AGENCY FOR INTERNATIONAL DEVELOPMENT

PROJECT DATA SHEET

1. TRANSACTION CODE: A (A = Add, C = Change, D = Delete) — Amendment Number: Original — DOCUMENT CODE: 3

2. COUNTRY/ENTITY: GHANA

3. PROJECT NUMBER: 641-0073

4. BUREAU/OFFICE: AFRICA [06]

5. PROJECT TITLE *(maximum 40 characters)*: District Planning & Rural Development

6. PROJECT ASSISTANCE COMPLETION DATE (PACD): MM 02 DD 30 YY 86

7. ESTIMATED DATE OF OBLIGATION *(Under "B." below, enter 1, 2, 3, or 4)*: A. Initial FY 80 B. Quarter 4 C. Final FY 84

8. COSTS ($000 OR EQUIVALENT $1 = ¢ 2.72)

A. FUNDING SOURCE	FIRST FY 80 B. FX	C. L/C	D. Total	LIFE OF PROJECT E. FX	F. L/C	G. Total
AID Appropriated Total	690	550	1,240	2,285	5,565	7,850
(Grant)	(690)	(550)	(1,240)	(2,285)	(5,565)	(7,850)
(Loan)	(--)	(--)	(--)	(--)	(--)	(--)
Other U.S. 1.						
Other U.S. 2.						
Host Country	--	215	215	--	2,800	2,800
Other Donor(s)						
TOTALS	690	765	1,455	2,285	8,365	10,650

9. SCHEDULE OF AID FUNDING ($000)

A. APPROPRIATION	B. PRIMARY PURPOSE CODE	C. PRIMARY TECH. CODE 1. Grant	2. Loan	D. OBLIGATIONS TO DATE 1. Grant	2. Loan	E. AMOUNT APPROVED THIS ACTION 1. Grant	2. Loan	F. LIFE OF PROJECT 1. Grant	2. Loan
(1) FN	283	242	--	--	--	7,850	--	7,850	--
(2)									
(3)									
(4)									
TOTALS				--	--	7,850	--	7,850	--

10. SECONDARY TECHNICAL CODES *(maximum 6 codes of 3 positions each)*: 210 240 060

11. SECONDARY PURPOSE CODE: 220

12. SPECIAL CONCERNS CODES *(maximum 7 codes of 4 positions each)*

A. Code	BR	BS	PART	LAB	IX		
B. Amount	10,650						

13. PROJECT PURPOSE *(maximum 480 characters)*

To strengthen the capacities of the Atebubu District Council and communities to identify and implement projects of direct benefit to the target group; and to improve coordination with sectoral ministries and their centralized and decentralized services in support of development activities in Atebubu District.

14. SCHEDULED EVALUATIONS: Interim MM 08 YY 83 — Final MM 08 YY 85

15. SOURCE/ORIGIN OF GOODS AND SERVICES: [X] 000 [ ] 941 [X] Local [ ] Other *(Specify)*

16. AMENDMENTS/NATURE OF CHANGE PROPOSED *(This is page 1 of a ____ page PP Amendment)*

New Project Paper

17. APPROVED BY — Signature: Brian A. Coker — Title: Mission Director, USAID/Ghana — Date Signed: MM 07 DD 15 YY 80

18. DATE DOCUMENT RECEIVED IN AID/W, OR FOR AID/W DOCUMENTS, DATE OF DISTRIBUTION: MM DD YY

AID 1330-4 (8-79)

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THE USAID DISTRICT PLANNING AND RURAL DEVELOPMENT PROJECT (DIPRUD) 641-0073

Executive Summary

The GOG in an attempt to improve rural life in Ghana has adopted a policy of decentralized authority to district level governments, giving them increased involvement and control over their development activities. This policy was enacted in the Local Government Act of 1974 which the Government is now moving to implement.

The purpose of the DIPRUD Project is to assist in this effort by strengthening the capability of regional, district and local level public institutions to design, implement, coordinate and evaluate public works projects and integrated rural development programs, involving the local population in all phases of this process. Atebubu District in the Brong-Ahafo Region has been chosen for the first area. However, the intent is to test and develop methods and activities at the local level that can be replicated in other areas of Ghana.

Under Phase I of this project, a Development Planning Advisor was assigned to the District to assist in preparing a development plan and studying the Atebubu District, its people, problems and its needs. Also, a study titled: "The Economics of Small Farms Systems and Socio-Economic Conditions in the Atebubu District" was conducted by the University of Science and Technology, Kumasi, Ghana and Virginia State University, Virginia, U.S.A. This study was done so that a better understanding could be obtained of the Atebubu District's people and farm communities and also to acquire some baseline data of pre-project conditions.

Under Phase I a series of experimental sub-projects were also planned and conducted to determine the preferences of the local people, their village development committees and the Atebubu District Council, and their willingness to cooperate in undertaking specific development sub-projects.

Phase I of the project was funded to the amount of $500,000 and was scheduled for one year. It was designed to be a learning and planning exercise that would lead into a larger Phase II effort which would last for five years.

The goal of Phase II of the DIPRUD Project is to improve the economic and social well-being of the Ghanaians in the Atebubu District in ways that become self-sustaining. This goal is consistent with GOG objectives and the USAID Mission's strategy as stated in its current country development strategy statement and with AID's mandate of increasing income, employment and standard of living for the rural poor. The Phase II project will be designed to assist the local government and related institutions in providing for the priority infrastructure needs of the rural poor engaged in the food crop production and con sumption system in the Atebubu area. A series of related activities are proposed to achieve the outputs of the project. These proposed activities are to be grouped into four general project elements:

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1. Infrastructure Planning, Management and Execution: This activity will involve close cooperation with the District Council and Village Development Committees to build up their capability to plan, manage, and implement development projects in their areas of responsibility.

2. Water Resources Improvement: This involves the identification of the need of water projects, the procurement of construction machinery and the building of water impoundment structures and systems for supplying potable water to the population.

3. Feeder Road Rehabilitation: This part of the project would consist of coordination between the Ghana Highway Authority and the Atebubu District Council in providing a way to improve the feeder road system in the Atebubu District. Results would be to provide a better, all-weather farm-to-market road system to facilitate distribution of agricultural inputs to the area farmers.

4. Miscellaneous Infrastructure Development: This would consist of mutually agreed upon small development projects that would be beneficial to the area's small farmers and villagers. They could consist of assistance to private entrepreneurs in the agricultural input supply sector, development projects of the village development committees, and district or town improvements.

AID will provide a technical assistance team of two U.S nationals and four Ghanaian Rural Community Development Specialists for a five-year period (the life of project). The GOG will make available a counterpart coordinator and the services as needed of various technical and administrative personnel in the District to participate in DIPRUD activities.

Life of project funding requirement is $10,650,000 of which $2,800,000 will be the Ghanaian contribution. The AID portion: $7,850,000 will largely be for local costs ($5,566,000), the balance being for technical advisors and U.S. commodity procurement.

The activities to be assisted through DIPRUD are not in themselves the purpose of the project, but a tool or vehicle for beginning community participation in rural development. Selection and planning of sub-projects by the communities themselves is essential for achieving this purpose. An illustrative list of such sub-projects has been identified by the District Council but will be refined after the project is under way. The project has been developed with a clear concept of what is to be achieved in building a capacity in the communities and local government to identify, design and implement development activities. A reasonable estimate of costs has been made which should ensure that project funds requested are adequate, and that there should be no long funding pipeline problem.

PART I - Summary and Recommendations

The Government of Ghana (GOG) is attempting to improve its rural development through decentralized planning and implementation of development projects. A more appropriate and effective response to rural needs and priorities is the purpose. Achievement of this will be through directly involving the Districts and their communities in planning and implementation of community development initiatives which are within their own capabilities. The District Planning and Rural Development Project (DIPRUD) will be a vehicle whereby GOG can verify that decentralized rural development is the most appropriate approach.

USAID proposes to assist DIPRUD which will operate in a small-scale farming District in central Ghana (Atebubu). The Atebubu District Council and communities will be encouraged to identify development activities which they might undertake and they will be assisted through DIPRUD to design and implement a number of these. The processes will be a learning experience for the communities and the District Council, and will accrue developmental benefits to the people. GOG will achieve experience in how decentralization can be effective, through the DIPRUD-type initiatives, and will gain ideas for replication to other areas.

U.S. will provide a technical assistance team of two expartriates and four Ghanaian Rural Community Development specialists for a five-year period (the life of project). GOG will make available a counterpart coordinator and the services as needed of various technical and administrative personnel in the District, to participate in DIPRUD activities.

Life of project requirements will be $10,650,000, of which $2,800,000 will be the Ghanaian contribution. The AID portion: $7,850,000 will largely be for local costs ($5,566,000), the balance being for expartriate advisors and U.S. commodity procurement.

As indicated, the activities to be assisted through DIPRUD are not in themselves the purpose, but a tool or vehicle for beginning a community participation in rural development. Selection and planning of sub-projects by the communities themselves is essential for achieving this purpose. Therefore, the sub-projects to be financed under DIPRUD will not be identified until the project is underway. The project has been developed with a clear concept of what is to be achieved in building a capacity in the communities and local government to identify, design and implement development activities. A reasonable estimate of costs has been made which should ensure that project funds requested are adequate, and that there should be no long pipe-line problem.

The Mission has concluded that the project is technically sound and administratively, socially, economically and financially reasonable, and meets all applicable statutory criteria.

Recommendation

That a Grant be provided to the Government of Ghana in an amount not to exceed $7,850,000 for a five-year project, and that FY 1980 funding be authorized in the amount of $1,240,000.

II. Background and Detailed Description

A. Background

1. Target Group Description

Inhabitants of Atebubu District are primarily food farmers and the traders, transporters and artisans of the villages who serve this farming community. Farming is on small plots, by traditional methods. Produce is similarly for traditional diets, yams, corn and sorghum being the most important. Much of the production goes to markets south of the District, primarily Kumasi and other population centers in the Ashanti Region.

Atebubu District has been developmentally neglected (see IIIC) and the population suffers from inadequate water supplies, badly deteriorated roads, and little or no effective extension of government services outside the few urban areas. Amenities are few and privations are causing many, particularly the youth, to leave the area and locate in cities to the south. Population within the District is tending to shift to the few urban centers along the main highway which traverses the District.

2. Mission and GOG Strategy

The CDSS for FY1982: "Our strategy's aim is to support Ghana's effort to achieve greater self-sufficiency in food, expand rural productivity and employment and assure progress in meeting basic human needs of the population. These proposed assistance efforts are in areas of high priority to the Liman administration and where AID has both a comparative advantage and legislative mandate."

The strategy of the Government of Ghana "..... is to improve institutional mechanisms to (1) provide and make accessible to small farmers the required agricultural inputs to improve production; (2) improve the social amenities in rural areas; (3) encourage the rural population to take an active part in the plans and decisions for developing their communities; (4) make available the necessary resources and consumer goods to improve their standard of living; and (5) reinforce existing regional and district-level planning and coordinating mechanisms." USAID proposes to encourage the trend toward decentralized planning of government services test and develop, in a small area, approaches to integrated rural development which might be replicated whenever the Government's resources permit; and support the programs of the Government to develop the capacities of local governments and village committees to plan and implement rural development programs.

3. Pre-design Phase of DIPRUD

Initial conceptualization of DIPRUD resulted in Project Review Paper which was reviewed in AID during FY1977. Because of insufficient data on the socio-economic setting and local government and no experience to indicate feasibility of the approach, the decision was reached not to proceed to a project design at that time. Instead, a pre-design activity was authorized and funded which included studies of Atebubu District, its people, their economy and local government, and experimentation in assistance to a small number of rural development initiatives proposed in the District.

Pre-design was of longer duration than originally expected, for a number of reasons. Not the least of these was the period of political unrest which culminated finally in replacement of military administration by the first popularly elected civilian government in nine years. While each successive administration during military rule expoused support for decentralization and local government, it was not actually permitted to work under the military bureaucracy and its highly centralized approach. It was not until the civilian government succeeded and a new constitution was voted late in 1979 that the climate for an effective decentralization began to change (see further discussion in Parts III.D and Annex E).

In fact, despite the political problems of the period, it was possible for USAID to achieve much of the desired fact-finding and some experimentation in small activities. A detailed study of the Atebubu District was conducted jointly by the Ghanaian University of Science and Technology and Virginia State University, and a report issued in December 1979: "Economics of Small Farm Systems and Socio-Economic Conditions in the Atebubu District." A development planning advisor was assigned to the District for a period of nearly a year, under contract Afr-C-1412 with Experience, Incorporated (E.I.). He worked with local officials to identify certain perceived developmental needs of the various communities. Four small projects were initiated with community and AID funding which are providing experience in activity design, community participation, implementation, beneficiaries and operation and maintenance. A private voluntary organization which has been active in the District has assisted in the technical assistance to these activities.

During this period, other consultants were provided under the E.I. contract for short assignments to evaluate the experience and data gathered, to perform pre-feasibility and feasibility engineering and economic studies, and to assist USAID in drafting a detailed Project Paper for a DIPRUD implementation phase.

4. Other AID Activities

A number of other AID projects are part of the broader integrated rural development effort, and will complement the activities of DIPRUD to some degree.

(a) Economic and Rural Development Management (ERDM)

This project serves the broad program by developing within the regions a system of training and consultancy services for district and regional level officials and council members which will enable them to plan, manage and coordinate development activities more efficiently and effectively. Under ERDM, a team of three full-time Ghanaian trainer/consultants are being established in each of the nine regions of the Country. They are responsible for preparing and conducting management training seminar/workshops for regional and district level officials and council members; providing consultancy services in the districts on rural development planning and implementation; continually assessing and redesigning the training program to better meet local needs. The Project also supports the GOG's program of training district planners. Two series of management seminars have already been held in selected districts, including Atebubu. ERDM will have substantial complementarity with and impact on the DIPRUD project as is indicated in various parts of this PP (See II B2, IIIA2 and 3, IIID 1 and 2, and Annex E). ERDM training and consulting services will strengthen the Atebubu District Council in its capacity to plan, facilitate and manage community-based initiatives. DIPRUD will provide resources to help finance and implement such initiatives, giving the District Council a vehicle for applying the ERDM training.

(b) Managed Input and Delivery of Agricultural Services (MIDAS)

MIDAS is designed to deliver in a coordinated fashion certain inputs and services to small-scale farmers in the Brong-Ahafo Region, with special attention to Atebubu District. The goal has been to increase production and income of small farmers by strengthening institutions which will provide critical inputs to them (seeds, fertilizer, credit technology and extension and marketing assistance). A phase II has recently been designed and is currently being reviewed. DIPRUD will not be providing agricultural production inputs to small farmers since this is a MIDAS function. However, it will be complementing the MIDAS initiatives by helping the farming communities to improve their supporting infrastructure to make their productive efforts more efficient (roads, water supplies, artisanal and commercial services).

(c) Development Application for Intermediate Technology (DAPIT)

This project does research, development and extension in appropriate technological processes for agriculture, family food processing and preservation and small industry production. Complementarity with DIPRUD will be similar to that of MIDAS.

(d) Farmer Associations and Agribusiness Development (FAAD)

A number of private voluntary organizations (PVOs) are active in Ghana, several of them working with small scale farming communities. Through FAAD, AID assists these PVOs in their activities in training small-scale rural craftsmen in business skills, encouraging organization of food processing and other enterprises, and promotion of other community development initiatives with economic and social welfare purpose. One of the PVOs in FAAD Program is in the Atebubu District and it has been quite successful in working with community associations and promoting small enterprises. The initiatives of DIPRUD in strengthening the local government institutions in support of development activities will facilitate the efforts of this and other PVOs working with the FAAD Project in Atebubu. The experience of the PVOs in organizing and implementing community development assistance provides DIPRUD with approaches and cautions which will be useful to the project implementation.

(e) Primary Health Care Support (PHCS)

This project assists GOG to expand health care services to rural and urban poor, providing the most effective form of health care delivering systems which are possible within the limited manpower and financial resources available to the Government. Aspects of PHCS which relate to rural populations will especially complement the initiatives of DIPRUD. In this regard PHCS seeks to improve the coverage of health services by establishing a village based system of health care, utilizing redeployed primary health personnel and utilizing and upgrading traditional practitioners. By helping to improve the community-level infrastructure in Atebubu District through DIPRUD, the efforts of PHCS will be facilitated. (PHCS is currently in the design stage, activities in Atebubu District may commence in 1981).

(f) Population Planning and Rural Development (POPRUD)

Still in the developmental stage, this project will have two major aspects: promoting delivery of family planning information and services to rural areas, and integration of population and demographic concerns into development planning and programs, including the local level. DIPRUD can complement this program in the same way as with PHCS.

5. Other Donor Activities

Atebubu District has enjoyed little attention from other assistance donors, which is one reason that the GOG welcomes the emphasis which USAID is providing. Apart from the AID activities discussed above, the only assistance currently offered is by voluntary organizations (see under discussion of FAAD, above).

B. Project Description

1. Goal and Purpose

The goal of this project is to improve the economic and social well-being of the population of Atebubu District. This will be achieved through: (1) strengthening the capacities of the Atebubu District Council and the communities to identify, plan and implement projects of direct benefit to the target group, and (2) improve coordination with sectoral ministries and their centralized and decentralized services, in support of development activities in Atebubu District.

2. Project Strategy

The strategy of the DIPRUD Project is to demonstrate that a rural district in Ghana can formulate and carry out at the district level a development program responsive to the needs and preferences of the people in that district.

This will be accomplished by mobilizing and strengthening the existing local government structure and its linkages to regional and national institutions, to assure that the district development process will accommodate choices for investment in rural infrastructure and productive enterprise that are technically and administratively feasible to construct and maintain. To offset the financial and logistic constraints resulting from the general economic decline and past mismanagement and neglect, the project will also provide the needed technical assistance and minimum material and financial resources needed to assure that the development plans of the Atebubu communities are carried out promptly and completely. With the assistance provided through DIPRUD, the Atebubu District Council will plan and implement selected development activities over a five-year period. Emphasis will be on infrastructure improvement and income-generating activities which will facilitate marketing and processing of agricultural products, and improve the economic and social well-being of the farmers and villagers of Atebubu District.

The Government of Ghana has long recognized the inadequacies of past programs to raise the standard of living of the rural population. It has sought to bring decision-making closer to the local population through decentralization of administrative machinery. However, effective decentralization of development processes has yet to be achieved. The Local Government Act of 1980 currently being debated in Parliament (June 1980), will provide the first formal delegation of authority to the districts as regards development programs. This Act, together with the

assistance which DIPRUD can provide, can offer a unique opportunity for GOG to test ways of involving Local Government in rural development processes, identify weaknesses and hurdles, develop experience and competence in the rural sector and local government, and identify formulas for potential replication in other districts of Ghana.

District Councils currently are ineffective to respond to the new mandate. They lack a capability to plan and implement development programs and projects. There virtually is no extension of development activities in rural areas, and a permanent channel between the district council as a whole and the rural sector is lacking. The mechanisms which will be developed through the DIPRUD activities, and the experience which the activities will bring will enhance the confidence of and in the District Council and the rural sector as participants in the development process; will provide the feedback essential to improve downstream projects; and will create the motivation for improved coordination with sectoral ministries and their decentralized services.

GOG and USAID have ongoing programs aimed at strengthening, planning and implementation capacity, through the Economic and Rural Development Project (previously discussed in Part IIA.4); the need has been recognized for outreach activities, while the planning mechanism is being developed, which will provide experimental experience to indicate modifications in process; DIPRUD will offer complementarity with ERDM by providing resources and planning at the local level, and the means for implementation of a series of small development activities. These, when aggregated, will provide learning experience in how development activities reach a specific target group, create a desired impact, and provide the basis for determining replicability to other districts.

By providing resources for specific development activities (against eligibility criteria) a mechanism will be created through which the Atebubu District Council can: (a) establish permanent communication channels with the rural population both in the traditional and modern sectors; (b) coordinate activities with the identified needs of the target group; and (c) create confidence in the Atebubu District Council that they can undertake rural development initiatives, and in the communities regarding their intention to do so.

The process (planning and project activity) is important and developmental. The activities undertaken will serve as a vehicle for developing competence, experience and confidence in a permanent outreach capability in the District Council. They will have a much broader and qualitative scope beyond the economic or social benefits of the initiatives themselves. To

achieve the desired purpose, the activities will have to meet developmental criteria which insure that the selected initiatives can noticeably improve economic activity and community well-being, and enhance community and district self-sufficiency. Selection generally will be limited to those activities which are sufficiently simple in design, implementation, utilization and maintenance for the District and communities to manage with only modest outside aid. Guidance for the District Council in a mechanism for evaluating activities is contained in Annex G. The guidance is intended to be illustrative since the criteria selection should be accomplished by the Council.

Linkage between DIPRUD activities in Atebubu District and the central government will be an important concern. DIPRUD, the first community-based rural development assistance of any magnitude in Ghana, will get under way soon after Ghana's decentralization policy is enacted. It will provide the central government with means of testing the validity and merit of decentralization in a way and on a scale which the government would find difficult to undertake alone, in view of its budgetary constraints. The mechanism for appraising the government of DIPRUD experience and achievements will be through semi-annual evaluations of completed sub-activities (see Part VII). The Ministry of Local Government will be the entity of central government for liaison with DIPRUD, and the District Council coordinator for DIPRUD (District Development Officer) reports functionally to that Ministry.

Other linkage with central government will take place through the functional ministries, whose decentralized services will be assisting in implementing the community activities. They will be reporting the nature of services and resources which have been provided, and the results of their assistance. They will be expected to anticipate requirements for budget year assistance, and to incorporate these in their annual funding estimates. (With passage of the decentralization act, such budgeting at the District level may well be on a consolidated basis, although this is not a certainty).

3. Funding Level

Total costs of DIPRUD will be $10,650,000 over a five-year period, of which $7,850,000 will be U.S. Grant, $2,800,000 represents the contribution of Ghana, including the apportioned salaries and other costs of GOG officials involved with DIPRUD plus the value of community contributions in cash or kind in support of DIPRUD development activities in the project area.

The funding level is based on the expected volume of qualifying activity requests over the five-year period, and the technical and support assistance estimated to be required. The pre-implementation phase of DIPRUD provided basic information to develop these estimates, including a number of specific activity requests from the District Council. The volume of activities proposed for DIPRUD assistance should be feasible within the capabilities of the technical assistance to be provided. This function is designed to devolve to the District Council and its functional departments on a gradual basis during the final years of DIPRUD (see Part III.D).

4. Project Design

a) Technical Assistance

The TA team core staff requirements are discussed in Part III A2. Costs will total $4,690,000 over the five years of the project including services and commodities.

b) Sub-Projects

Up to $3,160,000 in grant funds will be utilized to finance eligible sub-projects. Funds may be used to finance procurement of materials and of contract construction and equipment services. The communities and District Council will contribute at least one-thrid the total cost of eligible sub-projects. This contribution can be in-kind, (e.g., force account construction, use of construction equipment, contribution by the communities of volunteer labor) or as financial counterpart.

An illustrative list of activities which might qualify for assistance is as follows:

- Improvement of a feeder road by hand labor
- Improvement of a feeder road by construction contract
- Community maintenance system for a feeder road
- Community pond construction -- potable water
- Community pond construction -- animal watering
- Wharf or dock construction
- Village market shelter
- Village artisanal shelter
- Rural electrification
- Community enterprise activity
  - Blacksmithing
  - Woodworking
  - Tailoring

- Slaughtering
- Grain milling
- Food processing and sales
- Commercial transport
- Village warehousing
- Water delivery enterprise.

5. End of Project Status

Upon completion of DIPRUD, an effective GOG system of decentralized development support to Atebubu District and its communities should be operational, and the District Council should be able, on a continuing basis, to involve the target group population in the planning and implementation of modest development activities which are economically productive. The District Council and its operating departments will have received hands-on experience and training in planning and implementing development activities and in outreach to involved and participating communities. Primarily this training will accrue to the District Councillors and to personnel of the district departments which are concerned with the sectors in which the development activities fit, i.e., Social Welfare and Community Development, Engineering, Public Works, Agriculture, Survey and Town Planning. Specific outputs expected from these sub-projects will be about 70 miles of feeder road improvement, up to seventeen village ponds and other economically productive or enhancing infrastructure and commercial enterprise initiatives and facilities.

A final evaluation of DIPRUD will provide GOG with an indepth analysis of the experience of the project which will assist in determining prospects and conditions for replicating in other districts.

III. Project Analyses

A. Technical Analyses

1. Technical Approach

The project strategy is to assist the district government and local committees in identifying and undertaking development activities which will be within their capacities to implement. The project capitalizes on the new GOG initiative for strengthening local government, and reinforces activities already under way through ERDM, FAAD, MIDAS, etc., (see II A4). The strategy anticipates a more effective rural development process, sensitive to the needs and priorities of the rural population, as they participate directly. To this end, the activities of DIPRUD must be sufficiently modest in size, not too costly in implementation and recurring input requirements, simple in technology, and manifest in direct benefits to the district and communities.

2. Technical Capability in Atebubu District

At the start, the Atebubu District Council and the communities will have limited technical and professional staff to carry out planning and implementation of development activities. Apart from functional departments which are concerned with the routine activities of their ministries, local government units do not have specialized expertise necessary for designing and implementing development activities of any substantial size or complexity.

Atebubu villages are communities of small farmers together with services supporting their agricultural production (traders, transporters and artisans primarily). These communities are wealthy in practical know-how relating to small-scale farming and trading, but generally poor in other technical and business skills. District Councillors are their representatives and they equally lack technical specialized skills (although several of the councillors of Atebubu District are school teachers). The District Chief Executive is an administrator who would be expected to have competence in general planning and management. However, his functions to date have given little application to rural development initiatives, in the absence of resources for such purpose. The capabilities of the sectoral departments

in personnel and expertise vary widely. Generally, the competence of the specialists appears to be adequate, but talents are under-utilized because none of the departments have sufficient supporting equipment or resources to enable their personnel to be fully operational.

DIPRUD and ERDM must take account of these realities in working to strengthen the capabilities of district officials and communities. ERDM is currently training district officials and councillors in techniques of development planning and of management. In addition to scheduled training programs conducted in the district, ERDM is developing its own capacity, on a regional basis, to provide short-term consultancy assistance in the development function. This will include assistance in economic or social feasibility studies, business management, project design, engineering and others (ERDM will supplement its own staffing by sub-contracting for some services with universities, engineering firms, etc). USAID participation in ERDM will end in 1982, at which time the capacity to provide training and consultancy services on a continuing basis will be established for the region, and available to support the needs of Atebubu District.

DIPRUD will bring other resources to bear in strengthening the district's capability in rural development. This will include technical and support assistance in planning and implementing specific locally-identified development initiatives, working with district officials and community participants. The TA team will assist participating communities through existing district government institutions and entities. In the process, those institutions will receive improved skills and experience in development processes which will enable them to continue such activities after DIPRUD phases out. To maximize the experience and strengthen the district's outreach capability, it is planned for DIPRUD to assist in a substantial number of small initiatives during the five-year period. The technical requirements will be sufficiently modest that they can be met within the capability of the district, except for consulting assistance which other GOG resources can provide. The under-utilized technical expertise of the sectoral ministries (see discussion above) will be brought into the processes to the extent possible. Core staff for the technical assistance team will include a rural community development advisor, and, because of the district's need for infrastructure development, a civil engineer.

The TA team would also require a number of Ghanaian rural community development specialists (RCDS) to assist in the outreach to participating communities through local government

mechanisms. Inasmuch as from five to ten development activities may be under way at one time, four RCDS are provided in DIPRUD design. The core staff would be supplemented by short-term consultants as indicated in the implementation plan, and by clerical and other supporting staff.

The GOG is assigning a full-time counterpart in Atebubu to work with the DIPRUD Project. He will be the District Development Officer, under the aegis of the Rural Planning Unit, Ministry of Local Government. The TA team will work with him and with those district officials currently most concerned with community development activities and infrastructure. Departments of the district concerned with infrastructure include Engineering, Highways, Water and Sewerage Corporation and Public Works. For small community development and enterprise activities, the Department of Social Welfare/Community Development will be the point of contact, (see further discussion below).

Initial activities of DIPRUD will be from among the list of projects which the ADC has identified and proposed during DIPRUD I. Most of these are for improved feeder roads and village drinking water ponds. The DIPRUD design team has evaluated these for technical, economic and social feasibility and selected those which best qualify for assistance. The process for implementing them is indicated in the Part III A.3. Inasmuch as they reflect the expressed priorities of the communities it is expected that the communities will be quite cooperative in meeting the conditions for assistance.

3. Sub-Project Processes

Activities to be assisted through DIPRUD will follow a specific process in identification, design, implementation and utilization/maintenance. DIPRUD and ERDM will provide technical advice to Atebubu District officials and communities involved in these supplementing their expertise, and assisting them to make fullest use of technical resources available to them.

a) Activity identification: the communities, through their councillors, will propose activities to the District Council, which will evaluate them for submittal to DIPRUD. The District Development Officer (DDO) will participate ex-officio in the sessions of the Council, and advise on District priorities and policies.

b) Activity design: Activities submitted to DIPRUD will be reviewed by the DIPRUD Team Leader (DTL) and the DDO, who will decide how the design should be accomplished. This will depend on the nature and complexity of the activity. During the initial years of DIPRUD, the DIPRUD team will coordinate the design, working with the sponsoring communities, their Councillors and appropriate functional departments. During the final two years, the coordination of activity design will move to the DDO.

- Activities having technical engineering requirements will involve personnel from Highways, Water and Sewerage, Survey, Public Works or other departments, depending on the activity. The DIPRUD engineer will work with technicians of the participating departments to secure the technical design inputs. During the final two years of DIPRUD, the function of the DIPRUD engineer will become more advisory, and the participating departments will assume a greater role.

- Activities of an enterprise nature will generally involve a sponsofing community or association. The role of the Councillor representing the community will be greater in design of these, depending on his talents. Resources which would be called on for activities of some complexity could include ERDM consultants, the Department of Social Welfare/ Community Development, or a voluntary agency. In cases where these resources might be insufficient during the initial years of DIPRUD, the TA team would play a greater role in coordinating design.

- All activities to be assisted through DIPRUD will have to meet basic qualifying criteria as discussed in Part II B and Annex G. Activity sponsors will be responsible for completing the criteria analyses assisted by the DIPRUD team. During the final two years of the project, the DDO will assume responsibility for this coordination.

- All activities will require, as a condition of DIPRUD assistance, assurance that the facility will be properly operated and maintained. Activity requests will include such assurances from the sponsors, together with discussion as to how this will be achieved. Feeder roads, for example will require regular maintenance which will have to be financed by the communities served, or

through operating budgets of the District. Contributions of the communities could be in the form of in-kind labor. A community and District commitment to perform this maintenance would be essential (during the DIPRUD Project period a portion of the maintenance costs for assisted roads will be financed through the Project; however, after DIPRUD, the communities and District will be on their own). Activities other than roads will require commitments from the associations which will operate the enterprises or form communities which will utilize the facilities. The appropriate form would depend on the activity. E.g., donated labor to clean a village pond; user fees for utilizing a dock or wharf; community financing of maintenance of a community center. The DIPRUD team leader and DDO will determine the adequacy of the commitments and the estimates of continuing requirements. This will include a judgement as to the capabilities of the sponsors to operate and maintain the facilities.

c) Activity implementation: Sponsoring communities or associations will be responsible to designate someone who will be charged with implementation. That person will mobilize the community resources which are a condition of their commitment (cash toward financing the activity, mobilization of village labor, etc.). DIPRUD team will assign a Rural Community Development (RCD) specialist to mobilize DIPRUD inputs, help to arrange technical assistance from functional departments in the district, and generally assist the sponsoring organization in activity implementation. This role will gradually transfer to the DDO during the course of DIPRUD, although the RCD specialists will continue to be paid through DIPRUD. One option available to DIPRUD would be to contract for the services of RCD specialists through a voluntary agency which works in the District.

- Implementation of roads ponds and other construction - type activities will involve the DIPRUD engineer directly in construction supervision to a greater extent, particularly during the first three years of DIPRUD. One of the RCD specialists will be a trained engineering technician. He will assist the engineer in these functions. This will include mobilization (through the activity sponsor) of village labor, scheduling of the

construction process, provision of contractual services financed through DIPRUD, and construction' supervision and inspection. In as much as these functions will reside with the sectoral departments, following DIPRUD, the appropriate departments will be asked to participate in the activities and to gain experience in the process. The role of the DIPRUD engineer in coordinating these arrangements will devolve to the DDO during the final two years of DIPRUD.

- Contracting for construction and other direct services to activities will be financed by DIPRUD in contracts which are let through the District Council. The Local Government Act of 1980 provides authority to the Councils to contract their own in amounts up to ¢20,000, and with approval of region, up to ¢150,000. DIPRUD will provide a useful vehicle for the Atebubu District to gain experience in this function. ERDM will be called on to give technical consulting assistance.

