6360111
CONGRESSIONAL PRESENTATION

PROGRAM: SIERRA LEONE

636-0101

ACTIVITY DATA SHEET

CP 80-05(10-78)

TITLE	FUNDS	PROPOSED OBLIGATION (In thousands of dollars)		
CARE Rural Roads II (OPG).	Agriculture, Rural Development and Nutrition	FY 80 1,050		LIFE OF PROJECT 3,991
NUMBER 636-0111 GRANT ☒ LOAN ☐ NEW ☐ CONTINUING ☒	PRIOR REFERENCE Advice of Program Change Transmitted 11/16/77	INITIAL OBLIGATION FY 78	ESTIMATED FINAL OBLIGATION FY 80	ESTIMATED COMPLETION DATE OF PROJECT FY 81

Purpose: To provide subsistence farmers with better access to markets and developmental services through the construction and rehabilitation of rural roads.

Background and Progress to Date: An inadequate road network is one of the principal constraints to increasing agricultural productivity and income and improving the quality of rural life in Sierra Leone. This three-year road construction project is an extension of a previous CARE OPG activity which was evaluated as a success. The first phase of the project completed in FY 79 covered a total of 224 miles of feeder roads. In 1977 the government asked CARE to construct and recondition 401 miles of rural roads, principally in the northern province, where the World Bank/IDA is financing an integrated agricultural development project. Approximately 320 miles are existing gravel penetration roads which require rehabilitation and realignment, and 80 miles are new construction. The rural roads program in the north was formally inaugurated in February 1978; and AID signed an operational program grant with CARE, effective March 1, to fund almost half of the total project cost. Implementation got underway with the beginning of the 1978-1979 construction season.

Host Country and Other Donors: Over the life of the project the Sierra Leone Government will contribute the equivalent of $1,800,000 for road maintenance and other costs, CARE $1,200,000 for personnel and operating expenses, the World Bank $1,200,000 for construction equipment, and the Peace Corps and the U.K. Volunteer Services overseas $337,500 for personnel.

Beneficiaries: Direct project beneficiaries are the estimated 14,800 farm families living in the project area, for whom the roads will provide ready access to agricultural markets for cash crops like rice and cocoa, and to developmental inputs, such as improved seed, fertilizer, extension services, health care and education. The cost to AID per family benefited from FY 80 funds will be approximately $71 and over the life of the project $270.

FY 80 Program: In FY 1980 the final 150 miles of rural roads, including 110 miles in the northern project area, will be surveyed, designed and constructed. A bridge over the Male river will be completed.

Major Outputs:	All Years
Miles of roads constructed and reconditioned	400
Rural roads maintenance unit in operation	X
Maintenance equipment depreciation fund established	X
Miles of roads regularly maintained	583

A.I.D. Financed Inputs:	($ thousands) FY 80
Commodities: Spareparts, tools and equipment	210
Other Costs: Fuel and oil and local labor	840
Total	1,050

U.S. FINANCING (In thousands of dollars)	Obligations	Expenditures	Unliquidated
Through September 30, 1978	1,800	1,257	[illegible]
Estimated Fiscal Year 1979	1,141	1,200	
Estimated through September 30, 1979	2,941	2,457	484
		Future Year Obligations	Estimated Total Cost
Proposed Fiscal Year 1980	1,050	-	3,991

PRINCIPAL CONTRACTORS OR AGENCIES

Cooperative for American Relief Everywhere. Inc. (CARE)

PD-AAG-43

PD-AAG-413

636011100152

CLASSIFICATION

PROJECT EVALUATION SUMMARY (PES) – PART I

Report Symbol U-447

1. PROJECT TITLE	2. PROJECT NUMBER	3. MISSION/AID/W OFFICE
CARE Rural Penetration Roads II OPG/AFR-G-1400	636-0111	AAO/SIERRA LEONE

4. EVALUATION NUMBER (Enter the number maintained by the reporting unit e.g., Country or AID/W Administrative Code Fiscal Year, Serial No. beginning with No. 1 each FY) N/A

☒ REGULAR EVALUATION ☐ SPECIAL EVALUATION

5. KEY PROJECT IMPLEMENTATION DATES	6. ESTIMATED PROJECT FUNDING	7. PERIOD COVERED BY EVALUATION
A. First PRO-AG or Equivalent FY 78 B. Final Obligation Expected FY 80 C. Final Input Delivery FY 80	A. Total $8,521,200 B. U.S. $3,991,000	From (month/yr.) 10/78 To (month/yr.) 10/79 Date of Evaluation Review

8. ACTION DECISIONS APPROVED BY MISSION OR AID/W OFFICE DIRECTOR

A. List decisions and/or unresolved issues; cite those items needing further study. (NOTE: Mission decisions which anticipate AID/W or regional office action should specify type of document, e.g., airgram, SPAR, PIO, which will present detailed request.)	B. NAME OF OFFICER RESPONSIBLE FOR ACTION	C. DATE ACTION TO BE COMPLETED
Presentation of Evaluation for Authorization of Third Year Funding	SER/COM/RCD Grant Officer	11/79

9. INVENTORY OF DOCUMENTS TO BE REVISED PER ABOVE DECISIONS

- ☐ Project Paper
- ☐ Financial Plan
- ☐ Logical Framework
- ☐ Project Agreement
- ☐ Implementation Plan e.g., CPI Network
- ☒ PIO/T
- ☐ PIO/C
- ☐ PIO/P
- ☐ Other (Specify) _____
- ☐ Other (Specify) _____

10. ALTERNATIVE DECISIONS ON FUTURE OF PROJECT

- A. ☒ Continue Project Without Change
- B. ☐ Change Project Design and/or ☐ Change Implementation Plan
- C. ☐ Discontinue Project

11. PROJECT OFFICER AND HOST COUNTRY OR OTHER RANKING PARTICIPANTS AS APPROPRIATE (Names and Titles)

James A. Hradsky, REDSO/WA [signature] 10/15/79
Dennis Brown, CARE/SL Dennis Brown/by JH 10/15/79

12. Mission/AID/W Office Director Approval

Signature: R Huddleston / by JH 10/15/79

Typed Name: Robert Huddleston, AAO

Date: October 15, 1979

AID 1330-18 (3-78)

AFR/DP/PPE

SIERRA LEONE

RURAL PENETRATION ROADS II
636-0111

SECOND ANNUAL EVALUATION
OCTOBER 15, 1979

14

SECOND ANNUAL EVALUATION OF THE CARE RURAL PENETRATION ROADS II PROJECT IN SIERRA LEONE

(PROJECT N° 636-0111)

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SIERRA LEONE
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LIST OF ACRONYMS

AAO/ Freetown	AID Affairs Officer
AID	Agency for International Development (U.S.A.)
AFDB	African Development Bank
CARE	Cooperative for American Relief Everywhere
CUSO	Canadian University Students Overseas
EDF	European Development Fund
EOP	End of Project
GOSL	Government of Sierra Leone
IBRD	International Bank for Rural Development (World Bank)
MODEP	Ministry of Development and Plan
MOW	Ministry of Works
OPG	Operational Program Grant
PCV	Peace Corps Volunteer (U.S.A.)
PP	Project Paper
PPC	Program and Policy Coordination Office (AID)
PVO	Private Volunteer Organization
REDSO/WA	Regional Economic Development Services office/ West Africa (A.I.D.)
VSO	Voluntary Service Organization

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INTRODUCTION

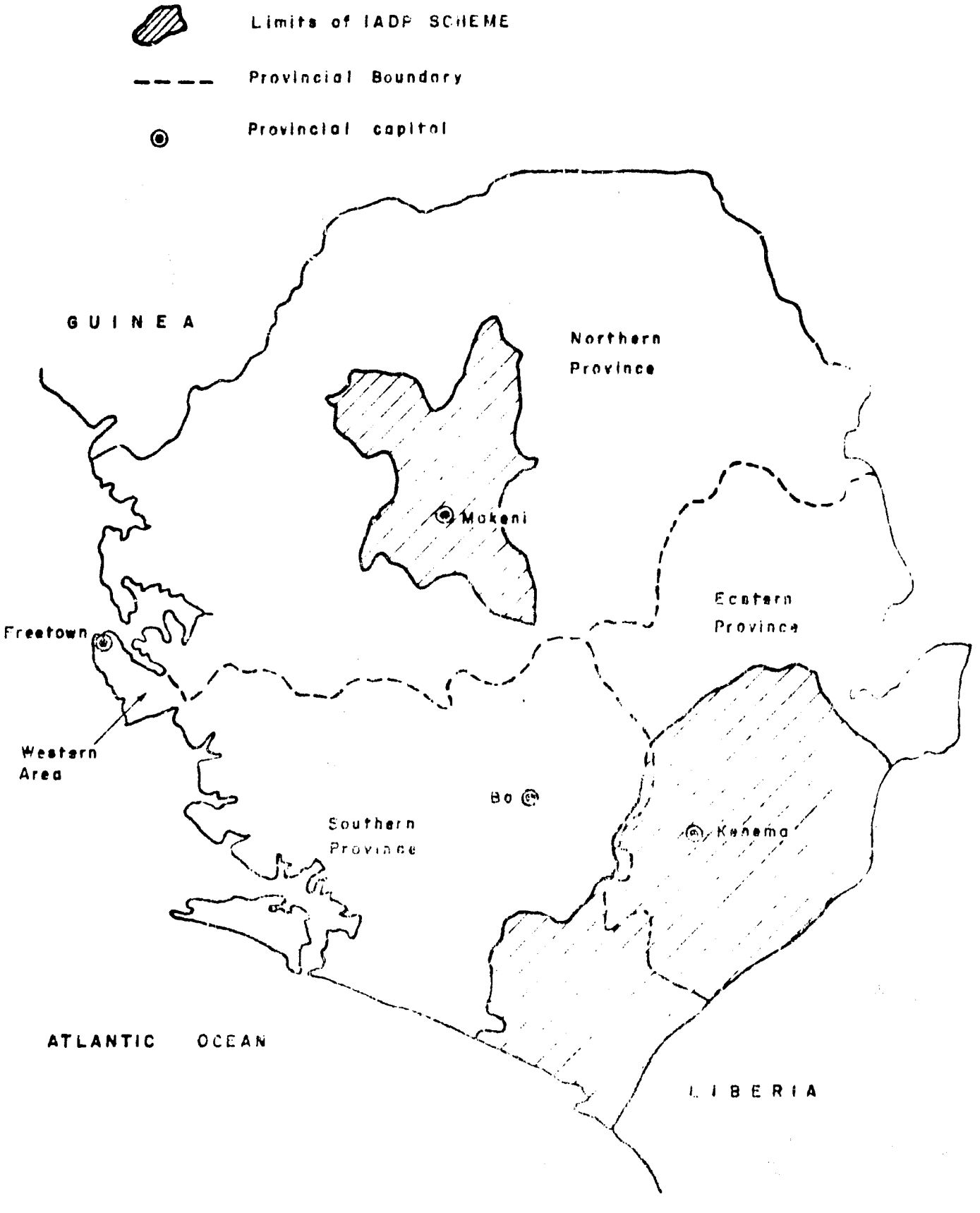
The enclosed evaluation report is the product of a joint AID/CARE assessment of the Rural Penetration Roads II Project (636-0111) which was undertaken in Sierra Leone from July 9-24, 1979. The effort was led by REDSO/WA and CARE/Freetown technical staff with collaborative inputs from the GOSL Ministry of Works and AAO/Freetown. The socio-economic impact study was carried out by a contract social scientist with logistical support from CARE/Freetown. Members of the evaluation team included:

James Hradsky, Project Officer/Economist (REDSO/WA)
Richard Dudley, Chief Engineer (REDSO/WA)
Dennis Brown, Project Coordinator (CARE/Freetown)
Antony Airey, Survey Researcher (Contract)
William Anderson, Program Evaluation (AID/PPC)

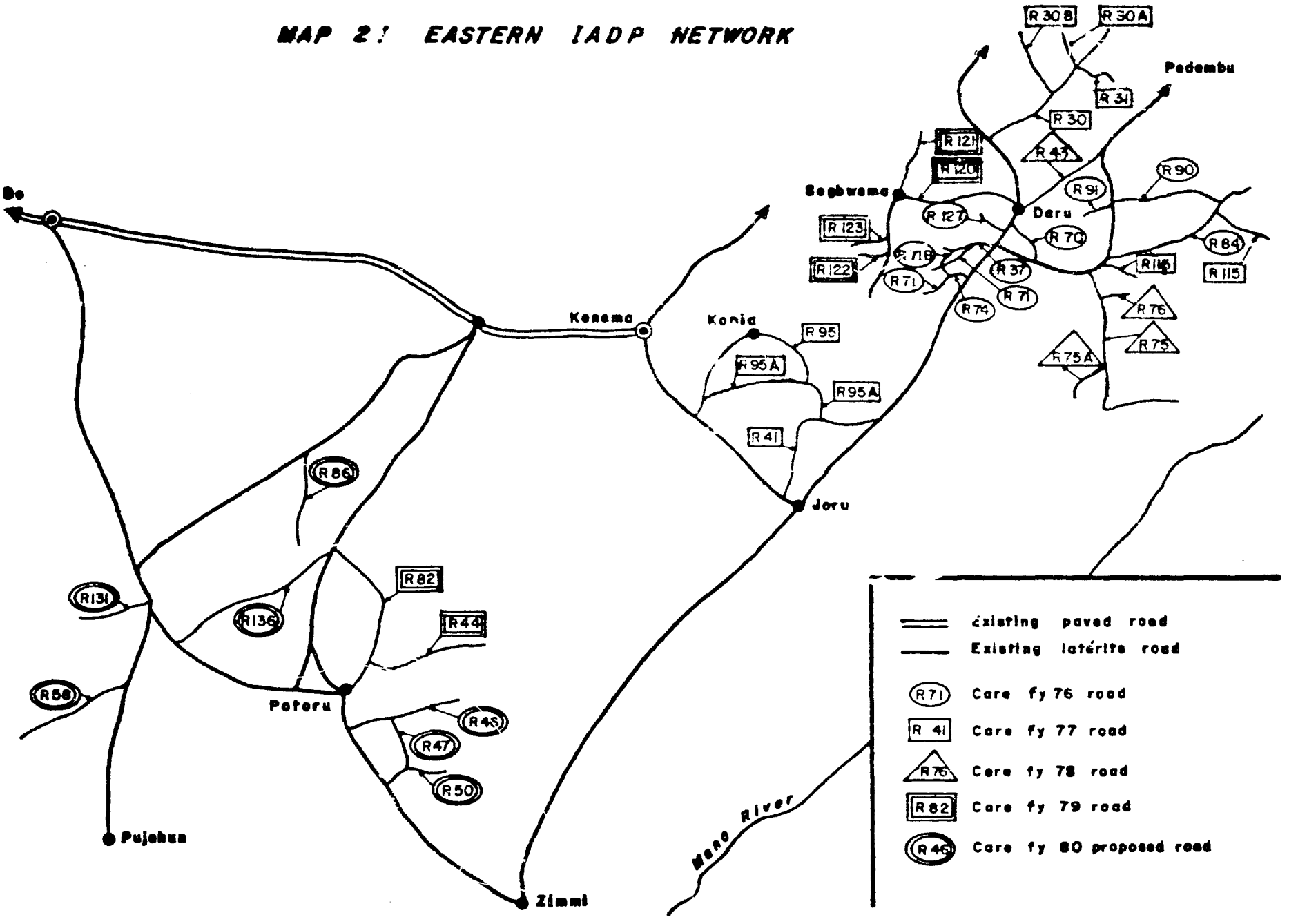
The evaluation team extends special acknowledgement to Mr. L. Yilla, Chief Highway Engineer (Maintenance) of the MOW who accompanied the team during its principal on-site inspection of the CARE road network.

Finally, it should be noted that all conclusions and recommendations contained in this report are those of the evaluation team alone and do not necessarily reflect the opinions of any GOSL office or official.

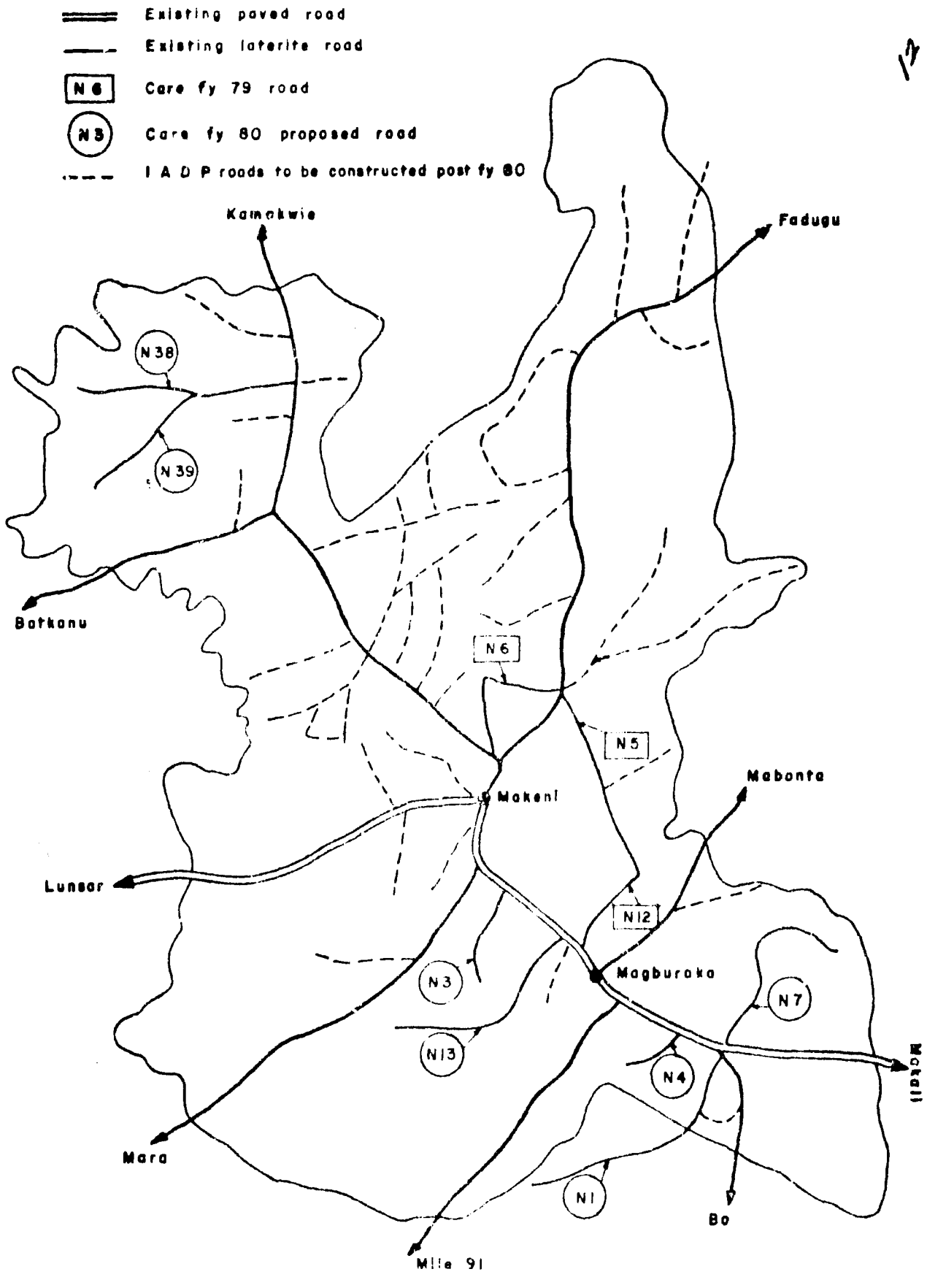
MAP I : IADP LOCATION MAP



MAP 2: EASTERN IADP NETWORK



MAP 3 : NORTHERN IADP NETWORK



RECAPITULATION OF SUMMARY FINDINGS

ITEM	OBSERVATIONS	RECOMMENDATIONS
1. FY 80 Funds (p. 42)	CARE has undertaken a successful feeder road program; the GOSL has responded adequately in providing for maintenance of those roads.	FY 80 funds in the amount of $1,050,000 should be released to CARE as soon as possible.
2. 1980 Evaluation (p. 42)	The annual project evaluations have proved to be useful in developing a successful road construction program.	A final CARE/AID joint evaluation of the project should be undertaken in July, 1980 incorporating those issues noted on p. 42 of this report.
3. Construction Costs (p. 26)	Road construction costs, based on the current analysis are now estimated at approximately [illegible],000/mile.	None.
4. GOSL/IBRD National Road Maintenance Project (p. 22)	The currently proposed road maintenance project will focus basically on primary and secondary road networks.	a) At a minimum, the IBRD should design the project so as to provide an institutional framework from which a program to address the feeder road maintenance issue could be developed. b) AID should consider mounting a parallel financing effort with the IBRD to develop an appropriate feeder road maintenance program.

