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**Zambia Agricultural Training, Planning,
and Institutional Development Project**

FINAL REPORT

Submitted by

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I. Background of the Project

Africa's economic crisis is pervasive, deep, and continuing. It has many dimensions but is, first of all, a crisis of stagnant or declining agriculture. The continent's agricultural production per capita is falling. In the 1970s, total agricultural output grew only by 1.3 percent per year, half as fast as population. As a result, food dependency has been deepening and agricultural exports have stagnated. Both commercial food-grain imports and food aid in-flows have risen.

The causes of the African crisis have been widely debated. Some analysts have placed the primary responsibility on the policy performance of African governments. Others point to historical and external forces that have resulted in the integration of Africa into the world economic system on unequal terms--a legacy of colonial exploitation and deteriorating terms of trade. The reality of the matter is that both internal and external factors have contributed significantly to Africa's current economic crisis.

In all countries--developed and developing, market-oriented and centrally-planned--governments intervene in agricultural markets. They subsidize farmers (mostly in older and newly industrialized countries); they tax farmers (mostly in lower-income countries); they provide food subsidies (mostly to urban consumers); they try to stabilize prices; they use parastatal organizations to control marketing; they provide fertilizer and credit at below market prices; and they organize research, extension, and other services. Many of these interventions have been at

the center of the controversy over the appropriate role of government in agriculture. Too often they have imposed serious financial burdens and generated allocative inefficiencies in countries that are already poor enough. Yet governments of developing countries are understandably skeptical about advice to reform their policies emanating from western countries when those same countries continue their own inefficient and costly interventions.

If the importance of improved policies is now widely appreciated, the experience of the 80s leaves little doubt about the difficulties of formulating and implementing policy reforms. Adjustments by developing countries are constrained both by an inhospitable world economic environment and by inadequate internal institutions and policy skills. Moreover, the search for policy reforms is more than a matter of economic analysis and rational choice. The process of reform involves conflicts between different interest groups that must be resolved in the arena of political bargaining. Success has meaning only in the context of weights attached to an agreed set of economic, social, and political objectives.

Land-locked Zambia recorded poor economic growth during the 1970's. It suffered from UN-mandated trade sanctions imposed on (then) Rhodesia. As a result, Zambia had to find alternative--and costlier--supply sources for many imported goods and use less dependable and more expensive external trade routes. Economic activity was further disrupted by the guerilla war that led to black rule in (now) Zimbabwe.

Mining has been the leading economic activity in Zambia since colonial times. The country is an extreme example of an export-led

economy--copper accounts for more than 90 percent of its export revenues. This historical dependence on a single mineral export has made Zambia highly vulnerable to fluctuations in world copper demand and prices.

The dominance of copper has been associated with an under-emphasis on agriculture. The pattern of neglect of agriculture after independence was largely a continuation of the colonial pattern.

Overall, Zambia has an abundance of agricultural land. Only 16 percent of land believed to be arable is currently cultivated. Since independence in 1964, the Government of Zambia has repeatedly stated its commitment to the goal of diversifying its economy away from copper by tapping the country's rich agricultural potential. Yet, until the 1980's, little was done to achieve agricultural advancement. Prior to the 1980's, domestic terms of trade were unfavorable to agriculture and only limited rural development efforts were undertaken. Low producer prices constrained production while subsidizing food costs for the large urban population. Cheap food and high urban wages encouraged rural-urban migration, making Zambia the most urbanized country in Sub-Saharan Africa.

Zambia also built up a large foreign debt in the late 1970's. As the 1980's began, the copper price fell, interest rates rose, and routes to the sea through Mozambique, Zaire, and Angola were blocked by war and chaos. Since copper is nearing depletion, even if the copper price recovers, production never will; future copper earnings won't be adequate to repay the external debt.

These pressures have forced the country into a difficult process of economic reform in the 1980s. Its objective has been to replace copper

earnings by developing Zambia's large but unrealized potential as a producer of food and agricultural products. If implemented, the reforms would favor the rural majority of the population at the expense of urban groups in the Copperbelt and the capital, Lusaka.

The reforms involved raising producer prices while cutting subsidies to consumers. Other reforms contemplated streamlining or dismantling the operation of agricultural parastatal organizations and promoting private sector market activity. A key reform was to devalue the national currency, the Kwacha, which was sustained in the 1970s at a grossly overvalued official rate. The government was also faced with the necessity to cut its own spending, especially on food subsidies.

In this context of policy and fiscal reform, Zambia faces a severe challenge to ensure that its agricultural policies and programs are designed to foster a broad-based pattern of agricultural development rather than continuing a bi-modal pattern in which resources are concentrated in a subsector of large and capital-intensive farm units. Commercial farmers in this subsector can respond quickly to incentives and supporting services. However, fostering increase in output and productivity among the 600,000 small-scale farms will be slower and ever so much more difficult. It will take time and resources to compensate for the legacy of neglect of the subsistence subsector and develop the effective institutions and public management capabilities required to reach this poor majority of the rural population.

At the time this report was written, the GRZ had reversed many of the previously announced economic policy reforms. Price controls were

imposed again on many products. The foreign exchange auction was ended in favor of a managed float. IMF conditionality was rejected. These reversals do not indicate that the project failed but clearly reveal the task that remains to further strengthen policy analysis, formulation, and implementation capacities within the country's policy management and decision-making structures.

II. Project Purpose and Approach

The purpose of the project was, "To improve the GRZ's performance and strengthen its capacity for the analysis, planning and management in the agricultural sector to contribute to an increase in Zambia's per capita food production and the incomes of small farmers" (ZATPID PP, p. 3, 1980). Five aspects of GRZ socioeconomic performance were identified in the project paper as indicators of achievement of the project purpose.

These were:

- increased investment of resources in the agricultural sector;
- a more coherent and effective agricultural strategy;
- an increase in the availability and utilization of information needed for managing the agricultural sector;
- improved design and execution of agricultural projects in small farmer areas; and
- the Ministry of Agriculture and Water Development (MAWD) improved procedures in analysis, planning, and management in the National Commission for Development Planning (NCDP), and other appropriate institutions.

From an operational standpoint it is useful to think of policy analysis capacity as having three components. The first of these is the human resource cadre and its technical skill level. The second is the institutional framework within which these human resources function and how that framework is organized--on paper and in practice. The third component is the support services on which these individuals and institutions depend for the data, data processing, and feedback needed to assure timely, accurate and relevant policy analysis. Given that there

is a demand by policy decision makers for sound analysis of agricultural policies and given that there is a capacity to implement a set of policies once agreed upon, then skilled manpower, responsive institutional organization, and technical support services form the core inputs to enhance a country's policy analysis capability. The project supported each of these core inputs through its capacity-building approach.

The project was authorized by USAID in September 1980 for an initial three-year duration with funding of \$4.8 million. A period of difficult relations between the U.S. and Zambian governments followed the project authorization and selection of Iowa State University to provide technical assistance under the project. As a result, most implementation activities did not begin until 1982, and some--such as the placement of a long-term advisor in NCDP--never occurred. Subsequently, the project was extended for another two years with a completion date of June 1987.

III. Project Implementation

In August, 1981, Iowa State University (ISU) was selected competitively as the U.S. university to provide technical assistance, training, and supporting services to the participating GRZ agencies under this project. A preliminary work plan to be initiated in January, 1982, was jointly prepared by the GRZ, AID, and ISU during a visit by a university project team to Lusaka in November, 1981. A cooperative agreement specifying the project objectives and operating procedures, the resources to be provided by AID and ISU, and a budget was signed by the AID Contract Officer and ISU President in December, 1981.

The original date planned for ISU long-term personnel to arrive in Lusaka was January, 1982. Delays in project implementation due to circumstances in Zambia resulted in the arrival of the first two long-term personnel in Lusaka in August, 1982. The third long-term staff member arrived in November, 1982. The official date for initiation of project implementation in Zambia was established as September 1, 1982.

The work plan for the project initially prepared in Lusaka in November, 1981, was then revised in May, 1982, when the Director of the Planning Division, a representative of NCDP, and the AID Project Officer visited Ames. This plan identified four major areas of activity for the project:

- A. Improving GRZ decision-making systems and institutions for analysis, planning, and management of the agricultural sector.
- B. Improving and utilizing analytical capabilities for policy analyses.

- C. Improving the data and information base for strategy formulation and identification of priorities for agricultural and rural development policies, programs, and projects.
- D. Training and staff development for planning, policy analysis, and management of the agricultural sector.

The work plan identified sub-activities under each major area, the date when each sub-activity would be accomplished, long- and short-term Iowa State staff expected to participate, and the GRZ agencies and personnel to be involved.

The initial work plan proved to be too general, too ambitious, and too accelerated for the available Zambian and ISU resources. In order to make priorities more precise and to show more clearly how resources would be used during the first year, a revised activity implementation schedule was prepared in October, 1982, when the campus project director was in Lusaka. This pattern of collaborative development of annual work plans continued throughout the project period.

IV. Project Accomplishments

Accomplishments are reviewed below within each of the four major areas of project activity.

A. Improving GRZ Decision-Making System and Institutions for Analysis, Planning, and Management of the Agricultural Sector

1. Planning Division, Ministry of Agriculture and Water Development

The central focus of the project was PD/MAWD, because it is the key institution for agricultural planning in the GRZ. The institutional development efforts in the Planning Division were integrated with several other donors as follows:

USAID project - four on team (maximum strength)

- 1 - Project analysis and implementation section
- 1 - Production/marketing section
- 2 - Sectoral policy analysis section

CIDA - five on team

- 1 - Director's office
- 1 - Agricultural statistics section
- 1 - Budget analysis section
- 1 - Production marketing section
- 1 - Sectoral policy analysis

SIDA - four staff in project analysis and implementation section

- 2 - Monitoring
- 1 - Women in development
- 1 - Manpower development

NORAD - one person in project monitoring

ODA - one person in project monitoring

FAO - one person in project monitoring (recently completed tour)

This large contingent of foreign advisors must work with a limited number of Zambian personnel. At last count, Zambians of all

professional levels were no more than equal in number to the total technical assistance personnel. During the project period, this situation has been aggravated by emphasis on long-term and short-term training for PD staff. While training exacerbates the shortage of staff in the short-run, in the long-run it improves the technical competence of the cadre.

Staff members are now beginning to return from long-term training in larger numbers. This is reducing both the constraints of number and technical capability of Zambian staff. Several have continued the quantitative research work begun for their degree research as a part of the on-going analytical activities of the Planning Division (PD).

Microcomputer capability is another area of contribution of the project to the PD. Microcomputers are now a part of the daily work of almost the entire staff of the Division. Some of these micros, software, and a training program to encourage utilization, were provided by the project.

In the initial period, a study of the main recurrent "outputs" of the PD was made. This study was used to define the skills and academic training required by the staff to "produce" the indicated outputs. This study, in turn, was used as a basis for a training plan for the division, indicating which staff member required what level of training. The training plan for the PD was presented as a model to the other GRZ agencies but none of them succeeded in matching this training plan during the life of the project.

In 1983-84, formal in-service training courses were offered for staff of the PD and other agencies. The first course dealt with market intervention policies and was given over a three-week period. The second course on investment planning was given twice, first as a one-week course and subsequently as a two-week course. These courses were judged to be very successful and cost-effective as a means of imparting knowledge and skills to Zambian staff. The need for them is likely to be greater as more Zambians return to their country with M.S.-level training. The project also assisted in developing a reference library and instructional materials for the PD.

2. Department of Rural Economy and Extension Education, School of Agricultural Sciences, University of Zambia

The need to improve teaching and research at UNZA was recognized from the beginning of the project. This is the main source of new staff for the planning agencies. Initial efforts involved two ISU visiting faculty for periods of 6 months each financed jointly by the project and other resources available to Iowa State University. Later, long-term technical assistance was provided to the University of Zambia's School of Agriculture Sciences to:

(1) Strengthen the B.Sc. program in Agricultural Economics

(2) Design a M.Sc. program in Economics/Agricultural Economics

In July 1985, there was in fact no B.Sc. program in Agricultural Economics functioning which could be strengthened. One had been designed and placed in the University calendar beginning in the

1983-84 academic year, but it was never implemented. Neither had any background work been done in planning towards a M.Sc. program.

Virtually no dialogue had or was taking place with the Department of Business and Industrial Studies (Economics Department) in the School of Humanities and Social Sciences with regard to a M.Sc. program.

Given the situation, the original work objectives were necessarily modified to be: (1) put a functioning B.Sc. program in place and strengthen it as much as possible; and (2) begin deliberations and planning towards a M.Sc. program. However, the latter was more a hope rather than a plan.