- Financial management of resources which are provided by sponsoring communities and associations will be a responsibility of those organizations. Commercial banking services are available in the District and their use will be encouraged. Activity sponsors will be advised and assisted by DIPRUD RCD specialists in handling, safeguarding and simple accounting of funds. (In projects of sufficient complexity, ERDM may be called on for special consulting assistance).

In some activities, partial funding may be provided through resources available to the District Council. The Councils established procedures for accounting and disbursing appear to be sufficient for this purpose; however, ERDM will be requested to evaluate this during the initial period of DIPRUD II, and to recommend how DIPRUD or ERDM can assist the council in strengthening its financial management.

d) Activity utilization and maintenance: The sponsors of activities will be responsible for insuring that the facilities are properly utilized and maintained, and that their commitments to this effect are honored. DIPRUD will advise and assist the sponsors to establish appropriate use and maintenance systems, and will perform with the sponsors a follow-up evaluation of how

the systems are working. This will take place at a mutually agreed time, depending on the nature of the project.

In the case of road improvement activities, a more formal process of ensuring maintenance will be used, one in which DIPRUD will maintain an interest and participation over a longer period. DIPRUD participation will follow the same process as in the case of initial reconstruction, i.e., more direct involvement by the DIPRUD engineer in monitoring, and in securing participation of personnel of the Highway Department in technical supervision and inspection.

4. Cost Estimates

Individual activities have been budgeted for U.S. assistance at an assumed average cost of $10,000 (1980 prices), being two-thirds of the estimated total average cost. Ghana would be expected to finance one-third in cash or kind. The estimate of average cost is based on the experience of the pre-implementation phase, and the judgement of the voluntary agency working in Atebubu District (see IIA 4 -- FAAD).

A wide range of activities will likely be assisted through DIPRUD, and these with a wide range of costs, depending on their nature. Criteria for activity assistance will require them to be modest in size and technology, and activities with substantial capital inputs would not normally qualify. It is not desirable for DIPRUD to establish rigidities in activity criteria beyond the general conditions established for selection evaluation (see Annex G). To do so might discourage or confuse communities which are invited to present their own idea for practical initiatives. Nonetheless, selection by USAID of those for assistance should take into account an appropriate balance in size and type of activities approved for funding. For this reason, no activities costing in excess of $30,000 (1980 prices) would normally be considered for approval. This condition, and the question of balance, will be a subject for particular attention by the AID/GOG evaluators at the time of the first in-depth evaluation.

5. Technical Feasibility

Activities supported through DIPRUD will be technically uncomplicated. Village ponds and some of the road improvement projects will require a degree of engineering and equipment inputs; most other activities, including road and pond maintenance/rehabilitation, small community facilities and village enterprise initiatives will emphasize labor inputs and simplicity in design. This is consistent with the DIPRUD philosophy and approach--to encourage development initiatives which are within capabilities of the rural communities, with dependence only on the limited technical assistance resources which are available in the District.

Activities will be evaluated and selected which meet sub-project specific criteria established for DIPRUD assistance (see Part IIB and Annex G). This will limit them to activity initiatives which are modest in size, technically uncomplicated, and practical for the communities to operate and maintain within their own resources and capabilities. Part IIIA. 2,3 and IIID. 2 refer to the technical expertise available in the District, and how it will be used in support of DIPRUD development activities.

Since feeder roads and village ponds have been identified by Atebubu communities as highest priority, they will receive major attention in DIPRUD. In view of this, and the importance of engineering and technical supervision necessary, a civil engineer will be included in the technical assistance team. He will work with engineering technicians assigned in the District (highway, water, survey, public works and other, as appropriate) to insure that these activities are properly designed, planned and implemented.

During design of the Project Paper, alternative options of construction/rehabilitation and maintenance of feeder roads and ponds were analyzed in detail by engineers and the economist on the design team. The results of the technical analyses are found in Annex B; the economic analyses in Annex A. It was determined most feasible to improve existing feeder roads by grader rehabilitation, followed by scheduled labor-intensive maintenance. Ponds similarly can best be exacavated by earth moving equipment, the soils not being practical for labor-intensive exacavation of the magnitude required. However, as in the case of roads, periodic maintenance by hand labor is the appropriate option.

A number of feeder tracks were requested by the District Council for upgrading. The cost of bringing these up to all-weather standards was determined to be infeasible on the basis of sparse population and production data.

During the implementation phase, it is expected that more complete data may indicate feasibility for improving some or parts of these tracks. For this purpose, the DIPRUD budget contains funds for labor-intensive improvement of twenty miles of such tracks.

Options for providing machinery inputs for road and pond construction were anlized, and the clearly preferred option will be to contract for the services. Government-owned equipment in the District is nil, except for miscellaneous pieces which have long been deadlined. The GOG contracts for all new road construction and for re-construction. The Highway Authority attempts to maintain main trunk roads, but cannot keep up with the needs for lack of parts and POL. Annex B discusses in some detail the conditions of the various options, and the reasons which recommend contracting.

B. Economic Analysis

1. Macro-economic Considerations

These recently have been analyzed for MIDAS II Project Paper (Project 641-0102), the findings in which equally apply to DIPRUD: "The Ghanaian economy has been deteriorating for over a decade. Real per capita GNP has actually declined, and key growth variables such as savings rate and the tax/GNP ratio have fallen well below 10%. Even more critically, subsidies, price controls, an over-valued exchange rate, and triple digit inflation have distorted market signals to such an extent that production has become less attractive than speculation, and rationing and black markets are a way of life. From 1973 to 1978, real GNP declined by 3.4% annually. The average Ghanaian is thus 18% worse off than he was in 1973.

....The over-valued exchange rates have contributed to declining exports and substantial smuggling, both of which have led to severe shortage of imported and domestically produced goods. These shortages impact on small farmers directly through the effect on farm inputs and transportation, and indirectly by reducing the incentive to earn increased cash income..."

2. The Regional Economy

Analysis shows that the first round effects of inflation have and will likely continue to benefit the small farmers in the project area, since food price increases have led the consumer price index over the last several years. Other indices indicate production declining in manufacturing, agriculture, mining and trade, during the previous 7 years. Plant and equipment has deteriorated in most producing sectors; spare parts, replacement items, and new capital equipment have been restricted to serious degree by the lack of freely available foreign exchange. Under these conditions, all production sectors are producing at increasingly higher cost levels and at lower levels of output. The prospect of higher taxes of goods, producers will not reduce cost burdens nor instill greater motivation.

Regional effects may reduce the number of farmers dealing on the cash market. At the same time, DIPRUD assistance to the small-scale farmer and entrepreneur may aid the emergency of a stronger regional economy, now more self-sufficient and dependent upon local supplies, workshops and initiation of local enterprises to replace those being lost intra-regionally. The identification of such enterprises and self-help measures which aid in coping with a growing regional isolation may provide the basis for a stronger local economy, and the means of future revival of trade on a more normal basis when national events are brought under control.

3. Sub-project Analysis

DIPRUD supports the GOG efforts to move toward decentralized rural development administration. It encourages activities which are functional to promoting economic development; but with a broader purpose--that of promoting greater local involvement in locally conceptualized development initiatives. In a real sense, the activities are justified in how well they promote a grass-roots impetus for development. Therefore, it is not sufficient for economic analysis to look solely at income, employment or economically productive assets generated in analyzing the value of sub-projects.

At the same time, economic analysis can be helpful in establishing criteria for activity design in such a way that initiatives will be economically sound. Activities without economic soundness are unlikely to enhance the assumption that decentralized community-involvement is the best approach to rural development.

The sub-projects (activities) will focus on the needs of communities of Atebubu District in ways which economically are directly productive, or improve economic infrastructure essential to generating additional productive assets. Most importantly, the project is aimed at implementing activities which are responsive to the needs of the district, as perceived by the rural populations. A rigorous benefit/cost analysis is not possible for most activities which may be supported by DIPRUD, since the specific nature and location of all the activities are not yet identified, nor can likely benefits be fully quantified at this time. Certain infrastructure activities have been identified by the District Council as having major importance, however, and sample pre-feasibility studies of several roads and village ponds have been conducted during PP design. The findings of these studies are in Annex A. Because of a paucity of accurate or complete data on populations, traffic levels, economic activity levels or local market operations, a largely conjectural data base has been employed. Nonetheless, it is believed that the findings are sufficiently valid to justify inclusion of certain of them in DIPRUD finding. Economic and other feasibility analyses of other activities will follow the procedure outlined.

4. Cost Effectiveness Analysis

Alternative options which might achieve the same objectives as DIPRUD design are these:

a) Remove or reduce the technical assistance element from the project:

While this option would still provide funding support for project activities, it would not provide the guidance essential for strengthening the capabilities of district officials and technicians to manage a decentralized rural development program.

Moreover, there would be less assurance that the activity initiatives meet tight criteria for development purposes, are adequately designed and implemented, or that the facilities would be satisfactorily operated and maintained. A successful experiment in decentralized rural development would have to meet these tests, or else the communities would be discouraged from initiating new ventures. The proposed technical assistance element would be essential for DIPRUD to achieve its purpose.

b) Reduce the time frame for DIPRUD

To do this, a substantial number of the project activities would not receive the support and careful attention which DIPRUD will provide. The start of the project is expected to closely coincide with enactment of GOG of its decentralization legislation. To achieve the outreach capability in the District, it does not seem likely that DIPRUD purpose could be achieved in a shorter time frame, since an insufficient learning experience would result.

c) Limit Supported Activities to those Showing Greatest Potential for Substantial Economic Returns:

This option would have the advantage of making project benefits more subject to quantification, and of maximizing economic outputs relative to AID-financed inputs. However, the project seeks to achieve a balance between the need to achieve concrete economic returns, and the need to be responsive to the priorities of local communities, where benefits might be more social than economic in nature.

C. Social Analysis

Atebubu District is a food farming area which produces for markets in Kumasi and other urban centers south of the District. Most of the farmers produce on a small-scale, generally cultivating less than five acres. Their methods of cultivation and production are essentially traditional. As recently observed in another study (Project Paper for MIDAS--Project 641-0067) "Poverty dominates contemporary Ghanaian rural life. A reason for this is an almost total neglect of the small farmer who uses largely pre-colonial techniques while experiencing rapidly escalating living costs." The MIDAS project ..." attempts to relax the grip of rural poverty, especially in the developmentally neglected Brong-Ahafo Region, by making possible changes in quantities and types of production factors available to small farmers, while reducing marketing costs." (See MIDAS PP -- Social Soundness Analysis).

Atebubu District is the most "developmentally neglected" area of the Brong-Ahafo Region; the poverty of the rural population reflects the poverty of soils, water resources and access of crops to markets. The project will provide assistance to the Atebubu rural population complementing that of MIDAS, by encouraging the communities to improve their infrastructure and support services through their own developmental initiatives.

Annex F provides a detailed socio-economic profile for Atebubu taken from a study conducted in 1979 (Economics of Small Farm Systems and Socio-Economic Conditions in the Atebubu District - - University of Science and Technology, Kumasi and Virginia State University). DIPRUD activities will take careful account of the societal conditions and factors which might impinge on design and implementation and the utilization of facilities to be achieved. DIPRUD will encourage rural communities to identify development opportunities appropriate to their capacities and priority needs which can be implemented without conflict with existing social systems and traditions.

DIPRUD outreach to the communities will involve various institutional elements of District Government. The Councillors, who represent the communities and traditional authorities; the District Development Officer, a new position in District Government; the Community Development Director (Social Welfare/Community Development Department) and his staff; and, for technical assistance, various specialists of other functional departments in the District. Sensitivity to social issues in the District Government particularly concerns the Councillors, as representatives, and the Social Welfare/Community Development Department. That department is charged with organizing adult literacy classes, small cottage industries and other community projects, communal labor for community projects, concern for community hygiene and sanitation, handicraft and nutrition activities, and housing functions for resettled families from the Volta River basin. It is the Department of district government with the most direct and continuous contact with the communities. The project will especially work with and through SW/CD in such contacts to insure that social factors are appropriately addressed in project activities. DIPRUD technical assistance team

will include four Ghanaian rural community development specialists, working with the expatriate rural development advisor. All of these will have qualifications in rural sociology and community development.

Part II.A3 discusses the processes for mounting community development activities, and for involving the communities in conceptualization, planning, implementation and utilization/maintenance. To achieve its purpose, decentralized rural development should be community-based. District Governments in their wisdom might successfully design and implement development schemes for the benefit of the people, but without direct involvement of the target beneficiaries, they would lack the desired sensitivity to beneficiary needs; and the beneficiaries would continue to be subjects rather than responsible participants. The DIPRUD philosophy and approach will assure that the communities and target beneficiaries are directly involved. In communities where village development committees are organized, these committees will be the point of contact on activity matters.

The population of Atebubu is largely concerned with food crop farming. However, the farmers depend on transporters, retail traders, food processors, blacksmiths and other services in support of their production. DIPRUD will give appropriate assistance to activities to strengthen or expand such support services. Some of these activities will take place in larger towns as well as in smaller villages. The entire District is rural in a very real sense (the current estimated population of the largest town, Atebubu, is only 9,800) and the services to the farming sector which the market centers provide are critical to the farmers' income and quality of life. This requires and justifies some attention to the urban areas of Atebubu District, in support of commercial and artisanal services to farmers.

Target beneficiaries of DIPRUD will be the "rural poor", which, in the case of Atebubu District, constitutes essentially the entire population of this neglected area. Within the communities, among the most important benefits to be derived will be for the villagers as a whole -- the enhancement of their capacity to initiate and maintain self-improvement activities which can better their levels of living; and the achievement of recognition by the Government that these community efforts are important in appropriate rural development.

Specific activity benefits and beneficiaries can be anticipated only at the time when the activities are identified and designed. Three illustrative examples of how benefits derived from DIPRUD activities might accrue to the largest number of beneficiaries are as follows:

1. Feeder Road Improvements

Beneficiaries	Benefits
Farmers	- reduce time necessary to get to and from farms; - facilitate getting crops to market, transport costs less.

Beneficiaries	Benefits
Women	- reduce time necessary to fetch water; - more traders patronize markets, improved supplies. - better access to services
Traders	- easier to reach markets; transport costs less.
Transporters	- easier to reach farm pick-up areas; - less wear and tear on vehicles; - reduced operating costs. - increased production generated by better access makes more business.
Food Processors and Artisans	- easier access to customers and sources of supply.
Community	- improved skills in community organization and action; more self-reliant and more knowledgeable in dealing with District Government.
District Government	- easier contact with communities; better awareness of their felt needs; better basis for development planning.

2. Village ponds

Beneficiaries	
Women	- reduce time to fetch water; increase time available for other enterprise.
Farmers	- possible small irrigation planting in periphery of ponds; water supply for small farm animals.
Families	- larger source of drinking water; less pollution or stagnation; better health due to less dehydration and purer water.
Community and District Government	- same as for roads

3. Blacksmithing enterprise

Blacksmiths	- improved availability of stock supplies and other inputs; ability to improve skills; better working conditions and facilities; more efficient production.

3. Blacksmithing enterprise (Cont.)

Beneficiaries	Benefits
Farmer	- better local capability for manufacture and repair of tools and farm implements.
Youth	- greater possibility for rural employment (as blacksmith increases skills and production, he will need assistance)
Women	- improved local capability for making and repairing cooking implements.
Community	- increased self-reliance; better capacity to utilize appropriate technology because maintenance capacity exists.
District Government	- better able to perform extension functions because technical skills needed to support farming innovations are now available.

The above examples are illustrative, assuming maximum benefit and minimum burden. Technical assistance provided the communities in designing the activities, and testing them against project criteria (Annex G) will help communities to insure that the activities not only will be sufficiently beneficial economically, but that social benefits and costs will justify their implementation.

The effects on women in the communities will be anticipated and evaluated in the activity analyses, particularly as regards their daily household burdens (getting water, gathering firewood, pounding grain or cassava, etc.), or effects that might help increase their personal incomes (handicrafts production, poultry raising, marketing activities). Possible negative effects on women will also be anticipated, including potential labor demands without direct personal return to the worker.

Activity proposal analyses will identify individuals or groups who might be adversely affected by the projects, such as for clearing an area where a village pond will be located, or straightening a feeder road through someone's cultivation. Community decisions would be expected to disqualify activities having significant adverse effects on individuals, unless equitable and agreeable compensation can be made (alternative land for cultivation, direct participation in and benefit from the development initiative; etc.). Active local community involvement in activity design and implementation is expected to provide a greater degree of consideration and equity, and assurance that the benefits of the facilities are fairly shared by the target beneficiaries.

D. Institutional Analysis

1. At District Council Level

As presently constituted, district councils are a loose confederation of local government entities (see discussion in Annex E). Currently, there is little coordination of the functional sectors at the district level, and little cooperation between the functional sectors to enable most efficient application of scarce equipment and other resources.

DIPRUD and ERDM, as originally conceived assumed a much more precise and effective decentralized organization and authority structure, as contemplated in the Local Government Act of 1974. Changes of government have delayed implementation of this. However, each succeeding military administration has supported the concept of decentralization of authority which will allow people in the districts to exercise substantive control over the administrative and development activities in their districts.

The current administration, Ghana's first democratically-elected since the early 1970's, now has before Parliament a bill which will consolidate the process of decentralization. It will strengthen the district councils by establishing administrative coordination over most sectoral functions of government at the district level. The prognosis for passage of the Local Government Act of 1980 is considered very good.

ERDM (See IIA 4) and DIPRUD will work with the Atebubu District Council to strengthen its ability to plan, design and implement development activities. Resources available to the District will include the personnel and operating allotments of the functional sectors, revenues which the ADC collects through its rating authority, and grants-in-aid which are made available by the central government and donor organizations.

Until passage of the Local Government Act of 1980, little of the resources from functional sectors can be expected to be available to support miscellaneous small development activities, for reasons cited in Annex E. These resources are deemed by the ministries to be inadequate for the basic routine operations of the sectoral functions in the district, let alone to be applied to development activities. The Local Government Act of 1980 may cause some change in this, to the extent the District Council can effectively coordinate the operations of the sectors within the District. ERDM and DIPRUD will encourage the District Council to make the fullest possible use of these functional departments in the process of identification, design, engineering and implementation of development activities.

The revenues which are collected at the district level are considered much lower than the potential, largely because of inertia and inefficiency in the collection process. ERDM has attempted to strengthen the capacity of the District Council to improve its financial management systems, and will continue these efforts through training programs and consulting services. A national commitment to make effective decentralization of rural development a reality can insure that increased locally-generated revenues will be retained in the district to be applied to development initiatives, and will not be used to resolve deficits in on-going operating programs. That this is the case will be a concern for the evaluation

exercise for DIPRUD.

Another source of funding for district rural development initiatives will be the Local Government Grants-in-Aid, to be administered through the Ministry of Local Government. Given the current financial austerity of the Government it appears doubtful whether much can be expected through this source (see discussion in Annex E).

2. Institutional Assessment of Atebubu District

The Atebubu District Council as currently constituted will have sufficient strength and capacity to undertake DIPRUD, as designed, provided that the authority for the Council to administratively coordinate and control the functional departments is enacted by Parliament and is effectively exercised by the District. This authority will be critical to efficient implementation of the development activities under DIPRUD, which will depend on the functional sectors to participate in the process. While DIPRUD might provide or secure needed expertise outside of the functional departments, this would not achieve a lasting capability in Atebubu to continue a program of small development institutions beyond DIPRUD, nor a replicable scheme for GOG to initiate in other districts. Therefore a condition precedent to the project agreement should be evidence of an effective transfer of administrative authority over the functional sectors in the District. USAID has been assured that the local government Act of 1980 will provide this.

The activities designed for assistance under DIPRUD will not unduly tax the capacities of Atebubu District (See Part IIIA for process); they will individually be modest in size and complexity. Current staffing in the District (see Annex E) is considered sufficient in numbers for the purpose, and is generally quite under-utilized for reasons cited in Part III A2. A condition for more efficient utilization of personnel will be availability of transportation, tools and other resources. DIPRUD will supplement the District resources for this purpose, on a gradually declining basis over the life of the project.

During the project period, the role of the District Development Officer is expected to grow, together with a need for a GOG to provide a sufficient staff and budget for the needs of his function. Since the coordination and motivational responsibilities for small development activities in the District will ultimately reside with the DDO and his staff, a commitment by GOG to the continuing program must be reflected in a capable coordinating entity. DIPRUD will advise the District Council (and the Ministry of Local Government) as to the organizational and staffing needs for such a function, and a gradual provision of full staffing. ERDM will be called on to assist in this determination. (One possible source of candidates for a district development unit would be the Ghanaian Rural Community Development specialists who are initially members of the DIPRUD technical assistance team).

The organizational structure of Atebubu District Council is considered satisfactory for the implementation of DIPRUD activities (see Part IIA.3

for discussion of processes). Ultimately, a district coordinating unit under the District Development Officer will be essential, as discussed above. The evolution of such a unit can best occur during the course of DIPRUD which will provide experience as to the measure of needs. Also, the experience of DIPRUD may indicate other desirable changes in organizational structure, functions or staffing during the course of the project. This will be a subject for particular attention during the evaluation processes (See Part VII)

Provided that the decentralized authorities over functional departments are enacted, the District Council should have the necessary technical capacity to staff and implement the development activities under DIPRUD. One category of particular importance will be the technical design and supervision of construction - type activities. The process outlined in Part III A 3 should insure that this is satisfactorily accomplished. Procedure for working with the sponsoring communities and associations are outlined in the same section; and are adequate for commencement of DIPRUD. This will be a particular concern of the Rural Development Advisor of the DIPRUD team, together with the DDO, and ways of improving and strengthening involvement with the target beneficiaries/participants will require continuing attention as experience is gained.

Leadership and policy direction and coordination of a decentralized development program and projects will inevitably involve the district councillors and the District Chief Executive (Clerk of Council is the new title under the 1980 Act). ERDM has been giving attention to strengthening these functions, and the experience provided with DIPRUD assistance should gently enhance these efforts. The District Council and DCE have been incapable up to now in developing an effective role, for reasons cited in Annex and reflected elsewhere in this paper. Passage of the 1980 Act and the activity assistance which DIPRUD will provide can offer opportunities and means for the council and DCE to develop their roles. DIPRUD does not presume to achieve a comprehensive rural development of Atebubu District during the project period. The activities will only modestly achieve development objectives; they will be "targets of opportunity as conceived by villagers (rather than initiatives identified within global development programs of the central government); while they will have to individually meet the test of developmental purpose and therefore should enhance global development objectives, they will not be forced to fit pre-ordained sectoral priorities. To do this would defeat the objective of encouraging target farmer/villagers to undertake their own perceived activities for self-improvement.

IV. Administrative Arrangements

DIPRUD technical assistance team will be headquartered in Atebubu, seat of Government for Atebubu District. The team will consist of a Rural Development Advisor and an Engineer (expatriate) and three Ghanaian Rural Community Development Specialists, and one Ghanaian engineering technician. Supporting clerks, drivers, etc., will also be part of the team.

The counterpart organization will be the District Council, including the functional departments. Liaison with the DIPRUD team, and primary coordinator for GOG on DIPRUD activities will be the District Development Office, one of the functional departments of the District Council. This initially will be a one person office. The District Development Officer (DDO) will report functionally to the Ministry of Local Government. Administratively the DDO will report to the Clerk of Council as in the case of all functional departments in the District (upon expected enactment of the Local Government Act of 1980). The Clerk of Council will have authority to insure the participation and cooperation of the functional departments with DIPRUD activities under the coordination of the DDO.

Parts IIIA2 and 3, IID.1 and 2 and elsewhere describe in some detail how the District Council is organized, and how DIPRUD activity processes will involve the individual elements, of the Council. In summary the processes of activity identification, design, approval for DIPRUD support, implementation and evaluation will involve the communities, their councillors, the DDO, DIPRUD team, and appropriate functional officers of District Council. Initially, DIPRUD will play an important role in coordination of the processes, this will gradually devolve to the DD Office as experience is grained.

USAID will provide general direction and over-sight to DIPRUD through a Project Officer. GOG has designated the Rural Planning Unit in the Ministry of Local Government to be the point of liaison between USAID and the Central Government. By its nature DIPRUD should require little day-to-day attention by the central or regional governments, since the activities will be modest in size and will depend almost exclusively on input resources available in the District, (apart from commodities and equipment provided through the DIPRUD team). However, central and regional governments should have an interest in the experience which DIPRUD will provide as to community-based development initiatives under the new local Government Act. They will be kept informed through quarterly reporting by the DDO (assisted by DIPRUD) and through DIPRUD evaluation exercises, in which regional and central government will be invited to par ticipate (see Part VII).

The USAID Project ~~Officer~~ Manager will ensure appropriate coordination of DIPRUD with other USAID projects, especially ERDM, FAAD and MIDAS, and will work with project ~~officer~~ managers for these projects. This will not preclude direct coordination in the field between the various project TA teams on a day-to-day needs basis. The DIPRUD Project ~~Officer~~ Manager will also be concerned with U.S. Procurement ordering, receiving and transporting to Atebubu. He will work with USAID supporting staff in Executive, Program and Capital Development Offices in this regard.

Financial arrangements for DIPRUD will involve the USAID Controller, as described in the Financial Analysis Part V.

V. Financial Plan

1. Budget Content

DIPRUD total requirements are $10,652,000, of which $4,691,000 is for technical assistance by U.S. $3,161,000 is direct U.S. support assistance to community activities and $2,800,000 is the direct and in-kind contributions of Ghana. All of the U.S. support assistance to community activities and $2,405,000 of the technical assistance is for local currency requirements. U.S. dollar costs for technical assistance are $2,286,000. Tables 1, 2 and 3 and respectively are a summary estimate, a costing of project outputs/inputs, and a projection of expenditures by fiscal year.

Current and projected inflation impacts greatly on the budget, especially as regards in-country costs. While Ghana has improved on the triple-digit rate which it suffered in 1978, the current annualized inflation is over 50%, with little evidence of abating. However, the Government is expected to succeed in progressively reducing inflation, and the budget assumes accordingly.

Since the inflation factor for the U.S. source TA and commodities is assumed to be substantially less than for in-country costs, budget line items have been grouped separately for that category. A compounded rate of 12% has been applied to those costs. The incremental annual rates for in-country costs were assumed to be these: 1981 - 48%; 1982 -42%; 1983 - 36%; 1984 - 33%. The five-year impact of inflation on total U.S. contribution to DIPRUD is $4,286,000 against the base figure of $3,566,000.

GOG contributions to DIPRUD will consist of direct contributions to the community activities in cash or labor (including those funds collected by communities as their share of activities), amounting to $1,587,000, together with the apportioned time of councillors, District Council officials including functional departments, regional and central ministry officials and others which is calculated to approximate $1,213,000 over five years.

The technical assistance component includes salaries and allowances of two expatriates at salaries equating to mid R -4 and R-3, plus contractor overhead and fees estimated at 75% of expatriate base salaries; salaries and allowances of four RCD specialists plus five supporting clerks,

driver-mechanics, etc., (based on S and A equivalences for FSN employees of USAID; four days per month of travel per diem in-country for each expatriate and 16.7 days per month total for the nine Ghanaian members of the team; funds for Ghanaian technical consultants who may be needed to supplement those provided through ERDM; funds for U.S. consultants for a rural electrification study in year two and for evaluation exercises in years three and five, estimated at $10,000 per person month including fees, transportation; per diem and contractor overhead; U.S. source commodities, vehicles and equipment at CIF costs; locally-purchased commodities including locally fabricated office furniture and emergency local procurement and contract services; a contingency factor of 10% of totals (before inflation) is also provided.

Direct U.S. assistance to community development sub-projects is calculated at two-thirds the estimated average cost of small enterprise and infrastructure activities, except for road rehabilitation and improvement activities, for which a separate formula was developed during project design. For these, contracting costs are to be funded by DIPRUD and labor costs by the communities, (see Table 4).

2. Financial Management

To the maximum extent possible commercial banking facilities in Atebubu will be utilized for financial transactions in the District. Accounts will be established and replenished for the DIPRUD team routine operations under provisions of the contract. Generally, replenishments will be made by the Controller, USAID, on the basis of certified paid invoices, within the totals and for purposes authorized in the contract.

Payments in direct assistance to development activities will follow a different pattern. Funding assistance for such activities will require submittal to USAID of an activity request containing the activity description, sponsor(s), estimated total costs, assurances of availability of the community inputs and responsibility for operation and maintenance of the facility/enterprise, together with a criteria analysis form (see Annex G). The activity request will be signed by the Clerk of Council and submitted to USAID by the team leader. The DIPRUD Project Manager will review it for completeness and recommend approval by the Mission. The request and approval process should be simple and straightforward provided that the activity clearly falls within DIPRUD criteria. Activities are expected to average $15,000, with USAID assistance averaging $10,000. An exception would be one of the feeder road rehabilitation projects scheduled for year one per Table 4. Generally no activities requiring U.S. assistance in excess of $30,000 (1980 prices) would be considered.

U.S. procurement will be performed by USAID for the project, following normal implementation processes. The Project Manager will be responsible for this function. Local procurement will be performed by the

team leader, under authority of the contract, within limitations and procedures established by USAID. Payrolls and allowances, including local travel, for members of the team will be administered by the team leader under provisions of the contract.

3. Continuing Costs

These are addressed in two categories: costs related to operating and maintaining the community facilities and enterprises which will result from DIPRUD: and costs to Atebubu District Council of maintaining a continuing program of assistance to its communities for new self-improvement initiatives.

Taking the latter category first, the Atebubu District Council should have achieved experience by the end of DIPRUD to be technically and administratively competent to continue a community-based assistance program. The communities will have observed and gained experience in how their development initiatives can bring them benefits, gaining not only confidence in their ability to implement useful projects, but also an appreciation of the true value of such projects. Therefore communities will be more interested in supporting new ventures which involve a greater contribution on their part. Additionally, the District Council's resources to assist such projects should be greater as their mechanisms for generating local revenues become more efficient, and as the central government's assistance through Local Government Grants-in-Aid begins to be effective (see Part IIID.1). The magnitude of a continuing District program will depend on these factors. However, a successful DIPRUD should help to insure the motivation for continuation of the program.

As for operating and maintaining the facilities which result, the assurance of meeting these costs will be in criteria for approval of assistance from DIPRUD in each individual case (see discussion Part IIIA.3). The sponsoring communities or associations will be required to accept responsibility, and will be evaluated by the District and DIPRUD as to their capacity to do so. Following completion of the activity, after an appropriate lapse, DIPRUD and the community will evaluate the adequacy of their performance, thereby learning of potentials and problems for consideration in consequent activity assistance. A point to emphasize is that these continuing costs will be local costs, not requiring foreign exchange.

Table 1

DIPRUD
Summary Cost Estimate and Financial Plan $000

Source	AID FX	AID LC	GHANA FX	GHANA LC	Total
Project Elements:					
Community Dev. Activities		1089		533	1622
Technical Assistance	1534	618			2152
Ghanaian Office & in-kind				373	373
Inflation	598	3688		1894	6180
Contingencies	154	171			325
Totals	2286	5566	-	2800	10652

Table 2

Costing of Project Outputs/Inputs
$000

Project 641-0073 - District Planning and Rural Development

Inputs	Project Outputs #1	#2	#3	Total
AID:				
Technical Asst.	4691			4691
Aid to activities		3161		3161
Ghana:				
Admin. of activities			1150	1150
Aid to activities		1650		1650
Totals	4691	4811	1150	10652

1 Technical Assistance
2 Aid to Activities
3 Admin. of Activities

Table 3

Projection of Accrued Expenditures by Fiscal Year

Fiscal Year	AID	Ghana	Total
1981	850	215	1065
1982	1000	316	1376
1983	1800	599	2399
1984	2000	824	2824
1985	1600	785	2385
1986	602	-	602
Totals	7852	2799	10651

Table 4

Atebubu District - DIPRUD Project
Feeder Roads Rehabilitation and Annual Maintenance

With Cost Apportionments in Cedis

	Year 1		Annually After Yr. 1	
Abeasi-Benim 23 miles	AID	GOG	AID	GOG
Contract	55346		13915	
Labor		9465		7740
Abeasi-Charimo 12 miles				
Contract	32002		7080	
Labor		4860		3960
Yeji-Kapua 13 miles				
Contract	90339		7325	
Labor		6090		4140
Kwame-Danso north (5 miles)				
Contract	8500		8500	
Labor		4746		4746
Abua east (5 miles)				
Contract	8500		8500	
Labor		4746		4746
Abeasi south (5 miles)				
Contract	8500		8500	
Labor		4746		4746
Atebubu north-west (5 miles)				
Contract	8500		8500	
Labor		4746		4746
Grand Total	($77,000)211,687	39,392	($23,000)62,320	34,824
	251,079 (plus inflation)		97,144 (plus inflation)	

VI. Implementation Plan

Critical elements in implementation scheduling for DIPRUD are timely actions for the Project Agreement, RFP for the TA contract, and first U.S. commodity procurement, all of which need to take place immediately upon approval of the PP and funding by AID/W. These will involve USAID and especially the Project Manager. Contracting will be through AID/W processes, and it will be important for USAID to follow these processes closely to be aware of changes in the implementation plan which any delays in contracting may require.

