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AFRICAN RURAL EMPLOYMENT RESEARCH NETWORK

WORKING PAPER

**PLAN OF WORK FOR THE IDR/MSU
RESEARCH PROGRAM IN THE ADA DISTRICT
OF ETHIOPIA**

Working Paper No. 5

November, 1974

**Institute of Development Research
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THE AFRICAN RURAL EMPLOYMENT RESEARCH NETWORK

The African Rural Employment Research Network was initiated in 1971 by a group of scholars interested in comparative analysis of the development process in selected African countries with emphasis on rural employment problems. The research program has been jointly designed by scholars in African countries, at Michigan State University and at other universities in North America. Research emphasis is being directed to Sierra Leone, Nigeria and Ethiopia. In addition, individual scholars in other countries, such as Ghana, Zaire and Tanzania, are carrying out research on rural employment problems and are members of the Network.

The research program emphasizes joint and individual studies of rural employment such as the demand for labor in alternative production systems and in the rural nonfarm sector, the migration process as a link between rural and urban labor markets and the impact of macro-economic policies on labor absorption in agriculture. Attention will be directed to developing policy models to trace the consequences of alternative strategies of agricultural development on farm output, employment, income distribution and migration and to incorporating the employment objective into project, sub-sector and sectoral analysis in developing countries.

The Network maintains links with similar research networks in Latin America (ECIEL) and Asia (CAMS) and with organizations such as the FAO, ILO and the World Bank.

African Rural Employment Papers are distributed without charge to libraries, government officers and scholars.

INSTITUTE OF DEVELOPMENT RESEARCH
HAILE SELASSIE I UNIVERSITY

The Institute of Development Research was approved by the Faculty Council of Haile Sellassie I University in July of 1971. The Institute was assigned the responsibility of conducting research in the social sciences, specifically aimed to help solve developmental problems of Ethiopia. In April of 1972, the President of the University appointed the core members of the Board of Advisors from HSIU's Departments of Economics, Geography, Political Science and Public Administration and the Planning Commission.

The Institute of Development Research was initiated in order to add to the variety of University functions that were designed to relate Haile Sellassie I University's academic efforts to the nation's search for solutions to development problems. In accordance with this general principle, the Board of Advisors has resolved that the Institute's research programme for the next five years will be focused on the evaluation of development programmes, with special emphasis on rural areas. Since Haile Sellassie I University encourages its social science units to coordinate their research capabilities, the Institute of Development Research, in cooperation with other Departments of the University, is undertaking interdisciplinary research programmes, the majority of which are in rural development.

Dr. Assefa Mehretu is the Director of the Institute of Development Research.

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PLAN OF WORK FOR THE IDR/MSU
RESEARCH PROGRAM IN THE ADA DISTRICT
OF ETHIOPIA

I. Background

In June of 1974 the Institute of Development Research (IDR) of Haile Sellassie I University and the Department of Agricultural Economics of Michigan State University signed a cooperative research agreement (Memorandum of Understanding)^{1/} to undertake research on a rural development project in the Ada District of Ethiopia.

The IDR/MSU Memorandum of Understanding calls for a joint program of research to "develop a conceptual framework for analyzing the socio-economic impact of the Ada Project over the 1974-79 period, including production, employment and income distribution". In addition, the Memorandum of Understanding calls for the execution of a series of socio-economic studies in order to provide feedback to the ADDP project staff, as well as to planners in various Ministries (Agriculture, Community Development and Planning Development). The Memorandum of Understanding calls for conducting the Ada research with maximum participation and cooperation of Ethiopian researchers, both within HSIU and in other organizations in the country.

Michigan State University will provide the services of two agricultural economists and a number of consultants under the terms of the Memorandum of Understanding. One of the MSU agricultural economists--Professor Trimble R. Hedges--is serving as the initial Research Coordinator of the IDR/MSU research in the Ada District. Professor Hedges arrived in Ethiopia

^{1/} The research is financed under a U.S. Agency for International Development contract (AID/csd 3625) with Michigan State University.

on August 5, 1974. An Ada Research Team was created (see Appendix A) and August and September were spent in developing a conceptual framework, sampling procedures, questionnaires and a time table. A draft plan of work was presented to the 1974 Conference of the African Rural Employment Research Network which was held in Debre Zeit, Ethiopia from September 29 to October 3, 1974. The draft plan of work for the IDR/MSU research on Ada drew on the previous research and knowledge of Ato Getachew T. Medhin [Getachew and Tilahun, 1974], the research of Dr. Tesfai Teclé [Tesfai, 1973], the 1973 IDR baseline study of Ada [Humphreys, 1974] and the services of two consultants--Dr. Dunstan Spencer of Sierra Leone [Spencer, 1972] and Dr. Warren Vincent of Michigan State University.

It appeared in early October that the overall thrust of the Ada Project was going to be redirected and, as a result, it would be necessary to revise the draft plan of work of the IDR/MSU research team. It now appears that the Ada Project will be reorganized by EPID during 1974/75 and that an attempt will be made to reduce the overhead cost of the Project. The Ada staff will now focus on conducting experiments which have potential replication in other parts of the country (e.g., credit, water, roads, alternative approaches to organizing extension services to farmers, etc.). In summary, the emphasis has shifted from determining whether the Ada package program can be replicated to determining which components (experiments) of the Ada Project may have wider application in other parts of the country. The IDR/MSU research team has taken these modifications into account in the plan of work which follows. Although the IDR/MSU research team will continue to devote major attention to interviewing a panel of 150 farmers in the Ada District over the January, 1975 through March, 1976 period, it will also undertake a number of special studies

as suggested in the paper presented at the Debre Zeit Conference by the Vice Minister of Agriculture and Director of EPID--Dr. Solomon Bekure [Solomon Bekure, 1974].