Program strengthening components or major work activity areas were identified as : (a) restructuring of B.Sc. program and get it functioning; (b) courses and materials; (c) giving leadership to departmental administration; (d) research; (e) opening dialogue with Economics Department with a view to planning M.Sc. program; and (f) promoting useful linkages for the department. Final comments on the need to further support the department conclude this section.

a. Restructuring of B.Sc. program and making it functional

This objective became top priority and was accomplished in January 1987 when fourteen third year students and ten second year students registered in the Agricultural Economics program. The first students will graduate at the end of the 1988-89 academic year.

The realization of the B.Sc. objective began slowly but ended in a surprising and timely manner. It began with about 7-8 months of study by the long-term advisor and getting acquainted with people and

and UNZA regulations. When Dr. Snodgrass became Head of the Department on March 1, 1986, it was much easier to be aggressive on moving a program forward. In February 1986, a restructured program was submitted to the departmental faculty for their consideration and approval. In March, it was sent for consideration to the Board of Studies in the School of Agricultural Sciences. At the April 4 meeting, it was referred back to a special study committee which became a major obstacle. It was finally resubmitted and approved at the Board meeting of June 26th.

In the meantime, the University was closed on May 18, 1980 due to student disturbances and was reopened in late June of that year to finish up graduating students. These students completed their work in late July. The closure tended to delay things generally. The next hurdle for the program to clear was the Academic Board of the University. When it was presented to the Board on October 9, the matter was removed from the agenda because the School had not verified the minutes of its June meeting. The School Board met on October 23rd and verified their minutes. It was resubmitted to the University Board on November 18 but was delayed again due to lack of time. It was finally approved in an extraordinary Board meeting the following week.

The University Senate was the next approval required and no Senate meeting was scheduled until March 1987. After the situation was presented to the Deputy Vice-Chancellor, an appeal was made to the Dean to ask the DVC as Chairman of the Senate to approve the program on behalf of the Senate. The Dean made such a request in a

memo dated January 7, 1987. On January 8th, the DVC then sent a memo indicating he was approving on behalf of the Senate to the Principal. The Principal followed with a memo to the Dean on January 9th giving approval for the program to begin. Student registrations began January 14th and classes began January 19th for the new academic year. Thus, had it not been for the closure in May 1986 which delayed the opening of the academic year by three months, the program would not have started until the 1987-88 year. Furthermore, the program gained an additional year when a group of third year students petitioned in November 1986 to be allowed entry into the program. Their request was granted two days before registration began.

In March 1987, a detailed information brochure was developed on the program in Agricultural Economics. It will be sent to all relevant government ministries and organizations and to the general managers of as many agribusinesses in Zambia as can be identified.

b. Student quality and teaching materials

Students are generally better than most outside observers believe. There is a dearth of reading materials for class use, either textbooks or reference books. In the Production Economics class there was no textbook available; yet, they performed quite well. A student's normal load is five units which means that 15 out of the 25 available lecture hours between 0800 and 1300 are filled. All afternoons (Monday through Friday 1400-1700) are taken up with scheduled tutorials. Thus, they have little time during the day to study between classes. However, the lack of books has made them

excellent note takers. On the average, their performance is equal to or better than similar classes in the U.S. Of course, the students are a very elite and sorted out group by the time they reach their 4th and 5th years at the University of Zambia.

The difficulties graduates of UNZA have had in the U.S. and Canada in graduate studies in agricultural economics and economics programs has resulted in the general impression that the B.Sc. program is of a low quality and that students are likewise. However, the only program UNZA has had is a general B.Sc. degree with half of the course work in technical agriculture. Students never had the opportunity to study rural social science nor basic social sciences (other than economics), or get a firm grounding in mathematics, statistics, and other quantitative methods. As a result, they could not do well in external M.Sc. programs in agricultural economics without getting the necessary remedial background. The test will be whether graduates from the new major program can do better.

In strengthening teaching materials, it was not possible to accomplish much, except to request additional text and reference books from CIDA, which has been the major source in the past. Dr. Snodgrass was able to acquire some computer software for teaching from FAO. During the last two years of the Project, USAID approved purchasing only four hard cover and four paperback books for the Department at UNZA.

c. Department administration

Dr. Snodgrass was appointed Head of Department on March 1, 1986. Prior to that time, a German advisor was Head. He was a caretaker doing the routine required tasks but with little incentive to make changes. Dr. Snodgrass' leadership was an important contribution to the future success of the Department and its programs. Aside from implementing the Agricultural Economics major, the Head's chair gave him a chance to have a lot of interactions and influence with other Heads of Departments. The influence extended to the Dean in particular, who was thrust into the position as a young and inexperienced faculty member. All of the leadership is young. There are only three professors in the School (all visiting expatriates) and no Zambian faculty at the Senior Lecturer rank. Most are Lecturer II grade.

In the 1985-86 academic year, the Department had four expatriate faculty members (two Germans, one Canadian, and Dr. Snodgrass). In February 1986, a Zambian was administratively transferred to the Department from the Rural Development Studies Bureau. In 1986-87, the year began with three expatriates and one Zambian and ended with one additional Zambian. In April 1986, a senior technician was recruited and added to the Department. His assigned tasks are primarily computer-related as a computer technician assisting faculty and students. Six Zambian faculty are on study leave--five Ph.Ds. and one for M.Sc. Three are expected back to begin the 1987-88 academic year. If they return, the department will still need one

additional expatriate in order to handle the teaching load next year. An additional German has been requested. CIDA does not intend to provide any faculty after August 1987.

Some observations on organization and management include the following:

(1) All the Heads of Department and the Acting Dean are junior faculty members. The expatriate senior staff provide an important stabilizing influence and source of counsel as the School struggles to advance.

(2) Operational funds make up an infinitesimally small amount of total departmental budgets. In the case of rural economy, it is less than one percent (K1663 of consumables for 1987). Were it not for personal funds spent by expatriates, the situation would pose a much more serious constraint.

(3) Administrative procedures are often either too short or too long for efficient decision-making. Many important decisions are taken by administrators with virtually no consultation of staff while others get stymied by the long bureaucratic chain. For example, final examination results are reviewed in detail by three separate bodies, but students are not allowed to have their own results. Student appeals require fees and written letters and are routinely denied without any information provided. Thus, instructors can fail any student they wish to and never be held for a review or accountability.

d. Research

The time available for research by the long-term advisor was directed towards student research projects, assisting other faculty in mounting projects, and making a small contribution towards Dr. Pervis' work on import substitution and export promotion.

Specifically, student research topics supervised included:

- (1) Evaluation of an alternative marketing system for ZAMSEED in the Eastern Province.
- (2) Factors affecting maize seed sales.
- (3) Least-cost feed formulations for commercial dairy and beef enterprises.
- (4) Impacts of agricultural tariff policy on government revenue and producers.
- (5) Economic evaluation of Zambian agricultural policy for wheat.

Although the lack of funds for research is the major overriding obstacle to strengthening the Department's program, Dr. Snodgrass was able to catalyze research proposals which were instrumental in getting microcomputers donated to the Department from the German Academic Foreign Exchange and additional funding from Global 2000. Dr. Snodgrass facilitated some research efforts in the Planning Division of MAWD by arranging fifth year students for interview work and a graduate for full-time work to assist Dr. Pervis.

The constraints on research output in the Department are considerable. Besides the money constraint, there is time. Direct hire expatriates get an annual vacation (one month) plus a long vacation (3 months) every two years. Zambians do too. Teaching

assignments are relatively heavy without a semester free from teaching as is sometimes the case on a teaching-research appointment. The number of staff in the establishment is determined by teaching loads and was cut from nine to eight for the Department for the 1986/7 academic year. In the case of the Rural Economy Department, the Rural Development Studies Bureau (RDSB) preempts most of the research funds from outside sources that could otherwise strengthen the Department's research efforts. A possible long-term solution is to merge the Bureau into the Department and establish both teaching and research as recognized formal functions with funding for both. The retention of trained Zambians in the Department and UNZA, as a whole, would be enhanced by such a merger. There are those in RDSB who would enjoy doing some teaching and those in the Department who would be able to benefit from access research funds. Presently, there is little cooperation between the two University entities, primarily because the Department has been one short of teaching personnel.

e. Planning for M.Sc. program

It was Dr. Snodgrass' view that the only hope for establishing a M.Sc. program in Agricultural Economics at UNZA is to have one joint program between the Department of Business and Industrial Studies (Economics) in the School of Humanities and Social Sciences and the Department of Rural Economics and Extension Education in the College of Agricultural Sciences. One program would enhance the prospects for both departments to have a functionally viable program.

Presently, the university calendar lists a Master of Arts in Economics degree program as follows:

Required Courses:

EC 500 Advanced Economic Theory
 EC 510 Quantitative Methods
 EC 520 Economic Development and Planning

Elective Courses: (one course to be taken)

EC 519 Regional Planning
 EC 529 Econometrics
 EC 530 Monetary Theory and Policy
 EC 539 International Economics
 EC 540 Public Finance
 EC 549 Economics of Public Enterprises
 EC 550 Financial Management
 EC 560 Industrial Development
 EC 570 Manpower Development
 EC 580 Transport Economic
 EC 590 Rural Development

The regulations state: "Normally the programme of study comprises approved coursework and research, but in certain circumstances the programme may consist entirely of supervised research followed by the submission of a dissertation. The usual duration of the program is two years for full-time candidates. In the first year, the equivalent of one academic year is spent on research on an approved topic, under the guidance of a supervisor appointed by the relevant Department, and in the preparation of a dissertation."

The Master of Arts in Economics has been in existence for five years and has produced six graduates. The three required courses have been taught except in the 1985-86 year. Of the elective courses, only EC 519, 530, and 539 have ever been offered. No

student has finished the program in two years, since none has been pursuing studies on a full time basis. The conclusion reached is that the program while on paper really is not yet viable.

A M.Sc. program in Agricultural Economics could use EC 500 and EC 510 as part of the course structure. In discussions with the Head of the Department of Economics, there is a willingness to discuss planning for a joint program, but not much enthusiasm can be detected for planning towards its implementation. It would seem to be some five years away, and then only if the B.Sc. major program has been sustained.

There are two opposing views on campus. One says that there needs to be at least one or two faculty members of Senior Lecturer rank in the Department before a graduate program is begun. Such a situation will not be the case in Rural Economy for at least five years. The other view is that if there are experienced expatriate staff in a department and their support from donors can be expected to be maintained, it is reasonable to begin a graduate program. In the case of Rural Economy, there is no donor showing willingness to supply faculty on an extended basis, except possibly West Germany.

f. Developing other linkages

Rural Development Studies Bureau. No progress was made on developing programs of mutual interest. A recently returned Zambian at RDSB, Dr. C. Mwila, took the initiative to express interest in doing some teaching for the Department. He is currently teaching EC

910 (Rural Development) for the Economics Department. Other assignments such as Mr. Sipula are positive steps that can be taken.

There may have been some past problems between the two entities, which may slow cooperation. Certainly the administrative transfer of a RDSB member to the Department was upsetting to the Department and the School. However, the advantages of merger which were mentioned under the research section would seem valid.

Planning Division of the Ministry of Agriculture and Water Development. Opportunity to discuss mutual cooperation was limited. Through Project colleagues arrangements were made to provide some students for interview work on surveys conducted in the Planning Division.

It was indeed unfortunate that graduates from the minor specialization in Agricultural Economics produced by the Department were not considered in 1986 until after they were placed. The Planning Division should be a major benefactor of the Department's program.

Most are sponsored by the GRZ and some of the final year students should be doing their research on Planning Division projects. The Department faculty can assist the Planning Division with short courses and seminars. These are a few ways for cooperation to yield mutual advantages.

g. Comments regarding future assistance to UNZA from USAID

USAID has asked UNZA for proposals on their needs. UNZA wants some ideas as to what USAID might support before spending a lot of their meagre resources in building a detailed proposal. There is

validity to both points of view. The two should sit together and communicate clearly what is expected from each other.

With regard to assistance to Rural Economy, CIDA and DAAD have and will continue to provide hardware (computers, furniture, books). They cannot provide software. USAID could make a tremendous contribution to the agricultural economics program by supplying a small quantity of Kwacha for operations, e.g. computer diskettes, support to students in their final year research projects, etc.

