

PD-ABP-055
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EVALUATION AND RECOMMENDATION of Phase II
of Small Ruminant Activity by
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Research Support Program)

January 1983

7, MAR 1983

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A) Appraisal of Experimental Design of Original Survey

Definition:

The small ruminant project was instituted on the basis of an original study by the "Société D'Etude pour le Développement Economique et Social" (SEDES) in 1974. The United States Agency for International Development (USAID) and "l'Office Malien du Bétail et de la Viande" (OMBEVI) became interested in 1977 and set out under the title of Mali-Livestock II to study the socio-economic as well as technical and environmental aspects of small ruminant production in Mali. The survey was to take place in three phases and time limits were set for each phase.

Phase I

Phase I of the project was to involve an analysis of available references and to prepare a preliminary survey. A consultant firm was hired: "Chemonics International". This firm produced a report on existing documentation and presented a model form to be used in the preliminary study.

The "Chemonics International" report dated March, 1980, gave a large list of good references. Unfortunately, these references were not made available to OMBEVI. An important project in progress at the International Livestock Center for Africa (ILCA in Mali) concerning small ruminant production was not cited.

Statistical analysis of data was not considered by other than tabulation methods. Livestock production parameters for small ruminants, such as precocity, fertility, proliferation ratio and fecundity were not discussed. No evaluation of the data from the preliminary survey was made. Fortunately, the poor model that was originally developed, was discussed at length and a survey instrument as well as a method for its use were later developed by OMBEVI.

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Phase II

The survey instrument was developed in part from the preliminary study and therefore followed the model in two areas of concern:

- 1) No plan for compiling data other than by hand tabulation was envisioned.
- 2) Vital animal science parameters were lost to poor questioning techniques.

In its final form, the survey instrument had 36 pages of information and took 2 hours to complete in the field. Field workers had undergone a 2 week training course under the supervision of a veterinarian and others trained in academic disciplines, such as sociology, animal science and agriculture.

The ideas and experimental design in the final survey instrument were good considering the 2 major drawbacks already mentioned. The adaptation of the survey instrument to the human and animal populations in Mali is the best possible effort given the socio-economic factors to be considered in carrying out such a study.

Phase III

A third phase was proposed for follow-up studies.

Statistical design of the original survey instrument:

The villages, selected at random, were stratified according to numbers of small ruminants present and according to the human population. Two strata were used. One concerned the sedentary population, the other concerned the migratory population. The substrata for the sedentary herds of small ruminants were:

- 200 animals per village
- 200-399 animals
- 400-599 animals
- 600-999 animals
- 1,000 and above animals in village.

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These substrata appeared to represent the villages fairly accurately.

The migratory populations were separated into only 3 substrata according to herd size:

- 1,000-1,999 per village
- 2,000-4,999 per village
- more than 5,000 per village

By calculating the average herd size for migratory animals in several areas, it was found that the strata did not closely approximate total animals numbers.