During September and October, 1974 the IDR/MSU Research Team opened a dialogue with the principal agricultural economics researchers in Ethiopia in order to avoid duplication of effort and to draw on their experience in developing the Ada plan of work. For example, the IAR's farm management research in sixteen areas of Ethiopia was reviewed at the Debre Zeit Conference [Solomon Belette, 1974]. Since the Ada research program is facing many of the same problems as the IAR's research program (e.g., data processing strategy), every effort will be made to maintain close cooperation with the IAR. Also, four of the eight Ethiopian doctoral candidates who will participate in the Ada research are members of HSIU's Department of Agricultural Economics.

Several productive discussions were held with Ketema Desta, Head, Economic Research Division, Ministry of Agriculture and Fesseha Ezaz, Head, Planning Evaluation and Liaison Division of EPID. EPID has agreed to appoint a representative to the Steering Committee of the Ada Research Committee. The first meeting of the Steering Committee for the Ada Research Program will be held in December, 1974 to review the plan of work. Members of the Steering Committee include the Director of the IDR, the General Manager of ADDP, representatives from EPID and the Ministry of Planning and Development and Professor Carl K. Eicher of Michigan State University.

II. Current Status of the Ada District Development Project

The ADDP was launched in 1972. The first year was spent in staff recruitment, planning and other initial steps. The current position of the project is as follows:

1. Staff

There are twenty-two professional staff at the Debre Zeit headquarters (seventeen are Ethiopians and five are American advisors). The following Ada agents are located at the seven service (development) centers served by the Ada Project: five home economics agents; seven credit, marketing and agricultural extension agents and five village level workers who have been seconded by the Ministry of National Community Development.

2. Development Centers

Although initial plans called for opening two development centers per year, the following five are in operation in October, 1974: Denkaka, Dukem, Godino, Dire and Bekejo. The Ada Project also provided limited services to farmers through two additional centers--Hide and Adulala.

3. Credit

In 1973 a total of 412 farmers were extended credit as compared to a goal of 256. This 1973 credit was allocated as follows:

	No. of Farmers	Seeds Purchased (E\$)	Average Credit (E\$)	Average Area Fertilized (Hectares)
Landowners	130	1,196.25	113.25	2.91
Tenant owners	42	611.25	128.44	3.02
Tenants	240	1,679.05	97.96	2.54
Total	412	3,486.55	105.96	2.70

A total of 1,085 farmers received credit in 1974, as compared with the goal of 512.

4. Road Construction

An 8 kilometer feeder road from Debre Zeit to Godino, including one large bridge, is now 75 percent completed. Surveying for road construction programs in other parts of the Woreda is now completed.

5. Water Resource Development

Two deep drilled wells are under construction--one at Dire and one at Bekejo. Three wells are being dug by hand. Numerous sites have been identified for the constructing ponds.

III. Problems of Ada Farmers

About 80 percent of the population in the Ada District is classified as rural. The small farmers in the Ada Woreda are known as good farmers and as the best teff producers in the country, in spite of the fact that most of them are generally at the subsistence level of living. The average farm size in the Ada District is 2.93 hectares and the average family size is 5.08 according to the 1973 baseline survey [Humphreys, 1974]. About two-thirds of the farmers are tenants. Their rent ranges from one-half to two-thirds of the harvest. Health and education facilities and the communications network are poor; all-weather roads are available to only a small percent of the rural people.

The six major crops according to land area are: red teff, white teff, corn, barley, wheat and chickpeas. Haricot (Michigan pea) beans are a

promising new crop. The cropping pattern varies widely according to elevation and soil type. Almost all small farmers depend on oxen and traditional plows to prepare their land. Only four farmers are reported to have purchased the improved CADU ox plow.

IV. Overall Objectives of the IDR/MSU Research Program

1. Develop a conceptual framework for analyzing the socio-economic impact of the Ada Project over the 1974-79 period, including production, income employment and income distribution.
2. a. Undertake micro-level studies in the Ada District including:
 - i. Demand for labor in alternative production systems.
 - ii. Demand for labor in off-farm rural activities.
 - iii. Determinants of seasonal and permanent migration.
- b. The results of the micro-level research will be aggregated in order to evaluate the effects of alternative policies on production, income, employment and income distribution over the 1974-79 period.
- c. From the results of "a" and "b" assist the Ministry of Agriculture in developing national strategies and policies for dealing with problems of rural employment and income distribution.

3. Assist in providing an improved theoretical and empirical basis for incorporating labor into project, sub-sector, sectoral and macro-planning models and rural development evaluation techniques which can be used by the Ministry of Agriculture and the Planning Commission Office.
4. Contribute to the training of HSIU economists and agricultural economists through research experience for undergraduate and graduate students.
5. Facilitate the development of a community of African researchers through the African Rural Employment Research Network which links Ethiopians with researchers in other African countries in order to exchange information on alternative approaches to research on problems of rural development, unemployment and income distribution in Africa.
6. Contribute to the development of the capacity of the IDR of HSIU to carry out policy oriented research on rural development.

V. Theoretical Framework

The theoretical framework for the Ada research uses the Byerlee and Eicher partial equilibrium framework as a point of departure [Byerlee and Eicher, 1972]. It also draws heavily on the integrated research program on small farmers in Sierra Leone which is being carried out under the direction of Dr. Dunstan Spencer.^{2/} The Byerlee and Eicher theoretical framework has to be modified, however, to take account of local conditions such as: (a) land tenure problems, (b) the importance of elevation and accessibility in influencing the farming systems, (c) the impact of the action program--ADDP and (d) the problems of oxen-powered cultivation. Farmers must be stratified as to participants and nonparticipants in the action program, for example, and according to locations at high, medium and low altitudes, as well as by other relevant characteristics. In addition, special long term studies will have to be initiated, e.g., selective mechanization in close cooperation with technical scientists. Finally, further revision of the theoretical framework will be necessary after the IDR baseline data for the Ada District have been analyzed.