The survival of the Department of Rural Economy in particular, may turn on donor willingness to give support for operational items. The faculty has been promised a 50% pay raise effective April 1, but no more government funds are forthcoming. With salaries and salary related items now comprising well over half the total budget, one wonders where it can come from--probably from not filling faculty positions (a freeze is now in place), cutting out research monies, not replacing or maintaining the capital plant, and cutting operational budgets still further. It is well and good for donors to take the position that says, "If UNZA can't even provide the housing and/or operational budgets for donor-provided faculty, then why should we provide anything. UNZA must show good faith by putting up this minimum." However, the 1987 reality is that UNZA can provide a salary, some salary fringe benefits and housing for most of its faculty and workers, monies for utilities and little else. For 1987, the budget of the Rural Economy Department is 99% salary and salary-related items and 1% for operations. The School of Agricultural

Sciences would be inoperable without the present support from the Belgians (Soil Science), Dutch (Agricultural Engineering), CIDA (Crop Science, Animal Science, and Rural Economy), and DAAD (Rural Economy). Three departments and the Dean's Office have just moved to a new building built with Zambian funds. However, there is not one phone in the building including the Dean's Office. These are the present realities.

USAID has chosen to strengthen RDSB which is a part of UNZA. It agreed to support only one long-term technical assistance assignment in the Department of Rural Economy with virtually no operational support. A very small level of operational support to the Department to complement the hardware being provided by other donors would be money well spent. The other donors are also contributing operational support to the faculty they provide. By mid-year 1987, the Department expects to have a secured computer room with six PC computer stations for teaching and research. But a likely scenario is that there will be little or no money for diskettes, computer paper for the printer nor related consumable supplies.

It would appear that RDSB was and will continue to be strengthened by USAID so that it can do surveys and generate data needed by the Planning Division of MAWD. The Department of Rural Economy is the only source of B.Sc. agricultural economists in Zambia. Yet, the Department is perceived by USAID to be too indirect a linkage to its major thrust to be included for support. RDSB can generate data and the Department can generate trained people. Both are important and vital for continued institutional development.

3. Rural Development Studies Bureau, UNZA

The project elected to increase the capability of the Rural Development Studies Bureau to do significant data collection work for other institutions. Contractual arrangements were made to involve RDSB in a major survey effort. Several staff were also sent for long-term participant training. Close liaison was maintained between the project technical assistance team and staff at RDSB.

The small-scale farm household survey was an example where 50 or more enumerators worked under RDSB staff supervision for the entire growing season in 1986. Subsequently, a dozen encoders were supervised to prepare over 80,000 pages of data for entry into computer files. Two well-trained data entry persons accomplished a monumental task in record time. At least six staff have received training in use of data set with SPSS/PC. The work was closely supervised and at every stage the RDSB staff were involved in the data preparation and processing.

Installation of computers and software was started two years ago. The software and hardware currently installed at RDSB are similar to those in PD/MAWD and CSO.

The eagerness for and commitment of time to learning the survey systems and procedures was noteworthy. It appears that a working team of RDSB staff could now execute a survey and present a verified data set for analysis without technical assistance. The analytical capacity has been present for some years, but it has been augmented by returnees with M.Sc. degrees. In the near future, additional staff will return from training including two Ph.D. recipients.

4. Central Statistical Office (CSO)

USAID and the U.S. Bureau of Census (Bucen) have developed a program of assistance to the Central Statistics Office. Long-term assistance in data processing was provided to CSO by the project in support of the Bucen program.

The 1980 Population and Housing Census final processing and analysis work, agricultural surveys and labor force surveys were processed during the final thirty months of the contract period under project funds provided by USAID.

a. The 1980 population and housing census

The second census after independence was launched in Zambia in August 1980. Its final report and detailed analytical works were completed in November 1985. The volumes of detailed census information completed and published after producing "camera ready" computer output tables by subjects are listed below:

- Volume I. General Population and Migration Tables
 - II. Analytical Report - Demographic and Socio-Economic Characteristics of Zambia
 - III. Analytical Report - Major Findings and Conclusions and Policy Implications
 - IV. Analytical Report - Fertility and Mortality
 - V. Analytical Report - Demographic and Labor Projections

The detailed analytical reports were done with the aid of computers by using several demographic analysis programs obtained

from Bucen and by developing CSO's own programs. Although the census work was a continuation of the UN-funded project which ended December, 1984 (as far as the data processing expert assistance was concerned), it was only possible to complete it with USAID assistance.

From November 25 to 29, 1985, the first seminar on population in the country was held at Mulungushi Hall under the title: "1980 Population and Housing Census: Dissemination and Utilization" in which several delegates from Zambia and other neighboring countries participated.

Microcomputers, installed through USAID assistance, were used in preparing the final analytical reports and seminar papers.

Mr. Bogale Demissie submitted papers with his counterpart, Mr. I.N. Muzeya, on the processing experience and recommendations for the coming census. In addition to this, Mr. Demissie jointly prepared and submitted a paper on population projections with the UN demographic analyst.

b. Agricultural surveys

Three agricultural surveys were conducted and processed during the assignment period with technical assistance in questionnaire design, survey planning, and sample design from Bucen experts on short-term visits.

As the main part of the USAID assistance program under this project and the Bucen project, the three agricultural surveys that were conducted and processed were:

- (1) The 1985-86 Crop-Forecasting Survey (3 phases),
- (2) The 1985-86 Post-Harvest Survey, and
- (3) The 1986-87 Crop Forecasting Survey (3 phases).

The survey processing work for the above three surveys were designed and prepared for microcomputer use. The survey processing system of the surveys includes:

- (1) The participation and advising on questionnaire design,
- (2) The data entry--program preparation and entering data into microcomputer,
- (3) The data editing and correction--program preparation and running,
- (4) The calculating of weighting factors--program preparation and running,
- (5) The tabulation--program preparation and tabulation, and
- (6) The analysis of variance--program preparation and running.

As part of the survey processing exercises, the survey processing system for the three surveys were documented for future use. The survey processing system document includes:

- (1) The survey sets;
- (2) The survey processing system definition and procedure manuals;
- (3) The programs logic definition, listings and test runs; and
- (4) The copy of final tables and results of analysis of variance.

There were no major problems encountered while processing the surveys identified above.

Several SDPU staff were trained in the general concept and understanding of the system and running procedure of the various prepared programs for microcomputers as part of their job training.

Both preliminary and final results of the two years (1985-86 and 1986-87) Crop-Forecasting Survey were made available to users almost on time.

The 1985-86 Post-Harvest Survey data processing work which was completed in March 1987 was with Agriculture Division (AD) of CSO waiting for final checking and publication at the end of the project.

The 1986-87 Comprehensive Agriculture Survey (CAS), First Phase, field work was on schedule and the questionnaires expected to arrive in Lusaka at the end of the project.

The 1986-87 Comprehensive Agriculture Survey processing system was also designed for microcomputers for which the data entry program preparation work was accomplished. Detailed tabulation plans and edit specification layouts were prepared by the Bucen/PASA experts on short-term assignments.

The Comprehensive Agricultural Survey is more detailed and complex than the other surveys described above. The data processing activities will be large when compared with Crop-Forecasting Surveys (CFS) and Post-Harvest Surveys (PHS). Detailed system layouts, definitions, and procedures were yet to be outlined at the end of the Project.

c. Labor force surveys

Other than the agricultural surveys, as the main activities of his assignments, Mr. Demissie assisted CSO on other surveys which included

two labor force surveys conducted during 1985 and 1986.

The Lusaka Labor Force Survey was the first survey to be conducted in 1985 as a pilot survey exercise for the later National Labor Force Survey. The surveys' main objectives were to study the labor force population of the country so that employed and unemployed both in formal and informal sectors could be identified. The surveys covered both rural and urban areas.

These surveys were funded mainly by the Government of the Republic of Zambia with marginal technical and material assistance from the International Labor Organization.

Mr. Demissie's contribution towards these surveys were:

- (1) Assisting with the subject matter when designing the questionnaires for processing on microcomputers;
- (2) Preparing survey systems of operations and procedures;
- (3) Writing of programs; and
- (4) Attending technical committee meetings.

The Lusaka Labor Force Survey was designed for microcomputers in which data entry, editing and tabulation were done by using the available microcomputers. At the end of the project, the results were analyzed and ready for printing.

The National Labor Force Survey was conducted in July 1986 covering 11,744 households with a 34,461 labor force population in all rural and urban areas. This survey was designed for the mainframe computer.

The data entry and editing were carried out at CSO by using the IBM 5280 stand-alone entry equipment and the ICL DRS20 micro-computers, respectively. The main processing work was accomplished

by using the Ministry of Finance's mainframe computer which included further editing of data, adding weighting factors, and tabulation. By the end of the project, 90% of the data processing was completed. Unlike the agriculture surveys, the labor force surveys were done with a great deal of coordination, planning and interest due to the fact the personnel, who had been assigned to work on the surveys, were interested and diligent in processing of the data.

d. Data processing capability development

The main task was to strengthen the Statistical Data Processing Unit (SDPU). Nineteen key-to-diskette data entry machines were purchased for the 1980 census processing. Personnel consisting of one staff member with some data processing training and over thirty other ad hoc staff employed temporarily during the census were strengthened by installing microcomputers, implementing the mainframe-to-micro linkage, and training staff at all levels.

Organization of the SPDU. The first step towards establishing a data processing unit is to study the organizational objectives of the unit. A detailed outline of functional sections and definitions of duties and responsibilities of the functional sections or sub-sections is required.

Mr. Demissie prepared a manual after studying the current and future CSO's data processing needs. In general terms, the concept was based upon sharing the Ministry of Finance's mainframe computer for processing of large scale surveys and censuses and by decentralizing the data entry systems and program development activities.

The study anticipated acquiring microcomputers for the processing of small-scale surveys and other statistical data processing works. The study detailed the objectives of each functional section of the unit by classifying the manpower requirements as well as duties and responsibilities, both technically and administratively, of defined jobs. The organizational report was submitted to CSO officials in April 1985, with a copy to the Chief-of-Party.

Staff organization and training. Out of the total of 52 posts that are required to establish the Statistical Data Processing Unit of CSO, only 8 posts are approved by GRZ and the remaining 44 posts are currently occupied mostly by ad hoc staff who are still temporary or by permanent staff. They are waiting for the post to be recognized by the Personnel Division before receiving a proper appointment.

During Mr. Demissie's assignment period, several SDPU staff (both permanent and non-permanent) participated in different types of training programs on data processing. Training provided under the project is described in the training section of this report.

The installations of microcomputers and mainframe-to-micro linkage. Six microcomputers (two IBM PC and four IBM PC/XT) were received from Bucen/PASA (USAID funded) in July 1985, and installed at CSO premises with all necessary software. They became operational almost immediately, and two IBM PC/XT microcomputers were upgraded with 30 megabyte hard disks in 1987.

Training (in-house) was organized for other users twice, (once in 1985 and the other one in 1986) for directorate, statisticians, demographers, and other technical staff of CSO on the general concept of microcomputers and how to use the available software with hands-on practices.

Training was also provided to other organizations: Ministry of Health, Ministry of Agriculture and Water Development, National Commission for Development Planning, and Ministry of Education on request through the Director of CSO.

CSO received and installed three more ICL DRS20 microcomputers (United Nations funded) in 1985.

The mainframe-to-micro linkage was accomplished in November 1985, after the communication expert from Bucen/PASA visited Lusaka. Unfortunately, the linkage was never utilized due to lack of telephone lines, disk storage, and software problems.

The data archive services. As a matter of data security concern, it was found necessary to establish a Data Archive Section during the 1980 Census processing time. Currently, the Section is handling the documenting and archiving data sets for censuses and surveys as well as programs and system documents.

The Section recorded and documented:

- (1) The 1980 Population and Housing data on magnetic tapes;
- (2) The external data on magnetic tapes;
- (3) The 1985-86 and 1986-87 Crop Forecasting Survey data on floppy (5 1/4") diskettes;
- (4) The 1985-86 Post-Harvest Survey data on floppy (8") diskettes;

- (5) The establishment Registration data on floppy (8") diskettes; and
- (6) Several ad hoc job data sets.

In addition, the Section documented tables, programs, system manuals technical reference manuals, periodicals and computer supplies and small number of computer parts.

Currently, the Section is using a card documentation and archiving system to control the flow of archived documents and data. The services of this valuable and very much expandable section will be increased as the data processing demands increase. Therefore, the present documentation system should be reviewed, in terms of spacing and archiving procedures so that it can be computerized at a later stage.

The computer room and it's services. The computer (microcomputer) room is well organized and established unit that provides word processing, data entry, and other statistical and related computing services.

