to collect statistics and therefore followed procedures thought best under the conditions obtaining in the assigned regions. Thus, the

measurement of agricultural output and productivity was essentially judgment estimation.

The creation of the Agricultural Economics Division in 1953 (which was brought about in order to centralize the collection and the release of official rice statistics) and its subsequent elevation to a Bureau of Agricultural Economics ten years later provided the opportunity for significant development in the Philippine agricultural data system. Initial success in the test applicability of national sample surveys for crop and livestock estimates paved the way for their continued use in the past twenty years. During this period, continuous improvements in sample design, questionnaire design and field enumeration techniques were made.

The following were the salient features of the sample designs employed by the Division, and later by the Bureau:

1. **Initial 1954 survey**

   a. Stratification of the country into nine geographic regions

   b. Three-stage sampling; towns, random points on town maps, clusters of farm households from each random point.

   c. Sample size: 40 towns, 400 grids, 8,000 farms.

2. **1955-1957 surveys**

   a. Each province in the country was treated as a separate stratum.

   b. Three stage sampling: Towns, barrios (villages), farm households.

   c. Random sampling at each stage.

   d. Sample size: 420 towns, 1,270 barrios and 12,300 farms.

3. **1958-1960 surveys**

   a. Barrios in each province were substratified by cropping pattern (major crops raised in the barrios).

b. Two-stage sampling: Barrios and farm households.

c. Sampling of barrios with probability proportional to size (pps) and simple random sampling of farm households.

d. Sample size: 1,130 barrios, 5,500 farms.

4. **1961-1966 surveys**

a. Substratification within each province by palay density and geographical location.

b. Two-stage sampling: Barrios and farm households.

c. Simple random sampling of barrios within the stratum: systematic sampling of farm households.

d. Sample size: 1,200 barrios, 6,000 farms.

5. **1967-1968 surveys**

a. Substratification within provinces by the presence or absence of production programme assistance, by cropping pattern and by farm area.

b. Two-stage sampling: Barrios and farm households.

c. Simple random sampling barrios within the stratum: systematic sampling of farm households within barrios.

6. **1969-1972 surveys**

a. Stratification within provinces reduced to cropping pattern and farm size.

b. Two-stage sampling: Barangays and farm households.

c. Simple random sampling of barangays within the stratum; systematic sampling of farms.

d. Sample size: 2,300 — 2,800 barrios; 10,000 — 14,000 farms.

As presented above, the development of annual sample surveys in the Philippines passed from a three-stage design to the present two-stage scheme as more information to enable the

improved stratification of barangays were accumulated. These surveys are enumerative in nature and interviewers are hired and intensively trained prior to the conduct of each year's field operations. Changes in survey design have been aimed at the precision of estimates; first at the national level and later at the regional and, to a limited extent, provincial levels. The increased availability of lower-level estimates necessarily called for constant expansion of the sample size.

Up to 1968, the Bureau of Agricultural Economics conducted the annual Crop and Livestock Survey, the agency's major field operation for current data on agricultural output and productivity, separately conducted from surveys aimed at amassing other agricultural characteristics such as farm prices, labor and wages. With the considerable increase in sample size of the Crop and Livestock Survey, these smaller surveys were fused into a major activity in 1969 to what was called the Integrated Agricultural Survey (IAS).

Components of the Statistical System in Agriculture

A. The Integrated Agricultural Surveys (IAS)

1. Purpose and Scope of the Survey

   The primary purpose of the survey was for the estimation of crop area and production, particularly on rice and corn and other selected major crops, as well as other relevant characteristics of crop area and production.

2. Type of Survey

   Before 1976, the IAS covered both crops and livestock. **Starting in 1976 however, it became purely a rice and corn survey.** Independent surveys on livestock (1976) and fruits (1977) were undertaken.

3. Coverage of the Survey

   Geographically, the IAS covered all the agricultural areas of the Philippines except those of two small islands/provinces which were not included due to administrative and operational difficulties and owing to the fact that their contribution to the total agricultural output is insignificant.

4. Design of the Survey

The survey employs a two-stage stratified sample design with the barangay (smallest administrative unit of the country) as the primary sampling unit and the farm household as the secondary sampling unit.

Each province is treated as the domain of the study and the sampling frame of the primary sample units (barangays) is based on complete enumeration of the 42,000 barangays in the country.