ITEM	OBSERVATIONS	RECOMMENDATIONS
5. CARE Cash Flow Problem (p. 41)	CARE will undergo a cash flow problem in work year 1980-81 which could seriously impair the success of future road construction.	The foreign donor community and the GOSL should attempt to locate minimal funding to assist CARE through this period of financial difficulty as soon as possible. AAO/Freetown should maintain contact with the IBRD to ensure that necessary funds are forthcoming.
6. Impact of the CARE Feeder Roads (p. 34)	The CARE roads are fullfilling a major supportive role for the IADP programs and are thereby making a significant contribution to the improvement of rural farm incomes and general well-being of the populations impacted by them.	None.
7. Future Socio-economic Surveys (p. 36)	The impact of the project roads over time is inadequately understood and not clearly measured by the current survey research.	a) AID, GOSL or IBRD should consider financing a follow-up study of the roads in 1982 or soon thereafter. b) Revisions to the current survey questionnaire are recommended on p. 35.
8. Long-term development of National Feeder Road Maintenance (p. 23)	At current levels of economic development, it is difficult to foresee how the GOSL will manage an adequate level of regular maintenance on the expanding national feeder road system.	Future interest parties should examine the potential for developing a decentralized system of feeder road maintenance relying heavily on village contractual labor for manual tasks.

ITEM	OBSERVATIONS	RECOMMENDATIONS
9. Selection of CARE Roads (p. 37)	Selection of roads under the CARE project has been undertaken in a reasonable and objective manner. Some feeder roads have demonstrated levels of traffic far beyond their design level, however, because the choice of alignment permit high levels of through traffic to use them as bypasses.	One criterion should be added to the current system of road selection so as to ensure that the feeder roads do not become bypasses or major through roads for long distance traffic.
10. Road Design (p. 6)	CARE has constructed roads to Sierra Leone official Class IV Standards. Some recent discussion would favor a reduction in standards to a level below Class IV	It is felt that a Class IV standard is reasonable given local terrain, maintenance capacity, and other factors. It is recommended that no major reduction be made to the current standards.
11. Labor/ Equipment Mix (p. 8)	CARE has evolved an approach to construction which makes optimum use of labor methods without unnecessarily impairing the cost or quality of the work they have been mandated to produce.	A shift in construction techniques to a more labor-intensive approach is not recommended.
12. CARE Cost Accounting (p. 27)	CARE's accounting system does not adequately separate out the costs of maintenance and construction, resulting in inaccurate unit costs.	CARE should refine their cost accounting methods so as to differentiate between road construction and maintenance costs.

ITEM	OBSERVATIONS	RECOMMENDATIONS
3. Project replicability (p. 27)	It is not evident that the success of the Sierra Leone CARE program could be easily replicated outside the Sierra Leone context. Although the current project could be expanded even more.	Interested parties should examine carefully the availability of qualified volunteer and local labor, local government support, etc. prior to assuming such a venture could be successfully mounted outside the Sierra Leone context.

1. Project Description and Analysis

A. General Background

A description of the general setting within which the CARE Rural Penetration Roads II Project is situated is a prerequisite to arriving at an understanding of several vital parameters of the project evaluation. Two topics would appear worthy of comment under this heading: the national economy and agricultural production.

The current outlook for the Sierra Leonean economy is generally disturbing. The value of imports (notable petroleum products) is large in relation to the size of the economy, growing, and is putting enormous pressures on meager national foreign exchange reserves. National income projections are fairly stagnant, especially as production of the major export item, diamonds, pregressively declines. Inflation is high, running at least at 20%-30% annually by official estimates. These delicate economic conditions, when combined with the political decision to spend heavily on the Organization for African Unity (OAU) conference which the GOSL will host in Freetown in 1980, have led to large budget deficits (current account deficit plus development expenditures), totalling some 115 million this year and mainly financed from the domestic banking system.

The GOSL has quite reasonably decided to promote agricultural sector programs as the cornerstone of its national development strategy. The potential for agricultural growth is theoretically favorable. Marketing (and presumably overall production) in the cash crop area have registered some gains recently, although they have been somewhat mitigated by changing world market prices as well as domestic market price differentials between Sierra Leone and neighboring

Liberia (which encourage illegal international trade). Table 1, below, reproduces official estimates of Sierra Leone Produce Marketing Board (SLPMB) purchases from 1977/78 to 1978/79.

Table 1.: SLPMB Officially Registered Purchases
(in long tons)

CROP	1977/78	1978/79	Δ %
Coffee	5,500	12,000	+118.2%
Cocoa	7,000	7,500	+ 7.1%
Palm Kernel	43,000	43,000	---
Ginger	5,040	7,000	+ 38.9%

Food crop production, however, and, especially rice, (which is the nation's staple food) would appear to be declining progressively as producers move into more remunerative areas of endeavor (cash crops, diamonds, etc.).

Although rice imports were negligible as recently as 1975/76, imports in the first eight months of 1979 totalled about 54,000 tons and are projected to grow even more. If one accepts that the best estimate for total rice production was close to 410,000 metric tons in 1978, this would indicate that rice imports are now running at almost 20% of total production. It should be underscored, however, that it is impossible to measure the amount of rice in the informal sector which may be moving across national borders to Guinea or Liberia.

The relevance of this information for the current CARE feeder road construction effort will become increasingly apparent as this report develops. First, the CARE road network is vital to the long-term development of the national economy,

playing a critical role in the successful development of major agricultural programs, themselves key aspects of the national strategy for economic growth. Second, the evaluation team estimates that the long-term, regular maintenance of the CARE network, when considered jointly with the overall requirements of other national roads will place an extremely heavy (if not impossible) burden on the national economic apparatus. An appropriate solution to this problem will not be easy, but is a prerequisite to the long-term success of the CARE feeder road system.

B. Project Background

In the early 1970's, GOSL proposals for rural development interventions came increasingly to focus on the Integrated Agricultural Development Project (IADP) concept as its primary means to improve living standards and promote rural production in large areas of upcountry Sierra Leone. Foreign development finance organizations, including, notably, IBRD, EDF, and AFDB, have been actively involved in designing and/or implementing major IADP schemes throughout the country.

Two major schemes (see Map 1) have been actually implemented to date - Northern IADP (beginning 1975) and Eastern IADP (beginning 1972) - largely with GOSL/IBRD funds. Both IADP's provide improved seed, basic inputs and extension, and both encourage the modern cultivation of upland and swamp rice. In addition, the Eastern IADP focusses on cocoa, coffee and palm oil development and Northern IADP on groundnut and livestock production.

Because of problems of poor access to 1) high productivity areas and 2) substantial portions of the local small farmer

population located within the IADP's, the construction of appropriate road networks was clearly of basic importance to the success of the overall IADP scheme.

CARE has served as implementation agent for construction of all new feeder roads for both IADP schemes. An initial CARE proposal was submitted to AID/W and approved in 1975, resulting in the first Operational Program Grant (OPG) to be awarded to a Private Volunteer Organization (PVO) for implementation of a national development program. A joint A.I.D/CARE evaluation of that OPG in 1977 resulted in a recommendation to expand the program yet further. The result of that recommendation was the authorization of $3.99 million of USAID funds (47% of total multilateral funding) towards the current feeder road construction and maintenance effort.

A complete representation of both the CARE roads built to date (FY-76, 77, 78, 79) as well as those planned for FY 80 can be found on Maps 2 and 3 for both and Eastern and Northern IADP's. The roads of particular interest to the project evaluation team are, of course, those included in period FY 78-80.

The first CARE grant (OPG 1154) ended in the construction of 177 miles of good quality, GOSL Class IV(1) laterite feeder roads, of which approximately 147 miles were located within the Eastern IADP scheme and 30 miles elsewhere.

The current CARE grant (OPG 1400) for $3.99 million was proposed to complete a total of 400 miles of class IV road,

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(1) Class IV road technical characteristics are presented on page 5 (Technical Analysis)

including 225 miles in Northern IADP, 145 miles in Eastern IADP and 30 elsewhere. The circumstances surrounding the current status of the CARE construction schedule are discussed in greater detail later, but it is worth noting at this point that CARE estimates for final construction under the current program will probably not exceed 242 miles, leaving at least 158 miles incomplete in the Northern IADP by the end of the next year.

C. Analysis

1. Technical Analysis

a) Design Standards:

Design of all CARE feeder roads meets the standards of Ministry of Works (MOW) Class IV roads, with a modification of width in certain cases. The W Class IV road standards follow:

Average Daily Traffic (ADT)	- less than 151 vehicles/day*
Suface Type	- 6" minimum thickness compacted laterite
Design Speed	- 25 mph
Min. Radius of Curvature	- 300 ft.
Max. Gradient	- 15%
Formation Width (roadbed)	- 16 ft.
Bridges	- British Standard (BS) 153 Part 3 (equivalent to H-20 loading)
	- 12 ft. wide

* The evaluation team finds the ADT by itself an inadequate measure to determine the structural design of the roadbed. Some distinction must be made as to the type and axle loading of traffic to assure adequate design.

CARE's construction manual for feeder roads modifies this design in assigning a category of Class IV A to the majority of roads using a roadway width of 20 feet and Class IV B with a width of 16 feet to the remaining roads. All roads carrying through traffic or connecting villages or towns have been designated as Class IV A, except for sections where relatively deep fills are encountered. At those points, the roadway is reduced to 16 feet. In the December 1977 evaluation of the first CARE roads project, Fredric R. Harris made a recommendation to reduce design for all roads to a 16 ft. width. This question surfaced again during the past year, reasoning that the time and effort saved could be applied to construction of a larger number of miles of roads. However, as the construction of 4 extra feet of width requires a relatively small additional input in comparison to the overall effort of mobilization and support, the savings in earthwork cannot be translated directly into extra length and in fact would result in a negligable increase in total length constructed. In addition, some areas with highly friable soils are subject to heavy erosion, particularly on the fill slopes of the roadbed, which at times progresses inward and decreases the effective usable roadbed width. Given the irregularity of quality control of construction by CARE and difficulties in maintaining rural roads by the Government, we believe the extra width in these areas increases the possibility that an adequate width of the road will remain open to permit passage of traffic during the seasonally heavy and long lasting rains that occur in Sierra Leone. In summary, in the opinion of the current evaluation team, the geometric design standards now used are in keeping with the requirements of the topography, soil conditions and predicted traffic loads.

b) Construction:

Construction procedures are quite good for the most part, although some mistakes have been made due to the inexperience of volunteer technical personnel (Peace Corps, British and Canadian volunteers) acting in supervisory capacities. In a few areas, water and/or rollers were not available for compacting the roadbed due to inoperable equipment at the time of construction, but the work continued with inadequate compaction, resulting in occasional roadbed failure after a rainy season and use by traffic.. Most of these operating procedures have been corrected by CARE and the first two years of construction can, to some extent, be considered as a learning process. CARE now appears to have established a relatively efficient method of operation.

The material used for roadbed construction and laterite surfacing is generally found in the immediate locality of the road. It was noted that the quality of laterite varied considerably in the different areas of CARE's project, from excellent granular, well-graded material which formed a durable impervious surface, to a less desirable material that remained loose and had little resistance to erosion. Given the limited hauling capacity of equipment available to CARE, and the extra expense and time needed to import a better select material, CARE had no option but to use the best locally available soils. In the areas with the less desirable material, the roads will require additional effort in both routine maintenance and reballasting.

The rate of construction progress has been considerably less than anticipated, due in part to over-enthusiastic estimates

of the rate of production on the part of CARE, delays in the arrival of AID-financed equipment, and excessive down time for repairs on the initial equipment received from the GOSL (a large part of which had been used on previous construction project). The PP predicted a total of 400 miles to be built by EOP, (September 1980) based on 1½ miles per week per construction unit (spread) with 34 workable weeks per year. This would equal approximately 150 miles per year with three spreads operating simultaneously. The PP assumed two spreadswould be fully operable the first year and three for the two following years. For reasons stated above, CARE has not been able to operate three spreads simultaneously. Although new AID-procured equipment will be on hand for the 1979-80 construction season, CARE will still only operate two spreads as most of the equipment obtained initially is now beyond economical repair and will be salvaged. As is noted in the following table, latest estimates of total construction under the project fall short of original projection by almost 40%.

	Miles Constructed		
Season	PP	Actual (equivalent)	Δ
1977-78	100	69	- 31.0%
1978-79	150	77 (est.)	- 48.7%
1979-80	150	96 (est.)	- 36.0%
TOTAL	400	242 (est.)	- 39.5%

c) Labor/Equipment Mix:

In planning its early road construction in Sierra Leone[1], CARE intended using heavily labor-intensive methods. The plan called for CARE to supply handtools, the GOSL to

[1] CARE files indicate that the first construction proposal to the MOW was dated September 21, 1972.

purchase cement and CARE (through PL 480) to supply food to the laborers. As proposed, it was anticipated that 30 laborers could undertake 3/4 mile of road rehabilitation per month and that 35 laborers could complete 3/4 mile of road construction every two months. This meant that some 40 miles of new road and 200 miles of rehabilitation could be completed per annum and could employ a workforce of close to 1500 people.

Exactly why the initial workplan was not adhered to is not completely clear, but, undoubtedly, CARE management became increasingly concerned about the viability of such a project as the details of implementation planning progressed. The first note of concern found in the CARE files was reflected in the minutes of a Project Coordinating Committee meeting on August 17, 1973, wherein CARE requested boarded machinery from the MOW to "help speed up the work." The ensuing search for equipment turned up used bits and pieces from MOW, Ministry of Agriculture and a CARE road project in nearby Liberia. Concurrently, GOSL delays in approving the project caused PL 480 supplies destined for the project to be redirected to the Sahel.

The main thrust of mechanization came in 1970-1977 with the recuppration of used machinery which Crown Agents, a British procurement agent, had utilized to construct the Bo-Tiama road. This was supplemented by a small number of pieces picked up through initial AID funds. As CARE became more deeply involved in the realities of up-country construction, field personnel made progressively greater demands for increased equipment procurement.

CARE technical personnel clearly support the theoretical concept of labor-intensive contruction but feel that current levels of 200 laborers per day is as large a labor-intensive effort as can be reasonably mobilized and con-

trolled. The existing voluntary labor force does not play a major role in actual road construction but is limited to such tasks as cleaning brush for surveyors, cutting of survey pegs, working on culvert crews and performance of manual road maintenance tasks (filling pot holes, brushing, cleaning ditches and culverts).

Because of incomplete records it would appear virtually impossible to analyze, in any clearly documented fashion, the exact reasoning behind the shift from labor to equipment-intensive construction methods. The December, 1978 evaluation of the CARE program makes specific mention of the following constraints to the utilization of predominately labor-intensive methods (p.12):

- The supply of unskilled labor is not constant and fluctuates with the agricultural growing season.
- A daily wage which would be competive with agriculture could not be paid, and, even if it could, would result in a deficit agricultural labor supply.
- The type of feeder roads to be constructed requires considerable volume of earthwork, which, if done only manually, would require an estimated 3,600 persons for 32 weeks to complete 150 miles

The evaluation team would add to this list:

- The difficulties of logistics and organization of such a massive effort.
- The fact that the minimum wage of labor has increased by 65% over the figure noted in the last evaluation.
- Adequate compaction of fill is not feasible by manual methods.

The team has concluded, therefore, that the particularities

of the up-country Sierra Leonean context effectively preclude most forms of labor-biased road construction. In the opinion of the evaluation team, CARE has evolved an approach to construction which makes optimum use of labor methods without unnecessarily impairing the cost or quality of the work which they have been mandated to produce.

d) Personnel:

CARE is undertaking the project with a mixture of paid and unpaid personnel. On the management side, the CARE project coordinator is a CARE employee (US national), with field support of 12 volunteers. (PCV and VSO) in professional and technical positions of responsibility[1]. The project manager is a salaried Sierra Leonean, as are 10 other professional and technical personnel. The management staff is supported by about 460 local employees working in technical or sub-technical positions and by volunteer local personnel who undertake hand labor in areas where the roads are being constructed. It appears at first glance that the project is overstaffed for the work produced, having up to three times the number of personnel normally found on a construction project of this magnitude in the developed countries of the world. However, considering the relative inexperience of the volunteers, CARE's sustained attempts to encourage labor-intensive approaches where feasible, on-the-job training, and the supervision necessary for untrained local personnel, these personnel would appear to be justified. It should be noted that little idle or unproductive time was observed by the evaluation team while in the field. CARE has made every effort to "Sierra Leonize" the operation

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1) All personnel figures are as of June 30, 1979.

of the project, replacing expatriate personnel with Sierra Leoneans wherever possible. Dennis Johnson, a Sierra Leonean, assumed duties as Project Manager in April 1979, a position previously held by expatriates.

e) Equipment Maintenance and Repair:

The maintenance and repair of project equipment is centered around the principal workship at Bo with satellite shops in the areas where work is being performed. As of June 30, 1979, these smaller shops were located at Makeni, Potoru and Daru. CARE undertakes all of the necessary repairs to project equipment in these shops, including major overhauls and rebuilding, with the exception of a few tasks which would require a heavy investment in shop machinery and/or tools and especially trained personnel. These tasks, which are "farmed out" to local or Liberian firms, are estimated to be less than 10% of the total costs of all repairs, and are limited to rebuilding of pumps and injectors, engine machine work (crankshafts, bearing, etc.), rewinding of electric motors and generators, and repairs of radios used for site-to-site communications. In addition, tracks for crawler-type equipment are taken to Monrovia for rebuilding, or, in the case of the new Caterpillar equipment, exchange.

The Bo shop serves as an on-the-job training facility for local employees as well as the primary repair facility and the main storage point for spare parts and materials. A fairly complete range of services is provided in this shop or by personnel from the shop who travel to field locations where services are needed. The Bo center includes the following repair shops in addition to administrative type staff:

a) Light Equipment Repair

b) Heavy Equipment Repair

c) Welding
d) Machine Shop
e) Auto Electric
f) Tire shop
g) Facility Support (A.C. electric, carpentry, plumbing, etc.)

Bo also serves as the principal location for ordering, stocking and issuance of spare parts. The current inventory includes approximately 6000 line items of spare parts, including 2000 line items for caterpillar equipment, which satisfies about 30% of the total requirement. Much of the spare parts inventory is dedicated to rapid-moving parts. Of the spare parts not carried in stock, about 60% to 70% can be obtained either in Sierra Leone or Liberia, and the remaining are ordered, for the most part, from sources in Europe of the U.S.

The operation and control of the spare parts system deserves special kudos. Working with the shop superintendent, the parts section maintains a good selection of parts considering the limited funding available. CARE personnel have established an inventory control system that supplies absolute information as to location and usage of parts, and a system of constant spot checks on inventory that revealed only about $100.00 in parts were unaccounted for during FY 1979, a record to be envied by most modern computor controlled systems worldwide.

Parts are issued for specific repairs from Bo, either to mechanics from Bo or the satellite shops, which stock a minimum of highly consumable parts. At the time of the evaluation team's visit, the parts personnel in Bo were "weeding out" parts no longer needed due to salvage of certain pieces of

equipment and other items excess to predicted requirements. These parts were to be sold with proceeds going to purchase more necessary items.

Although heavily weighted with mechanics, the Bo shops only performs about 15% of the repair work; the remaining 85% of the repairs are done by the mechanics stationed at the field ships supplemented by personnel from Bo. The Bo Shop is dedicated to the more involved repair/rebuilding work, and the less complicated work, much of which consists of the changing of components, is done in the field.

As mentioned above, the satellite shops are limited in capacity and personnel. For example, the Makeni shop includes one shop superintendant, five mechanics, three apprentice mechanics, one welder and one auto electrician, and thus is limited to routine preventive maintenance, and minor repairs.

Overall, the system as developed by CARE functions quite efficiently within the existing constraints of limited funding and lack of fully qualified technical, supervisory, and administrative personnel. In addition, a good deal of training of technical personnel occurs, benefitting both the CARE operation and Sierra Leone in general.

f) Road Maintenance:

1) CARE maintenance of the feeder roads

The Grant Agreement provided that CARE would supervise the maintenance of roads constructed under the Project during the Project period and for two years thereafter. This maintenance was to have been done through independent, self-sustaining road maintenance units funded by the Ministry of Works. To assure that equipment is to be available for road maintenance, of which almost Le 70,000 per year has been set aside in a "depreciation" fund with which CARE will

procure equipment for the GOSL road maintenance unit. To date, CARE has been maintaining all roads built, utilizing, for the most part, funds other than those provided by the GOSL. However, the GOSL has agreed to provide an additional Le100,000 specifically for post-project maintenance during FY80 and has promised to provide personnel to work under CARE's supervision in the maintenance efforts.

CARE has dedicated a higher percentage of its effort to road maintenance than anticipated due to a more rapid deterioration of some of the roads. The rate of deterioration on several roads has been accelerated by heavier traffic loads than those predicted in the PP.

