SAFGRAD - Farming Systems Research (Purdue)

RESUME

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1. Introduction:

The initial objective of the FSU is to provide an understanding
of   farming systems in the semi-arid zones of Africa and to develop
new farming systems which reflect the farmer's resources and environment.
The FSU was included in   SAFGRAD's framework to provide a link between
the farmer and the researcher for the bidirectional transmission of
information so essential in the whole process of development and transfer
of technology appropriate to small farm conditions.

Primary functions :

1. To conduct research which will lead to an understanding
of existing farming systems, the agroclimatic, economic
and social factors that influence farm/household production
and consumption decisions;

2. To utilize the results of farming systems research conducted
to identify and prioritize factors serving to constrain production
and productivity in the existing systems, and to interact with
other components of SAFGRAD to identify research approaches;

3. To evaluate the likely impacts of new technology on existing
farming systems. The impact of new technology is to be evaluated
through socio-economic studies including interaction of new
techniques with other household activities, as well as through
agronomic trials. The techniques for evaluation will be chosen
in cooperation with other scientists and SAFGRAD's Accelerated
Crop Production officers in member countries;

4. To provide the exchange between ` farmers and researchers for
the flow of production-related information to ensure that research
results are appropriate to farmer's needs and environment; and

5. To develop suitable methodologies for farming systems research in
SAFGRAD countries.
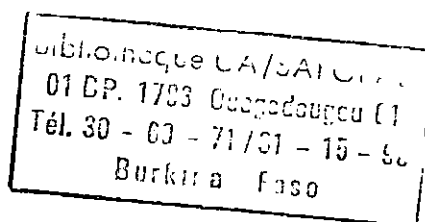
FSU's Major Activities up to date :

2. Intensive Studies

FSU selected 7 villages in 3 regions of Upper Volta for intensive
studies - both socio-economic and agronomic. These are :
Zorgho (with three villages), Ouagadougou (one village) and Ouahigouya
(three villages). There are around 100 farm households in the sample.
In addition, we collaborate with another researcher in the Kaya area with
3 additional villages.

2.1. Information Collected through Intensive Village Studies :

Detailed profile of household members, their demographic and socio
economic activities, complete data on crops and crop rotations, labour-
time, input-use, cropping patterns, yields, patterns of distribution of
production responsibilities among households members, inventories, credit
constraint, transactions, and time allocation of household members.

2.2. Organization of FSU Personel :

1. Each village has one investigator for the socio-economic
   survey. There are 15 farmers (households) for intensive
   study by each investigator stationed in the village.
2. For each region - there is a research supervisor to control
   the data gathering, its quality and help in analysis; and a
   person in charge of field trials.
3. The team's principal scientists are in overall control of the
   field work and pay frequent visits to villages and farms.

2.3. Analyses of Data :

The data on crops, labour-time use, and labour constraints during
critical periods are however being sorted out for simple computation
and analysis. This will help in working out the labour and non-labour
input utilization and requirements by crop soil combination, and the
input-output metrices for programing models intended to be developed
for small farms with the help of FSU's survey data and agronomic trial data.

The FSU has installed two micro-computer in Upper Volta for data
recording, cleaning and processing. The computers help greatly with the
task of sorting the 2000 fields in the sample.

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2.4   Progress of Work

Data on cropping patterns and field areas werecollected for the 1979

crop year.   Complete data on crop production activities and cropping

patterns have been obtained for the 1980 crop season.

Data on family economic   transactions were obtained during 1980,

but collection of transaction data has proven difficult and the quality

of the data irregular.

The first major data analysis undertaken has been to calculate the

average work time per family for each of the major production operations

excluding harvest.   Planting has been summarized on a daily basis and

ploughing and weeding on a weekly basis, with the intention of showing

when the family work force was fully occupied and when family labor

resources were not fully utilized.   These summaries show the family work force

to be fully occupied during weeding, particularly early weeding and after

major rains during the planting periods.   The sequencing of the planting

and weeding of the different crops has been identified subjectively, and

labor inputs per hectar for the various operations calculated for

a subsample of the fields.

