

6150170 / 2
15N - 23151

DUPE

PD - 1000-608

KENYA RURAL ACCESS ROADS
AND GRAVELLING, BRIDGES AND CULVERTS
PROGRAMME

CONSULTANTS' FIRST ANNUAL REPORT

Prepared for: U.S. Agency for
International Development
Kenya Mission
Under Contract No. AID/
AFR-C-1529

Prepared by: Devres

David Brokensha
Peter Moock
Bernard Riley

October 18, 1979

WEIGHTS AND MEASURES; EXCHANGE RATES; ABBREVIATIONS

WEIGHTS AND MEASURES

1 kilometer (km.) = 0.621 mile
1 hectare (ha.) = 2.471 acres

EXCHANGE RATES

Fluctuated between U.S. \$ 1.00 = Kenya shillings 7.4 and 7.3 over a period in field.

ABBREVIATIONS

CBC	-	Central Bureau of the Census
CBS	-	Central Bureau of Statistics
CPE	-	Certificate of Primary Education
DC	-	District Commissioner
DDC	-	District Development Committee
DDO	-	District Development Officer
GNP	-	Gross National Product
GOK	-	Government of Kenya
PC	-	Provincial Commissioner
PQLI	-	Physical Quality of Life Index
PSO	-	Provincial Statistical Officer
RAR	-	Rural Access Roads

FIRST ANNUAL REPORT

TABLE OF CONTENTS

	<u>Page</u>
I. EXECUTIVE SUMMARY.....	1
A. Benefits.....	1
B. Local Participation.....	2
C. Road Selection Criteria.....	2
D. Evaluation.....	2
E. Conclusions.....	3
F. Recommendations.....	3
II. BENEFITS.....	5
A. Introduction.....	5
B. Increased Employment—Road Construction and Road Maintenance.....	5
C. Increased Agricultural Production.....	9
D. Improvements in Social Services.....	11
E. Distribution of Benefits.....	21
1. The rural elite.....	21
2. The rural poor.....	23
3. Women.....	24
4. Two case studies.	25
III. LOCAL PARTICIPATION.....	28
A. Introduction.....	28

TABLE OF CONTENTS (continued)

	<u>Page</u>
B. Local Participation, Past and Present.....	28
C. Local Participation - Road Selection.....	35
D. Local Participation - Road Construction.....	37
IV. ROAD SELECTION CRITERIA.....	38
A. Present Criteria.....	38
B. The Search for New Indicators.....	38
C. Coordination with Related Projects.....	41
D. Recommendations.....	46
E. Information Needed.....	48
V. EVALUATION.....	51
A. Introduction.....	51
B. Evaluation Plan.....	51
C. Evaluation Hypotheses.....	51
D. Evaluation Data.....	52
E. G.B.C. (Gravelling, Bridging and Culverts) Programme.....	55
 ANNEXES	
A. Cross-Tabulations.....	56
B. Evaluation Team: Disposition of Time.....	73
C. List of Persons Met.....	75

TABLE OF CONTENTS (continued)

	<u>Page</u>
D. Some Problems.....	78
E. Summary of Tasks.....	81
F. Bibliography.....	83
FIGURE 1: Map of Siaya No. 1 Impact Area	50

I. EXECUTIVE SUMMARY

A. Benefits

It is too early to make definitive statements about the expected benefits. Road construction and road maintenance (the crucial aspects of the project) provide direct benefits in the form of wages to the workers, few of whom are women. Road workers' wages are a significant addition to the cash that is available locally.

The RARs should lead to increased agricultural production, but statistical evidence for this will have to wait until we have several completed cycles of CBS data analyzed. This should be the case by the time of the 1980 evaluation.

Regarding social services, primary schools are expected to benefit from improved access roads and access to local health services should also be easier. We consider in our report the local perceptions of benefits.

The distribution of benefits will depend to some extent on the existing structure of Kenyan society: who controls which resources? Characteristics of the rural elites and of the rural poor are examined.

We expect to make more precise statements on social and economic benefits by the end of 1980. We are satisfied with the CBS data-collection and analysis system.

B. Local Participation

Participation of local people in RAR projects is accepted in principle, but presents some problems in practice. Traditional and present forms of cooperation are examined, and the value of local knowledge is emphasized. We also recognize the crucial roles of the DDO and the RAR engineer in the rural access roads programme.

C. Road Selection Criteria

Road selection receives much attention. We select several indices that seem crucial to us, and propose to examine them next year when more data will be available.

We discuss specific sets of indicators, and show that these must be considered together and not separately in the road selection process. We stress the value of on-site visits, for which we see no substitute. Coordination of RAR with other development projects is also stressed. We spell out specific topics on which information is needed, and attach a simple diagrammatic map as an example of a useful aid to road selection.

D. Evaluation

This section includes eight evaluation hypotheses that will be tested in subsequent years. We would like to add one item to the cyclical questionnaire on contacts with government officials.

We would also like to have CBC evaluations conducted using the same methods and data base as used in RAR.

E. Conclusions

We conclude:

- o that precise cost benefit studies are not yet practicable;
- o that present road selection system works fairly well;
- o that the RAR projects will be injecting substantial amounts of money into the local economies of the impact areas where income earning opportunities, both farm and non-farm, are few;
- o that RAR projects should lead to increased agricultural production, and regarding social services, primary schools are expected to benefit from improved access roads;
- o that the distribution of benefits will depend to some extent on who controls which resources;
- o that the DDO and RAR engineer have important roles to play in road selection and in the success of RAR projects;
- o that it is fruitless to search for universal and precise indicators applicable to all areas.

F. Recommendations

We recommend:

- o that site visits form part of RAR activity at all stages from planning to implementation;
- o that the flow of information from CBS to DDC's be improved;
- o that statistical data be supplemented by a good description of the proposed roads;

- o that District Development Plans be used more regularly;
- o that more local participation be encouraged;
- o that local needs and constraints be given due consideration in RAR projects;
- o that local people give their approval to proposed routes;
- o that one item on contact with government officials be added to the cyclical questionnaire;
- o that CBC evaluations use the same methods and data base as used in RAR.

II. BENEFITS

A. Introduction

Because most of the roads are either still under construction, or have recently been completed, it is not yet possible to make many definitive statements on the benefits of the roads. There will be a clearer picture by the time of next year's evaluation. What we have done here is to make some general remarks, and indicate some difficulties. One major problem in all such evaluation efforts is the impossibility of attributing any effect to any one specific cause. Fortunately, this has been recognized in all reports on the project. We shall, with the help of our detailed and ongoing ethnographic survey, remain aware of the relative significance of land adjudication, agricultural innovations and other development projects.

B. Increased Employment--Road Construction and Road Maintenance

Because the benefits (wages) are direct, visible and easily isolated, we deal with them first. The number of people involved in the innovative road maintenance programme is small and the programme is just getting under way on a few roads. Nevertheless, we note in passing that we are concerned about the effectiveness of this programme which will depend greatly on frequent supervision, careful inspection and regular payments to the contract workers: each worker will be given an assigned stretch of road, variable in length according

to the terrain, which he will be required to maintain at approved standards in twelve working days each month. Other road studies have stressed the crucial aspect of maintenance, for unless new roads are properly maintained, all the projected benefits will decline. Clearly, we shall be paying close attention to RAR maintenance on our subsequent visits to Kenya.

Compared to maintenance workers, much larger numbers are working on the construction of rural access roads. In our initial tour, we saw several road gangs at work, and we also observed and interviewed workers on two CBS (Central Bureau of Statistics) survey roads - Busia No. 4 and Siaya No. 1. In addition, we read an advance copy of the excellent recent Labour Supply Study: Final Report (IBRD/MOW) based on a sample survey of 891 workers on RAR (Rural Access Roads) projects in 11 districts of Kenya. Our own observations and interviews reflect the general results of the wider sample survey, in that:

1. Most workers were men, (92% in the national sample). With the exception of Kisii, where women constituted about half the labour force, women were either absent (Busia) or present in small numbers (3 of 82 as water carriers, at Siaya). The presence of women workers in Kisii raises some interesting questions, which we intend to pursue in succeeding years. The high numbers of women workers cannot be explained by a shortage of male workers, for large numbers of people of both sexes sought work, and a lottery decided who was given work. Why should there be so many women seeking work in Kisii? It may be related to tea and other cash crops; it may also be attributed at least in part to cultural factors such as traditional division of labour according to sex.

2. Many of the workers were aged under 30. The proportion for the national sample was 65% and for our smaller samples about 50%.
3. Few workers owned much land - .57 hectare was the national small-holding area per road-worker.
4. Most workers lived at a distance of less than 4 kms. from the road - 58%, nationally, about the same at Siaya. At Busia, a poorer area, 66% claimed to live 8 kms. or more from the site (contrasted to 8%, nationally). This may be accounted for partly by the fact that road work was being done at the end of the 10 km. road, and many workers had been with the project from the beginning, when construction was nearer their homes.
5. Turnover of worker is low; according to the RAR engineer for Siaya and Kisumu Districts, turnover was generally about 10% after the first wage payments, and then the labour force remained stable, unless the work became very much harder. Distance from work is not a major deterrent, but some workers leave when they have to work on their own farms at busy seasons. We propose to examine more carefully, next year, the relationship between peak farm labour periods and road labour availability.

Given these general characteristics - of a work-force that was predominantly young and by no means affluent - what would the wages be spent on? So far, in our small sample surveys, we only have the answers to the question, "what did you - or will you" - (in the case of workers who had yet to receive pay) "spend your wages on?"

Recognising that actual expenditure patterns may differ significantly from those stated, nevertheless it is worth summarising the answers.

At the Siaya road, 16 (of 28) said that one of their primary aims would be to buy clothes, some having quite specific targets such as - a pair of shorts, Shs. 57/- (\$8); a blanket, Shs. 84/- (\$12); school uniforms for my two children at primary school. The next

most frequently stated preference was the purchase of livestock-goats, cattle, chickens and sheep. Those naming cattle said they would save as the monthly wage of about Shs. 200/- (\$26) would not suffice for a beast. Other stated targets included school fees, food, corrugated iron, hire of farm labour, bridewealth, a mattress, a plough and "business".

We hope to collect more precise information on this topic, later. What is certain is that the RAR projects will be injecting about K900 (\$2400) per road per month into the local economy, a significant amount when employment and income-earnings opportunities, both farm and non-farm, are so few. The construction time for a RAR is six to nine months, occasionally longer, as that the total amount of wages paid for each road (estimating an average of ninety workers) would be K3400 to K 8000 (\$15,000 to \$22,000). The magnitude of these amounts can only be properly appreciated when compared to cash available from other sources.

The national survey examined in great detail the possibility of RAR workers neglecting their own farms, and concluded that this was not likely to happen, for several reasons. At Siaya the workers could, if hard working, finish their allocated piece of work by about 1 p.m., leaving time for some farm chores after work.

One other direct, if minor, economic benefit occurred to enterprising women who sold porridge to the Siaya workers,

at 30 cents a bowl unsweetened, 50 cents a bowl if sugared.

In 1980, and in subsequent years, we shall be investigating further the direct impact of roads, by checking expenditure patterns of selected labourers. We shall be able to use MOW (Ministry of Works) records as a base, and to conduct small-scale surveys ourselves. We shall be particularly interested in any relationship between road wages and agricultural inputs and production.

One final note on road construction concerns the RAR tools, which have been specifically designed for this project. We heard reports that on some roads workers objected to some tools, claiming for example, that the hoes were too heavy, or too blunt. The RAR engineers are well aware of the importance of providing good tools, and even select tools according to the soil conditions. We are concerned to find out if existing technological usages inhibit or encourage adoption of "improved" tools, and whether there may be, for example, an excessive reliance on the hoe to the exclusion of other tools. We shall also find out whether there is any spread effect from new tools: if these are perceived as being superior, will they be adopted for ordinary farm work, or will they be unavailable, or too expensive?

C. Increased Agricultural Production

This is, of course, the major anticipated benefit and the

primary justification for the RARP. We are satisfied that the CBS, in its intensive surveys, is collecting the right sorts of information and that our proposed cross-tabulations will begin to provide, from 1980, sensitive indications of changes. We shall be concerned not only with total production, but also with relative emphasis on cash crops and subsistence crops, and with the distribution of increased production among the people.

D. Improvements in Social Services

We first consider primary schools. An analysis of figures from the 20 mixed primary schools in Boro East (Siaya District) showed that:

	<u>Mean</u>	<u>Highest</u>	<u>Lowest</u>	<u>Totals of 20 schools</u>
Enrolment of Boys	316	542	165	6,328
Enrolment of Girls	<u>271</u>	<u>487</u>	<u>131</u>	<u>5,412</u>
Total Enrolment	587	1021 ¹	296	11,740
Std VII ² only				
Boys	24	41	8	474
Girls	<u>14</u>	<u>39</u>	<u>6</u>	<u>272</u>
Total	38	80	17 ¹	746

¹Total refers to one school and does not necessarily correspond with figures above.

²In Kenya, primary education is divided into seven standards or grades. Standard VIII is the final year of primary schooling, when the crucial C.P.E. (Certificate of Primary Education) examination is written. The results of this examination determine whether the student can proceed to secondary school, and also quality of secondary school to which he or she may be admitted --providing that the secondary school fees, which may amount to Shs. 1100 (\$150) a year, can be raised. The average age of Standard VII students is 13. The ratio of boys to girls is 100: 85 overall, but 100: 58 in Std. VII. The population of pupils in Std. VII is:

- 7.4% of all boys enrolled
- 5.0% of all girls enrolled
- 6.4% of total enrolled

The elimination of primary school fees in 1974 may partly account for the disproportion as after that date enrollments increased significantly. And those currently enrolled in Std. VII were already in school. There are still monies to be paid, for school fund, uniforms, etc., but many more children are now enrolled in schools.