Assuming that the team can be recruited and in-country by the 7th month after ProAg, the next important element will be orientation of the team and initial meetings with the District Council. These are discussed in the detailed implementation plan which follows. Other especially significant implementation actions are the summary activity evaluation meetings of the Council which will take place at six month intervals, indepth evaluations of DIPRUD by AID/GOG in the third and fifth years, and review and modification (if required) of the Project Agreement following the first in-depth evaluation. Second U.S. commodity procurement, scheduled for the 24th month, must also be accomplished on a timely basis so that the project can proceed. The indicated months are illustrative, to show relative timing. Any slippage in initial action dates will require similar adjustment throughout.

Months	Detailed Implementation Action
Month # 1	- PP reviewed AID/W
	- USAID drafts PIO documentation for U.S. commodities and Technical Assistance Contract. Drafts submitted to AID/W for preparation of RFPs and initial procurement arrangements.
	- Project Agreement drafted by USAID, discussed with GOG
2	- PP approved; Project funding authorized; Mission informed.
	- Project Agreement formally negotiated and signed.
	- PIO documents signed and AID/W informed.
	- AID/W commences procurement and contracting processes
9	- TA contract awarded.
	- USAID interviews candidates for Ghanaian positions on TA team.
10	- Contract advisors nominated and approved.
	- Housing and office arrangements for TA team completed.
12	- Advisors arrive in country. Orientation in Accra with USAID and with GOG ministries (Atebubu District Development Officer participates).
	- TA team leader selects and employs Ghanaians for TA team.
	- TA team arrives in Atebubu; is installed in housing.

Months	Detailed Implementation Action
12	- Team meets district officials. Travels to view proposed activity sites. Evaluates proposed design, methodology, and estimates of required inputs for initial activities (proposed during DIPRUD I) District Planning Officer (DPO) participates.
13	- Team and DDO develop plan of action for first six months of development activities.
	- Team meets for first time with District Council, DDO and Team Leader discuss methodology for implementing DIPRUD, the expected roles of the Councillors, the communities, Village Development Committees and the functional departments in the District. The procedures for activity identification, feasibility analysis, design, implementation and facility maintenance are explained, along with discussion of evaluations. This is the key session for initiating the project*, and will cover all the basic elements contained in the PP as regards responsibilities; conditions, and processes. In preparing for this meeting the DDO and team leader review the pertinent sections of the PP (esp. IIB,IIIA,IV,V and VII, and Annex B).
	- DDO and team leader present proposal for first activity selection, design and implementation; discuss activity proposals which Council submitted during project design phase; secure Council's agreement on those to be submitted for USAID approval. For each of them, a designated RCD specialist on the team is assigned to work with the interested Councillor and community to prepare feasibility analysis, followed by detailed design, per procedures in the PP, and submittal to USAID for approval.
14	- Activity feasibility and design, approvals by USAID.
	- First activities are approved and implementation begins. The process from this point on continues, activities identified by communities and presented at various times by Councillors for consideration by DDO and the DIPRUD team. (Councillors meet at least every 2 months.)
18	- First summary evaluation of sub-activities and special meeting with Councillors (attended by USAID Project Manager, Chief Rural Planning Officer, ERDM (see Part VII).

* In view of the special importance of this first meeting, it will be highly desirable if the session is attended, at least in part, by the USAID Porject Manager and the Chief Rural Planning Unit, Ministry of Local Government. ERDM might also be invited to be represented.

Month		Detailed Implementation Action
24	-	Second summary evaluation of activities (see process above.
24	-	Second U.S. commodity procurement by USAID Project Manager.
30	-	Third summary evaluation of activities and first in-depth AID/GOG evaluation of DIPRUD (see Part VII).
32	-	Based on experience to date and results of AID evaluation of DIPRUD, USAID and GOG review Project Agreement to see if modifications are in order. Agreed changes are made. DDO begins to assume greater role in coordinating TA function (see Part III D.2).
36	-	Fourth summary evaluation of activities.
42	-	Fifth summary evaluation of activities.
48	-	Sixth summary evaluation of activities.
54	-	Seventh summary evaluation of activities.
59	-	Eighth summary evaluation of activities, and final AID/GOG evaluation.
60	-	AID/GOG evaluation report to two governments. TA team departs.

VII. Evaluation - Diffusion

Evaluation for DIPRUD will be a continuing important element, integrated into the diffusion process. Community-based rural development is a relatively new philosophy, and requires careful tuning of processes to insure that they are appropriate to the situations, Improvements in processes, inputs and organizational arrangements are to be sought as formulas are tested and evaluated. Community participation requires community motivation which, in turn, requires visible opportunities which impose only tolerable risks to the participants. Thus, project design becomes a dynamic function which does not end at the time of the Project Agreement.

The evaluation mechanism also provides a very useful vehicle for apprising the central government of the progress of the DIPRUD experience in facilitating decentralized development initiatives. The Government thus can follow the development of replicable formulas which might be applied elsewhere in rural areas. Ministries can learn how their decentralized services are important in this process, and an appreciation of how cooperation between functional sectors at the local level can be mutually reinforcing, to the advantage of all.

Processes for evaluation of DIPRUD will be in two parts, formal indepth evaluations, as typically performed for AID projects at scheduled intervals, and sub-activity evaluations of the individual development initiatives undertaken by the communities with DIPRUD assistance. The timing of these latter evaluations will depend on the natures of the activities, and the length of time necessary to accrue operating and maintenance experience following completion of the facilities. The DIPRUD team leader together with the District Development Officer and the individual activity sponsors will determine at what time these activity evaluations shall take place. They will cover such questions as the initial assumptions on which the activities were justified (costs, benefits, beneficiaries, participants), adequacy of design and implementation, and the degree to which the facilities are utilized and maintained. Evaluation will be a joint effort, involving the DIPRUD team, the DDO and the activity sponsors. Generally an RCD specialist of the DIPRUD team or of the community development unit (SW/CD Department) will serve as evaluation reporter.

Initially at six month intervals, but subject to change if circumstances require, the DIPRUD team and DDO will summarize the results of evaluations completed during the intervening period. These will be presented at special meetings of the District Councillors, at which functional departments will also be represented. Others invited to attend these sessions will be representatives from ERDM, the DIPRUD Project Manager from USAID/Accra, and the Chief of Rural Planning of the Ministry of Local Government.

The DDO and DIPRUD team will report the results of activity evaluations, and will lead discussions in which Councillors will report on their Wards -- genral interest which DIPRUD has created and specific concerns with ongoing DIPRUD activities in their communities. Councillors will be encouraged to discuss with their communities, village development

committees and associations reports of DIPRUD assistance, successes, problems, etc., so that communities can receive feedback for how to improve existing participation, and be encouraged to undertake new initiatives. Functional departments of the District Council will be invited to report on their participation in DIPRUD activities over the previous interval and their continuing capacity to assist.

The DDO and the DIPRUD team, will take notes of the discussions and will prepare a report which will accompany the evaluations summary. Distribution of this will be as follows: internally to the Councillors the Clerk of Council and the District functional departments; externally, to the Regional Ministry, ERDM, USAID/Accra and the Ministry of Local Government. Other distribution will be made as becomes appropriate during DIPRUD implementation.

Formal indepth evaluations of DIPRUD will be performed during the third year and near the end of the fifth. They will be joint exercises of USAID and GOG. Participation might include representatives from AID/W, USAID, the Ministry of Local Government, the District Council, and ERDM. Base data for these evaluations would be the project agreement and amendments, the Project Paper, the technical assistance contract(s), the semi-annual evaluation reports of sub-activities and other progress reports submitted by the DIPRUD team and the DDO. These evaluations will particularly cover the substantive achievements of the project in terms of initial projections, the adequacy of DIPRUD and GOG inputs, the adequacy of administrative processes, and the degree to which DIPRUD experience is developing replicable formulas for the Government.

The nature of this project and its approach make it impossible to establish meaningful quantitative targets at the design stage (numbers of communities to participate, numbers of sub-activities to be designed and implemented, numbers of beneficiaries to benefit, etc.). After the initial experience in the first participating communities, there may be sufficient experience into enable some such quantification for those activities and communities to be added later, It is important to emphasize, however, that the situations vary so much in the different areas that standard quantifications would have little meaning. To be successful, the project must emphasize quality of rural activities more than numbers, or risk pressure to encourage and support activities which might poorly qualify or be ill-designed and implemented. Such results would work counter to the purpose of convincing the communities of the value of their own efforts in productive development ventures. Quantitative targets should be used sparingly, if at all, for this project.

Annex A

Economic Feasibility Aspects -- Feeder Roads and Village Ponds

Road Projects in Atebubu

The District Council has identified its major concern for road and water projects, along with small-scale enterprise and workshops. Sample pre-feasibility studies of several such road projects have been produced by USAID contractors. This section summarizes the problems, statistical basis, and general results which may be expected for these road projects.

Problems of Project Selection

The data base for analysis of projects is largely conjectural; little or no data exists on populations, traffic levels, economic activity levels, or local market operations (prices, costs, demand, suppliers, etc.). Roads selected by the Council for improvement may likely have been subjectively determined; the objective basis for selection is lacking.

Statistical Basis for Analysis.

A study had been made of six roads, three of which are track unimproved, and three deteriorated engineered gravel. The basis for analysis was largely inferential, based on substitute data which mainly described the farm household, crops, and apparent travel requirements. The process of analysis follows:

1) Man-days of labor were calculated for 8 crops dominating Atebubu output, for the typical 5-member family unit plus a temporary hired hand.

2) The relative percentage of these crops in total output was calculated against each farmer's average 5.2 acres of land, with output per acre in lbs. of output per average farm-family.

3) Market prices by crop indicated gross values of output (sales and subsistence and losses), re-stated as gross market value per man-day. This represents also opportunity cost or alternative time-value of each farm family member in alternative employments. Time value per person employed in road building or pond construction, or in travel to and from economic activities could thereby be measured.

4) Travel activity by the farm family members was estimated for each from an assumed area in or near any village, to the family farm, school, neighbor, market in town, to another main market town, or to the village water supply. This was further refined to count only traffic taking place on the road.

5) As a device for measuring the scale of traffic demands according to size of village population, a matrix was created showing total daily (and annual) traffic as in 4) above, for villages ranging in size from 400 to 24,000.

6) Type transport used and distance travelled was estimated from observation.

7) Costs of transport were estimated for: foot, bicycle, tractor and farm cart, taxi-pickup, 3-ton truck or bus, and 7-ton truck or bus. These were stated as costs per vehicle-mile and costs per passenger mile.

8) A range of transport costs for 7) above identified maximum transport costs for the track unimproved, and the minimum expected transport costs for an engineered gravel road with machine maintenance. Within this range, other possible costs levels were defined for lesser kinds of improvements, from labor intensive maintenance only to machine rec-onstruction with labor maintenance.

9) Benefits to road users depended upon the mode of travel, distance travelled on the improved road according to 6 trip purposes, relative village population, initial kind of road and its condition, and final kind of improvement to the road. This range of possible outcomes, while somewhat rigidly imposed by the matrix designed for this purpose, also makes it possible to calculate other roads in Atebubu not yet selected for preliminary study.

10) Results of this preliminary study indicate the following:

General Results:

Seven cases of road improvement out of 15 tested indicated positive economic rates of return after discounting at 18 percent over 20 years. Six of the seven cases are two road sections which are feasible at three different levels of improvement. That is, out of 6 road sections total, two of these showed economic returns at three different cost of rehabilitation levels.

Tracks were tested with two alternatives: labor intensive maintenance only, and total new construction followed by labor maintenance.

Selected Road Sections

Selected road sections were as follows:

	(Benefit/Cost . Balance 18% Discount) (¢000)			
	1	2	3	4
Abease-Benim	508/222	508/184	826/519	-
Abease-Charimo	285/125	285/94	582/269	-
Abease-Kumfa	-	-	-	241/233
Yeji-Kapua	-	-	164/153*	-

* Yeji-Kapua originally was tested based on the population of the terminus village, the only village reported in the 1970 census. It did not

qualify under that c ondition. However, the team was able to inspect the full extent of this road improvement, and to estimate the population of three additional villages served. Using the higher population figure (a conservative estimate, the road would meet feasibility as indicated.)

Benefit-cost balances remaining after discount at 18 percent, as shown above, relate to:

1. Deteriorated engineered gravel brought to passable condition.
2. Deteriorated engineered gravel, bladed.
3. Deteriorated engineered gravel, bladed and gravelled.
4. Unimproved track brought to passable, labor only.

No road section passed the test for:

Track: total new construction with labor maintenance following.

The relative level of feasibility, for feasible road section projects, as shown above, is greatest for items #2, or, deteriorated gravel rebladed with labor maintenance following. This is because the incremental benefit cost ratios obtained by comparison of the increase in costs with the increase in benefits to higher levels, shows a greater added cost than added benefit in alternative cases. This is also the equivalent of the highest Internal Rate of Return.

Time for analysis did not permit the repetitive process of determining the Internal Rates of Return for each feasible and non-feasible project. The incremental benefit-cost analysis therefore determines the least-cost situation for completing projects, and for the road section Abease-Kumfia, shows that benefits and cost are nearly equal, or virtually at an 18 percent rate.

Whether the 18 percent rate adequately compensates the investor for higher inflation rates, risk-taking, and return on capital, may rightly be questioned at this time. However, by the time of undertaking it, the adverse national events dictating a higher rate may have ameliorated. There will be a positive effect on the economy regionally from the investments of DIPRUD, although these benefits cannot be assessed at this time.

General Conclusions on Road Section Analysis

The Methodology. The matrix system adopted for the analysis has general value for future application to other road selections. No real data base now exists. Several premises need to be made clear:

1. Village population is the substitute for actual traffic counts or traffic surveys. It imputes to the individual farm family behavior patterns, average family size, and distances travelled which become fixed in the behavior of all towns. As villages grow in size, these patterns of demand increase linearly. Such demands are a main determinant of feasibility.

2. Village populations are uncertain. Some 1960 and 1970 census data exists, but mainly for larger towns. Villages of small size were often missed. A large chance of error exists for all population data, not remedied by forecasts to 1980 and 1990, as done here for villages with reported population.

3. The level of traffic, and of benefits, was oriented toward evaluation of the effect of connecting the smaller village with the main regional market. This creates a bias. The population matrix essentially shows one-directional flows: from the smaller to the larger. A main market in a larger town would not, in this matrix, generate traffic moving to the smaller town. A town of 9,000 population connected to a larger town of 13,000 would generate 9 times the traffic of a village of 1,000 connected to a larger town of any size, including one of 24,000. In all the road sections studied, only one village was 3,000 three were 1,700, one 1,000, and one 400. The low populations of the roads selected for study were a main cause of a 50 rejection rate.

4. Future study, involving interpretation by the matrix, should envision connecting more populated villages with main regional markets.

This would maximize the economic benefits received for the investment undertaken.

5. Analysis of benefits adjusts the range of potenti al economic gains by 33.3 percent (for unimproved track to passable; 55 percent (for unimproved track to roughly engineered gravel standards). Both of these levels result from labor intensive rehabilitation and labor maintenance alone. For cases involving engineered gravel roads let to deteriorate, a 55 percent level of possible maximum benefits also results from labor intensive rehabilitation and labor maintenance alone. An equivalent 55 percent benefit results from the use of machine blading, followed by labor maintenance, as both cases are brought to the same condition, and maintained at somewhat rough levels. In this case, obviously, machine use is more costly; at low population levels it has proven uneconomic. The same machine use on heavily populated sections may not be uneconomic, as labor inputs for such sections must also rise sharply.

Maximum gains result, of 90 percent of total potential, by bringing a deteriorated engineered gravel road to design standard. by blading and gravelling, followed by labor maintenance; 90% benefits are also produced when a track road unimproved is totally reconstructed to gravel engineered standards, followed by labor maintenance. A 100 percent benefit level is disallowed due to labor maintenance, rather than machine.

6. Possible benefit levels are also determined by the existence in the larger village (as terminus) of an active market: among the six reasons for road travel is travel to the "other t own" for market trade. All the net benefits of road improv-ement due to this factor are removed from the additive benefits if the larger village does not have such a market. In all roads studied in this paper the larger village did have an active market, except Bease, which was, on the other hand, a central truck loading station (an average benefit of market town and non-market town was given to Bease to recognize this function a-dequately). In other road sections, later to be studied, some may not be market t-owns, and lower benefit levels may apply.

The Benefits Distribution;

Road sections: The distribution of benefits resulting from road section improvements are singularly easy to determine. The use of an "average" farm family unit of five members plus one hired temporary laborer derives from calculations of travel patterns, and mode of travel, by each member, as a typical daily occurence. The Trip cost savings to each, by type of trip, can be summarized below, from statistical origins of the purpose of trip:

Purpose of Trip	Farm	School	Neighbor	Market	Other town	Water Supply	
Benefit Distribution (Percent):	30	1	4	2	57	6	
Percent of trip by road	90	20	35	30	90	20	
Mode of travel; as percent							
foor	85	95	80	70	20	80	
Bicycle	10	3	15	20	30	5	
Bus/truck	-	-	-	5	30	-	
Tractor-cart	5	2	5	5	20	15	
Number trips per day							Total
Father	1	-	.2	.1	.2	-	1.5
Mother	.2	-	.5	.5	.2	2	3.4
Son	.2	1	.2	.1	.1	1	2.6
Daughter	-	1	.2	.5	.1	1	2.8
Laborer	1	-	-	.1	.2	-	1.3
Uncle	.5	-	.5	.2	.1	-	1.3
Total	2.9	2.0	1.6	1.5	.9		12.9

Most benefits derive from road trips to the farm and to main markets in other towns. Travel to the farm is predominantly on foot, but widely spread over common conveyances when travel takes place to the other town.

The relative share in these main benefits accrues to nearly all members of the family, including the temporary labor, and the "uncle" (who might be an aunt, brother etc.). For farm trips, the father and the laborer mainly benefit: equal to 34 percent each of the total benefits (1/2.9). Benefits are more evenly spread for market trips to the "other town": 22 percent each to the father and mother and the laborer (.2/.9); and 11 percent each to the son, daughter and uncle.

The lesser benefits are relatively small in amount. It is the mother, son and daughter who benefit wholly from savings on trips to the village water supply. Higher benefits would be registered in any category to the extent more of the total trip involved travel by road, such travel was by a relatively more expensive vehicle, and there were more trips per day. The above distribution, however, appears to most nearly duplicate the actual situation.

Water Impoundment Projects - Feasibility Aspects:

Statistical data relating to water-borne ailments and deaths are not avilable for rural areas. Because other vectors for disease than water contribute to such health problems, inferences drawn from the data presented here are largely speculatory

In Atebubu District, surveys of farm villages revealed that health problems which could be water-borne affected over 50 percent of the population. Such complaints as fever, headache, weakness, waist pains, stomach trouble, and the guinea worm infestation accounted for 82 percent of complaints (malaria was also represented in 30.5 percent of cases generally reported as malaria, fever and headache). The low educational level contributes to a higher than necessary incidence of such diseases. Among farmers in Atebubu, 73 percent never attended school of any kind, and 58 percent

of non-farmers attended no school.

The surveyed population in Atebubu District, asked to relate their opinion of the most important inducement to farming settlement, indicated that "good drinking water" lead the list, at 28.7% of all responses. Next in order were a house (20.7%), farm inputs or tools and equipment (13.5%). The frequency of medical care trips per month by 544 surveyed villagers showed that 55 percent required care once a month, 24 percent twice a month, and 11 percent 3 times a month. For this group of 544, a total of 988 man-days per month were lost from their normal desired routine.

Water-Related Ailments as Social Costs

These physical complaints, and their care, in many cases are traceable to not only "polluted" water, but to the degradation of the supply: during the drought period, turbid waters turn to mud, and the mud finally to dry clay. The increasing scarcity of supply forces short rations, and bodies become more susceptible to ailments, physical weakness, and dehydration. Sources at greater distance must be found. But rationing continues; more villages are supplied from a single source far removed from normal seasonal supply. There is less that can be carried from long distances, and more people to be served.

District statistics describing the medical care sought by 544 patients indicate the number of visits per month; some of the complaints included guinea worm (1.9%) stomach trouble (21.1%), weakness and waist pains (28.8%) and fever and headache (including malaria) (30.5%). The actual number of monthly visits directly or indirectly caused by bad water and/or simple lack of water of any kind, cannot be known. But the total of these complaints add up to 82% of the total reasons for visits to medicl stations. Other reasons were specific: rheumatism, eye trouble, etc.,

It is possible to calculate the man-days lost by these patients from all reported aliments. If only small fractions of the 82% reporting general disorders are water-related., as is undoubtedly so, man-days lost to these numbers can give some index to the magnitude of social costs.

For example, the guinea-worm statistically accounts for 1.9% of maladies. For each 1000 of village inhabitants, this amounts to 11.4 cases annually, of the 600 persons per year who will seek medical help. For these, 20.5 man-days will be lost annually at the medical ststion itself. Uncounted other days will be lost because the ailment is debilitating and not readily cured.

Analysis contained in the Annex has calculated rates of general complaints in terms of percentages of likely cause by bad water (or lack of water).

For example thousand of village population, 600 cases per year will seek medical help for all causs, and lose 1.8 man-days for each case, on average. These are the statistical indidences derived from Atebubu District. Various statistical profiles can be forecasted on the basis of reported "general" complaints as being water-related.

1. If 5% (21.1% reporting) of stomach trouble is due to correctible water supplies, 30 cases will be spread, costing 54 man-days annually, valued at C 480.6, in terms of the value per man-day of agricultural output. Discounted over 20 years at 18%, benefits of C 2534 do not quite compensate the investment cost of C 8260 for a water pond per thousand of people.

2. If 14.4% (28.8% reporting) of weakness and waist pains is correctible by adequate water, 86.4 cases and 155.5 man-days will be saved, valued at C 1383.9. Discounted over 20 years at 18%, benefits of C 7390 almost equal the investment cost per pond for 1000 village as of C 8269.

While neither 1 or 2 alone sustain the cost of the village pond, together the amount of saving is C 9924 against C 8269, discounted over 20 years.

3. If 10.5% (30.5% reporting) of fever and headache is correctible by adequate water, 63 cases and 113.4 man-days will be saved, valued at C 1009 annually. After discounting, this value is C 5402, against C 8269 for the water pond.

While alone this is not adequate to balance cost, 1. plus 2. plus 3 cumulatively amount to C 15,325 against C 8269.

4. If all ailments which apparently relate to conditions affecting general complaints are in these proportions related to bad or inadequate water, a total of 31.8% of all cases (82.3% reporting "general" cases as above), correction of bad/inadequate water would spare 190.8 cases, 343.4 man-days and C 3056 annually. After discounting at 18%, total savings would be C 16,357 against waterpond costs of C 8269.

In summary, for every village of 1000, and every 1000 of all villages larger in size, the invested cost of C 8269 could yield over 20 years a not unreasonable proportion of total costs; may yield a very high rate of return if considered together. The exact causes of these generally stated maladies is, of course, not known. The chance that the proportions cited here either directly or indirectly are correctible, by water ponds providing adequate supplies, cannot be assured. If half this number were correctible, the cumulative benefits would return an 18% rate. The medical costs, if they could be known, of treatment for such proportionate cases, would subtantially add to these savings.

Time Costs of Fetching Water as Ponds Benefits.

During the dry season, villages in the district report that the (weighted) avera increase in time taken to draw water is fully 8 times that of drawing water during the rainy season, when local sources of supply are adequate. If such time is valued in market values of agricultural produce for the average farm in Atebubu District (C 8.90 per man-day), the relative cost during these six months of the dry season is C 3.872 per trip, compared to C.463 per trip during therainy season.

The reasons for this condition are estimated to arise from: 1) a farther distance to draw alternative supply, 2) a longer wait for slower discharge of source, and 3) trickle-filling of containers to reduce mud intake. If each condition is taken at 1/3 equal value in the longer time for fetching water, the water pond installation is believed able to remedy 2/3 of the time costs involved. The 1/3 attributable to longer distance may not be remedable; the pond should be at some distance to provide the best site, not usually found immediately at hand.

The average cost to villagers of time spent in drawing water under the present seasonal regimen is C 2.167 per trip (6 months dry season and six months wet season). With a water pond, the normal wet season costs of C.463 will obtain throughout; but 33.34% of the dry season costs of C. 3.872 will be additionally sustained, or C 1.291 throughout the season, for the longer distance involved. Average total pond trip-costs would be C 1.754.

By village size, from 1000 to 20,000 a water pond can be estimated to save C .413 per person-trip. Annual costs and benefits, not discounted, show the following:

Village Size	No families	Trips	Trip savings	Capital costs	Net First-Year Benefits Cedis	As multiple of cap. costs
000	000	000	000	000	000	
1	167	173	71	8.3	62.7	7.6 X
5	834	867	358	41.3	316.7	7.6
20	3334	3467	1432	165.4	1266.6	7.6

6 members per family
4 times daily per family (5 days per week) or 1040 times/year

The surprising level of benefits, valued at the average market value per man-day in agriculture, indicates in monetary units the time involved in mundane house-keeping chores, which commonly fall to the women and children of the family. The value itself derives from calculations of the typical farm output (percentages and crop types from Atebubu District) valued at market prices for both sales, subsistence and losses. The aggregate annual value is divided by 6 (total family members), so that a presumption of equal contribution applies.

It can be observed that the first-year benefits alone are 7.6 times the installed cost of the water pond. Water pond costs rise linearly for each 1000 of population, and in the same fashinn, the demand on this supply is a linear function of population. The implied meaning of the valuation of time consumed in trips to the water supply is that time saved on such errands is applicable toward earning the farm family's income, and loss of such alternative best employments is the definition of opportunity cost, the clearest measure of economic value.

MAN-DAYS OF LABOR PER ACRE X TYPE CROP
ATEBUBU DISTRICT

	CPERATOR OWNER	FAMILY MALE	FAMILY FEMALE	HIRED LABOR *	MAN-DAYS TOTAL
Yam	14.4	24.7	8.9	17.5	65.1
Rice	16.8	20.1	11.3	23.9	72.2
Maize	11.5	15.8	11.3	10.6	48.3
Sorghum	12.6	13.1	11.4	8.6	45.7
Cassava	21.7	18.3	9.4	13.7	63.1
Eggplant	12.8	18.7	18.4	45.1	94.9
Peanut	16.2	29.5	17.4	25.4	88.4
Vegetables	13.9	13.1	17.4	18.1	62.4
Total	119.9	153.3	105.5	162.9	540.1

* Peak labor demand during Feb.- Mar-Apr.-May

SUBSISTENCE AND SALES PROPORTION OF CROP (%)

	SUBSIS.	SALES	LOSSES
Yam	40.6	47.4	3.0
Rice	17.2	75.7	0.5
Maize	25.4	69.3	0.9
Guineacorn	32.1	56.2	0.8
Cassava	25.1	64.8	1.5
Eggplant	5.7	90.5	0.5
Groundnut	13.1	79.4	0.7

Source: Small Farm Systems, Virginia State University, December 1979

AVERAGE FARM PRODUCTION VOLUNE (ATEBUBU DISTRICT)

	% Dist. Acres Cult. Atebubu District	Crop Acres Per Average 5.2-Acre Farm	LBS/ Acre	LBS Per Average Farm
Yam	20.8 1/	1.08 4/	4544 5/	4907 7/
Rice	3.2	.17	1570	267
Maize	18.5	.96	5446	5228
Sorghum	1.8	.09	661	59
Cassava	22.2	1.15	8749	10061
Eggplant	2.5	.13	1080 6/	140
Peanut	5.7	.30	1080	324
Vegetables	7.1 2/	.37	4106	1519
	(81.8)			(22505)
Plantain	4.4 3/	.23	4624	1063
Cocoyam	11.4 3/	.59	4723	2786
Total	(97.6)	5.07		(26354)

1/ USAID Agriculture Statistics, 1976 Data, May 1980

2/ Includes pepper 4.0%; Tomato 0.2%; Okra 2.2%; Beans/cowpeas 0.7%.

3/ Not reported in survey data of "Small Farm Systems", Virginia State University, but included in data from footnote No.1.

4/ Column 1 X 5.2 Acres = Acres of crop shown

5/ Ministry of Agriculture, Accra: GHana Average.

6/ Using peanut yields

7/ Column 2 x column 3

ANNUAL MAN-DAYS OF LABOR PER AVERAGE FARM AND GROSS MARKET VALUE OF FARM LABOR

	Annual Man-days/ Farm	Output in LBs	Market Price/ LBs	Gross Value	Gross Value Per Man-Day
Yam	338.5	4907	.73	3582	10.58
Rice	375.4	267	1.54	411	1.09
Maize	256.4	5228	.78	4078	15.90
Sorghum	237.6	59	1.85	109	.46
Cassava	328.1	10061	.32	3219	9.81
Eggplant	492.5	140	1.25 4/	175	.35
Peanut	459.7	324	2.64	855	1.86
Vegetables	324.5	1519	.96 5/	1458	4.49
Plantain	50.0 2/	1063	.59	627	12.54
Cocoyam	257.0 2/	2786	.62	1727	6.72
Total	3179.7	26354	-	16241	5.20
Per Calendar Day:	8.55	72.2	-	44.50	8.90 8/

1/ 5.2 Acres/average farm X Man-days per acre

2/ Estimated. Cocoyam as ratio of price cocoyams to yams; ratio (76%) X Yam Man-days.

3/ Annual, statistical average of gross, excluding losses.

4/ Estimated 1.3 X Tomato price .96

5/ Estimated average at tomato price.96

6/ Subsistence and sales volumes at market prices

7/ Gross value/Man-days per farm. Farm unit is 5 persons plus 1 temporary hire laborer.

8/ C 44.50 per farm per calendar day of total labor man-days input divided by number of farm family members (5) equals market value per calendar day per family member. Labor hired is excluded; wages paid are equal to marginal value of his service; gross values of farm output are retained. ¢8.90 C 365 = ¢3248.5/Year/Capita or US $ 250 at ¢13 = $1

I. TRAVEL BY TRIP PURPOSE AS A FUNCTION OF FARM-FAMILY MEMBERS

(1 Way Trips daily)[1/]

	Father	Mother	Son	Daughter	Labor	Uncle	Total
Farm	1.0	.2	.2		1.0	.5	2.9
School			1.0	1.0			2.0
Neigbor	.2	.5	.2	.2		.5	1.6
Market	.1	.5	.1	.5	.1	.2	1.5
Othertown	.2	.2	.1	.1	.2	.1	.9
Water supply		2.0	1.0	1.0			4.0
Total	1.5	3.4	2.6	2.8	1.3	1.3	12.9

II. TRAVEL ACTIVITY BY VILLAGE SIZE BASED ON TYPICAL FARM FAMILY MEMBERS

Village Population		Travel To: (Daily 1-way trips per village) [2/] Farm	School	Neighbor	Market	Town	Water	Total
		(50% of population shown enconomically active)						
400	"	96	67	53	50	30	133	429
1000	"	241	167	133	125	75	333	1074
1700	"	411	283	226	212	127	567	1826
3000	"	725	500	400	375	225	1000	3225
9000	"	2575	1500	1200	1125	635	3000	10037
13000	"	3142	2166	1733	1625	935	4333	13934
24000	"	5800	4000	3200	3000	1800	8000	25800

1/ All trip frequencies are estimated.

2/ Village populations (1/2) divided by 6-member average farm family unit X no. daily 1-way trips.

DISTANCE TRAVELLED AND AVERAGE MILES PER 1 - WAY TRIP

Distance in Miles:

	.2	.5	1	3	6	9	12	Average Total (Miles)
Farm	(As percentage distribution) 1/							
%	15	25	25	15	10	5	5	
Avrg.								2.5
School								
%	50	30	10	10				
Avg.								.65
Neighbor								
%	40	30	15	10	5			
Avg.								1.63
Market								
%	30	40	20	5	5			
Avg.								.91
Other Town (Man Market)								
%	-	-	-	-	20	30	50	
Avg.								9.8
Water Supply								
%	10	15	40	30	5			
Avg.								1.7

1/ Expressed as % probability (in total district) of this distance of travel occurring for any villager relative to his home location in village. Estimated.