The room is supervised and controlled by one supervisor and supported with two other well trained microcomputer operators and three other data entry operators.

All installed machines are properly numbered each having a log book so that all users enter the time in and out by job in order to measure monthly computer usage.

Services are given to all CSO statistical divisions on the completion and approving of job requisition forms prepared by the computer room.

Services are also given to outside users subject to the completion of specially prepared job requisition forms after approval of the Director of CSO for which a service charge is made. Service charges are calculated based on the number of computer hours utilized (elapsed service rendered) by the user which includes programming and related services.

The data processing bottleneck was improved during the last two years while progress in developing CSO's own data processing capabilities were improved.

In addition to the censuses and surveys processing jobs done, the computer room has provided service in preparation and processing of the following other statistical applications for CSO:

(1) Public Finance Statistics--data entered, processed and analyzed for the 1984 to 1986 GRZ revenue.

(2) External Trade Statistics--published the 1986 BTN files after entering the entire data on microcomputer with screen data entering and updating system.

(3) Establishment Registration--data for over 12,000 establishments (wholesalers, retailers, etc.) throughout the country's urban area were entered and listed for public use with a screen update and retrieval system.

(4) Motor Registration--data entered, processed and analyzed for the 1985 and 1986 data.

(5) CSO's Payroll System--studied and prepared for micro-computers, it has become operational since January, 1987.

The microcomputers also became very useful for survey forms and questionnaire design. For example, the agricultural and labor force surveys were designed with the aid of microcomputers.

The following published reports were also prepared with the aid of microcomputers:

- (1) The 1985 Country Profile
- (2) Quarterly Price Index (since 1985)
- (3) National Accounts (the first report to be produced)
- (4) 1986 Migration Reports
- (5) 1985 Input/Outputs
- (6) Monthly Statistical Digest
- (7) Zambia in Figures (since 1985)
- (8) Yearly Statistical Bulletin
- (9) Several other ad hoc jobs.

Major outside requests. Apart from the major statistical and other applications as specified above, the microcomputers services were extended to the following outside users on request as follows:

(1) National Commission for Development Planning: Provided both a full-time officer and a microcomputer during the preparation of the Fourth National Development Plan (FNDP). In processing of the Secondary Service Centre Based Planning Study in Western Province for an estimated 1,500 households, the study was undertaken in collaboration with JNZA. The SDPU assistance for this study included the data entry, editing and the producing of tables on microcomputers. "Women Survey" data--a study carried out in Luapula Province was entered by using CSO's microcomputers. SDPU also provided additional technical advice during tabulations which were later produced on NCDP's microcomputers.

(2) Ministry of Health, Statistics Unit: SDPU trained one officer from the Ministry of Health, Statistics Unit for a period of three months by bringing their own microcomputer to CSO. The training consisted of hands-on and familiarization practice on

application programs like Lotus 1-2-3, dBASE III ad SPSS/PC+. After completing the microcomputer course, their microcomputer was installed and tested by SDPU staff at their premises.

(3) Tropical Disease Research Centre: SDPU provided assistance to the Centre in analysis of data on blindness.

(4) Preferential Trade Area (PTA): dBASE III program was written for PTA countries Company Profile Data-base enquire system.

(5) Ministry of General Education: SDPU was consulted on microcomputer needs for their office requirement through international aid and advised accordingly. SDPU designed and wrote an entry program for entering Primary and Secondary Schools Production Units Annual Returns and processed and produced final tables.

(6) Rural Development Studies Bureau (RDSB-UNZA): Two data entry operators were trained.

5. National Commission for Development Planning

A major effort in this agency was contemplated in the original plan of the project. A long-term macroeconomist to provide technical assistance to NCDP was included in the budget throughout the project. The objectives of the position in Sectoral Planning were partially met by Dr. Applegate's work on national input-output tables. Also, Dr. Warren conducted an agricultural strategy workshop for NCDP. The position was available but not filled because of pressing workloads in NCDP generated by World Bank reviews. The loss to the

overall effort was significant and can be characterized as the lack of a current agricultural sector analysis. Had such an analysis been done, it would have guided the investment priorities of the GRZ and institutional development in all of the GRZ agencies.

A significant relationship did develop and considerable gain was made in the "training of trainers" focused on Integrated Rural Development Projects (IRDPs). Three major workshops in three separate years trained over forty staff in team building and strategic planning techniques for agricultural development. This effort was organized by Regional Planning in NCDP and the Ministry of Decentralization. The agricultural planners from the Provincial Planning Units made up a significant share of the participants. All trainees have conducted their own workshops at the District and Provincial levels. These workshops have resulted in an improved capacity to plan and implement projects at the local level.

6. Ministry of Finance

CSO and NCDP are also parts of the Ministry of Finance but are discussed separately. Minimal objectives were set for Finance and little was accomplished outside of the long-term participant training of two of its economists for M.Sc. degrees. The USAID Human and Institutional Resource Development (HIRD) project is training managers. HIRD looks to other GRZ departments for training candidates as well.

Concerted effort was made to get a tax study underway assisted by short-term technical assistance and the Project team in country.

Change of personnel and pressures of recurring budget work caused the cancellation of this study.

B. Improving and Utilizing Analytical Capabilities for Policy Analysis

Work in this major project activity was centered in the Planning Division, Ministry of Agriculture and Water Development. It featured a "learning by doing" approach in which ISU staff collaborated with Zambian staff on specific analytical activities related to current policy issues. As a result of this collaborative approach, Zambian personnel now have command of techniques and access to data to:

- (1) Evaluate effects of price changes on production budgets by crop and make pricing recommendations.
- (2) Optimize the transportation and storage of maize in relation to differentiated regional pricing.
- (3) Formulate the input-output structure of the agricultural sector.
- (4) Evaluate impacts of changes in the exchange rate as established by a foreign exchange auction or as set by GRZ policy.
- (5) Assess the production and consumption responses of small-scale farmers to price changes.
- (6) Evaluate the opportunities for export of agricultural commodities under variable economic conditions.
- (7) Assess the socioeconomic impacts of economic policies.

1. Agricultural Finance and Credit Study

One of the earliest specific studies undertaken by the Planning Division in collaboration with ISU long-term and short-term technical

assistance was an agricultural finance and credit study. The purpose of the study was to provide an overview of problems and constraints in financing agriculture and develop a framework and scopes of work for priority, on-going studies. In addition, the study was to provide a vehicle for up-grading the analytical capabilities of the Planning Division staff.

While the team basically completed the assignment given and submitted the study report for critical review, there were a number of problems and issues faced in planning and implementing the agricultural finance study. These problems are illustrative of the situation that continued to exist to some degree during the project period.

Problems related to staff availability and quality. It was difficult to obtain appropriate PD staff who (1) had enough experience in the Planning Division to contribute significantly to the study, (2) who viewed the problem area addressed by the study as a major component in the approved program of work for which they had a responsibility, and (3) who did not already have other competing commitments. Also, Zambian staff involvement in the agricultural finance study was intermittent and largely during the data collection phase of the study, greatly hampering the achievement of the improved analytical capabilities. The one experienced Zambian who did assist the study team was withdrawn for other work in the middle of an analytical exercise he had been assigned to do for the study.

There were several reasons the above problems occurred. The timing of the recruiting was not early enough to allow section heads

to provide the needed staff. Section heads were not informed of the study even though it had been identified by the Planning Director as a priority area for Project involvement. This was partly due to a communication gap and partly due to shifts in which sections would have a major responsibility for work in the area of agricultural finance, a result of reorganization.

There was an associated problem of shortage of staff. This shortage was amplified by the number of more experienced staff who had been sent off to work on post graduate degrees. Current Zambian and expatriate staff are thus overburdened with daily routine and emergency types of work. This provides little room for uninterrupted blocks of time which could be devoted to the needed studies.

Efforts are being carried out in the Planning Division to improve staffing levels. Ongoing efforts to improve communications and to have work plans which reflect total staff involvement will also improve the situation. Priorities need to be agreed upon by those implementing them. Realistic assessment of how long it takes to plan and implement a meaningful study would be helpful. The timing and structure of the studies need to realistically reflect staffing constraints.

Shifts in priorities. When the scope of work was written for the Agricultural Finance Study, the request from the Director of Planning was to provide a study that included credit, but went beyond to emphasize the broader issues and constraints associated with financing agricultural production and marketing. (A number of credit

position papers had already been written by the Planning Division.) The Planning Director was away when the short term assistance team arrived. So, several days into the study, the Director returned and in an interview with the team, instructed them to address primarily the issue of the appropriate institution(s) to provide credit to farmers, i.e., should the newly instituted agricultural development bank be encouraged to begin operations. The resulting increased emphasis on studying the agricultural credit system limited available time to address the broader rural finance problems and issues. However, the team was able to provide a fairly comprehensive overview of the agricultural finance system. It is commendable that the team could adjust to the change in priorities.

Clarifications on "for whom" and "by whom". In discussions among team members of the agricultural finance study, it was decided to write the report as originating from the two outside experts to allow room to say some things which otherwise might not be accepted by policy makers. Thus, the study became known early on as the "Bourne and Boehlje Report" for the Planning Division. In addition, it was not clear prior to the writing of the report, who the end users would be, i.e., what the distribution would be to outside agencies and the public. The Zambian Government is sensitive to the use of the information generated in these studies for publication and distribution outside Zambia.

In the review process to which the Agricultural Finance Study Report was subjected, some of these issues were clarified and were

useful in planning other studies. The conclusion and decisions reached were:

(1) The study should be prepared as a product of the Planning Division. This particular study will be the first in a series resulting from collaboration between the PD and Iowa State University/USAID Agricultural Planning Project. Anything which should be said in the document will be said as coming from the PD, and the Ministry of Agriculture and Water Development.

(2) The study should receive wide distribution among policy makers in the GRZ.

(3) The document should be bound with an attractive cover as a formal publication of the Planning Division.

(4) Credit to those who contributed to the study should be appropriately given.

(5) The report of the study should be subjected to review within the PD prior to final write-up and release for distribution.

2. Agricultural Commodity Pricing Recommendation for 1984/85 MAWD Submitted to Cabinet by the Ministry of Agriculture and Water Development (MAWD)

MAWD recommended regionally differentiated maize meal prices to cut transport and handling subsidies. Work done by project economists with Zambian and Canadian economists on regional pricing, transportation costs and border pricing provided the basis for this recommendation. Import and export parity border prices were used in the pricing formula along with costs of production to determine the recommended producer prices.

The Cabinet memo quoted the project produced groundnut study recommending decontrol of groundnut market pricing and an increase of confectionary groundnut prices relative to maize price to provide incentive toward increased production for export. The study also contributed to the recommendation for price differential between Chalimbana confectionary nut and Makulu Red oil seed groundnut as well as providing information which led to a differentiated price for sunflower seeds based on seed quality.

Sorghum, millet and cassava prices were raised substantially to provide incentive for their production, since these crops are good substitutes for maize and can be produced at a comparative advantage.

MAWD recommended a negotiated producer price for milk as a first step toward decontrol of milk price. Project staff contributed to the rationale for this recommendation.

In 1984/85 producer prices were announced at least two months earlier than normal as the result of improved analytical capabilities of PD staff and the use of the APPLE IIe microcomputer purchased with project funds. The Cabinet memorandum for the first time included yield sensitivity analysis on crop producer costs and consumer price impacts of alternative price and subsidy scenarios. In addition, the Minister and his staff were provided a volume of supporting documents for increasing the quality of the debate, all made possible through improved computing and word processing capabilities.

After the initial submission of the Cabinet memo, the Cabinet requested impact analysis of an increase in fuel prices and

fertilizer prices. These analyses were given to the Minister of Agriculture within one day of the request. The official prices announced by GRZ included both these changes in relation to the official prices.

Most importantly, Zambian staff members were deeply involved with all of the analytical activities in support of pricing recommendations during the period.

3. Additional Indications of Use of Analytical Studies by GRZ and Donor Agencies in the Early Project Period

As mentioned earlier, the groundnut production and marketing study had significant impact on groundnut price policy. The study was also the basis for the change in emphasis of research and extension in Eastern Province toward the improved production of Chalimbana, the confectionary nut with high export potential. The study also provided Eastern Province officials a basis for their decision to encourage sunflower production versus groundnuts for oil seeds.

A fertilizer study carried out in the same manner as the study of the credit system was quoted by World Bank and other agencies in their recommendations for restructuring the fertilizer production and marketing system. Because of their involvement in the fertilizer study, Project and PD staff were invited by INDECO to participate in the work session on the rehabilitation of Nitrogen Chemicals of Zambia Ltd. Consultant teams presented their initial findings and recommendations at this session.