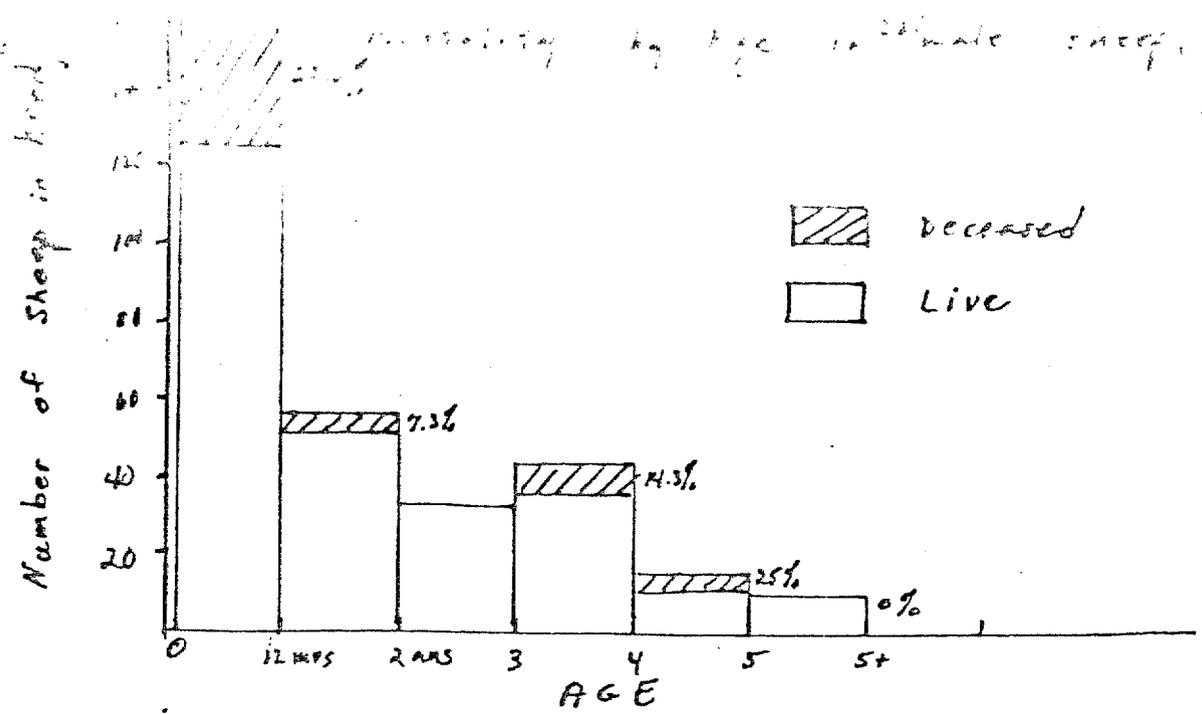
Census data was referenced for people to 1976 and for herd size to 1977. Using a sampling fraction of 0.1, a systematic random sample (every nth unit) was taken within each stratum. A total of 1,007 villages were chosen through random sampling and via site visits to each of the villages, 5,000 herds were identified. Sixty nomadic herds were also surveyed at their temporary points of concentration in the Sahel.

B) Statistical Analysis

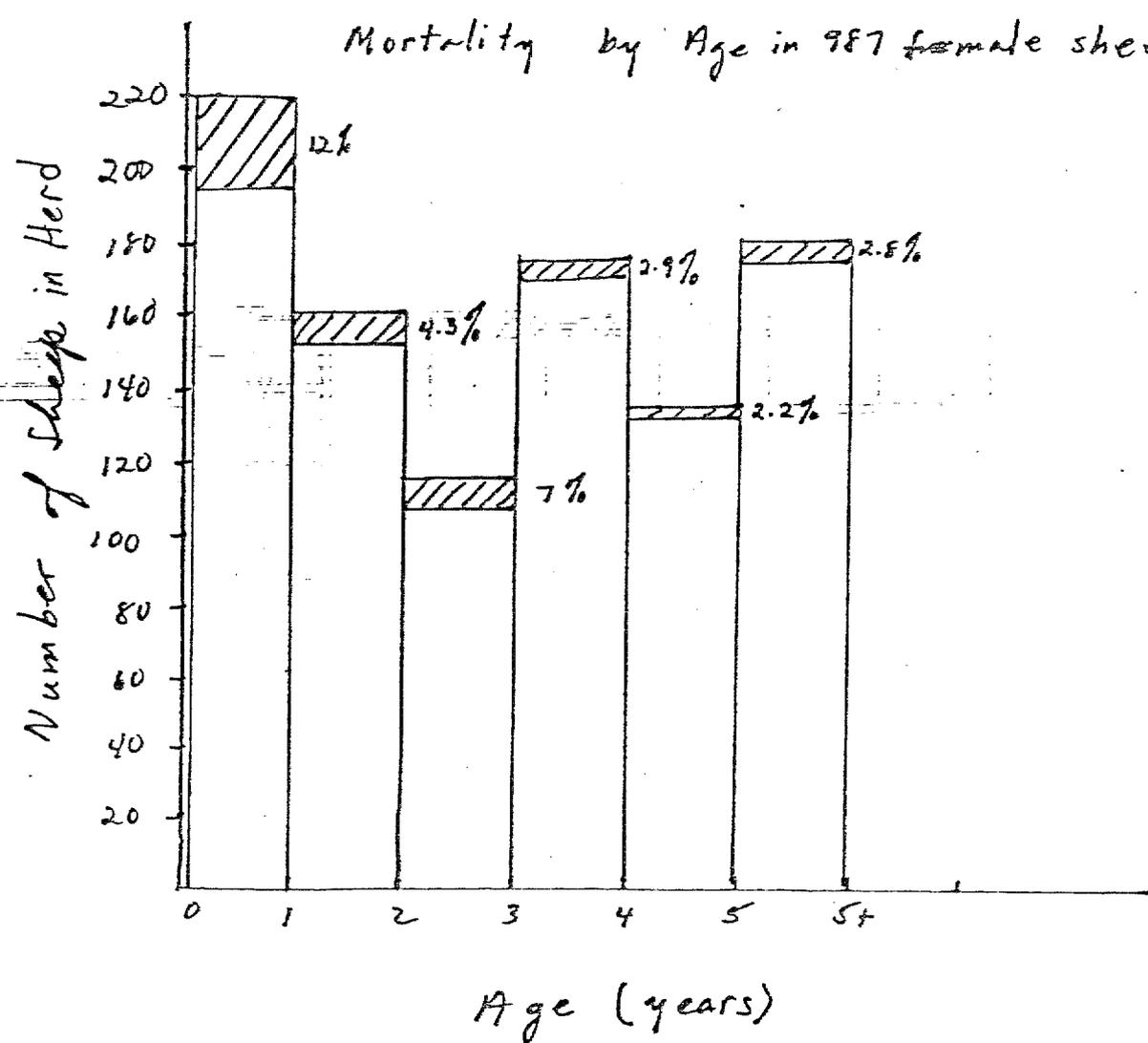
The survey instrument was not designed for computer processing by a data entry clerk, and we estimate that 60 person weeks of coding onto 80 column code sheets would be required to prepare the data for key punching or other means of computerized data entry.