I. AVERAGE TYPE TRANSPORT USED X PURPOSE OF TRIP
(Daily 1-Way trips)

Travel to: (As percentage)

	Farm	School	Neighbor	Market	Other Town	Water Supply
Foot %	85	95	80	70	20	80
Bicycle %	10	3	15	20	30	5
Bus/truck %	-	-	-	5	30	-
Tractor-Cart %	5	2	5	5	20	15
Total	100	100	100	100	100	100

II. AVERAGE DISTANCE TRAVELLED X TYPE TRANSPORT USED
(Daily 2-Way Trips)

(Miles/trip)

* Road Miles	Farm 4.50	School .26	Neighbor 1.14	Market .546	Other town 17.64	Water supply .68
Foot	3.825	.247	.912	.382	3.528	.544
Bicycle	.450	.008	.171	.109	5.292	.034
Bus/ truck	-	-	-	.028	5.292	-
Tractor-Cart	.225	.005	.057	.027	3.528	.102

* % Roadway miles of total miles:

(%)	90	20	35	30	90	20
Total Miles	2.5	.65	1.63	.91	9.8	1.9
Road Miles	2.25	.13	.57	.273	8.82	.34
Round trip: (X2)	4.50	.26	1.14	.546	18.64	.64

I. COSTS OF TRANSPORT AS COSTS PER MILE (ESTIMATED)

(Per Vehicle - Mile	EARTH ROADS Existing (US $ Per mile)	Improved [1]	Equivalent (Cedis per mile)	
Bicycle	.20	.12	.66[2]	.40
Tractor w/cart	.70	.50	10.50	7.50
Taxi pickup	1.10	.75	16.50	11.25
3 ton truck	1.55	1.20	23.25	18.00
7 ton truck	2.40	1.75	36.00	26.25

1/ Engineered gravel, machine-maintained
2/ Open market conversion rate at Cedis 15: US $1

II. AVERAGE TIME IN TRANSIT AND TIME COSTS OF TRANSPORT

	Existing road Speed (MPH)	(Maximum Cost) minuts per mile	cedis per mile	Improved Road Speed (MPH)	minutes per mile	Minimum cost) Cedis per mile
Foot	2	30	.55620[1]	3	20	.37080[1]
Bicycle	6	10	.18540	10	6	.11124
Tractor	10	6	.11124	15	4	.034.6
Taxi	17	3.53	.06545	30	2	.03708
3-ton	17	3.53	.06545	30	2	.03708
7-ton	15	3.53	.06545	30	2	.03708

1/ Cedis 8.90/Farm family member per man-day (time value) = Cedis 1.1125/ hour (8 hour day) = Cedis .08154/minute.
Minutes per mile x .01854

III. Vehicle - mile costs as Costs /Passenger mile

(Cedis)	Vehicle costs (divide by)	Passenger Existing	Improved
Bicycle	1	3.000	1.800
Tractor	14	.750	.536
Taxi	8	2.060	1.406
3-ton	18	1.292	1.000
7-ton	30	1.200	.875

TIME AND DISTANCE COSTS PER PASSENGER TRIP PER FARM-FAMILY (MAXIMUM COST CONDITIONS)

Existing Road unimproved : (Total Round-trip costs per trip)

	Farm	School	Neighbor	Market	Other town	Water supply
a) Distance costs per passenger (Pass-trip costs)						
b) Time costs per single trip						
c) Total costs per single passenger trip						
Foor	-	-	-	-	-	-
	2.127	.137	.507	.212	1.962	.303
	2.127	.137	.507	.212	1.962	.303
Bicycle	.287	.005	.113	.032	3.483	.022
	.083	.001	.032	.020	.981	.006
	.380	.006	145	.092	4.474	.028
Bus / *	-	-		.042	8.028	-
Trk				.002	.341	-
				.044	8.369	
Tractor	.169	.004	.043	.020	2.646	.076
	.025	000	.006	.003	.392	.011
	.194	.004	.049	.023	3.038	.087

(Calculation is Table 7-II X Table 8-II and 8-III)

*Average passenger-trip costs of Taxi, 3-ton and 7-ton vehicles:

	Existing road		Improved road	
Taxi	2.060		1.406	
3-ton	1.292		1,000	
7-ton	1,200		.875	
	4,552	= 1,517	3.381	= 1,127

I. INDIVIDUAL PASSENGER TRIP COSTS ON EXISTING UNIMPROVED ROADS (MAXIMUM COST CONDITION)

Cedis

	Farm	School	Neighbor	Market	Other town	Water Supply	Total
(Roadway round trips only)							
Foot	2.127	.137	.507	.212	1.962	.303	5.248
Bicycle	.380	.006	.145	.082	4.434	.028	5.125
Bus/Trk	-	-	-	.044	8,369	-	8.413
Tractor	.194	.004	.049	.023	3.038	.087	3.395
Total	2.71	.147	.710	.361	17.803	.418	22.181

II. ANNUAL PASSENGER TRIP COSTS ON EXISTING UNIMPROVED ROADS

(Cedis)

	Farm	School	Neighbor	Market	Other town	Water Supply	Total
(Roadway round trips only)							
Foot	776	50	185	77	716	111	1915
Bicycle	139	2	53	33	1633	10	1870
Bus/trk	-	-	-	16	3055	-	3071
Tractor	71	1	18	8	1109	32	1239
Total	986	53	256	134	6513	153	8095

III. ANNUAL TOTAL VILLAGE TRIP COSTS X SIZE VILLAGE

(Cedis 000)[1/]

Village Pop.	Farm	School	Neighbor	Market	Other town	Water Supply	Total
400	95	3	13	7	195	20	333
1000	238	9	34	17	488	51	837
1700	405	15	58	28	823	87	1476
3000	715	26	102	50	1465	153	2511
9000	2144	79	307	151	4396	459	7536
13000	3098	115	443	218	6350	663	10887
24000	5718	212	819	402	11323	1224	19698

1/ (Calculation is Table 10-II Total X Table 4-II daily trips per village ; i.e., 986 x 96 = 95000 for village of 400 population).

TIME AND DISTANCE COSTS PER PASSENGER TRIP PER EARLY FAMILY (MINIMUM COST CONDITION)

Improved Road (total roundtrip costs per trip)

	Farm	School	Neighbor	Market	Other Town	Water Supply
a) Distance costs per passenger (Pass - trip costs)						
b) Time costs per single trip						
c) Total costs per single passenger trip.						
Foot	-	-	-	-	-	-
	1.418	.091	.338	.142	1.308	.202
	1.418	.081	.338	.142	1.308	.202
Bicycle	.180	.003	.068	.043	2.157	.014
	.050	.001	.018	.012	.589	.004
	.230	.004	.087	.055	2.706	.018
Bus/ Trk *	-	-	-	.032	5,964	-
				.001	.186	
				.033	6.160	
Tractor	.120	.003	.030	.014	1.891	.055
	.017	.000	.004	.002	.262	.003
	.137	.003	.034	.016	2.053	.062

* Average passenger trip costs of taxi, 3-ton and 7-ton improved road.

taxi	1.406		
3-ton	1,000		
7-ton	.875		
	3.281	=	1.09 *

I. INDIVIDUAL PASSENGER TRIP COSTS ON IMPROVED ROADS (MINIMUM COST CONDITION)

(Cedis)

	Farm	School	Neighbor	Market	Other town	Water supply	Total
(Roadway round trips only)							
Foot	1.418	.091	.338	.142	1.308	.202	3.499
Bicycle	.230	.004	.087	.055	2.706	.018	3.100
Bus/Trk.	-	-	-	.033	6.160	-	6.193
Tractor	.137	.003	.034	.016	2.053	.062	2.305
Total	1.785	.098	.459	.246	12.227	.282	15.097

II. ANNUAL PASSENGER TRIP COSTS ON IMPROVED ROAD

(Cedis)

	Farm	School	Neighbor	Market	Other Town	Water Supply	Total
(Roadway round trip costs only)							
Foot	.517	33	123	52	477	74	1276
Bicycle	84	1	32	20	988	7	1132
Bus/Trk.	-	-	-	12	2248	-	2260
Tractor	50	1	12	6	749	23	841
T							
Total	651	35	167	90	4462	104	5509

III. ANNUAL TOTAL VILLAGE TRIP COSTS X SIZE VILLAGE (CEDIS 000)[1/]

Village Population	Farm	School	Neighbor	Market	Other Town	Water supply	Total
400	62	2	9	5	134	14	226
1000	157	6	22	11	335	35	566
1700	268	10	38	19	567	59	961
3000	472	18	67	34	1004	104	1699
9000	1416	53	200	101	3012	312	5094
13000	2045	36	289	146	4350	451	7357
24000	3776	140	534	270	8032	832	13584

1/ Calculation is Table 11-II Totals X Table 4-II Daily trips per village i.e., 651 X 96 = 62000.

MAXIMUM ANNUAL BENEFITS OF ROAD IMPROVEMENT (USER SAVINGS)

ANNUAL TOTAL VILLAGE BENEFITS X SIZE VILLAGE (Cedis 000)

Village Population	Farm	School	Neighbor	Market	Other Town	Water Supply	Total
400	33	1	4	2	61	6	107
1000	81	3	12	6	153	16	271
1700	137	5	20	9	260	28	459
3000	243	8	35	16	461	49	812
9000	728	26	107	50	1384	147	2442
13000	1053	39	154	72	2000	212	3530
24000	1942	72	285	132	3691	392	6514

1/ Applies only if village trade is with a regional market town of larger size. Large village travellers do not increase traffic to small village. A non-market town is considered a small village.

2/ Total village traffic is 4. directional. Savings shown can accrue 1-direction only with road improvement. one-fourth of this amount obtain for point - to - point road improvements.

note:

costs of road reconstruction and maintenance not yet considered. These benefits apply only to savings derived from maximum cost vs. minimum cost consitions.

USER BENEFITS X ROAD CLASS AND LEVEL OF IMPROVEMENT

POSSIBLE BENEFIT LEVELS: (¢000)			(MAXIMUM SAVINGS)
	(a)		(b)
Size Village	4-Way Benefits	Small Village To Regional Market	Small Village To Small Village
400	107	26	11
1000	271	68	29
1700	459	115	49
3000	812	203	87
7000	2442	610	264
13000	3630	882	382
24000	6514	1628	706

Further determinants:

Road Class and Level of Improvement
(Annual user Savings)

	Track		Engineeered Gravel:	
	(1)	(2)	(3)	(4)
Size village	Unimproved to Passable	Unimproved to Engrad. Gravel	Deteriorated to Passable	Deteriorated to Design Standard
	(1, 2 and 3 labor intensive)			(4. machine construction labor maintenance)
	(a) (b)	(a)	(b)	(a) (b)
400	9 4	14	6	23 10
1000	22 10	37	16	61 26
1700	38 16	63	27	103 44
3000	67 29	112	48	183 78
9000	201 87	335	145	549 238
13000	291 126	485	210	794 344
24000	537 233	895	388	1465 635
	33%	55%		90%

Note: (2) and (3) Are equivalent in cost savings under labor intensive reconstruction and maintenance.

I. LABOR INTENSIVE ONLY COSTS AND BENEFITS (¢000) UNDISCOUNTED

YEAR		1	2	3	4	5	6	
A. Track: (Unimproved to passable) #1)								
1. Kwame Danso	C	62	57	57	57	57	-	Not Feasible
- Mantukwa	B	38	38	38	38	38	-	
(1300) (a)								
2. Abua-Sela-(Prang)	C	116.5	108	108	108	108	-	Not Feasible
Kwame Danso	B	22	22	22	22	22	-	
(1000) (a)								
3. Abease-Kumfia	C	39	36	36	36	36	-	241 After 15%
(1700) (a)	B	38	38	38	38	38	-	233
B. Engineered Gravel: (Deteriorated to passable) No. 3								
4. Abease-Benim*	C	39	34	34	34	34		508 After 15%
(3000) (a) (b)	B	80	80	80	80	80		222
5. Abease-Charimo*	C	21.5	19	19	19	19		285 After 15%
(1700) (a) (b)	B	45	45	45	45	45		125
6. Yeji-Kapua	C	19	17	17	17	17	-	Not Feasible
(400) (a)	B	14	14	14	14	14	-	

* Abease is not an active market town, but is a truck loading point at harvest. Take average value of benefits a + b/2

II. REHABILITATION WITH LABOR MAINTENANCE COSTS AND BENEFITS

		YEAR: 1	2	3	4
A. Track: <u>New Construction</u> (Deteriorated: to design standard, labor maint.)					
1. Kwame Danso	C	2326	7	7	7
-Mantukwa	B	103	103	103	103
(1700) (a)					
2. Abua-Sela (Prang)	C	4045	13	13	13
- Kwame Danso	B	61	61	61	61
(1000) (a)					
3. Abease-Kumfia	C	1618	5	5	5
(1700) (a)					
B. Engineered Gravel: <u>Reconstruction</u> (Bladed, no gravel, labor maint.) No.2					
4. Abease-Benim *	C	65	22	22	22
(3000) (a) (b)	B	80	80	80	80
5. Abease-Charimo*	C	37	11	11	11
(1700) (a) (b)	B	45	45	45	45
6. Yeji-Kapua	C	96	11	11	11
(400) (a)	C	14	14	14	14

* Abease is not an active market town, but is a truck loading point at harvest.

BENEFITS AND COSTS DISCOUNTED AT 18%

	I. LABOR INTENSIVE CASES						II. REHABILITATION CASES					
	3		4		5		1		2		3	
	C	B	C	B	C	B	C	B	C	B	C	B
			13%						90%			
0	39	38	39	80	21.5	45	2326	103	4045	61	1618	103
1.	30	32	29	68	16	38	6	87	11	52	4	87
2.	26	27	24	57	14	32	5	74	9	44	4	74
3.	22	23	21	49	12	27	4	63	8	37	3	63
4.	19	20	18	41	10	23	4	53	7	31	2	53
5.	16	17	15	35	8	20	3	45	6	27	2	45
6.	13	14	13	30	7	17	3	38	5	23	2	38
7.	11	12	11	25	6	14	2	32	4	19	2	32
8.	10	10	9	21	5	12	2	27	3	16	1	27
9.	8	9	8	18	4	10	2	23	3	14	1	23
10.	7	7	6	15	4	9	1	20	2	12	1	20
11.	6	6	6	13	3	7	1	17	2	10	1	17
12.	5	5	5	11	3	6	1	14	2	8	1	14
13.	4	4	4	9	2	5	1	12	2	7	1	12
14.	4	4	3	8	2	4	1	10	1	6		10
15.	3	3	3	7	2	4		9	1	5		9
16.	3	3	2	6	1	3		7	1	4		7
17.	2	2	2	5	1	3		6	1	4		6
18.	2	2	2	4	1	2		5	1	3		5
19.	2	2	1	3	1	2		4	-	3		4
20.	1	1	1	3	1	2		4	-	2		4
	233 :	241	222 :	508	124.5	285	2362 :	635	4114:	388	1643 :	653

BENEFITS AND COSTS DISCOUNTED AT 18%

	II. REHABILITATION CASES ENGINEERED GRAVEL (BLADED) 55%						ENGINEERED GRAVEL (GRAVELLED) 90%					
	4		5		6		4b		5b		6b	
	C	B	C	B	C	B	C	B	C	B	C	B
0	65	80	37	45	96	14	483	130	252	103	323	23
1.	19	68	9	38	9	12	6	110	3	87	3	19
2.	16	57	8	32	8	10	5	93	3	63	3	17
3.	13	49	7	27	7	9	4	79	2	53	2	14
4.	11	41	6	23	6	7	4	67	2	45	2	10
5.	10	35	5	20	5	6	3	57	2	38	2	9
6.	8	30	4	17	4	5	3	48	1	32	1	7
7.	7	25	3	14	3	4	2	41	1	27	1	6
8.	6	21	3	12	3	4	2	34	1	23	1	5
9.	5	18	2	10	2	3	2	29	1	20	1	4
10.	4	15	2	8	2	3	1	25	1	17	1	4
11.	4	13	2	7	2	2	1	21		14		3
12.	3	11	2	6	2	2	1	18		12		3
13.	3	9	1	5	1	2	1	15		10		2
14.	2	8	1	4	1	1	1	13		9		2
15.	2	7	1	4	1	1		11		7		2
16.	2	6	1	3	1	1		9		6		1
17.	1	5		3		1		8		5		1
18.	1	4		2		1		7		4		1
19.	1	3		2		1		6		4		1
20.	1	3		2				5		3		
	184:508		94:285		153:89		519:826		269:582		344:134	

RELATIVE LEVELS OF FEASIBILITY: ROAD SECTIONS (18% DISCOUNT)

1. LABOR INTENSIVE ONLY

No.	SECTION	CLASS AND CONDITION	BENEFIT BALANCE AFTER 18%
1.	Kwame Danso - Mantukwa	Track (unimproved to passable)	No
2.	Abua-Sela-(Prang)	" " "	No
3.	Abease - Kumfia	" " "	241/233
4	Abease-Benim	Eng'rd Gravel (to passable)	508/222
5.	Abease-Charimo	" "	285/125
6.	Yeji-Kapua	" "	No
	II REHABILITATION WITH LABOR MAINT.		
1.	Kwame Danso-Mantukwa	Track (New Construction)	No
2.	Abua-Sela-(Prang)	" "	No
3.	Abease-Kumfia	" "	No
	ENGINEERED GRAVEL (BLADED)		
4.	Abease-Benim	Eng'red Gravel (Bladed)	508/184
5.	Abease-Charimo	" "	285/94
6.	Yeji-Kapua	" "	164/153 (for 750 pop.)
	ENGINEERED GRAVEL (GRAVELLED)		
4.b	Abease-Benim		826/519
5.b	Abease-Charimo		582/268
6.b	Yeji-Kapua		No

INCREMENTAL B:C DETERMINANTS

4. Abease-Benim 508/184 Selected (Bladed)
   Alternative 508/222 increases cost 1.2 X with no gain.
   Alternative 826/519 increases cost 2.8 X with 1.6 X gain.

5. Abease-Charimo 285/94 Selected (Bladed)
   Alternative 285/125 increases cost 1.33 x with no gain
   Alternative 582/269 increases cost 2.86 x with 2.0 x gain.

WATER - RELATED AILMENTS AND OTHER RURAL HEALTH PROBLEMS (ATEBUBU FARMER SURVEY)

COMPLAINT	No.	%
Malaria, Fever, Headache	178	30.5
Weakness, Waist Pains	168	28.8
Stomach trouble	123	21.1
Rheumatism	35	6.0
Eye trouble	29	5.0
Hernia	21	3.6
Guinea worm (Parasite)	11	1.9
All Other	19	4.3
Total surveyed:	584	100.0

EDUCATIONAL LEVEL OF ATEBUBU RESIDENTS

(%)	Small Scale Farmer	Non Farmer
No School	73	54
Primary	14	24

VITAL STATISTICS AND MORTALITY RATES

Population	11 million
GNP/Capita	US $380
Crude birth rate	49/000
Crude death rate	20/000
infant mortality	115/000
Child mot. 1-4 year	70/000
Life Expectancy	49 years

Sources: Economics of Small Farm Systems (Ghana), Virginia State University, December 1979
Ghana Health, Population and Nutrition - Sector Report, January 19, 1979.

IMPORTANCE OF DRINKING WATER AS INDUCEMENT TO FARMERS TO LIVE/SETTLE ON FARMS (ATEBUBU DISTRICT)

KIND	NO.	%
Good drinking water	713	28.7
House	513	20.7
Farm inputs	334	13.5
Transport/Good roads	247	10.0
Electricity	216	8.7
All other*	458	18.5
Surveyed:	2481	100.0

* Less than 4.8 % for each item

Source: Economics of Small Farm Systems (Ghana)
Virginia State University, December, 1979

FREQUENCY OF MEDICAL CARE TRIPS (ATEBUBU DISTRICT)

KIND	FREQUENCY PER MONTH						MAN-DAYS LOST/MONTH
	1	2	3	4	5	6	
Hospital	232	100	48	33	1	9	767
Clinic	41	24	9	7	-	2	156
Medicine Man	26	6	-	4	1	1	65
Total	299	130	57	44	2	12	988
%	55	24	11	8	-	2	

(Surveyed: 544 (% shown 15 of 544)

MAN-DAYS LOST TO MEDICAL CARE
DUE TO ALL CAUSES
(Village of 1000)

Frequency per Month (All causes);	1	2	3	4	5	6	Man-Days Month	Man-Days Year
Visits to hospitals, clinics, medicine men:								
Number 1/								
2/	27.5	12	5.5	4	-	1	90	1080
%	55	24	11	8	-	2		

Average total mandays lost annually, as rate:

Per Village of 1000 = 1080/000 = 1.08
Per person ailing = 1080/600 = 1.8 3/

Economic Value of man-day losses annually
Due to Bad/inadequate water
(Village of 1000)

If complaint is water related:

% of cases (Est.	No cases 3/	Man-days lost 4/	Value of loss 5/	Cost per capita
1.9	11.4	20.5	182.45	.182
5	30	54	480.6	.481
10.5	63	113.4	1009.3	1.009
14.4	86.4	155.5	1383.9	1.384
Total:				
31.8	190.8	343.4	3056.2	3.056

1/ Village of 1000: 5% visiting for all causes (= 50/month)
2/ Reported frequent of visits per month for all causes.
3/ Annual cases = 50/month X 12 = 600 (x % water related)
4/ rate = 1080/600 or 1.8 X No. cases
5/ Gross market value per man-day in Atebubu farming = ¢8.90

ECONOMIC RATES OF RETURN ON ELIMINATION OF MAN-DAYS LOST, BY WATER - BORN MALADY (PER 1000 OF VILLAGE SIZE)

(DISCOUNT : 18%)

Rate*	5 %	10.5%	14.4 %	31.8 %
0	- 8269[1/]	-8269	-8269	-8269
1	407	855	1172	2588
2	345	725	994	2194
3	293	615	843	1861
4	248	521	714	1576
5	210	441	605	1335
6	178	373	512	1131
7	151	317	434	960
8	128	268	368	813
9	108	227	311	688
10.	92	193	264	584
11	78	163	224	495
12	66	138	189	419
13	56	117	161	354
14	48	100	137	302
15	34	85	156	257
16	29	72	98	217
17	24	61	83	183
18	21	51	71	156
19	18	43	51	131
20	15	37	43	113
Benefit/cost balance after 18% discount=				
$\frac{2534}{8269}$		$\frac{5402}{8269}$	$\frac{7390}{8269}$	$\frac{16357}{8269}$

* As % of cases reported (of a kind) Water-Borne, and remedied.

1/ ¢8269 per thousand (or ¢8,269 per capita)

5% = 480.6 14.4% = 1383.9

10.5 = 1009.3 31.8 = 3056.2

74

CUMULATIVE

RATES OF RETURN ON WATER POND INVESTMENTS ACCORDING TO MALADY AT 100% CORRECTION LEVELS 1/

(Per 1000 Village Population)

Number of Cases Cited:		After Discount Benefits (Cedis)	Costs (Cedis)
a) Stomach trouble 21.1% (Water-borne, corrected) : 5%	=	2534	8269
b) weakness, waist pains 28.8% (Water-borne, corrected): 14.4%	=	7390	
Cumulative	=	9924	8269
c) Malaria, fever, headache 30.5% (Water-borne , corrected): 10.5%	=	5402	-
Cumulative	=	15326	8269
(OR)			
d) Malaria, fever, headache, 30.5%			
Weakness, waist pains 28.8			
Stomach, trouble 21.1			
Guinea worm parasite 1.9			
Total 82.3%			
(Water-borne, corrected): 31.8%	=	16357	8269

1/ Total remedy of ailment assumed; serves as proxy for medical bill costs (unknown), which add to savings, taken here at nominal daily value of agricultural output per person.

I. HOUSEHOLD TIME SPENT FETCHING WATER

RAINY SEASON *			DRY SEASON		
Time (Mins)	No.	%	Time (Mins)	No.	%
10	269	38.4	10-20	43	4.8
20	173	24.7	30-40	80	8.8
30	135	19.3	50-60	136	15.0
40	25	3.6	70-80	8	0.9
50	18	2.6	90-100	65	7.2
60	53	7.6	120	187	20.7
+60	28	4.0	140-180	160	17.7
	701	100	200-240	109	12.0
			270-1440	117	12.9
]				905	100

* Rainly season is Apr- May- June- July with minor rains Sep. Oct. 6Mo)
Dry season is Nov.-Dec.-Jan-Feb-Mar. with short dry in Aug. (6Mo)

Source: Economics of Small Farm Systems (Ghana), Virginia State University, December 1979

II. RELATIVE TIME COST OF FETCHING WATER (PER TIME)

RAINY			DRY		
Minutes	%	Cedis 1/	Minutes (Mid point)	%	Cedis 1/
10	38.4	.031	15	4.8	.013
20	24.7	.091	35	8.8	.057
30	19.3	.107	55	15.0	.153
40	3.6	.027	75	0.9	.012
50	2.6	.024	95	7.2	.126
60	7.6	.084	120	20.7	.459
+60	4.0	.059	160	17.7	.524
(80)		.423	220	12.0	.488
			855	12.9	2.040
					3.872

1/ Minutes X % X ¢.0185/minute
(¢8.90/man-day or ¢1.1125/man-hour or ¢.0185/min 8-hour day)

TIME SAVINGS OF ADEQUATE POND WATER

EXISTING CONDITION

6 Months : ¢.463/time (Wet season)
6 Months : 3.872/time (Dry season)
Average/time : 2.167 (Year round)

Dry Season costs higher due to:
1) Futher distance to draw alternative supply (33%)
2) Longer wait for slower discharge at source (33%)
3) Trickle-filling container to reduce mud (33%)

Probable future condition

1) Water pond supplies euqal to wet season costs :	¢. 463
2) Further distance to pond: 33% of 3.872	1.291
Average time cost per trip to pond	1.754

Saved time costs ¢2.167 - 1.754 per time = C 413

Benefit cost levels by village size

Village Popula. (000)	No Fam. 1/	Village trips (000) 2/	Trip savings (000) 3/	Capital cost (000) 4/	Net First Year Benefits Cedis (000)	As multiple of capital Cost
			Annual Costs and Benefits			
1	167	173	71	8.3	62.7	7.6 X
2	334	347	143	16.5	126.5	7.6
3	500	520	214	24.8	189.2	7.6
4	667	693	286	33.1	252.9	7.6
5	834	867	358	41.3	316.7	7.6
10	1667	1733	715	82.7	632.3	7.6
15	2500	2600	1074	124.0	950.0	7.6
20	3334	3467	1432	165.4	1266.6	7.6

1/ 6 members per family
2/ 4 times daily per family x (say 5 days/week) = 4x 260= 1040 times per year per family.
3/ per village per year: ¢.413/trip x village trips
4/ ¢8269 per thousand of population, once, non-recurring.

ANNEX B

Technic-al Feasibility -- Feeder Roads and Village Ponds

Infrastructure Engineering Construction and Maintenance

The Atebubu District Council and its system of supporting local institutions have developed a list of projects which, if constructed, will improve the infrastructure of the Atebubu District. Among these projects are 17 water impoundments and six sections of feeder roads.

The technical feasibility of designing, con-structing and maintaining these projects has been undertaken with the aim of involving local institutions in every phase. A field trip was made to the Atebubu District where local interviews were conducted and sites visited. Since the rain season had started only 40% of the feeder roads could be covered, and of these only 12% of the unimproved feeder tracks were passable. Water impoundments sites were visited. The terrain is uniform throughout the district and is favorable for runoff collection.

Water Resources

Water supply in most of Atebubu District is a serious problem. The UST/G-VSU study, Table 1 estimates that more than 70% of households spend more than one hour per day carrying water for domestic purposes during the dry season. During the rainy season only 10% of the household will spend one hour or more per day carrying water. The lack of water not only affects the quality of domestic life but also restricts the development of livestock and crops.

The district includes three rivers which flow throughout the year. All other streams are dry one month after the end of the rainy season.

The average annual rainfall is 55 inches per year. The rain season is from late March to October, with a short lull in August. Table 2 presents the monthly and annual rainfall data for Atebubu, Kwame Danso, Prang, Bassa and the average for the district. Figure 1 shows the rainfall distribution within the Atebubu District.

Villagers have hand dug impoundment ponds in several locations; however, these are small in capacity and generally dry up by mid or late February.

Similarly there are hand dug wells in the villages. These wells were dug as part of a program conducted by the Ghana Water and Sewerage Corporation. This project was abandoned in the District because of the impervious nature of the soils, (high clay content) and the fact that most of them dried up during the dry season.

There have been attempts to obtain water by drilled wells by the Kumasi Division of the Water and Sewerage Corporation. Of four attempts

only one well, the USAID well at Atebubu, has been successful and its volume is not economical for a village size operation. In addition drilled wells are dependent on diesel generated power and technical expertise for their operations. There are recurrent shortages of diesel, and spare parts which could cut off water supply.

There are three pumped water supply systems in Atebubu. These system supply water to Kwame Danso, (pumped from the Sene River), Abease, (pumped from Pra River), and Atebubu which is pumped from a 200 feet square hand dug well. All of these systems require some technical expertise not only for the pumping plants but also for the water treatment facilities that are incorporated.

The most promising water supply facility appears to be the water impoundment ponds. A Volag has constructed one pond and has several more planned for construction in the near future. These facilities are inexpensive to construct and provide the necessary water with a minimum of technical skills required for operation and maintenance.

Water impoundment sites were inspected during the visit to Atebubu District. The sites are amenable to excavated impoundments with minimum embankment construction. The soils have a relatively high clay content from approximately one foot of depth to over 20' deep.

The embankments can be restricted to less than 8 feet in height by providing 80% of the capacity by excavation. This factor aleviates most of the technical concern required when constructing large embankment, or dam, types of water impoundments.

The 17 proposed sites for the water impoundments are shown on Figure 1. Also indicated on the figure are the impoundments proposed by APPLE. Construction will be coordinated so that the greatest number of people will benefit. Areas of greatest need will also be given priority.

Two factors necessary for site specific design are missing. First, topographic surveys have not been conducted at the proposed locations. Second, detailed population studies have not been conducted in the area to be served by the water impoundments. The time alotted to the planning team precluded obtaining this information during our field inspections. Fortunately, the terrain at the sites tends to be uniform and the soils consistent. It has been possible to design a standard water impoundment to serve a population center of 5,000 people. Using the design criteria shown in figure 2, calculations for this standard water impoundment have been completed. Since the various parts of the impoundment, i.e., top soil removal, cutoff trench, excavation, general excavation and embankment construction, have an essentially linear relationship, estimates for impoundments serving population from 2 -- 10,000 people may be derived.

Cost estimates for the 17 impoundments are calculated at ¢41,345 for an average population size of 5,000. Volag representatives and others familiar with the district believe this to be a representative figure and one that will provide a workable basis for final design during implementation of the project.

Water purification schemes have been reviewed. Fast and slow sand filters would appear to have the greatest feasibility. However, properly graded sand and gravels have not been found in the district.

While the filtration and purification of water supplies should be ultimately achieved, we believe that this problem should be deferred until adequate water is available to most of the people in the Atebubu District.

Maintenance of water impoundments

The water impoundments will require little maintenance after a good cover of grass is established on the above water embankments and waste areas. Once per year a work day should be established near the end of the dry season. All families who use a given impoundment should spend this day removing debris, siltration, and aquatic weed growth from the pond. This should be considered the annual tax for the right to use the pond.

Highways and Roads

The Highway Department is a GOG centrally controlled authority with regional, district and sub-district offices. Requests to do work are forwarded from the district once a year through the regional office to the central office in Accra. Here the requests are balanced with established national goals and standards along with funds available into a performance budget which authorizes the district to perform work. This is a modern and very workable system; however, it cannot cope with severe shortables of parts, fuel and lubricants. The results are that many otherwise satisfactory roads have deteriorated badly in recent years.

The road system of Ghana is officially classified under three major categories; trunk, secondary and feeder. Actually there is a fourth category of roads which are not under the GOG official system. This latter category is comprised of enginnered, constructed gravel roads and non-engineered tracks. For our purposes both of these may be considered to be feeder roads.

The Highway Department limits its operations to maintenance. If a new road is to be constructed, or if an existing road requires major rehabilitation or upgrading, the work is contracted. With the exception of adequate spare parts and POL, the district has resources to conduct routine maintenance.

Atebubu District has the following resources:

Equipment: 2 Graders, Champion
3 Tippers
8 Tractors and Trailers
2 Mowers
1 Asphalt kettle
Misc. shovels, picks and cutlasses

Personnel: 1 District Director
1 Deputy
2 Engineers
8 Mec-hanics
8 Sub-District Foremen
112 Workers

During the design team's inspection only one of the pieces of equipment was operational. One grader had been loaned to a contractor working on the Atebubu-Kwame Danso Secondary. The grader was out of fuel and none was available.