The finance study was used by government in the reorganization of the agricultural credit system and in particular in the lending policy of ZADB, e.g., block lending to cooperatives will be a major means of lending to small-scale producers.

4. Commercial Farm Cost Survey

Purpose. The objective was to obtain empirical data that can be used to estimate costs of production on commercial farms. Cost of production estimates are used in the Planning Division for recommending producer prices. In the past, the budgets for commercial farms were based on a mixture of recommended practices by crop scientists and extension workers and could not be defended in hearings with commercial farmers on costs. What was needed was a set of estimates based on empirical data.

Methodology. Members of the Production and Marketing Section of PD/MAWD jointly designed the survey questionnaires and pretested them. A sample was drawn from the list of members of the Commercial Farmers Bureau. UNZA third and fourth year students from the Department of Rural Economics and Extension Education were hired to assist in the field enumeration. These students also assisted in the data tabulation. After the data were tabulated, new cost budgets were built on the computers in the Planning Division with Symphony spreadsheets.

Results. Fifty-six, large-scale, commercial farmers were interviewed. These interviews provided data to build budgets for

maize, irrigated wheat, and soybeans. A second group of farms in the Mumbwa area were also interviewed. This included 30 farmers which we call small-scale, commercial farmers. They use tractors for draught power but the farms contain an average of only about 30 hectares of cropland. They do some custom work for neighboring farmers. Data from these farmers were obtained to build cost budgets for maize, cotton and sunflower. These 6 budgets along with the budgets developed for oxen farms from the rural household survey are the basis of a 45 page manuscript now submitted for review in the Planning Division. Publication is planned as a PD Special Report.

The above mentioned budgets constitute the bulk of the budgets under consideration at the present time for setting producer prices for the 1987-88 cropping year.

Lessons learned. (1) No big problems were encountered in this survey. It served as a good way to introduce students from UNZA to the Planning Division's activities. (2) Planning Division staff are usually too busy to conduct all of the field work, although this served as an excellent way for them to see some new facets of agriculture first hand. (3) The survey design, enumeration and analysis provided a good media for close cooperative work for Dr. Krenz and his counterparts and thus served as a good training device.

Recommendations for future work. When the above surveys were being conducted the Director of Planning Division requested additional cost surveys on dairy and beef production. No time was available to undertake these surveys. New budgets are still needed

for groundnuts, cassava, Virginia dn Burley tobacco, cashew nuts and Kenaf. These commodities should be subjects of future costs surveys. Not only do these budgets serve a role in setting producer prices, but they can be used for many other analytical purposes.

5. Fertilizer Distribution Study

Purpose. To get a better set of estimates of the aggregate use of fertilizer in Zambia, i.e., by crop, type of farm and region of the country. These estimates are needed to know what crops, what types of farms, and what regions of the country are benefiting from fertilizer subsidies, or on the other side, which may be affected by reduced subsidies.

Methodology. This project was given low priority on Dr. Krenz' work schedule. However, a spreadsheet was prepared including: (1) the fertilizer use estimates obtained from the commercial farm cost survey; and (2) the rural household survey on oxen farms to make estimates for several crops by type of farm for most major crops, including large-scale commercial farms, small-scale commercial farms, oxen farms and hoe culture farms. Estimates were also made of the hectareage in each crop by type of farm and then total estimates obtained which match total fertilizer use in the country.

Results. The spreadsheet needs further work. Estimates on fertilizer use by crop for crops raised under hoe culture from the rural household survey were obtained to further refine the spreadsheet. The spreadsheet also contains estimates of maize production

and marketings by type of farm. A brief report (10-15 pages) was prepared before the end of the contract. Preliminary results indicate that 88 percent of the fertilizer used in Zambia is used on maize. Sugar is the next highest user at four percent. Commercial farms use about 28 percent of all fertilizer. Commercial farms also appear to be producing about 30 percent of the maize and furnish about 40 percent of the marketed maize.

Recommendations for further work. The comprehensive agricultural survey planned by CSO should provide data to further refine these types of estimates. When this data becomes available, it should be incorporated into the spreadsheet and expanded to provide estimates for the major producing provinces.

6. Urban Impacts of Economic Policy Reforms

This work activity evolved as a change from what was envisioned in the project work plan. Initially an evaluation of IRDP's was contemplated. But after discussion with USAID and PD/MAWD, the current activity was instituted in its place. It was considered appropriate to assess impacts of GRZ policy reforms on urban households, since the impacts would be first discernible in urban centers.

Objectives. (1) To determine the social-psychological, socio-cultural, and economic impacts of the economic restructuring program. (2) To identify the magnitude and direction of relationships, between different categories of impacts. (3) To provide better information for policy makers.

Policies studied. The following new economic policies were central to the recent GRZ economic restructuring efforts:

- (1) Foreign Exchange Auction System
- (2) Removal of consumer subsidies
- (3) De-control of prices
- (4) Elimination of controls on interest rates.

Study design. (1) Household interviews--(1986 May-Nov.)-- interviews with representative samples of household heads (n=1,200) in four cities (Lusaka, Livingstone, Kitwe, Chingola). Three types of residential areas were sampled in each of the four cities: High Population Density--site and services areas and upgraded compounds; Medium Population Density--modest priced houses with a wide range of services provided by the District Council; Low Population Density--medium and high priced houses on larger lots with a wide range of services provided by the District Council. Information was obtained about household composition, sources of income, health of family members, housing characteristics, residential mobility, and attitudes about selected topics, e.g., cost of living, government policies, and social problems.

(1987 Feb.-March)--reinterviews of a subsample of the same persons who participated in the 1986 survey (n=600). Information was obtained about the consumption of mealie meal, recent changes in eating patterns, expenditures on selected items (including food purchases), monthly income, and attitudes about selected topics (e.g., the 1986 food riots).

(2) Interviews of community influentials/knowledgeables--the principal investigators conducted interviews with community leaders

in each of the four cities. Included were party officials, community development workers, social workers, health personnel, educators, businessmen, and religious leaders.

(3) Review of secondary data--census data, government reports, and findings from previous studies were reviewed. This material is useful in documenting the nature and magnitude of recent changes in various institutional areas, e.g., health, education, etc.

Selected study findings. (1) Public perceptions of the new economic policies--a large majority (upwards of 75 percent) of the respondents (1986) see the new economic policies as adversely affecting their lives. Disaffection with the policies is found throughout the class structure, i.e., in high-, medium-, and low-density areas. In a positive vein, the policies are popularly viewed as having brought an increased availability, and variety of new goods. Most of these goods, however, are felt to be expensive and out-of-reach of the average person. The government is felt to spend lavishly while people suffer. Concern was frequently expressed by the interviewees about the lack of fairness, or equity, in how citizens are having to bear the financial burden of economic reconstruction. Most respondents, in all density groups are uninformed about the rationales for policy changes. No systematic effort by the United Independent Party or the Government of the Republic of Zambia was found to inform citizens of why policies are being implemented or what they are intended to achieve.

(2) Public perceptions of selected social problems--a sizeable number of respondents in all density areas (from half to two-thirds) perceived a sharp increase recently in their local communities in prostitution, crime, juvenile delinquency, alcoholism, and truancy. Some other problems also are commonly seen as increasing, including divorce and wifebeating.

(3) Respondents' perceptions of their personal life situations--most persons say they are "barely able to make ends meet" in today's economy. In fact, recent years have brought debilitating increases in the cost-of-living. Clearly, the economic viability of urban households (especially among the poor) has been impaired in recent years. A large number of respondents (upwards of three-fourths), perceive a marked deterioration in recent years in the adequacy of government services. There is evidence of considerable despair about the future in all density groups. It was conclusion of the study that this level of frustration is reaching explosive levels.

(4) Selected study impacts (many of these impacts were identified in the interviews with community influentials): Family functioning--intense economic pressures are jeopardizing the ability of extended families to fulfill traditional functions and obligations. For example, the interviews showed concern among respondents about being able to send needed remittances to family members. Also, there is a weakened sense of obligation, because of high food costs, to house and to feed relatives. Respondents report great difficulty in

budgeting their monthly income because of frequent and large increases in food and other needed items. It is the contention of community development workers that a growing number of families are giving at least lip service to the need to limit family size because of the deteriorating economic situation. But there seems to be little that the government is doing to encourage family planning or to stem the explosive population growth in Zambia.

Medical care--there is an acute scarcity of medicines, hospital beds, and doctors. The quality of care available to patients has deteriorated rapidly in recent years. Health officials report a growing incidence of disease and malnutrition in the compounds. Unsanitary conditions are felt to be placing an ever-increasing burden on an already strapped health system. Adjusting for inflation, government per-capita expenditures for health care declined by 20 percent between 1975 and 1985.

Education--educators report that, following Independence in 1964, Zambian urban families have come to place a high value on the education of their children. High school graduates often are unable to find employment upon graduation and, not uncommonly, are thrust into competition with persons who have been displaced from their jobs. Adjusting for inflation, government expenditures on education declined by 26 percent between 1975 and 1985. The per-capita decline was 42 percent.

Public services--there is a constriction in funding for public assistance and social services at the same time that the demand for

these services are mushrooming. District council officials report being unable to provide adequate public services, e.g., garbage collection, ambulance services, fire protection, etc. Presently, the rate of population growth is well in excess of annual economic growth. Thus, even an expansion of public services and facilities, e.g., classrooms, is proving inadequate to maintain or improve, established levels in the quality and availability of these services and facilities.

Social problems--many respondents, especially in the compounds, display a high level of discontent and frustration with their living conditions. In our estimation, a continued deterioration in these conditions could trigger public protest and even violence, perhaps along the lines of the December food riots in the Copperbelt Province. The "success" of the December riots (in securing a prompt roll-back in breakfast meal prices) is felt by community development workers to be a lesson that has not been lost among impoverished families, especially in the Copperbelt.

(5) Coping strategies--food patterns, some poor families are reluctantly substituting roller meal for breakfast meal as food prices increase. Most often these families have simply reduced their consumption of breakfast meal. Breakfast meal is much preferred over roller meal. A 1985 survey of urban household budgets found three-fourths of the expenditures in site and services areas for mealie meal going to breakfast meal. Given high prices, many families are now forced to buy smaller quantities of some basic food items (e.g.,

cooking oil), resulting in a much higher per unit price for these items. A sizeable number of persons are skipping meals to save money. Educators report that many of their students come to school hungry. Physicians report a large incidence of malnutrition in the high density areas. There is increased reliance on kitchen gardens to provide needed foodstuffs. Illegal brewing of beer is widely reported.

Numerous households in the high-density areas receive no income from the formal sector (wages/salaries). To compensate, there has been increased trading activity (informal sector). A substantial proportion of families in the compounds are engaged in some type of informal sector activity. Community development workers report very high levels of unemployment in the compounds, especially among school leavers. Widespread pessimism is expressed about the future of the economy.

Lessons learned. To acquire useful and accurate data at the urban household level, it is essential to utilize the services of resident enumerators who for the most part are familiar with the area and can relate to the target group. The selection of a supervisor from among the enumerators, minimized the amount of time the principal researcher spent in the field.

In most of the "compounds," street names and numbers are either non-existent or improperly marked. Hence, tracking down a random selection of respondents is difficult and time consuming. It is recommended that in the future some sort of "opportunity sampling"

frame be used. Specific compounds could be identified and interviews conducted with respondents on the basis of every other house or street. When this exercise is completed the enumerators could move on to another area or compound.

Recommendations. (1) Develop social indicators to gauge the response of either urban or rural households to a variety of policy affected issues. (2) Decrease the turnaround time for reports by utilizing an "opportunity sample frame." (3) Institutionalize monitoring and evaluation of agricultural policies on specific classes of the population.

7. Sectoral Policy Analysis

Technical assistance in Sectoral Policy Analysis Section of the Planning Division in the record phase of the Project resulted in several modeling and analytical efforts.

Develop and implement a transportation model of Zambia to assist in reducing the cost of transporting maize. The model was developed on an IBM PC/XT microcomputer. The procedures were documented in "Road Transportation Model for the Management of Maize: Zambia (The ZAMTRAN Model) A Computer-Based Management Tool," Planning Division Special Study No. 23, Ministry of Agriculture and Water Development, July 1986. The model was presented to the Ministry and others at a seminar in early 1986. Two Zambians have had training using this model, one has left for training in the U.S. Further training was available to the second Zambian in 1987.