Barangays (PSUs) are stratified into 6 strata and varying sampling frames were used in each stratum as follows:

a. Barangays with 500 hectares of rice and corn — 100 percent

b. Barangays with 200-499 hectares of rice and corn— 28 percent

c. Barangays with 100-199 rectares of rice and corn— 20 percent

d. Barangays with 1-99 hectares of palay and corn — 8 percent

e. Barangays without rice and corn and with farming households — 2 percent

f. Barangays with farming households but no croplands — 2 percent

Sample barangays are drawn independently (for strata 2-6) by simple random sampling without replacement.

The secondary sampling units are the households stratified into:

a. Households operating rice and/or corn farms; and

b. Households operating other crop farms.

About 1/15th of households in each stratum are drawn as samples by systematic sampling with the random start.

A ratio estimator is used in estimating area and production for each crop. Variances as well as coefficients of variations of estimates are also derived for purposes of validating results of the survey and introducing improvements in the design, particularly on the size and allocation of samples by stratum and by province.

Methods of Enumeration

The interviewer meets with every sample farmer personally and interviews each one of them for the purpose asked for in the questionnaire for the survey. Upon completion of the enumeration work in all barrios assigned to them, the interviewers turn over to their immediate supervisor the accomplished schedules for the latter's scrutiny and editing after which these are sent to the Central Office for final processing and tabulation.

Organization of Field Work

The Bureau of Agricultural Economics of the Department of Agriculture is charged with the function and responsibility for the conduct of the surveys in agriculture. The Office was, for 10 years a staff division of the Department before being elevated to a Bureau in 1963. As organized and operated since then, the BAEcon is headed by a Director, who is assisted by 2 Assistant Directors: one for Statistical and Administrative Operations, and one for Agricultural Economics Research and Marketing. Directly under the Office of the Director is the field service staff composed of regional and provincial personnel. The functions of the provincial offices are under the supervision of 12 regional coordinators at offices located strategically within the administrative regions.

The planning of agricultural surveys and the compilation, analyses, and interpretation of the basic statistics relating to agriculture are undertaken through the Office of the Assistant Director for Statistical and Administrative Operations and the Statistics Division directly under his office. Data collection is performed by the field services. For many years now, the major portion of the work of the field personnel of the Bureau has been the gathering of basic agricultural statistics. The

provincial offices recruit, select, hire and train qualified interviewers.

Training of Field Supervisors

All the Provincial Officers-in-charge undergo refresher training sessions under respective regional offices, particularly on the mechanics and details of the survey, for about three days. After this training the field statisticians return to the respective offices to recruit and train interviewers for the survey.

Recruitment, Selection, and Training of Interviewers

Recruitment is confined within the survey province particularly within or around the sample barangays. The following criteria are followed in recruitment:

1. Applicant must have at least 2 years of college work, preferably in agriculture, commerce, or engineering.

2. Applicant must be from 20 to 35 years of age, and in good health.

3. Applicant must be able to speak and understand the dialect spoken within the province so that he will be able to translate the English version of the questionnaire to the respondent.

4. Applicant must indicate his willingness to accept the work, which involves foot travel where respondents are located, at the minimum wage within a fixed number of days.

5. Applicant must pass a screening test as well as complete the required pre-survey training of at least three days before the actual survey is conducted.

Considering such other criteria as background, previous experience and fitness, the required number of interviewers is drawn from those who meet the above requirements and having passed the qualifying written examinations. A total of about 800 regular personnel of the Bureau who act as supervisors in the survey and about 1,000 emergency interviewers for the major rounds and about 500 for the minor rounds are employed. Survey supervisors are provided with 73 jeeps and 69 motorcycles (for the whole country) in making their supervisory rounds.

Before the actual survey is conducted in the sample barangay, the supervisors, as well as the enumerators, are instructed to get the full cooperation of the barangay officials and this measure has greatly enhanced the cooperation of respondents through the intercession of such officials.

For controlling and checking the field work, a tight scheme of supervisor is enforced. The regional supervisor is responsible for the effective supervision, coordination and completion of survey work in his region. He follows a regional program of supervision designed to insure proper implementation of field procedures and completion of the survey as a whole. Such program of supervision includes among others, an organized plan for follow-ups and field checking of the activities of the provincial supervisors and interviewers. As mentioned previously, for purposes of controlling the quality of data collected, he is required, especially during major surveys, to undertake post enumeration interviews personally in the selected sample barrios.