Average Daily Traffic (ADT)

ADT	Percentage of Roads[1]		Percentage of Mileage[1]
	PP	1979	1979
0-50	80%	45%	34%
51-150	20%	40%	54%
over 150	0	15%	12%

Part of the excessive traffic on the CARE roads is due to their use as alternate primary or secondary routes which have become impassable or difficult to use due to lack of maintenance or failure of a culvert or bridge.

CARE has divided road maintenance into two categories--routine and periodic. Routine maintenance is normally restricted to a single pass over the roadway with a motor grader to maintain the shape of the roadbed, cleaning of ditches and culverts, and repairing small potholes and eroded areas. Periodic maintenance would include reballasting which should not be required more frequently than 3 year intervals for the more heavily traveled roads, and varying

1) Based on actual traffic counts on approximately 80% of Completed roads.

from 3 years up to an indefinite period for the roads generating lesser traffic loads. The evaluation team noted some sizable road sections less than two years old which either required reballasting or where the process of adding laterite to the roadbed was taking place. It appears that this may have been required as a result of the increased traffic as noted above, poor compaction during construction or the use of low grade laterite for road surfacing.

The evaluation team saw the roads during the early part of the rainy season, and noted a variety of classical maintenance problems, e.g.: both longitudinal and transverse erosion of the roadbeds, erosions of the fill slopes, localized failures of the roadway (usually located around culverts at low points in the roads), minor failures of the fill slopes caused by undercutting, etc. CARE had maintenance crews in the area and in many cases appeared to be correcting the cause of the failure in addition to providing maintenance.

It should be noted that CARE has had some success t with the use of voluntary labor in road maintenance. paramount chiefs of the various chiefdoms throughout the project area have been made responsible for the non-machine type labor, and depending on his authority and/or interest in the road, will provide village labor to fill potholes, to keep ditches and culverts free from debris and grass, to repair fill slopes, etc. The GOSL tends to believe that once CARE leaves the area this volunteer labor source will gradually dry up, leaving road maintenance to the paid labor of the MOW. Indeed it would probably not be realistic to believe that village volunteers would work without compensa-

tion along side these paid laborers. CARE has been relatively successful up to now in the utilization of volunteer labor largely through maintaining contact with the Paramount Chiefs and by not using MOW road maintenance workers simultaniously assigned to do hand labor on their feeder roads.

CARE has suggested that one potential solution to the problem of competition between volunteer village labor and MOW paid labor could be for the GOSL to periodically pay local Paramount Chiefs for the successful manual maintenance of the feeder roads within their chiefdoms. This would not be withoutcertain technical problems, however, including:

- Although hand maintenance is necessary, the maintenance done by machine is equally or perhaps more important, as only equipment can perform the grading or reballasting of the roadbeds.

- One also should consider the lack of interest on the part of the volunteer labor if the road becomes impassable due to lack of machine type maintenance.

The maintenance of these feeder roads in the post-CARE era is an important question and will be treated more extensively in the next section. The transition from CARE to MOW responsibility will not be an easy one but, on a number of fronts, the evaluation team noted room for cautious optimism, including current GOSL performance

in attempting to meet the short-term maintenance requirements for the project roads, a current IBRD proposal for reorganization and development of a national road maintenance capability, and CARE experimentation with a system of local contractual village labor for regular maintenance of feeder roads.

2.) GOSL Current and Long-Term Performance

Early in the implementation of the current project CARE and the MOW established a program which clearly delineated the actions and responsibilities required of both parties in order to arrive successfully at a transition to total MOW takeover of maintenance of the project roads. A preliminary fact-finding mission undertaken in early May revealed that a number of long-overdue actions stipulated in the CARE/MOW program were still incumbent upon the MOW. A letter informing the MOW of these shortcomings was sent on May 7, 1979 (see Annex H).

The evaluation was particularly gratified to discover upon returning to Sierra Leone in July that every issue raised in that letter or in discussions with officials of the MOW and MODEP was satisfactorily resolved, including:

- Appropriation of Le. 100,000/year exclusively to the payment of recurrent costs for maintenance of the CARE network.

- Assignment of an inspector of works (Mr. Amara) to Kenema District to head up the maintenance program for CARE-built roads in Eastern IADP.
- Completion of a list of Le. 218,000 worth of maintenance equipment to be purchased by CARE and destined to equip the first feeder road maintenance brigade.
- Designation of 56 skilled and semi-skilled workers to the Kenema maintenance brigade.
- MOW acceptance of the staged take over of maintenance of the roads, including 77.2 miles this year, 36.5 additional miles in CY 80 and 60.1 additional miles in CY 81, etc.
- Inclusion of the MOW Chief Highway Engineer (Maintenance), Mr. Yilla, as a member of the current evaluation team effort.

Despite the fact that the GOSL has reacted efficiently to cover the short-term requirements of maintenance on the CARE network under their responsibility, it is imperative to begin planning immediately for a satisfactory solution to the longer-term problems posed by not only the CARE feeder system but the larger national primary, secondary and feeder systems as well, all of which represent parts of a larger whole.

The current road maintenance program carried out by the MOW is characterized by its high degree of centralization and a reliance on labor-intensive methods for overall activities. MOW headquarters, located in Freetown, administer all maintenance funds and personnel through the Chief Highway Engineer (Maintenance), who, in turn, works through his representatives (Area Engineer) in seven MOW areas which together blanket the country (Kenema, Makeni, Bo, Port Loko, Mile 91, Western and Lungi Areas). Maintenance is the responsibility of an Inspector of Works, who is likewise supervised by the Area Engineer.

The operational system established by the MOW for maintenance of the national road network focuses on the use of labor-intensive methods. In theory, crews of five MOW laborers are assigned to the field for every five miles of road to be maintained. Their daily work schedule is intended to include such routine maintenance tasks as filling of potholes, brushing and cleaning of culverts and drains.[1] These employees enter on the GOSL permanent employment rolls and are currently paid the minimum wage of Le 1.65/day. According to current MOW statistics, the Kenema Area alone carries 2,374 laborers on its payroll. At the national level the MOW employs 8,359 laborers at a total cost to the GOSL of Le 4,391,872, not including overtime - well over

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1. Major maintenance tasks, of course, such as grading, re-gravelling and periodic repair of major ruptures in the system (bridge or culvert washouts) depend substantially on heavy equipment.

one-half of the total MOW annual budget (maintenance plus all other MOW activities).

For anyone who has travelled in upcountry Sierra Leone, however, it rapidly becomes clear that very little road maintenance is undertaken on a regular basis, a fact which is readily admitted by MOW officials in the field. Reasons heard by the evaluation te team were varied and included: lack of capital for operating costs (especially fuel and spare parts), poor organization, worker laziness, need for more machine-intensive methods, poor training and widespread corruption. Any or all of these causes could easily prove to be contributors.

When the magnitude of current problems within the MOW are compared with the future demands which will necessarily be placed on it as the national (and probably, most notably, the feeder) road system expands, one wonders if the GOSL is not condemned to financing the expensive task of reconstructing periodically what could have been maintained regularly at a significantly lower cost to the economy. Clearly, Sierra Leone has a major challenge on its hands if it ever hopes to organize and finance the maintenance of its national road network. This concern needs to be doubly underscored in the case of low-level feeder roads which are particularly vulnerable to deficiencies in basic maintenance operations.

On key step to the improvement of the GOSL's overall maintenance capacity is a World Bank sponsored national maintenance project, the implementation of which has been delayed pending signature of a formal IMF-GOSL agreement on general economic policy. That agreement was signed in September 1974 and, at last report, the IBRD intends to dispatch a reappraisal mission to Sierra Leone in early October in order to resuscitate the project as rapidly as possible. As presently conceived, however, the national maintenance proposal will focus basically on trunk and secondary road systems. The evaluation team would, therefore, strongly urge the IBRD to design their project so that, at a minimum, the institutions and structures created by their project provide at least a theoretical framework from which one could develop future programs to address the highly sensitive feeder road question. It is likewise recommended that, should adequate funding for this aspect of the IBRD program be lacking, AID consider mounting a "parallel financing" effort in collaboration with the Bank. It appeared clear to the evaluation team that the problem of long-term maintenance of the CARE and other feeder road system, even with the IBRD project, will not be an easy one to solve. The national economy in general, and the MOW specifically, will be hard pressed to mobilize the human and financial re-sources necessary to undertake such an effort through classical government-sponsored road maintenance approaches.

Based on its field observations and discussions with local officials, the evaluation team urges that future interested parties examine carefully the potential for developing a more decentralized system of feeder road maintenance leaning heavily on local contractual labor for such routine operations as brushing, pothole filling and cleaning of culverts and ditches. CARE has been using a local labor system for maintenances over the past few years on a volunteer basis and with mixed success. They now are experimenting with a contractual approach whereby the Paramount Chief will receive a pre-established reimbursement for the appropriate manual maintenance of those feeders roads within the boundaries of his chiefdom. Payment would be made only upon inspection and approval of the works, once they are completed. Such cash payments could subsequently either be directly redistributed to those villagers who participated in the local maintenance effort, or, could be returned to some local communal fund to finance village or other improvement projects (schools, wells, latrines, etc.). The detailed implications and coordination of such a scheme would have to be carefully examined, of course, and it is hoped that the current CARE experiment will provide special insight in this matter.

Finally, it would appear worth noting that there is currently some sentiment being voiced in Sierra Leone for a return to the former decentralized District Council System. Should such a

proposal ever be actually approved, it would seem probable that the MOW would likewise be decentralized to that level. A MOW Inspector of Works or other technician at the District level could fulfill a useful role in monitoring the quality of the local rural road system. He could, for example, be made responsible for the technical input necessary to authorization of release of funds to the Paramount Chief in the type of scheme mentioned briefly above and could coordinate any mechanical maintenance required through a regionally-based mechanized unit.

If AID funds are to become involved in any aspect of a future national feeder road maintenance program, it is hoped that these issues will all be examined in much greater detail with the GOSL.

g) Costs

Unit cost of construction has increased substantially from that estimated in the PP. One of the largest factors in this increase is the reduction of total miles of road to be constructed from 400 miles to 242 miles, 60% of what was planned. This can be blamed, for the most part, on: 1) inordinate down time of equipment originally obtained from the GOSL; 2) delay of approximently one year in the arrival of most AID-financed equipment, and 3) a shorter working year, (dry season) some 2 or 3 weeks less than that originally anticipated. In addition, the fact that all actual costs were not included in earlier estimates, and economic factors such as inflation, unusually high

increases in costs of POL and local salaries, and relative devaluation of the dollar, played a part in the sharp increase in unit cost of construction.

Estimates of unit costs of construction have varied throughout the history of the project, each estimate utilizing different methods of calculating the cost. Following is a summary of such estimates in financial terms:

Project Paper (7/29/77)	Page 18	$12,214/mile
	Page 33	$15,700/mile
Fredric R. Harris Evaluation (12/77)		$16,500/mile[1]
AID Evaluation (6/30/78)		$19,925/mile

It is difficult to make a comparison of these various estimates. The Fredric R. Harris report, for example, used 1977 dollars and indicated that costs would increase at approximately $2000/mile

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1) As equitable comparison of costs is made yet still more difficult by CARE 'chopping' from its inventory spare parts valued at almost $600,000 in 1978. These parts were procured under the first CARE feeder road project, but did not arrive in time to be utilized in that project, and so were carried over into the CARE feeder roads II project. The evaluation team does not fully understand the subtleties of CARE's accounting system, but it is clear that it was not correct to deduct this amount from the FY 1978 total cost of road construction. Correcting this error, the unit cost for road construction in FY 1978 increases from $19,925 per mile to $29,340 per mile, a cost more in keeping with the FY 1979 evaluation findings.

per year of construction (indicating a slight decrease in unit costs considering an annual inflation rate of 12%). The other estimates involved not only varying components, but were valued at current dollar costs.

In calculating unit costs, this evaluation team has considered actual costs related to construction, including those costs not charged to CARE or to the GOSL (such as the cost of PCV's and VSO's), and equipment depreciation, but has not used shadow prices for volunteer village labor or local material for which no costs were actually incurred.

The evaluation team's calculations indicate that the cost per mile for the 1978-79 construction season is approximately $33,500 per mile and the average cost per mile over the three year life will be about $32,000 (see Annex F for details).

It should be noted that these figures include road maintenance costs as CARE's accounting system does not separate construction and maintenance. As the project progressed, the cost of maintenance utilizes a larger percentage of CARE's efforts, both from the total miles of road to be maintained and the type of maintenance performed. The PP assumes of total of 8.75% of total project financing will be used for maintenance of roads. If this same percentage were applied to the estimate average end-of-project

unit cost of $32,000, the cost of construction would be reduced to $29,200 per mile. In order to obtain a clearer picture of the actual cost of maintenance, it is recommended that CARE isolate construction and maintenance costs during the 1979-80 construction year.

In summary, therefore the actual unit costs appear to be about two times those estimated in the PP. The major factor in this increase is the reduction by 40% of the total miles of roads constructed, caused by events not controllable by CARE. It is the opinion of the evaluation team that the original cost estimate was nevertheless unrealistic, and that $29,200 per mile is a reasonable cost for the class of road constructed under the project.

h) The Question of Project Replicability:

The degree of success that CARE has enjoyed under manifestly difficult working conditions in its Sierra Leone feeder road projects leads one to the obvious question of replicability. It is the opinion of the evaluation team that replicability may be possible, but would caution that the juxtaposition of conditions and circumstances critical to the project's success may well be unique to the Sierra Leonean context.

CARE has benefitted from a wide range of PCV and VSO personnel to assist in execution of the project, some of them possessing exceptional technical skills. CARE has obtained the strong support

of key GOSL officials, often at high political levels. The GOSL has not only assigned volunteers to the project, but has also provided substantial equipment, facilities and some financial support. Adequate local technical and administrative personnel were available to fulfill CARE requirements and the traditional Paramount Chief hierachy was instrumental in providing a method through which volunteer labor could be provided.

Because of these reasons it appears probable that CARE could continue and, potentially, expand, its current feeder road effort in Sierra Leone. It is, however, far less clear that similar programs could be easily generated outside the Sierra Leone context and still undertake construction operations at similar cost-per-mile levels.

2. Socio- Economic Analysis

a) General Impact on Rural Development:

As one of the major components of the IADP schemes, the feeder roads constructed by CARE condition the delivery of vital inputs as well as the evacuation of marketable production. In visits to both IADP's, it was made more than clear to the evaluation team that without the CARE feeder roads, the effectiveness of the IADP programs would have been seriously compromised.

In the Northern IADP, the project manager indicated flatly that there was "no doubt" that the construction of the CARE roads has had a major impact on the rural economy. It was reported for example, that before the CARE bulldozer had finished clearing one mile on the first road, local populations began building new homes along the alignment. Furthermore, it was noted that small businesses, bush taxi service and new houses all generally follow construction. The local Rokel Tobacco and Mobole Fruit Companies are now considering the development of major small farmer extension programs in tobacco, pineapple and citrus fruits in those areas where construction crews have passed.

In the Eastern IADP similar observations were made by local officials. Inter alia, it was felt that the CARE roads have enabled farmers to receive a fairer price for their produce and have permitted vastly wider diffusion of private credit to small farmers and, particularly, a wider IADP planting program in cocoa and oil palm. The Eastern IADP project manager offered the opinion that without the roads, the IADP program would have reached its limits in the second year of operation.

Thanks to the foresight of those who designed the CARE project, funds were made available for the establishment of socio-economic baseline data on the roads constructed under this program. In 1977, 1978 and now in 1979, a project-financed social scientist, Mr. Anthony Airey, undertook socio-economic and traffic surveys

in conjunction with AID/CARE evaluations of Phase I and Phase II of the CARE feeder road program. A recapitulation of all studies undertaken by Mr. Airey to date is noted in the table below.

Survey Research to Date: CARE Feeder Roads

Year	Area	Sample
1977	S. Kailahun District	50 villages
1978	Dama Chiefdom	7 villages
	S. Kailahun District	(traffic only)
1979	Potoru Area	8 villages
	Makeni Area	7 villages
	S. Kailahun District	8 villages
	Dama Chiefdom	(traffic only)

In 1980, Mr. Airey will return to Sierra Leone to conclude his baseline study research on the CARE roads constructed during the 1979-80 work season (Potoru and Makeni Areas).

b) Resume of 1977 and 1978 Surveys :

In both 1977 and 1978, socio-economic surveys were undertaken in conjunction with A.I.D. evaluations of Phase I and II of the CARE rural road project. The 1977 and 1978 surveys were both in the general area affected by the Eastern IADP project but in two different localities--S. Kailahun and Dama chiefdom. In both of these surveys, CARE-affected communities were building more new houses, were constructing more community facilities (school, stores, a rice mill), and received more visits by IADP extension

officers than non-CARE affected communities. In the 1978 survey, the survey team found several additional features distinguishing CARE-affected communities, including more cement construction and more use of fertilizer. Communities on CARE-built or improved roads also marketed a wider range of crops than villages not affected by CARE roads was the sharply increased marketing of firewood on the roadside (a product of land clearing provoked by agricultural expansion).

c) Resume of the 1979 Survey:

In the 1979 evaluation, the survey team studied new villages in the Makeni (Northern IADP) and Petoru (Eastern IADP) areas as well as repeating the 1977 survey in South Kailahun District (Eastern IADP). The South Kailahun study is particularly worthy of note as it represent the first attempt made in the evaluation of the current project to ascertain the impact of the road over time. This longitudinal approach is in marked contrast to the cross-sectional[1)] approach utilized in all other CARE project road surveys to date.

An integral copy of the final report of the socio-economic evaluation and the survey questionnaire utilized has been placed

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1) comparing "with" and "without" cases in a given year.

in Annex I. The major conclusions forwarded by that report are:

South Kailahun District Study

- CARE roads show declining use of fertilizer (linked perhaps to declining IADP activities), high awareness of agricultural innovation and considerable increase in planting of improved cacao varieties.

- CARE roads show heightened commercial awareness in terms of crop marketing, especially rice. It is also noted that high interest in selling rice could lead local farmers to turn to less nutritive crops for home consumption.

- CARE roads show a dramatic increase in availability of transport facilities.

- CARE roads have led to higher levels of spending in consumer goods, housing and education.

- CARE roads have provided greater access to existing social service facilities and use of them has increased.

- CARE road communities are growing slowly in size and demonstrate a dramatic increase in the use of cement in construction.

- CARE roads reflect greater interest in swamp rice cultivation, and factor which may be important in maintaining local self-sufficiency in rice production.

- CARE roads seem to continue to demonstrate outmigration trends.

Potoru and Makeni Area Studies

- CARE roads in both areas show greater extension activity and more farmer predisposition to move into swamp rice production a factor which may be significant in reducing heavy pressure on upland ecologies.

- CARE roads in both areas do not yet show evidence of enhanced building activity and are characterized by high outmigration, although this latter phenomenon is not necessarily attributable to construction of the roads alone.

- CARE roads show a greater range of crops marketed in Makeni, but no difference in Potoru (with exception of cacao).

- CARE roads show evidence of greater visitor incidence in Makeni, but not in Potoru.

- CARE roads seem to encourage consumer good consumption in Makeni but not in Potoru.

- CARE roads in Makeni afford greater access to social services.

d) Conclusions to be Drawn from Surveys to Date:

The obvious major impact of CARE feeder roads construction program based on local survey research has clearly been to serve a key supportive role for the IADP programs. In effect, the CARE road program overcomes what is probably the primary constraint between the rural target populations and the well-funded and organized IADP program. Without the road, the chances of the IADP program impacting on target groups are generally poor or nil; with the road, the direction and magnitude of modern socio-economic development which follows is largely dependent on the scope and dynamism of services offered by the IADP locally. In many ways, therefore, one might hypothesize that the socio-economic surveys undertaken therein not only reflect rural road impacts but those of the entire integrated rural development mechanism, as well.[1]

1. It is clearly for this reason that economic feasibility analysis of feeder road projects is generally studied as only one part of their larger IRD schemes. Costs and benefits are not attributed to the road alone, but, rather, are associated with the aggregate development effort.

The development pattern which seems to be reflected by the totality of these surveys appears generally favorable, showing greater rural farmer sensitivity to the monetary economy, increased production of both cash and food crops and general increase in socio-economic welfare of the rural poor. Some problematic impacts can be associated with the project as well, however. Development efforts supported by the road could, for example, lead to rapid deforestation and pressure on local ecologies, induce lower levels of nutrition, encourage greater outmigration or lead to higher incidence of water-borne disease by encouraging greater farmer interest in swamp rice production. Furthermore, it should be noted that little or no information is provided by the current surveys on the topics of income effects or the impact of the project on women.

Based on its review of the survey methodology utilized, the evaluation team would recommend that the composition of the questionnaire be modified so as to reflect the following concerns:

a) The composition of the questionnaire contains too few controls on "other" factors which may be effecting the target population. The analysis is not yet refined enough to permit it to distinguish between "road" and "other" impacts in most cases.

b) The questionnaire does not provide sufficient data on several key items: demography, class, social structure

(family lineages, divorce lineage), women and several economic variables (prices and size of transactions, quantities of agricultural inputs). Lacking such data, it is difficult to understand and measure the impact of the road on such issues as equity, income, land distribution, sex roles, and demography.