^{2/} The Sierra Leone research program is an integrated nationwide study of 575 rural households who are being interviewed twice weekly. The research program is divided into six sections as follows: (a) farm level study, (b) marketing and processing, (c) rural nonfarm, (d) rural consumption study, (e) migration study and (f) the development of a rural economy model for policy analysis (see Chuta and Liedholm, 1974 and de Haen, Byerlee and Spencer, 1974).

VI. Methodology

The research design emphasizes an integrated research program that may serve as a model for similar IDR research studies in Ethiopia. First, it lays out a framework to encourage interested scholars to join in the design and conduct of a major study, rather than working as individual researchers pursuing isolated topics over a short period of time. Second, it tries to avoid "rushing to judgment" on the success or failure of a rural development program. It contends that a minimum period of three to five years is necessary for an action program to organize and carry out a meaningful program (CADU did not generate significant findings until its third and fourth year of operation). Third, the research program stresses the need to conduct a baseline study (such as the 1973 IDR baseline study of Ada) in order to provide a reference point to measure change over time. Fourth, the research program stresses the need to collect primary data from a panel of farmers over a full cropping season (15 months) rather than using one-shot interviews to conduct special studies (e.g., credit). Fifth, it utilizes special studies in order to respond to the specific request of agencies such as ADDP and EPID. These special studies--e.g., an analysis of cooperatives--will utilize some of the data collected from the panel of 150 farmers, as well as data collected from farmers and institutions not covered in the panel. Sixth, in order for the Ada research team to assess the wider implications of ADDP experiments it will be necessary to conduct socio-economic studies in other parts of the country. These additional studies will provide a comparison of the alternative strategies, programs and approaches. In summary, substantive research on rural development in Africa cannot avoid

going back to the basics--collecting farm management and marketing data through repeated interviews over time.

The data base for the Ada research is as follows:

1. The 1974 IDR baseline survey of the Ada District was partially analyzed in mid-1974 and will be completed by late 1974. This survey contains detailed socio-economic data on 632 randomly selected farm families.
2. The IDR/MSU research team will utilize a "panel" of 150 randomly selected households from the baseline survey, stratified to three pre-selected service center areas presently served by ADDP and two pre-selected service center areas not currently served by ADDP. "Stock" or inventory type data will be collected from each member of the panel at the beginning and the end of a fifteen month period^{3/} beginning in January, 1975 and "flow" (current) data will be collected weekly throughout the period from each cooperator (see Appendix B for the list of questionnaires).
3. An enumeration of all small scale industries will be undertaken in the selected centers Godino, Dankaka, Dire, Gongo and Yilmo and in the urban areas of Dukem, Debre Zeit, Mojo and Quqa.
4. Special studies will be undertaken within the panel group outside the panel but within the District, outside the District or some combination of the above as the needs of the study demand. Some of these special studies are discussed as Ph.D. and M.S. theses.

^{3/} Since the harvesting season lasts from December to March, it will be necessary to collect information over a fourteen to fifteen month period in order to capture the farm transactions for a full production and harvesting season.

5. A repeat of the baseline study some time after the completion of the 15 months of the panel. Enumeration service areas will cover a radius of about 6 kilometers.
6. Enumerators will live in the service centers and will visit farm families throughout each week. Two enumerators will reside in each of five service centers and provide their own transportation.

Transportation must be suitable for year-around use in accordance with the enumeration plan. The road conditions essentially narrow the choices to either walking or riding a mule or horse.

One enumerator working five days per week can visit four to five families each day or a total of twenty to twenty-five family households per week.^{4/} We estimate that since thirty farmers will be interviewed in each service center, one enumerator can handle twenty farmers and the second can cover ten farmers, leaving one-half of the second enumerator's time for collecting information for special studies (e.g., market prices, information for the small scale industry study, cooperatives, credit, etc.).

Cost route-type and one-vist surveys are the primary methods to collect micro-level data. The cost route method is considered the most appropriate to obtain the type of farm management flow-type data needed for the Ada study [Spencer, 1972]. This methodology was used by Miller and Tilahun to study the Kotu farm and social centers in Harar and by Getachew and Tilahun for a similar study in Ada. Farmers will be interviewed once a week. The cost route method, although it limits the number of cases, has the advantage of collecting accurate and reliable information.

^{4/} Norman points out that one enumerator in northern Nigeria interviewed fifteen to twenty families in three to four days [Norman, 1973].

VII. Projected Ph.D. and M.A. Thesis Topics

1. Optimum Farming Systems for Farmers in the Ada District: Implications for the Development Planning in the Central Highlands of Ethiopia

This topic has been tentatively selected by Ato Getachew Teckle Medhin, Debre Zeit Experiment Station and projected Ph.D. candidate in Agricultural Economics at Michigan State University beginning in January, 1976.

Ato Getachew, as a consultant to the IDR/MSU research team in August and September, 1974, played a major role in developing the methodology that will be used in collecting information from the panel of 150 farmers. These farmers will be interviewed weekly over the January, 1975 through March, 1976 period. While at Michigan State, Getachew will process the panel data and utilize budgeting and various programming models to analyze these data.