Transportation System

The only mechanical means of transportation which small-scale farmers in the District use to and from work is the bicycle.

About 51% use bicycle to and from work, while the other half commute on foot.

A systematic relationship exists between means of transportation to and from work and distance from house to farm. As the distance increases, more people tend to use bicycle as a means of transportation to work.

During the pre-implementation phase of DIPRUD, it was learned that 79% of the farmers faced transportation problems conveying farm produce between farm and market. About a fifth (21%) indicated they did not have any transportation problems. 65.2% of the farmers identified non-availability of vehicles, followed by lack of access/feeder roads (23.1%) as sources of their transportation problems. Inadequate labor to convey farm produce was cited as a transportation problem by 10.3%, while 1.4% felt that their transportation problem is high cost of transporting farm produce. Less than a tenth (8.3%) utilize vehicles to transport farm produce to homes and or market place. The small utilization of motor vehicles to transport farm produce is thought to be due to the inaccessibility of most farms to feeder roads and lack of adequate vehicles for local uses.

Experience demonstrates, when an improved farm to market road is made available, vehicle transport dramatically increases. It is believed that the implementation of improved farm to market feeder road would result in many farmers having increased access to markets as well as a number of indirect benefits.

Proposed Feeder Road Improvements

The District Council has identified several feeder roads which they would like to have upgraded to all weather travel status. Table 3 indicates these roads plus one additional road added by the design team. These roads fall into two categories:

1. non-improved tracks
2. engineered gravel roads

The non-improved tracks were largely impassable during the design team's visit. Attempts were made to inspect these tracks which resulted in "stuck vehicles". Because of this the design work is of necessity an extrapolation from the known quantities of areas visited.

The engineered roads were constructed roads which have fallen into disrepair through lack of maintenance. They are largely passable but trackers do not use them because of the damage which would result to their trucks. None of the roads requested for improvement are presently maintained by the Highway Department. Figure 1 is a map of the district showing the roads in question. The track from Asua to Sela to Kwame Danso is not shown on any map and the location shown is only approximate.

There is no information available on the people inhabiting this area and because of the rainy season we could not personally visit the area. Our information concerning these two routes is incomplete.

Table 4 through 6A describe the initial engineering proposal for the feeder roads requested. In brief the proposals are described in the presumption of two phases:

Phase I Feeder Road Improvement

The first phase is designed to involve the local population through the village chief and District Council in an immediate labor-intensive operation. The scheme would be to hand fill the potholes and unblock drainage. This would be accomplished by district furnished labor and DIPRUD furnished tractor and trailers and native laterite gravels. The immediate goal is two fold: First, to get the road open to vehicle traffic and second to involve the people in a commitment to not only open the road but keep it open. Following the initial opening, a routine monthly maintenance detail would accomplish routine maintenance. During the rainy season it is assumed that the routine maintenance would have to be increased. Finally, during Phase I, the project manager would re-evaluate the data collected during the project design to see if the design assumptions were valid and if the road or track in question should go on to Phase II.

Phase II Feeder Road Improvements

Phase II would incorporate recommendation of the engineered gravel roads and construction of an engineered gravel road to replace the present track roads. In both cases, maintenance would be performed by the District as indicated in Phase I.

At some time in the future the Highway Authority may be in a position to take over the maintenance of these roads; however, at present, they have too much to take care of for their resources.

Economic Analysis

An economic analysis was performed on the Phase I and II proposals described. The analysis revealed the following points discussed by the roads or track involved:

1. The Kwame-Danso-Mantukwa and the Abua-Sela-Kwame-Danso feeder roads are not economically feasible under any of the proposals. One point should be emphasized. Not enough information is known about either of these roads. The economist and the engineer had to prepare construction and cost data from an extremely small data base. The Council's judgement concerning the roads may be correct; however, insufficient data is available to collaborate their judgement.

2. The Abease-Kumfia track is marginally economically feasible for Phase I; however, the engineering is based on less than 4% of the track.

3. The three engineered gravel roads, i.e. Abease to Benim, Abease to Charimo and Yeji to Kapua are economically justified for Phase I and II; however, the savings involved by doing Phase II at once would provide one year savings of ¢35,000.

Conclusions

We recommend grader rehabilitation of engineered gravelled feeder roads as outlined in the preceeding paragraph as bringing the greatest returns in the shortest possible time. However, although economic factors mitigate against a labor-intensive approach for these roads, it is believed desirable for DIPRUD to include as a motivational option, a modest trial and demonstration activity for up to four short sections totalling about 20 miles which would be performed through a Phase I methodology. Sections which might be included for this could be the commencement of the road north from Kwame-Danso, the road east from Abua, the road south from Abease and a road more recently requested by District Officials which extends north-west from Atebubu.

Table 7 lays out the above recommendations together with initial and recurring costs.

Institutions and Infrastructure Available to Contract or Construct Roads.

Discussions were held with government and private parties concerning their ability to participate in road construction activities. Cost of equipment rental was solicited from the concerns and derived by the engineer based on local import, cost of new machines, parts, POL and labor.

Four basic approaches were investigated:

1. Bring in new equipment and key personnel to supervise operation and repair. Directly supervise construction activities. Dispose of equipment at the end of project.

2. Contract the work through a private contractor. If necessary, commit a substantial percentage of the contractors cost to imported parts of his choice.

3. Contract the work through the State Construction Company. This is a GOG-owned and operated construction company.

4. Pay the Highway Authority to do the work.

Analyzing each proposal in order, the following recomme-ndations are made:

1. Direct import of machines and key personnel would be the best option if obtaining the quickest results were the prime concern. The problem is that the residual cost to the district to con-tinue operating the equipment and plant would be excessive. An annual hard currency cost of nearly $100,000 per year would be required to keep up the operation after DIPRUD is terminated. This would be beyond the resources of the Atebubu District.

2. Contracting the work through a private contractor has the advantages of working within Ghana's system. The contractors' equipment is in poor shape; however; they have ways of correcting their problems that are normally not open to government concerns, USA or GOG. Contractors would react favorably to a client who has readily available cash; especially if this cash could be partially available as hard credit for imported spare parts. Finally the contractor furnishes the institution and infrastructure to support his operation. The only supervision required of DIPRUD would be to insure that the specifications of the contract were carried out.

3. Contracting the work through the State Construction Corporation has many of the same advantages as does the private contractor excepting as follows:

a. SCC does not have the degree of freedom to solve its problems that a private contractor has. Motivation to resolve parts and POL problems is probably less, explaining, perhaps, the preference of the Highway Authority to rely on private contractors for new road construction.

b. The clients' - (DIPRUD) control of performances of a government company would be considerably less than control over a private contractor.

4. Paying the Highway Authority to accomplish the work has the advantage that they are knowledgeable about roads and have a direct concern about the results. Unfortunately the road department does not have adequate inspection personnel to handle their present workload. Also, the feeder roads which DIPRUD would be improving are not in the category for which the Highway Authority is responsible. One additional consideration is that the Highway Authority has no responsibility, interest or capacity in water impoundments, another area of concern with DIPRUD.

In conclusion, the only realistic choices available are between the private contractor and the State Construction Corporation. There are plans under way at this time which may alleviate some of the spare parts problem.

The IBRD (IDA) is providing a six million dollar credit for spare parts for construction equipment, to be made available for private and public equipment. The design team recommends that the DIPRUD contracting invitations be made available to both private contractors and to SCC. Cost should be comparable, with a slight advantage to the private sector.

Tables 8 through 9 illustrate the base data gathered for this sector of the study.

Maintenance of Feeder Roads

Maintenance may be defined as the minimum level of repair work necessary to maintain the designed functional use of a facility for its designed life expectancy. More sophisticated economic analysis may optimize the amount of maintenance at a level which will provide the highest economic return for users in relation to the lowest annual maintenance cost and rebuild cost at the end of the design life.

In the Atebubu District, the prime concern is to provide an all-weather road, which will allow the movement of people and goods at moderate speed with normal wear and tear of the equipment at the least possible cost.

The feeder roads under study are of two types: non-engineered tracks and engineered gravels.

The non-engineered track has the highest level of annual maintenance. Due to climatic and soil conditions, this level of roads has a life span of one year. This means that once each year the road is, ineffect, rec-onstructed. The reconstruction is followed by low level monthly maintenance, moderate level rainy season maintenance, and followed by an intensive effort to return the track to its original condition at the end of the rainy season and thus starting another year.

The engineered gravel has a useful life at five years. The road is rehabilitated at the beginning of the cycle which is followed by routine monthly maintenance and moderate maintenance during the rainy season. The maintenance cycles continues until the fifth year at which time it will be necessary to rehabilitate the road again.

The above levels of maintenance are different from track feeder road to engineered gravel road. The track road which provides less than 50% of the service provided by the engineered gravel, cost 2.8 times as much to maintain.

The type of maintenance can further be divided into labor-intensive or machine-intensive. In the case of Atebubu District and the general case of Ghana at this time the only practical approach is labor-intensive.

Recommended Maintenance Schedules are:

Non-Engineered Track

Annual intensive rehabilitation (one/year)

Labor 10 man-days/mile at ¢15 =¢150.00

Labor 10 man-days/mile at ¢15		=¢150.00
Equip. 1/2 tractor trailer day/mile at ¢115	¢ 57.50	
Material, none	-	
	¢207.50/mile	

Routine Maintenance (once/month)		
Labor 24 man-days/mile at ¢15	=	¢360.00
Equip. 2.1 tractor-trailer days/mile at ¢115	=	241.50
Material 25 tons/mile at ¢7	=	175.00
		776.50

Wet Season Maintenance (3 days/month for 4 months)

Labor 30 man-days/mile at ¢15.00	=	¢450.00
Equip 6 tractor trailer days/mile at 115	=	690.00
Materials 75CY/mile at ¢7	=	525.00
		¢1,665.00

Total Annual Cost/Mile = ¢2,649/mile

Engineered Gravel Roads

Routine Maintenance (once/month)

Labor 12 man-days/mile @ ¢15	=	¢180.00
Equip. 1 tractor-trailer/mile @ ¢115		115.00
Materials 10 cy gravel/mile @ ¢7.00		70.00
		¢365.00

Wet Season Maintenance (3 days/month 4 months/year)

Labor - 10 man-days/mile at ¢15	=	¢150.00
Equip. 2.1 tractor trailer day/mile at ¢115	=	¢241.50
Materials - 25CY gravel/mile at ¢7.00		¢175.00
		¢566.50

Total Cost 931.5/mile/year

Table 5 summarizes maintenance cost for proposed feeder roads.

ANNEX B Tables

Engineering Feasibility

Tables and Figures

Table 1

Time spent by households fetching water during rainy and dry seasons*

Rainy Season			Dry Season		
Time (minutes)	F	%	Time (min utes)	F	%
10	269	38.4	10 - 20	43	4.8
20	173	24.7	30 - 40	80	8.8
30	135	19.3	50 - 60	136	15.0
40	25	3.6	70 - 80	8	0.9
50	18	2.5	90 -100	65	7.2
60	53	7.6	120	187	20.7
60*	28	4.0	140 -130	160	17.7
	701	100.0	200 -2 40	109	12.0
			270-1440	117	12.9
				905	100.0

* From the UST/G-VSU Study

Table 2 - Monthly and Annual Rainfall Data for Atebubu District (Mean Figures in Inches) (Up to 1978)

	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept.	Oct	Nov.	Dec.	No. ofyrs
						Atebubu 400 ft. Above Sea-Level							
Mean	0.35	1.88	2.93	5.74	7.00	7.90	5.72	4.50	4.70	7.55	1.37	0.78	23
Max	0.76	4.04	7.48	10.70	10.11	11.52	16.33	9.38	12.63	11.80	3.40	5.58	13
Min.	0.00	0.00	0.98	2.78	4.16	3.60	1.33	1.91	3.66	2.61	0.00	0.00	13
Range	0.76	4.04	6.50	7.92	5.95	7.92	15.00	6.47	8.97	9.19	3.40	1.58	13
						Kwame Danso 520 ft. above sea-level							
Mean	0.40	1.70	3.60	4.87	6.17	8.69	6.34	4.02	7.42	7.20	1.87	0.67	17
Max.	0.98	3.85	7.11	10.43	10.49	11.23	17.37	8.66	15.30	10.59	4.70	2.45	5
Min.	0.00	0.00	1.12	1.45	2.71	3.44	3.05	0.90	3.07	2.52	0.00	0.00	5
Range	0.98	3.85	5.99	8.98	7.78	7.79	14.32	7.76	12.23	8.07	4.70	2.45	5
						Prang 350 ft. Above Sea-Level							
Mean	0.32	1.19	3.30	4.35	6.97	8.16	7.18	4.88	8.48	5.62	1.03	0.39	16
Max.	0.68	1.64	6.36	7.79	10.21	9.69	11.59	15.42	10.82	10.32	3.54	0.75	5
Min.	0.00	0.00	0.83	1.92	4.79	3.72	3.20	0.00	4.23	1.42	0.00	0.00	5
Range	0.68	1.64	5.53	5.87	5.42	8.97	8.39	15.42	6.59	8.90	3.54	0.75	5

Table 3: Road Sections Inspected

Section of Road	Length	Travelled	% Travelled
Kwame Danso-Mantukwa	23 miles 37 Km	3.3 miles 5.3 Km	14.3%
Abua-Amkrakuta-Sela-Kwame Danso	40 miles 64.28 k m	5.7 miles 9.1 km	14.1%
Abease-Benim to District Line	23 miles 37 k m± *	2 1.9 miles 35.2 km	95%
Abease-Kumfia	16 miles 25 km	0.6 km 1 km	4%
Abease-Charimo	12 miles 20 km.	6.6 miles 10.7 km	55%
Yeji-Kapua-Abromease	36 mile s ** 57.9 km.	14.5 miles 2 3.3 km	40%
	241.2 km	84.6 km	
Total	150	52.5 miles	35%

* Exact location of District Line unknown
** District Line is at approx. 11 miles. District Council has asked for entire section.

ANNUAL LABOR INTENSIVE MAINTENANCE COST SUMMARY

Name of road	Length in miles	Type Road	¢ Initial maint.	¢ Routine maint.	Wet Season maint.	¢ Total Cost	¢ Cost Per Mile
Kwame Danso-Mantukwa	23	Track	4980	18000	39,260	62,240	2706
Abu-Sela-Kwame Danso	40	"	8300	28940	79,220	116,460	2911
Abease-Kumfia	16	"	3320	17560	18,180	39,060	2411
Subtotal	79	Track				217,760	2756
Abease-Benim	23	Engr'd Gravel	4980	14520	19,630	39,130	1701
Abease-Charimo	12	Engr'd Gravel	2490	7780	11,100	21,370	1780
Yeji - Kadua	11	Engr'd Gravel	2490	7420	9,230	19,140	1740
Subtotal	46	Engr'd Gravel				79,640	1731

Table 4

SELF HELP ROAD CONSTRUCTION AND MAINTENANCE

Kwame Danso - Mantukea (23 miles)

Initial Maintenance (once)

Pothole patching, drainage and clearing 20 village laborers, 12 days
Farm tractor and trailer 12 days.

Routing Maintenance (once/month)

Pothole patching and drainage
46 village laborers 1 day/month
4 farm tractors and trailers
600 c.y. laterite gravel

Wet Season Maintenance (4 months)

Gravel patching
60 village laborers, 3 days/month
12 farm tractors 3 days/month
1700 c.y. laterite gravel

ANNUAL COST	AID	District
Initial Maintenance		
Labor 240 paid at ¢15.00		¢3,600
Farm tractor and trailer 12 days at ¢115	¢1,380	
Routine Maintenance		
Labor 552 paid at ¢15.00		¢8,280
Tractor and trailer, 48 days at ¢115	¢5,520	
600 cy gravel at ¢7.00	4,200	
Wet Season Maintenance		
Labor 720 paid at ¢15		10,800
Tractor and trailer, 114 days @ ¢115	16,560	
1700 cy laterite gravel @ ¢7.00	11,900	
	39,560	22,680

Total cost = ¢62,240 ($22,633)
Cost/Mile = ¢2806 ($984)

Table 4 A

SELF HELP ROAD CONSTRUCTION AND MAINTENANCE

Abua - Sela - Kwame Danso 40 miles

Initial Maintenance (one)

Pothole patching, Drainage and Clearing
20 village laborers, 20 days
Farm tractor and trailer 20 days

Routine Maintenance (once per month)

80 village laborers, 1 day/month
8 tractor and trailers, 1 day/month
500 cy laterite gravel

Wet Season Maintenance (four months)

Gravel patching
120 village laborers, 3 days/months
24 tractor trailers, 3 days/month
3500 cy laterite gravel

ANNUAL COST	Aid	District
Initial Maintenance		
Labor 400 paid at ¢15.00		¢6,000
Tractor and trailer 20 days at ¢115	¢2,300	
Routine Maintenance		
Labor 960 paid at ¢15.00		14,400
Tractor and trailer 96 days at ¢115	11,040	
500 cy gravel at ¢7.00	3,500	
Wet Season Maintenance		
Labor 1440 paid at ¢15.00		21,600
Tractor and trailer, 288 days at ¢115	33,120	
3500 cy gravel at ¢7.00	24,500	
	74,460	42,000

Total Cost ¢ 116,460 ($ $42,349)
Cost/Hire ¢2911 ($1058)

Table 4 B

SELF HELP ROAD CONSTRUCTION AND MAINTENANCE

Abease - Kumfia 16 Miles

Initial Maintenance (once)

pothole patching, drainage, and clearing.
20 village laborers 8 days
Farm tractor and trailer 8 days

Routine Maintenance (12 months)

Pothole patching and drainage
32 village laborers, 1 day per month
5 Farm tractor and trailer 1 day per month
700 cy Gravel

Wet Season Maintenance (4 months)

Gravel patching
20 village laborers, 3 days/month
6 Farm tractors and trailers 3 days/month
900 cy gravel

ANNUAL COST	AID	DISTRICT
Initial Maintenance		
Labor 160 paid at ¢15.00		¢2,400
Tractor trailer 8 days at ¢115	¢ 920	
Routine Maintenance		
Labor 384 paid at ¢15.00		¢5760
Tractor trailers 60 days at ¢115	6,900	
700 cy gravel at ¢7.00	4,900	
Wet Season Maintenance		
Labor 240 paid at ¢15.00		3600
Farm tractors and trailers, 72 days at ¢115	8,280	
Materials, 900 cy at ¢7.00	6,300	
	¢27,300	¢11,760
Total cost ¢39,060	($14,204)	
Cost.Mile ¢2441	($ 888)	

Table 4 C

SELF HELP ROAD CONSTRUCTION AND MAINTENANCE

Abease - Benim 23 miles

Initial Maintenance (once)

Pot hold patching and drainage
20 village laborers 12 days
Farm tractor and trailer 12 days

Routine Maintenance (12 months)

Pothole patching and drainage
46 village laborers, 1 day/month
3 Farm tractor and trailer, 1 day/month
300 cy gravel (Laterite)

Wet Season Maintenance (4 months)

Gravel patching
30 village laborers 3 days/month
6 Farm tractors 3 days/month
850 cy Gravel (laterite)

ANNUAL COST	AID	DISTRICT
Initial Maintenance		
Labor 240 paid at ¢;5.00		¢3,600
Tractor and trailer 12 day at ¢15	¢1,380	
Routine Maintenance		
Labor 552 M.D at ¢15.00		8,280
Tractor and trailer 36 day and ¢115	4,140	
Materials 300 cy at ¢7.00	2,100	
Wet Season Maintenance		
Labor 360 M.D. at ¢15.00		5,400
Tractor and trailer 18 days at ¢115	8,280	
Materials 850 cy at ¢7.00	5,950	
	¢ 21,850	¢ 17,280

Total cost ¢39,130 (~~$14,229~~)

¢170/mile
~~$61.81~~

Table 4D

SELF HELP ROAD CONSTRUCTION AND MAINTENANCE

Abease - Charimo 12 miles

Initial Maintenance (once)

Pothole patching and drainage
20 village laborers, 6 days
tractor and trailer , 6 days

Routine Maintenance (once/month)

Pothole patching and drainage
24 village laborers, 1 day/month
2 tractors and trailers, 1 day/month
100 cy laterite gravel

Wet Season Maintenance (four months)

25 village laborers, 2 days/month
5 tractor trailers, 2 days/month
500 cy laterite gravel

ANNUAL COST	AID	DISTRICT
Initial Maintenance		
Labor 120 paid at ¢15		¢1,800
Tractor and trailer, 6 days at ¢115	¢ 690	
Routine Maintenance		
Labor 288 paid at ¢15		4,320
Tractor and trailer 24 day at ¢115	2,760	
100 cy gravel at ¢7,00	700	
Wet Season Maintenance		
Labor 200 paid at ¢15		3,000
Tractor and trailer 40 days at ¢115	4,600	
500 cy gravel at ¢7.00	3,500	
Total	12,250	9,120

Total cost ¢21,370 ($ 7771)
Cost/Mile ¢1780 ($647)

Table 4 E

SELF HELP ROAD CONSTRUCTION AND MAINTENANCE

Yeji - Kapua (11 miles)

Initial Maintenance (once)

Pothole patching and drainage
20 village laborers, 6 days
Tractor and trailer 6 days

Routine Maintenance (once/month)

Pothole patching and drainage
22 village laborers, 1 day/month
2 tractors and trailers, 1 day/month
100 cy laterite gravel

Wet Season Maintenance (4 months)

Gravel patching
20 village laborers, 2 days/ month
4 tractors and trailers, 2 days/month
450 cy laterite gravel

ANNUAL COST	AID	DISTRICT
Initial Maintenance		
Labor 120 paid at ¢15.00		¢1800
Tractor and trailer, 6 days at ¢115	¢ 690	
Routine Maintenance		
Labor 264 paid at ¢15.00		¢3960
Tractor and trailer, 24 days at ¢115	2760	
100 cy gravel at ¢7.00	7.00	
Wet Season Maintenance		
Labor 160 paid at ¢ 15		2400
Tractor and trailer 32 days at ¢115	3680	
450 cy gravel at 7.00	3150	
	10,980	8,160

Total ¢19,140 ($6,960)
Cost/mile ¢1740 ($ 633)

Table 4 F

Table 5: Rehabilitation and Maintenance Cost Summary, Engin eered Grave-lled Roads

Name of Road	Length in miles	Type of road	¢ Rehabilita-tion	¢ Routine Maint	¢ Wet Season Maint.	¢ Total Cost	Average Cost Mile
Abease-Benim (No gravel)	23	Engrd. gravel	43,156	8510	13.145	64,811	2,818
Abease-Charimo (no gravel)	12	"	25,822	4380	6,660	36,862	3,072
Yeji-Kapua (no gravel)	13	"	84,964*	4630	6,835	96,429	7,418
Subtotal	48						
Abease-Benim (graveled)	23	Engrd. gravel	483,000	5267	2 ,047	490,314	21,318
Abease-Charimo (graveled)	12	"	252,000	2748	1,068	255,816	21,318
Yeji-Kapua (graveled)	13	"	326,496	2977	1,157	330,630	25,433
Subtotal	48						

* Contains reconstruction cost for three miles and ext ends length or section two miles extra construction cost ¢37,264.

Table 5A
Grader Rehabilitation and Maintenance (No Gravel Added)

Abease-Benim 23 Miles

Rehabilitation

23 days grader and operator
move in
move out
5 days clean up with scoop
5 village laborers 23 days

Routine Maintenance (once/month)

23 village laborers, 1 day/month
2 tractor and trailer
230 cy laterite gravel

Wet Season Maintenance (4 months)

20 village laborers 3 days/month
4 tractors and trailers
575 cy yds. laterite gravel

First Year Cost

Rehabilitation		AID	District
23 days grader and operator at 770/day	=	¢17,710	
5 days loader and operator at 644/day	=	3,220	
Move in and out		13,750	
POL for Grader		5,703	
POL for Loader 45 hrs. at			
Labor 115 PO @ ¢15		1,048	
Routine Maintenance			1,725
Labor 276 PO at ¢15			4,140
Tractor and trailer, 24 days at ¢15		2,760	
230 cy gravel at ¢7.00		1,610	
Wet Season Maintenance			
Labor 240 days at ¢15			3,600
Tractor and trailer 48 days at 115		5,520	
575 cy gravel at		4,025	

Table 5A (contd.)

Abease-Benim (Contd.)

	AID	DISTRICT
Sub-total	₵55,346	₵9,465
Total	₵64,811 ($23,568)	
Cost/Mile	₵ 2,818 ($ 1,025)	

Second Year Cost

Routine Maint.

Same as first year.		
Labor	₵ 2,760	₵4,140
Material	1,610	

Wet Season Maint.

Same as first year

Labor		₵3,600
Equipment	5,5 20	
Materials	4,0 25	
Sub-total	₵13,915	₵7,740
Total	₵21,655 ($7,875)	
Cost/Mile	₵ 942 ($342.00)	

Table 5B. Grader Rehabilitation and Maintenance (No Gravel Added)

Abease-Charimo 12 Miles

Rehabilitation

12 days Grader and Operator
3 days Loader and Operator
5 Village laborers 12 days
Move in and out

Routine Maintenance (once/month)

12 village laborers 1 day month
1 Tractor and Trailer, 1 day/month
120 CY laterite gravel

Wet Season Maintenance (4 months)

10 village laborers 3 days/month
2 tractors and trailers
300 CY laterite gravel

First Year Cost	AID	District
Rehabilitation		
12 Days Grader and Operator @ ¢770/day	9,240	
3 Days Loader and Oper-tor @ ¢644/day	1,932	
Labor 60 PO @ ¢15/day		¢ 900
Move in and out (lumpsum)	13,750	
Routine Maintenance		
Labor 144 days @ ¢15		2,160
Tractor and trailer 12 days at ¢115	1,380	
120 CY gravel at ¢7.00	840	
Wet Season Maintenance		
Labor 120 PO at ¢15/day		1,800
Tractor and trailer 24/days at ¢115	2,760	
300 CY at ¢7.00	2,100	
Sub-total	¢32 ,002	¢4,860
Total	¢36,862	
	($13,404)	
Cost/mile	¢ 3,071	
	($1,117)	

Table 5B (Contd.)

Abease-Charimo (Contd.)

Second Year Cost	AID	District
Routine Maint.		
Same as first year.		
Labor		¢ 2,160
Equipment	1,380	
Materials	840	
Wet Season Maint.		
Same as first year		
Labor		1,800
Equipment	2,760	
Materials	2,100	
Sub-total	7,080	3,960
Total	¢11,040 ($4,015)	
Cost/mile	¢ 920 ($335)	

Table 5C - Grader Rehabilitation and Maintenance

Yeji-Kapua 13 miles

Rehabilitation -- (includes two miles new road bypassing backwater and one mile new construction at Yeji)

13 days grader and o perator
6 days D-6 dozer and operator
3 days loader and operator
150' 36" cone culvert
10 village laborers 13 days
Move in and move out

Routine Maintenance (once/m-onth)

13 village laborers, 1 day/month
1 tractor and trailer, 1 day/month
130 C.Y. laterite gravel

Wet Season Maintenance (4 months)

10 village laborers, 3 days/month
2 tractor and trailers, 3 days/month
325 CY laterite gravel

First Year Cost

Rehabilitation	AID	District
13 days grader and opera-tor at ¢770	¢10,010	
6 days D-6 dozer and operator at ¢1,094	8,046	
3 days loader at ¢644	1,932	
Move in and out		
150' x 36" culvert at ¢191	30,938	
Transport of culvert	2 8,650	
Labor 130 PO at ¢15	3,438	1,950
Routine Maintenance		
Labor 156 PD at ¢15		2,340
Tractor and trailer 12 day at 115	1,380	
130 C.Y. gravel at ¢7.00	910	

Table 5C (Contd.)

Yeji-Kapua Cont.

Wet Season Maintenance		TD	District
Labor, 120 Pd. @ ₵15			1,800
Tractor and trailers 24 days at ₵115		2,460	
325 CY gravel at 7.00		2,2 75	
	Sub-total	₵90,039	₵6,090
	Total Cost	₵96,429 ($35,065)	
	Cost/Mile	₵7,4 18 ($2,697.00)	

Second Year Cost

Routine Maint.			
Labor			2,340
Equipment		1,380	
Materials		910	
Wet Season Maint.			
Labor			1,800
Equipment		2,760	
Materials		2,275	
	Sub-total	7,325	4,140
	Total Cost	₵11,465 ($4,169)	
	Cost/Mile	₵ 882 ($ 321)	

Table 5D

Grader Rehabilitation and Maintenance

with 4" Comp acte d Gravel

All Sections by Contract.
Cost Derived from Current Road Department C ost of:

Abease-Benim 23 miles at ¢21,000/mile = ¢483,000

Abease-Charimo 12 miles at ¢21,000/mile = 252,000

Yeji-Kapua 13 miles at ¢21,000/mile = ¢273,000

Plus

Yeji - Kapua (3 miles new construction)

	AID	District
6 days Dozer at ¢1,094	¢6,564	
1 day loader at ¢644	644	
150 ft. 36" culvert at ¢191	28,650	
Labor 30 PD at ¢15		¢ 450
Move in and out	13,750	
Pipe transport	3,438	
	¢53,046	¢ 450
Total	¢53,596 ($19,453)	
Cost/mile	¢17,832 ($ 6,484)	

Table 5D (Contd.)

Maintenance Graveled Rehabilitated Roads

All Sections:

Routine Maintenance (once/month)

1 man/two miles, once/month
1 tractor and trailer/10 men
10 CY laterite gravel/mile/year

Wet Season Maintenance

5 men/tractor day
1/10 tractor and trailer/mile
10 CY laterite gravel/mile/year

Cost/Mile/Year

Routine Maintenance	AID	District
Labor 6 PD/mile at ¢15		¢ 90
Tractor 0.6/mile at ¢115	69	
10 CY gravel/ at ¢7	70	
	139	90
Wet Season Maint.		
Labor 1/2 PD/mile at ¢15		7.50
Tractor and trailer 1/10 at 115	11.50	
10 CY gravel at 7	70	
Sub-total	220.5	97.5
Total	¢318/mile ($115.00)	

COST SUMMARY

CONSTRUCTION TO ENGINEERED GRAVEL ROAD OF EXISTING TRACK ROADS

Name of Road	Length in miles	Type Road	Construction cost	Routine maint. cost	Wet Season maint. Cost	Total first yr. Cost	Total future Annual cost
			¢	¢	¢	¢	¢
Kwame Danso - Hantukwa	23	Track	2,325,576	5,267	2,047	2,332,890	7,314
Adua - Sela - Kwame Danso	40	"	4,044,480	9,160	3,560	4,057,200	12,720
Abease-Kumfia	16	"	1,617,792	3,664	1,424	1,622,880	5,088
Total all sections	79		7,987,848	18,091	7,031	8,012,970	25,122

Table 6

NEW CONSTRUCTION AND MAINTENANCE COST

Construction Estimate

Assumptions:

+ Simple Borrow - Embankment road section, 20 ft surface.
+ D - 6 to D- 8 Dozer will rough grade 1/2 mile / day
+ 1-18", 1-24", and 1 36" culvert/mile will be required
+ Cat 12 g type grader will finish grade 1 mile/day
+ 2 cy loader will clean up 5 miles/day
+ loader will require 3 days/mile for drainage installations
+ 25 mandays labor will be required/mile
+ Move in and out cost will cost ¢800/mile of construction
+ Transportation cost for culvert will be ¢3500/mile
+200 cyds laterite topping/mile
+ contingencies will be 20%
+ Engineering will be 10%
+ Overhead (including inflation) and profit 53%

Table 6 A

Construction Cost/Mile By Contract

2 days dozer ¢110/day	=	2,200
1 day grader ¢770/day	=	770
3.2 days loader ¢ 664	=	2,125
36' - 18" conc. culvert at ¢62	=	2,232
39' - 24" cone culvert at ¢79	=	3,081
45' - 36" cone culvert at ¢191	=	8,595
Culvert transport cost	=	3,500
hove in and out cost	=	800
labor-25 paid at 15	=	375
Materials 200 cy at 14	=	28,000
Sub total		51,678
Contingencies 20%		10,336
		62,014
Engineering 10%		6,200
Overhead and Profit 53%		32,867
		¢ 101,087
		$ 36756.00

Routine maint. cost/mile = ¢230
Wet season maint. cost/mile 89

Annual Cost ¢
= 319/mile

Table 6 A continued

RECOMMENDED FEEDER ROAD REHABILITATION AND MAINTENANCE

(Cost in Cedis)

Name of Section	Length	Type of Road	Action proposed	Initial cost	Routine maint. cost	Wet season-cost	1st yr. cost	Recurrent cost
Abease - Benim	23	Engr'd	Rehabilitate & Maint.	43,156	8,510	13,145	64,811	21,425
Abease - Charimo	12	"	"	25,822	4,380	6,660	36,862	11,178
Yeji-Kapua	13	"	"	84,964	4,630	6,035	96,492	12,110
Abease Toward Kumfia	5	Track	Labor intensive maint.	1,038	3,883	8,325	13,246	13,246
Abua Towards Sela	5	Track	"	1,038	3,883	8,325	13,246	13,246
Atebubu - Duabonte	5	Track	"	1,038	3,883	8,325	13,246	13,246
Kwame Danso Towards Manfukwa	5	Track	"	1,038	3,883	8,325	13,246	13,246
							251,149	97,679

Table 7

Table 8 - Equipment Rental Summary

Size and Type Machine (or equiv.)	Source of Quote 1/		
	2/ Highway Dept.	Plant Pool 3/	Calculated by Team
Dozer D-6			¢118.00/hr.
Dozer D-7		¢120/hr.	
Grader Cat 12G	¢69/hr.	¢84/hr.	¢ 86/hr.
Loader Cat 930		¢7 0/hr	¢ 71/hr.
Roller Vibratory		[illegible]/hr	
Roller Steel Wheel		¢30/hr	
5 CY Tipper	¢35/hr.	¢30/hr	
Tractor and Trailer	¢14.38/hr.		