Several studies were done using this model: 1) Estimation of the most efficient transportation routings for maize grown in the 1985/86 crop year; 2) the determination of the differential ceiling prices on mealie meal in each province, based on the transportation costs of maize flowing into the province in the least transportation cost model; 3) an estimation of the cost of the transportation inefficiencies created by the uniform price of maize throughout the country.

Study the effects of maize market liberalization. This study took the form of a projection of fertilizer prices, grain maize prices, breakfast meal prices and roller meal prices under the assumption that subsidies would be removed over a number of years. It was completed in December 1986 and presented to the Ministry; but due to its sensitive nature, it was not presented as a formal report. The Ministry expressed an interest in having Dr. Pervis discuss it with policy makers, but this discussion did not take place.

Study the export potential of agricultural products. This study was completed and presented in a paper in June 1987. It consists of detailed analyses of selected products. The main results are in the form of tables indicating the necessary ZK/US\$ exchange rate which must prevail given various combinations of production cost reductions and domestic inflation rates, if each product is likely to be an efficient foreign exchange earner.

Rural household production/consumption models. Due to the late availability of the survey data, it was not possible to complete

this task by the end of the project. It was envisioned that models for seven regions of the country would be developed.

A single "megamodel" was outlined. This "megamodel" included all of the activities and constraints that are likely to be included in any of the submodels. Each separate model would consist of a subset of these activities. Various data not included in the smallholder survey have been collected and is included in the "megamodel." Without the survey data analyzed and calculated in very precise ways, no working model can be completed.

A workshop was conducted in March 1987 involving eighteen experts in a discussion of the "megamodel" and the Zambian smallholder economy.

8. Analysis of the Impacts of the Foreign Exchange Auction on the Agricultural Sector

In October of 1985 the Government of the Republic of Zambia implemented one of the most important policy initiatives since the country's independence. Having struggled several years with the problems associated with a highly overvalued exchange rate, the GRZ implemented a weekly foreign exchange auction which determined the prevailing exchange rate for all foreign exchange transactions during the following week. On May 1, 1987 the President announced that due to the economic hardships created by the rapidly devaluing kwacha, the auction would be discontinued and the exchange rate would be fixed at K8.00 to one U.S. dollar.

Work on this topic identified the reasons for implementing the auction, the economic impacts of the auction on sectoral prices and outputs including the major aggregate economic variables in current and constant prices, reasons why the kwacha devalued so rapidly, and policy measures which could have prevented the kwacha from falling so drastically. Implications for the agricultural sector were assessed.

Analysis of the impact of the auction and alternative policy measures was implemented by the use of an economic model consisting of 75 non-linear equations which can be solved to obtain values of sectoral prices, real sectoral outputs, GDP and other important aggregate variables in current and constant values, and the equilibrium exchange rate. It can be run assuming a fixed exchange rate such as is the case at the present time. It can also be used to obtain projections into the future.

The adjustment resulting from the elimination of intermediate and primary factor price distortions resulting from allowing the exchange rate to reach its equilibrium level through the auction will have the greatest impact on those sectors which are heavily dependent on imported inputs and capital. This gives agriculture an advantage over the import-intensive sectors such as the industrial sector. This is particularly true for traditional agriculture which is much less capital intensive and dependent on imported inputs. The implication of this is that import substitution can take place in the agricultural sector as a whole by increasing production in the traditional agriculture subsector. Also during this process of

adjustment we would expect commercial farms to concentrate their efforts more on high-value specialty crops which require more mechanization and technology, such as highly perishable vegetable and fruit crops and dairy products, while the traditional sector will produce a greater share of basic food crops, such as maize.

One of the most important effects of devaluation is the potential impact on exports. As the kwacha is devalued, the kwacha equivalent of the foreign exchange earned from exports rises. If at the same time costs of production do not rise as rapidly, then improved incentives for exporting exists. This effect will be greatest for sectors such as agriculture in which production is less import-intensive.

C. Improving the Data and Information Base for Strategy Formulation and Identification of Priorities for Agricultural and Rural Development Policies, Programs, and Projects

Policy design and analysis requires two essential elements: (1) reliable data, and (2) analytical frameworks. To improve data collection for the agricultural sector, the project provided assistance to the Central Statistical Office to increase capability for data processing and carrying out agricultural survey work as described earlier.

Additionally, a one-time, small-farm survey was carried out through the Planning Division of the Ministry of Agriculture and Water Development and the Rural Development Studies Bureau to provide baseline data for the traditional agricultural sector. To provide analytical framework, quantitative models could then be built based on the data collected.

This last element is essential if policy analysis is to be

more than a descriptive picture of the agriculture sector. When analysts are required to determine the relationship between two or more variables, some kind of model must be used whether it is expressed explicitly as a quantitative model or not. This is particularly true if one is trying to design policy rather than measure the impact of implemented policy. The advantage of quantitative models is that they force consistency into the analysis of alternative policies.

1. Purpose of the Rural Household Survey

The purpose of the survey was to gather data that would be useful in agricultural policy decision-making. The training aspects of teaching our counterparts the art of conducting such surveys was an additional purpose of the survey.

2. Methodology

Sampling procedure. The Central Statistical Office including Mr. Bogale Demissie were very helpful in the sampling design. The Census Supervisory Areas (CSA) were used as the sampling frame. Maps from CSO were also used to direct field workers to sample areas. Sampling experts from Iowa State provided advice on selecting sample households and estimated the weights to give valid aggregations for national estimates.

Questionnaire design. A workshop in July 1985 kicked off the discussion on the entire survey. It was widely attended by members of the Planning Division, RDSB, CSO, members of the long-term project

team and several staff from Iowa State. The questionnaire content was a major topic of this workshop. Following the workshop the design and layout of the survey instruments were the responsibility of Dr. Ronald Krenz and Dr. Rudy Stewart with help from other members of the Planning Division.

Field work. The field work portion of the survey was conducted in the following parts:

(1) A quick listing of the households in the selected study areas gathered data on amount of land farmed so that the sample could be stratified by size.

(2) A benchmark survey conducted in Oct.-Nov. 1985 gathered primarily descriptive data on production practices and markets available and used by these households. Data were obtained on 911 households.

(3) A flow survey conducted from Dec. 1985 to Aug. 1986 collected input data on crop production, activities of all household workers, income expenditures and consumption patterns. Data were obtained on 477 households.

Data editing. Several clerks were provided by RDSB to do the questionnaire editing and coding. Dr. Krenz prepared all of the coding manuals, trained the clerks and supervised this activity.

Card layout. Dr. Krenz prepared statements which define all the data variables, describe each variable, indicate the column numbers for each variable, and indicate the range of data of each specific variable. These are needed to interpret the data in the computer files.

Data capture. Mr. Bogale Demissie and Dr. Krenz wrote the entry point programs for all the questionnaires. Mr. Demissie trained the key punch operators and Dr. Krenz handled the problems encountered by the key punch operators. Data entry did not include verification by duplicate data entry. Checks were conducted by each person doing data entry and encoding.

3. Results

At this stage very few results can be presented. The data analysis has just begun. Frequency counts have been made of variables on both surveys primarily for the purpose of detecting improper codes and data that are out of reasonable ranges.

A subsample of the flow data consisting of about 100 farms in Central, Southern, Eastern, and Lusaka Provinces which use oxen in farming was used to build cost budgets for maize, cotton, groundnuts, sorghum, millet, and sunflower. These budgets were utilized in the exercise of determining producer prices for 1987-88 particularly for maize and cotton. These data showed much higher costs for cotton production that was indicated by previous budgets in the Planning Division.

A workshop was held with the primary aim of introducing people in the Planning Division and RDSB to the data. Results of data analysis were not the focus of the workshop. Some results from frequency counts and crosstabs were presented to stimulate interest in further analysis by GRZ personnel. The focus was on explaining the methods used in sample selection, design of the sample and questionnaire,

and a full description of the field techniques. A discussion of all of the problems encountered was included so that the analysts have an understanding of the data and can better proceed with analysis of the data.

4. Lessons Learned

Errors in questionnaire design. A few questions should have been included in the questionnaire that were not, e.g., the availability of fertilizer or other reasons for not using fertilizer. The practice of milking cows was covered but not how many cows milked. In the flow component, respondents who produced cotton could not give quantitative data on pesticides use because of their method of payment to Lintco.

Two serious layout problems occurred in the Flow. Most enumerators had difficulty remembering to get data on amount of use of oxen. This question came after questions on rental rates. If the oxen were not rented the enumerators failed to go on to the quantity question. Similarly, many enumerators failed at first attempt to get production data, because it come after questions on other cropping expenses.

Procurement of equipment. The survey suffered in several respects from the lack of adequate and proper equipment. At the initial planning stages, it was decided that three Land Rovers were needed for field work. At the commencement of the field work only two old Land Rovers were available. Problems with lack of tires and

need for repair caused several delays with these vehicles and the lack of the third vehicle slowed the rate of field work. An additional vehicle was obtained in October during the Benchmark phase.

Scales for weighing the children were requested in July 1985, but were not available by October for the Benchmark. Additional questions were added on the weights, heights, and ages of children. This caused the need for the Extended Benchmark, which was conducted during the Flow. This reduced the sample size for the weighting exercise to little more than half. It also made the transfer of scales around the country rather difficult.

Compasses and measuring tapes for the field measuring exercise were not provided in a timely manner. These were borrowed from Mt. Makulu, CSO and FAO, but not in sufficient quantity or quality to equip the field staff as desired.

The first computer was not available until January 1986 while computer capacity was needed as early as September for training and design work. Data entry for the Benchmark could have started in late October. A second computer was not made available until July 1986. So clean up of the Benchmark data interfered with cleanup of the Flow data. Both computers were requested at the initiation of the survey. If all equipment had been made available when needed, the analysis of the data would have been about 4 months ahead of the present schedule.

Training of enumerators. Some 20 enumerators were used for the Benchmark. RDSB had that many with some experience, and as a result our enumeration problems with the Benchmark were not serious. The Flow required 40 enumerators and only about 20 experienced enumerators were available. A four-day training exercise was held which apparently was not sufficient. The survey started with only forty-three people and hence the survey staff was able to screen out only three. The training consisted of two days in the classroom and two days of field practice with supervision. Training and supervision are interchangeable to a degree. In the absence of adequate field supervision, additional training for at least five of the poorer quality enumerators would have been beneficial. Or a larger pool of candidates would have allowed more screening.

Supervision of field work. Overall, the Flow field work suffered from inadequate supervision. Originally, three land rovers were requested along with three full time field supervisors. Only two supervisors were available most of the time and they were stranded in Lusaka for lack of equipment or money about 40 percent of the time. Actually, the lack of equipment and money was more serious than the lack of personnel. This lack of field supervision occurred during the early critical stages of the Flow field work. At that stage, enumerators who were doing things incorrectly could have been corrected. Almost no supervision of some of these inexperienced enumerators was possible for the first two months of the Flow field work.

One serious result of lack of supervision was the misinterpretation by many enumerators of the concept of a visit to the sample households. Each enumerator was told to visit each sample household every 7-10 days and gather data on what had transpired since the last visit. Many enumerators made a distinction between a visit and an interview and counted a visit with a household as a completed enumeration, even if they found no one at home. This error was not corrected for several weeks in some cases. Two crews were put to work in the field to measure the farmers fields. Dr. Krenz spent two days training these people in the use of the measuring equipment. The resulting data fell short of our expectations for two reasons, poor equipment and insufficient supervision. Due to the use of cheap quality compasses, inaccurate compass bearings were obtained. One crew had good equipment and the other did not. The quality of the data was noticeably different. Both crews failed to get forward and backward compass readings. This requires a doubling of the amount of effort required and without supervision, the crews failed to do what they were supposed to do. The crews also failed to measure almost half of the reported crop fields. They did not work closely enough with the enumerator for that household and left out crops reported by the enumerator.

Supervision of editing and data capture. Although they were constantly told that this survey was their survey, participation in the planning or conduct of the survey by members of the Planning Division was minimal. The major reason was the short supply of staff

in the Planning Division and the constant assignment of ad hoc duties to the staff of the Planning Division.

Verification of data entry. A considerable effort was expended in the cleanup of the data sets. Duplicate entry of the data at CSO for the purpose of comparing with the RDSB data entry could have saved months.

5. Recommendations on Futher Survey Work

The following recommendations reflect the experience of the project with the large scale survey.

(1) No additional survey work should be planned until the staff of the Planning Division and RDSB have had time to digest what has already been collected.

(2) At some time in the future, a follow-up will be needed to provide an estimate of changes made over time.