These figures show that there are significantly fewer girls at school, especially at the highest level, Std. VII. This obviously has implications for the ability of local girls and women to take advantage of new opportunities.

Primary schools differ greatly, in how they are perceived by students and parents, in the quality of education, dedication of teachers and success rate in the CPE examination. Some have a passing rate as high as 75%. The schools that are seen as most successful will attract much larger enrolments, (often of 1,000 or more) than those that are not so highly regarded. Some children will be sent to good schools that are more than 5 km. distant, in preference to nearer schools that have lower reputations. We can not be certain of the relative importance of location, though this obviously influences the total picture, as does - character and qualifications of staff, especially the headmaster or headmistress; relative wealth of area; local harambee (self-help) contributions; age and state of buildings. We can say that, other things being equal, an isolated school with poor road access is likely to be among the worst in the area because:

- o Most teachers who come from outside the local area prefer to have regular bus access to their homes, and to shops and services, so remote schools are unpopular postings, indeed teachers are often sent there as a punishment;
- o isolated schools receive fewer visits from assistant education officers and other officials, so there is less opportunity for special pleading for supplementary funds;

- o Harambee committees may also have difficulties in fund raising;
- o school books and other supplies are fewer if transport is a problem and they must be carried by porters, or by pupils;
- o the free milk program for schools seldom functions satisfactorily at remote schools ($\frac{1}{2}$ a pint for each child twice a week). Nyadhi Primary School, for example - in Siaya No. 1 impact area - is supposed to get milk twice a week, but frequently the contractor fails to bring the milk, even in the dry season. Sometimes the milk arrives but is spoiled.

So we expect RAR's to result in some improvement in local primary schools. Secondary schools will scarcely be affected, except in increasing convenience for students coming and going, and eventually in more income from cash crops being available for school fees. Nearly all existing secondary schools are located on or very near to a good classified major road, because this simplifies access (for staff, students and visitors) as well as facilitating supply of water, electricity and other services.

We are less certain about the effects on health services, despite the fact that many people, when asked to name benefits of RAR, listed access to hospitals first. ("If my child is ill I can take her to a hospital.") Even if people have better access to hospitals, this will not necessarily result in improved health, as the major needs seem to be preventive rather than curative. Malaria, for example, is extremely common in Siaya: hospital visits would not lower the incidence.

The RAR's may improve health outreach and extension services, simply by facilitating visits from health workers to people in the impact area. Officials from government departments such as community development, social services, probation, health and co-operatives will probably visit the areas more frequently, though actual benefits of such visits may be difficult to measure. We shall combine our own observations with analysis of CBS survey data in an attempt to establish the incidence of such visits, and of their effects.

This expectation, of increased benefits from visits of government officials, was shared by many people, most of whom tended to rate increased agricultural production second or third in their anticipated benefits. Many thought that the government would do things for them, rather than seeing improved roads as the opening of a door, the creation of opportunities for self-help and enterprise. Should this dependency syndrome be pronounced and widespread, it could be a constraint on development and it therefore warrants some attention in future years. This will involve an exploration of people's attitudes and perceptions, especially while conducting the intensive ethnographic survey.

With regard to perceptions of benefits, we made one survey of public opinion, consisting of an essay contest, at two schools (Ambira Boys and Rang'ala Girls) near the Siaya impact area.

Students wrote on "How improved rural roads will affect my home area."

The students, from Forms II to VI (i.e. about 13 to 18 years of age) wrote insightful, thoughtful and for the most part fairly realistic essays. Some vivid statements were made, for example:

"A man near my place hanged himself when he could not transport his sugarcane harvest to the factory so as to obtain money for his two sons who had been invited to the University to further their studies."

"Good rural roads can also destroy families - with the money he gets from the harvest (cane) a drunkard might buy nothing but alcohol---he might meet an accident and die--- leaving a widow-----."

"With all the (expected) developments some traditional customs will disappear, like the traditional way of taking out you lower teeth ----- roads will bring civilization."

"Many teachers do not like my area---when they want to carry their things they have to trouble the pupils and this makes the pupils very unhappy. Also, when school equipment such as chalk, books, as well as milk are to be brought, pupils have to carry them."

"During the rainy seasons the many streams flood and the children are unable to cross (to go to school) because there are no bridges----so they miss going to school. Roads and bridges would improve attendance."

"Communication is very difficult when a person dies and his relatives are away in towns, it is not easy to inform them of the death----if roads are improved, we can tell people quickly."

"Some people want to build permanent houses----it is not easy to transport sand and cement and sheets of corrugated iron---the lorries have to pass through cultivated fields which causes quarrels between the owners of the fields and the person who has made the lorries destroy the crops."

"A person might want his maize to be ground and he goes to the maize-meal mill---he might be told that the machine broke down and lack of transport has not enabled the obtaining of spare parts---improved roads would ease such minor problems and make the peoples live happy."

"One day I asked my uncle why he had chosen to plant only a quarter of an acre with sugar cane. He answered me with sorrow. 'My son, have you ever heard the sound of a vehicle here? If you plant four acres, where will you take the sugar-cane when it is a distance of 20 kilometres to the road?' I had nothing to say."

"Government officers are not ready to come and work in such areas---one teacher resigned---he argued 'how can a person be posted in such a remote area where a month can end without seeing a newspaper?'"

"Tea leaves are perishable and therefore require quick transportation to the processing factories. This can only be done if rural roads are improved."

"Due to many vehicles using the roads there will be air pollution which choke the residents who live near the roads."

"There would be robbery because we will be connected to the outside world---robbers can use the roads and come and rob innocent citizens."

"Films and magazines and books will be available. We will be entertained by acrobats."

"Smuggling from Uganda will increase."

"Land Rovers will flock in and out looking for chang'aa (illicit liquor) brewers."

"Roads will attract members of parliament, trade magnates, or rich academicians."

"Some rude teachers rarely go to school, increasing failure in examinations but they will fear immediate inspection from high authority (and will improve their ways)."

"Our people cannot easily sell fish from the lake, but with better roads fishermen will easily transport their catch, either smoked or even fresh as refrigerated lorries can be used."

"Groundnuts are grown abundantly but cannot be sold because of no proper transport."

The advantages and disadvantages of improved rural roads, as perceived by these secondary school students, are summarised below. It should be noted that the students presented a wide range of possible "effects", and that nearly all of them are quite realistic. This list indicates both the local perceptions, and also the complex array of possible impact of roads.

ADVANTAGES

Agriculture

Cash crops: easier transportation to market or factory, so more crops can be grown.

Extension: more advice available.

Livestock: visits by artificial insemination officer.

Markets: will expand.

Perishable crops: easier to market tea, sugar cane, fish, vegetables, milk and other perishables.

Cooperatives: will be encouraged.

Farm labour: will be more available.

Loans: easier to get.

Trade

Shops: more shops will open and sell more goods at lower prices.

Industries

Small-scale: rural industries will develop.

Employment

Road construction and maintenance will provide jobs.
General rural development will result in more jobs.

Labour

will move about to and from work freely.

Rural Electricity

needs a road before it can come in.

Education

Primary schools will get books, supplies, milk.
Teachers won't run away.
Better inspection of schools.
Small children will not be stranded by flooded rivers.

ADVANTAGES (Continued)

more money = more fees for secondary education

Easier to build or repair. class-rooms and teachers' houses. More books, magazines, newspapers. More films, especially educational ones on agriculture, family planning less illiteracy.

Health

Sick people, accident victims, and pregnant women can be rushed to hospitals. More drugs for dispensaries. More advice on hygiene and on family-planning. Doctors and nurses can visit. Bush will be cleared, reducing tse-tse fly and other pests.

Administration

More visits by government officers such as DC, DO, Chiefs, sub-chiefs; self-help activities will be easier. MP's, Ministers, even the President can visit area.

Public Safety

Police can move about easily, thus curbing crime. Cleaning of bush will get rid of hiding-places for thieves.

Cultural

"Civilization" will spread new ways of dressing, cooking, keeping house nice. Strangers will come in with new and better ideas.

General and Social

Social travel easier for secondary students, also for pedestrians and cyclists. Easier to notify people of death or serious accidents. Better houses will be built as it will be easier to transport corrugated iron, cement and other materials.

Rural centres and small towns will
spring up.
More entertainment, films and
acrobats.
Local pride will grow.
Tourists may come in.

DISADVANTAGES

Economic

Some prices may rise.

Health

Diseases such as venereal diseases
may increase.
More traffic accidents.
More Land-Rovers moving about in
search of Chang'aa.

Cultural

Our old ways will disappear.
Culture conflict will happen,
between old and young.

Social

Increase drift to cities.

Environmental

Air pollution, (exhaust fumes)
and noise pollution from lorries.

E. Distribution of Benefits

We are asked to consider the distribution according to (i) size of head of household, and (ii) sex of head of household. We shall also review distribution between "trucking, trading and farming sectors." Our cross-tabulation of CBS data will provide useful information in 1980. We can consider these aspects of distribution all together, as there is much overlap. Both published sources (especially information from the CBS Integrated Rural Survey and from the 1979 - 1983 National Development Plan) and our own observations indicate that much rural social stratification already exists, as well as an incipient self-perpetuating rural elite.

Let us consider two crucial questions: Who are members of the elite? Who are the poor?

1. The rural elite

Studies from many different parts of the Third World describe the emergence of a new group of what are generally called "Big Men." They are also known as cultural brokers, entrepreneurs or spiralists: They are people who have made successful adaptations and who control a larger than average proportion of local resources of land, or capital, or credit, or cattle, or labour, or prestige. The rural areas and western Kenya all have their share of Big Men, who combine economic, cultural and psychological characteristics. It is fairly easy to ascertain who the "big men" are, in any

area, simply by asking the local people. The same names occur again and again. If we consider the Big Men of Siaya, they share many of the following inter-connected characteristics (and these would be found also in other areas):

- o overwhelmingly male;
- o mostly in their 40's, 50's or early 60's;
- o have had in the past salaried employment, mainly with government (Railways, Posts, Prisons, Customs were all popular with Siaya people) but there are some who had been with private concerns - e.g. one man had retired from the United Touring Company after 30 years as a driver/guide;
- o have had some education, though seldom beyond Primary level: most speak good Kiswahili, but little English;
- o live in a neat and impressive compound with a quite large house roofed with iron, often with glass windows, cement floors and even ceilings; some, notably cattle traders, scorn modern houses and occupy round, thatched houses, but these are invariably larger and neater than average;
- o have more personal possessions, such as bicycle, radio, clock, sewing machine, plough;
- o own enough land to grow food for their families;
- o keep their fields in somewhat better condition than average;
- o have access, either through relatives, in-laws or hired labour for their needs;
- o are aware of advantages of modern agricultural inputs and use them;
- o ensure that their children have access to education;
- o are confident, ambitious and want to make good use of their resources and opportunities.

2. The rural poor

The poor exhibit very different characteristics, often the obverse of those listed above for the elite. They tend to include large numbers of women, children and elderly; they are subject to more sickness, and receive less medical care; more have had no education, and most have never had regular salaried employment. These are exceptions; we met a few men whose fortunes have reversed, but more often there seems to be a slow but steady movement upward on the part of those who have been termed (by some anthropologists) "spiralists".

In Western Kenya, as elsewhere, there is a recognizable cycle of poverty, which has its own signals or stigmata. One can judge with some accuracy the relative wealth of a compound merely walking by it - the structures will be dilapidated; livestock will be few or non-existent; hedges, exotic trees, neat lawns in the compound - all these will be lacking. There are likely to be more children of school age who are not in school, and the inhabitants may be shabbily dressed. Other indicators are illness and malnutrition of young children, but these are also found in richer households, though not to the same degree.

The Development Plan 1979 - 1983 presents a thoughtful review of poverty in Kenya. "In most cases, poverty can be traced to a lack of access to employment opportunities, land,

water, markets, credit, modern technological innovations, power, quality education and medical care." (Vol 1, 2.5) Five target groups, who share low incomes and lack of access to opportunities, are identified in the Plan: the two groups that concern us are the small farmers and the landless rural workers. The Kenya CDSS (Country Development Strategy Statement), prepared by the USAID Mission, Nairobi) also gives an insightful and comprehensive account of aspects of poverty in Kenya.

While it is an easy matter to identify the "target group," the rural poor, it is difficult to predict what share of economic or general welfare benefits will go to this group. We shall need to focus, in our data analysis, on different groups such as Big Men, small farmers and landless, and see how they fare, respectively, after the roads have been completed. We may later be in a position to recommend some supplementary interventions, and to see how much access the poor actually have to opportunities for economic or social improvements.

3. Women

We are satisfied that the system of data-collection and analysis, that will be followed by CBS, will provide us with adequate information. Appendix 1, Cross-Tabulations, provides specific details.

Each CBS road impact area survey provides regular and ongoing information from 120 households, so we should be able to monitor changes in the lives of the women (including many female heads of households). In addition, the detailed ethnographic survey will provide qualitative and quantitative information on benefits accruing to women.