The analysis will seek to identify viable farming systems for the diverse geographic and economic conditions within the district. It will also evaluate these proposed systems with regard to the kinds of "package programs" that are most desirable under heterogeneous agricultural production conditions. The contention to be studied is that minimum package programs will yield a wide range of possible responses because of the diverse production and marketing conditions found within a given area.

2. Economics of the Decision Making Processes Among Farmers in Ada District

This topic is closely related to "1" above and has been tentatively selected by Ato Yacob Fisseha, Department of Agricultural Economics, Haile Sellassie I University, Alemaya. Ato Yacob will move from Alemaya to Debre Zeit in December, 1974 and will play a major role in helping select and train

enumerators and in supervising the field work phase of the research program. He will leave on January 1, 1976 for graduate study at Michigan State University. Yacob and Getachew will both utilize the stock and flow type data to be obtained from the 150 panel farmers for their dissertations. Yacob will supplement these panel data with case studies of individual farms for intensive analysis of how basic management decisions are made under existing conditions of land ownership and tenancy. The security (food) needs of the family are of overriding importance in this analysis. Yacob will analyze why new crops and fertilizer have, or have not, been introduced into farming systems, decisions on the use and productivity of producer and consumer credit under alternative tenure systems and other farmer decision situations.

3. The Performance of Cooperatives in Ethiopia: Implications for Rural Development Strategies

This topic has been tentatively identified for Gebremicael Menghistu, Ph.D. candidate in Agricultural Economics at the University of Wisconsin. Ato Gebremicael will return to Debre Zeit in January, 1975 and join the Ada research team for twelve to fifteen months. It is proposed that Gebremicael devote about one-third of his time to the supervision of data collection from panel farmers in the Ada District and the other two-thirds to analyzing cooperatives. The analysis of cooperatives will be divided into three phases: (1) a review of the evolution of the cooperative movement in Ethiopia, (2) an analysis of the secondary data and published reports on the role and performance of cooperatives in the package programs, such as CADU, WADU and in the MPP and (3) primary data will be collected on cooperatives in the Ada District. This third phase will be conducted in close cooperation with ADDP staff members. The major question being addressed is, "What

can be learned from Ethiopia's experiments with cooperatives to help determine the role of cooperatives in Ethiopia's future rural development programs?"

4. Alternative Input Delivery Systems, for Farmers in the Yerer Kereya Awraja

This topic has been tentatively selected by Kifle Negash, Department of Agricultural Economics, Haile Sellassie I University, Alemaya. Ato Kifle plans to transfer to Debre Zeit in July, 1975. He will spend about one-third of his time in supervising the data collection from the panel of farmers in Ada. The remaining two-thirds will focus on input delivery systems with an emphasis on credit.

Most research on credit in Ethiopia has focused on CADU's experience [Cohen, 1974; Gill, 1974; Henok, 1971; Holmberg, 1973 and Michael, 1973]. Ato Kifle will carefully review the methodology and findings of these studies. Next he will analyze ADDP's credit program which served 412 farmers in 1973 (130 landowners, 142 tenant owners and 240 tenants) and 1,085 farmers in 1974.

The major question being addressed is whether or not there is a credit constraint on individual farms in the Ada District. If so, what lessons can be learned from the ADDP's credit program for wider application in the Awraja and in Ethiopia's central highlands. Finally, the research will attempt to identify experiments that should be carried out as alternatives to government credit programs, e.g., high subsidized fertilizer programs, such as are found in Nigeria, Ghana and Sierra Leone.^{5/}

^{5/} The level of fertilizer subsidy ranges from 50 to 80 percent in these countries.

5. Role of Women in Rural Development in Ethiopia: A Case Study in Ada

This topic has been tentatively reserved for Salome Gebregziabher, a member of HSIU's Department of Sociology and currently a Ph.D. candidate in Sociology at Michigan State University. Wt. Salome plans to join the research team in Debre Zeit for one year, beginning in March of 1975.

An increasing volume of literature is now available on the role of women in social and economic development in Africa. A number of proposals also have been advanced to devote more attention to women in social and economic development programs. For example, ECA has a special program to foster the role of women in development. There is relatively little documentation, however, on what women currently are doing in specific countries, specific ethnic groups and in specific farming systems.

ADDP recently hired five high school graduates as home extension agents. They have launched a number of programs, such as providing seeds for home gardens, nutrition and sanitation programs. The home agent in the Bekejo service center, for example, is leading a class of seventy-five women who are interested in improved nutrition through vegetable production.

It is obvious that the role of women should not be studied in isolation from the labor allocation decisions of the total family. The panel of 150 farm families will afford a unique opportunity for Wt. Salome to work with agricultural economists on labor allocation by sex within the household, within the farm and in rural nonfarm activities.

As a member of the research team, Wt. Salome will help supervise the data collection from the panel families and also conduct special indepth studies of women's roles in both the isolated service centers (e.g., Yilmo), as well as in service centers, such as Denkaka and Dukem which are located

on all-weather roads and are close to Debre Zeit.

The results of Salome's research will establish what women presently are doing and should serve as a valuable guide to ADDP home economics agents and to EPID. Since Salome is an HSIU faculty member, she can generate time series data on the changing role of women over the 1975-80 period.

6. The Economics of Small Scale Industry in the Central Highlands of Ethiopia: A Case Study in the Ada District (Topic Unassigned)

An estimated 90 to 95 percent of the people of Ethiopia live in rural areas. Policy-makers are trying to devise rural development strategies which can expand productive employment in both farming and rural nonfarm activities. There has been virtually no research on small scale industry in rural areas in Ethiopia, however, and policy-makers have identified this as a priority research topic [Solomon Bekure, 1974].