OMBEVI has tabulated by hand the responses to the items on the questionnaire and has prepared tally sheets by village, sector, and region. From these tally sheets, histograms or frequency polygrams could be constructed to give simple descriptive statistics. Two such histograms are shown in Figure I, in which the mortality rate by age in male and female sheep for the region of Timbuktu and sector of Timbuktu, can be seen.

Mortality by Age in 221 male sheep, 1950-1951



Mortality by Age in 987 female sheep.



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C) Computer Programs

There were no computer programs to be analyzed.

Recommendations for computer analysis of existing data:

- 1) The coding of data by sector from the tally sheets onto new forms is necessary. This would be best accomplished by the regional "cadre" of OMBEVI. There are approximately 200 man hours of coding to be done. There would be 46 forms: that is, one per sector.
- 2) The coded data would then be sent to Tufts University.
- 3) Upon receipt at Tufts, the coded data would be key punched: 50 hours of key punching.
- 4) The analysis would be accomplished by the Doctors Mahan, Gregory and other necessary experts. It would be advisable to send one person from OMBEVI with the data to aid in the analysis.
- 5) The complete analysis would be returned with the representative from OMBEVI and the final report would be written by OMBEVI.

The estimated cost of coding, key punch and analysis: \$10,000.00. This estimate does not include flight nor living expenses for the OMBEVI representative.

D) Advice on Market Survey

Completion of the marketing survey should only be undertaken with the understanding that the markets available for study are government controlled and government imposed taxes at these markets encourage the existence of other clandestine markets. All other market forms would not enter into the data obtained and a significant part of the small ruminant economy would not be surveyed. A method to quantify this gap in small ruminant production and sales will be discussed in the future subsector activities.

Development of a pre-coded questionnaire has been done to facilitate the market survey. In this way, data is already prepared for computer entry.

E) Advice on Future Subsector Activities

In consideration of the limited results that can be obtained from the present small ruminant project, future subsector activities are indicated to improve the existing data. All future programs should only proceed with technical assistance and all survey models need interdisciplinary evaluation in the areas of socio-economics, animal production, health and computer science.

According to Sollod (1982), experience with livestock development projects in other parts of Africa indicates that ten years or longer are needed to make a worthwhile contribution to livestock production in pastoral systems.

The types of activities which should be supported include field research and small scale testing of emerging technology.

The "Small Ruminant Study" already in progress in Mali would benefit from the continuation of Phase II. This would include computer analysis of the existing data and completion of the marketing survey if the constraints of the markets are taken into consideration.

A method to quantify the amount of small ruminant production sold in urban markets could be obtained through an estimation of the small ruminants consumed in Mali. An idea of the total number produced can be obtained from the present study. Subtracting those small ruminants consumed in Mali and those sold in controlled government markets from the total produced in Mali would give an estimation of the importance of clandestine markets.

A Phase III project of great interest to small ruminant production would consider accurate diagnosis of small ruminant pathology. This might be done in conjunction with the proposed work to be carried out by the U.S.D.A.