4. Two case studies

- o Mr. A. is a trader who owns a corner store at Ndere;
- o the Post Office at Ndere;
- o a small shop at Agulu (this is run by his wife, and his is one of two tiny dukas in the impact area);
- o a Land Rover;
- o an impressive compound at Agulu. (This is one of the nicest in the impact area, with about .5 ha. of fenced yard, substantial buildings, even a double lavatory with iron roof and electric light from a generator, large water tanks; many exotic fruit, shade, construction and fuelwood trees; systematic manure collection, and form improved livestock);
- o one of the best cotton fields in the area, together with good fields of maize, sorghum and cassava. (He is a member of a four-member farm co-operative, which has excellent fields in the Agulu area.)

When we asked Mr. A. what effects he thought the road would have, he did not hesitate. He is in a favoured location, as the proposed road will pass in front of his house and shop and will link it with major roads in two directions. He proposes to erect a large store: his present shop carries a

very limited range of about 30 items - sodas, ink, patent medicines, soap, detergent, ball-point pens, cigarettes, no single item priced at more than shs. 10/- (\$1.50). He says he will have a proper shop, and he also intends to open a posho mill. The nearest mills are now at Ndere, 4 kms. south of Agulu, and at Ugunja, 5 kms. north, so he would be in an advantageous position. Mr. A. spoke briskly and with conviction, as though he had made careful calculations and estimates and had planned thoroughly. Our point is not simply to support private enterprise for its own sake, but to suggest that Mr. A's plans (judging by his past achievements) are likely not only to benefit himself but also the community; he will be providing improved commercial services, and offering employment opportunities for others.

Our second example is Mr. B. who owns the only industrial sugar jaggery factory, located in the south-east corner of the area. Unlike Mr. A, Mr. B does not speak English, but he has an excellent command of Kiswahili. He is a trader at Eldoret, leaving the jaggery factory to be managed by his brother, with weekly visits by the owner. Sixty people are employed at the factory, on the lorries, and in his 26 acres of cane. At present the factory is reached by 4.2 kms. of rather rough track from Ndere; the track is difficult to travel or impassable in the rains. Mr. B's plans are to improve an existing track

to the proposed RAR, about 1 km. away, and to expand his production at the factory. He would like to produce white sugar "like the factory at Rangala" (7 kms. away). He has financed his own business ventures up to now with no loans and no partners. However, he is considering applying for credit to undertake his proposed extensions. Like Mr. A. he would enhance the development potential of the area, and also offer a significant number of new jobs.

It is clear that;

- o these two men are truckers, traders and farmers;
- o they are likely to benefit from the new road to a greater extent than most;
- o in so doing, they will aid the general development of the area.

In describing these two Big Men, and in pointing out the likely (substantial) benefits they will receive from the RAR, we are not endorsing a simplified "trickle-down" theory.

Rather we wish to point out that the present structure of Kenyan rural society and economy is such that most developments will result in a greater share of benefits going to those who already control local resources. Our task will be to monitor in as precise detail as is possible the respective shares (between groups) of the benefits, and to suggest ways of ensuring that the target group does receive some benefits.

III. LOCAL PARTICIPATION

A. Introduction

Participation of local people, grass-roots planning, and development from below are urged by many authorities on rural development. The Government of Kenya states quite unequivocally that "an essential ingredient is increased participation in the decision-making process at the local level...programmes such as RAR...already encourage local level participation in helping determine needs and priorities." (Development Plan, 1970-1983, para 2.93). USAID, also, enjoins and encourages local participation, and our contract requires us to check on the extent of this in connection with RAR. But it is one thing to accept the principle of local participation, another to decide how exactly this is to be implemented, as we see below in Section (C). Local participation has so far, for a variety of reasons, been rather limited, and that "the wishes of the people" are mostly expressed through elected or appointed representatives, who may or may not reflect local views.

B. Local Participation, Past and Present

Before considering specific problems of participation in RAR, we give a brief overview of local co-operation, on the assumption that a strong and enduring tradition of co-operating for the common good will facilitate effective local participation in rural development

projects. Where there is no such tradition, participation may be weakened or hindered by factionalism and individualism.

In Siaya we find one of the most universal forms of peasant co-operation, the agricultural work party, called Riuruck in Dholuo. It consists typically of a group of about ten women, who work together on weeding or other agricultural tasks on the field of one member of the group. The hostess or organiser provides some food or other refreshment. This is typical of the "festive" type of work-party, which has many advantages in making tedious tasks more pleasant and acceptable. This traditional co-operative group survives today especially among church members, indicating that close association and a shared ideology foster such co-operation; the groups even hire themselves out to non-members if they wish to raise money for group purposes.

The work-parties are organised by women, underlining a capacity (often overlooked) of women to organise themselves for the common good. Another example of local participation by women comes from the Rang'ala Catholic Church Parish Council, about which two aspects are noteworthy. First, membership includes five women (one quarter of the total) who play an important and respected role on the council. Because of women's successful participation here, we recommend that other development committees, from district down to sub-location, level, should include more women. At present, several

committees have no female members. Second, the Parish Council has full financial responsibility for its affairs, deciding what the church rates and special levies will be, and how much will be allocated to projects. According to the parish priest (who is glad to have passed on decision-making responsibilities to the Parish Council) the system works well. This suggests that the people could well be given more authority, rather than merely a consultative role, on development committees at all levels. The main form of modern rural co-operation in Kenya is the Harambee or self-help system, which in Siaya has sponsored mostly primary school projects such as classrooms or teachers' houses (repairs or construction). Cattle Dips have also been tackled, often with less success and more support from government. Dips are often built before there is adequate provision for water. There is presently a proposal in Central Alego for the establishment of a village polytechnic, but nothing is definite. Harambee projects are notoriously elusive to follow through in detail, their history is littered with failures, or projects that have been bailed out at considerable expense by government. Recognising this weakness, the current Development Plan, 1979 - 1983, states that "all Harambee self-help projects will require approval of the District Development Committees before they are initiated." (para 2.92).

One other aspect of local participation consists of using

local knowledge, especially of indigenous agricultural production systems, and of local natural resources. This knowledge is a frequently overlooked resource, and should be examined because:

- o it is likely that some, at least, of the prevailing beliefs and practices are rationally adapted to the local society and environment;
- o it is a courtesy to the people, to study what they do and what they believe before recommending wholesale changes;
- o rural development projects are more likely to succeed if they incorporate some local elements.

For example, many residents of the impact area in Siaya show a keen interest in, and have a wide knowledge of, trees and shrubs, which appear in the compounds in greater numbers and variety than in many other parts of Kenya.

Compounds are usually fenced, with euphorbia, sisal, dracaena or thevetia. Trees are planted within the compound - fruit - mango, guava, papaya, citrus; construction - markamia; shade and/or fuelwood - eucalyptus, cupressus, cassia, palm, grevillea, jacaranda.

In addition, many compounds have a lawn of grass. This interest in vegetation could surely be used to further the afforestation so urgently needed.

We do not suggest that local knowledge can or should supplant "scientific" knowledge, merely that there should be a balance between specialized indigenous beliefs or "folk-science" on one hand, and the more universal science on the other. There are ways to tap local

knowledge, and these should be used in planning social and economic changes. The main points here are that benefits from Rural Access Roads will be maximized if the roads are co-ordinated with other development projects, and that such co-ordination will be more effective if based on existing local knowledge and practices.

We turn now to the crux of the problem of local participation in development—the local development committees. The Development Plan, 1979 - 1983, emphasises the need for "a growing degree of decentralization and reliance on local units (such as) locational development committees, to contribute to decision-making and implementation—DDC's will play an increasing role in planning, co-ordinating, monitoring, ... DDC's will be required to monitor all government expenditures directed at district level and identify lags in plan implementation by all ministries... development committees below district level will be strengthened." (2.91, 92).

We shall monitor with interest the steps that are taken to implement these policies. Initially, there appear to be two main obstacles to a fuller and more effective local participation. First, there is (whatever national policies state) still an attachment to centralized administration. Many government officials, convinced that they know best, are reluctant to share their decision-making powers with lay people. However, such officials might be re-educated, if the government emphasises the decentralization policy.

The second obstacle may prove to be the more severe, and that is the power of separate ministries with their vertical rather than horizontal integration. Whatever happens, we hope that lower level development committees are strengthened and provided with:

- o more feedback on decisions at higher levels; and
- o incentives to monitor and supervise programmes in their areas.

At present, most committees, from district level down, lack the capacity to design, co-ordinate, implement, supervise, maintain and evaluate projects, as attested by the amounts of unspent district development grant funds each year. For example, Nyanza Province spend K190,000 (\$515,000) from 1974/5 to 1976/77, but had K174,000 (\$470,000) in unspent balances.

In theory, there are institutionalized committees at several levels, holding regular meetings:

<u>Level</u>	<u>Chairman</u>	<u>Secretary</u>	<u>Unofficial Members</u>	<u>Notes</u>
Province	PC (Provincial Commissioner)	PPO (Provincial Planning Officer)	all official	
District	LC (District Commissioner)	DDO	Some "local leaders"	
Division	DO (District Officer)	DDO (Dist. Dev. Officer)	Some "local leaders"	
Location	Chief	-	2 members from each sub-location	meets irregularly
Sub Lo- cation	Sub-Chief	-	Haphazard	meets irregularly

(in Siaya District, the Central Alego location committee, and the Kakum - Kombewa sub-location committee, have each met once in 1979; "we meet when there is something urgent")

The role of the DDO (District Development Officer) in relation to the DDC's, and to rural development generally is extremely important. Attempts have been made, starting with the Ndegva Commission (1971) when there were no DDC's through the Development Plans of 1974/78 and 1979/83, to clarify and strengthen the power of the DDO and the DDC. There is no one clear role, as this depends on several historical, political, personal and

administrative factors. There is a high turnover of staff, which makes for difficulties as there is no real institutional memory. Sometimes DC's (District Commissioners) and MP's (Members of Parliament) exert the real power, and as yet there is no really effective grass-roots participation. The power of the ministries means that most expenditure is still centrally controlled: according to one estimate, DDC's control only 54% of total development expenditure. Despite these factors, some DDO's and some DDC's are relatively effective, and some experienced DDO's manage to make a rather unwieldy system work.

also problem of conflict between those who represented by DDO and 'old order' represented by DDC or DC

C. Local Participation - Road Selection

The road selection process is still new. MOW has set up procedures which are meant to ensure that there is grass-roots participation. This is what happens in theory. The lowest level, the sub-location, has a development committee that meets to propose suitable roads for RAR's; these are submitted to the location development committee, then the divisional development committee, and finally to the DDC. At each step, the committee should consider the roads proposed, and rank them in order of priority, according to the guidelines (engineering, economic and social) that are prescribed. The DDC should finally come up with a list of 10 to 20 roads, about 100 km., in total,

from which the RAR engineer makes a final selection.

In practice, there are some obstacles. Let us consider Siaya District, where Boro Division is one of four divisions in Siaya, Central Alego is one of eighteen locations in Boro Division, and Kakum-Kombewa is one of eleven sub-locations in Central Alego. About two hundred development committees, involving 3,000 or 4,000 people (in all Siaya District) should meet to discuss the selection of RAR's. It is difficult to ensure good attendance at meetings, especially for unofficial members, unless they perceive some clear advantage. There are logistical problems of distance and transport, as well as lack of remuneration, and members having other more pressing commitments.

Even if members attend, they may find that the senior official-sub-chief, chief, DO (District Officer), or DC-plus a few other prominent officials, may dominate the proceedings.

We would like to attend development committee meetings but there was none during our stay because of the imminent national elections. Next year we hope to be able to delve further into this matter and make some specific recommendations. We shall be interested to find out more details of the unofficial members and of their participation. What are their occupations? How many are church leaders, businessmen, elders, farmers, women, teachers, representatives of other groups? How are they appointed? What is their contribution as perceived by themselves and by the chairman?

D. Local Participation - Road Construction

Participation here is a much easier affair than is road selection. MOW has worked out an efficient and a just system for recruitment of labourers, giving preference to those who live in the area and holding a lottery in cases where there are more applicants than vacancies. All our evidence is that the system is working fairly and efficiently, and that turnover is relatively low. On our annual visits, we shall monitor some road gangs to ensure that local participation in the employment opportunities continues.

IV. ROAD SELECTION CRITERIA

A. Present Criteria

At the donors' meeting, general dissatisfaction was expressed with existing criteria for road selection. There was no quarrel with the engineering criteria, which are clear and straightforward. But the economic criteria appeared unsatisfactory, particularly attempts to establish precise gross margins for agricultural production. Furthermore, social access indicators need refining, as at present they consist of estimates of distance to hospital, health centre, post office and divisional headquarters, a strange assortment. We have been asked to propose some simple indicators, perhaps considering a time-series analysis of development investments and their durability.

B. The Search for New Indicators

There have been many attempts, in other areas of development, to establish a composite index that can be quantitatively used to rank factors and is relatively simple to use. Most attempts have failed. One of the more successful indices is the Physical Quality of Life Index (PQLI) developed by the Overseas Development Council to replace the inadequate GNP (Gross National Product) index. PQLI is based on three weighted factors: infant mortality, life expectancy, and adult literacy.

Results are expressed in scale 0-100 (100 high) and the ranking of nations is interesting. Sri Lanka, for example, has a very high PQLI despite its relatively low GNP, while some of the OPEC nations score in the 20's and 30's, their high GNP's notwithstanding. Is it possible to develop such a simple and affective index for ranking possible Rural Access Roads? What factors need to be taken into account?