If sufficient human and financial resources can be mobilized to incorporate these revisions in the 1980 survey questionnaire, the evaluation team would urge that this be undertaken as completely as possible. Some assistance could be requested by REDSO/WA in order to develop the new questionnaire, should this be required.

It would appear useful for the GOSL and responsible IBRD employees to exploit the data, both optimistic and pressimistic, being generated by these surveys in order to better monitor and rectify, as appropriate, the overall development program which is being undertaken in the IADP areas. Both in the context of an attempt to evaluate the impact of the CARE feeder road program and, indirectly, of an attempt to evaluate the overall impact of the IADP programs, the evaluation team would strongly recommend that AID, IBRD or the GOSL consider financing a follow-up study of the roads in 1982 (or soon thereafter) in order to better understand the impact of the program over time. Indeed, a major deficiency in the current surveys is precisely that they are cross-sectional,

not longitudinal, in approach. This means that the results obtained are often fairly ambiguous at best and potentially misleading at worst. The evaluation team has already initiated two efforts to interest AID or IBRD in financing the follow-up study (see Annex K and L for text of these proposals) and urges interested parties to look seriously into the planning and financing of this study as soon as possible.

e) Selection of Roads:

Within any given area of a country like Sierra Leone the spead of potential road projects is far larger than can be accomodated within usual project budgetary limitations. Furthermore, past experience has clearly indicated that selection of agricultural feeder road projects can become a highly politicized process and therefore, potentially detrimental to the crucial agricultural production role they were intended to serve.

In general, the evaluation team has concluded that selection of the roads under the CARE project was undertaken in a reasonable and unbiased manner. The selection process currently utilized is orchestrated at two separate levels:

1) The IADP, in conjunction with the local CARE construction engineer, selects those roads alignments locally which
   - are over three miles in length,
   - serve to open up an area of priority agricultural

development according to the IADP master plam, and

- serve the greatest population.

If it is estimated that the roads can be built to Class IV standards at a reasonable cost, they are forwarded to a special GOSL approval committee.

2) The "Feeder Road Project Coordinating Committee" was set up in 1976 in an effort to depolitize the road selection process. The committee is composed of the following members:

- The First Vice President of Sierra Leone (ex-officio Chairman)
- Ministry of Development and Economic Planning (The Permanent Secretary).
- Ministry of Works (Chief Engineer Highways)
- CARE (Director or Project Coordinator)
- Peace Corps (Assistant Director)
- Ministry of Agriculture (observer)
- Ministry of Social Welfare (observer)
- Ministry of Tourism (observer)

The Committee normally will meet three times per year in order to approve the IADP submission or serve as open forum for any problems which arise in association with their selection.

Although there are infinitely more complicated models which could

be constructed to screen the IADP roads, the level of sophistication of the process described above is probably approximately concommitant with the sophistication of the available data base. Some improvements in refining the criteria might be attempted if certain background information such as accurate aerial photography, a local census or land use survey were available. Future programs currently envisaged (Eastern IADP III, Koinedugu IADP, Moyamba IADP) might be well advised to consider such information as a part of their overall planning process

One concrete criticism of the current list can be made, however, Because of the poor state of maintenance on neighboring secondary and even trunk roads the CARE feeder roads are often utilized as a bypass by large numbers of through vehicles and heavy long-distance trucks (e.g. R 120 in the Eastern IADP and N5 in the Northern IADP). ADT's of over 200 v.p.d. have been measured on some roads, levels for which they have not been engineered. It would seem appropriate, therefore, that an additional criterion should be added to the preceeding list stipulating that project roads should not link up with other parts of the network at both ends. In all cases they should be designed to avoid becoming by passes or major through roads.

II. CONCLUDING REMARKS

The evaluation team is unanimous in commending the local CARE team for the general success with which they have developed a feeder road construction effort in rural Sierra Leone. Based on its investigations the evaluation team feels that the project, as an important part of the larger IADP schemes, is well on its way to making a significant contribution to the improvement of rural farm incomes and general well-being in those area where the roads have been constructed.

Substantial progress has been registered on the road maintenance front as well, with short-term maintenance of the project roads substantially guaranteed by the concrete actions undertaken by the GOSL and which were noted earlier.

Road construction under the CARE program is falling short of anticipated levels due to a number of circumstances, the majority of which were completely beyond the control of the CARE administration. Of the initially 400 miles of road projected to be constructed, less than 250 miles will be completed prior to the end of the final 1979-80 constructinn workyear.

Given the important role that the CARE network plays in the

overall rural development effort promulgated by the IADP schemes, it would seem vital to locate new funds which could assist CARE to complete the most pertinent sections of its overall network. The majority of these roads will be located in the Northern IADP. The evaluation team has had informal discussions on this matter with IBRD and MOW officials. The timing of foreign-donor supplementary financing for the project would appear particularly critical, as is noted in Annex M. Current cash flow predictions anticipate that CARE will traverse a period of financial difficulty during the 1980-81 workyear due to the drying up of foreign donor funds in that year. Funding under the current AID grant will have been completely utilized by the end of the 1979-80 workyear and EEC and IBRD funds for the Koinadugu and Eastern IADP programs respectively will not be available until the 1981-82 workyear, at the earliest. Such a cash flow problem could have catastrophic repercussions on the CARE roads program, which has slowly built up momentum over the last five years. The laying off of key employees and the shut down of all operations for more than a few months would cause serious personnel and administrative problems for CARE at best, and, at worst, could conceivably stop the entire program. The evaluation team therefore strongly urges the foreign donor community and the MOW to examine carefully the possibility of locating the necessary funds to permit CARE to carry through on their operations during the 1980-81 workyear.

The evaluation team recommends that a final evaluation of the project be undertaken in July, 1980 incorporating, notably; an assessment of the performance of the MOW in following through on their CARE feeder roads maintenance proposal; an assessment of the current CARE experiment in utilization of contractual village labor for routine maintenance of the feeder roads; an update of the economic analysis noted in the original PP and leading to a better understanding of the thrust and magnitude of economic change attributable to the project roads; a road user analysis showing composition and intensity of traffic on the project roads; a study of maintenance costs on the CARE roads and how they evolve with the passage of time.

Finally, the evaluation team unanimously recommends that FY80 project funds amounting to $1,1050,000 be alloted to CARE as soom as possible so as to spare CARE of any further funding discontinuities due to delays in availability of USG finances.

ANNEXES

ANNEX A

PROJECT DESIGN SUMMARY
LOGICAL FRAMEWORK

Project Title: CARE Rural Penetration Roads

Life of Project:
From FY 77 to FY 79
Total U.S. Funding $3,991,000
Date Prepared: July, 1977

NARRATIVE SUMMARY	OBJECTIVELY VERIFIABLE INDICATORS	MEANS OF VERIFICATION	IMPORTANT ASSUMPTIONS
SECTOR GOAL: To increase the per capita income of the rural population of Sierra Leone	1. Average cash income per rural household exceeds $365 per annum. 2. More than 40% of rural households earn more than $469 per annum.	World Bank Assessment	1. Rural terms of trade with urban sector will not deteriorate. 2. Favorable GOSL action on taxes, agricultural pricing.
PROJECT PURPOSE: To provide farmers in the eastern, southern and northern areas with continuing access to agricultural inputs and market outlets.	**END OF PROJECT STATUS:** 1. Extension services: An estimated 270 extension agents travel on penetration roads to provide agricultural services to estimated 14,800 rural families (143 direct beneficiaries). 2. Increasing quantities of produce including rice, cocoa, and groundnuts transported on penetration roads. 3. Increasing quantities of ag supplies (e.g., fertilizer and improved seed) are transported on penetration roads. 4. 624 miles of penetration roads maintained regularly by an independent self-sustaining unit operated/funded by the MOW.	Assessments conducted by: (a) World Bank (IADP) (b) USAID/Liberia and CARE/Sierra Leone	1. IADP/GOSL extension services will be provided at a ratio of 1:40. 2. Prices offered to farmers will induce increased production and marketing of crops. 3. Transport systems expand adequately to meet marketing needs. 4. All donor contributions received on schedule.

PROJECT DESIGN SUMMARY
LOGICAL FRAMEWORK

Life of Project:
From FY 77 to FY 79
Total U.S. Funding $3,991,000
Date Prepared: July, 1977

Project Title: Haste - Lo - Fa - e
CARE Rural Penetration Roads

NARRATIVE SUMMARY	OBJECTIVELY VERIFIABLE INDICATORS	MEANS OF VERIFICATION	IMPORTANT ASSUMPTIONS
PROJECT OUTPUTS: 1. Construction/rehabilitation of a. rural penetration roads b. bridges and box culverts c. pipe culverts 2. Unit within MOW funds and supervises road maintenance.	1. End of FY (Cumulative): a. Miles (total) 1970: 100; 1979: 250; 1980: 400 IADP - North 1970: (30); 1979: (95); 1980: (110) Swampland 1970: (10); 1979: (10); 1980: (10) IADP - East 1970: (60); 1979: (35); 1980: (20) Rice project 1970: -; 1979: (10); 1980: (10) b. Culverts/bridges 1970: 10; 1979: 10; 1980: 11 c. Pipe culverts 1970: 370; 1979: 550; 1980: 550 2. a. MOW participates in OJT conducted by CARE. b. Maintenance funds in GOSL beginning FY 1978	1. CARE/Sierra Leone records 2. USAID/Liberia engineer reports and annual evaluation.	1. Weather conditions permit 32 full weeks of construction time. 2. Spare parts are in adequate supply to keep equipment availability above 70%. 3. Equipment deliveries on time to permit use as scheduled. 4. Estimated level of commercial labor forthcoming. 5. GOSL high priority placed on this project continues.

PROJECT INPUTS:3/	$(000) 7/77-9/78	10/78-9/79	10/79-9/80	TOTAL	%
AID: Local personnel construction equipment	1,747.4	1,169.7	1,073.9	3,991.0	47
GOSL: Equipment & equipment operators for road maintenance and local personnel costs.	489.7	515.5	787.7	1,792.9	21
CARE: U.S., third country and local personnel costs	370.4	385.4	445.0	1,200.8	14
IBRD: Road construction equipment	911.2	101.7	186.0	1,198.9	14
Peace Corps and Volunteer Services Overseas (V.S.O. - U.K.): U.S., third country and local personnel	112.5	112.5	112.5	337.5	4
	$3,631.2	2,284.8	2,605.1	8,521.1	100

3/ See Financial Analysis: AID Circular Airgram Number A-530 (dated 9/27/76) states that "...a 25% contribution to total life of project costs from non-AID sources will be expected for all OPGs. This would include case and in-kind contributions from PVOs, local collaborators and other non-governmental donors as well as from host governments, other governments and international organizations."

ANNEX B

ok

SUMMARY OF WORK

FISCAL YEAR	CLASS III ROADS ON IADP	OTHER ROADS STRUCTURES ONLY OFF IADP	TOTAL
FY 76 L1	55.9	41.5	97.4
FY 77 L1	64.3	12.7	77.0
FY 78	54.6	8.5	63.1
FY 79	71.5	5.7	77.0
	246.3	68.4	314.5

FY 80 Projection —South

44S	9.7
46S	6.0
47	7.5
58S	6.3
80S	4.5
82S	0.8
86S	7.0
129S	8.0
131S	4.6
136S	5.3
	50.7

North

1	6.7
2	8.25
3	3.65
4	1.4
7	7.3
13	4.7
38	12.25
39	7.0
	51.25

APPROX 102 Miles

Work seasons 30 weeks

Output/Week 3.4 miles or 1.7 per unit/week

Increase of output is based upon the use of three scraper bowls which are being rehabilitated now.

L1 CARE Rural Roads I Project

Annex C

[redacted] TRAFFIC COUNTS (FY 1979)

Roads	Miles	Count
30	12.5	62.14
30 A	4.0	17.14
30 B	8.5	55.86
37	6	60.56
41	12	-
43	9	114.29
70	6	179.57
71	4	-
71 A	4	-
71 B	4	-
74	0.6	41.28
75	16	116.28
75 A	3	19.0
76	1.5	25.14
84	11.1	126.43
90	9	67.57
91	2	39.9
95	18	25.26
95 A	13	23.54
115	5	109.15
116	3.5	50.00
120	7.1	195.99
121	4.0	291
122	2	-
123	1.5	-
127	4.0	13.85

pecial	Roads Counted 20		Miles Counted 143.8		
0 80%	0-50	9 45%	0-50	49.6	34%
-150 20%	51-150	8 40%	51-150	77.1	54%
r 150 [redacted] 0%	Over 150	3 15%	Over 150	17.1	12%

ANNEX D

MAINTENANCE COST SUMMARY
(In Leones)

Mechanical - Structural

	March	April	May	June
Personnel	1,646.11	1,606.75	1,760.36	2,006.82
Pers - Support	1,226.67	1.230.67	1,635.67	1,721.38
Materials	1,829.00	1,829.00	1,829.00	1,829.00
Equipment	3,696.00	3,245.00	2,706.00	4,112.00
Equip Support	4.00	4.00	242.00	322.00
Total	8,402.00	7,915.42	8,173.05	9,991.2
Miles	21.6	21.6	33.3	24.75
Cost/Mile (Le)	395	373	252	412

Manual Labor

Personnel	1,298.46	1,298.40	1,833.82	1,857.72
Miles	52.25	33.0	24.0	14.75
Cost/Mile (Le)	25	39	76	126

Extrapolated Average Cost of Maintenance per Mile/Year

Mechanical Le 1074 = US$ 1100
Manual (not including Vol. Labor) Le 200 = US$ 200

The above figures are indicative only, and can not be used as a base for future maintenance costs as very little reballasting took place during this period.

FY 1979 CONSTRUCTION COSTS AND FINANCING ($US 000)

	FX	LC/1	TOTAL
IBRD	- 0 -	349	349
GOSL	- 0 -	242	242
AID	383	882	1,265
CARE	145	210	355
P.C. VSO/2	100	- 0 -	100
TOTAL	628	1,683	2,311

Depreciation:

Equip Procured FY 1979	.2 x 242 =	50
Equip Procured FY 1978	.2 x 930 =	186
Equip Procured pre FY 1978	.2 x 745 =	149
Maint. & Shop Repair (a979)	.2 x 65 =	13
		398
Subtotal		2,709
Less Difference in Spare parts purchased in FY 1979 and those used		(-) 145
TOTAL 1979 COST		2,564,000

$2,564,000 ÷ 77 miles = $33,300/mile

/1 1 leone (Le) = $1.00 U.S.

/2 Peace Corps Volunteers are costed out at $10,000/year VSOS are costed out at $5,000/year (Salaries are paid under local costs section above)

END OF PROJECT CONSTRUCTION COSTS

Fundings

AID	$3,991,000
GOSL	1,792,900
CARE	1,200,800
IBRD	1,198,900
Total	$8,521,100

Residual Costs

Unamortized Equipment	$700,000
Maintenance and Equip. Fund	414,000
Unamortized Workshop Improv.	50,000
Materials and Spare Parts	100,000
WOA Bridge (Project funds used for non-road construction) - Credit	130,000
Total	$1,394,000

Total Project Costs = $8,521,100
Less 1,394,000
Costs $7,127,100

Unit Costs = $7,127,100 ÷ 242.1 miles
= $29,440/mile

ANNEX F

COST BREAKDOWN: FY 1979

	(US$000)	Percent of Total
Plant Depreciation	398	15%
POL	349	14%
PERSONNEL	716	28%
MATERIALS	252	10%
SPARES	443	17%
ADMINISTRATIVE COSTS	406	16%
TOTAL	2,564	100%

COST BREAKDOWN BY YEAR

(US$000 and percent of Total)

	FY 76 /1	FY 77 /1	FY 78	FY 79
Personnel	266 (26)	319 (37)	490 (29)	716 (28)
POL	154 (15)	137 (16)	308 (18)	349 (14)
Material	123 (12)	106 (12)	227 (13)	252 (10)
Spares	438 (42)	234 (27)	561 (33)	443 (17)
Support	61 (5)	73 (8)	131 (7)	406 (16)
TOTALS	1,042 (100%)	869 (100%)	1,717 (100%)	2,564 (100%)

/1 CARE Feeder Roads I

ANNEX II

May 7, 1979

Mr. J. D. Sandy
Permanent Secretary
Ministry of Works
New England
Freetown

Subject: Evaluation of CARE Feeder Roads Project

Dear Sir:

Permit me to extend my personal appreciation for the discussions which Mr. Brown and I were able to undertake this morning with you and other key members of the professional staff of the Ministry of Works. Although, normally, project correspondence would go through CARE, I felt, with their approval, that in this instance you would appreciate a letter from the AID standpoint.

As you are now aware, AID and CARE are in the process of mounting a critical evaluation effort of the subject feeder roads project. That effort has tentatively been scheduled for the first two weeks of the month of July, 1979. A major point of focus for the evaluation team will be the maintenance of the feeder roads, which, to a large extent, have been constructed with U.S. Government grant funds. Ultimate responsibility for the maintenance of these roads, of course, falls upon your Ministry.

I would, therefore, draw your attention to the following issues, all of which hopefully will be resolved by the MOW prior to the arrival of the evaluation team.

1) MOW PARTICIPATION IN THE JULY EVALUATION - We would appreciate the direct participation of the Chief Engineer-Highway Maintenance, Mr. Villa, in the evaluation. He would be expected to travel with the team to Kenema and Daru so as to carry out a field investigation of local conditions. We currently anticipate that the total time required of Mr. Villa for the evaluation will not exceed five days. We will, of course, also look forward to a close collaboration with Messrs. Boston-Mansah, Jones-Dove and yourself at that time.

2) KENEMA ENGINEER - It is critical to the project that key MOW maintenance personnel be placed in the field as rapidly as possible. Hopefully an engineer or experienced inspector of works will be assigned to Kenema immediately so that he may begin taking over maintenance activities in that area. It is anticipated that maintenance of the CARE feeder roads would be this individual's only responsibility.

3) RECURRENT COSTS - For purposes of clarification, the evaluation team will require a decision from the MOW indicating how it intends to cover the personnel and equipment operating costs which will be incurred on a recurrent basis when the Ministry takes over maintenance of the CARE feeder roads. This includes a number of masons, foreman, operators, drivers and laborers who the Ministry plans to assign to the area. Additionally, we need to know if the MOW has already located the personnel and at what point in time they will be assigned to the field.

4) EQUIPMENT LIST - It is requested that the Ministry draw up (as requested in CARE letter dated April 2, 1979) a recommended list of equipment destined for maintenance of the CARE feeder roads in the Eastern Region and which would be purchased by CARE. At present, the CARE maintenance unit consists of:

1 -Grader
1 -Self-propelled compactor
1 -Front End Loader
2 -Farm tractors
4 -Trailers
1 -1-Ton Pickup
1 -Motorcycle

5) ROADS TO BE MAINTAINED - According to the Feeder Roads Maintenance proposal submitted by Mr. C. B. Roberts to AID and CARE, the MOW will assume full responsibility for lthe adequate maintenance of the CARE roads within two years following completion of their construction. Completed CARE roads are noted below, by fiscal year, for your reference

	Road No.	From	To	Distance (Miles)	
A.	Completed FY 76				
	# 37	Nyandehun	Senehun	6.0	
	# 70	Daru	Kotuma	6.0	
	# 71	Folu	Tewama	4.0	
	# 71A	Baiima	Kambona	4.0	
	# 71B	Senehun	Tawama	4.0	
	# 74	Kambona	Fagoya	0.6	
	# 84	Mobai	Bomaru	11.1	
	# 127	Giema	Jagbwema	4.0	39.7
B.	Completed FY 77				
	# 30	Gboyola	Semabu	12.5	
	# 31A	Mambona	Bunumbu	1.5	
	# 90	Mobai	Baiwala	9.0	
	# 91	Mobai	Potolu	2.0	
	# 115	Baiwala	Senga	5.0	
	# 116	Kuiva	Jambohun	3.5	
	# 121	Segbwema	Baoma	4.0	37.5
C.	Completed FY 78				
	# 30B	Fabana	Kigbai	7.0	
	# 43	Daru	Baiima	9.0	
	# 75	Mobai	Dumpe	16.0	
	# 75A	Kakbyenhun	Japowahun	3.0	
	# 76	Bawama	Giehun	1.5	36.5
D.	Completed FY 79				
	# 30A	Mambona	Jokibu	4.0	
	# 41	Mondokelema	Joru	12.0	
	# 95	Giema	Madina	18.0	
	# 95A	Kotuma	Sandaru	13.0	
	# 120	Daru	Segbwema	7.1	
	# 122	Baiima	Bandajuma	2.0	
	# 123	Baiima	Jagbwema	4.0	60.1
			Total miles to date:		173.8

Theoretically, therefore, as of July of this year the MOW should be actively maintaining 77.2 miles of road. This responsibility will cover 113.7 miles by July, 1980 and 173.8 miles by July, 1981. This represents, of course, only those roads constructed in the Eastern Province to which must be added subsequent construction in the Northern and Southern Provinces. Realizing the magnitude of the effort required of you, I am sure you will agree with me that all parties involved should move rapidly toward the establishment of a detailed and realistic overall plan for the appropriate yearly maintenance of these low-level roads.