1/ Private contractors are reluctant to quote a rental rate without looking over the work. They felt the above prices generally appropriate

2/ Based on 8-hour day

3/ Based on 9-hour day

ESTIMATED HOURLY OWING AND OPERATING COST

CAT D-6-D 27 May 1980

Cost of Ownership

Delivered price including attachments	$110,750
Less resale value after 10 years	(11,075)
Net value for depreciation	99,675

Hourly depreciation cost

$$\frac{99,675}{12,000} \qquad \$8.31/hr$$

Hourly interest insurance, tax cost

$$\frac{\frac{10+1}{20} \times 110,750 \times 22\%}{1200} \qquad \$1.17/hr$$

Operating Cost

Fuel	6.1 gal/hr	X $1.45/gal	=	$8.85
Engine oil	.04 " "	X 6.56/ "	=	.26
Transmission oil	.02 " "	X 6.56/ "	=	.13
Final drive oil	.01	X 7.36/ "	=	.07
Hydraulic oil	.02 " "	X 6.56/ "	=	.13
Grease	.05 Kg "	X 2.32/k	=	.12
Filter estimate				.43
			$9.99	$9.99/hr

Undercarriage Cost

(I + A + Z) X Factor

(.2 + 3 + 1.0) X 5.0 = $7.50 $7.50/hr

Repairs

4.0 X 1.1 = 4.40/hr $4.40/hr

Bits and teeth

$\frac{\$495}{600 \text{ hrs}} = 0.82$ $0.82/hr

Labor at ¢14/day $0.70

Total $42.19 (¢11[illegible]6.00)

Table 8 A

ESTIMATED HOURLY OWNING AND OPERATING COST
CAT 12 G GRADER — 27 May 1980

Cost of Ownership

Delivered price including attachments	$91,230
Less tire cost 6-13.0 x 24 (1ops) at	(2,500)
Less Resale value after 10 years	(9,123)
Net value for depreciation	79,607
Net value / Est, hours = 79607 / 12000	$ 6.63/hr

Interest, ins. taxes

$$\frac{(N + 1 \text{ X Del. Pr}) \text{ X Int X Tax Ins.}}{2N \text{ hours/year}}$$

$$\frac{(10 + 1 \text{ X } 91{,}230) \text{ X } 22\%}{20} \Big/ 1200 = 9.20$$

Operating Cost

Fuel : Unit cost X consumption
$1.45/gal. X 6.6 gal/hr += $ 9.57

Lubricants fuels and grease

Engine	$6.56/gal x .02 gal/hr	= 0.13	
Trans. oil	6.56/gal X .02	= 0.13	
Final Dr.	7.36/gal X .01	= 0.07	
Hydral.	6.56/gal X 01	= 0.07	
Grease 2.32/kg	X.02kg/hr	= 0.05	
Filters (est.)		0.04	
Total fuel, lub. and filters		10.02/hr	$10.02

Tire cost 6-13.0 X 24 (1ops) at 4000 hours	.62
Repairs $3.25/hr x 1.06 =	3.45
Bits and teeth Bits = $311 + 50% for teeth = 1000	0.47

Table 8 B

Operators cost including loading ¢14/day = $0.70/hr

Total owning and operating cost/hr
= $ 31.09/hr
========

¢85.50/hr

========

Table 8 B continued

Estimated Hourly Ownhership and Operating Cost

CAT 930 — 27 May 1980

Cost of ownership	$62,785
Delivered price including attachments	$62,785
Less resale value after 10 years	$(6279)
Less tire replacing cost 4-14.D x 24hr (12 pr.) at 784	$(3136)
Net value for de preciation	53,370

Hourly depreciation Cost

$$\frac{\$53,370}{10,000 \text{ hrs}} = \$5.34$$

Hourly interest, insurance and tax cost

$$\frac{(8+1 \times 62,785) \times 22\%}{1200} = 6.22$$

Operating cost

Fuel	5.1/gal /hr	X	$1.45/gal	= 7.40	
Engine oil	.03gal/hr	X	6/56/gal	.20	
Transmission fuel	.01	X	6.56/gal	.07	
Final dr. oil	.02	X	7.36/gal	= .13	
Hydr. oil	.04	X	6.56/gal	.26	
Grease	.02kg/hr	X	2.32/gal	.05	
Filter estimate				.36	
Total hourly operating cost				8.47	$8.47

Tire cost

$$\frac{\text{replacement value}}{\text{hours of life}} = \frac{\$3,136}{2,000 \text{ hrs}} = 1.57$$

Repair cost

Factory	X	Ext. life		
3.00	X	1.0	= $3.00	3.00

Bits and teeth	$ 0.60
Operstor cost	0.70

Table 8 C — Total $25.90 (¢71.23)

COST SUMMARY
INSTITUTION AND INFRASTRUCTURE
TO
IMPORT MAINTAIN, AND OPERATE
CONSTRUCTION EQUIPMENT
FOR DIPRUD

EQUIPMENT TO PURCHASE

D6 Cat and attachment	$110,000	CIF	Accra
12G Grader	95,000	CIF	Accra
930 loader	65,000	CIF	Accra
5CY dump trucks (3)	165,000	"	"
Vibratery sheeps foot	25,000	"	"
B6HP Diesel tractor w /sheep	35,000	"	"
One -3/4 ton pickups (4X4) with winch and canopy	15,000		
One 1 ton mechanic truck 4x4 with utility body detachable "A" Frame and winch	30,000		
Subtotal	540,000		
40% spare parts (4 years)	$ 226,800		
Subtotal	766,800		

Shop infrastructure

(including tools, equipment generator)	$250,000
POL at $81,000/year X 4 =	324.000
One heavy equipment specialist at $100,000/yr X 4	400.000
One heavy equipment Mech. specialist at $100,000 x 4	400.000
Total dollar cost	$2,140,800

Cedis Cost

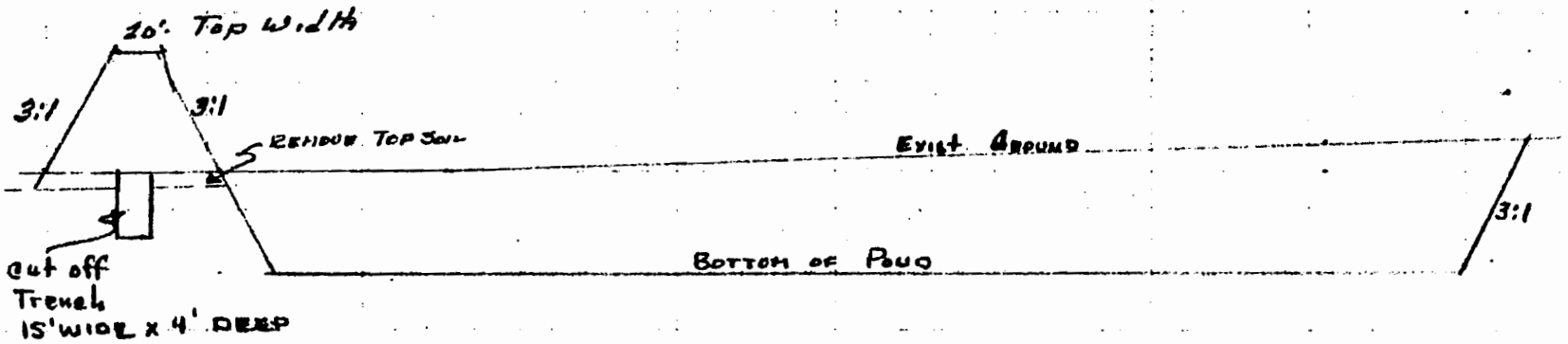
7 Operators at ¢6000/yr	= ¢168.000
4 mechanics at ¢600/yr	= 96.000
12 laborers at ¢4000/yr	= 192.000
Total	¢ 456.000

Table 9

Annual Recurring Cost/Year to Ghana

15% parts	¢1,080.000
POL	300,000
Labor	456,000
	¢1,836.000

Table 9 continued



Strip all top soils to approx 1 foot

Waste all silt soils
compact & seed

Use clay for embankment
compact in 6" layers

Horizontal Scale distorted for illustrative purposes

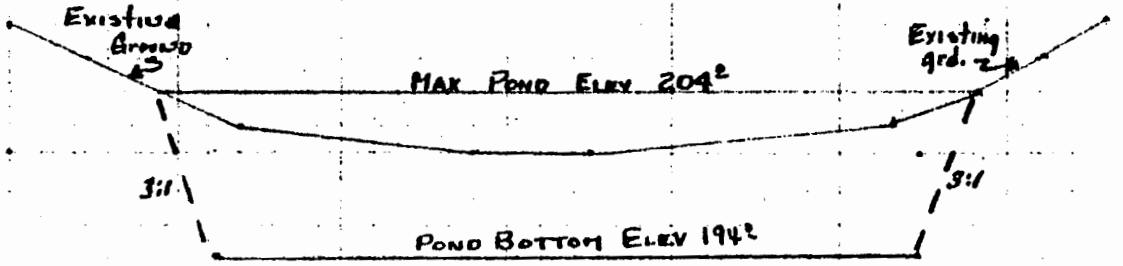


Figure 2A

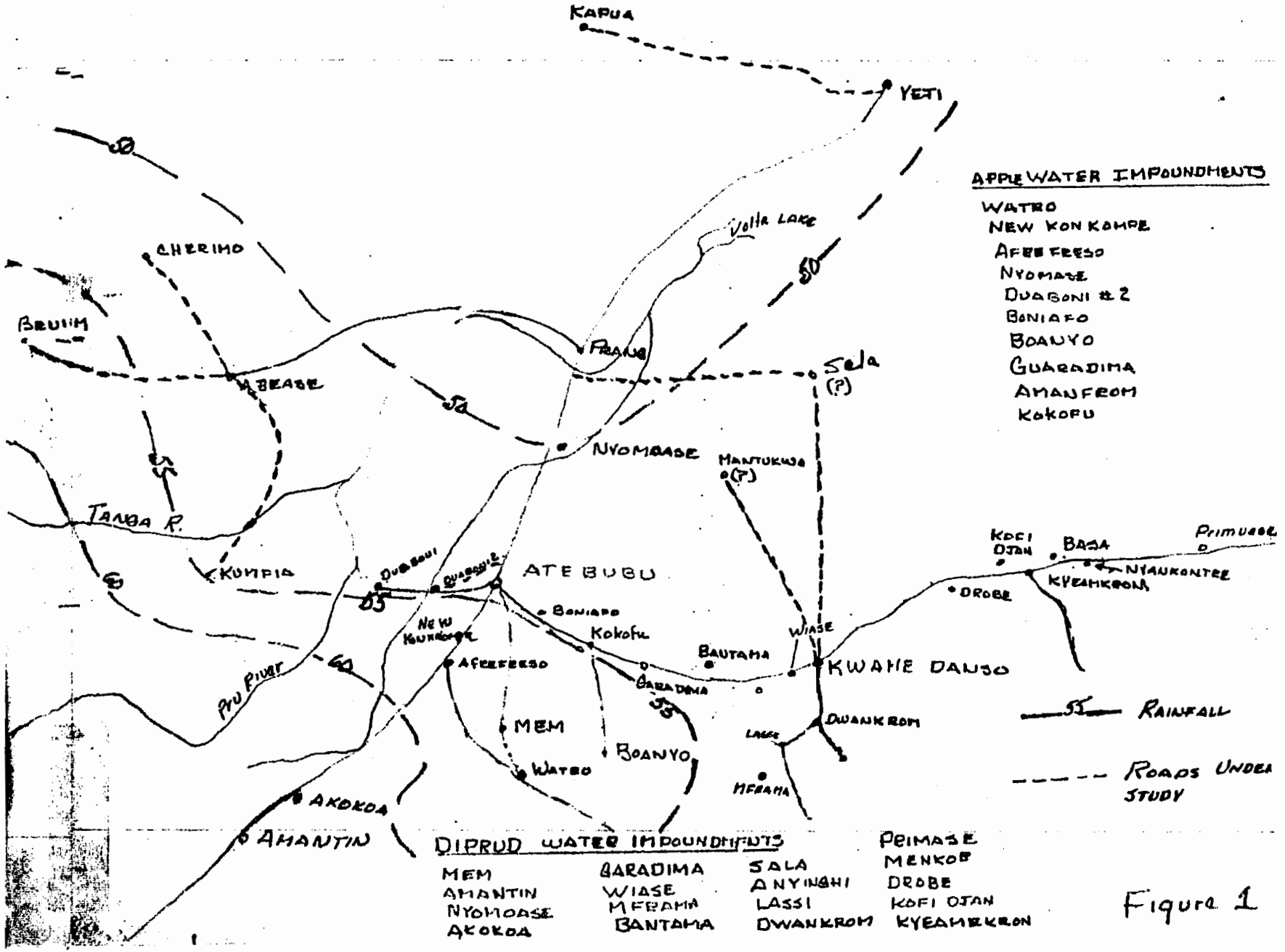

KAPUA
YETI
CHERIMO
BEUIIM
ABEASE
VOLTA LAKE
FRAMA
Sala (?)
NYOMOASE
MANTUKWA (?)
TANOA R.
KUMPIA
DUABONI
DUABONI #2
ATE BUBU
BONIAPO
KOKOFU
NEW KONKOMPE
AFEFEESO
BANTAMA
WIASE
KWAME DANSO
PRU RIVER
MEM
BOANYO
WATRO
AKOKOA
AMANTIN
DWANKROM
LASSI
MFRAMA
KOFI OJAN
BASA
PRIMUASE
NYANKONTEE
KYEAMEKROM
DROBE
APPLEWATER IMPOUNDMENTS
WATRO
NEW KONKOMPE
AFEFEESO
NYOMASE
DUABONI #2
BONIAPO
BOANYO
GUARADIMA
AMANFROM
KOKOFU
RAINFALL
ROADS UNDER STUDY
DIPRUD WATER IMPOUNDMENTS
MEM
AMANTIN
NYOMOASE
AKOKOA
GARADIMA
WIASE
MFRAMA
BANTAMA
SALA
ANYINGHI
LASSI
DWANKROM
PRIMASE
MENKOE
DROBE
KOFI OJAN
KYEAMEKROM

Figure 1

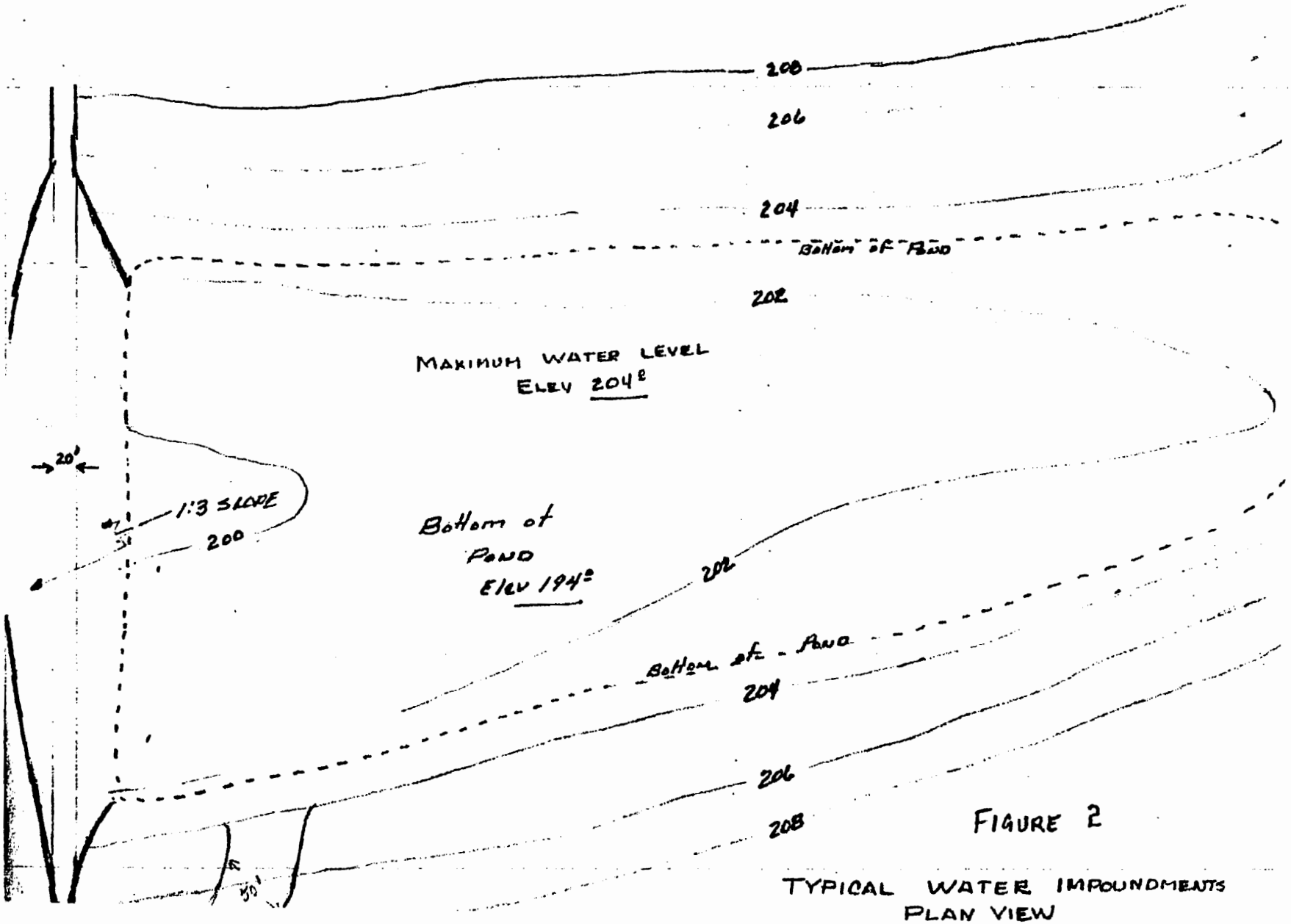


FIGURE 2

TYPICAL WATER IMPOUNDMENTS
PLAN VIEW

ANNEX C

DISTRICT PLANNING AND RURAL DEVELOPMENT

Initial Environmental Examination

Project Location:	Republic of Ghana, Brong-Ahafo Region
Project Title:	District Planning and Rural Development (DIPRUD)
Funding:	7.85 million by AID 2.80 million by Ghana
Life of Project:	Five years
IEE Prepared by:	USAID/Ghana Jerry L. Rann
Date:	June 1980
Environmental Action Recommended:	Negative Determination

Concurrence: Irvin A. Coker Date: July 3, 1980

Assistant Administrator's Decision:

_____ _____

Approval of Environmental Action REcommended Date

_____ _____

Disapproval of Environmental Action Recommended Date

Project Description: This project will assist the Atebubu District Council to promote and implement a program of community-based rural development initiatives in Atebubu District. The communities will participate in identifying, designing and implementing a variety of self-betterment projects, in categories of small infrastructure (feeder roads, village ponds, market structures, for example) and small enterprises and artisanal facilities and services, such as grain milling, commercial transport and blacksmithing, among others. The activities will individually be modest in size and technical requirements; the benefits, while modest individually will be expected to be sufficient to strengthen the communities' motivation and capacity to undertake other similar self-improvement initiatives on a continuing basis.

Environmental Setting: The District with an area of 6,000 square miles and a population of over 90,000 people occupies the eastern part of the Brong-Ahafo Region. It lies between longitude C^{o} 15'E and 1^{o} 30'W. It shares boundaries with the Ashanti Region to the south, the Volta Region to the east, the Northern Region to the north and the Wenchi District of the Brong-Ahafo Region to the west. Atebubu occupies part of the Central portion of the Volta Basin. The basin is composed of sandstone, shale, and mudstone. The land generally is low lying with the monotony of the topography being broken at intervals by flat topped hills.

Roads: The District lacks an efficient transportation network. It has no direct all weather road connecting the District with the rest of the region. Connection with the regional capital, Sunyani, is by two circuiteous roads that pass through the Ashanti Region lying to the south of the District. In addition to roads that link the regional capital to the District and the northern road from Kumasi which passes through Atebubu, the District is traversed by two sub-standard roads, Atebubu-Kujokrom road to the east and Prang, Abease road to the north-west of Atebubu: one major road and three feeder roads to open up the hinterland are currently under construction. A major road is a continuation of the Prang-Abease road to connect Kintampo on the Brong-Ahafo Region to Atebubu. Two of the three feeder roads are to link Atebubu to villages to the south and south-west of Atebubu. The third feeder road is designed to connect villages south of Kwame Danso. Aside from the northern Kumasi road, the present mileage of mororable roads in the District is about 121 miles.

Identification and Evaluation of Impacts: The attached IEE matrix is an estimate of the environmental impacts of water supply and feeder road improvement activities of the project. In each category, the expected impacts will be low or negative. While the specific activities to be implemented will not be selected until the project is under way, it is dertain that a number of these will be for feeder road improvements and village ponds (see Part III and Annexes A and B). Therefore, feasibility studies have been conducted during project design for such activities, from which the invironmental impact can be judged.

1. Land Use: The project will have little effect on the character or use of land. Village ponds will be located in existing marshy swales which generally are unsuited for other uses. The roads which will be improved are existing roads and tracks; DIPRUD assistance should, by grading, shaping and leveling and by construction of culverts appreciably decrease erosion.

2. Water Quality: The village ponds will provide the communities with a larger volume of water during the dry season, less subject to pollution and stagnation than their village wells.

3. Atmospheric: No environmental impact.

4. Water Diversion and Use: Village ponds will be located in existing drainage areas, involving no major diversion or large dams. They will be supplied by natural run-off during the rainy season, and are designed to provide sufficient storage to supply community needs through the dry season.

5. Socio-Economic: Improved feeder roads will make the communities more accessible to markets. Village ponds will make water supplies more accessible.

6. Cultural: No environmental impact is expected.

7. Health: Malaria is endemic to the area. However, no increase in the vector is expected to result from DIPRUD activities. Village water supplies will be improved, where ponds are constructed. As indicated above, the larger volume impounded will tend to provide water which is less polluted than from existing village wells.

8. Impacts of other DIPRUD Activities: The matrix does not evaluate impact which might result from other kinds of development activities, yet to be identified. These activities are small, averaging in cost only $15,000. The effects on environment will also be small, and generally will be favorable impacts (better management and maintenance by communities of their supporting facilities). DIPRUD will assist to sensitize communities to consider environmental factors in their development activities. Subactivity design requires that those selected for assistance must meet appropriate environmental criteria, including social and economic factors. Therefore, each activity individually will be evaluated for its environmental impact, prior to being selected for assistance through DIPRUD (see Parts IIB.4 and Annex G).

Environmental Action Recommended: It is recommended that a negative determination be made for this project. Based on this IEE the proposed project will not have a significant effect on the physical or socio-cultural environment, and therefore does not require an Environmental Assessment or an Environmental Impact Statement.

IMPACT IDENTIFICATION AND EVALUATION FORM

1/

Impact Areas and Sub-areas

A.	LAND USE	
	1. Changing the character of the land through:	
	a. Increasing the population	L
	b. Extracting natural resources.. ..	L
	c. Land Clering	N
	d. Changing soil character	L
	2. Altering natural defenses	N
	3. Foreclosing important uses	N
4	4. Jeopardizing man or his works	N
	5. Other factors	
	Erosion control	L/M
	_____	
	_____	
B.	WATER QUALITY	
	1. Physical state of water	L
	2. Chemical and biological status	N
	3. Ecological balance	L
	4. Other factors	-
	_____	
	_____	
C.	ATMOSPHERIC	
	1. Air additives	N
	2. Air pollution	N
	3. Noise pollution	N
	4. Other factors	-
	_____	
	_____	
D.	NATURAL RESOURCES	
	1. Diversion, altered use of water	L
	2. Irreversible, inefficient commitments ..	N
	3. Other factors	-
	_____	
	_____	

1/ Use the following symbols:

N - No environmental impact
L - Little environmental impact
M - Moderate environmental impact
H - High environmental impact
U - Unknown environmental impact

IMPACT IDENTIFICATION AND EVALUATION (CONTINUED)

E. CULTURAL

1.	Altering physical symbols	N
2.	Dilution of cultural traditions	N
3.	Other factors	-

F. SOCIO-ECONOMIC

1.	Changes in economical/employment patterns ..	L
2.	Changes in population	N
3.	Changes in cultural patterns	N
4.	Other factors	-

G. HEALTH

1.	Changing a natural environment	N
2.	Eliminating an ecosystem element.. ..	N
3.	Other factors	-

H. GENERAL

1.	International impacts .. .-	N
2.	Controversial impacts	N
3.	Larger program impacts ,, ..	N
4.	Other factors	-

I. OTHER POSSIBLE IMPACTS (not listed above)

	-
	-
	-

ANNEX D

GHANA -- District Planning and F · l Development - DIPRUD -- 641-0073

Life of Project: 5 Years
Total U.S. Funding: $7,852,000
Date Prepared: June 1980

Narrative Summary	Objectively Verifiable Indicators	Means of Verification	Important Assumptions
Goal: -Improve the economic and social well-being of the population of Atebubu District.	-Increased production and trade in Atebubu District in the communities participating in the project -Increased access to services.	-Statistics on food production, and general commercial activity. Evaluations for MIDAS Project.	-That community-generated local development initiatives can prov-ide a significant improvement in the level of living of rural populations.
Purpose: -Strengthen the capacities of the Atebubu District Council and communities to identify and implement projects of direct benefit to the target group. -Improve coordination with sectoral ministries and their centralized and decentralized services in support of development activities in Atebubu District.	-Communities are taking initiative in identifying and implementing rural development activities. -Atebubu District Council is effective by enc-ouraging and assisting them. -Communities are effectively utilizing and maintaining facilities. -Sectoral departments in the District are actively assisting the communities in their development initiatives.	-Increasing numbers of participating communities. -Numbers of user/maintenance systems installed and operating. -Numbers of activities proposed to ADC and DIPRUD and approved for assistance. -Project evaluations will verify that the critical assumptions are being met, and that the project purpose is being attained.	-That the Local Government Act of 1980 is enacted. -That a GOG priority is the effective implementation of the Act. -That the District Councils thereby achieve essential coordinating authority for the sectoral functions operating in the District, and are enabled to apply available government resources in a more efficient way. -That these resources will be sufficient for the needs of the District Council to support community-based rural development activities. -That these activities have been carefully selected and designed so as to demonstrate practicality, feasibility and sufficient benefits.

ANNEX D

Logical Framework

GHANA - District Planning and Rural Development - DIPRUD - 641-0073

Narrative Summary	Objective Verifiable Indicators	Means of Verification	Important Assumptions
OUTPUTS: - Atebubu District communities and District Councils officials receive hands-on experience and technical expertise in planning and designing rural community development activities. - Communities receive technical and support assistance to implement specific rural development activities. - District Council gains experience in assisting communities to implement development activities of their own choosing. - District Council finds effective vehicle for involving sectoral departments in coordinated operations, to maximize efficient application of available resources for overall benefit of the District. - Rural community development facilities are put into use by the communities of Atebubu Dist; systems for operating and maintaining the facilities are installed	-Communities within twelve wards of Atebubu District receive assistance as project implementation takes place. -District Councillors and functional sector officials and technicians are involved in activity design and implementation, receiving technical assistance from DIPRUD. -District Development Officer (DDO) evolves a greater function in promoting and coordinating community-based development initiatives, coordinating larger numbers on his own. -Specific rural community development activities will be identified and implemented during the life of DIPRUD. -Numbers and types will not be known until project is under way. Budget inputs would permit assistance to rehabilitate/improve/maintain 68 or more miles of feeder roads, 17 or more village ponds and assist in 75 other development activities, at an average cost of $15,000 each.	-The DIPRUD team and the DDO will measure and evaluate the OVI and report progress in quarterly reports to the District Council and to USAID. Information copies will go to Region and to the Ministry of Local Govt. -Formal project evaluations scheduled during the third and fifth yrs.	-That Atebubu communities can conceptualize and propose sufficient numbers of development activities within the qualifying criteria. -That their Councillors are responsive and helpful in transmitting their proposals, and assisting to get them implemented. -That the resources necessary to implement the activities are sufficient and can be mobilized when needed (resources of the communities, of the District Council, of DIPRUD).

INPUTS

DIPRUD BUDGET -- AID APPROPRIATED
$000

Line Item	Year 1	2	3	4	5	Total U.S
In-Country Costs:						
Feeder roads rahabilitation 48 miles	65					65
Feeder Rds.imp. (Lab.int.)20 mi.	12					12
Feeder rds.maint. (Lab.int.)68mi.		23	23	23	23	92
Excavation village ponds	40(4)	50(5)	40(4)	40(4)		170
Sm.infra.&enterprise activities	100(10)	150(15)	200(20)	200(20)	100(10)	750
TA team-Ghanaians S&A	32	34	35	37	38	176
In-country travel & per diem	20	20	20	20	20	100
Local furn.,sup., and contr.sus.	15	10	10	10	10	55
POL	51	51	55	55	50	262
Consultants (Ghanaian)	5	5	5	5	5	25
S/T in-country costs	340	343	388	390	246	1707
Add contingencies 10%	34	34	39	39	25	171
S/T before inflation	374	377	427	429	271	1878
*Inflation (compounded)	180(48%)	415(42%)	794(36%)	1201(33%)	1098(33%)	3688
Total in-country Costs	554	792	1221	1630	1369	5566
U.S. Source Costs						
Expatriates' S&A (plus contr.overheads)	170	174	178	182	186	890
U.S. commodity procurement	389	5	120	5	5	524
Evaluations and special studies		40	40		40	120
S/T U source costs	559	219	338	187	231	1534
Add · agencies 10%	56	22	34	19	23	154
S/T before inflation	615	241	372	206	254	1688
* Infla. 12% per yr. compound.	74	61	151	118	194	598
Total U.S source costs	689	302	523	324	448	2286
* Inflation factors compounded:						1/
In-country: X	X1.48	X2.10	X2.86	X3.80	X5.05	
U.S source:	X1.12	X1.254	X1.405	X1.574	X1.763	
1/ Grand Total	1243	1094	1744	1954	1817	7852

INPUTS - DIPRUD BUDGET -- GHANA CONTRIBUTION
₵000, Except Where Converted to $000

Line Item	Year 1	2	3	4	5	Total
Feeder road rehabilitation 48 miles	20					20
Feeder road improvement (Lab. int.) 20 miles	19					19
Feeder road maint. (Lab. int.)68 miles		35	35	35	35	140
Village Ponds	56(4)	70(5)	56(4)	56(4)		238
Small infra. and enterprise activities	140(10)	210(15)	280(20)	280(20)	140(10)	1050
Ghanaian officials and in-kind	165	178	205	225	253	1026
S/T	400	493	576	596	428	2493
Inflation	192	542	1070	1669	1732	5205
Total in ₵000	592	1034	1646	2265	2160	7698
Total in $000	215	376	599	824	786	2800

ANNEX E

DISTRICT COUNCILS

Prewar colonial administration involved only the traditional chiefs in the so-called indirect rule. Following World War II, a more formal local government which emphasized administrative decentralization was enacted (1951 Local Government Ordinance) including a system of district, urban and local councils. However, the units were too small to be effective. Establishment of larger units was proposed by the Siriboe Committee in 1967, including a system of regional, district and local councils, the district being the main administrative tier. This proposal became the basis for the 1974 Local Administration Act.

This Act has yet to become totally operational. While certain administrative functions have been allocated to the districts, authorities for the regional councils have not yet been active. District Councils are the basic units of administration, and the sole rating/taxing authorities at the district level. They are charged to provide public services and, utilizing locally collected revenues, to perform development functions.