The literature on the Kenya RWP (Rural Works Programme) is suggestive here, as there have been several attempts to devise an index to rank districts so as to determine allocations of development funds. The basic question here is one really of national policy. Is preference to be given to those districts that are already relatively developed, and that are likely to make good use of further investments, or to those that are lagging behind, in an attempt to modify inequalities? The same basic questions arise in considering selection criteria for RAR's. In looking at RWP, several ingenious indices were proposed, including:

- o agro-climatic zone;
- o average size of farm;
- o population density;
- o underemployment and unemployment;
- o overall income level;
- o growth;

- o lack of ability to pay;
- o school enrolment compared to number of children of school age;
- o degree of self-help or harambee activities.

In 1980 and in succeeding years, we propose to investigate transport costs with the help of interviews and observations.

We shall be asking these sorts of questions:

- o What are existing transport costs for passengers and for produce and goods?
- o How are new rates (i.e. on newly opened roads) established? How much competition is there? What are the real costs?
- o To what extent does the transporter benefit from his charges?
- o Do the customers receive any proportion of the benefits?

The problem is that one cannot determine which factors to use, and how to weight them, until the basic decision has been made: is the aim to promote efficiency or equity or some combination of the two? The same dilemma arises with RAR criteria.

In considering road selection, we have been stressing benefits. Yet it is important not to omit a consideration of costs, for the costs of RAR's apparently vary considerably, (from C \$2000 to C \$5000 per km) so these costs must be weighed against any projected benefits.

C. Co-ordination with Related Projects

Roads should be related to other development efforts, in fields of agriculture (crops and livestock projects), soil conservations, water, and social services. We consider one specific area in some detail as an example - Forestry (with special reference to Siaya District).

Frequent statements by national and local leaders in Kenya reiterate the urgent need to conserve and extend forest resources. The situation in Siaya is as urgent as elsewhere, with a rapidly growing problem of finding fuelwood, as scarce supplies dwindle and are not adequately replaced. To compound matters, land adjudication further restricts access to available supplies because, once a person acquires individual title to land, others will seldom be allowed to use any vegetative resources of the land.

The forestry department encourages afforestation, as shown by these figures. In 1978, the department sold 110,000 seedlings in Siaya, issued free 48,000 seedlings, and planted in forest reserves 29,000 seedlings. At Madurume Nursery, which serves Boro division, 374,000 seedlings were pricked out from 1974 to 1978, with a total of nearly one million for the whole district. For 1978, the total number of seedlings pricked out was just over 500,000.

The main species which are grown include:

Eucalyptus saligna
Eucalyptus maculata
Eucalyptus camalduensis
Jacaranda mimosifolia
Cupressus lesitanica
Casuarina equisetifolia
Pinus patula
Cassia spectabilis
Markhamia platycalyx

These are sold at a nominal price of 25 cts. per seedling or Shs 7/50 (\$1.00) for a tray of 100.

The last named species, Markhamia, is one of the few indigenous trees. Known locally as siala, it is a common tree in Siaya compounds, valued for its use in construction. Because it is already well-known and appreciated and because it grows easily, it could be further encouraged.

Although the forestry department produces many seedlings each year, the total is still far short of what is required. A recent paper, "Forestry and Wildlife in the Lake Victoria Basin" (F. Owino, Institute for Development Studies, University of Nairobi, May 1979) states that "present nurseries within the basin have the potential of combined annual output of some 2,000,000

seedlings. Proposed forestry developments call for an annual nursery output of nearly 10,000,000 seedlings. The scale of tree plantings is still very small vis-a-vis future domestic wood demands. Off-site plantings and poor husbandry contribute significantly to failures." What needs to be done? First, new nurseries should be established, and second, steps should be taken to see that the seedlings are planted. Such steps could include establishing demonstration plots: Siaya proposes to have two plots in each of the 13 locations. Schools already are entitled to free issues. These could be increased and rewards established for successful school programmes. One local resident, himself an avid and successful tree-planter, even suggested that compulsory programmes should be re-introduced, reverting to colonial policy.

One other aspect of forestry warrants attention, and that is major forest produce. In Siaya District, and particularly in Boro and Ukwala divisions, the dominant species is *chlorophora excelsa*, or mvule (in Kiswahili, Olua in Dholuo) which produces splendid timber. These are valuable trees, but at present the individual owners usually receive very little - shs 200/- or 500/- (\$40 - \$70) per tree - and it is the loggers (who are seldom local people) who reap the profits. "The DC, Siaya, has instructed the DO's and chiefs to check the cutting of this rare species," according to the forestry department, but exhortations are

unlikely to be effective unless they are backed by sanctions. In olden days (and even within living memory) the Olua tree was traditionally recognized as such valuable property that it could not be cut without permission of clan elders, who used to sacrifice a chicken at the tree before it was cut down. Some sanction is urgently needed unless another valuable natural resource is to disappear from the landscape.

We have gone into the question of forest resources in some detail because of its importance, and because any development programme such as RAR should be integrated with the key sector of afforestation. Roads will affect both forestation and deforestation, and will to some extent determine the scale of each.

What is needed is a knowledge of existing and proposed projects in all fields, including crop production - innovations, credit, new varieties, new inputs, new technology, demonstration farms; livestock - cattle dips, improved stock; marketing facilities; education and health; water and irrigation; and community development and self-help activities.

It would be helpful to include past projects, even those which have failed or have been only partially successful.

Donors should insist that, before approving road selections, they be provided with full information of existing and proposed development activity in the areas concerned. There is a tendency of some department officials, in presenting their views on development needs for their districts, to concentrate on requests for more Land-Rovers, additional staff, or improved housing, rather than on the substance of development projects.

It is too early to say now the Lake Victoria Development Authority will operate, but it may also need to be taken into account in co-ordinating development efforts.

While co-ordination seems to be eminently desirable, we need to express some caution. First, there is a danger that excessive co-ordination might slow everything down. As an official of one ministry said "My own ministry is very efficient." (His view was not shared by officials from other ministries.) "If we had to wait for x, y and z ministries to formulate plans, we could wait forever. It is better that we go ahead with our projects and let others fit in." This may be an extreme view, but one must consider departmental rivalries, ministerial opposition, limited capacity, technical limitations and centralized rigidity as potential limiting factors.

D. Recommendations

Before making specific recommendations, we summarise some general points. First, we do not believe that our present state of knowledge permits us to do vigorous and meaningful cost-benefit studies with any degree of precision.

Second, we conclude that the present system of road selection - at least as practised in Western and Nyanza Provinces - is fairly efficient, and that the roads selected under the RAR programme all have a great deal to recommend them. This degree of successful choice appears to be related to the intensive local knowledge and the frequent field visits of USAID officials, who have encouraged and helped MOW to make good final choices, according to clear and acceptable criteria. We are convinced that there is no substitute for site visits and for spot-checking of potential road sites: time spent in the field permits more effective evaluation of written reports.

Third, two people play crucial roles in road selection. These are the RAR engineer, and the DDO (District Development Officer). Effective road selection depends greatly on those two officials being knowledgeable, conscientious, insightful, hardworking and co-operative.

With that preamble, we make the following specific recommendations to ensure that a high standard of road selection is maintained.

- o More time should be spent on site-visits, by representatives of donor agencies and MOW. The RAR Engineer and the DDO should be closely involved with road site visits. Over flights by low flying aircraft are highly recommended as a supplement to ground observations.
- o The flow of information from CBS and to and from DDC (District Development Committees) should be improved. See section (e), below, for some information headings.
- o There should be no attempt to establish universal and precise indicators, but rather indicators should be considered as pointers, only, and should always be assessed as part of a package.
- o Any consideration and selection of roads requires a full general description of the candidate sites for roads. Emphasis needs to be on non-quantifiable aspects.
- o The District Development Plans should be used more extensively, and where necessary should be improved.
- o There should be more local participation in road selection. For example, local traders and transporters could usefully be asked for their views: any-one with good commercial instincts would know which roads had good economic potential.
- o The road selection process should recognize certain local needs and constraints. For example, in the multi-ethnic district of Bungoma, it is wise to include ethnicity as one of several criteria for final selection; it would be unwise to omit any sizeable ethnic group.
- o Before making any final selection, it should be ascertained that there is indeed widespread local support for the proposed road and that the relevant land-owners have given their approval of the proposed route.

E. Information Needed

Where possible, district development plans (or at least the descriptions of potential road sites) should be accompanied by a map and by the following sorts of information, much of which is already readily available and has indeed been used in previous road selection procedures.

- o Area of arable land, showing proportion cultivated.
- o Population density (once the results of the 1979 Census start appearing, it should be easy to obtain good detailed demographic information, even for micro-areas).
- o Existing classified roads, indicating condition and ADT (Average Density of Traffic).
- o Major Land-Rover tracks and main foot-paths, as these are likely to include suitable stretches for RAR's.
- o Existing commercial facilities - markets, maize-meal mill, petrol station, rural bakery, shops - all these should be graded according to size or volume of business.
- o Schools and health facilities.
- o Government offices
- o Other major development projects such as tree nursery, cattle dip, dam, village polytechnic, agri-service stations.

For each district, a series of threshold indicators should be established, the aim being to decide on a minimum for various categories - area and population, in relation to (a) kms of road and (b) \$ cost per km; cash-crops, existing roads and markets. Where the minimum was not met, this should be regarded as a danger signal but not as a reason for automatic rejection.

For in certain cases it might be desirable to include one road site in a below average or neglected area. Selection should always be flexible and allow for the exercise of informed judgment rather than relying solely on any mechanical formulae.

A map could incorporate most of the above sorts of information, and it should be based on diagrammatic cartography, as illustrated by the map of the area of intensive ethnographic survey (Figure 1).

Such a map could facilitate the process of road selection by:

- o presenting an easily comprehensible view of existing development;
- o allowing for quick comparisons between competing areas;
- o showing existing roads and paths at a glance;
- o pointing out significant gaps in existing developments, as well as emphasising clusters with high potential for more development; showing the relationship between population, area and roads.

We recognise that this still leaves the unresolved problem of deciding the priority when two or more proposed roads meet these criteria. We expect to be in an increasingly stronger position to suggest ways of prioritizing roads as our data accumulate. After our experience with roads in the first phase, we shall certainly have more evidence on which to base definite recommendations. At present, we believe that the variables we mention are crucial, and we are collecting as much evidence as possible to support our beliefs. We are confident that in future years we shall be able to make more precise and meaningful recommendations.

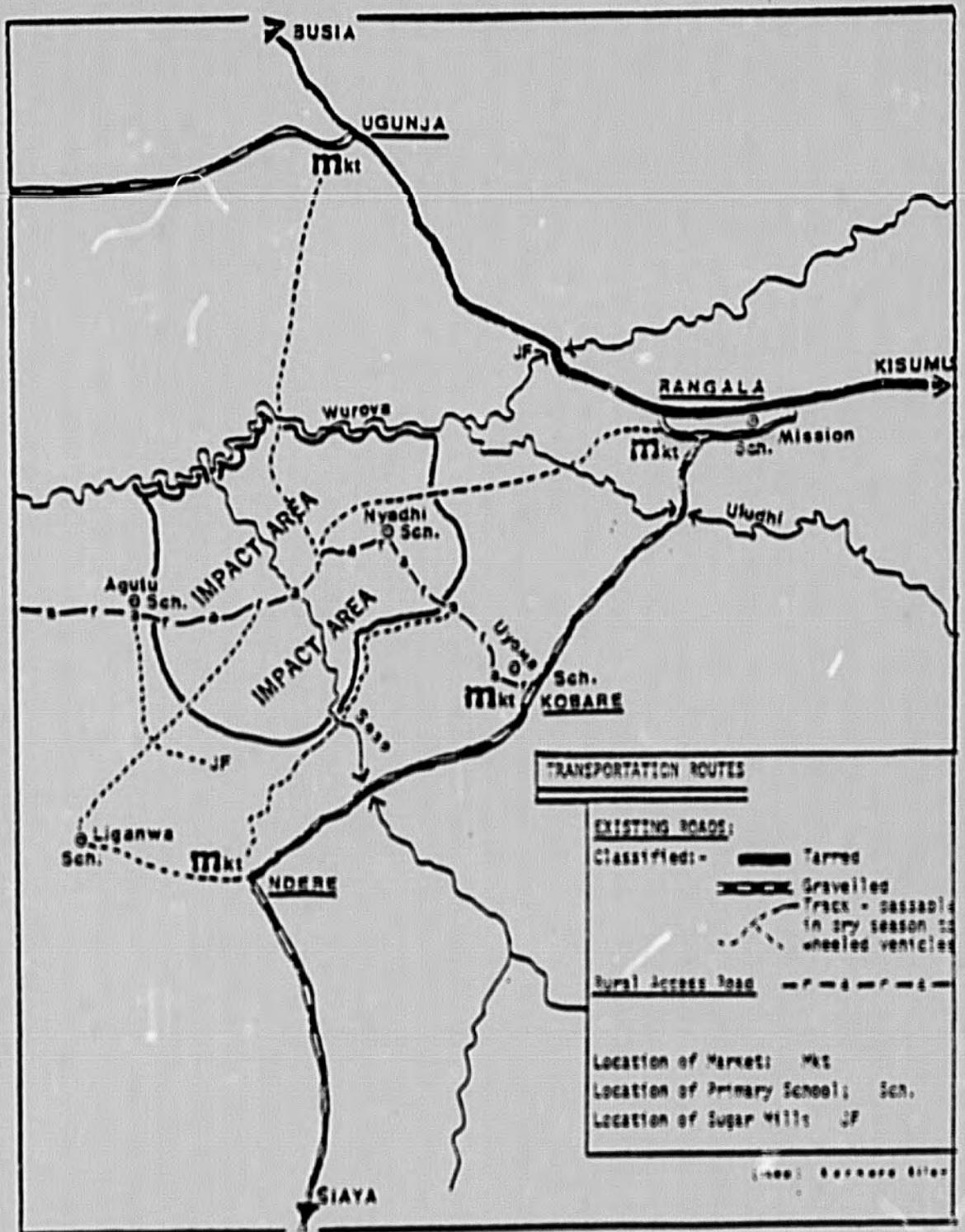


Figure 2: Map of Siaya No. 1 Impact Area

Sketch maps like this can be used as an aid in rural road selection.