The research design for the Ada program includes a study of the potential for small scale industry. The researcher undertaking this topic can draw on the conceptual framework developed by Liedholm [Liedholm, 1973] and the methodology being used by Chuta and Liedholm [Chuta and Liedholm, 1974] in their current nationwide study of small scale industry^{6/} in rural areas in Sierra Leone. Preliminary data indicate that small scale industry in rural areas accounts for 95 percent of all employment in small scale industry in both urban and rural areas in Sierra Leone [Chuta and Liedholm, 1974].

If a researcher cannot be located for this topic by January, 1975, the Ada research team will locate and interview proprietors of business firms

^{6/} Small scale industry in Sierra Leone is defined by Chuta and Liedholm as a firm employing one to fifty workers.

in the five service centers included in the panel--Godino, Denkaka, Dire, Yilmo and Gongo, as well as Dukem, Debre Zeit, Mojo and Qoqa. This Phase A enumeration will determine the total population of firms whose primary occupation (in terms of labor allocation) is producing nonfarm goods and services. A Ph.D. candidate could then undertake special surveys of rural nonfarm firms in the nine locations over a period of one year.

7. An Interdisciplinary Analysis of Selected Mechanization of Small Farms in the Central Highlands of Ethiopia (Agricultural Economist Not Yet Identified)

Almost all small farmers in the Ada District use oxen power and the traditional wooden plow with a steel point to prepare seedbeds [Ellis, 1973 and Humphreys, 1974]. Three or four plowings are common.

CADU has undertaken most of the research and field demonstrations of improved implements for small farmers in Ethiopia. CADU has designed an improved model board plow and a V shaped spike tooth harrow. CADU has advised farmers to plow only once with the model board plow and to follow up with three harrowings to obtain better and faster results. The CADU staff estimates the time required for seedbed preparation with a mold board plow and harrow is about 50 percent less than with repeated plowing with the traditional plow. Nevertheless CADU farmers or farmers served by EPID centers have not widely adopted the improved implements [Ministry of Agriculture, 1974].

Research on the impact of tractors on tenants in the CADU area was classified after it was completed several years ago. EPID recently noted that, "A study of the effects of mechanization was carried out by CADU, and its findings were so challenging to official IEG policy that the study was

classified and no agreement could be reached within IEG whether EPID should also launch such a study" [Ministry of Agriculture, 1974, p. 48]. Gemmill and Eicher report in a review of research on mechanization that most studies of mechanization by economists include some of the following shortcomings: (a) the studies have frequently been conducted by single researchers without adequate technical information from agricultural engineers, soils specialists and other production specialists; (b) most studies have focused on one mechanization scheme, such as a tractor hire scheme, rather than considering a range of mechanization alternatives, such as oxen power and small, medium or large tractors; (c) the researcher frequently attempted to prescribe national mechanization strategies, although his studies concentrated on a limited geographical area; (d) financial rather than both financial and economic analyses were computed and (e) inadequate attention was paid to selective mechanization of specific agricultural activities, specific crops and specific tasks.

It is timely to launch a medium term (five to ten years) research program on selected mechanization in the Central Highlands using Ada as a starting point. Ellis' study in the Ada District provides an excellent point of departure [Ellis, 1973]. An agricultural engineer will join the Debre Zeit station in the near future. He will concentrate on research on improved tools and equipment. Since the Debre Zeit Experiment Station already has agronomists and soils specialists, only an agricultural economist is needed to complete the mechanization research team.

The mechanization research team can draw on detailed input-output data from the panel of 150 farmers. It is proposed that the agricultural engineer should order improved oxen-powered implements from both East and West African countries. It is also recommended that a range of CADU

implements be introduced in early 1975 (without charge) to the ten farmers who were interviewed by Getachew and Tilahun over the past two years. This approach will permit two sets of data to be collected concurrently in 1975/76: (a) input-output data from the panel of 150 farmers and (b) detailed data on the technical and economic performance of the CADU implements on the ten pilot farmers. A proposed research design for this study is available [Gemmill and Eicher, 1973]. This research could generate an invaluable data base for the proposed National Tool and Implements Center. Close liaison will be maintained with CADU, EPID and the IAR on this study. We note here that there will not be a payoff to this type of research in less than three to five years.

8. Diffusion of Innovation by Tenants and Landowners in the Ada District (A Researcher in Communication or Rural Sociology has not as yet been identified)

Economists have often used the rate of return on investment in their analysis of the diffusion process. On the other hand, communication researchers have often concentrated on such variables as age, education, distance and exposure to mass media. Communication researchers have had great difficulty in incorporating the profitability or rate of return on investment in their framework (they have sometimes used "relative advantage" as a proxy for profitability).

It should be relatively easy to design a study of the diffusion process in Ada by drawing on the vast literature on the diffusion process and on Johnson's recently completed research on diffusion in CADU, Aregay's ongoing research on CADU and on Bisrat Aklilu's current diffusion research in MPP areas. This research should be integrated with proposed research on

credit, the role of women in development and the decision making process of Ada farmers. Close liaison also should be maintained with EPID to insure that the research will contribute to EPID's overall evaluation needs.

9. A Descriptive Study of the Marketing of Grain in the Ada District

This topic is being reserved as a M.S. thesis topic for Ato Argaw Kebede, Department of Agricultural Economics, University of Nairobi. There is an assumption in Ethiopia, as in many other African countries, that the traditional marketing system is inefficient. This assumption, however, has not been rigorously tested in Ethiopia. Although the Economic Research Division of the Ministry of Agriculture recently completed a major survey of grain marketing in eight Awrajas, it was unable to reach any definitive conclusions on the overall efficiency of the traditional system or on the efficiency of alternative systems (e.g., government control of major marketing functions) [Ministry of Agriculture, 1973]. The Economic Research Division's report, however, is an invaluable guide to researchers who will undertake more indepth research on specific commodities and in more limited geographical areas.