The district councils are composed of elected officials of the communities and villages (two-thirds) and appointees of the major traditional authorities (one-third) who meet six or more times a year to discuss community problems, needs and priorities, and suggestions for specific development activities. A "District Chief Executive" (DCE) appointed by the Ministry of Local Government serves as executive secretary for the individual council, and the district heads of the sectoral ministries meet with the councils as ex-officio members. In principle, the DCE coordinates the activities of the district government, within policy guidance of the councillors. In fact, his responsibility is much clearer than his real authority. Only a few of the sectoral ministries have decentralized pursuant to the 1971 Act, and even they continue to function in a highly centralized fashion (although through regional intermediaries, in some cases).

The District Chief Executives and their district councils have been incapable of coordinating the sectoral activities at the district level. Managerial and other difficulties which currently impede district coordination and administration have been identified through a series of training seminars which were conducted in 1979 by the Economic and Rural Development Management Program (ERDM). ERDM is a USAID-assisted project -- see Part IIA 4 for description. Among the problems cited by participants at the seminar in Atebubu District were the following:

- Centralization of management by sectoral ministries is preventing cooperation between the sectoral departments at the district level. There is little or no exchange of information regarding programs and problems, and no cooperation in assisting each other with equipment or other resources.

- The district councillors meet infrequently with the district-level sectoral officials. There is inadequate communication between the district council and the local communities regarding the communities perceptions of priority needs and the district capabilities to help address those needs.

- The district chief executive is allowed little authority to control the sectoral departments in the district because of the "allegiance" which the ministries demand of their cadre in the field.

- Exacerbating problems are those of travel within the district (rough or impassable roads, poor or no vehicles, inadequate travel allowances, no accommodations in villages); a paucity of vehicles, tools, personnel and other resources available for use by the operating departments; lack of telephones or other means of communication, cumbersome budgetary process and inadequate involvement of middle-management in the allotment processes; among many others.

The net effect of this has been a very loose confederation of governmental entities at the district level, who, lacking clear authority for coordination, or the means to make such coordination effective have retreated into a "do your own thing" philosophy. The future of career personnel of the sectoral ministries* feel that they have insufficient resources to exercise their won functions, let alone help their colleagues in other sectors; lacking the means to demand cooperation from the operating departments, and inadequate revenues to finance development activities on their own, the district councils have symbolic meetings at which little or no coordinating of district priorities takes place. This is the frustrating situation which has prevailed during the pre-implementation phase of DIPRUD.

The Government of Ghana continues to believe in the merits of decentralized rural development planning and local administration. A bill currently before Parliament will establish the Local Government Act of 1980. The Act would substantially clarify the role of the DCE (whose title would change to "Clerk of Council"), would make the Clerk responsible for coordination of programs of "all other government institutions ... in the district and for "harmonizing" them with those of the district council. His authority would extend to matters of administration and discipline over the sectoral departments (functional technical supervision continuing to be provided through the ministries). The Clerk of Council's new authorities should strengthen the ability of the district council to ensure cooperation of the operating sectors in development planning, prioritizing within district perceptions of needs, and cooperation in application of total resources. (Table 1 is a functional organization chart of the district council as established in the proposed Act).

This assumes, of course, that Parliament enacts the new legislation, and that there will be a national commitment to make it work. The central ministries will continue to be strong, and there will likely be some

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* is with their ministries; the ministries ...

resistance to the reduction of their control over the field cadres.

Another unknown will be the role and influence of the regional councils as it affects the authorities and controls exercised by the district councils. In this regard, the language of the proposed Act seems to create a basis for the regional council to insert itself into the administrative functions of the district council, including "..... the approval, coordination and supervision of the development plans and programs of the district councils in the region and the coordination and supervision of any other functions of such district councils." In fact, it would seem unlikely that direct involvement by the regional council would occur except in situations of crisis.

A more probable influence which the regional council might exercise would be through the allocation of central government grants-in-aid for development activities. These funds are to be administered through a Local Government Grants Commission in the Ministry of Local Government which is responsible "(a) to determine the proportion of grants to be allocated to regional councils and the local government councils ... (b) to make grants to the district and other local government councils ... for specific projects approved by Government; ... to augment the income of the district council ... whose revenue and resources are inadequate ...."

The grants-in-aid program will be a useful tool for motivating local developmental initiatives within the districts, particularly of the self-help variety. The only resources currently available for such initiatives are the poor revenues which the districts currently are able to collect, together with donor agency contributions, and these are totally inadequate for the needs.

Table 1

DISTRICT GOVERNMENT

(Bill for local Government of 1980)

Regional Admin. Officer is responsible for supervisory and disciplinary control over Clerks of Councils

Regional Minister
Regional Admin. Officer

Dist.Council Admin. Authority

Clerk of Council
is the head of the staff of the Council, is responsible for disciplinary matters and for coordination of programs of all other government institutions in the district, and harmonizing them with those of the D.C.

District Council

A deliberative body concerned solely with matters of policy & the critical assessment of the performance of the staff in charge of the various departments of the council:

12 Wards
12 Elected Councillors
6 Appointed Tribal Councillors

Councillors represent the Committees, villages and tribal groupings in the communities. Some villages have organized Village Development Committees which are the local entities for planning and implementing development activities.

Sectoral Ministries

The district sectoral departments report to the ministries except for matters of administration and discipline. Some of the ministries exercise this role through their regional structure.
Others centrally from Accra.

Dist. Sectoral Depts. (partial list)

- Agriculture
- Treasury
- Education
- Survey & Town Planning
- Social Welfare & Com. Development
- Public Health
- Engineering
- Statutory Corps.

ANNEX F *

SOCIOLOGICAL PROFILE OF THE ATEBUBU RURAL FARMING COMMUNITIES

The sociological analysis portion of this study focusses on two groups of respondents: 1) 500 non-farmers and 2) 1000 small-scale farmers in the Atebubu district.

The sociological component of the two surveys provides background information on the overall sociological characteristics of the population in the district. These data enable one to compare sociological attributes of the two groups of respondents.

3.1 Characteristics of Respondents

Basic Ascribed Characteristics

There is a higher proportion of older people among the small-scale farmer sample than in the non-farmer sample. About 69% of the small-scale farmer sample were over 37 years, while 47% of the general sociological sample were above that age. (See Table 3.1). The small-scale farmers were largely male (92.3%) while the non-farmer sample had a slight majority of (58.6%). (See Table 3.2). These findings indicate that small-scale farmers in Atebubu district are largely male and concentrated in the older segments of the population. This does not mean however that women are not involved in small-scale agricultural activities as discussion in Chapter Four describing the farming system in the district will indicate.

* From "Economics of Small Farm Systems and Socio-Economic Conditions in the Atebubu District", UST, Ghana and Va. State Univ. December 1979 (tables not included in this extract)

Ethnic and Religious Characteristics

The two groups of respondents in the surveys are heterogeneous with respect to tribe. In addition to the main indigenous groups, Brongs, Chumurus and Dwans, there are other Akah groups , Ewes (mainly fishermen and fishmongers), various ethnic groups from the Northern and Upper Regions, and non-Ghanaians from various West African countries. (See Table 3.3). The heterogeneity of the area is also reflected in the languages and dialects spoken and hometown. In addition to their own mother tongue, most respondents speak another language, the most important being Twi, followed by Hausa and then English. While in both samples, a large proportion of the respondents came from other regions of Ghana, almost two-thirds of the non-farmer sample and half of the small-scale farmers were born outside the area. (See Table 3.4).

From Table 3.3 it can be seen that tribes from the Northern and Upper regions predominate in the district followed by Brongs and Chumurus. The respondents' hometown region are mainly Brong-Ahafo, Northern and Upper Regions which account for the largest proportions of the two sample groups with 84.1% of the small-scale farmers and 69.5% of the non-farmer sample.

The two dominant religions in the district are Islam and Christianity. The small-scale farmers are predominantly Moslem (41.8%) with Christianity the next major religious group (28.8%) and the remaining 29.4% consists of traditional religions. The non-farmer sample shows a majority of Christians (47.2%) followed by Moslems (34.9%) (See Table 3.5).

Marital Status

The largest proportion of people in the district are married monogamously (63.8% of the small-scale farmers and 63.6% of the non-farmers).

Polygamous marriage is not as predominant as one would have expected, but it is worth noting that its incidence is higher among small-scale farmers. A slightly greater percentage of the non-farmers sample were never married, formally divorced or widowed. (See Table 3.6).

Educational and Occupational Characteristics

It is in the area of education that one of the strongest contrasts is seen between the small-scale farmers and the other groups. As will be noted from Table 3.7, 73.3% of the farmers have no schooling versus 53.5% of the non-farmers. The small-sacle farmers when compared with non-farmers show a higher proportion with Arabic schooling and lower proportion with primary and middle schooling. This indicates that the small-scale farmers in the district have had little access to formal education and only 1.1% have gone beyond primary school.

Engaging in more than one occupation, job, or profession appears to be a common phenomenon widely practiced in many rural communities in Ghana. In the Atebubu district, it was found that about 30% of the small-scale farm operators, and about 58% of the non-farmers were engaged or employed in minor occupations of various kinds. The largest segment of the 306 small-scale farmers listing a minor occupation were found in the retail trade and small-scale businesses (35.3% and 22.9%). These two employment areas were also found to be the predominant major occupations of the non-farmer sample (35.5% and 21.8%). Of this group, the 292 who listed minor occupations were concentrated in the agriculture related area (74.7%). It appears that agriculture, retail trade and small-scale business are the predominant occupational categories of the Atebubu district. (See Tables 3.8 and 3.9).

Most small-scale farmers (79%) and non-farmers (approximately 65%) seem to have held the same job for more than eleven years. People who have

changed jobs have done so mainly for economic reasons (i.e., to seek more attractive job opportunities.

Cross-Examination of Characteristics

Examining age by level of education reveals that among the small-scale farmers those who had Arabic schooling were predominantly above 32 years. The largest group with no schooling were in the 42-46 age category (20.7%) and that overall higher percentages of no schooling were found above 32 years of age. An examination of education by income did not show increased earnings with higher educational level. When sex of respondent is examined by educational level it is found that 82.9% of women had no schooling compared with 72.4% for men. In addition women had lower percentages of primary and middle school education and no Arabic schooling.

When examining the small-scale farmers' education by their minor occupation it is found that of the 301 respondents listing a second occupation 38% of those with no schooling were in retail trade, 22.4% in small-scale business and 10.9% in an agriculture related job. Among those with primary education, 23.2% were artisans, 25% in retail and 28.6% in small-scale business. Middle school education was largely represented in retail (40%) and small-scale business (26.7%). The two largest job categories for "0" level education were retail (57.1%) and agricultural related jobs (28.6%). Those with Arabic school training were concentrated in professional/managerial (62.5%) and retail (18%). Throughout the education categories, the two areas of retail trade and small-scale business seemed to be the predominant minor occupations of the small-scale farmers reflecting the importance of these two areas in the employment sector of the Atebubu district.

The non-farmer sample showed the greatest number of persons with no schooling in the 27-46 year category (36.3%). The younger persons in the sample had more education. When age is examined by major occupation, for the non-farmers a strong concentration is seen in the retail trade and small-scale business categories. Over 50% of all workers in the 22-46 years age range are in these jobs. Respondents indicating a minor occupation were heavily concentrated in agricultural related work. This was especially true for the 22-46 years age groups.

The non-farmer sample showed greater variation between men and women for certain characteristics. These distinctions can be attributed to greater numbers of women in the non-farmer sample (41.4% versus 7.7%). About 62% of the men had never married versus 3.8% women. Around 18% of the men were married polygamously. A larger proportion of women were formally divorced (10.4%) than men (3.8%). There were also more women in the widowed category (11.4%) than men (0.7%). This last finding could be attributable to the age of respondents since there are slightly more women in the oldest category (52.4%)

Sex examined by education, shows a higher percentage of men than women have education over all education categories. About 72% of the women had no schooling versus about 42% of the men. Women are predominant in the retail trade (76.1%) but are under-represented in all other employment categories except small-scale business. An examination of minor occupation reveals that women make up 54.8% of retail trade and 58.3% of small-scale business. Men predominate in agricultural related jobs (75.2%) and in the artisan category (100%).

Examining education by major occupation, those with no schooling, primary, and middle school worked predominantly in retail trade and small busine:

The average household size in the small-scale farmer sample is 5.6 persons.[1] The non-farmer sample averaged 5.1 persons per household.

The household heads of each sample were compared for some basic characteristics. The small-scale farmer sample showed household heads to be predominantly in the 18-50 years of age category (69.5%). About 95% were male and the majority of the heads of household were married monogamously (72.1%) while 15.7% were married polygamously. The non-farmer sample household heads were predominantly 18-50 years of age (about 82%). About 78% of the household heads were male and 21.5% were female. About 67% were married monogamously and 12.1% polygamously.

The households themselves were made up of 53.1% males and 46.9% females for the small-scale farmer sample. The non-farmer households had 50.2% males and 49.8% females. The age distribution for the households were also similar in both survey groups. The 1-15 age category showed 42.7% in the small-scale farm sample and 43.9% in the non-farmer sample. The largest category for both was the 16-50 year range with 48.7% in the small-scale farm households and 49.9% in the non-farmer group. The upper age categories (51 and above) showed 7.7% and 6.2% respectively for these households.

The two survey samples show differences in marital status and religion. The non-farmer survey households showed a greater proportion of never married persons (41.9%) than the small-scale farmer group (29.7%). This cannot be attributed to differences in age, as shown above, but may be partly due to an under-representation of younger family or household members in the small-scale farmer survey due to limitation on the number of people in the household that data were collected on. The largest groups in both samples are

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[1]The number is an approximation as information was only collected on up to 11 persons in the small farmer sample, and the actual average may be higher.

The 282 respondents listing a minor occupation were heavily involved in agricultural related jobs (74.5%). This occupation predominated across education levels.

These cross-examinations of characteristics indicate the importance of the retail and small-scale business sectors in the Atebubu district along with agriculture. Even those persons who are not working as farmers are involved heavily in agricultural related jobs as a second source of income.

3.2 Rural Social Structures, Relationships and Responsibilities

An understanding of socioeconomic behavior of rural people depends on an awareness of the influence of the family and social context which may impinge on their decision-making. This section will examine the basic structure and size of households in the study area, the compositon of rural households, and the effect of these rural social relationships on household responsibilities.

The Family/Household Structure and Size, and Composition of Rural Households

Data on characteristics of the rural households were obtained by asking the respondents in each sample to give information on the persons living in their household. In some cases, the respondent was the household head, in others he/she was a household member. This request yielded information on a broader range of persons than the 1,000 and 500 contained in the samples surveyed. This information can thus be used to present a broader spectrum of the sociological characteristics of people in Atebubu district, and to draw certain inferences about social characteristics of household units.

married monogamously with 59.9% in the small-scale farm households and 45.7% in the non-farmer group. In comparing religious affiliation, the small-scale farm households were 31.3% Christian, 43.6% Moslem, 16.9% Pagan and 7.7% fetishist. In contrast, the household members in the non-farmer survey were 48% Christian, 37.4% Moslem, 11.9% Pagan and 2.8% fetishist. The small-scale farm household showed higher percentages of members who were Moslem and those who practised traditional religions.

When examining occupation and employment status, there appear to be some differences between the small-scale farm households and the non-farmer households. The first group has the largest concentration in agriculture related occupations (52%) followed by other occupations (26.5%) This last category includes students, housewives and unemployed. Retail trade is next with 12.7%. The non-farmer households have the largest number in other occupations (38.8%) followed by retail trade (19.6%) and agriculture related (13.7%). Examination of employment status helps to explain occupation as both surveys have large numbers of students (20.3% for small-scale farm and 26.3% for non-farmer). Both household groups have the largest numbers in the self-employed category (65.7% small-scale farms and 46% non-farmer). The non-farmer households have a larger number of unemployed (8.6%) than the small-scale group (4.9%).

Rural Social Relationships

Kinship and obligations are important in the social systems of developing countries especially rural communities, since here the ties are strong and the obligations binding. For a study of rural communities, it is important to seek out information on the web of kinship since it is believed that kinship obligations can have effect on individual effort. Studies on

the kinship system have shown that it has both negative and positive effect on an individual. On the negative side, it is argued that dependence of relatives on a worker may weaken his/her motivation to work harder since any financial success might mean a host of claims from poorer members of the extended family. On the other hand, the strength of family ties might become encouragement to improve earning power. The study attempts to find out the network of kinship relationship and their importance in the lives of small-scale farmers and other individuals in the Atebubu district.

About 25% of the small-scale farmers and about 36% of the non-farmers have dependents living outside their household. These dependents are parents, siblings and, in a few cases, adult children, laborers, servants, friends (non-relatives).

The main obligation involved for both the small-scale farmers and the non-farmer survey is material assistance (financial, educational, clothing, etc.). About 80% of the non-farmer group and 70.2% of the small-scale farmers owed such obligations to close kin (members of their extended families). Most respondents from both groups felt delighted or proud to meet these obligations (over 50% in both cases). Only 5.8% of the small-scale farmers and 9.8% of the non-farmers felt that these obligations were a worry or burden to them.

The respondents from both samples retain links with relatives both within and outside their communities with reciprocal visitations and services. Both groups visit close kin and other relatives often performing such services as assisting with farming activities and providing financial assistance (the two categories with the greatest response for both groups).

The small-scale farmer and non-farmers are also visited by close kin and other relatives regularly. Services performed for the respondents by these

relatives are predominantly financial assistance and gifts of food.

There seems to be strong ties between the small-scale farmer and their close extended kin, particularly brothers and sisters. These ties are based on a system of reciprocal exchange of material assistance and personal interaction. Perhaps the reciprocal nature of the material exchange explains why the majority of the respondents interviewed feel that kinship obligations are socially necessary. Whatever is given to dependents or other kin is returned in some other form under mutual agreement.

Household Responsibilities and Ownership Patterns

Household responsibilities reflect the cultural norms of the general society. Kinship and inheritance systems - both agnatic and uterine - seem to influence respondents' attitude towards property ownership, arrangement for spending, etc. For instance, the "successor" (in matrilineal or uterine kinship system) who succeeds either his/her maternal uncle or elder brother after his/her death (if he/she should die intestate) can take over his property and incorporate it into family property.[2] That individual property is always in the process of conversion to family property is important in a person's attitude toward joint ownership between husband and wife or a person and his/her family.

Five options are generally available to small-scale farmers for keeping their money; these are savings and current accounts with Banking Institutions, savings with susu groups or credit unions, and unorthodox non-institutional savings arrangements such as keeping money under mattresses, in boxes at home, etc.

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[2]Polly Hill, Studies in Rural Capitalism in West Africa, Cambridge, Cambridge University Press, 1970, p. 29.

It is generally believed that rural farming people usually prefer to keep their monies at home instead of in banks. The arrangements for keeping money adopted by small-scale farmers in the Atebubu district are presented in Table 3.25. A first striking thing noticeable from the table is that the small-scale farmers in Atebubu district do not operate joint accounts with others—including their spouses or other kin. Next, given the various money-keeping arrangements, it will be noticed that a preponderant percentage of the farmers do not use any one of the available systems. The table shows that for those farmers who have a money-keeping arrangement, the separate savings account system appears to be the most popular. The use of the current account arrangement is almost insignificant. This is probably due to the high incidence of illiteracy among rural farmers; also the rules of the financial institutions do not promote or favor the operation of current accounts by illiterate people.

The money-keeping arrangement designated "other" in Table 3.25 is obviously the most popularly used mode of keeping money by the small-scale farmer in Atebubu. This bears testimony to the general observation that rural folk (particularly rural farmers) prefer keeping their monies themselves to entrusting them to other people or agencies.

With respect to the rural non-farmer sample, the situation is almost similar with regards to the joint money-keeping arrangement. As in the case of the small-scale farmers, a majority of the non-farmer sample also have no money-keeping arrangements like their counterparts in the small-scale farmer sample; however, a relatively larger percentage make use of the institutional money-keeping arrangements.

Among the non-farmer rural people, the savings arrangement is again the most popular and relatively more people use this arrangement. This is

probably because this group contains mainly traders and small-business men and women. Next to savings arrangement, the current account money-keeping arrangement is the most popular. Here also, relatively more people use the system; a probable explanation is the larger number of literate persons in this group. Thirdly, it is worth remarking that non-farmers use money-keeping arrangements organized as susu groups or credit unions.

Finally, it should be observed that a greater percentage of non-farmers use the institutional arrangements for money keeping than those who still use the traditional non-institutional arrangement. This probably means that non-farmers are changing faster and moving away faster from tradition in this respect than their more 'conservative' counterparts—the small-scale farmers.

The small-scale farmers were almost equally divided on whether joint ownership of property with spouse was desirable (52.3% yes and 47.7% no). On joint ownership with kin, 54% were in favor and 46% against. Those who were in favor gave reasons which were predominantly for the promotion of better family development (68%). Those opposed to joint ownership gave preference to spouse and children inheriting property as their main reason (16.7%), with avoiding family disputes and inheritance problems as the next two reasons.

The non-farmer group was also almost equally divided on joint ownership with spouse (53.8% yes, and 46.2% no). On joint ownership with kin 58.4% were in favor and 41.6% against; basically the same reasons for one position or the other were given as in the small-scale farm sample. This group also preferred each spouse keeping money separately and contributing to household expenses.

In examining contributions for household expenses among small-scale farmers, it appears that most major household expenses were borne by the respondent or in some cases the spouse. (A similar pattern was in evidence for

the non-farmers also.) Both groups found household fund contribution arrangements satisfactory on the whole (close to 90%.)

In the area of performance of household activities, it was found that most housekeeping tasks for the household, preparation of meals, care of children, etc., are performed by the spouse (in the case of the small-scale farmers this is the wife), followed by self and then sons or daughters. Similar findings pertained to the non-farmer group. It is clear from these results that most household tasks are being performed by wives and children. The only exception is household repair which is undertaken by landlords. Shopping for food and fetching water are also chores being performed mainly by wives and children in the households. The majority of the arrangements are rated satisfactory by the respondents.

3.3 Traditional Social Structures and Attitudes Associated with Potential for Change

Traditional Social Structures

The present section points out factors which could affect the potential of the study area's subjects to modernize or to adopt innovations. The emphasis will be placed on traditional arrangements which could affect the motivation of the inhabitants to change their way of living or accomplishing tasks. Data from the study area show the high proportion of respondents with no formal education in both the small-scale farmer (73.3%) and the non-farmer (53.5%) samples. As Table 3.7 shows, 85.4% of the small-scale farmers and 77.5% of the non-farmer respondents have not gone beyond the primary years in school. The data indicate that the labor force in the study area is not highly educated. The respondents' low levels of education may be attributable to the need of having to start to work at a young age. However, the respondents may have accepted the educational achievement of their parents as a guideline

for their own educational goals. Lower levels of education, coupled with the rarity of visits by agricultural extension agents, is not conducive to the adoption of new agricultural methods or technologies. The older generation becomes the major source of knowledge about the physical environment and how to survive in that environment. The problem of modernization is heightened whenever the societal group places a strong emphasis on the respect of parents and elders who cling to the traditional way of life. In rural Ghana, most children are taught to obey their parents without questioning. With limited levels of education, individuals are not prepared to deal with new technical ideas on their own so they are likely to accept the advice of parents and community elders.

Religion and belief in the supernatural may also affect the orientation and the efforts of individuals to modernize and be innovative. Among individuals who still believe that illness and bad luck are caused by evil people through juju, the role of supernatural elements has to be taken into account. As long as individuals believe that factors affecting their lives are attributable to supernatural or mystical factors, they will not be motivated to make attempts at controlling events in their lives. It is believed by some of the people in the study area that God controls their economic future and the production on their land. This belief could discourage attempts at the introduction of new forms of technology not used traditionally. Thus, technology becomes of secondary importance in explaining economic success and failure. Table 3.10 shows that the major reasons why the small-scale farmers would not go to their farms on a particular day are religious (49.2%) or taboo (16.4%). Only approximately 30% of the responses indicated that a nonspiritual or nonreligious reason acted as a discouragement from working on the farm on a given day. On days that the small-scale farmers do not go

out into the fields, responses in Table 3.11 indicate that they generally spend it resting (36.3%) or engaging in religious activities (34.9%). The need to pay hommage or respect to God, on a specific day, could interfere with the farmers' most efficient scheduling of work activities on the farm. Freedom or flexibility to schedule work activities according to farmers' needs would be beneficial, rather than having work activities dictated by religious or supernatural beliefs.

Attempts to adopt innovations or to modernize should take into consideration the traditional arrangements for owning property between the husband, wife, and kin. The cost of modern technology is high and sometimes beyond the financial means of a given individual. Pooling of the resources of spouses and kin would make available to the small-scale farmer a greater amount of liquid capital to purchase equipment, parts, seed, fertilizer, etc. that could contribute to increased production. Pooling of resources can also lower the amount of risk taking on the part of any given individual. Lower risks might serve as an impetus to try out new methods and techniques. The willingness of individuals to form associations across kinship lines provides an avenue for increasing the political and the economic clout of its members. Cooperation with other workers in the same occupation would provide a mechanism that could be used to obtain credit, equipment, political favors, etc. In the study area, the small-scale farmer and the non-farmer survey samples were about equally divided on whether or not property should be held jointly by the husband and the wife (Table 3.12).

In regard to owning property jointly with kin members, Table 3.13 indicates that the respondents in both samples approved of it. The reasons for the approval of the ownership of property with kin were mainly distributed among the categories of promoting unity within the family, providing home

for child and kin, property used for family problems, benefits to children, extended family system, and inheritance system for the non-farmer sample of respondents in Table 3.14. Respondents in the small-scale farmer sample indicated that bringing unity within the family, providing a home for children and kin, property remains intact, and matrilineal inheritance system were the major reasons for approving ownership of property with kin. The data seem to indicate that ties with related kin are greater than those based on the marital bond when it comes to matters of property. There seems to be some basis to indicate that joint family effort or pooling of resources might be possible among individuals and their kinsmen.

Associations established with non-kinsmen have the potential of being larger and even more powerful than those established between kinsmen. The larger the number of individuals who could form a basis for an occupational association then the more influence and resources that could be brought to bear in improving economic conditions. Table 3.15 indicates that there is a large percentage (63.4%) of respondents in the small-scale farmer sample who would be willing to form associations with non-kinsmen, such as farm neighbors. The farmers who would be willing to join with their farm neighbors to form associations would seem to be putting their business interests in the fore front when choosing individuals to associate with in order to improve their standard of living. Only 7% of the small-scale farm respondents said they would choose their associates on the basis of friendship. Associations to help improve the economic position of the small-scale farmer in marketing, obtaining consumer goods, and joint ownership of machinery were the primary responses in Table 3.16. About 53% of the responses in the small-scale farmer survey indicate that the main benefit to be derived from an association to improve standard of living would be to provide access to work-

ing capital. The working capital could be used to acquire farm inputs of machinery/tools, labor, fertilizer, etc. (Table 3.17).

Another traditional arrangement which may have an effect on the production activity of the small-scale farmer is their pattern of living in the village rather than on the farm. Depending on the distance of the farm from the village, the small-scale farmers may spend a considerable amount of time in transit. Also, village life might provide distractions which consume time that might otherwise be spent on agricultural activities. Theft, animal or rodent damage, etc., to the farmers' crops may go unchecked due to the farmer's absence for periods of time in the village. The data reveal that 65.7% of the respondents would like to live on their farms. The remaining 34.3% of the small-scale farm respondents would still prefer to reside in their villages. The respondents who stated they would like to live on their farm (57%) said the reason was to be able to more intensively work their land. Table 3.18 shows that "family/social obligations" and "inconvenience because of other duties" were the most common responses chosen for why the small-scale farmer would not want to live on the farm (18.9% and 18.6%, respectively). The traditional custom of living in the village would not have to be changed if the mode of transportation to the farms is efficient. Presently, 50.7% of the small-scale farm respondents in Table 3.19 travel by bicycle to work compared to 48.5% who travel by foot. Among the respondents of the non-farmer sample, a much greater 75.2% travelled to work by foot and only 13.8% travelled by bicycle. Eighteen percent of the sample of small-scale farm respondents said they did not want to live on their farm because their farm was not far from the village. Distance from the farm and mode of transportation should be considered when examining ways to improve the farmer's production.

Communication channels should be examined when attempting to introduce new ideas into the occupational and farming methods of the area's residents. It appears reasonable to conclude that channels of communication used to receive information about the community would be channels that might effectively serve to convey new occupational practices and techniques to the study area's work force. Table 3.20 conveys the message that information must be processed through the traditional channels of friends, relatives, children and "gong-gong." The modern mechanisms of communication, such as radio, television, newspaper, magazines, and district information service, were used by less than 10% of either the small-scale farmer or the non-farmer respondents as sources of information about the community. Workers, such as farmers, are most likely to hear about new ideas if they are conveyed in an informal manner through friends, relatives, and children, with approximately 40% of each sample using this as a main source of information about the community.

Attitudes Toward Change

Individuals who feel successful may have the personal qualities and resources which enable them to obtain from their environment those elements which promote their feelings of successfulness. Success can become a self-fulfilling prophecy with success promoting in the individual those activities and frame of mind which are needed to generate future successes. Feeling that you are a failure can generate hopelessness. The feeling of being a failure and the belief, real or imagined, that the individual does not possess the necessary resources to become successful would not leave the individual in a state-of-mind that is conducive to trying out new forms of behavior or technology. The respondents from the non-farmer sample (40%)

in Table 3.21 were more likely to rate themselves more well-to-do or successful than the respondents in the small-scale farmer survey (28.1%). Forty-five percent of the small-scale farmer respondents placed themselves in the category of "near the middle" as compared to 23.6% of the sociological respondents. Among the respondents who placed themselves in the not successful or the near middle categories, over 90% of each sample expects to become successful. Although not successful, many respondents do not feel that the door of opportunity is closed to them. The likelihood that these individuals will become successful depends on certain assumptions being met. Success may be forthcoming if the respondents can obtain access to the items that they would need to become successful. However, it may not be realistic to expect that items designated necessary for success will ever become accessible in the quantities needed by many of these individuals. Capital is the major requirement believed needed for success among the respondents from the small-scale farmer and the non-farmer surveys. Also, the respondents from both samples indicate that machinery and equipment are also essential if they are to become successful in their occupations.

The importance of this section should be to highlight the need to take into consideration traditional social arrangements and the attitudes of the people when proposing plans to introduce new forms of technology or innovations that affect the people's economic activities. Failure to take the social element into consideration may lead to a loss in effectiveness of the efforts to introduce the new economic or agricultural ideas.

3.4 Sociology of Economic Behavior

Economic behavior is influenced by social factors which affect choices and patterns of action. Some of these factors include work habits, allocation of work effort, subsistence/market behavior, selection of credit sources and patterns of decision-making.

Farming Activities

Work habits

The small-scale farmer's day begins between 7:00 and 8:00 a.m. and ends around 4:00 or 5:00 p.m. Thus the farmer spends eight hours at work with a rest period of about an hour and half. Actual time spent on various activities of farming is thus six and half hours.

Most of the farms are not very far from the farmers' house. The average distance from the house is 5.0 kilometers and the farmer takes on the average 42 minutes to get to work.

The main non-farming days for the farmers are Fridays, Sundays, market days and 'Kapoke' days. Moslem and Christian farmers do not work on Fridays and Sundays respectively, and most Moslems and Christians give the reasons for not working as religious. 'Kapoke' days are traditional days which are considered to be taboo days and people are required not to work on the land. This custom is prevalent in Yeji township area and every sixth day is considered 'Kapoke' day. For instance if Tuesday is 'Kapoke' day, the next 'Kopoke' day will be Monday and so on. Farmers take the opportunity offered by non-farming days to perform their duties and chores such as attending religious service or activities, resting, marketing and shopping and working on their minor occupations.

Financial activities

One of the important factors which influences farmers to continue farming for self-sufficiency is security and social recognition. A farmer's inability to produce sufficient food to feed his own family and other kin is still regarded as a shame. The stability of such security is evidenced by the fact that only 12% of the sample indicated that they wanted to change to other crops. The experience that they have acquired in growing these crops provides a higher probability of meeting the subsistence needs with the particular combination of crops which have been successfully grown over time. Farmers favor continued self-sufficiency in food production because they also need it in exchange for financial and material gifts which other kin, especially those outside the community, give them. The majority of the farmers find it difficult to obtain credit from credit institutions mainly because of the cumbersome administrative procedures and delays by bank officials and what to the farmers seems unnecessary rejection of their applications. This attitude of perceiving the bank officials in negative terms is likely to affect the way farmers respond to formal credit institutions. This is unfortunate since the culture and social organization of the lenders are such that the local officials have no choice but to work within the constraints and opportunities within the organization.[1] The farmers are unaware that these organizations are bureaucratic, that authority flows from the top to the bottom, and that while it may be delegated, the actual control still rests with the authority at the top and that communication between the various hierarchies takes some time. For this reason, the farmers become distrustful because credit is given too late to be useful. For this reason, farmers tend to use

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[1] D. Gordon: Credit for Small Farmers in Developing Countries, Boulder, Colorado, Westview Press, 1976. pp. 53-64.

non-institutional sources of credit where loans are readily available without bureaucratic constraints associated with institutional sources.