V. EVALUATION

A. Introduction

This will be a short section, as most of the main points have either been covered in other parts of this report, or they must wait until the appointment of the MOW development economist. We summarise our contractual tasks, and our proposals.

B. Evaluation Plan

The major effort here has been to examine carefully the CBS data, and to suggest various cross-tabulations. which we have done. Further refinements must wait till next year, when we expect to have the first cycle of data from the CBS, as well as to have the benefit of the presence of the development economist.

C. Evaluation Hypotheses

We make some general and tentative hypotheses:

- o Farm patterns will change: there will be a change to more intensive crops, as well as more intensive input use on existing crops. There will be an increase in the supply of inputs, as well as an increase in marketing. Commercialisation will grow in the area, with more ancillary facilities springing up.
- o The road construction will provide an important windfall income, about h900 (\$2400) per month per road.
- o Part of the increased income from the farms will be invested in capitalization of farms.

- o All year access will lead to improvements in communication generally (e.g. more newspapers sold) as well as in education and health.
- o The degree of development will be much influenced by co-ordination with other projects.
- o There will be an unequal distribution of benefits, some impact area residents being in a much stronger position to take advantage of new opportunities than others.
- o Land adjacent to the new roads, and plots easily accessible, will increase in value.
- o These changes will take some time - two or three years to become apparent.

D. Evaluation Data

We have been favorable impressed by the systematic, thorough and professional approach of CBS, at their Nairobi headquarters, in the provinces, and among the field staff. The gathering of data by the enumerators, which is a crucial step, is generally proceeding satisfactorily. We have some minor reservations: the present educational system tends to inculcate among students a sense that the best jobs are urban-based and done from behind a desk. Such jobs as enumeration, which involves miles of walking, or bicycling in remote rural areas, and which often necessitate residence in a remote area, are not among the most desired jobs. So few enumerators are brimming over with zeal and dedication. However, with regular and close supervision the enumerators should do their duties well. It is desirable to ensure continuity,

as any prolonged gaps in the systematic collection of data would jeopardise the data analysis.

When we accompanied the enumerators on their rounds, we were impressed by the good relationships which they had established with their respondents. Understandably, there are a few sensitive areas where even friendly respondents are unlikely to provide complete information; for example, one man just laughed when asked how much he had spent on liquor. "Oh, you want to know how much chang'aa (illicit liquor) I've drunk," he said, and remained silent. Apart from a few areas of this sort, and allowing for human fallibility and memory, we expect the data to be good.

As far as the processing of data is concerned, it is too early to comment, as the evaluation only started in February 1979, and we shall have to wait for a complete cycle before we can judge properly. The data collecting cycles are of four weeks and three months duration, so the minimum period is three months, and two or three completed cycles would provide even better information. The CBS concept of household seems to us to be a good working definition: a person or group of persons, generally bound by ties of kinship, normally residing together, under one or several roofs, within a single compound, sharing a common source of food, sharing a community of life, and answerable to the same head.

The last two phrases may give rise to some ambiguities or difficulties. What exactly is "a community of life?" "Answerable" for what? But generally the definition is sensible and clear. It is unfortunate that there is no one single definition of household for all Kenyan data collection. The LADP (Integrated Agricultural Development Programme) for example, uses a slightly different definition, which makes comparison of results difficult. As the data are analyzed it will be important to make comparisons with LADP, IRS (Integrated Rural Survey), and other national surveys.

Turning to the MOW (Ministry of Works), we have no major comments because the development economist has not yet been appointed. The inventory of community facilities, as presented in the evaluation report for each RAR, could be improved. It simply gives a crude approximation of distance from four rather arbitrarily selected institutions - hospital, health centre, divisional headquarters and post office.

We make one recommendation - the cyclinical questionnaire should include one additional item that seeks information on contacts with government officials in the fields of agricultural extension, health, family planning, community development, and administration.

E. GBC (Gravelling, Bridging and Culverts) Programme

This associated road programme differs in many aspects from the RAR, perhaps the main difference being in selection procedure. GBC roads are selected according to simple criteria - they must be existing classified roads (in D or E or X categories) and there must be a minimum ADT of 10 vehicles per day. Roads have already been selected in Bungoma and South Nyanza districts, and work is due to start this month.

We recommend that identical data be collected in the surveys of GBC roads as on the RAR roads, for three main reasons:

- o This will ensure the systematic collection of a comprehensive body of relevant data;
- o Comparisons will be facilitated;
- o It will be much simpler to use the same procedures.

We also recommend that, initially at least, we use the same cross-tabulations. It will be a simple matter to modify or add to our cross-tabulations should this be necessary.

The rationale for using the same data collection and analysis procedures is that we are asking basically the same questions for GBC roads as for the RAR's. What are the benefits? How are they distributed? Is the target group being effected? What is happening to the women? What related factors should be considered?

ANNEX A

Cross-Tabulations

The detailed instructions to CBS, reproduced below, clearly show what we are trying to achieve. The list of variables has been critically examined by Mr. Harvey Herr of CBS, who considers it sensible and manageable. The list was drawn up with AID's specific emphasis in mind: where possible we differentiate between men and women, and we also seek to isolate "the poorest 40% where this is practicable. The main purpose of the cross-tabulations is to provide information on which we can base meaningful statements, verify hypotheses and make predictions, in accordance with our mandate for the annual evaluation.

To summarise, the cross-tabulations cover these areas:

Created Variables

1. Non-farm employment
2. Transport costs
3. Farm agricultural production
4. Farm livestock
5. Agricultural input use
6. Farm income
7. Household food consumption
8. Material possessions
9. Health status

10. Use of social services
11. Non-farm Income
12. Total household income

Interval-scale variables and nominal-scale variables are listed, together with instructions.

Household level analysis will be done on these (created) variables:

1. Road-number
2. Sex of household head
3. Distance from road
4. Household area of land
5. Type of road

Cross-tabulations

Road number x sex/occupation/m or s of hh.

x distance from road

x area of land

x road type

Because of the comprehensive list of questions prepared for CBS enumerations in impact area, together with the adequate sampling frame and the apparently high standard of the completed questionnaires, the cross-tabulations should yield vital information, in succeeding years.

CREATED VARIABLES

1. Non-farm employment

- a. Proportion of HH members engaged in non-farm activities
 $\frac{\text{NF-EMP1}}{\text{HLDTOT}}$ = count of HH members employed. (record 31)
divided by HLDTOT (record 01)
- b. Proportion of active-aged HH members engaged in non-farm activities
 $\frac{\text{NFEMP2}}{\text{count of HH members aged 18-55}}$ = Count of HH members employed (record 31)
divided by count of HH members aged 18-55 (record 01)
- c. Farm wages paid over past 3 months: $\frac{\text{F-WAGES-IN VALUE}}{\text{PERIODIN}}$ (record 41, INPUT-CO 99) over 3 months (3.25 cycles if PERIODIN = 1, 1 cycle if PERIODIN = 2)
- d. Non-farm wages paid over past 3 months: $\frac{\text{NF-WAGES}}{\text{PERIODNF}}$ = FN-WGSAL (record 31) over 3 months (3.25 cycles if PERIODNF = 1, 1 cycle if PERIODNF = 2)
- e. Numbers of HH members engaged in non-farm activities: $\frac{\text{NF-EMPS}}{\text{count of PPL-ENGA}}$ over all respondents (record 31).
- f. Hours last week of non-farm employment per active-aged HH members: $\frac{\text{NF-HRS}}{\text{count of HH members aged 18-55}}$ = sum of HRSWORK over all respondents (record 31) divided by count of HH members aged 18-55 (record 01)
- g. Proportion of active-aged HH members who are self-employed:
 $\frac{\text{S-EMPD}}{\text{count of HH members aged 18-55}}$ = [Count of EMP-ST (record 31) when EMP-ST = 1 or 2] divided by count of HH members aged 18-55 (record 01)
- h. Payment of domestic wages over past 3 months: $\frac{\text{DOM-WGS}}{\text{PERIODHE}}$ = ITEMVALU (record 60 ITEMCODE 82) over 3 months (3.25 cycles if PERIODHE = 1, 1 cycle if PERIODHE = 2)

2. Transport costs

- a. Minutes per kilometer: $\frac{\text{MINPKM}}{\text{DSFIDEST}}$ = [Sum of (TRIPFREQ times TIMEMIN) divided by sum of TRIPFREQ] divided by [Sum of (TRIPFREQ times DSFIDEST) divided by sum of TRIPFREQ]; record 50
- b. Shillings per kilometer: $\frac{\text{SHSPKM}}{\text{DSFIDEST}}$ = [Sum of (TRIPFREQ times TRIPCOST) divided by sum of TRIPFREQ] divided by [sum of (TRIPFREQ times DSFIDEST) divided by sum of TRIPFREQ]; record 50

- c. Bus/matatu fares: ITEMVALU (record 60, ITEMCODE 61)
- d. Non-farm business transport costs over past 3 months:
TR-COSTS = sum of NF-TRNSP over all respondents (record 31)
over 3 months (3.25 cycles if PERIODNF = 1, 1 cycle if
PERIODNF = 2)
- e. Non-farm business transport costs per shilling of receipts:
TR-C-PS = TR-COSTS (=d) above) divided by T-NF-INC (11 (d)
below)

3. Farm agricultural production

- a. Uncultivated area as proportion of total: $UNCULT = \frac{[HLD-AREA \text{ (record 07)} - \text{sum of CRPLAREA over all plots (Record 07)}]}{\text{divided by HLD-AREA.}}$
- b. Tenure: TENURE (record 07)
- c. Area rented as proportion of total: $P-RENTED = \frac{A-RENTED \text{ (record 07)}}{\text{divided by HLD-AREA (record 07)}}$
- d. Area in staple food crops (maize, millet, sorghum, cassava etc.)
as proportion of total: $P-STAPLE = \frac{[Sum of CRPLAREA when CRP1-1 is 01-04 or 07-11 or 32 (record 07)]}{\text{divided by [sum of CRPLAREA over all plots (record 07)]}}$
- e. Local maize as proportion of total if applicable:
 $P-LOCAL = \frac{[sum of CRPLAREA when CRP1-1 is 01-04 (record 07)]}{\text{divided by [sum of CRPLAREA when CRP1-1 is 01-04 (record 07)]}}$
exclude farms that do not grow maize.
- f. Coffee output per hectare, if applicable: $C-YIELD = \frac{[HARVEST \text{ (record 42), CROP-COD 44}]}{\text{per past year (13 cycles if period HD = 1, 4 cycles if PERIODHD = 2)}}$ divided by $[\text{sum of CRPLAREA when CRP1 is 44 (record 07)}]$: exclude farm that do not grow coffee.
- g. Tea output per hectare, if applicable: $T-YIELD = \frac{[HARVEST \text{ (record 42), CROP-COD 45}]}{\text{over past year (as above)}}$ divided by $[\text{sum of CRPLAREA when CRP1-1 is 45 (record 07)}]$ exclude farms that do not grow tea.

- h. Hybrid maize output per hectare if applicable: $HM-YIELD = \frac{[HARVEST \text{ (record 42, CROP-COD 02) over past six months (6.5 cycles of PERIODHD = 1, 2 cycles if PERIODHD = 2)]}{[sum of AREA-MTR \text{ when CROP-COD is 02 (record 40) over six months period prior to past six months (6.5 cycles if PERIODPT = 1, 2 cycles if PERIODPT = 2)]}$ divided by 10,000: exclude farms that do not grow hybrid maize.

4. Farm livestock production

- a. Improved cattle as proportion of total, if applicable: $P-ICATT = \frac{ICATT-T \text{ (record 20)}}{[ICATT-T + UCATT-T]}$ exclude farms having no cattle.
- b. Number of sheep: NO-HLD-S (record 43)
- c. Number of goats: NO-HLD-G (record 44)
- d. Number of pigs: NO-HLD-P (record 45)
- e. Number of chickens: NO-HLD-C (record 46)
- f. Number of cattle: NO-HLD-T (record 47)
- g. Milk output over past 3 months per cattle head if applicable: $MILK-Y = \frac{MLK-KILO \text{ (record 47) over 3 months (3.25 cycles if PERIODCT = 1, 1 cycle if PERIODCT = 2)}}{[NO-LASTT + NO-HLD-T]}$ divided by 2: exclude farms having no cattle.