Ato Getachew T. Medhin and Dr. Tilahun have recently completed the collection of data on grain prices in eighteen Ada District markets over the past twelve months. These data are now being analyzed to identify the grain marketing channels and measure the marketing margins at each step in the system.

It is proposed that Ato Argaw Kebede pursue an indepth study of grain marketing in the five service centers included in the interview panel. He could measure the losses under traditional storage systems in order to test

the "conventional wisdom" that grain losses are high--up to 25 percent under traditional onfarm storage conditions. Alternatively, he could focus on ADDP marketing program activities in close cooperation with the proposed study on cooperatives.

10. Other Topics

The above list of nine topics is not exhaustive. Other topics, such as land tenure, consumption and migration, could be undertaken in Ada if funding and personnel are available.

VIII. Data Processing

1. The basic assumption is that card punching should be done as near the field data collecting process as possible.
2. Card punching should be done directly from the coded survey forms, if possible.
3. Questionnaires should be partially pre-coded; additional coding should be done at Debre Zeit.
4. The following code structure is prepared on the assumption of a 80 column card system. (If a 96 column card system is used, the area called data fields would be expanded from 16-80 to 16-96--or sixteen additional columns.

<u>Description</u>	<u>Columns</u>
(a) Card type	1, 2
(b) Farm center number	3, 4
(c) Household identification number	5, 6
(d) Date completed	7-10
(e) Card control	
Last line entry number = 0, yes = 1	11
Line number within table	12, 13
(f) Form table number	14, 15
(g) Data fields with columns designated in table column headings	16-80

5. Exploration is underway to determine the feasibility and cost of installing an IBM key punch machine at the Debre Zeit Experiment Station. The machine would be used about 100 to 125 days per year (an estimated 100,000 cards per year will be used in the Ada research). The balance of the time of the key punch operator could be used to serve the needs of researchers at the Debre Zeit Station.
6. All cards will remain at the IDR. The cards will be transferred to tape and a tape will be sent to MSU for programming by the researchers at MSU (Warren Vincent and Ethiopian doctoral candidates).

IX. Time Table for 1974-76 Data Collection

October, 1974

- (a) Select panel of 150 farmers in five service centers of the Ada District. The farms will be selected randomly from the IDR baseline survey. Of the 632 households included in the IDR baseline survey, a total of 350 are located in the five service centers included in the 1975/76 panel of farmers.
- (b) Complete design of stock and flow questionnaires.
- (c) Begin coding manual.
- (d) Hire secretary.

November, 1974

- (a) Prepare draft of reference training manual^{7/} for enumerators.
- (b) Complete coding manual.
- (c) Complete processing of IDR benchmark data. Dr. Tesfai Teclé will spend
Nov. 1974 on this task at Michigan State University. Tewoldeberhan
Zerom will work on this assignment in the IDR office at Addis from
October through December, 1974.
- (d) Pretest stock and flow questionnaires.
- (e) Develop special studies.
- (f) Purchase office equipment.
- (g) Hire driver.

^{7/} The reference manual which has been used by Dunstan Spencer's research team in Sierra Leone over the past three years will serve as a valuable guide to the preparation of the reference manual for the Ada research program.

December, 1974

- (a) Design questionnaires for one or two special studies.
- (b) Contact farmers in the panel and functionaires in order to establish early rapport with the panel and local officials in the five service centers.
- (c) Meeting of the Steering Committee for the Ada research program:
 - (1) Director of the IDR,
 - (2) IDR/MSU Research Coordinator for the Ada Project,
 - (3) General Manager of ADDU,
 - (4) Ministry of Planning and Development,
 - (5) EPID representative,
 - (6) Carl K. Eicher of Michigan State University.
- (d) Select enumerators for training course.
- (e) Conduct two week training course for enumerators.
- (f) Undertake Phase I of small scale industry study in the five service centers included in the panel, as well as in Dukem, Debre Zeit, Mojo and Qoqa.
- (g) Revise stock and flow questionnaires on the basis of an analysis of '11 benchmark data and pretesting of the questionnaires.
- (h) Secure furniture and move into the six new offices at the Debre Zeit Station.

January, 1974

- (a) Finalize data processing procedures.
- (b) Post enumerators to the five centers.
- (c) Launch farm level survey.

February, 1975 through March, 1976

- (a) Collect data weekly from 150 farmers over a fifteen month period.
- (b) Develop special studies, prepare questionnaires and launch special studies.

Appendix A

Members of the IDR/MSU Research Team*

1. Professor Trimbel R. Hedges, Research Coordinator.
2. Gebremicael Menghistu, Ph.D. Candidate, Department of Agricultural Economics, University of Wisconsin (January 1, 1975 through December 31, 1975).
3. Getachew Teckle Medhin, Debre Zeit Experiment Station, College of Agriculture, Haile Sellassie I University, Debre Zeit (Part Time until January, 1976).
4. Kifle Negash, Department of Agricultural Economics, College of Agriculture, Haile Sellassie I University, Alemaya (July 1, 1975 through March, 1976).
5. Salome Gebregziher, Member of Haile Sellassie I University, Department of Sociology and currently Ph.D. Candidate, Department of Sociology, Michigan State University (March, 1975 through February, 1976).
6. Dr. Dunstan Spencer (Consultant), Department of Agricultural Economics, Njala University College, University of Sierra Leone.
7. Dr. Tesfai Tecle, Research Fellow, Institute of Development Research, Haile Sellassie I University.
8. Professor Wareen Vincent (Consultant), Department of Agricultural Economics, Michigan State University.
9. Yacob Fisseha, Department of Agricultural Economics, College of Agriculture, Haile Sellassie I University, Alemaya (January, 1975 through December, 1975).
10. Argaw Kebede, M.S. Candidate, Department of Agricultural Economics, University of Nairobi (effective July, 1975).
11. Part-time HSIU faculty.
12. Two research assistants.
13. Ten to fifteen enumerators.
14. One to two drivers.
15. One secretary.
16. One messenger.