(3) More data is needed on the emerging farm sector, such as the oxen farms and the small commercial farms. Especially on things such as trying to determine what are their limiting factors to expansion. Also, some special studies need to be made of crops such as ground-nuts, cotton, coffee, tobacco, i.e., on alternatives to maize and especially on export potential crops.

(4) More training in computer techniques, survey techniques, and sampling procedures is needed before actually getting any further surveys underway.

(5) Two years is a minimum time period needed to conduct such a large survey even under ideal conditions. An additional two years of length of project is needed for the analysis.

(6) There are many analyses that can be conducted with the data already collected. Effort should be directed at making sure the data is accessible to as many people as possible.

D. Training and Staff Development for Planning, Policy Analysis, and Management of the Agricultural Sector

Participant training under the Zambia Agricultural Training, Planning, and Institutional Development Project got underway in late 1982 with the first two participants arriving in the United States in March 1983. Since those first two, forty-one additional participants have received training in either long-term degree and diploma programs or short-term certificate courses. A total of 24 long-term and 24 short-term training programs were funded under the project for the 43 participants. This represents a significant contribution to the development of human resources in Zambia and a financial investment of ~~almost~~ one million dollars in direct training costs.

Of those who were involved in long-term training programs, nine have returned to Zambia with Master's degrees, five participants have returned with diplomas and eight will continue their programs under a new project. Only two participants were terminated before completing their long-term degree programs.

This section of the report covers all aspects of participant training --from its inception under the Cooperative Agreement in 1982 through the

termination of the project on June 30, 1987. In addition to this introductory section, training is discussed in four following parts. The second introduces and explains the philosophy, design and implementation of training under the Iowa State University-USAID/Zambia Cooperative Agreement. Part three discusses the participants while part four describes the evolution and development of specialized training services. Conclusions and recommendations on training are presented in part five. A detailed list of long-term and short-term participants trained under the Project is contained in the Appendix tables.

1. Philosophy, Design and Implementation of Training

Participant training was viewed as a vital component in the process of strengthening Zambian institutions to more effectively perform the task of agricultural decision making. Short-term and long-term training were established to meet the immediate and longer run human resource development objectives as set out by each participating Zambian institution. Individual training objectives were expected to fit within the broader institutional development goals. To summarize, participant training was seen as a developmental process that served to facilitate the achievement of goals set out by individual Zambian institutions.

The initial design of training, following from the statement of philosophy, required first that nominations come directly from representatives of participating institutions and second that those nominations fit within the long-range development goals of the

institution. Once nominees were selected, the Chief-of-Party and AID/Zambia Training Officer would assist nominees with preparation of their application materials in Zambia. These materials would then be used by the Training Coordinator at Iowa State University for purposes of placement. The USAID/Zambia Training Officer would assist those nominees who had been successfully placed with predeparture information.

In addition to procedures that were laid out in the USAID Participant Training Handbook, Handbook 10, a few specific design features were established prior to the implementation of training. Others were developed during the implementation phase.

A number of issues arose and were successfully resolved during the five-year span of the Project. Many of these could not have been anticipated during the design phase of the Project. Some are outlined briefly below:

(1) Travel advances. The first participants had a great deal of difficulty picking up travel advances at Heathrow Airport. A system whereby ISU wired \$150 per participant to Citibank in New York City for the account of USAID/Zambia in Lusaka was quickly put into practice. Although there were still a few bugs in the system with respect to delays in receipt of funds in Zambia, in general the process was successful in ensuring that participants had sufficient foreign exchange enroute and on arrival in the U.S.

(2) Allowances. All allowances were paid as per USAID Handbook 10, Appendix C. Initially participants who attended the

Economics Institute in Boulder, Colorado as part of their long-term training program were paid the University of Colorado long-term allowance rate. After reviewing this procedure, it was decided to pay participants attending the Economics Institute the long-term technical allowance rate to conform with other program sponsors.

(3) Training-related travel allowance. Initially this allowance for long-term degree trainees was set at \$500 annually in addition to attendance at an USAID-sponsored Midwinter Community Seminar (MCS). Given the significant variation in costs of professional meetings, this policy was amended away from a set dollar amount for travel. Instead, participants could attend one professional meeting of their choosing per year and a MCS within the following limits: Master's degree participants could attend a total of 2 MCS's while Ph.D. participants could attend a maximum of three.

(4) Housing. Although the full responsibility of the participant, the Training Coordinator attempted to ensure housing availability at the outset of training. This problem was most often handled by utilizing institutional housing. Early in the project, an agreement was reached with the ISU Residence department to reserve three student apartments for use by a maximum of twelve participants. To ensure housing availability at other institutions, application materials were sent out in a more timely manner. This was accomplished by communicating to the Training Committee in Lusaka the need for more timely nominations.

(5) ISU representation on PD Training Committee. The need for more timely nominations and placement prompted the recommendation that a project staff member in Zambia represent ISU on the PD's Training Committee. This person could help the committee realistically match nominees' qualifications with the criteria used by U.S. educational institutions.

(6) Training Guide. In order to better prepare nominated participants for training, a guide was developed with instructions on all facets of training, including predeparture orientation. A copy of the Training Guide is available from Iowa State University.

(7) Zambia research guidelines. A primary concern of the Project was to ensure that participant research focused on Zambian problems. In support of this objective, it was decided that interested participants should be encouraged to return to Zambia to collect data for their master's or doctoral research. A brief set of guidelines to facilitate this process was developed. A stipend equal to their usual U.S. allowance was given to participants during the research period for research-related expenses.

(8) Zambian newspapers. With the assistance of the Project Support Unit in the AID/Zambia office, copies of the Daily Mail and Times of Zambia were distributed to participants beginning in November 1984 and continuing through the duration of the Project.

(9) Family travel. Officially USAID does not encourage families to join participants during training. Acknowledging this position, but recognizing the stress this can place on a married

participant's family, a policy for family travel was developed. If a participant successfully (maintaining a B- average) completed one semester at their institution, could provide round-trip air tickets for all family members and show proof that a family health insurance policy had been purchased, the family could join the participant.

2. Participants

Twenty-four participants began degree or diploma training programs under the Project. A table summarizing all long-term participants, their degree objectives, training institutions and dates of degree completion is given in the Appendix. In addition, the current status of all returned and continuing participants is reported in the last column of the appendix table.

All participants who successfully completed their degree programs returned to Zambia to work for their former agency. Mr. Sumbwanyambe, although unable to complete the requirements for a Bachelor's of Statistics at Makerere University, also returned to MAWD where he is currently employed. In all, only one (or 4%) of the total number of long-term participants trained refused to return to Zambia when his program terminated.

Short-term training covered a range of subjects from fertilizer marketing strategies to international contract negotiations. All short-term participants identified by their Zambian employer and including their training institution, field of training and dates of training are listed in the Appendix table on training.

3. Evaluation of the Economics Institute for Remedial Work

In late July 1983, following the admission of Project participants into programs at the Economics Institute in Boulder, Colorado, the Training Coordinator visited the site to evaluate the program's effectiveness as a remedial tool. Her report suggested that the Economics Institute was a viable option for participants who had not yet gained admission into an academic program due to a weak background and/or low GRE scores. It also pointed out a number of problems participants encountered once they arrived at their full-time academic institutions, such as a second settling-in/adjustment period (with no additional settling-in allowance) and course repetition. It was recommended that the benefits and costs for each participant be weighed before deciding upon attendance at the Economics Institute.

4. Summer Seminars for Participants

During the first two years of the Project, seminars on topics of interest to participants were organized at Iowa State University. Since most long-term participants were in attendance at ISU, they could be actively involved in Project activities as they developed. A major source of seminar speakers was from ISU faculty who had returned from short-term assignments in Zambia under the auspices of the Project. Additionally, visiting officials from Zambia were called on to address participants and other interested persons. The list of visiting speakers included Francis Mbewe, former Director of

the Planning Division, MAWD; Ben Mweene, Vice Chancellor, University of Zambia; and James M'tonga, formerly Permanent Secretary, National Commission for Development Planning and Ministry of Finance.

Participants attended field trips during their course of study through organized seminars and programs. In addition, several field trips were planned by the Training Coordinator to expose participants to new areas of interest. Such field trips included a visit to Boone County (Iowa) farms and agribusinesses and a trip to a small-scale tractor production operation called Self-Help, Inc.

To meet the demand from the many ISU participants who were interested in the subject of mathematical programming, a special summer seminar was held during the summer of 1984. This seminar, led by Professors Raymond Beneke and Leanne McGranahan, provided the essential foundation for at least three of the theses completed by participants in the Economics Department at ISU.

The summer 1984 seminar on the topic of linear programming was such an overwhelming success among participants that it was decided to continue a program of summer seminars which would revolve around participants' research interests and current Zambian policy issues. The seminars, two and a half days in length, brought both long-term and short-term participants together at Iowa State University during 1985-1987. Speakers included Zambian policy analysts, USAID officials, Project and non-Project specialists, and participants themselves.

The topics around which each of the seminars was focused are listed below:

1985 - Communicating Research and Training Experience

1986 - New Directions for Research and Policy in Zambia

1987 - Zambian Agriculture and Institutions in Transition.

Each year, evaluations indicated that participants found the seminars to be of continued and increasing value.

5. Rural Farm Household Survey Data Set

A Project output of particular importance to participants' training programs was the completion of the large-scale multi-purpose rural farm household survey. As previously described, the survey was conducted throughout all nine provinces in Zambia over the period November 1985 to October 1986. It produced household-level baseline data on 911 rural farm families and detailed resource allocation data for the 1985/86 crop year for nearly 500 families.

This data base, which is located on microcomputers at RDSB and MAWD in Zambia, was officially released for use by participants in the U.S. in June 1987. Workshops on the survey format and use of the data were held during the 1986 and 1987 summer seminars. The size of the data base is such that it will provide primary research material for many participant theses and dissertations.

In conjunction with the collection and analysis of this data set, participants attended workshops on the use of SPSS/PC+, the principal statistical package in use in Zambia.

6. Summary and Recommendations

Participant training under the auspices of Iowa State University was designed to be a dynamic, evolving component of the Project. In keeping with this philosophy of training, participants received not only the skills and education acquired in their degree programs but the opportunity to apply their knowledge and skills in policy situations as presented through the Project seminars. In addition, complementary non-Project training activities, such as professional meetings and community-based seminars, emphasized the life-long nature of the training experience.

The following recommendations are based on Iowa State University's experience with participant training under the Project:

- (1) continue linkage of participant training objectives with overall project goals;
- (2) continue placement of participants in institutions and programs where they will have individualized attention (to encourage the development of a professional mentoring relationship);
- (3) continue to keep participant apprised of current events in Zambia via newspapers, speakers and summer seminars;
- (4) continue placement of copies of all participant theses/dissertations are placed in the MAWD library;
- (5) implement follow-up activities with returned participants as provided for in USAID Handbook 10 on participant training;
- (6) make sure all participants file final feedback reports at the completion of training;
- (7) continue the summer seminar program; and
- (8) continue to nominate well-qualified individuals as early as possible for efficient placement.
- (9) continue to offer long-term participants the opportunity to return to Zambia to collect data for theses and dissertations.

V. Concluding Observations

The central objective of this project was to increase the GRZ capability for policy analysis and planning affecting the agricultural sector. The report has described the achievements of the project in the four major areas of activity. Clearly, much remains to be done in each of these areas. Improvement of UNZA educational programs is a high priority if the future "intake" of beginning analysts and planners is to improve in quality. Staff training, especially on-the-job training, needs to be continued to offset personnel turnover and sharpen the analytical skills of the staff. Further technology transfer in the form of data collection and analysis techniques are required. Improved management and organization will facilitate closer linkage of analysts to policy decision-makers and encourage timely delivery of reliable and relevant information. Continued pressure on Zambian budgetary resources available to meet the recurrent costs of the data and analysis systems is the most serious problem to be resolved in the future.

Institutionalization of a national capability for data collection and policy analysis is not a goal that can be completely achieved in a limited project period. The key lesson learned from this project is the need to address all major elements of that capacity at the same time. Technical assistance requires a critical mass of country analysts. Techniques must be selected both to produce information on a current basis as well as provide for a major upgrading in the quality of that information over time. Training staff abroad to fill specified positions

is inadequate if staff turnover is high and in-country training is not producing a new generation of replacement staff with an adequate level of analytical skills. Continued donor assistance is required if the gains made under this project are not to quickly dissipate.