5. Agricultural input use

- a. Cost of crop inputs over past 3 months: $C-INPUTS = \text{sum of } IN-VALUE \text{ for } INPUT-CO \text{ 70-84 and 99 (record 41) over 3 months (3.25 cycles if PERIODIN = 1, 1 cycle if PERIODIN = 2)}$
- b. Cost of livestock inputs over past three months: $L-INPUTS = \text{Sum of } IN-VALUE \text{ for } INPUT-CO \text{ 90-93 (record 41) over 3 months (as above)}$
- c. Cost of all purchased inputs over past 3 months: $T-INPUTS = C-INPUTS + L-INPUTS \text{ (see a) and b)}$

6. Farm income

- a. Crop receipts over past 3 months: $C\text{-REV} = \text{BOARDS} - 2 + \text{CO-OP-2} + \text{TRADER-2} + \text{CONSUM-2}$ (record 42) over all crops over 3 months (3.25 cycles if PERIODHD = 1, 1 cycle if PERIODHD = 2)
- b. Sheep receipts over past 3 months: $\text{SH-REV} = \text{KMC-UPL2} + \text{LOC-MAK2} + \text{SL-SALE2}$ (record 43) over 3 months (as above)
- c. Goat receipts over past 3 months: $\text{GT-RVE} = \text{KMC-UPG2} + \text{LOC-MAG2} + \text{SL-SALG2}$ (record 44) over 3 months (as above).
- d. Pig receipts over past 3 months: $\text{PIG-REV} = \text{KMC-UPL2} + \text{LOC-MAP2} + \text{SL-SALP2}$ (record 45) over 3 months (as above).
- e. Chicken receipts over past 3 months: $\text{CH-REV} = \text{KMC-UPC2} + \text{LOC-MAC2} + \text{SL-SALC2}$ (record 46) over 3 months (as above).
- f. Cattle receipts over past 3 months: $\text{CATT-REV} = \text{KMC-UPT2} + \text{LOC-MAT2} + \text{SL-SALT2}$ (record 47) over 3 months (as above)
- g. Milk receipts over past 3 months: $\text{MLK-REV} = \text{MLK-SALE}$ (record 47) over past 3 months (as above)
- h. Livestock receipts over past 3 months: $\text{L-REV} = \text{SH-REV} + \text{GT-REV} + \text{PIG-REV} + \text{CH-REV} + \text{CATT-REV} + \text{MLK-REV}$ (see B through g) above).
- i. Livestock purchases over past 3 months: $\text{L-URRCH} = \text{PURCHA-2} + \text{PURCHG-2} + \text{PURCHAP2} + \text{PURCHAC2} + \text{PURCHAT2}$ (records 43-47) over 3 months (as above)
- j. Crop gross margin over past 3 months: $\text{C-GM} = \text{C-REV}$ [(a) above] minus C-INPUTS [5 (a) above]
- k. Livestock gross margin over past 3 months: $\text{L-GM} = \text{L-REV}$ [(h) above] minus L-INPUTS [5(b) above] minus L-PURCH [(i) above]
- l. Total farm gross margin over past 3 months: $\text{T-GM} = \text{C-GM}$ [(j) above] + L-GM [(k) above]

- m. Total farm gross margin over past 3 months per HH resident: $T-GM-PR = T-GM [(1) \text{ above}]$ divided by HLDTOT (record 01)
- n. Total farm gross margin over past 3 months per hectare of land: $T-GM-PH = T-GM [(1) \text{ above}]$ divided by HLD-AREA (record 07)

7. Household food consumption

- a. Maize consumption per HH resident over past 3 months, in Kgs: $MZ-CONS = [CONSUM-1 (\text{record } 42, \text{CROP-COD } 01-04) \text{ over } 3 \text{ months } (3.25 \text{ cycles if } PERIODHD = 1, 1 \text{ cycle if } PERIODHD = 2)]$ divided by HLDTOT (record 01)
- b. Millet/Sorghum consumption per HH resident over past 3 months, in Kgs.: $MT-CONS = [CONSUM-1 (\text{record } 42, \text{CROP-COD } 07-11) \text{ over } 3 \text{ months (as above)}]$ divided by HLDTOT (record 01)
- c. Cassava consumption per HH resident over past 3 months, in Kgs.: $CS-CONS = [CONSUM-1 (\text{record } 42, \text{CROP-COD } 32) \text{ over } 3 \text{ months (as above)}]$ divided by HLDTOT (record 01)
- d. Legume consumption per HH resident over past 3 months, in Kgs.: $LG-CONS = [CONSUM-1 (\text{record } 42, \text{CROP-COD } 16, 17, 23-29) \text{ over } 3 \text{ months (as above)}]$ divided by HLDTOT (record 01)
- e. Potato consumption per household resident over past 3 months, in Kgs.: $PT-CONS = [CONSUM-1 (\text{record } 42, \text{CROP-COD } 30, 31) \text{ over } 3 \text{ months (as above)}]$ divided by HLDTOT (record 01)
- f. Number of sheep consumed per HH resident over past 3 months.: $SH-CONS = [CONS-HMSH (\text{record } 43) \text{ over } 3 \text{ months (as above)}]$ divided by HLDTOT (record 01)
- g. Number of goats consumed per HH resident over past 3 months: $GT-CONS = [CONS-HMG (\text{record } 44) \text{ over } 3 \text{ months (as above)}]$ divided by HLDTOT (record 01)
- i. Number of chickens consumed per HH resident over past 3 months: $CH-CONS = [CONS-HMC (\text{record } 46) \text{ over } 3 \text{ months (as above)}]$ divided by HLDTOT (record 01)

- j. Number of cattle consumed per HH resident over past 3 months: $CT-CONS + [CONS-HMT \text{ (record 47)} \text{ over 3 months (as above)}]$ divided by HLDTOT (record 01)
- k. Milk consumed per HH resident over past 3 months in Kgs: $MLK-CONS = [MLK-CONS \text{ (record 47)} \text{ over 3 months (as above)}]$ divided by HLDTOT (record 01)
- l. Bread purchased per HH resident over past 3 months, in Shs: $BRD-CONS = [ITEMVALU \text{ (record 60, ITEMCODE 23)} \text{ over 3 months (3.25 cycles if PERIODHE = 1, 1 cycle if PERIODHE = 2)}]$ divided by HLDTOT (record 01)
- m. Sugar purchased per HH resident over past 3 months, in Shs.: $SUG-CONS = [(ITEMVALU \text{ (record 60, ITEMCODE 26)} \text{ over 3 months (as above)})]$ divided by HLDTOT (record 01)
- n. Fish purchased per HH resident over past 3 months, in Shs.: $FSH-CONS = [ITEMVALU \text{ (record 60, ITEMCODE 07)} \text{ over 3 months (as above)}]$ divided by HLDTOT (record 01)
- o. Porridge fed to youngest child now eating porridge in HH: $Y-POR = POR-MADE$ of minimum age for which information available (record 11)
- p. What added to porridge of youngest child in HH now eating porridge: $Y-ADD-P = ADD-POR$ of minimum age (as above)
- q. Proportion of children in HH who ever fed commercial babyfood: $P-LOR-F = [Count \text{ of } LOR-FOOD \text{ when } LOR-FOOD = 1 \text{ (record 11)}]$ divided by count of children (record 11)

8. Material possessions

- a. Number of bicycles: BICY-NU (record 20)
- b. Number of ploughs: PLOU-NU (record 20)
- c. Number of radios: RADIO-NU (record 20)
- d. Number of parafin lamps: PRF-LAMP (record 20)
- e. Number of permanent houses: P-BLDGS (record 20)

- f. Number of semi-permanent houses: S-BLDGS (record 20)
- g. Traditional houses as proportion of total:
 $P\text{-TRAD} = T\text{-BLDGS} \text{ divided by } [P\text{-BLDGS} + S\text{-BLDGS} + T\text{-BLDGS}]$
- h. Number of stores = ST-BLDGS (record 20)
- i. Maize in storage, in Kgs.: $M\text{-STRG} = [\text{Sum of IN-STORE (record 42) CROP-COD 01-04} + \text{sum of STORED (record 42, CROP-COD 01-04)}] \text{ divided by } 2$
- j. Source of water in dry season: SOURCE-D (record 12)
- k. Distance to water in dry season, in Kms. (ortenths of Kms). DIST-D (record 12)
- l. Sewage disposal: SEWAGE (record 12)

9. Health status

- a. Standard weight-for-age of children in household:
 $ASTDWAGE = \text{sum of STDWAGE for children in HH (record 11)} \text{ divided by count of children (record 11)}$
- b. Standard height-for age of children in household:
 $ASTDLNAG = \text{sum of STDLNAGE for children in HH (record 11)} \text{ divided by count of children (record 11)}$
- c. Standard weight-for-height of children in household:
 $ASTDWGLN = \text{sum of STDWGLN for children in HH (record 11)} \text{ divided by count of children (record 11)}$
- d. Weight-for-age of youngest child: $YSTDWAGE = \text{STDWAGE of minimum age (record 11)}$
- e. Height-for-age of youngest child: $YSTDLNAG = \text{STDLNAGE (as above)}$
- f. Weight-for-height of youngest child: $YSTDWGLN = \text{STDWGLN (as above)}$
- g. Average length of sickness during last two weeks of children in household: $ASICK2 = \text{sum of SICK-2WK (recorded 0 = 0, 1 = 1, 2 = 2.5, 3 = 5.5, 4 = 10.5) for children in HH divided by count of children (record 11)}$

10. Use of social services

- a. Proportion of children aged 7-12 in primary school, if applicable: $P\text{-ENROL} = \text{count of HH members of AGE 7-12 for whom SCHTYP} = 1 \text{ (record 01) divided by count of all HH members of AGE 7-12}$; if no HH members of AGE 7-12, assign missing value
- b. Proportion of children aged 14-19 in secondary school, if applicable: $S\text{-ENROL} = \text{count of HH members of age 14-19 for whom SCHTYP} = 2 \text{ (record 01) divided by count of all HH members of age 14-19}$; if no HH members of age 14-19, assign missing value.
- c. Proportion of sick children, if any, taken to health center or private doctor:
- (1) recode SICK-2WK (record 11) 0 = 0, 1-4 = 1;
 - (2) recode ACTION (record 11) 1-2 = 1, 3-5 = 0;
 - (3) T-SICK = sum of SICK-2WK (recoded) over all children;
 - (4) T-ACT = sum of ACTION (recorded) over all children;
 - (5) if T-SICK = 0, assign missing value to HLTHSRV;
 - (6) if T-SICK is greater than 0, HLTHSRV = T-ACT divided by T-SICK.
- d. Market trips during past 7 days:
- (1) recode TRIPPURP (record 50) 1, 2, 5, 6 - 0.3 = 1;
 - (2) M-TRIP = [TRIPPURP (recoded) times TRIPFREQ] summed over all HH members.
- e. Kilometers to market during last 7 days:
- (1) TRIPPURP recoded as above
 - (2) M-KMS = [TRIPPURP (recoded) times TRIPFREQ times DSFIDEST] summed over all HH members.
- f. Insurance premiums over past year: $INSUR = \text{ITEMVALUE (record 60, ITEMCODE 73) over year (13 cycles if PERIODHE} = 1, 4 \text{ cycles if PERIODHE} = 2)$
- g. Purchase of newspapers/books over past recent 4 visits: $BOOKS = \text{ITEMVALUE (record 60, ITEMCODE 60) over four cycles}$

- h. Veterinarian fees over past 3 months:
 $VETFEE = IN-VALUE$ (record 41, INPUT-CO 93)
 over 3 months (3.25 cycles if PERIODIN = 1,
 1 cycle if PERIODIN = 2)
- i. Kilometers travelled by HH members: $RDKMS =$ sum
 of (TRIPFREQ times DSFIDEST) over all rows: see
 2 (a) and 2 (b) above

11. NON-FARM INCOME

- a. HH receipts from sales in main non-farm activities
 over past 3 months: $T-SALES =$ sum of ACTSALES
 over respondents (record 31) over 3 months (3.25
 cycles if PERIODNF = 1, 1 cycle if PERIODNF = 2.
- b. HH receipts from services rendered in main non-farm
 activities over past 3 months: $T-SERV =$ sum of ACTSERVS
 over all respondents (record 31) over 3 months
 (as above)
- c. HH receipts from sales and services in secondary
 non-farm activities: $T-SCND =$ sum of SCNDINCM
 over all respondents (record 31) over 3 months (as
 above)
- d. HH receipts from all non-farm activities over past
 3 months: $T-NF-INC = T-SALES + T-SERVS + T-SCND$
 [(a) through c) above]
- e. HH expenditures on non-farm business activities
 over past 3 months: $T-NF-EXP =$ sum of (NF-RENT +
 NF-FAWMT + NF-WGSAL + NF-TRNSP + NF-OTHR) over all
 respondents (record 31) over 3 months (3.25 cycles
 if PERIODNF = 1, 1 cycle if PERIODNF = 2)
- f. Nett income from non-farm business activities over
 past 3 months: $N-NF-INC = T-NF-INC$ (=d) above)
 minus $T-NF-EXP$ (=e) above)
- g. Nett investment in non-farm activities over past
 year: $N-INVEST = CAP-PURC$ minus $CAP-SALE$ (record
 32) over past year (13 cycles if PERIODTI = 1, 4
 cycles if PERIODTI = 2).