*Some members of the team are subject to approval by the Institute of Development Research Board of Advisors.

Appendix B

List and Description of Questionnaires
to be Used in the Ada Study

The basic set of questionnaires to be used in collecting data from the panel of farmers are:

1. The stock questionnaire
2. The input-output questionnaire
3. The field parcel questionnaire.

Additional questionnaires will be designed for special studies, such as small scale industries, the role of women in rural development, etc.

I. The Stock Questionnaire

The stock questionnaire is to be administered at the start of field enumeration in January, 1975. The questionnaire has ten sections or tables as follows:

1. Identification: This contains information that would allow the household to be identified, i.e., service center number, household number, the baseline survey number of the household and the name of the household head.
2. Labor Stock: The name of each household member is recorded in this table. For each household member the age, sex, relationship to the head, educational attainment and number of months available for work is recorded.
3. Field Identification: The soil, size, last year crop, direction from the residence and other characteristics of each panel of land

to be cultivated by the household are to be recorded in this table. This allows each parcel of land to be identified.

4. Buildings and Fencing: Information on the ownership, type and use of each building is recorded in this table.
5. Farm Equipment: The quantity, age and replacement value of each type of farm equipment is recorded on this table.
6. Livestock Owned: The sex, quantity, age, estimated value (and girth in the case of oxen and young bulls) are recorded for each type of livestock owned by the household.
7. Stock of Produce and Supplies: The quantity and value (selling price) of grains, animal feed, fuel, farm supplies and livestock products in stock are recorded in this table.
8. Nonfarm Business Equipment and Supplies: The quantity, age, (for equipment only) and value of equipment and supplies to be used in a nonfarm business are recorded in this table.
9. Stock of Household Items Owned: The quantity and replacement value of a few reference household items are recorded. The same set of items were enumerated in the baseline survey and this enumeration will indicate whether there have been any changes in the eighteen months between both surveys.
10. Source of Water: Information will be recorded in this table on the source of human and animal drinking in the dry and wet season, the distance from the residence, the mode of transportation of the water and the frequency of collection.

II. The Input-Output Questionnaire

The input-output questionnaire is to be administered once a week for each selected household for as long as the panel is in operation--in any case not less than fifteen months. The questionnaire contains nine sections or tables.

1. Identification: Same information as recorded on stock questionnaire.
2. Labor Use Per Day: The activity of each household member or hired worker is to be recorded in this table. The time spent on each activity in each field, in marketing produce in nonfarm business or as exchange labor is to be recorded for each day of the week.
3. Cash Expenses Per Week: Household expenditure on farm investment, purchase of available inputs for farm and nonfarm business are recorded. Also recorded in this table are consumption purchases for food, as well as consumer durables, educational and other expenses. The type and quantity of the item purchased will be recorded. Whether payment is in cash or in kind, the type of seller and the place of sale will also be recorded.
4. Farm Produced Goods Home Consumed: The quantities and value of grains and other food crops consumed at home are recorded in this table. The quantities removed from storage during the week will be recorded rather than actual consumption. Since grains are removed periodically from the store, this provides a means of estimating consumption directly with storage losses as a residual.
5. Use of Farm Inputs: The type and quantity of fertilizer, seed and chemicals used on each field during each week will be recorded here.

6. Farm and Nonfarm Output: The quantity of crops harvested from each field, the landlord's share of the crop, the quantity and type of livestock output and nonfarm items produced each week will be recorded here.
7. Family Income Per Week: The quantity and value of sales of crops and livestock, as well as the type of buyer and place of transaction, will be recorded. Also, income from labor sold and gifts and contributions will be recorded.
8. Loans Given and Renewed: The purpose of each loan given or received, the amount given and the amount to be repaid will be recorded for the week.
9. Information on Nonwork Days: Each week the household will be required to supply information on illness of each household member, the type of treatment, the number of nonwork holy days and the number of days spent in litigations. This table should provide information on labor supply.

III. The Field/Parcel Questionnaire

This questionnaire is to be administered for each field soon after the crop is planted or soon after harvest. A field questionnaire should also be completed for all uncropped fields controlled by the household. A sketch of each field within a parcel is made and the crop on the field will be recorded in section II. In section III, compass readings and distances are recorded. In section IV, land characteristics, e.g., soil type and slope are recorded. The quantity and type of each input used are recorded in section V. Information is also recorded on the

storage facilities to be used for storing crops when harvested from the field and the ownership of any machines used in the field.