APPENDIX TABLES

APPENDIX TABLE 1
PROJECT STAFFING

Short-Term Personnel in Zambia

L.B. Fletcher	6/20-24/81	L.B. Fletcher	1/6-12/85
G. Klonglan	10/2-15/82	R.D. Shinn	1/6-12/85
R.R. Beneke	10/2-15/82	D.R. Starleaf	1/6-12/85
L.B. Fletcher	10/11-21/82	J. Robinson	1/19-2/11/85
D. Grosvenor	10/16-31/82	L.B. Fletcher	7/6-17/85
L.B. Fletcher	1/9-18/83	H. Baker	7/6-17/85
L.B. Fletcher	3/11-12/83	T. Teklu	7/6-24/85
D. Grosvenor	3/13-8/15/83	H. Baker	9/28-10/3/85
C. Bourne	5/16-6/11/83	J. Robinson	10/27-11/29/85
M. Boehlje	5/16-6/04/83	L.B. Fletcher	1/12-18/86
N. Blid	5/23-8/31/83	D.M. Warren	2/28-3/15/86
J. Fosu	6/1-7/4/83	K.H. Larson	3/5-4/11/86
L.B. Fletcher	6/3-26/83	R.D. Shinn	3/1-13/86
J.A. Prescott	6-12/83	W. Merrill	6/30-7/16/86
R. Ginder	7/1983	D.M. Warren	6/11-7/14/86
L.B. Fletcher	8/7-14/83	M. Calsyn	6/29-8/1/86
R.R. Beneke	12/6-14/83	J. Merrill	10/4/86-1/22/87
W. Kelly	12/6-14/83	W. Merrill	12/29/86-1/24/87
G. Christensen	12/6-14/83	K.H. Larson	1/1-2/28/87
G. Klonglan	12/6-14/83	H. Baker	1/8-2/12/87
R. Pounds	1-6/84	G. Bultena	1/31-4/4/87
L.B. Fletcher	2/12-17/84	D. Deal	3/15-5/30
D. Jansen	6/5-24/84	J. Robinson	4/1-5/7/87
L.B. Fletcher	6/5-24/84	D.M. Warren	5/15-30/87
R.D. Shinn	8/13-24/84	M. Applegate	5/16-30/87
L.B. Fletcher	9/10-14/84	M. Esman	5/31-6/12/87

Long-Term Personnel in Zambia

D. Mike Warren	8/82-6/85	Milton Snodgrass	7/85-6/87
Edward Rawson	8/82-6/85	Dennis Pervis	7/85-6/87
LeAnn McGranahan	10/82-5/84	Rudolph Stewart	7/85-6/87
Michael Applegate	8/84-7/86	Ronald Krenz	7/85-6/87
Bogale Demissie	2/85-6/87	R. Duane Shinn	7/86-6/87

Campus Staff

Lehman B. Fietcher	Linda Breitenbeck
Raymond R. Beneke	Patricia Monroe
Dennis R. Starleaf	Nina Blid
Gerald Klonglan	Joseph Fosu
R. Duane Shinn	Rudolph Stewart
William Merrill	Lual Deng
Kathryn H. Larson	

APPENDIX TABLE 2
ZAMBIAN PARTICIPANT TRAINEES

Long-Term Participants

NAME	DEGREE	FIELD	TRAINING INSTITUTION	ADDITIONAL TRAINING ACTIVITIES	CURRENT STATUS	
Y. Akakulu	CSO	Dipl.	Survey Methods	ISPC	ISPC field trips; Mgmt. Comm. for Dev. (MCD) Seminar, 1985	completed 12/85; working at CSO, Lusaka
G. Chilongo	UNZA	Ph.D.	Rural Sociology	ISU	MCS: NY 1983, Iowa 1984; Texas 1985; Prof. Meet. 1984, 1987	Exp.Grad.'87; tng. cont. under new proj
A. Jere	CSO	M.A.	Economic Stat.	ISPC/GWU	ISPC field trips; Mgmt. Comm. for Dev. Seminar, 1985	completed 12/85; working at CSO, Lusaka
S. Kabumu	CSO	Dipl.	Comp. Data Sys.	ISPC	ISPC field trips; Mgmt. Comm. for Dev. Seminar, 1986	completed 8/86; working at CSO, Lusaka
P. Katepa	UNZA	Ph.D.	Agric. Econ.	Purdue U.	MSC: Michigan 1985, Indiana 1986; Prof. Ag.Econ.Meet., 1986, '87	Exp.Grad.'89; tng. cont. under new proj
K. Katongo	PD/MAWD	M.S.	Agric. Econ.	ISU	MSC: Pennsylvania '83, Washington D.C.'85; Prof.Ag.Econ.Meet.'84 ISARD Seminar 1984; Economics Institute 1983	completed 12/86; wky. PD/MAWD, Lusaka
H. Libongani	NCDP	M.S.	Agric. Econ.	Purdue U.	MSC: Tennessee 1986; Economics Institute 1987	Exp.Grad.'89; tng. cont. under new proj
C. Lufumpa	PD/MAWD	M.S.	Agric. Econ.	ISU	MCS: Missouri 1986; Prof. Ag.Econ. Meeting 1987	Exp.Grad.'89; tng. cont. under new proj
D. Mendamenda	NCDP	M.S.	Agric. Econ.	UMC	MCS: Iowa '84; Wash. DC '85; ISARD Sem.'87; Prof.Ag Ec Mtg '85	completed 7/87; working NCDP, Lusaka
T. Mudenda	RDSB	Ph.D.	Consumer Econ.	ISU	MCS: Wash. DC '83, California '85; ISARD Seminar '84	Exp.Grad.'88; tng. cont. under new proj
C. Muleya	NCDP	M.S.	Regional Plan.	ISU	MCS: Wash. DC '83, Albuquerque '86; ISARD Seminar '84 Prof. APA meet. '84, '85, '86; Economics Institute 1983	completed 5/86; wrkg NCDP, Livingstone
C. Mupimpila	UNZA	Ph.D.	Economics	ISU	MCS: New York '83 & '85; Prof. Ag.Econ Meeting 1984	Exp.Grad.'88; tng. cont. under new proj
S. Musowafu	CSO	Dipl.	Agric. Stat.	ISPC	ISPC field trips; Mgmt. Comm. for Dev. Seminar, 1985	completed 12/85; working CSO, Lusaka
A. Mwanamo	PD/MAWD	M.S.	Agric. Econ.	Purdue U.	Prof.Ag Econ Mtg.'85, '86; ISARD Sem.'86; MCD Sem.'87	completed 8/87; working PD/MAWD, Lusaka
M. Mwanza	CSO	Dipl.	Demog. Stat.	ISPC	ISPC field trips; MCD Seminar '86	completed 8/86; working CSO, Lusaka
W. Mwanza	NCDP	M.S.	Int'l.Dev.Stud.	ISU	MCS: Alabama '83; Econ. Inst.'83; ISARD Sem.'85; MCD Sem.'86; Prof. Ag. Econ. Mtg. '86	Incomplete program, terminated 6/87
B. Nonde	MoF	M.S.	Economics	ISU	MCS: Alabama 1983; ISARD 1984; Econ. Institute 1983	completed 5/85; working MoF, Lusaka
S. Sichone	CSO	Dipl.	Ag. Development	CSU	MCS: Alabama 1983; ISARD 1984; Econ. Institute 1983	completed 12/84; working NCDP, Lusaka
C. Siisii	PD/MAWD	M.S.	Agric. Econ.	UMC	MCS: Minnesota '84; ISARD Sem.'86; Prof.Ag Econ Mtg.'85, '86, '87	Exp.Grad.'87; tng. cont. under new proj
F. Sipula	RDSB	M.S.	Agric. Econ.	ISU	MCS: Wash. DC '83; ISARD Sem.'84; Econ. Institue '84	completed 11/85; working RDSB, Lusaka
R. Suba	PD/MAWD	M.S.	Agric. Econ.	ISU	MCS: Arizona '83; Wash. DC '85; ISARD Sem.'84; Econ. Inst.'83	completed 1/86; SADCC, Harare
C. Sumbwanyambe	PD/MAWD	B.St.	Statistics	Makerere	(Uganda University)	Inc.prog. Term. 6/85; wkg. CSO, Lusaka
A. Sumbye	PD/MAWD	M.S.	Agric. Econ.	MSU	MCS: Tennessee '86	Exp.Grad.'89; tng. cont. under new proj
L. Zulu	NCDP	M.A.	Devel. Econ.	UW-M	MCS: Salt Lake City 1985	completed 8/86; working NCDP, Lusaka

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Short-Term Participants

NAME		TRAINING INSTITUTION	FIELD OF TRAINING	TRAINING DATES
C. Banda	NCDP	Economics Institute, Boulder, CO	Math, Statistics, Economics	June-Aug. 1987
V. Chifwepa	PD/MAWD	ILCA, Addis Ababa, Ethiopia	Ag. Information Systems	August 1985
A. Kani	NAMBoard	IFDC, Muscle Shoals, AL	Fertilizer Marketing	Aug.-Sept. 1983
H. Katilungu	NCDP	Economics Institute, Boulder, CO	Math, Statistics, Economics	June-Aug. 1987
C. Lufumpa	D/MAWD	(1) Iowa State Univ., Ames (2) Stanford Univ., Stanford, CA	Transportation Modelling Microcomputers & Development	May-Sept. 1984 Aug.-Sept. 1985
E. Malambo	PD/MAWD	ILI, Washington, D.C.	Int'l. Contract Negotiation	May 1987
E. Mtamboh	PD/MAWD	(1) ILI, Washington, D.C. (2) Harare, Zimbabwe	Int'l. Contract Negotiation Loan Administration	March-Apr. 1983 March 1984
S. Muchindu	PD/MAWD	Economics Institute, Boulder, CO	Math, Statistics, Economics	June-Aug. 1983
A. Mugwagwa	PD/MAWD	Economics Institute, Boulder, CO	Math, Statistics, Economics	June-Aug. 1983
M. Mulala	PD/MAWD	Georgetown Univ., Washington, DC	Investment Negotiation	May-July 1983
C. Muntanga	PD/MAWD	U. Minnesota; SPSS-Minneapolis	Ag Policy Analysis; SPSS/PC+	June-July 1986
A. Mwaba	PD/MAWD	U. Minnesota; SPSS-Minneapolis	Ag Policy Analysis; SPSS/PC+	June-July 1986
G. Mwenya	NCDP	A.D. Little Mgmt. Ed. Institute Cambridge, MA	Management	May-July 1987
F. Mwiinga	PD/MAWD	(1) Econ. Institute, Boulder, CO (2) U. Minnesota, Minneapolis	Math, Statistics, Economics Ag Policy Analysis	June-Aug. 1983 June-July 1987
A. Phiri	CSO	ISPC, Washington, DC	Ag. Survey Management	November 1984
Y. Phiri	CSO	ISPC, Washington, DC	Survey Management	March-Apr. 1985
M. Shitima	MoF	ISPC, Washington, DC	Computer Center Management	June-July 1985
G. Sicilima	CSO	ISPC, Washington, DC	Ag. Survey Management	Nov.-Dec. 1985
C. Sumbwanyambe	PD/MAWD	USDA, New Mexico State U.	Ag. Data Bases & Analy. Sys.	Aug.-Sept. 1983
D. Tembo	NCDP	IPSI, Hartford, CT		May-June 1987
P. Theo	NCDP	Economics Institute, Boulder, CO	Math, Statistics, Economics	June-Aug. 1987

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EXPLANATION OF ABBREVIATIONS IN APPENDIX TABLE 2

CSO = Central Statistical Office
CSU = Colorado State University, Ft. Collins, CO
GRZ = Government of Zambia
GWU = George Washington University, Washington, DC
IFDC = Int'l. Fertilizer Development Center
ILCA - Int'l. Livestock Center for Africa
ILI = Int'l. Law Institute
IPS/I = Institute of Public Services, Int'l.
ISARD = Int'l. School for Ag and Rural Development, Ft. Collins, CO
ISPC = International Statistical Programs Center, Washington, DC
ISU = Iowa State University, Ames, Iowa
MCS = Midwinter Community Seminars
MoF = Ministry of Finance
MSU = Michigan State University, Lansing, MI
NAMBoard = National Agricultural Marketing Board
NCDP = National Commission for Development Planning
PD/MAWD = Planning Division/Ministry of Ag and Water Development
RDSB = Rural Development Studies Bureau
UMC = University of Missouri-Columbia
UNZA = University of Zambia
UW = University of Wisconsin, Madison, WI
USAID = United States Agency for International Development
USDA = United States Department of Agriculture

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