12. TOTAL HOUSEHOLD INCOME

- a. Total household (HH) income over past 3 months, excluding remittances and loans: $T-INC1 = T-GM$ [6 l) above] + $T-NF-INC$ [11 f) above]
- b. Shillings borrowed over past 3 months:
 $LOANSIN = CAP-LNRC$ over 3 months (3.25 cycles if $PERIODTI = 1$, 1 cycle if $PERIODTI = 2$.)
- c. Shillings lent over past 3 months: $LOANSOUT = CAP-LNGV$ over 3 months (as above)
- d. Shillings remitted to HH over past 3 months:
 $RMTSIN = TRV-RECV$ over 3 months (as above)
- e. Shillings remitted from HH over past 3 months:
 $RMTSOUT = TRU-GIVN$ over 3 months (as above)
- f. Total HH income over past 3 months including remittances and loans: $T-INC2 = T-INC1$ [a) above] plus $LOANSIN$ [b) above] minus $LOANSOUT$ [c) above] plus $RMTSIN$ [d) above] minus $RMTSOUT$ [e) above]
- g. Regular HH expenditures over past 7 days:
 $REGEXP =$ sum of $ITEMVALU$ (record 60) over all items ($ITEMCODE$ 01-63)
- h. Major HH expenditures over past 3 months: $MAJEXP =$ sum of $ITEMVALU$ (record 60) over all items ($ITEMCODE$ 70-83) over 3 months (3.25 cycles in $PERIODHE = 1$, 1 cycle if $PERIODHE = 2$)
- i. Total HH expenditures over past 3 months:
 $TOTEXP = [REGEXP$ (as g. above) times 13] + $MAJEXP$ (as h. above)
- j. Shillings saved over past 3 months: $SAVINGS = T-INC2$ (as f. above) minus $TOTEXP$ (as i. above)
- k. Income per HH member: $T-INC2-P = T-INC2$ (as f. above) divided by $HLDTOT$ (record 01)

INTERVAL-SCALE VARIABLES

NF-EMP1	C-REV
NF-EMP2	SH-REV
F-WAGES	GT-REV
NF-WAGES	PIG-REV
NF-EMPS	CH-REV
NF-HRS	CATT-REV
S-EMPD	MLK-REV
DOM-WGS	L-REV
MINPKM	L-PURCH
SHSPKM	C-GM
ITEMVALU (Record 60, code 61)	L-GM
TR-COSTS	T-GM
TR-C-PS	T-GM-PR
UNCULT	T-GM-PH
P-RENTED	MZ-CONS
P-STAPLE	MT-CONS
P-LOCAL	LG-CONS
C-YIELD	PT-CONS
T-YIELD	SH-CONS
HM-YIELD	GT-CONS
P-ICATT	PIGS-CONS
NO-HOLD	CH-CONS
NO-HLD-G	CT-CONS
NO-HLD-P	MLK-CONS
NO-HLD-C	BRD-CONS
NO-HLD-T	SUG-CONS
MILK-Y	FSH-CONS
C-INPUTS	P-LOR-F
L-INPUTS	BICY-NU
T-INPUTS	PLOU-NU
	RADIO-NU
	PRF-LAMP
P-BLDGS	
S-BLDGS	
P-TRAD	
ST-BLDGS	
M-STRG	
DIST-D	
ASTDWAGE	
ASTDLNAG	
ASTDWGLN	
YSTDWAGE	
YSTDLNAG	
YSTDWGLN	

ASICK2
P-ENROL
S-ENROL
HLTHSRV
M-TRIP
M-KMS
INSUR
BOOKS
VETFEES
T-SALES
T-SERVS
T-SCND
T-NF-INC
T-NF-EXP
N-NF-INC
N-INVEST
T-INC1
LOANSIN
LOANSOUT
RMTSIN
RMTSOUT
T-INC2
REGEXP
MAJEXP
TOTEXP
SAVING
T-INC2-P

NOMINAL SCALE VARIABLES

TENURE
Y-POR
Y-ADD-P
SOURCE-D
SEWAGE

MARGINALS: All variables, original plus created: pooled data set, all 7 Rural Access Road impact areas.

1. Interval-scale variables: CONDESCRIPTIVE = mean
median
mode
standard
deviation
maxium value
maxium value

2. Nominal-scale variables: FREQUENCIES = no statistics

HOUSEHOLD LEVEL ANALYSIS: breakdowns/cross tabulations of
created variables only

1. Variable X ROAD-NUMBER (Record 00)

- a. Interval scale: analysis of variance F-test

	<u>MEAN</u>	<u>STD. DEV.</u>	<u>NO OF CASES</u>
<u>NYANZA</u> <u>PROVINCE</u>			

Kisii
Kisumu
Siaya
South Nyanza

WESTERN
PROVINCE

Bungoma
Busia
Kakamega

- b. Nominal Scale: test of association (χ^2)

	<u>Code 1</u>	<u>Code 2</u>	<u>Code 3</u>
<u>Order as given above</u>			

WHEREVER DATA AVAILABLE DO SAME BREAKDOWNS AND
CROSS-TABULATE WITH IRS DATA FOR SAME TIME PERIOD:

RURAL NYANZA
RURAL WESTERN

2. Variable X Sex of Household Head (Sex if relation =1,
record 01)

X $\left\{ \begin{array}{l} \text{MANOCC if male (record 01)} \\ \text{MARRY-ST if female (record 01)} \end{array} \right.$

a. Interval scale: F-test

MEAN STD. DEV. NO OF CASES

Male

Self-employed farmer
(Code for S-E farmer
or codes 00-09, 99)

Other

Female

Married

Other

b. Nominal Scale: test of association (X^2)

Code 1 Code 2 Code 3

Male S-E farmer
Male other
Female married
Female other

3. Variable X ROADST (record 00) or DSFRHLD (record 50)

a. Interval Scale: F-test

MEAN STD. DEV. NO OF CASES

Dichotomy should result in approx equal numbers. 0 - 0.5Kms
0.5 - Max Kms

b. Nominal scale: (X^2) test

4. Variable X HLD-AREA (record 07)

a. Interval scale: F-test

MEAN STD. DEV. NO OF CASES

Divide HLD-ARE) Group 1
A at approx) Group 2
40th percent-
ile.)

b. Nominal scale: X^2 test

5. Variable X ROADTYPE (record 50)

a. Interval scale: F-test

MEAN STD. DEV. NO OF CASES

No Road
Under construction
Construction Complete

b. Nominal scale: χ^2 test

6. CROSS TABULATIONS:

Road Number (re-ordered) X

- a. Sex/occupation/marital status of household head (2. above)
- b. DSFRHLD (recoded)
- c. HLD-AREA (recoded)
- d. ROADTYPE

ANNEX B

Evaluation Team:Disposition of Time

<u>Date</u>	<u>Place</u>	<u>Tasks</u>	<u>Moock</u>	<u>Riley</u>	<u>Brokensha</u>
June 4	Nairobi	arrival	x		
" 5-9	"	Preparatory work	x		
" 10	"	arrival		x	x
" 11	"	Discussions AID, Mow, CBS.	x	x	x
" 12	"	Donors' meeting	x	x	x
" 13	Bungoma		x	x	x
" 14	Busia/Bungoma	Tour of RAR + GBC projects with donors			
" 15	Kisumu				
" 16	Kisii				
" 17-19	Kisumu	Tour RAR's	x	x	x
" 20	Nairobi	Discussions AID	x	x	x
" 21	"	" Donors	x	x	x
" 22	Nairobi	" IADP, Min. Planning, CBS, AID	x	x	x
" 23-25	"	Discussions, reading, interviews	x	x	x
" 26-29	"	Working on Cross-tabulations with CBS	x	x	
" 26-29	Rang'ala	Ethnographic Survey Busia Road 1.			x
June 30 - July 2	Nairobi	Team and AID discussions	x	x	x

ANNEX B

(Continued)

Evaluation Team:Disposition of Time

<u>Date</u>	<u>Place</u>	<u>Tasks</u>	<u>Moock</u>	<u>Riley</u>	<u>Brokensha</u>
July 3	Nairobi	Team and AID discussions	x	x	x
July 4	"	depart	x		
" 4-6	Kisumu	Discussions PPO and P.S.P: Tour Busia		x	x
" 7-14	Rang'ala	Ethnographic Survey		x	x
" 15-22	"	" "			x
July 23	Siaya/Kisumu	Discussions with DDO, Forestry, Lands Education and P.P.P.			x
July 24-27	Kisumu	writing draft report + field visits			x
" 28-Aug 5	"	Final site visits, and checking ethnographic survey			x
Aug. 6-7	Nairobi	To present draft report		x	x
Aug. 20-21	"	To discuss draft report		x	x
Aug. 21	"	depart		x	x

ANNEX C

List of Persons met

NAIROBI

- o Mr. J. Arach - project manager - CBS
- o Mr. S. Asfah - MOW
- o Mr. Curt Carnemark - World Bank - donor representative
- o Mr. R.A. Carver - United Kingdom - donor representative
- o Mr. Dennis Casley - MOW
- o Mr. E. Cummings - MOW
- o Mr. Peter Delp - Adviser - Min. Economic Planning
- o Dr. Edward Greeley - Anthropologist (REDSO), USAID
- o Mr. Harder - HELVETAS - donor representative
- o Mr. Harvey Herr - MOW
- o Mr. Richard Hook - Adviser - Min. Economic Planning
- o Prof. John Kokwaro - Botany - University of Nairobi
- o Prof. Philip Mbithi - Sociology - University of Nairobi
- o Dr. Shem Migot - Institute for Development Studies - University of Nairobi
- o Mr. J. Moller - DANIDO - donor representative
- o Mr. G.H. Mwangi - MOW
- o Mr. Njunguna - MOW (RAR)
- o Dr. Walter Ogugi - Political Science - University of Nairobi
- o Mr. Festus Omoro - i/c Health sector, CBS
- o Mr. Joseph Pastic - Dep. Project Manager - RAR - USAID
- o Mr. Carl Penndorf - Economist - USAID
- o Mr. A.A. Quinn - MOW
- o Mr. N.P. Radier - Chief Engineer - MOW
- o Mr. Satish Shah - Project Manager - RAR - USAID
- o Mr. John Simpson - MOW - (RAR)
- o Mr. Slattery - Sociologist - USAID
- o Mr. Weishaupt - MOW

AMBIYA

- o Mr. William Omune - Teacher - Boys Sec. School

BUSIA

- o Mr. Wilson Ndege - i/c Kenya Cotton and Lint

KAKAMEGA

- o Mr. S.S. Amboye - Asst. Provincial Statistical Officer - Western Province
- o Mr. Mbili - Provincial Statistical Officer - Western Province

KISUMU

- o Mr. Malcolm Milne - Adviser - Provincial Planning Officer
- o Mr. Vincent Ongaya - Provincial Statistical Officer - Nyanza Province
- o Mr. James Were - Deputy Provincial Statistical Officer - Nyanza Province

RANGALA

- o Father Clohesy - i/c Catholic Mission
- o Sister Hermina - Catholic Mission
- o Sister Leila - Catholic Mission - (Hospital)
- o Mother Patricia Oleo - Headmistress - Girls Sec. School

SIAYA

- o Mr. Hudson Bigogo - District Development Officer
- o Mr. Stanley Thuo - District Commissioner

SIAYA ROAD # 1

- o Mr. Ezekiel Ahenda - Sub-chief - Kakum-Kumbewa
- o Mr. William Nyapola - Headmaster - Nyadhi School
- o Mr. Richard Odieng - Sugar factory owner
- o Mr. Richard Oduor - Prominent local person
- o Mr. Maurice Ogoyo - Road overseer - RAR
- o Mr. Stephen Okach - Store owner
- o Mr. Pachoba Okoyo-Olino - Inspector trainee - RAR
- o Mr. Cyrus Ongaro - Prominent local person
- o Mr. Richard Owili - Chairman local development committee
- o Mr. Joram Sewe - Mill operator

ANNEX D

Some Problems

Overall, the evaluation team met with very helpful and positive responses from GOK officials at all levels. There were, however, a few problems that lessened the effectiveness of our contribution. Most of these can easily be ironed out by the time of the 1980 evaluation.

1. MOW (M.&E) Development Economist

The failure to appoint a Development Economist (for reasons which we need not go into here) was a handicap, as our presence, and the conduct of the initial evaluation, had been predicated on the early appointment of this person. We were unable to complete parts of the evaluation, as the data were not available. We hope that an appointment will soon be made, and that next year we shall have the benefit of the economist's contribution.

2. CBS and cross-tabulations

A few days were lost because of the unexpected absence of some officials at CBS, but this was not very serious. When all officials were present, they co-operated fully.

Another potential problem at CBS is that there is a relatively long turn-around period in getting results of data. In addition, the computer is apparently often occupied with higher priority work such as government salaries. We shall wait to see how effective the

computer is for our needs next year.

3. Registration of voters

The national registration of voters caused some inconvenience, because practically all government officials, at district and divisional levels, were fully occupied with this task for most of July, (the extension of registration, from 15th to 22nd July exacerbated the problem). It was not possible to get as much information as was desirable, on various aspects of rural development. Some officials were also busy preparing for the National Census (25th Aug.) and others for the Kisumu Agricultural Show (2nd -4th August), further increasing their inaccessibility.

4. Housing

Although no suitable housing was available within the impact area (of Siaya Road No. 1, the one selected for intensive study) we were fortunate in finding accommodation at the Catholic Mission, Rang'ala, which is only a few kms. from the impact area. We have made advance arrangements to rent a house at Nyadhi, within the impact year, for 1980 and succeeding years.