About 28% of the small-scale farmers responded that they would expand their farming business should they become richer through farming, while 37% would build houses, 16% would increase personal property and 15% would invest in children's education. (See Table 3.22).

The investment opinions expressed by the farmers are consistent with the norms of prestige not only within the community, but in Ghanaian society in general. The farmers have the expectations and aspirations of most Ghanaians. They are acutely aware that if they are able to conform to certain norms of prestige attained by certain patterns of consumption which conform to the standards of highers groups (e.g., rich businessmen) within the society, they can have economic advantage and may be able to achieve some of the advantages of such groups.[2]

Non-Farming Activities

Persons in the district not directly involved in small-scale farming are represented by the non-farmer sample. Their activities can also be evaluated in terms of their economic behavior and its relationship to sociological constraints. As explained in 3.1, the primary occupations for Atebubu district are in retail trade and small-scale business in addition to agriculture (See Tables 3.8 and 3.9). 82.8% of those responding in the non-farmer sample indicated that they had sought these occupations on their own. Of those who did not select their own occupation, almost one-half had it selected by their parents.

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[2]Gordon, op. cit.

Work habits and material requirements

Most people begin work around 7 a.m. and finish working around 5 p.m. Most variations in work day activities are seasonal or related to the nature of the activity itself. Many people use intermediate imputs in their occupation. The main source for these materials is the local market followed by sources outside the district, local shops and government agencies. When asked what kinds of inputs are needed to increase output, respondents listed fixed inputs first followed by intermediate inputs. Less than 5% listed support facilities as the inputs needed.

Outputs were mainly sold to the general consumer (79.5%) with market women (8.2%) and institutions/firms (3.5%) also mentioned. The main reason for selling goods and services given was the existence of demand in the community (87.1%).

Respondents lived approximately 5 kilometers from their work and take approximately 22 minutes to reach it (on the average). The largest proportion reach their work by foot (75.2%) followed by bicycle (13.8%).

Attitudes Toward Work Situation

Of those responding, 74.2% found their opportunity to advance themselves adequate. About 42% had special skills (mainly in technical areas, agriculture and teaching) and 58.4% had no special skills. Those with training had obtained it formally (61.7%) and on the job (34%). Most people said they had an opportunity to use training on their current job (76.4%). Those that could not said that the situation could be improved mainly through relocation. Only a small group (96 responses) obtained fringe benefits through work (mainly rent). Men and women were said to be treated equally at work in terms of workload (75%) and responsibility (63.5%) with some respondents indicating

inequality in these two areas.

About 58% of those responding said that work had caused a transfer and the average number of times was two. The outcomes of these transfers had no effect on 21%, but others listed damage to property and accommodation problems as negative results. When asked to list factors hindering job performance, people listed working conditions, accommodation and lack of inputs.

When asked if the respondent had people working for him/her the answers were almost evenly divided. Of the half who employed others, paid family workers were more likely to be permanent than casual and were mostly male and over 15 years of age. Unpaid family workers were mostly permanent, female and over 15. Hired labor was mostly casual, male and over 15. Apprentices were both casual and permanent, 75% male and over 15. Most people were hired for the full year, with the January-April season ranking next.

Financial activities

When asked if they had a source of credit, 65.7% of the non-farmer sample said no. The main reasons given were no need, no access, and unsuccessful attempts. Of those with a source of credit, the uses listed were mainly for general expenses (farm/business), to purchase inputs and for subsistence. The main sources of credit listed were commercial banks, credit union, money lenders and personal savings. Parents and spouses were also listed as sources. The sources used most often are commercial banks, personal savings, parents and credit unions. These sources were used mainly because of lending conditions. About 54.4% said that they paid interest for their credit and that loans were paid in a specific time period. Most of the 23% who used security for the loan used their house first followed by two guarantors. The main reasons given for repayment problems were crop failures and fluctuation in

types of decisions that may be made by the typical rural household unit. These decisions relate to where to live and work, how to educate children both from the secular as well as the moral aspects, what crops to grow, what resources and how much of them to use, etc. The decision-making authority in the traditional rural household may be the head who is commonly the husband, and sometimes the wife. In the case of the small-scale farmer sample columns (a) and (d) in Table 3.23are added together to make the last column (a & d), representing the head of household as another decision-making agent. This is not done for the non-farmer sample since almost 50% of this sample consisted of women. The decision-making process in the Atebubu district among small-scale farmers generally involves four main decision-making agents. As indicated by Table 3.23 the most important household member who makes most decisions appears to be the household head. This individual is presumably the husband, or less often the female spouse. The decisions made by this individual range over all the (tabulated) types of decisions taken in the farm-firm-household.

The next important decision-making agent appears to be the husband and wife together' or 'both decide together.' Again, the type of decisions ranges over all the possible decision types commonly taken within the farm-firm-household. The third decision-making agent of importance is described as "husband with wife's advice";lastly, it is interesting to note that decisions taken by 'husband alone' are the least common.

The pattern of household decision-making by non-farmer groups is almost similar to that of the small-scale farmer. The essential difference in pattern between the two groups of rural people seems to be that within non-farmer households decision-making by "husband alone" is more prevalent than it is within purely farm-firm-households. However, it could be said that generally, no essential differences exist between the decision-making patterns of rural farmers and their counterparts, the non-farmer group.

ANNEX G

SELECTION CRITERIA AND RANKING SYSTEM FOR SUB-ACTIVITIES

Summary Data on Proposed Sub-Activity

- Location: _____
  Village _____, Ward _____
- Nature of Activity: _____
- Budget Cost _____Cedis
- Expected life of facility (if construction)_____
- Number of Beneficiaries: Primary_____
  secondary _____
- Main ethnic group involved _____

Criteria and Checklists - General

Four main categories of criteria are defined: economic, social, construction and environmental. Overall rankings of the sub-activity for each main category are indicated below. Evaluation rankings are graded 1 through 3:

1 - ranks low
2 - ranks moderately
3 - ranks high

The purpose of the factor ratings is to insure careful deliberation: in the sub-activity design process so that feasibility issues are adequately treated. Rankings will not be totalled to dete rmine selection priorities; however, activities with any overall ranking of 1 will not be considered for approval.

Overall Ranking by Major Qualifying Criteria

- Economic Criteria ranking 1 2 3
- Social criteria ranking 1 2 3
- Construction criteria ranking 1 2 3
- Environmental criteria ranking 1 2 3

The above overall rankings are derived from rankings of the elements of the major criteria. These are attached hereto. (Any not applicable elements in particular sub-activities are marked NA.)

Elements of the Major Criteria

Rankings

Economic

1 2 3 - The activity should have a developmental purpose.
1 2 3 - Benefits should be high enough to motivate users to utilize or exploit the facility or activity, and to insure its maintenance.
1 2 3 - Annual input costs required of the users to expoit the activity should be realistic and reasonable.

1 2 3 - Adequate markets for the production or service should be assured.
1 2 3 - Technology required to exploit the facility or activity should be adequately simple, and the part icipants should have the necessary skills.

1 2 3 - Technical assistance of specialists should be securable for upgrading skills or improving efficiency of the production process.

Social

1 2 3 - The number of beneficiaries should reasonably relate to the magnitude of the activity.
1 2 3 - The beneficiaries should be clearly identified, both primary and secondary.

1 2 3 - The poorest in the community should feel the benefits to a substantial degree.
1 2 3 - The activity should be designed to enhance or protect the welfare of women in the community.
1 2 3 - Inconvenience to any individuals which the act_ivity might cause should be minimal and adequaately compensable.
1 2 3 - Disruption of existing social traditions and values which might result from the activity must be acceptably insignificant.
1 2 3 - The activity s hould be of a nature which would motivate and enhance community organization and participation in development activities.

Construction

1 2 3 - The location of the activity sho_uld be accessible.
1 2 3 - The activity should emphasize manual labor.
1 2 3 - The activity should be capable of completion in n o more than four months.
1 2 3 - Workers necessary for any construction should be available without detriment to local planting and harvesting needs.
1 2 3 - Any machinery requirements should be securable at the time required.
1 2 3 - Any technical expertise requirements should be securable at the time required.

Rankings

Construction (cont'd)

1 2 3 - Design required for the facility should be relatively simple.
1 2 3 - Maintenance of the facility should be relatively simple, and within the funding and skills resources of the community and district government.

Environmental

1 2 3 - Environmental effects of the activity on soil, cultivation, habitation, accessibility, public health, etc., should be favorable. Potential adverse effects should be minimal and relievable.

Economic Analysis Worksheet - Enterprise Activities

- What products or services will be produced? _____
- What is the current unit price? _____
- What will be the total amount of production or output to result annually from this sub-activity? _____
- What will be the gross value of that output (based on current unit price)? _____
- Has an adequate market demand for the product or services been verified? _____
- Is the technology involved uncomplicated and field-tested? _____
- Do the participants possess the necessary skills? _____
- Will necessary training specialists be available for upgrading skills? _____
- What will be the annual cash costs to the participating entrepreneurs for them to utilize the facility or to operate the enterprise? _____
  - Costs of raw materials, tools, etc. _____
  - Annual costs to maintain facility _____
  - Total annual cash costs _____

  (Note that the labor of the participants themselves is not included in this evaluation)
  - What will be the value of the output after the above costs are deducted? _____
  - How many participating farmers or artisans or entrepreneurs will earn this income? _____
  - What would be the average per capita share? _____
  - Will this be sufficient to insure that the activity will be utilized/exploited? _____

Economic Analysis Worksheet - Wate r Impoundment Activities

- How far do villagers now have to go for water during the dry season? _____
- How many villagers will utilize the proposed pond? _____
- How far will they have to go to utilize the proposed pond? _____
- Is the saving in their time sufficient to insure that they will utilize and maintain the pond? _____

Economic Analysis Worksheet - Other Infrastructure Activities (such as access roads/tracks, docks, market shelters, etc.)

- What is the facility proposed? _____
- What is the purpose and expected benefits: _____
  - to facilitate transport of produce by prov iding _____
  - to facilitate livestock production by providing _____
  - to improve water supply for _____
  - to facilitate marketing by _____
  - other purposes and benefits _____
- How many beneficiaries will utilize facility? _____
- Currently these people are handicapped because they must _____
- The facility will cost _____ Cedis and should last _____ years
- Its estimated value per beneficiary per year is _____ Cedis, based on the assumption that _____
- An adequate system to insure maintenance of the f acility has been developed and is described in the sub-activity proposal _____.

Analysis Worksheet of Social Aspects and of Beneficiaries

- How many primary beneficiary family units? _____
- How many primary beneficiaries (including family members)? _____
- What predominent ethnic group? _____
- What is their primary economic activity? _____
- What is their economic level in community? _____
  - Economically depressed _____
  - More well-to-do villagers _____
- How will activity affect women beneficiaries? _____
  - Significant positive effect expected _____ because _____
- How many secondary beneficiaries? _____
- How will they benefit? _____
- How would they be inconvenienced? _____
- How will they be recompensed, or their inconvenience remedied? _____
- Is the activity of a nature to encourage further community participation in planning development activities? _____
- Will the activity have a potential adverse effect on existing social traditions in the community? _____

Analysis Worksheet of Technical Aspects - Construction -type Actities

- Dates of construction would be from _____ to _____.
- Implementation will require _____ workers.
- They will be required at a time of low _____ or high _____ seasonal workload for agriculture in the community (planting season, harvest season).
- If required during busy agriculture season, adequate labor for the construction can be assured by _____
- Technical design of the rural works activity was simple - it was accomplished by technical cadre available in the region _____
- Technical design is more complicated -it has required special technical assistance from _____.
- Additional technical design will be necessary for _____ prior to start of construction.
- Implementation will be supervised by _____
- Technical assistance will not be required for the implementation _____.
- Technical assistance will be required and secured as follows _____
- The nature and dimensions of the activity is adequately described in the sub-activity proposal _____.

Environmental Impact Analysis Worksheet

(To be completed for all types of activities, with those eleme n ts which are not applicable marked NA.)

- The rural works activity will change the course, flow or storage of surface water as follows _____
_____

- The rural works activity will have the following impacts or potential impacts:

	Negative	Neutral	Positive
On soil erosion			
On soil fertility			
On flooding			
On community health			
On displacement of villagers			

- Any negative effects are minor_____significant _____
- They may result because _____
_____
- They will be minimized/corrected/compensated for by _____
_____

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ANNEX H

Supplies and Equipment for TA Team
U.S. Procurement -- CIF Accra

	Year 1	Year 3	Each Other Year
2 5-ton diesel dump trucks	$ 80,000	$	$
4 Scout Blazers or Carryalls	60,000	60,000	
1 7-ton diesel flat-bed	30,000		
5 Motorcycles with spares	11,500	5,000	
25 Bicycles with spares	5,000	2,000	
3 Typewriters	2,500	1,000	
1 Mimeograph	2,000		
1 Tractor with bucket and back hoe	21,000		
Vehicle parts and tires	40,000	35,000	
Tools and machinery	5,000	1,000	
Office Supplies	5,000	4,000	
Furniture and Appliances	92,000		
	$354,000	$108,000	
Contingencies	35,000	12,000	5,000
	$389,000	$120,000	$ 5,000

Local Procurement - Local currency (in dollar equivalents)

	Year 1	Each succeeding year
Generator fuel	$16,000	$16,000
Other POL	35,000	35,000
Office furniture	5,000	
Emergency local procurement	5,000	5,000
Local contractual services	5,000	5,000
	$66,000	$61,000

Ghana - DIPRUD Costs (Cedis 000)

	Years					
	1	2	3	4	5	
Councillors- 162 pers. days at ¢30	4.9	5.0	5.5	5.5	5.5	
DC Clerk and staff @ 25% first year	30.0	30.0	35.0	35.0	40.0	
Dist. Development Office @ 100%	15.0	15.0	15.0	25.0	35.0	
SW/CD Dept. @ 25% first year	30.5	35.0	35.0	40.0	40.0	
District Engineer @ 25% 1st. year	5.0	5.0	7.0	7.0	8.0	
Reg. Min. & Adm. Off. @ 10% 1st. yer.	5.0	5.0	7.0	7.0	8.0	
Min. Local Govt.20% one pers. year	4.0	4.5	5.0	5.5	6.0	
Highways Dept. 310 pers. days/yr.	18.5	20.0	25.0	25.0	30.0	
Communities 750 pers. days @ 10¢	7.5	10.0	15.0	15.0	15.0	
Other miscellaneous departments	15.0	18.0	25.0	25.0	30.0	
Other miscellaneous costs	30.0	30.0	30.0	35.0	35.0	
	165.4	177.5	204.5	225.0	252.5	
Community contrib. to activities	235.0	315.0	371.0	371.0	175.0	
						Totals
Sub-total ..	400.4	492.5	575.5	596.0	427.5	2491.9
Inflation ...	192.2	541.8	1070.4	1668.8	1731.4	5204.6
Total Costs (Cedis)000)	592.6	1035.3	1645.9	2264.8	2158.9	7696.5
Total Costs ($000)						2800.0

DIPRUD Technical Assistance Team

	Years ($000)				
	1	2	3	4	5
Expatriates					
Rural Development Aevisor(R-3 level)	63	64	65	66	67
Civil Engineer (R-4 Level)	52	53	54	55	56
Contractor overhead and fees (75% base salary)	55	57	59	61	63
	170	174	178	182	186
Ghanaian					(¢000)
Rural Development Spec./Eng.(N-3 Level)	13.5	14.0	14.6	15.2	15.8
Rural Com.Dev.Specialist (3 at N-4 Level)	35.1	36.6	38.4	39.9	41.7
Office Manager (N-5Level)	10.6	11.1	11.6	12.0	12.5
Clerk-Steno (N-7 Level)	8.7	9.1	9.5	9.9	10.3
Mech/Driver (N-8 Level)	7.9	8.2	8.6	8.9	9.3
Mech/Driver (N-9 Level)	6.9	7.2	7.5	7.8	8.1
Maintenance Asst. (N0-10 Level)	5.8	6.1	6.3	6.6	6.8
Totals in ¢000	88.5	92.3	96.5	100.3	104.5
Equiv. in $000	32.2	33.6	35.1	36.5	38.0

ANNEX I

PROJECT AUTHORIZATION AND REQUEST FOR ALLOTMENT OF FUNDS

Name of Country: Ghana

Name of Project: District Planning and Rural Development (DIPRUD)

Number of Project: 641 - 0073

1. Pursuant to Section 103 of the Foreign Assistance Act of 1961, as amended, I hereby authorize the District Planning and Rural Development Project (DIPRUD) for the Republic of Ghana involving planned obligations of not to exceed $7,850,000 in grant funds over a five year period from date of authorization, subject to the availability of funds in accordance with the A.I.D. OYB/Allotment process, to help in financing foreign exchange and local currency costs for the project.

2. The project consists of improving the capability within the Atebubu District and to plan and implement development activities designed to improve the standard of living of its inhabitants (hereinafter referred to as the "Project").

3. The Project Agreement which may be negotiated and executed by the officer to whom such authority is delegated in accordance with A.I.D. regulations and Delegations of Authority shall be subject to the following essential terms and covenants and major conditions, together with such other terms and conditions as A.I.D. may deem appropriate.

4. Source and Origin of Goods and Services

Goods and services, except for ocean shipping, financed by A.I.D. under the project shall have their source and origin in the Cooperating country or in the United States except as A.I.D. may otherwise agree in writing.

Ocean shipping financed by A.I.D. under the project shall, except as A.I.D. may otherwise agree in writing, be financed only on flag vessels of the United States.

5. Conditions Precedent

a. Conditions Precedent to Disbursement for Technical Assistance

Prior to any disbursement, or the issuance of any commitment documents under the Project Agreement, other than to finance technical assistance, the Cooperating Country shall furnish to A.I.D., in form and substance satisfactory to A.I.D.:

(1) Evidence that there has been a formal delegation of authority to the District Council in Atebubu which will enable the Council to exercise administrative coordination over the programs of all other government institutions in the District.

b. Conditions Precendent to Disbursement for Sub-Projects

Except as A.I.D. may otherwise agree in writing, prior to any disbursement or issuance of any commitment documents under the Project Agreement, to finance sub-projects with the Atebubu District, the District Council shall furnish to A.I.D. in form and substance satisfactory to A.I.D.;

(1) Evidence that a Project Administrator, who is an employee of the Cooperating Country, has been appointed with authority and responsibility for coordinating all aspects of the project.

(2) Evidence that the Council has established and staffed an office or that an existing office has been identified which will be responsible for monitoring and coordinating development activities undertaken.

(3) A statement of the responsibilities of the office and a plan indicating how the office will carry out its development activities.

(4) A detailed implementation plan which shall include procedures for designing, selecting, monitoring and evaluating sub-projects.

_____
Date

_____
Goler T. Butcher
Assistant Administrator for Africa

UNITED STATES OF AMERICA
AGENCY FOR INTERNATIONAL DEVELOPMENT
MISSION TO GHANA

ANNEX J

Ring Road East Near Danquah Circle
P. O. Box 1630
ACCRA—GHANA
TELEPHONE 75346

June 30, 1980

Certification Pursuant to Section 611(e) of the
Foreign Assistance Act of 1961, As Amended

I, Irvin D. Coker, the principal officer of the Agency for International Development in Ghana, having taken into account among other factors the maintenance and utilization of projects in Ghana previously financed or assisted by the United States, do hereby certify that in my best judgment, Ghana has both the financial capability and the human resources capability to effectively maintain and utilize the project: District Planning and Rural Development.

Irvin D. Coker
Director, USAID/Ghana

June 30 1980
Date

ANNEX K

5C(2) - PROJECT CHECKLIST

Listed below are statutory criteria applicable generally to projects with FAA funds and project criteria applicable to individual fund sources: Development Assistance (with a subcategory for criteria applicable only to loans); and Economic Support Fund.

(641-0102)

CROSS REFERENCES: IS COUNTRY CHECKLIST UP TO DATE? Yes. See MIDAS II Project Paper/
HAS STANDARD ITEM CHECKLIST BEEN REVIEWED FOR THIS PROJECT?

A. GENERAL CRITERIA FOR PROJECT

1.	FY 79 App. Act Unnumbered; Faa Sec. 653(b); Sec. 634A. (a) Describe how Committees on Appropriations of Senate and House have been or will be notified concerning the project; (b) is assistance within (Operational Year Budget) country or international organization allocation reported to Congress (or not more than $1 million over that figure)?	Project was included in FY1979 and 1980 Congressional Representations.
2.	FAA Sec. 611(a) (1). Prior to obligation in excess of $100,000, will there be (a) engineering, financial, and other plans necessary to carry out the assistance and (b) a reasonably firm estimate of the cost to the U.S. of the assistance?	Yes
3.	FAA Sec. 611(a) (2). If further legislative action is required within recipient country, what is basis for reasonable expectation that such action will be completed in time to permit orderly accomplishment of purpose of the assitance?	No further legislative action is required.
4.	FAA Sec. 611(b); FY 79 App. Act Sec. 101. If for water or water-related land resource construction, has project met the standards and criteria as per the Principles and Standards for Planning Water and	N/A

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	Related Land Resources dated October 25, 1973?	
5.	FAA Sec. 611(e). If project is capital assistance (e.g., construction), and all U.S. assistance for it will exceed $1 million, has Mission Director certified and Regional Assistant Administrator taken into consideration the country's capability effectively to maintain and utilize the project?	N/A
6.	FAA Sec. 209. Is project susceptible of execution as part of regional or multilateral project? If so why is project not so executed? Information and conclusion whether assistance will encourage regional development programs.	The project cannot be executied as part of a regional/multilateral project since it is designed to meet needs particular to a district within Ghana.
7.	FAA Sec. 601(a). Information and conclusions whether project will encourage efforts of the country to: (a) increase the flow of international trade; (b) foster private initiative and competition; (c) encourage development and use of cooperatives, credit unions, and savings and loan associations; (d) discourage monopolistic practices; (e) improve technical efficiency of industry, agriculture and commerce; and (f) strengthen free labor unions.	(b) The project will finance village development projects selected by communities; (e) Construction of rural economic infrastructure (e.g., feeder road links) will improve the efficiency of agriculture.
8.	FAA Sec. 601(b). Information and conclusion on how project will encourage U.S. private trade and investment abroad and encourage private U.S. participation in foreign assistance programs (including use of private trade channels and the services of U.S. private enterprise).	It is anticipated that most of the technical assistance and equipment for the project will be procured from U.S. private sector sources.

9.	FAA Sec. 612(b); Sec. 636(h). Describe steps taken to assure that, to the maximum extent possible, the country is contributing local currencies to meet the cost of contractual and other services, and foreign currencies owned by the U.S. are utilized to meet the cost of contractual and other services.	The Project Agreement will provide for the host country contribution in excess of 25%.
10.	FAA Sec. 612(d). Does the U.S. own excess foreign currency of the country and, if so, what arrangements have been made for its release?	No
11.	FAA Sec. 601(e). Will the project utilize competitive selection procedures for the awarding of contracts, except where applicable procurement rules allow otherwise?	Yes
12.	FY 79 App. Act Sec. 608. If assistance is for the production of any commodity for export, is the commodity likely to be in surplus on world markets at the time the resulting productive capacity becomes operative, and is such assistance likely to cause substantial injury to U.S. producers of the same, similar or competing commodity?	N/A

B. FUNDING CRITERIA FOR PROJECT

1. Development Assistance Project Criteria

a. FAA Sec. 102(b); 111; 113; 281a. Extent to which activity will (a) effectively involve the poor in development

The project's central focus seeks to promote the participation of the Atebubu District in all activities. Participation of women will be encouraged.

by extending access to economy at local level, increasing labor-intensive production and the use appropriate technology, spreading investment out from cities to small towns and rural areas, and insuring wide participation of the poor in the benefits of development on a sustained basis, using the appropriate U.S institutions; (b) help develop cooperatives, especially by technical assistance, to assist rural and urban poor to help themselves toward better life, and otherwise encourage democratic private and local governmental institutions; (c) support the self-help efforts of developing countries; (d) promote the participation of women in the national economies of developing countries and the improvement of women's status; and (e) utilize and encourage regional cooperation by developing countries?

Local communities will participate in project identification development, finance implementation thereby fostering democratic and local government in stitutions.

b. FAA Sec. 103, 103A, 104, 105, 106, 107. Is assistance being made available: (include only applicable paragraph which corresponds to source of funds used. If more than one fund source is used for project, include relevant paragraph for each fund source).

(1) (103) for agriculture, rural development or nutrition; if so, extent to which activity is specifically designed to increase productivity and income of rural poor; (103A) if for agricultural research, is full account taken of needs of small farmers;

Yes. The project is specifically designed to increase rural productivity and income through the financing of projects.

(2) (104) for population planning under sec. 104(b) or health under sec. 104(c); if so, extent to which activity emphasizes low-cost, integrated delivery systems for health, nutrition and family planning for the poorest people, with particular attention to the needs of mothers and young children, using paramedical and auxiliary medical personnel, clinics and health posts, commercial distribution systems and other modes of community research.	N/A
(3) (105) for education, public administration, or human resources development; if so, extent to which activity strengthens nonformal education, makes formal education more relevant, especially for rural families and urban poor, or strengthens management capability of institutions enabling the poor to participate in development;	N/A
(4) (106) for technical assistance, energy, research, reconstruction, and selected development problems; if so, extent activity is:	N/A
(i) Technical cooperation and development, especially with U.S. private and voluntary, or regional and international development, organizations;	N/A
(ii) to help alleviate energy problems;	N/A
(iii) research into, and evaluation of, economic development processes and techniques;	N/A

(iv) reconstruction after natural or manmade disaster;	N/A
(v) for special development problem, and to enable proper utilization of earlier U.S. infrastructure, etc., assistance;	N/A
(vi) for programs of urban development, especially small labor-intensive enterprises, marketing systems, and financial or other institutions to help urban poor participate in economic and social development.	N/A
c. (107) is appropriate effort placed on use of appropriate technology?	Yes. The project will use appropriate technology.
d. FAA Sec. 110(a). Will the recipient country provide at least 25% of the costs of the program, project, or activity with respect to which the assistance is to be furnished (or has the latter cost-sharing requirement been waived for a "relatively least-developed" country)?	Ghana will provide at least 25% of the project's costs, and such contribution will be reflected in the Project Agreement.
e. FAA Sec. 110(b). Will grant capital assistance be disbursed for project over more than 3 years? If so, has justification satisfactory to Congress been made, and efforts for other financing, or is the recipient country "relatively least developed"?	N/A
f. FAA Sec. 281(b). Describe extent to which program recognizes the particular needs, desires, and capacities of the people of the country; utilizes	The executing agency will be local communities and decentralized public institutions. They are aware of the needs and requirements in their local geographic area. The project will support the strengthening of these institutions and encourage local participation in the development process.

the country's intellectual resources to encourage institutional development; and supports civil education and training in skills required for effective participation in governmental and political processes essential to self-government.	
g. FAA Sec. 122(b). Does the activity give reasonable promise of contributing to the development of economic resources, or to the increase of productive capacities and self-sustaining economic growth?	Yes
2. Development Assistance Project Criteria (Loans Only)	
a. FAA Sec. 122(b). Information and conclusion on capacity of the country to repay the loan, including reasonableness of repayment prospects.	N/A
b. FAA Sec. 620(d). If assistance is for any productive enterprise which will compete in the U.S. with U.S. enterprise, is there an agreement by the recipient country to prevent export to the U.S. of more than 20% of the enterprise's annual production during the life of the loan?	N/A
3. Project Criteria Solely for Economic Support Fund	
a. FAA Sec. 531(a). Will this assistance support promote economic or political stability?	N/A

To the extent possible, does it reflect the policy directions of section 102?	N/A
b. FAA Sec. 533. Will assistance under this chapter be used for military, or paramilitary activities?	N/A

5C(3) - STANDARD ITEM CHECKLIST

Listed below are statutory items which normally will be covered routinely in those provisions of an assistance agreement dealing with its implementation, or covered in the agreement by imposing limits on certain uses of funds.

These items are arranged under the general headings of (A) Procurement, (B) Construction, and (C) Other Restrictions.

A. Procurement

1.	FAA Sec. 602. Are there arrangements to permit U.S. small business to participate equitably in the furnishing of goods and services financed?	The standard procedures for facilitating small business participation in AID financial procurement will be followed.
2.	FAA Sec. 604(a). Will all commodity procurement financed be from the U.S. except as otherwise determined by the President or under delegation from him?	Yes
3.	FAA Sec. 604(d). If the cooperating country discriminates against U.S. marine insurance companies, will agreement require that marine insurance be placed in the U.S. on commodities financed?	Ghana does not so discriminate
4.	FAA Sec. 604(e). If offshore procurement of agricultural commodity or product is to be financed, is there provision against such procurement when the domestic price of such commodity is less than parity?	N/A
5.	FAA Sec. 608(a). Will U.S. Government excess personal property be utilized wherever practicable in liew of the procurement of new items?	Yes

6.	FAA Sec. 603. (a) Compliance with requirement in section 901(b) of the Merchant Marine Act of 1936, as amended, that at least 50 per centum of the gross tonnage of commodities (computed separately for dry bulk carriers, dry cargo liners, and tankers) financed shall be transported on privately owned U.S.-flag commercial vessels to the extent that such vessels are available at fair and reasonable rates.	The Project Agreement will so provide.
7.	FAA Sec. 621. If technical assistance is financed, will such assistance be furnished to the fullest extent practicable as goods and professional and other services from private enterprise on a contract basis? If the facilities of other Federal agencies will be utilized, are they particularly suitable, not competitive with private enterprise, and made available without undue interference with domestic programs?	Yes
8.	International Air Transport. Fair Competitive Practices Act, 1974. If air transportation of persons or property is financed on grant basis, will provision be made that U.S.-flag carriers will be utilized to the extent such service is available?	Yes
9.	FY 79 App. Act. Sec. 105. Does the contract for procurement contain a provision authorizing the termination of such contract for the convenience of the United States?	Yes

B. Construction

1. FAA Sec. 601(d). If a capital (e.g., construction) project, are engineering and professional services of U.S. firms and their affiliates to be used to the maximum extent consistent with the national interest?	N/A
2. FAA Sec. 611(c). If contracts for construction are to be financed, will they be let on a competitive basis to maximum extent practicable?	Yes
3. FAA Sec. 620(k). If for construction of productive enterprise, will aggregate value of assistance to be furnished by the U.S. not exceed $100 million?	N/A

C. Other Restrictions

1. FAA Sec. 122(e). If development loan, is interest rate at least 2% per annum during grace period and at least 3% per annum thereafter?	N/A
2. FAA Sec. 301(d). If fund is established solely by U.S. contributions and administered by an international organization, does Comptroller General have audit rights?	N/A
3. FAA Sec. 620(h). Do arrangements preclude promoting or assisting the foreign aid projects or activities of Communist-bloc countries, contrary to the best interests of the U.S.?	Yes. The Project Agreement will so specify and GOG is aware of this restriction.

4.	FAA Sec. 636(i). Is financing not permitted to be used, without waiver, for purchase, long-term lease, or exchange of motor vehicle manufactured outside the U.S., or guaranty of such transaction?	Yes
5.	Will arrangements preclude use of financing:	
	a. FAA Sec. 104(f). To pay for performance of abortions or to motivate or coerce persons to practice abortions, to pay for performance of involuntary sterilization, or to coerce or provide financial incentive to any person to undergo sterilization?	The Project Agreement will provide for specific uses of AID funds for agreed upon purposes and thus preclude allocation of such funds for the purposes covered by the Legislation cited in items 5a through 5i.
	b. FAA Sec. 620(g). To compensate owners for expropriated nationalized property?	
	c. FAA Sec. 660. To finance police training or other law enforcement assistance, except for narcotics programs?	
	d. FAA SEc. 662. For CIA activities?	
	e. FY 79 App. Act Sec. 104. To pay pensions, etc., for military personnel?	
	f. FY 79 App. Act Sec. 106. To pay U.N. assessments?	
	g. FY 79 App. Act Sec. 107. To carry out provisions of FAA sections 209(d) and 251(h)? (Transfer of FAA funds to multilateral organizations for lending).	

h. FY 79 App. Act Sec. 112. To finance the export of nuclear equipment, fuel, or technology or to train foreign nations in nuclear fields?

i. FY 79 App. Act Sec. 601. To be used for publicity on propaganda purposes within U.S. not authorized by the Congress?