Should you require any more detailed technical information on the above mentioned points, I am sure that the local CARE office will be more than pleased to assist you.

Permit me in closing to underscore the importance that AID attaches to the maintenance of what appears to date to be a highly successful feeder road construction program. I shall look forward to a creative and fruitful resolution of any outstanding problems associated with the maintenance question this coming July.

Sincerely yours,

James A. Hradsky
Acting Chief, Projects Office
FEDSO/WA

cc: Mr. Boston-Mamah, Professional Head, MOW
Mr. Yilla, Chief Engineer, Highway Maintenance, MOW
Mr. Kuyembeh, Ag. Development Secretary, MODEP
Mr. Ramp, Director, CARE/Sierra Leone
Mr. Huddleston, AAO, AID/Sierra Leone
Ambassador John A. Lindner, American Embassy, Freetown

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ANNEX I

A.AIREY B.Sc., M.A.

SOCIO-ECONOMIC AND TRAFFIC EVALUATION OF CARE FEEDER ROADS IN SIERRA LEONE

Second report of the evaluation conducted in Sierra Leone, June 1979 - August 1979.

Geography Department,
Lanchester Polytechnic,
Coventry, England.

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INTRODUCTION

This socio-economic evaluation organised and conducted over a period of six weeks follows one of the established methodologies of social science research, namely that of the limited interview technique. This technique is eminently suitable to evaluative work of this kind. It is relatively easy and cheap to organise; it is speedy in its execution and enables the researcher to interview a large sample of respondents. It does have several major criticisms and these should be born in mind when reading this report, or attaching any significance to its findings:-

1. Memory Recall - Since this research is based on a single interview the memory recall of the respondent is of paramount importance and heavy relianceis placed on the accuracy of this recall. Human nature being what it is we can expect several types of errors to creep in:-

a) Loss of memory - The human memory has a limited accuracy and this accuracy is reduced with time. Therefore figures and information involving recall from the past will have a larger error factor than those of the present e.g. marketing data age of fallows.

b) Perceptual bias - An individual's perception of his environment will influence his factual judgement of that environment. Thus those communities unaffected by the CARE Feeder Road Building Programme (F.R.B.P.) may exaggerate their transport difficulties. In contrast, CARE affected communities may be less inclined to exaggerate this aspect of their life since they are no longer constrained by transport problems.

c) Disguising the truth - Areas which the individual respondent feels are sensitive to action from officials or the opinion of his peers will be areas in which he will obscure the truth. Thus the ownership of radios may be an under-estimate. Most radio owners do not have the required government licence and are, therefore, sensitive to enquires as to radio ownership.

2. Measurement or Observation errors - Measurement or observation errors will occur since the tool for measuring change is based on a single 40 minute interview. These errors will arise in a number of ways. Misinterpretation of the questions asked, mistranslations and answer evasion are common sources of error.

However, these errors can and were minimised by using several techniques:-

a) Training the interviewer.

b) Pre-testing the interview schedule.

c) Incorporating check-questions into the schedule to test the validity of the answers given.

3. Problems of understanding - More importantly, however, is the danger of complacency that this technique may induce. Can an understanding of the real process of change and the social, economic, cultural, agricultural and demographic background to that change be gauged from a single interview? This is rhetorical question to which there is no ready answer.
Nevertheless, the field experience of the author linked with an academic training in agriculture, resource development and ecology of West Africa, ensures that the difficulties of this type of research have been recognised. Measures have been taken to meet these criticisms but such is their fundamental nature that they can never be completely overcome.

The report is organised into four parts. The first three parts deal with the socio-economic evaluation of CARE's activities in three different areas of the country (Map 1). Parts one and two are essentially cross-sectional in their approach. In contrast part three is concerned with a resurvey of an area studied in 1977. It therefore offers a more accurate longitudinal analysis of CARE's impact on rural farming households in Sierra Leone.

Finally part four is concerned with the results of three origin and destination traffic surveys.

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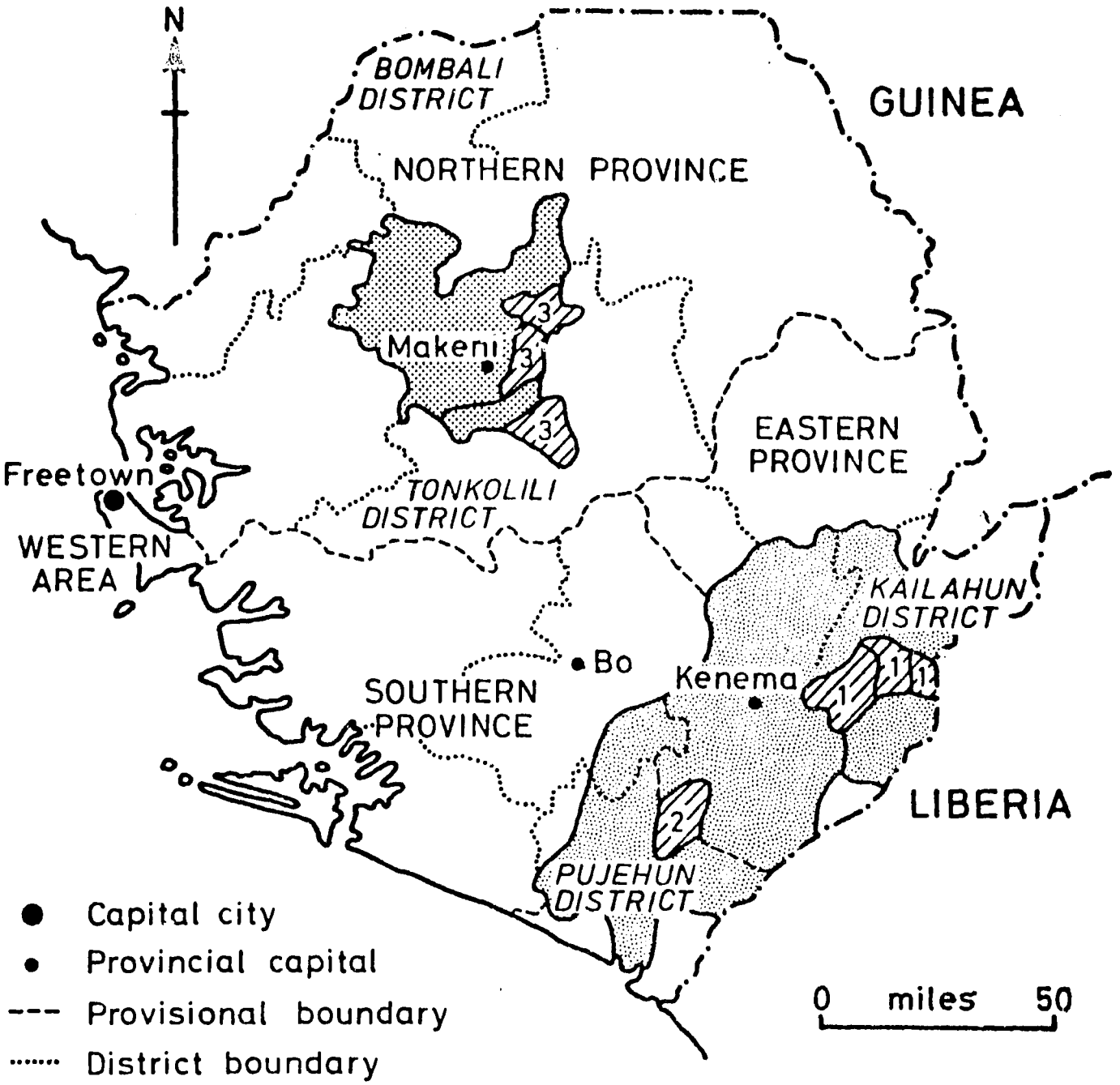
MAP 1 SIERRA LEONE: SITUATION OF EVALUATION AREAS



- ● Capital city
- • Provincial capital
- --- Provisional boundary
- ····· District boundary
- Evaluation areas
- I.A.D.P. Eastern area
- I.A.D.P. Northern area

1 Daru area
2 Potoru area
3 Matotaka-Binkolo area

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PART ONE

SOCIO-ECONOMIC EVALUATION IN BARI CHIEFDOM

Potoru Area

General background to the socio-economic survey

Bari chiefdom is situated in the Pujehun district of the Southern Province of Sierra Leone. It is one of the largest chiefdoms in the district with an estimated area of 175 square miles. It is the second largest chiefdom in population terms, with 14,710 inhabitants. This is an overall density of 84.1 people per square mile c.f. a national density of 98.5 people per sqare mile.[1]

Climate

Climatically Bari chiefdom is distinctive from other areas of Sierra Leone in that it enjoys a more intense rainy season of some 7 to 8 months of effective rainfall. Annual average totals exceed 120 inches.

Relief and Drainage

Varied relief again is a feature of the chiefdom, situated as it is on the interfluve between the Waanje and Moa rivers.

Vegetation

The natural vegetation (Tropical Rain Forest) remains, in a slightly modified form, in the northern part of the chiefdom where the activities of the Forestry Department has controlled agricultural incursions. Elsewhere low arm bush dominates the vegetation.

Agriculture

Agricultural activities in Bari chiefdom are concerned with the cultivation of rice, coffee and cacao, similar in many respects to the agriculture of Dama chiefdom except that cacao and coffee are less generalised.

Objectives

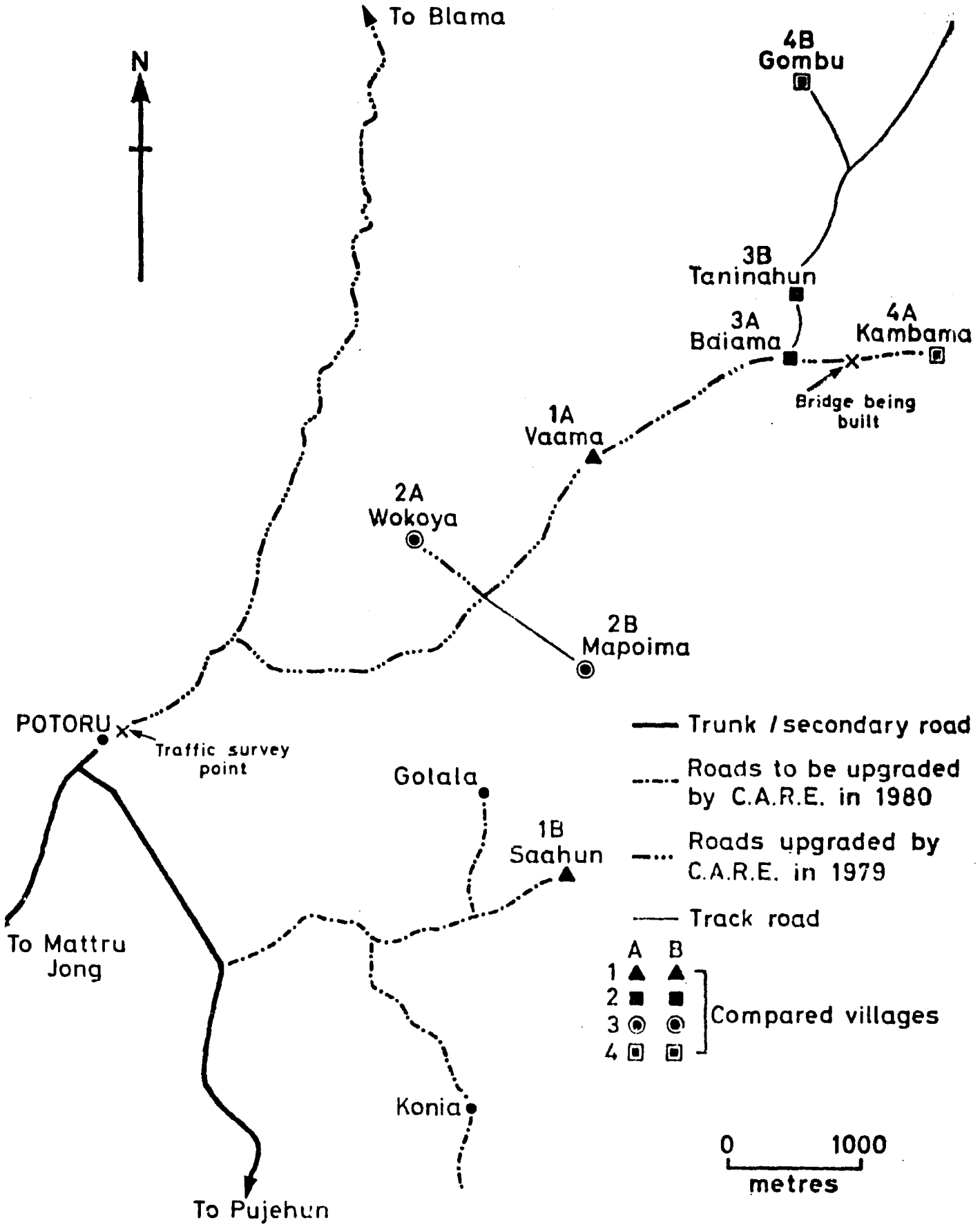
1. To measure the achievement of intermediate goals established in previous evaluations.
2. To identify other social, economic and agricultural characteristics of the CARE affected communities as base line data for future surveys.

Methodology

Bari chiefdom in Pujehun district is the only chiefdom to have benefitted from a completed CARE road (R 92) in the Potoru area. R 92 was completed early in 197[illegible] and accessment to improved accessibility has been of a short duration. In view of this a with-without evaluative framework was adopted which also provided the bases for a future longitudinal before - after analysis. Four pairs of villages were selected as characteristic settlements of the CARE affected rural scene in Bari chiefdom (Map 2) :-

1. Unpublished 197[illegible] Census information

MAP 2 SOCIO ECONOMIC SURVEY IN BARI CHIEFDOM
LOCATION OF SURVEY VILLAGES



1. Large "section" villages of over 500 people with a politico-administrative function.

a) Vaama (pop. in 1974 595) b) Saahun (pop. in 1974 577)

2. Medium sized villages of over 200 people

a) Wokoya (pop. in 1974 163) b) Mapoima (pop. in 1974 171)

3. Small villages/hamlets

a) Baiama(pop. in 1974 98) b) Taninahun (pop. in 1974 98)

4. Remoter villages

a) Kambama (estimated pop. 92) b) Gombu (pop. in 1974 159)

All of these villages were situated on seasonally motorable tracks of varying quality since there were no suitable non-motorable villages in the study area. Category 4 villages might, however, be regarded as the controls,Gombu, by virture of its distance from the CARE road, and Kambama,by the difficulties of bridging a small tributary of the Moa.

Intermediate goals

1a. Increased Agricultural Extension Service Activity

Table 1 - Number of positive responses to questions concerning Extension Service Activity

settlement category and name	No interviewed	Knowledge of extension off.	Visits by Ag. teachers	Knowledge of fertilizer.	Use of fertilizer.	Knowledge of IADP
1a. Vaama	23	1	8	22	6	21
2a. Wokoya	9	9	5	9	2	9
3a. Baiama	11	0	1	5	0	7
Total	43	10(23%)	14(33%)	36(84%)	8(19%)	37(86%)
1b. Saahun	27	0	4*	23	3	26
2b. Mapoima	16	15	5	15	8	14
3b. Taninahun	11	0	0	10	2	11
Total	54	15(28%)	9(17%)	48(89%)	11(20%)	51(94%)
4a. Kambama	10	0	4	8	1	9
4b. Gombu	12	0	0	7	0	9
Total	22	0	4(18%)	15(68%)	1(5%)	18(82%)

*Peace Corps Agricultural Assistance

The 1978 findings in Dama are generally confirmed in that extension activities are much greater in the CARE affected communities (category A.) Knowledge of agricultural workers, fertiliser, IADP, is everywhere high but CARE affected communities are able to put into practice this knowledge due to the concentration of IADP activities along the feeder road. Thus some 28% of farmers in category A communities had been, or are, participants in the IADP (the majority are swamp rice farmers). This contrasts to only 6% of category B farmers.

1b. Increased Visitation Rates

Table 2 Farmers reported last contact with IADP agricultural extension officer.

	Within last 4 weeks	Within last 1-3 months	Within last 3-6 months	Within last 6-12 months
A Communities	4	1	2	6
B Communities	1	0	1	3
4a (Kambama)	3	0	0	1

Table 2 indicates that current agricultural extension is biased very much towards the CARE affected (and in the case of Kambama to be affected) communities. This clearly confirms the mutually reinforcing activities of CARE and the IADP in Dama chiefdom in 1978.

2. Increased Marketing of Agricultural Crops

a. Increase in types of crops harvested

Table 3

	No. Inter-viewed	Coffee Units sold	Coffee No. of farmers Involved	Cocoa		Rice		Cassava		Orange		Banga	Kola	
1a Vaama	23	159	20			12	2	3	1	9	2			
2a Wokoya	9	26	8	2	3	29	3						.75	1
3a Baima	11	20	7		3					2	1			
Total	43	205	35	8.2	16	41	5	3	1	11	3		.75	1
Average per farmer		5.9		1.4		8.2		3		3.7			.75	
1b Saahun	27	[illegible]	25	29.5	11	14	3	6	1	39	3		19.5	7
2b Mapoima	16	39	13	3	1	52	6	10	2	45	4		8.5	4
3b Taninahun	11	35	11	16	3	13	1			10	2		4.3	2
Total	54	168.5	47	48.5	15	84	10	16	3	94	9		32.3	13
Average per farmer		3.6		3.2		8.4		5.3		10.4			2.5	
4a Kambama	10	9	4	4	1	10								
4b Gombu	12	19	9	13	3								1.5	3
Total	22	28	13	16	4	10	1						1.5	3
Average per farmer		2.2		4		10							.5	

The marketing picture is not a clear one and the problem of farmers failing to give reliable data is a very real one. A. communities in particular seem reluctant to disclose their true level of marketing. It is therefore difficult to draw any conclusions about the impact of the CARE road vis a vis the non CARE B communities.

Nevertheless the remoter Kambama and Gombu do apparently market a smaller range of crops and to a smaller extent than their more accessible counterparts. It is possible to suggest that this reflects the remotemess of these communities. The CARE impact on Kambama when the road is completed will therefore be particularly interesting.

One area where a new road might be expected to have an influence is in the diffusion of new ideas and crops. The spread of the IADP introduced "Amazon" cacao (a dwarf high yielding amenolada cacao) is one such innovation studied. Knowledge of this cacao is quite high in the area, some two thirds of farmers in both categories of communities knew of the plant. However a slightly higher percentage (12%) of farmers in CARE affected villages had actually planted the new seedlings compared with 9% in their unaffected counterparts. This confirms, albeit tentatively, the spread of new crops along the roads. Gombu, the remotest village, had the lowest level of knowledge and no plantings of the new cacao.

3 Increased Transportation facilities

a. More frequent transport services

Mazda poda podas are based in both Saahun and Vaama. However the vehicle at Saahun is being repaired in Kenema and the village is without regular rainy season transport facilities. In contrast there are two poda podas based in Vaama and these are in working order leaving the village everyday for Potoru and beyond. Thus Vaama enjoys on average the visits of four poda podas each day. Saahun in contrast receives only two poda podas per day on average. A rainy season premium is also in operation similar to that observed in Daru chiefdom.

b. Greater range of vehicles using the roads

The Vaama road carried a small amount of traffic, composed principally of poda podas and motor cycles. The Saahun road carried less traffic dominated by poda podas. The sensitivity of the motor cycle to the road surface noted in Daru can thus be supported.

c. Vehicle ownership more common among villages in communities linked by new roads.

The low level of vehicle ownership in the area is noted. However the five vehicles that occur (4 bicycles and 1 Honda) are all owned by farmers in the non CARE communities. This contradicts last years findings in Dama chiefdom.

4. Changes in Socio-economic status

a. Population more materialistic

Using the criteria applied in Dama chiefdom namely the use of the radio and ownership of consumer durables, the A communities appear to be less materialistic than their B counterparts. Both show the same level of radio usage for crop price information (38% of farmers in each case). However as table 4 shows category B communities appear to be wealthier than their A counterparts:-

Table 4 Material possession of A and B communities

	Umbrellas	Plastic buckets	Watches	Radios	Charcoal iron	Honda or bicycle
A Communities	30(70%)	7(16%)	14(33%)	4(9%)	11(26%)	0(0%)
B Communities	50(93%)	19(35%)	19(35%)	9(17%)	15(20%)	5(9%)

It follows that category B households possess on average some Le21.72c worth of goods (1978 prices) compared with Le15.42c of the A communities. The greater materialism of A communities can not be sustained using this evidence.

b. Increased contact with monetarised economy

Farmer income in the two categories of villages seems to be of a similar order. Average per household income from farm sales in A. communities was Le162 (1978 prices) compared with Le256 for B. communities. Such is the similarity that increased cash crop marketing of A communities is not in evidence.