Other Information About the IAS

The IAS is conducted five times a year: 1) the first round in September; 2) the second round in November; 3) the third round in January; 4) the fourth round in April; and 5) the final round in July.

The first two rounds, which cover a sub-sample size of about 2,000 sample barangays and 15,000 sample households, are aimed to collect indicators for purposes of forecasting rice and corn production for the period July to December or the first semester for the crop year starting July 1st and ending June 30 of the following year. The third round in January which covers 4,000 sample barangays and 30,000 households provides the final estimates for rice and corn during the first semester and forecast for the remaining semester of the crop year. The fourth round in April seeks to confirm the forecast obtained in January, and the final round in July provides the final estimates for the second semester ending June 30.

The survey on prices, farm labor, cereal stocks inventory in households and other special surveys on the current rice and corn programs are still linked with the IAS. These surveys cover the same sub-sample size equivalent to 1/4 of the total number of sample barangays in the final round conducted in January and June.

B. Livestock and Poultry Survey

The IAS design has been found to be inadequate for collecting livestock and poultry data. The situation gave rise to the need to conduct an independent survey on livestock and poultry. In view of limited resources (which situation has been a major reason for being unable to conduct an independent survey on livestock), the BAEcon sought the assistance of the BAI in terms of additional funding and personnel. An agreement was finally reached in 1975, for the two agencies to undertake jointly, independent of the IAS, a livestock and poultry survey.

The first of the project included the training of all BAI technicians, including their Regional Directors and Provincial Veterinarians, on the basic concepts of field data collection. The training was followed by the construction of the frame which was used in the survey on commercial livestock farms. This latter activity was performed by the field personnel of both agencies.

General Scheme of the Current Livestock Surveys

1. For Commercial Livestock Farm

The survey for each of the types of livestock and poultry (cattle, hog, chicken and duck) employs an independent survey frame. Farms are grouped according to size in terms of number of livestock raised. All farms classified as very large are completely enumerated. On the other hand, samples are drawn by simple random sampling from the group of small commercial farms, using a variable sampling fraction; i.e., heavier sampling rate for medium-size farms. Each province is considered an independent domain of study.

The survey covers about 4,000 sample farms out of about 8,000 commercial farms of the four types of livestock.

2. For Small Farms (Backyard)

The survey employs a two-page sampling design; the barangay is the primary sampling unit and the household, the secondary sampling unit.

The barangays within the domain of study (province) are categorized according to the predominant livestock raised and according to size on the basis of the number of livestock raised.

Samples are chosen systematically with a random start, independently from each size-group of barangays. A minimum of fifty sample barangays are drawn for each province.

All households in the sample barangay are classified into farming and non-farming. Samples are drawn independently from each group of households by systematic sampling with a random start. A 10 percent sample is enumerated for each sample barrio. A total of about 40,000 sample households in about 3,800 sample barangays (out of a total of 33,000) barangays) for the whole country are enumerated.

The Field Survey Organization

The BAI Regional Directors, together with the BAEcon Regional Coordinators, are responsible for the implementation and completion of the survey in each region under their jurisdiction.

The provincial supervisory staff consists of the BAEcon Provincial Officer-in-Charge and Provincial Veterinarian, as joint officers-in-charge of the survey operations in the province. A number of BAEcon field statisticians and selected BAI personnel in the province are also designated as district supervisors. The number of such supervisors (on the district level) is dependent on the number of such interviewers in the province, such that a ratio of one supervisor for every five enumerators is fielded for the survey operation. The field operations included:

a. Listing of households and mapping

b. Selection of sample households

c. Interview of sample households

These field activities are undertaken by trained regular personnel of both agencies and by trained emer-

gency data collectors in provinces where there is a lack of personnel of both agencies to complete the survey within fifteen days.