Tables of input data for each crop have been completed and will

be analysed using regression analysis to determine the most important

factors in determining the per hectar yield of each crop (production

functions).

Information on the socio-economic status of household members and

demographic structures has been collected and tabulated to facilitate

comparison of the FSU survey zones with other areas of Upper Volta and

Africa

3.   Farmer Researcher Contact:

One of the beliefs behind farming systems research is that farmers

are rational in their choices of production methods.   Farming systems

researchers should always try to make the most productive use out of
the farmers ability to perceive his own problems and find his own
solutions.

3.1 Extensive, Descriptive and Reconnaisance Surveys:

Short term reconnaisance surveys work because farmers can
describe their production problems if asked in a manner which is
relevant to their own experience.

The SAFGRAD Farming Systems Unit has also initiated general
descriptive surveys in selected zones of Upper Volta which appear to
have broadly different agro-climatic, social, and economic systems.
We wish to identify as quickly and qualitatively as possible some of
the principal means whereby agricultural production and productivity
can be increased taking into account agronomic, economic, and social
constraints characteristic of these zones.

The FSU has developed a detailed questionnaire and used it in
an initial reconnaissance survey in the Bobo region. FSU/SAFGRAD will
conduct a number of such 6-10 day multi-disciplinary surveys in other
zones of Upper Volta, some with the participation of other in-country
specialists and research organizations. We are attracted by this low
cost but potentially high yielding research methodology as an initial
means of designing relevant field trials and focused socio -economic
survey research.

3.2 Visits:

The FSU has organized visit of research scientists to our
laboratory villages where we can answer in detail their questions about
production practice. Also we have organized visits by farmers from
our villages to the Kamboinse research station in the hope that the
questions posed by these farmers would give us new insight into the
potentials of the technologies which they saw on the station.

Trials of a donkey drawn planter used in Senegal and Mali indicate that this planter is adapted for use in Upper Volta as well. Although the planter has not been evaluated economically, it is clear that it can help increase cereal production by first allowing peanut planting to be finished earlier, permitting earlier and more weeding of cereal crops, and second, decreasing the planting delays where animal traction cultivation preceeds planting.

4.3   Improved Varieties

The variety E35-1 released by ICRISAT Upper Volta appears to be more susceptible to yield depression because of poor seedbed preparation, low soil fertility and low rainfall than the local varieties. Yields under good conditions on village or household plots were good. Farmers have demonstrated extreme reluctance to delay planting to the optimum date for E35-1 because this delays their weeding schedual and interferes with the planting of peanuts and corn.

The cowpea variety KN-1 released by the Upper Volta national cowpea program was evaluated in association with millet and sorghum. It was planted one month after the cereals and performed very poorly in these conditions. Next year the economic returns of solid stand cowpeas as a cash crop with use of insecticide will be compared to the economic returns from peanut production.

5.   Training and Institution Building:

The FSU has identified two economists to work with the team. These individuals work as survey supervisors and analysts and are considered for training in the US. One economist worked with us for a year, and has recently been sent to Purdue's Department of Agricultural Economics, where he will work toward his doctorate and do analysis of the data which he has collected in Upper Volta.

The FSU collaborates with the Polytechnique Institute of the University of Ouagadougou in training fifth year students. A Chadian student has recently received his degree having written a thesis on the use of rock phosphate fertilizer.

The FSU provides on the job training for its interviewers, field technicians and computer operators. One computer operator is currently training in the US and 2 field technicians are to attend short courses at IITA.

6.   Conclusion

The FSU believes in the productivity of what David Norman refers to as "Downstream" farming systems research. Downstream farming systems research is simply applied agricultural research with a great deal of emphasis on the nature of the environment into which technology must fit. Farming systems researchers are not specialists and farming systems research is not a new area of study. Farming systems researchers are good agriculturalists and farming systems research relies on techniques which it takes from a number of different disciplines.

Because of wide possibility of activities in farming systems research we think that it is particularly important that farming systems research be oriented toward particular geographic areas and particular technologies. Without this "downstream" or applied orientation farming systems research may drift into academic description of the systems with which it is working.

Farming systems research has the same relationship to Agricultural Science as engineering has to physics and chemistry.

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