5. Increase in other Community Services

a. Increase number of visitors

There is again no evidence that there has been an increase of visitors to the category A community. In fact households reported fewer visits vis a vis their category B counterparts (i.e. 67% c.f.83%). However the remoter villages of Gombu and Kambama had much lower visitor rates with only 76% of households reported receiving a visitor in

the past four weeks.

Family visitors again dominate the household visitor scene.

Official visitors to the chief of the village confirms the activities of the IADP extension staff. All the A. villages plus Taninahun and Kambama had received a visit from one of the IDA extension staff in the past four weeks. Saahun, Mapoima and Gombu had not.

Both Saahun and Vaama, as the chief towns of their section enjoyed a regular monthly visit by a mobile health clinic.

b. New mosques, churches, schools and stores

There is no evidence of any new communal building in the short space of time that has elapsed since the road was built.

6. Evidence of new house construction

There is as yet no evidence of increased house construction, nor the greater use of cement in villages situated on CARE roads vis a vis their non CARE counterparts.

7. Changes in the agricultural systems

Further investigation of the decline in fallows experienced in Dama chiefdom was undertaken. The findings are summarised in Table 5:-

Table 5 Upland rice fallow characteristics

	Age of bush cleared in 1979	Time bush is normally allowed to fallow	Number and % of farmers with swamp rice farms	Number and % with a decrease in fallow	Number and % with an increse in distance to rice farm
Vaama	9.4	10.8	16(70%)	15(65%)	4(21%)
Wokoya	7.8	8.1	8(89%)	9(100%)	9(100%)
Baiama	7.3	8.5	2(18%)	8(72%)	2(18%)
Average	9.1	10.0	26(60%)	32(74%)	16(41%)
Saahun	9.1	10.2	18(67%)	21(78%)	8(32%)
Mapoima	9.8	8.7	15(94%)	16(100%)	16(100%)
Taninahun	9.6	15.8	5(45%)	5(45%)	3(33%)
Average	9.4	10.7	38(70%)	42(78%)	27(54%)
Kambama	10.7	8.5	4(40%)	4(40%)	4(40%)
Gombu	14.3	10.8	2(17%)	6(50%)	7(70%)
Average	10.9	9.9	6(27%)	10(56%)	11(60%)

There is a positive correlation (+0.68) between the number and percentage of farmers with swamps and those who recognise that their fallows have decreased. This confirms the supposition made in last years evaluation that decreasing fallows induce a change in the farming systems towards swamp rice farming. The reasons cited for the decline in the fallow period for upland rice fall into two groups:
too many farms (often tree crops are specifically mentioned) 60%,
too many people 40%
Both types of communities are affected by this development. However Gombu and Kambama seem to be less severely affected in the opinions of their inhabitants; pressure on bush must be less in these remoter villages. In this situation of declining bush farmers have either to increase the distance travelled to make a rice farm (assuming they have land tenure rights over distant bush) or they have to make a swamp. We can see in this area individuals making this decision.

8. Changes in Population

As in Dama chiefdom there is a high level of out migration in Bari chiefdom. On average each household reported that 2.9 persons brought up by that household was now living away. The A. communities had a lower out migration rate (2.5 persons per household) compared with the B. communities (3.2 persons per household).

Male migration is much more important in this area which contrasts with Dama chiefdom where female migration was more important. This may reflect the poorer economic circumstances of young men seeking better economic opportunities.

Conclusion

The intermediate goals have been examined in Bari chiefdom with the following results :-

1. Extension activity is greater in CARE affected communities.
2. There is no evidence of a greater range of marketable crops in the CARE affected communities. There is a slight suggestion that diffusion of the new cacao is biased towards the more accessible CARE communities.
3. There is the suggestion that transport facilities have improved on CARE roads but it is too early to confirm this develcoment.
4. There is no evidence of increased materialism in the CARE affected communities.

5. There is no evidence as yet of increased visitor rates. With the exception of the ADP there is no evidence to suggest that developmental involvement in the CARE affected communities has increased.
6. There has been no enhanced building activity in the CARE affected communities.
7. There is evidence that roadside communities in general, have experienced a shortening of upland rice fallows, and are more likely to be engaged in swamp rice farming.
8. Population migration is characteristic of the area. Male migration, so much a feature of African migration, is identified which suggests that economic opportunities are attracting males away from the rural economy of Bari chiefdom.

The short time that has lapsed since the completion of the road (it is still not fully completed) and the survey has meant that the survey can only be tentative in its findings. Several of the intermediate goals have not proved to be of immediate significance to villages newly connected by a CARE feeder road.

PART TWO

SOCIO-ECONOMIC EVALUATION IN TANE, PAKI MASABONG AND SAFROKO LIMBA CHIEFDOMS

Tane, Paki Masabong and Safroko Limba chiefdoms.
General background to socio-economic survey.

These three chiefdoms are situated in the Northern Province of Sierra Leone. Tane is in central Tonkolili district whilest Paki Masabong and Safroko Limba are in southern Bombali district. Their population characteristics are summarised in Table 1 below:-

Table 1 Chiefdom Population Totals

	Areas (sq. mls)	Pop.in 1963	Population in 1974	Pop. change 1963 - 1974	Pop. density (sq. mls) 1974
Tane	205	12,479	13,666	+9.51%	66.6
Pski Masabong	79	11,277	10,542	-6.52%	133.4
Safroko Limba	130	16,612	14,485	-12.8%	111.4

Both Paki Masabong and Safroko Limba stand out as having high population densities (average density for Sierra Leone was 98.5 people per square mile). In consequence we can summise rural out migration is a feature of the demography in these two chiefdoms. Tane has a much more favourable man-land relationship than its two neighbours.

Culturally this area of northern province is chacterised by ethnic diversity with Timne, Limba and Loko peoples often living in adjacent villages along this cultural watershed.

Climate

The climate enjoyed by the three chiefdoms is perhaps the normal climate for Sierra Leone since it has a moderate rainfall of some 100 to 110 inches falling in a rainy season of 7 to 8 months duration.

Relief and Drainage

An undulating relief with many denuded hills, particularly in the two northern chiefdoms, perhaps best summarises the area's physical features. The drainage network is dense and centred on the Pampana and Rokel rivers.

Vegetation

The natural vegetation is left as a relict feature on the higher more inaccessible hills of the south. Farming activities have been so intense that low farm bush and derived savanna characterise the man made vegetation of the uplands. Even inland valley swamps have been cultivated. There remains as a result even fewer areas of natural vegetation.

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Agriculture

Agriculturally the three chiefdoms are characterised by the dominance of both upland and swamp rice cultivation. Tree crop cultivation of coffee is not greatly in evidence and declines as one progresses from the south to the north. Upland rice farms seem larger and much less varied than in Eastern Province. The fallow period between Upland cultivation is also apparantly much shorter. Swampland cultivation is greatly in evidence and seems to be accepted rather than innovative agricultural activity.

Objectives

1. To measure the achievement of intermediate goals established in previous evaluations.
2. To identify other social, economic and agricultural characteristics of the CARE affected communities as base line data for future evaluations.

Methodology

Two CARE roads have been completed in the area, N5 and N6. Since the majority of villages were of Timne origin, culturally the survey, in the main, confined itself to this ethnic group. Two Limba villages were however incorporated into the survey to take into account the other ethnic group affected by the roads.

A with-without framework was established for the purposes of this report. The without situation (8. villages) drew from the bush cleared N1 road in Tane chiefdom. Here two Timne villages of suitable sizes were incorporated into the current evaluative framework. In this way the without villages of N1 will provide base line data for future longitudinal socio-economic surveys.

Again 8 pairs of villages were selected as the basis of the study;-

1. Large villages with approximately 500 people with a politico - administrative function.

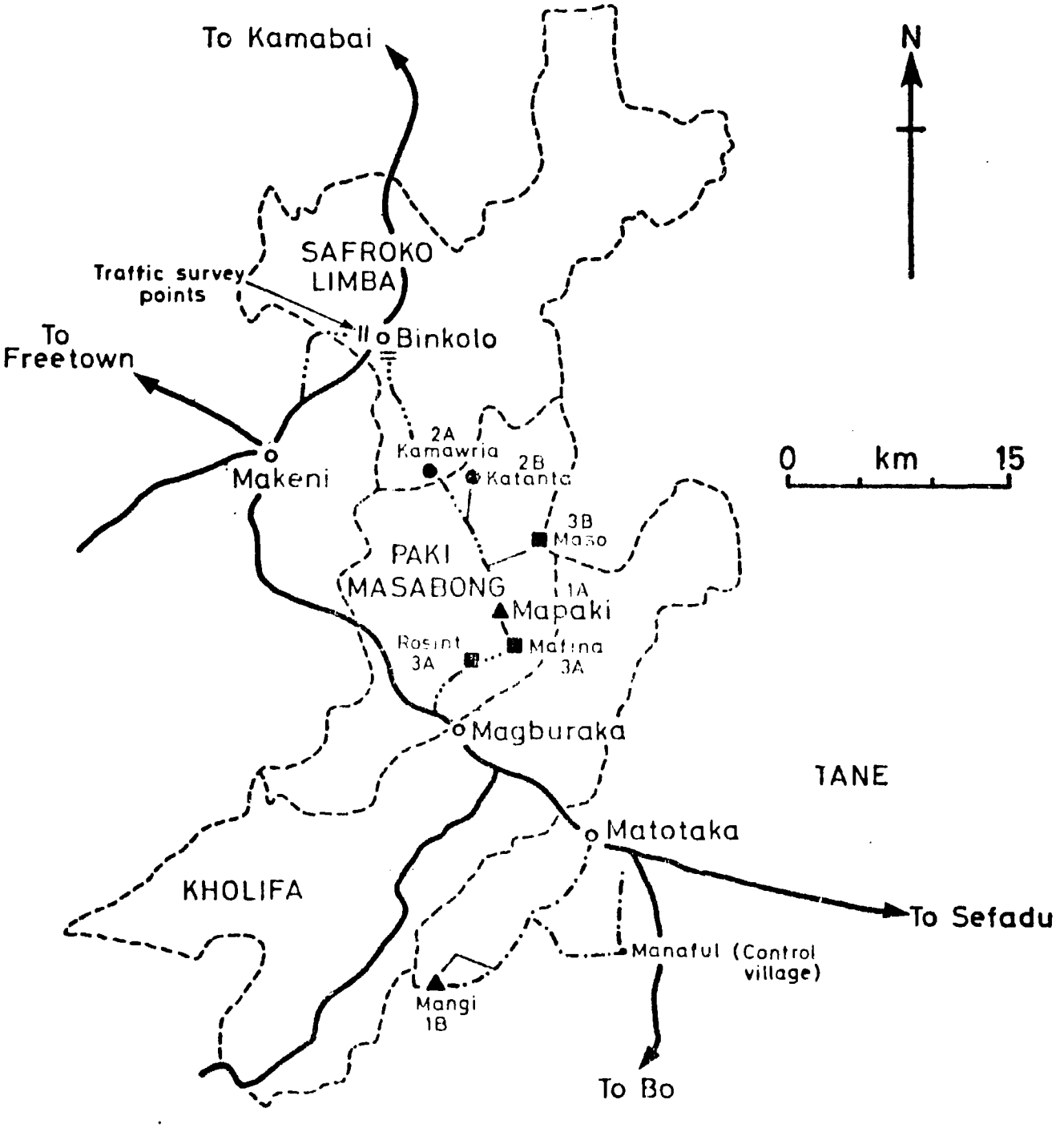
a. Mapaki, popuation in 1974 was 586. This village is the chiefdom headquarters i.e. it ranks higher than section towns. It was however the only large town affected by N5 and in spite of its high status was selected as typifying this village type.b.Mangi,pop 448 (1974).

2. Medium size villages with approximately 200 people.

a. Kamawria, a Limba village of 207 people (1974)

b. Katanta, a Limba village of 244 people (1974)

MAP 3 BINKOLA MATOTAKA AREA: LOCATION OF SURVEY VILLAGES



--- Chiefdom boundary

o Chiefdom H.Q.

A B
1 ▲ ▲
2 ● ● Compared villages
3 ■ ■

Roads upgraded by C.A.R.E. in 1979

Roads to be upgraded by C.A.R.E. in 1980

Trunk / Secondary road

Track road

3. Small villages with approximately 100 people

97 a. Rosint, population in 1974 118

Mafina, population in 1974 117

b. Maso, population in 1974 123

Remote village as a control

4b. Manaful, population 79 in 1974. This village is one of the remotest in the area, since it is inaccessible to four wheeled vehicles. Its situation will be dramatically changed when N1 is completed during the 79/80 building season.

Six other villages were surveyed in the Tane chiefdom and they will be used as base line data for assessing changes brought about by the completion of N1. (Map 3)

Intermediate goals

1. Increased Agricultural Extension Service Activity

a. Increased knowledge of availability of this service

Whilest the IADP Northern Province is the major extension agent for agricultural innovation in the area, there are other agricultural projects at work, such as the Rokel Leaf Tobacco Development Corporation (RLTDC). Both agencies have taken advantage of CARE feeder road building activities and Table 2 illustrates this:

Table 2 Number of positive responses to questions assessing extension service activity.

	No. Interviewed	Knowledge of Extension off.	Visits by Agricult. teachers	Knowledge of fertilizer	Use of fertilizer	Knowledge of IADP
1a Mapaki	28	22	22	28	27	27
2a Kamawria	11	3	4	7	1	5
3a Rosint	7	6	7	7	0	7
a Mafina	5	0	5	5	5	5
Total	51	31(61%)	38(75%)	47(92%)	33(65%)	44(86%)
1b Mangi	14	2	3	13	1	12
2b Katanta	9	1	4	8	8	9
3b Maso	5	0	4	4	2	5
Total	28	3(11%)	11(39%)	25(89%)	11(39%)	26(93%)
4b Manaful	4	2(50%)	0	4	0	4

In all situation the CARE affected communities exceed their unaffected counterparts. This confirms the mutually reinforcing nature of the IADP and CARE activities, and underlines the importance of access for

extension activities.

In terms of the R.L.T.D.C. a similar picture emerges with 16 farmers (31%) in CARE affected villages having planted tobacco (many for the first time). This compares with oly 3 farmers (11%) of the total interviewed) in the non CARE situation.

b. Increased visitation rates

Visits by extension officers during the rainy season should be frequent, usually at least once a month. This frequency of at least one visit per month is maintained in 82% of the farmers in the CARE affected situation. In contrast, of the 8 community farmers who were visited by an agricultural teacher, only 38% received such a visit in the past four weeks.

The reluctance of mobile agricultural extension workers to maintain regular contacts with their adopted farmers is characteristic of the non CARE road situation in both the northern and eastern IADP's.

2. Increased Marketing of Agricultural crops.

Table 3. Range and average amounts of marketed crops

	Coffee[1]		Rice[1]		Orange[2]		Banga[2]		Kola[3]		Others	
	No. of farm-ers	total amount	No. of farm ers	total amount	No. of farm ers	total amount	No. of farm ers	total amount	No. of farm ers	total amount	No. of farm ers	total amount
1a Mapaki	11	29	8	54			2	37			tobacco	
2a Kamawria			1	20	1	8	3	18.75	3	500	groundnuts	
3a Rosint	2	1.5	2	17								
3a Mafina	1	1.5			1	1						
Total	14	32	11	91	2	9	5	55.75	3	500		
Average per farmer	2.3		8.2		4.5		11.15		166			
1b Mangi	7	10.05	3	12	3	20	2	8.5				
2b Katanta	3	5	4	26.5	1	4	4	24	3	3400		
3b Maso	2	0.8										
Total	12	15.85	7	28.5	4	24	6	32.5	3	3400		
Average	1.3		4.1		6		5.4		1133			
Manaful	4	8.5										
Average	2.1											

1= bushels 2= bags 3= nuts

Table 2 indicates the range and amounts of crops marketed by the farmers in the area. The CARE affected communities do market a wider range of crops than their unaffected counterparts. Thus the addition of tobacco to crops marketed can be regarded as a CARE induced phemomenon. The category A. farmers also seem to market more of the two most important crops (coffee and rice) than those in category B. communities. The average amounts of these commodities marketed in Tonkolili district in 1971[1] was 1.9 bushels of coffee and 8.4 bushels of rice. In both cases category A. farmers seem to market average/ above average amounts in contrast to the poorer performance of category B. farmers.

One is also struck by the generally low level of involvement in marketing by the farmers interviewed. Thus overall, approximately one third of farmers marketed coffee and one quarter marketed rice. The returns of the 1971 census show that only 3% of farmers marketed coffee and 11% of farmers marketed rice in 1970. So the farmers interviewed appear to be more market orientated than the majority of Tonkolili farmers. In both situations a lower level of commercial activity is in evidence when compared to the farmers of Eatern Province. Average farm income, derived by dividing the value of crops sold (1978 prices) by the total number of farmers, is an estimated Le.69, one third of the average estimated income of Bari and Dama chiefdom farmers.

3. Increased transport facilities

a. More frequent transport services

There was no evidence of an increase in the transportation service made available to the farmers interviewed. N6 is carrying an ADT of eighteen vehicles in its northern section. This compares with an estimated ADT of ten for the bush cleared N1 on which the 8 villages are situated.

Moreover the stationing of vehicles in villages does not seem to characterise this northern area so it is difficult to see if CARE roads have influenced vehicle distributions.

b. Greater range of vehicles using the roads

It was not possible to hold a traffic survey on the bush cleared N1 so it is difficult to compare the traffic composition of N6 and N1. Nevertheless the high usage by motorcycles of the N6 can be regarded as a CARE induced phenomenon (see Part 4).

1 1971 Agricultural Census

c. Vehicle ownership more common villages in communities linked by new roads.

Vehicle ownership is again rare in the study area. Of the 83 house holders interviewed 3 owned a two wheeled vehicle, 2 owned motorcycles an 1 owned a bicycle. All 3 were in the largest town, Mapaki on the newly upgraded N6. This confirms the association, but again a word of caution is needed in that the presence of these vehicles may reflect the higher wealth and social status of some individuals living in the chiefdom headquarters.

4. Changes in Socio-Economic Status

a. Population more materialistic

Crop price sources used by the interviewed farmers indicates a major area of difference with other areas studied. There is the same low level of knowledge of the official Produce Marketing Board (recently disbanded).

However in the actual realisation of prices for crops sold there is an overwhelming reliance on the buyer/trader for price information. Indeed one farmer said "we bargain over the price." 81% of farmers selling crops rely on the buyer for price information: 78% in A. communities, 83% in B. communities. The use of radio is therefore very low (10% overall), however the majority resorting to the radio live in the A. communities. This pattern of crop marketing probably reflects the low level of farmer sales of commercial crops.

In terms of material goods Table 3. indicates that in spite of the apparant low level of commercial farming,households possess a similar range of common consumer durables.

Table 4 Ownership of consumer durables

	Umbrella	Plastic bucket	Watch	Radio	Charcoal iron	Honda/Bicycle
A villages	36(71%)	21(41%)	16(31%)	12(24%)	17(33%)	3(6%)
B villages	18(56%)	9(28%)	2(6%)	4(13%)	9(28%)	0(0%)

Indeed on average the households have possession worth some Le.20.43 (c.f. Le.26.37 + Le.23.88 in Dama chiefdom). The large disparity between the two categories probably reflects the disparity of settlement status in the survey. In particular Mapaki, the large category A. village is the chiefdom headquarters of Paki Masabong. This village is thus at the top of the rural socio-economic hierarchy. Mapaki residents own on average some Le.34.50 worth of goods

compared with Le.12.22 in the other A. communities. It is fair to conclude therefore that these northern farmers are poorer than comparable farmers in the east.

b. Increased contact with the monetarised economy

Overall on average of Le.69 worth of agricultural produce was reportedly sold by interviewed farmers. A. communities sold on average some Le.76 worth of farm produce compared with Le.61 of the B.communities. However Mapaki the chiefdom town dominates the marketing of A communities, on average each farmer sold Le.108 worth of produce compared with only Le.41 in the remaining A communities. CARE's influence is thus difficult to extract from the existing hierarchy of cash crop production. However the addition of tobacco to the cash crop economy of the feeder road villages (noted in Section 1a) will undoubtedly improve farmer incomes in the near future.

The low use of cement in the area is to be expected and only 6% of houses have a cement skin and there were none built of cement block. The majority of these cement skin houses are found in B communities.

However there is a much higher level of attendance at school. On average each household in the A communities has sent, or is sending 3.4 children to primary or secondary school. This compares with 2.3 children in the B situation. This can not as yet be regarded as a CARE induced phenomena.