Current Improvements

The joint BAEcon and BAI survey reflects the current improvements in the livestock and poultry data system of the country, which may be briefly summarized as follows:

a. The survey, which is an independent undertaking, was designed purposely for the collection of livestock and poultry data.

b. The involvement of BAI in the planning and execution of the survey was resulted in improvement in the design of the sample as well as the questionnaire; information essential to program planning was likewise introduced.

c. More updated and accurate survey frames have been used, particularly that used for commercial farms.

d. More resources in terms of funding and personnel have been available for the survey, the lack of which was the primary reason for the weakness of the livestock data system in the past.

e. Another major improvement could be traced to the timeliness of reporting. In the past, processing had been always prioritized for rice estimation, such that livestock and poultry estimates could not be released earlier than six months after the survey operations. The present system makes possible the release of data about two months after the field survey operations.

f. Another feature of the survey which could be considered a major development is the inclusion of non-farm households in the samples which resulted in a much larger sample size of about 45,000 households compared with the 27,000 households covered in the IAS. Previous surveys did not account for the livestock raised by non-farming households.

g. The BAEcon and BAI estimates are much more precise than those derived from the IAS. The CVs of the national level estimates for each type of livestock are about 2 percent; regional CVs range from 2 to 10 percent.

C. Agricultural Labor Survey

Objective

To gather monthly information on the agricultural labor situation, including farm wages, of the country.

Coverage and frequency

This is a bi-monthly nationwide survey covering all provinces, except Batanes and Tawi-tawi.

Sample Size

The survey covers a sub-sample representing 10 percent of the IAS sample barangays with a minimum of 5 barangays per province. About 500 sample barangays and 2,500 sample farmers are enumerated for the whole country.

D. Farm Prices Survey

To collect monthly prices received and paid by farmers.

Coverage and frequency

This survey is conducted nationwide on a bi-monthly basis.

Sample Size

The survey covers a sub-sample of 15 percent of the IAS sample barangays (or 1,030 sample barangays) with a minimum of 10 sample barangays per province.

For each sample barangay, one respondent is chosen for the information on **prices received** by farmers from sales of agricultural commodities. If the barangay captain is knowledgeable of the prices received by farmers residing in the sample barangay, he is the preferred res-

pondent. Otherwise, a knowledgeable farmer (preferably other barangay official) is interviewed.

The operator of a barrio store in the sample barangay (preferably one where majority of farmers by consumer goods) is interviewed, for information on **prices paid by farmers.** One store in the town (Poblacion) where the sample barangay is located, preferably one where majority of farmers from the sample barangay buy their basic needs, is enumerated (in addition to the barrio store) for information on **prices paid by farmers.**

E. The 1971 Census of Agriculture

The censuses of agriculture in the Philippines are usually conducted every ten years; the latest of which was conducted in 1971.

Scope and Coverage

The census of agriculture covers the number, size, and type of agricultural holdings, area under crop, types of crops grown and production, number and kind of livestock and poultry, characteristics of farm population, area under irrigation and other information on agriculture.

Design of the Sample

All farms with an area of five hectares and over or those reporting 20 or more heads of livestock and at least 100 heads of poultry were completely enumerated. Twenty percent sample was enumerated for farm with an area of at least 1,000 square meters but less than 5 hectares.

Geographical Coverage

All provinces, municipalities, and barangays were covered.

Statistical Frames

The preparation of the frame of farms was conducted simultaneously with the population and housing census conducted in 1970.

Recruitment and Training

About 130 provincial census officers and assistants participated in the 9-day training program given before the actual census operations were undertaken.

A total of about 1,500 municipal census officers was recruited and trained by the provincial census officers for seven days.

About 10,300 enumerators were recruited and trained for seven days by municipal census supervisors.

Organization Responsible for the Census

1. **Central Office**

   a. Director — determines major policies and directs the census programme.

   b. Assistant Director — assists the Director in directing the programme.

   c. Census Advisory Staff — assists the Director on policy determination composed of heads of government offices having to do with developmental planning, data gathering, etc.

   d. Agriculture Division — formulates and develops plans on sampling methods and processing procedures; prepares census materials and training programmes; drafts plans on recruitment, tabulation, etc.

   e. Field Operations Division — in charge of actual implementation of census programme; coordinating arm for various participating or contributing government agencies.

   f. Auxiliary Units

      (1) Administrative Division — administers programmes for procurement of supplies, equipment, and other logistics.

      (2) Budget Division — prepares budget estimates and advises the Director of the same; controls allocation of funds.

(3) Personnel Division — establishes qualification standards for selective recruitment; prepares appointments of the same.

(4) Geography Division — prepares E. D. maps

(5) Machine Data Processing Unit — prepares computer programme, in charge of input preparations and actual tabulation.

(5) Publication Division — in charge of the printing of census forms.