References

- Byerlee Derek and Carl K. Eicher. 1972. "Rural Employment, Migration and Economic Development: Theoretical Issues and Empirical Evidence from Africa," AREP No. 1, African Rural Employment Paper, Department of Agricultural Economics, Michigan State University, East Lansing, Michigan.
- Chuta, Enyinna and Carl Liedholm. 1974. "A Progress Report on Research on Rural Small Scale Industry in Sierra Leone," WP No. 4, African Rural Employment Working Paper, Department of Agricultural Economics, Michigan State University, East Lansing, Michigan, November.
- Cohen, John M. 1973. "The Chilalo Agricultural Development Unit as a Program Intermediary for Foreign Technical Assistance in Ethiopia," Small Farmer Credit in Ethiopia, Vol. VIII, February (paper presented at the AID Review of Small Farmer Credit).
- de Haen, Hartwig; Derek Byerlee and Dunstan S. C. Spencer. 1974. "Preliminary Formulations of Policy Models of the Sierra Leone Economy Emphasizing the Rural Sectors," WP No. 3, African Rural Employment Working Paper, Department of Agricultural Economics, Michigan State University, East Lansing, Michigan, November.
- Debre Zeit Agricultural Experiment Station. 1974. "Progress Report of Fertilizer Response Study on Wheat and Teff, 1973-74: Special Report for Ada Agricultural Development Project," Debre Zeit, Ethiopia.
- Ellis, Gene. 1973. "Man or Machine; Beast or Burden: A Case Study of the Economics of Agricultural Mechanization in Ada District, Ethiopia," unpublished Ph.D. dissertation, University of Tennessee.
- Getachew Teckle Medhin and Tilahun Makonnen. 1974. "Socio-Economic Characteristics of Peasant Families in the Central Highlands of Ethiopia--Ada Wereda," Branch Research Station, College of Agriculture, Haile Sellassie I University, Debre Zeit, Ethiopia, July.
- Gill, G. J. 1974. "Traditional Ethiopian Land Tenure and New Inputs (A Case Study Based on the Fertilizer Trails Programme)," Ethiopian Journal of Development Research, 1 (1): 81-101, April.
- Henok Kifle. 1971. "An Analysis of the CADU Credit Programme, 1968/69, 1970/71 and Its Impact on Income Distribution," CADU Publication No. 66, August.
- Holmberg, Johan. 1973. "The Credit Programme of the Chilalo Agricultural Development Unit (CADU) in Ethiopia," Small Farmer Credit in Ethiopia, Vol. VIII, February, Agency for International Development, Washington, D.C. (paper presented at the AID Spring Revue of Small Farmer Credit).

- Humphreys, Charles. 1974. "Ada Baseline Survey: Part I. Farm Characteristics of the Ada Wereda," IDR Working Paper No. 10, Institute of Development Research, Haile Sellassie I University, Addis Ababa, Ethiopia, June.
- _____. 1974. "Ada Baseline Survey, Technical Appendix," IDR Working Paper No. 10, Institute of Development Research, Haile Sellassie I University, Addis Ababa, Ethiopia, January.
- Liedholm, Carl. 1973. "Research on Employment in the Rural Nonfarm Sector in Africa," AREP No. 5, African Rural Employment Paper, Department of Agricultural Economics, Michigan State University, East Lansing, Michigan.
- Mellor, John. 1974. "Report on Rural Development Issues in Ethiopia-- Problems and Prescriptions with Special Reference to EPID and the Ada Project," Consultants Report to USAID/Ethiopia, July.
- Micael Beyene. 1973. "An Analysis of the CADU Credit Programme, 1971/72, 1972/73," CADU Publication No. 92, January.
- Ministry of Agriculture. 1974. "EPID Phase II--Proposal for the Expansion of EPID During 1973/76-79/80 and for Support by SIDA," EPID Publication No. 21, Addis Ababa, Ethiopia, August.
- _____. 1973. "Findings of a Market Structure Survey and Analysis of Those Grains That Provide the Basic Subsistence for the People of Ethiopia (A Survey and Analysis of Eighty Awrajas)," Planning and Programming Department, Economic Research Division, Addis Ababa, Ethiopia, July.
- Norman, D. W. 1973. "Methodology and Problems of Farm Management Investigations: Experiences from Northern Nigeria," AREP No. 8, African Rural Employment Paper, Department of Agricultural Economics, Michigan State University, East Lansing, Michigan.
- Solomon Bekure (Vice Minister of Agriculture). 1974. "A Perspective on Ethiopia's Approaches to Rural Development: Implications for Socio-Economic Researchers," paper presented at the 1974 Conference of the African Rural Employment Research Network, Debre Zeit, Ethiopia, September 29-October 4.
- Solomon Bellette. 1974. "Current and Projected Agricultural Economics Research Programme of the Institute of Agricultural Research (IAR)," paper presented at the 1974 Conference of the African Rural Employment Research Network, Debre Zeit, Ethiopia, September 29-October 4.
- Spencer, Dunstan. 1972. "Micro-Level Farm Management and Production Economics Research Among Traditional African Farmers: Lessons from Sierra Leone," AREP No. 3, African Rural Employment Paper, Department of Agricultural Economics, Michigan State University, East Lansing, Michigan.

Tekola Dejene and T. J. Goering. 1974. "Fertilizer Pricing Policy Over the Medium Term (1974/80)," Planning Commission Office, Addis Ababa, Ethiopia, May.

Tesfai Teclé. 1974. "An Economic Evaluation of Agricultural Package Programmes in Ethiopia," unpublished Ph.D. dissertation, Cornell University.

_____. 1974. "Rural Development in Ethiopia: Past, Present and Future," paper presented at the 1974 Conference of the African Rural Employment Research Network, Debre Zeit, Ethiopia, September 29-October 4.

AFRICAN RURAL EMPLOYMENT PAPERS

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- WP No. 3 Hartwig de Haen, Derek Byerlee and Dunstan S. C. Spencer, "Preliminary Formulations of Policy Models of the Sierra Leone Economy Emphasizing the Rural Sectors," November, 1974.
- WP No. 4 Enyinna Chuta and Carl Liedholm, "A Progress Report on Research on Rural Small Scale Industry in Sierra Leone," November, 1974.
- WP No. 5 "Plan of Work for the IDR/MSU Research Program in the Ada District of Ethiopia," November, 1974.