5. Increases in other Community Services

a Increased number of visitors

75% of A community households reported receiving on average 7 visitors in the past four weeks. This contrasts with 53% of B community house holds who received an average of 6 visitors. It would appear there fore that CARE has increased the visiting rates of the interviewed farming households. There were also more non family visits to the A community farming households,though family visits dominate the visiting pattern in both situations.

The pattern of official visitors to the village headman clearly demonstrates the influence of accessibility on developmental agencies. Thus apart from IDA officers characterising the official visitors in the A communities, they also noted the visits of another development agency, Plan International. In one village there have been discussions to build a primary school with Plan International and local self help. These two agencies are both confined to the A communities. Discussions with Plan International suggest that its activities are closely influenced by accessibility and thus CARE feeder roads.

A similar situation arises with the Leprosy Control Unit, a mobile trained paramedic based in Makeni. They have been greatly aided by CARE feeder road building activities and have according to the paramedic been able to expand their activities in the areas on, and adjacent to, the feeder roads.

In contrast in Mangi the large B village, the headman indicated that Government health services and the Leprosy Control Unit had withdrawn their services in the recent past. Difficulty of maintaining communication would be one of the facts influencing this decision.

5b. New mosques, schools and stores

There has been some enhanced building of communal infrastructures in the study area. Thus Mapaki had its health centre expanded in 1978 with the aid of Plan International. This parallels the building of N6. Similarly in Rosint there has been discussions on the building of a primary school.

The IADP wells building programme is also characteristic of feeder road activity though it has proved difficult to coordinate the two. Thus in Tane chiefdom where N1 will be built eleven wells have been completed, seven of these (64%) are sited in villages situated on CARE feeder roads. This complementarity of road and well building is an integral part of the development strategy of the IADP.

6. Changes in Community Size and Buildings

a. Communities become larger and more permanent, both locationally and structurally.

It is too soon to make any firm statements on the achievement or validity of this intermediate goal.

b. Evidence of new housing construction

There has been too short a time lapse between the completion of N6 and the socio-economic survey for any evidene of new housing to occur.

7. Changes in Agricultural Systems

Table 5. Upland Rice Fallow characteristics

	Age of bush cleared in 1979	No.+ % of Upland Rice farmers	No.+ % of Swamp Rice farmers	No.+ % with decrease on fallow	No.+ % with an increase in distance to Rice farm.
1a Mapaki	6.25	22(79%)	28(100%)	22(78%)	13(52%)
2a Kamawria	6.5	11(100%)	8(73%)	10(91%)	7(78%)
3a Rosint	4	4(57%)	5(71%)	7(100%)	1(14%)
3a Mafina	6	5(100%)	5(100%)	5(100%)	1(20%)
Average		42(82%)	46(90%)	44(86%)	22(43%)
1b Mangi	8.6	14(100%)	3(21%)	7(50%)	5.5(39%)
2b Katanta	8.6	9(100%)	8(89%)	9(100%)	3(33%)
3b Maso	6.25	3(60%)	3(60%)	3(60%)	3(60%)
Average		26(93%)	14(50%)	19(68%)	11.5(41%)
4b Manaful	9.75	4(100%)	3(75%)	2(50%)	1(25%)

It is evident that the bush fallowing of upland rice farms has reached a very low fallow cycle, notably in the A communities where fallows are less than seven years in duration. This decline of the natural fallow system is matched by an increase of interest in swamp rice farming. There is thus a positive correlation (+0.49) in the number and percentage of farmers with swamps and the number and percentage of those who recognise a decrease in the fallow period. This has come about, according to the respondents, through population growth and an increase in the number of farmers that the land has to support. It would appear from Table 5 that the man-land relationship has reached a much more critical stage than the areas studied in southern and eastern Sierra Leone. This is confirmation of the 1974 census data which indicates that higher population density characterise these A villages. A communities appear to have the worst man-land relationships. B communities seem to be more fortunate whilest the remote Manaful seemingly has less pressure on the land and therefore has a longer period of fallow for its bush.

This indirectly suggests popultion growth and possibly the concentration of population along the CARE upgraded roads has already placed a strain on the existing agricultural systems. CARE improvements, whilest they might exacerbate this situation, may also offer the solution to this imbalance by virtue of the close IADP involvement. The swamp-

upland rice improvement package should, if sustained, offer an alternative to the present apparent over use of the land in the A communities.

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8. Changes in Population

As already noted in the introduction, population out migration is already a feature of the situation in the two northerly chiefdoms from which the majority of surveyed villages are drawn. The survey confirms this since each household reported that on average 6.6 people were now living away. This is double the rate noted in Bari chiefdom (Part One). The A communities has a much higher rate of 7.7 people per household compared with 4.6 per household in the remoter villages. This confirms the findings of Blair[1] in Northern Province, that roads aid out migration.

The sexes show equal propensity to move from their household, though one suspects, and Blair's work confirms this, that male movement is much more likely to be long distance movement/migration in a true sense. Female movement tends to be movement from the house hold/village of birth to the household/village of marriage.

Conclusion

The intermediate goals have been examined in Northern Province with the following results:-

1. Extension activity of the IADP and other agricultural developments (RLTDC) is greater in the CARE affected communities.
2. Marketing of crops is low. CARE affected communities market a greater range of crops and per capita a larger amount than their unaffected counterparts.
3. There is no real evidence to suggest that transport facilities are any greater on the two roads compared. Vehicle ownership is low but confined to the CARE communities.
4. Because of the low level of crop marketing rural incomes are much lower and household possessions are less than encountered in other areas. There is a marked contrast between A and B communities but this might reflect settlement hierarchy rather than accessibility.
5. Household visitor rates indicate that CARE affected villages receive more visitors than their unaffected counterparts.

From a developmental point of view the CARE roads have had an impact on the activities of Plan International and Leprosy Control. Villages on CARE roads can therefore expect to enjoy amenities and

developmental inputs which have been greatly facilitated by improved accessibility.

6. There is no real evidence as yet of any enhanced building activity arising subsequent to CARE upgrading the rural roads studied.

7. Agriculture in the north is much more fragile vis a vis its use of bush fallowing. Fallow periods are low and consequently swamp rice activity is very high. This suggests that pressure on uplands is already high. CARE improved roads will, it is hoped by facilitating IADP's agricultural intensification programme redress this ecological man-land imbalance.

8. Population migration is high, so much so that overall Paki Masabong and Safroko Limba are losing population. CARE affected communities are losing proportionally more than their unaffected counterparts. This is not attributable to CARE activities but rather reflects an exciting pattern of population mobility.

This survey was conducted some six months after N5 was completed. As a result changes that are noted are those of a more volatile immediate nature e.g. the ingress of tobacco farming. Medium and longer term changes can not really be identified from such a short term evaluative exercise.

References

1 J.A.S. Blair. - The regional impact of a new highway in Sierra Leone. African Environment Vol 111 No. 2 Feb. 1978.

PART THREE

SOCIO-ECONOMIC EVALUATION IN THE DARU AREA

General background to the socio economic survey

1. Climate

Climatically the three chiefdoms do not differ markedly from Dama chiefdom. The rainy season is slightly longer i.e. 8-9months duration, but rainfall totals are of a similar order i.e. 102" per annum.

2. Relief and Drainage

The three chiefdoms are situated primarily in the Moa basin, an undulating area lying between 500 and 600 feet. Isolated hills and small ranges rising upto 1,000 feet occur and become more frequent towards the Liberian border.

The Moa river and its tributaries drain much of the four chiefdoms. Associated with these rivers and streams are the valley swamps, narrow winding, small areas of impeded drainage (c 20 acres in size on average). They are an important element of the landscape, occupying as they do an estimated 10% of the land surface.

3. Vegetation

The original vegetation of the area, primary rain forest, has largely been replaced by a landscape of low farm bush dominated by oil palm. This fire resistant man made vegetation has been produced by the rotational fallowing strategy of traditional upland rice farming. Relict forests do occur in the higher remoter hills and forest reserves but even here they have been affected by man's agricultural and forestry activity.

4. Population

As Table 1 shows population in the three chiefdoms has increased by c 2% between the two censuses. Man-land relationships indicate above average pressure on the land and some of the highest population densities affected by the CARE Feeder Road Building Programme.

5. Agriculture

The farmers of Eastern Province blend two kinds of agricultural activity. The first is the production of the households staple food, rice. The second is cash crop production, primarily of coffee and cacao for the export market.

Objectives

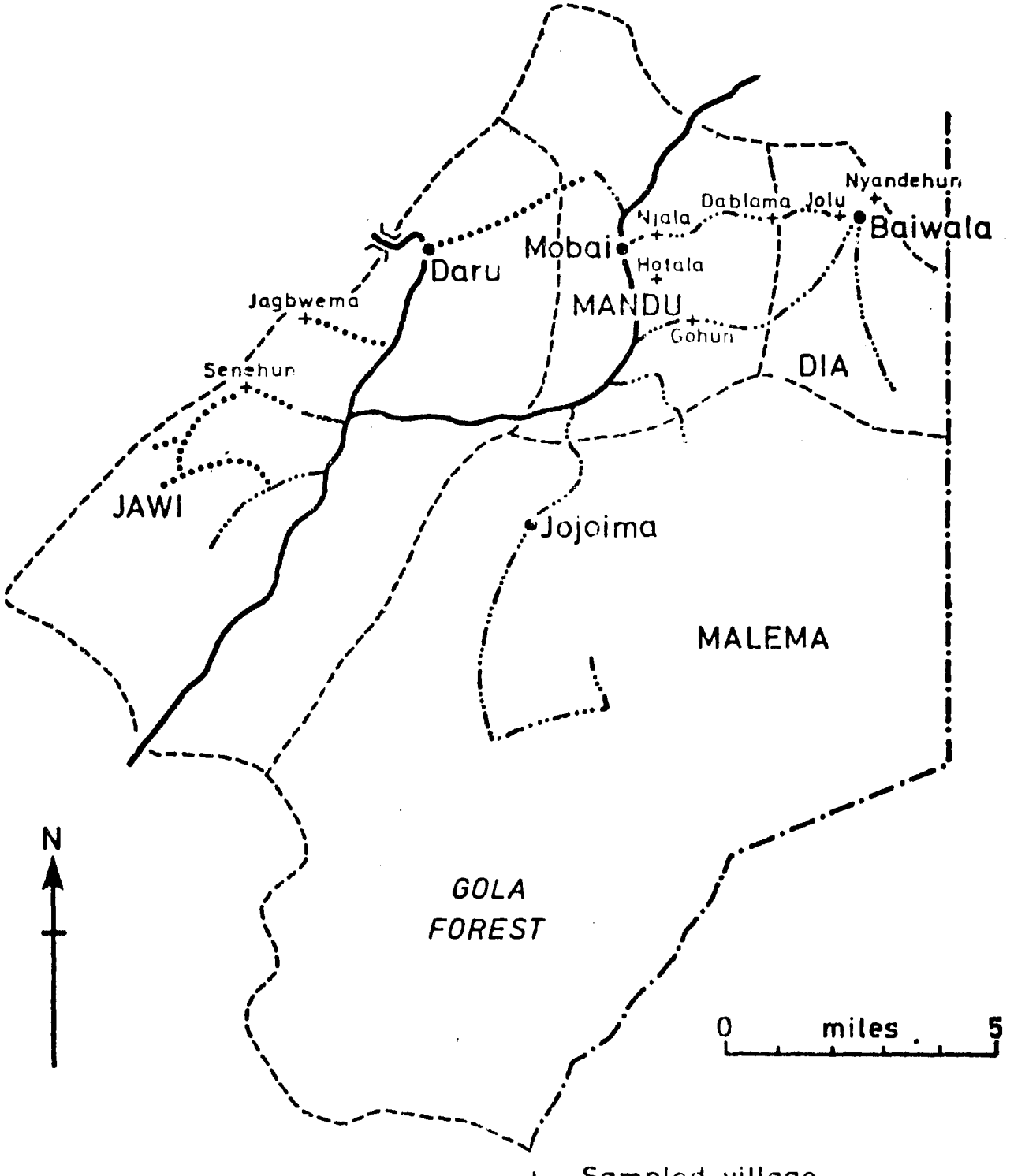
1. To identify and quantify changes that have taken place in communities first affected by the CARE FRBP in 1977.

Table 1 Population totals for the three chiefdoms.

	1963	1974	Difference	Annual % increase	Population density (sq.miles)
Dia	3,987	5,085	1,098	2.2	134
Jawi	14,231	18,069	3,838	2.2	132
Mandu	9,152	10,663	1,501	1.3	172

Source: A.Thomas,Population change 1963-1974,Ministry of Development and Economic Planning.

MAP 4 DARU AREA: SOCIO ECONOMIC SURVEY
LOCATION OF SURVEY VILLAGES



- International boundary
- Chiefdom boundary
- Trunk / Secondary road
- Chiefdom H.Q.
- Sampled village
- Roads upgraded by C.A.R.E. (since 1976)
- New penetration roads built by C.A.R.E. (since 1976)

Methodology

This is a longitudinal survey in which a two year time lapse has occurred between the initial survey of August 1977 and the present one. Eight villages of the original survey were selected for re-interviewing, seven of them situated on CARE roads and one of them off the road as a control (Map 4). These villages represent the full range of village types in Eastern Province i.e. from villages with c 500 people to small hamlets. Unfortunately the control is of necessity a hamlet of 4 households since larger villages usually enjoy motorable tracks. Where ever possible the same householders were re-interviewed, but this was not always the case and this should be born in mind when interpretting the data.

It is convenient to maintain the same format as adopted in the previous evaluations.

1. Increased Agricultural Extension Activity

a. Increased knowledge of agricultural innovations.

Farmers were asked to identify and explain the meaning of nine agricultural innovations, five of them IADP related. In the period knowledge of agricultural innovations has increased by 14% i.e. one third of farmers knew what the innovations were in 1977 now one half know. The control in the same period has improved its knowledge by 10% from 12.5% in 1977 to 22% in 1979. This seems to suggest that the diffusion of agricultural knowledge is enhanced in roadside communities.

To test the importance of knowledge in a practical sense two indicators of agricultural change were identified: the use of fertilizer and the planting of the IADP introduced Amazon cacao.

In terms of the use of fertilizer farmer practises have retrogressed from a situation in 1977 when approximately one third used fertilizer to the position in 1979 when one sixth use fertilizer. The control showed no use of fertilizer in either 1977 or 1979. This decline in the use of fertilizer perhaps reflects the decline in the vigour of the IADP - now incorporated as the Farmers Finance and the Daru Oil Palm Companies. Just as important, however, is the dramatic doubling of fertilizer costs from Le.4.50 to Le.9.00 in 1979.

The unofficial diffusion of Amazon cacao is also an instance of practical application of knowledge. The dwarf high yielding variety has been recognised and extensively adopted throughout the area. Thus whilest only 7 farmers received official IADP allocation of cacao (c 8%), a further 30 (34%) planted this cacao, begging and

buying seed or seedlings from friends, neighbours and farmers who had harvested some new cacao. In the control situation this cacao was also being planted with the same vigour so it is not possible to suggest that this diffusion is road biased.

b. Increased visitation rates

In 1977 five(70%) of the roadside villages received at least one visit of an IDA extension worker per month compared with no visits in the control. By 1979 only one village (14%) was regularly visited by the IDA. So visitation rates have dramatically fallen if the responses of the village chiefs are an accurate reflection of reality.

Further confirmation of this comes at the household level where 5 out of 11 IDA rice farmers have abandoned their IDA swamps. High cost of repayments and lack of visits were two of the reasons for this down turn of IDA swamp rice activity.

2. Increased Marketing of Agricultural Crops

Table 2 summarises the marketing situational changes over the two year period for the five main marketing crops.

Table 2 The average amount marketed per marketing farmer (in bushels).

		Coffee	Cacao	Rice	Orange	Kola
CARE	1977	4.3	6.8	5.6	16	0.5
villages	1979	4.9	7.4	12.0	20	2.6
% increase		14%	9%	107%	25%	52%
Control	1977	1.5	0.25	0	0	0
	1979	3.5	0.5	0	3	0.25
% increase		133%	100%		100%	100%

Thus whilest there has been an identifiable increase in agricultural production in the two year period. The comparisons of the CARE villages with the control suggests that this increase, in terms of the tree crops, is not confined to the roadside situation. In fact over the two year period official buying prices for coffee and cacao has increased some 25%. Price responsiveness seems to be as much a part of the explanation for increased marketing of coffee an cacao.

In terms of marketing, in 1977 5 farmers (6%) sold rice, this had increased to 13 (15%) in 1979. Moreover the amount of rice sold per capita had increased from 5.6 to 12 bushels. This represents a 500% increase in the number of bushels sold from the seven CARE affected villages. However this enhanced sale of rice is matched by

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a concomitant failure to "grow enough" rice for all year round consumption. Thus in 1977 thirty four farmers (46%) grew enough rice for their household needs. In 1979 only nine farmers (11%) did so. Thus commercialisation of this staple is probably undermining local subsistence. This is a phenomenon not apparantly experienced in the control village.

The range of crops marketed does not appear to have dramatically changed. However there has been an increase in the percentage of households participating in the marketing process (Table 3).

Table 3 Number and percentage of farmers selling crops

	Coffee	Cacao	Rice	Orange	Kola	Cassava
1977	50	56	5	3	1	1
1979	73	72	13	18	14	7
Percentage increase	46%	39%	160%	500%	1300%	700%

Commercialisation of agriculture seems to have become more generalised in the CARE affected communities. This does not appear to have developed to the same degree in the control community.

3. Increased Transport Facilities

a. More frequent transport services

It did not prove possible to organise a traffic survey in the area of this evaluation. However comparison of the dry season 12 hour counts in 1977, 1978 and 1979 on the R90, where the majority of villages are situated, indicates a dramatic improvement in transport services.

Table 4. Average daily use of R 90 by vehicle class

	Total vehicles	Motor vehicles	Cars Taxis	Poda Podas	Heavy vehicles + Lorries
Jan 1977	5.4	3.2	0	2.2	0
April/May 1978	27.0	17.6	3.3	4.7	0.4
April/May 1979	44.3	21.1	8.1	10.7	4.4

In January 1977 the road had been bush cleared and construction had begun, and was completed by August of that year. Traffic increased some 500% in the first year of completion and then a further 300% in the second year (using January 1977 as the base line). Transport facilities enjoyed by the population along this road has increased by a similar magnitude if we look at the car/taxi and poda poda modal classes. As evidence of this households in 1977 undertook an average of 1.4

journeys per month, 37% of them on foot. By 1979 householders were journeying 2.6 times per monthly, and only 19% of them being on foot.

In addition the completion of the R.90 has allowed cars, taxis and heavy vehicles to penetrate into its rural hinterland, which prior to upgrading they were reluctant to do so.

c. Vehicle ownership more common

In 1977 only four bicycles were owned by less than 5% of the house holders interviewed. By 1979 five Hondas and two bicycles were owned by 8% of the householders. The spread of the Honda and the decline of the bicycle is noted as being characteristic of these CARE affected communities. The control's householders did not own any of these vehicles.

4. Changes in Socio-Economic Status

a. Population more materialistic

With the more generalised marketing activities of 1979 one might expect more awareness of prices. However the use of the radio for price information has fallen from 47% of farmers using it in 1977 to only 35% in 1979. This probably reflects the increasing preference for travelling outside to sell the cash crop. 61% of farmers preferred to travel outside to sell in 1977, but this had risen to 65% in 1979. In doing so using the trader as a price source is natural. Thus CARE, in improving accessibility, is also encouraging farmers to travel outside to sell their crops and as a result is creating greater dependence on the trader and his honesty.

In terms of possession of material goods ownership of consumer durables has risen. Now 38% of householders own a watch and 20% a radio compared with 27% and 10% respectively in 1977. Vehicle ownership too has risen. Yet ownership of household utilities has fallen slightly. One suspects that ostentatious spending by male householders dominates the consumer durable scene. The control did not show the same level of spending.

b. Increased contact with the monetarised economy

Between 1977 and 1979 on average householders increased their income by Le.124 from Le.415.60 in 1977.* The average income of the control village increased proportionately more from Le.91 in 1977 to Le.208 in 1979.

* Using 1978 agricultural prices.

This dramatic increase in income seems to have been disposed of by an increase in consumer durable purchasing but probably more important are the improvements to housing and the increased provision of education for children.

In terms of housing there were 14 more cement houses in the villages, an increase of 37%. The percentage of cement houses in the villages had increased from 21% to 28%. The control village showed no such increased use of cement.

In terms of education there has been a dramatic increase (111%) in the number of children attending primary school. In 1977 on average one household in three sent a child to primary school now on average one household in two does so. Enrolement in secondary schools does not show the same increase simply because of the need for academic attainment as well as fees. The control community shows this slight shift to primay education.

5. Increase in Community Services

a. Increased number of visitors

The number of visitors received by the households has doubled between 1977 and 1979. The majority of these are, as noted elsewhere, visiting for family reasons.