(7) Presidential Census Coordinating Board (PCCB) —an ad-hoc body created by virtue of Executive Order No. 280 on 30 December 1970 to coordinate at the national level census activities involving recruitment, transportation, communication, publicity and security provided by various participating government agencies.

2. Field Organization

a. Provincial Census Officer — assisted by the PCCB local counterpart Provincial Census Board — in charge of overall census operations in the province.

b. City Census Officer — assisted by the PCCB local counterpart City Census Board — in charge of overall census operations in the City.

c. Municipal Census Officer assisted by PCCB local counterpart Municipal Census Board — in charge of overall census operations in the municipality.

d. Enumerator assisted by the PCCB local counterpart in the barrio — in charge of actual enumeration.

F. Post Enumeration Surveys (PES)

1. Sampling

a. Probability proportional to cluster size; three-stage sampling.

b. A province represents a stratum. In each stratum, sample municipalities are selected. Municipalities in a province serve as a cluster, the sizes of which are based on the total number of large farms (5.0 hectares and over) reported in each municipality. This was based from the List of Household questionnaire which was prepared in the 1970 Census of Population and Housing. The sampling rate in the first-stage sampling unit depends on the number of municipalities selected in a province.

c. In each sample municipality, the sample barrio was selected at random. Barrios without the 1970 List of Household questionnaires were not given chance to be selected.

d. In each sample barrio, all certainty farms enumerated during the main census were re-enumerated; whereas, for all other farms, 1 out of 2 were re-interviewed. Two hundred ninety-nine municipalities or 301 barrios were covered in the PES.

2. Thirty-one PES supervisors trained for 3 days, 299 PES enumerators in 19 training centers from 29 April to May 1971. Enumeration for coverage and content check purposes was conducted for 6 days, 3 to 8 May. A total of 3,600 questionnaires were accomplished.

3. Manual editing and edit-verification of PES questionnaires were completed in December 1971.

4. Organizational Set-up for Processing

   a. Field Receipt Section

      (1) Box Receipt Unit — responsible for receiving census documents at the Manila transport terminals.

      (2) Box content Verification Unit — responsible for checking the box contents against field receipts.

   b. Geographical Verification Section — responsible for verifying consistency of geographical identification items in the questionnaires against the list of farm operators interviewed and arranging them in a manner following master list of geographical sequence.

c. Central Receipt and Control Section — in charge of the storage and centralized flow of census documents.

d. Questionnaire Perforation and Folioing Section — responsible for systematic handling of census documents.

e. Agriculture Division

(1) Questionnaire Classification Section — responsible for determining out-of-scope, non-response, stratum-shifting cases; follow-up of non-response certainty farms and the preparation of adjusted universe. The main objective of questionnaire classification is to classify farms according to basic sample type characteristics. Only 10 percent or below of the estimated total number of questionnaires were allowed to be mechanically imputed.

(a) 1971 List of Households Processing Unit — responsible for processing the 1971 List of Household questionnaires. These were filled up for E. D.'s not listed in the 1970 and from which sample farm operators (certainty farms 100 percent enumerated) were selected and enumerated subsequently during the 1971 Agricultural Census main enumeration.

(b) Non-Farm Household Livestock and Poultry —Tally count from the 1970-71 List of Household Questionnaires — the number of livestock and poultry raised by household that were classified as non-farm was included in the final tabulation of the census.

(2) Agriculture Questionnaire Manual Editing Section — responsible for editing-edit-verifying and card typing of Agriculture Questionnaires. Manual processing was completed in July 1972.

(3) Farm Prices Questionnaire Processing Section— As of January 1972, all questionnaires had been consolidated for all 1,503 municipalities prepa-

ratory for computerization; this was the source of valuating farm production. This job was completed in August 1972.

(4) Post-Enumeration Survey Processing—in charge of analyzing the coverage and content errors of main census.

f. Machine Data Processing Division — 77 conventional keypunch, 25 key-verification machines and 48 IBM 2260 were used for input preparation. The punching and verification of data were completed in December 1972. The system and overall computer programme were tested in March 1972.

G. Fishery Statistics

In 1973, the BAEcon, jointly with the BFAR conducted for 12 months, a daily monitoring of fish catch loaded and unloaded at the Navotas fish terminal market (as it was known then). Although the primary objective was to study the fish marketing channels and "come up with specific solutions and suggestions towards the establishment of an efficient fish marketing study," a corollary objective was to determine the volume of fish catch unloaded of each species and their sources and eventual destinations (i.e., specific consumer markets) including corresponding prices at each point of sale.

There were four major respondents: fishing boat operators; fish brokers; buyers; and consumers.

Prior to the actual survey, a complete list of fishing boat operators and brokers were obtained from the BFAR; and a partial list of major buyers.

In 1976, three other major commercial fish trading centers were surveyed: Iloilo, Bacolod and Zamboanga. The same methodology was utilized, i.e., a complete enumeration of fish catch as to source, destination and species; and the corresponding prices at each point of sale. This was regarded as Phase I.

Phase II involved the collection of marketing information and a study of the market structure and conduct and

performance in these 3 centers and involved the sampling of fishing boat operators, brokers and buyers.

Another survey which is going to be undertaken soon is a socio-economic study of municipal and sustenance fisheries funded by both PCARR and BFAR, with the technical assistance of BAEcon. It will involve about 400 barangays in 8 provinces identified by BFAR initially as major fish producers. Other provinces may be surveyed at later date as more funds and more information for the survey frame become available.

H. Statistical Research Activities

Starting in 1974 statistical research activities had been intensified in BAEcon to provide:

1. rational solutions to problems of data collection and reporting, and to ideas regarding the direction of new developments in statsitical methodology, and
2. a higher level of quality of agricultural statistics in the country.

Features

These research activities are built-in mechanisms in the BAEcon system of surveys for purposes of pursuing a continuing search for better methods and techniques of gathering and reporting good quality data. The scheme employed includes, among others, pilot studies and gradual introduction into the system of:

1. Objective estimation of crop yields by crop-cutting and of crop area by actual measurement;
2. Use of area frame (employing landsat and aerial photos and maps) for crop and livestock;
3. Objective forecasting of crop production.

I. What has been accomplished

Since 1969, the following activities have been undertaken:

1. Nueva Ecija Project

Demonstration of techniques designed to minimize non-sampling errors: 1) use of good questionnaire, 2) better training of survey personnel, 3) better supervision and 4) better mobility, was undertaken in the province of Nueva Ecija from 1969-71.

2. Forecasting of Coconut Production

A forecasting model for coconut production is presently being developed based on the following variables: a) monthly series of actual count of nut production from button to matured stage, for determining the "rate of survival", and c) monthly series of weather data such as rainfall, temperature, etc.

3. Crop Cutting and Area Measurement

A sub-sample of the IAS (now Rice and Corn Survey) in 12 pilot provinces (one in each region) is covered in this research activity.

Before the crop cutting and measurement of the area of the sample farm, the operator is interviewed for information about the farm such as: a) variety of palay, b) seeding rate, c) methods of planting, d) area planted and c) expected production. To ascertain the "true" production, actual farm output is obtained after threshing of the entire farm harvest.

In other words, for production — 3 independent estimates are obtained for the farm: 1) as estimated by the farmer, 2) estimate based on crop cutting and 3) actual production after threshing. For area — 2 estimates are obtained: 1) as obtained from the farmer, and 2) area as actually measured.

The analysis of these different sets of data shall be directed to provide:

a. an indication of the statistical validity of data on area and production as reported by the farmer during the interview.

b. models for "adjusting" area and yield figures based on interviews.

c. necessary technical skills and experience to warrant the expansion of this activity to all rice areas in the country, and

d. reliable estimates of seeding rate by type of rice culture.

Looking Ahead

With this strengthened foundation for crop and livestock estimation, the Bureau of Agricultural Economics is now much better equipped to build a new data series that is more attuned to the needs of development programs. Within the next five years the BAEcon hopes to develop an area farm with the aid of aerial photos and topographic maps. The application of remote sensing to the estimation of crop production will be done on an experimental basis. Likewise, initial successes in experiments on crop cutting techniques has paved the expansion of such activity in major rice areas of the country in conjunction with crop surveys employing interview methods of data collection.

A continuing involvement of subject-specialist as well as data users (or multi-disciplinary approach) in the planning of survey shall be encouraged and pursued with more vigor.

The Philippines agricultural data system shall continue to incorporate progressive training programs for all government personnel who are involved in the collection of agricultural statistics.

In short, the Bureau of Agricultural Economics shall endeavor to improve the reliability of agricultural statistics in terms of measurements through the adoption of more objective techniques of data collection and the employment of better trained personnel.