There seems to be no real increase in community services but by improving accessibility CARE has improved peoples use of external services. Thus during the past four weeks 50% of the households used western medicine to cure an ailment. This compares with only 39% in 1977. Whether this is a visit to a clinic or the purchase of asprin is not that significant. But what is important is the improvement in medical services available to the population. The control also shows a similar improvement in the use of western medicine.

b. New mosques, schools and stores

There seems to be no real improvement in these social and economic amenities. Only one village is rebuilding its mosque in concrete blocks, an expensive and time consuming operation.

6. Changes in Community Size and Building

The fallow periods allowed for bush regeneration, before clearance for the upland rice, is everywhere very low. In 1977 the average age of bush cleared was 6.5 years compared with 6.7 in 1979. There appears to be no significant diminution as yet. However there seems to be proportionally more swamp rice farmers in 1979 (62.5%) than in 1977 (38%). At the same time the proportion of upland farmers has increased

6. Changes in Community Size and Building

There is no dramatic evidence of any increase in the size of the villages surveyed. Between 1977 and 1979 the housing stock of the villages increases from 185 residences to 188. However as already mentioned there has been progressive modification and replacement of mud and stick houses to those that incorporate cement.

The demography of the villages seems to be healthy and there has been a slight increase in the average household size, which was 6.9 persons in 1977 and is 7.5 in 1979. But it is not possible to measure population growth without enumerating the whole village. So we can only summise that the villages have increased in their populations. In contrast the control village declined in population terms.

7. Changes in the Agricultural Systems

The fallow periods which allow bush regeneration before renewed upland rice farming is everywhere very low. In 1977 the average age of bush cleared was 6.5 years compared with 6.7 years in 1979. There appears to be no significant diminution as yet. There seems to be proportionally more swamp rice farmers in 1979 (62.5%) than in 1977 (38%). However at the same time the proportion of upland farmers has increased some 30%. This probably reflects the impact of the rice shortages early in 1979 and the very high prices paid for this staple. This will have undoubtedly stimulated the subsistence strategy of the peasant farmers. In the long term the fact that, in the five years prior to 1979, sixty farmers had increased the size of their coffee and cacao farms means that upland rice bush will get increasing scarce. If prices for these commodities remain high then upland rice farming will increasingly be untenable.

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8. Changes in Population.

Unfortunately the questionaire is only concerned with outmigration so that the total demographic picture and fual balance can not be gauged. The comparison between 1977 and 1979 is one of increasing out migration. In 1977 on average each household reported that it had lost 1.7 persons. By 1979 this had risen to 2.4 persons. The majority of this increase is attributable to female migration which increased disproportionately from 0.8 per household to 1.3 per household. Migration would appear to be enhanced since CARE improved the road facilities of this area in spite of the envigourated economy. It is tempting to suggest that the increase in educational spending by households is in part responsible for this increased migration.

Conclusion

1. Whilest knowledge of agricultural innovations is high the decline of IADP impetus has seen a decrease in the use of fertilizer. In contrast the improved cacao, which fits in well with existing tree crop practises, shows considerable evidence of vigorous diffusion.
2. There has been a significant increase in the marketing of crops, though it is difficult to attribute this increase to CARE activities. Rice marketing does seem to be a CARE induced phenomenon and it reflects an increasing commercial attitude. The danger is that the nutritional status of these rural communities may deteriorate as they sell their rice when its cheap and may not afford to buy when it is expensive. It is at this stage that gari, cassava and other cheap less nutritious substitutes may be used.
3. There has been a dramatic increase in transport facilities enjoyed by the villagers along the sampled road R.90.
4. The sampled households have, because of higher incomes, increased their spending in three areas: ostentatious consumer goods: housing: education.
5. Because of good transport and road facilities villages are able

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to take advantage of existing facilities. There is no real evidence of other developmental inputs in the area studied.

6. Changes in community size is a longer term concequence of road porvision. There has been a slight increase in the number of houses. There is also a dramatic increase in the use of cement.

7. It is considered almost inevitable in view of continued high commodity prices that the traditional upland rice agricultural system will be replaced by permanent swamp rice cultivation. The evidence for this has been obscured by the recent rice shortages and the subsequent return to subsistence farming.

8. Outmigration of population seems to be a continuing feature of the demographic situation in the surveyed villages.

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PART FOUR

TRAFFIC SURVEYS

a) Northern area

b) Southern area

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a) Northern area

Table 1. Traffic volumes

Road no.	Enumerator site	Vehicle class	Mon	Tues	Wed	Thurs	Fri	Sat	Sun	Total week	Daily average	Total daily A.D.T.
		m/c	15	14	20	14	13	8	16	100	14.3	
N5	Binkolo	car/taxi	0	1	0	0	2	0	0	3	0.4	18
		pass. v.	2	4	2	0	1	2	2	13	1.9	
		heavy v.	5	0	0	1	3	1	0	10	1.4	
		m/c	11	10	4	9	7	13	7	61	8.7	
N6	Binkola	car/taxi	0	3	2	4	1	0	4	14	2.0	15.4
		pass. v.	7	4	2	5	3	8	3	32	4.6	
		heavy v.	0	0	0	0	1	0	0	1	0.1	

These two recently completed roads to the north and east of Makeni seem to be carrying very light traffic loads. Using the criteria applied to the traffic evaluation conducted in 1978 these two roads would appear to be characteristic feeder roads. As such these roads are carrying light, essentially local traffic, dominated by the motor cycle. IADP usage of the roads is high, 19% and 36% of the vehicles using N6 and N5 respectively are carrying IADP personnel. These roads would also appear to be improving accessibility of the areas through which they are built since 63% and 97% of the drivers using N6 and N5 have not used the road/track prior to the CARE improvement.

b. Southern area

Table 2 Traffic volumes

Road No.	Enumerator site	Vehicle class	Mon	Tues	Wed	Thurs	Fri	Sat	Sun	Total week	Daily average	Total daily A.D.T.
		m/c	19	11	14	7	15	14	11	91	13	
R82	Potoru	car/taxi	16	5	6	6	4	10	6	53	7.6	62.3
		pass. v.	33	44	37	30	31	39	39	253	36.1	
		heavy v.	0	4	11	10	9	1	4	39	5.6	

R82 can be regarded as a higher grade secondary road which has a collector rather than a feeder function. It has a moderately high ADT dominated by the poda poda passenger vehicle (some 58% of all vehicles). Origin and destination of vehicles using the road indicates the importance of the larger towns to vehicles using the road. There is also a moderate heave vehicle component to the traffic composition.

R82 had infact become one of the major routes to Pujehun (District capital of Southern Province) due to the collapse of a bridge on the Konbundu Pujehun road. It is therefore probable when this route is reopened that there will be a slight decrease in the traffic using the R82.

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ANNEX J

1.

CARE SOCIO-ECONOMIC SURVEY FOR INDIVIDUAL HOUSEHOLDS

(This or circlecoded answers or write in full answer if code not adequate)

Village.....

1. Name of Head of Household.....

2. Social Status 1. Chief 2. Vice Chief 3. Speaker

4. Imam 5. Moriman 6. No status

7. Other specific

3. Was Head of Household born in this village Yes No

4. If he was not born in this village was he born in this chiefdom

Yes No

5.

		Date built	Walls built of:-	Roof built of:-
Number of residencies owned/used by his household	1.			
	2.			
	3.			
	4.			

6. Do you own, rent or borrow:-

Built latrine Exclusive use .....

Shared use .....

Barns How many

7. Have you improved any of your buildings since the road was built?

Give details.....

8. Number of people at present in his household?.....

9. Number of his wives at present in his household?.....

10. Number of children (less than 15 years) at present in his household?.....

11. Number of people who help full time with farm work
(i.e. people over 15 with no other main farm occupation).....

12. How many have individual farms (gboe).....

13. Do you receive any NON FARM INCOME Yes No.

from what?

14. Can you tell me the number of boys/men [ ] girls/women [ ]
who you have raised but are now living away from you?

15. Of the people you raised and are living away and those that are living with you.

How many	Boys	Girls
have received an arabic education and		
many have gone to a Primary School		
many have gone to a Secondary School		

16. Which medical services (Western e.g. - nurse, dispenser hospital doctor
(Native e.g.
would you use in the following cases:-

1. If your wife were having a baby
2. If you were bitten by a poisonous snake
3. If you broke a leg
4. If you had yellow fever
5. If you had bilharzia

17. When was the last time one of your household was treated by
(Tick appropriate box)

	last 4 weeks	1 - 3 months	3 - 6 months	6 - 12 months	- 12 months
Western Medicine					
Native Medicine					

18. Where does your household obtain its water during

	Roof	River stream	Trad well in swamp	Lined well	other specify
Rainy Season					
Dry Season					

19. Where does your household go to the toilet

Bush Native Pit Latrine Built Latrine

20. How does your household light the house at night?

Aladdin lamp Kerosene Lamp Other specify

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21. How many journeys have you made in the last 4 weeks

by a. Foot..... b. foot and vehicle .....

(A journey is a trip from village to another destination not connected with routine daily household activities) ....

22. If no journey was made in last 4 weeks when was last journey made:-.....

Within last 3 months.....

3 - 6 months.....

6 -12 months.....

23. Do your household own any of the following goods

Umbrella	Yes/No	Number owned	
Plastic buckets			
Watch			
Radio			
Honda/Bicycle			
Goose/Charcoal Iron			

24. When did you last buy some goods

In past 4 weeks 1 - 3 months 3 - 6 months

6 - 12 months 12 months plus

What did you buy?.....

And where did you buy?

Trader visiting village
Village store/Market
Nearby village store/Market
Other specify

How did you travel if you bought the goods outside?

Foot Foot vehicle

25. How many visitors have you had on past 4 weeks

What was their purpose

family
business (specify)
trade
other (specify)

26. Do you know what the following are:-

Item	I have/have not heard of it	Yes Can he explain what it is (write down his explanation)
1. SLRB		
2. Fertiliser		
3. Extension Worker		
4. Rice Corporation		
5. Honda Mechanical Tiller		
6. IDA		
7. Insecticide		
8. Cooperative Society		
9. Brazilian Cacao		

27. Have you ever been visited by a man to teach you about farming Yes.... No.....

When did one last visit you?

1 - 4 weeks 1 - 3 months 3 - 6 months 6 - 12 months

28. Are you an IDA farmer (give details)

Have you been an IDA farmer

Swamp Cacao Oil Palm

29. If you have abandoned your IDA Swamp

Why is this so?

30. Which of the following farms is being cultivated by your household

Upland Rice Swamp Rice Coffee
Cacao Orange Banana Cassava
Groundnut Oil Palm Other

31. For your upland Rice farm what was the age of the bush you cleared this year?.....

32. How many years does your upland rice farm usually fallow?.....years

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33. Is this the same as 10 years ago Yes..... No.....

34. How many years did you used to let your rice farms fallow.....years

35. If your fallows have shortered Why has this occurred? (give reasons)

.....

36. Has the distance to your rice farm been: increasing decreasing same
Why is this?

37. Have you increased the size of any of your farms in the part 5 years
Specify farm and when your began to increase it.....

38. Have you planted any Brazilian Cocoa Yes..... No.....

39. Where did you get the seedling.....No planted.....when planted.....

40. Do you have problems acquiring more land?

41. Did you use fertilizer on any of your crops?
Which crops?

42. Have you been given any help this season by:-
IDA Chinese Peace Corps Other specify

43. For this season can you tell me the number of bushels you planted
in your upland rice farm.....;
swamp rice farm.....
Is this the same/more/less bushels than last season.

44. From last years crop have you enough rice to feed your household until
this year crop is harvested Yes..... No.....
If No why havent you enough rice?.....;

45. Have you ever milled your rice Yes..... No.....
Since when?

46. Which crops have you sold/traded since a year ago?

	Amount in bushels, if other units used specify
Coffee	
Cocoa	
Rice	
Cassava	
Cotton	
Maize	

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47. When you sell any of your crops what do you prefer to do?

a. Sell your crops "at the Farm gate"

b. ... Travel outside to sell your crops

48. Which crops did you sell at the farm gate?

and which ones did you travel outside to sell?

49. How did you know the price for your crop?

Radio Friend Trader Buyer Other

50. Did you sell your crops at the time you wanted Yes....., No.....

If No why did you sell your crops earlier than you would like?

51. If village on CARE road:-

Has the road improved your way of life? Yes..... No.....

52. If village not on CARE Road

Has your way of life improved in recent years? Yes..... No.....

If so How/Why not?

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ANNEX K

July 31, 1979

Mr. Tony Airey
265 Little Aston Road
Aldridge
Wallall
Staffs
WS9 OPG
England

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Dear Mr. Airey:

As Project Officer for the recently completed evaluation of the CARE Rural Penetration Roads Project (AID Project N° 636-0111) permit me to indicate, on behalf of Ambassador Linehan and AID/Freetown the importance we accord the socio-economic impact studies you have undertaken in the project area to date. The results of your research are valued by the Agency not only as a means of better grasping the overall effect that these USG-financed roads have on the local rural development process, but, also, as a new and significant contribution to development literature for West Africa in general.

Based on our observations, it would appear vital that you return to Sierra Leone at some point in time after the end of the current project in order to follow-up on your current baseline studies and better evaluate the impact of the CARE roads over time. We feel that an appropriate timeframe for such a study would be July-August, 1982. Unfortunately, no funds have currently been programmed for such a post-project effort and the Agency has little memory recall for such an expenditure. All ofnthe principal actors concerned by this study - Ambassador Linehan, AID/PPC Evaluation Officer, Bill Anderson, AID/Freetown representative, Bob Buddleston and I expect to depart post in 1980. It is crucial

ATTACHMENT: INDICATIVE SCOPE OF WORK FOR FOLLOW-UP STUDY OF CARE FEEDER ROADS BASELINE SOCIO-ECONOMIC IMPACT STUDY

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Background

The contractor, Mr. Tony Airey, has undertaken socio-economic survey research of the following USG-financed roads constructed under two separate OPG grants to CARE, Inc. (OPG # 1154 and OPG # 1400):

Year	Area	Sample
1977	S. Kailahun District	50 villages
1978	Dama Chiefdom	7 villages
	S. Kailahun District	(traffic only)
1979	Potoru Area	7 villages
	Makeni Area	8 villages
	S. Kailahun District	9 villages
	Dama Chiefdom	(traffic only)

In 1980 Mr. Airey will return to Sierra Leone to conclude his baseline study research on the CARE roads constructed during the 1979-80 work season. It is critical that time be permitted to elapse so that impact trends can be measured and delineated more clearly. A follow-up study in 1982 would appear sufficient to give us clear indications of those impacts--thus allowing 5,4,3 and 2 years respectively to have elapsed since baseline data were established for each of the road construction areas.

Summary Scope of Work

The contractor should undertake both socio-economic surveys and traffic (origin-destination) surveys in a representative sampling of the areas he has already measured. It is expected that this work could be undertaken in the eight week timeframe July-August, 1982.

To accomplish his work both types of surveys should be undertaken simultaneously in approximately the following fashion:

Socio-economic Surveys	
--15 villages in South Kailahun	(2 weeks)
-- 7 villages near Potoru	(1 week)
--16 villages near Makeni	(2 weeks)
--Time for mobilization, tabulation, contingencies	(3 weeks)
--Total approx. 40 villages in	8 weeks

Traffic (origin-destination) surveys
--4 roads in South Kailahun
--1 road in Dama Chiefdom
--4 roads near Potoru
--4 roads near Makeni

--Total approx. 13 roads surveyed

Approximate Cost

It is, of course, impossible to anticipate the exact level of expenditure which will be required to undertake the study some three years hence. An indicative study budget is therefore noted below in current (1979) prices, against which the concerned official who draws up the final plan will have to adjust for increases in such items as air tarifs, salaries, etc.

--Contractor's compensation
($100/day X 40 days).....$ 4,000

--International travel
(Birmingham-Freetown-Birmingham).....$ 1,500

--Per Diem
a) Freetown ($70/day X 10 days).....$ 700
b) Up-country ($35/day X 46 days).....$ 1,610

--Other direct costs
(enumerators, tabulators, equipment, secretary, computer time, statistician, etc.).....$ 3,000

Approximate total cost $10,810

This estimate presumes that AID or CARE could furnish a vehicle for up-country transport for the duration of the study.

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therefore that you correspond with the appropriate Embassy and AID officials in Freetown when the 1982 study is due for scheduling. I would suggest that you do so in the last quarter of 1981 so that adequate time is allocated in requesting special evaluation funds from AID/W, or, potentially the Ambassador or AID representative through funds in their respective local budgets. You should attach a copy of this letter in form of explanation for your request.

Based on my observation of your work in the field and my discussions with you, I have drawn up and attached an indicative work plan and cost estimate for your request.

I wish you luck in your work and hope to see the results of your 1982 study when it is available.

Sincerely yours,

James A. Hradsky
Acting Chief, PDO

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cc: Ambassador Linehan, Freetown
Bob Huddleston, OAR/Freetown
Dennis Brown, CARE/Freetown
Bill Anderson, AID/PPC/PE

JHradsky:7/31/79:np

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ANNEX L

September 10, 1979

Mr. Tony Airey
265, Little Aston Road
Aldridge
Walsall WS9 OPP
Staffs
England

Dear Tony:

Thank you for your letter of August 29. I have received two copies of your socio-economic impact study and will incorporate it appropriately into the current evaluation report. I still hope to get the final report into AID/W by late September, although that may slip a bit. I sincerely appreciate your effort to make the socio-economic study available to me as early as possible. You may likewise receive a final copy of the total evaluation report as soon as it is available.

As I promised during our last meeting in Freetown, I discussed your study with World Bank officials while in Washington last week. It would appear that the IBRD has both the memory recall and the money to finance your 1982 study if you can demonstrate to them the validity and reliability of your baseline data and study methodology.to date. If you are interested in pursuing the 1982 question further please contact:

Mr. Curt Carnemark
Transportation, Water & Telecommunication
.. Dept
World Bank
1818 H Street
Washington, D.C. 20433

and provide him with as detailed a description as possible of your research outline and the results of your findings. As with AID, they are quite interested in examining your study, given the sparseness of good research on the topic of rural road impact

I wish you luck in your attempt to organize a 1982 study and look forward to hearing from you in the near future. Please keep in touch.

Sincerely,

James A. Hradsky
Project Development Officer

cc: Mr. Curt Carnemark, IBRD/Washington
Mrs. Brigitte Mitchell, IBRD/Abidjan
Mr. Dennis Brown, CARE/Freetown

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ANNEX M

CASH FLOW PROBLEMS FEEDER ROAD PROJECT

1. All current funding-AID Grant, IBRD commitment, CARE project funding, GOSL commitment-will finish on June 30, 1980 (The end of the CARE fiscal year).

2. There are no firm comitments of funds for FY 81. It is expected, however, that the Government of Sierra Leone will allocate Le 600,000 in the Development Estimates for FY 81. The heavy financial burden of the OAU conference could cause this figure to be reduced.

3. If there are no firm commitments of funds by March, 1980, the Feeder Road Project will begin its winding down process. There will be no advance bush clearing beyond what will be needed for FY 80. Ther will be no advance structures work (culverts and bridges) beyond what will be needed for FY 80.

4. There also will be no reorder of culvert pipes, bulk order of spares, tires and tubes, batteries and materials. All these orders must be initiated in April if there is to be any hope that they will be on hand for the start of the FY 81 work season (November 1980).

5. FY 81 remains the year of the financial short fall. Several projects are being discussed with FY 82 commencements:

a) National Feeder Road Program-EEC allocation through Lome II

b) IADP East Phase III and IDA-North Phase II. These would be World Bank funded and run possibly three years.

c) Magbosi IADP - World Bank funded. It is certainly expected that one out of the three would begin by July 1981.

6. If CARE were forced to shut down at the end of FY 80, the chances of resuming the project in FY 82 (July 1981) are extremely small. The staff will have dispersed to other jobs and the equipment, plant, and offices will have been disposed of.

7. In reference to item #2, if only the GOSL commitment were forthcoming, CARE would have two choices.

a) Carry on an expanded Feeder Road maintenance operation, but dispose of the construction equipment. Some offices, workshops would be abolished.

b) Carry on as in FY 80 for as long as the money last. Since the first quarter contains, by far, the heaviest expenditures (since bulk orders made in April arrive and are paid for then.). This would be very difficult to implement since the bulk order costs would exhaust the entire Le 600,000. There would be no sense to initiate the bulk orders without very firm indications that money will be available by November, 1980 to

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meet payrolls, POL bills, etc.

Expected costs - 2 construction units and one maintenance unit for one year - FY 81

Personnel	850,000
Spare Parts	320,000
Material Local	130,000
Materials-US(Culverts)	150,000
P.O.L.	450,000
Support Costs	200,000
	2,100,000

Bulk Order

Oil	120,000
Culverts	150,000
Material	80,000
Spares	200,000
	550,000

	1st Quarter (July-Oct)	2nd	3rd	4th
Bulk	550,000			
Recurrent	280,000	420,000	420,000	430,000

ANNEX N

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