5. Other problems

We make brief mention of some other problems, which will be taken up by our contracting firm, Devres, directly with AID/W.

a. Transport

The transport allocation is clearly inadequate, and will in fact be exhausted this year. Having tried several alternatives - renting a car, begging rides from GOK officials, awaiting at the roadside for buses and matatus, using bicycles and walking - we are convinced that we cannot perform our contractual duties effectively unless we have our own transport. We shall continue to use alternative means where they are appropriate, of course. But we do need to be able to visit officials (at all levels from sub-location to province) and also to visit various RAR and GBC sites within Nyanza and Western Provinces: to do these activities properly, we need a car.

b. Student assistance

Devres will also take up the question of budgetary provision for a few selected high school and university students. While CBS data-gathering activities are admirable, and competently organized, there are still many areas where we need to generate our own data, and/or to make our own observations.

ANNEX E

Summary of Tasks

1. General Objectives

Conduct annual socio-economic evaluation.

- a. are forecast benefits being achieved?
- b. what is distribution of benefits?
- c. could this be improved?
- d. what is the level of local participation? (site selection; construction)
- e. what is the degree of coordination with other GOK rural development projects?
- f. are road selection criteria valid?

2. Evaluation

- a. Refine evaluation plan.
- b. Specify evaluation hypotheses.
- c. Assure evaluation data are being correctly gathered (by CBS and M and E/MOW) and processed.
- d. Visit road sites.

Specific Tasks

3. Moock

- a. Analyze economic impact of road construction and maintenance.
- b. Analyze increased agricultural outputs.
- c. Analyze benefit distribution by (i) land tenancy and sex of HH, (ii) sector-trucking, trading, farming.

4. Riley

- a. Analyze economic impact of project on women.
- b. Consider level of participation in rural communities.
- c. Analyze incidence of distribution of social benefits by land tenancy and sex of HH.

5. Moock and Riley

- a. Prepare cross-tabulation plans for information from 3 surveys:
 - (i) household
 - (ii) community
 - (iii) traffic.

ANNEX E

Summary of Tasks (Continued)

5. Moock and Riley (Continued)
 - b. Analyze preliminary data from surveys to suggest changes in road selection criteria.
 - c. Review additional information requirements.

6. Brokensha
 - a. In-depth analysis of "a selected area."
 - b. Prepare social-anthropological map of "projected road impact area."
 - c. Prepare detailed descriptive report on "the area," including
 - (i) household and family structure
 - (ii) community relationships
 - (iii) mobility patterns.

7. Brokensha
 - a. Prepare a draft report before leaving Kenya.
 - b. Write final report no later than one month after receiving comments from AID and MOW.

ANNEX F

BIBLIOGRAPHY

Central Bureau of Statistics. Integrated Rural Survey, 1974-1975: Basic Report. Nairobi: Ministry of Finance and Planning, 1977.

Republic of Kenya. Development Plan 1979-1983 (Two parts). Nairobi: Government Printer, 1979.

Vaidya, K. G. Labour Supply Study: Final Report (Kenya Rural Access Roads Programme, British Technical Assistance). IBRD/MOW Technology Unit, 1979.

KENYA RURAL ACCESS ROADS AND
GRAVELLING, BRIDGES AND CULVERTS
PROGRAMME

DETAILED ETHNOGRAPHIC SURVEY

SLAYA No. 1

Prepared for: U.S. Agency for
International Development
Kenya Mission
Under Contract No.
AID/AFR-C-1529

Prepared by: Devras

David Brokensha
Peter Mook
Bernard Riley

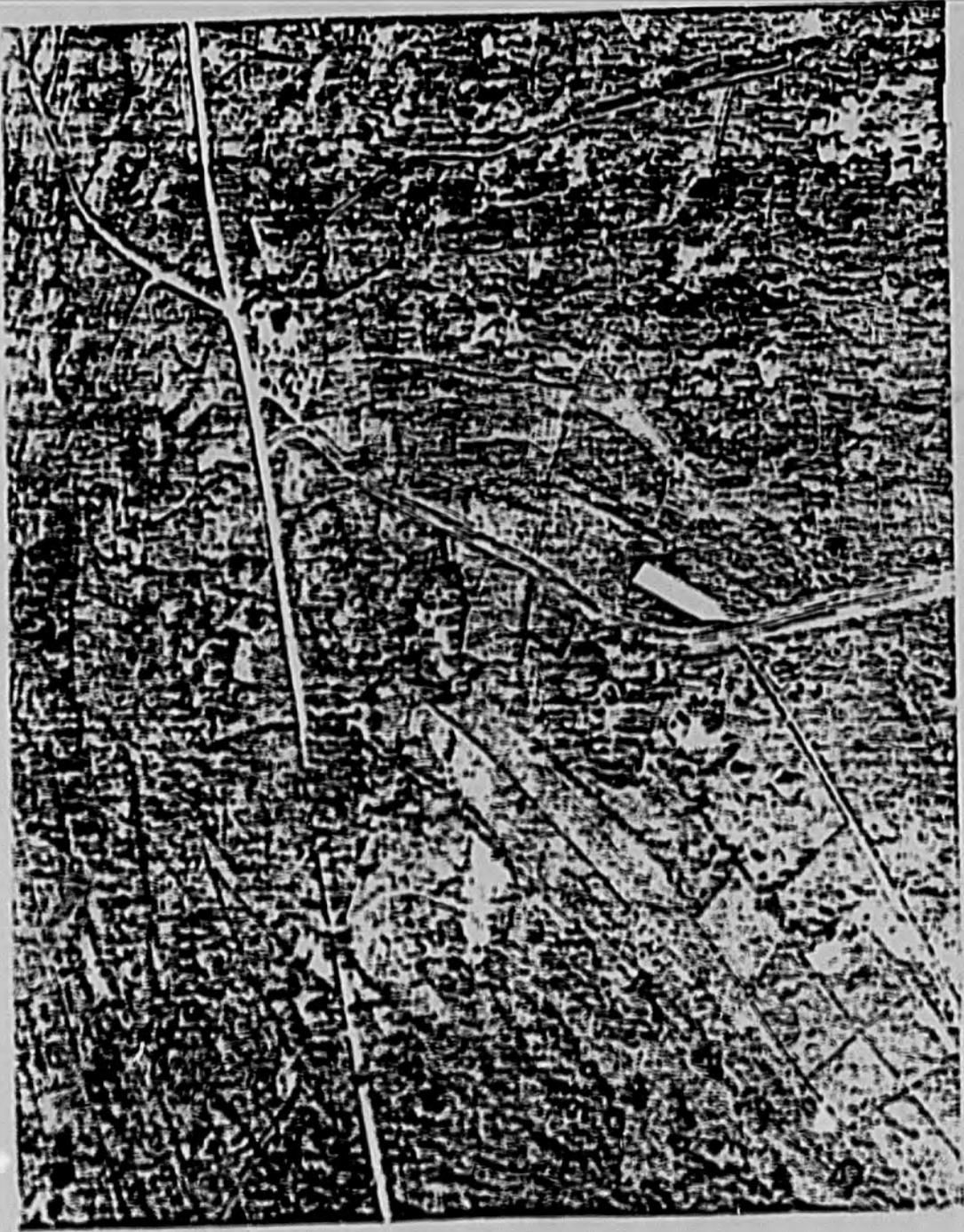
October 18, 1979

DETAILED ETHNOGRAPHIC SURVEY

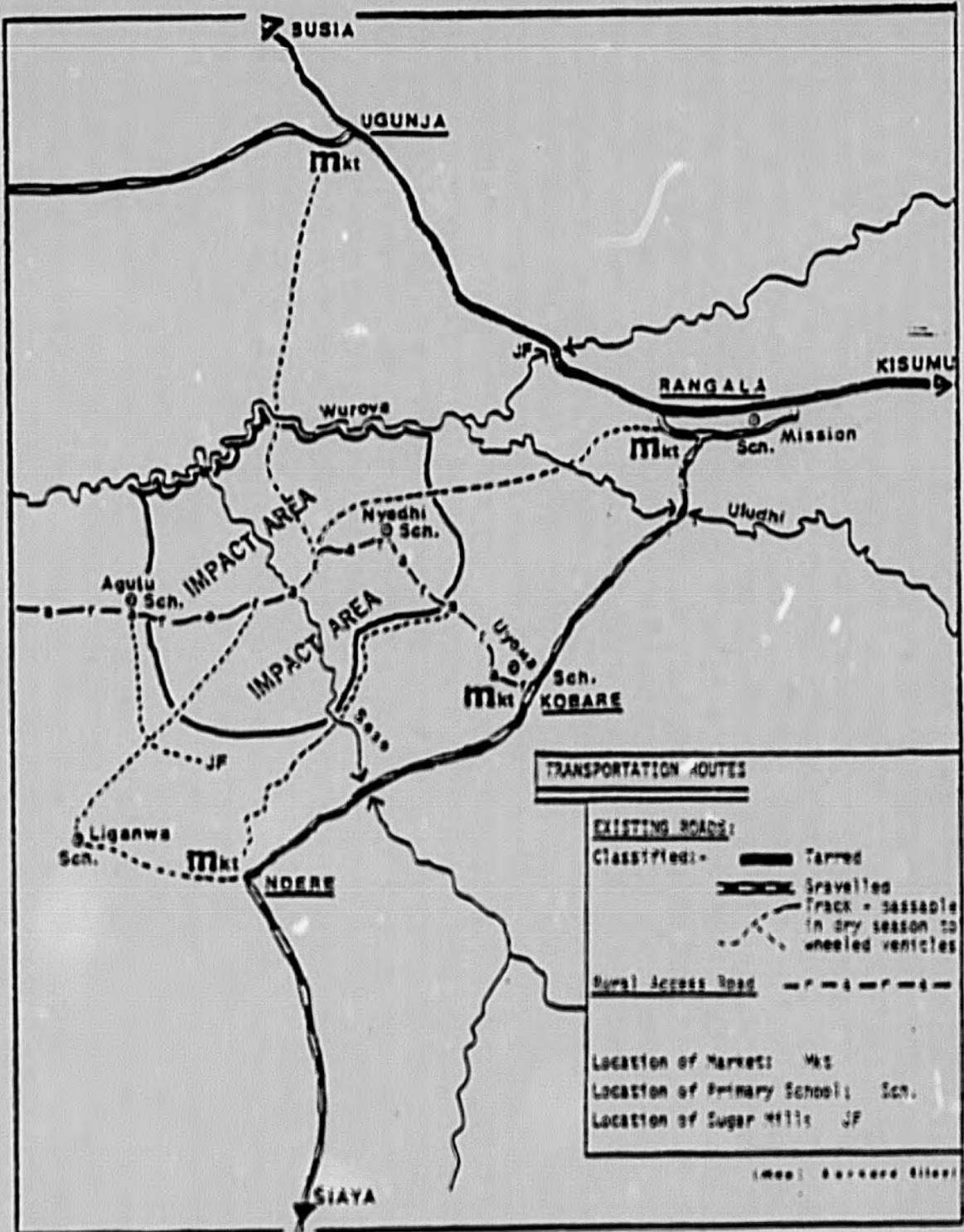
SIAYA NO. 1

TABLE OF CONTENTS

	<u>Page</u>
MAPS:	
Aerial Photograph of Siaya No. 1 Impact Area	1
Sketch Map of Siaya No. 1 Impact Area	11
I. INTRODUCTION	1
II. ENVIRONMENT	5
A. Soils	5
B. Water	6
C. Vegetation	7
D. Wildlife	9
III. SOCIAL ORGANIZATION	11
A. Basic Social Structure	11
B. Political and Administrative	14
C. Economic	15
D. Religion and Values	19
E. Community	20
F. Health	21
IV. LAND	23
V. SUMMARY	26



Aerial photograph of Stage No. 1 Impact Area.
Arrow shows new road construction section of the EAB project of the



Sketch Map of Siaya No. 1 Impact Area.

I. INTRODUCTION

After discussions with AID and GOK (Government of Kenya), the CBS impact area of Siaya Road No. 1 was selected for intensive study, a major advantage of this choice being that road work was just starting. The location and main features of the area are indicated on the accompanying map.

The area consists of 1875 ha. A population of 4838 gives a density of 258/km². This impact area covers the central and most of the eastern parts of the proposed road, but omits both ends - see map. The two CBS enumerators, who were helpful, are collecting information from 120 households: Gilbert Otieno has a sample of 90 households, which he visits once in three months, and Philip Ochieng has 30 households, each every month. The information which they are collecting will provide an invaluable data-base for this ongoing ethnographic survey. The contribution of this survey to our evaluation will be cumulative. It should be more valuable each year as we watch the dynamic processes of change, and as we add valuable qualitative information to the statistical data.

The population is remarkably homogeneous. Not only is it all Luo, but nearly all people belong to one of a few localised clans. Asked if there were any strangers, the sub-chief said

"well there is R., his father came from Ngi'ya (20 km. distant), and only his mother is from Kombewa." The area has been settled for many years.

The local people have a keen historical sense, when compared to other peoples of Kenya. We were often struck by precise answers we received to such questions as how long a certain type of vegetation had been known in the area, when a crop was first planted, and so on.

Because the CBS survey will be providing detailed information, and also because we lacked the resources to collect data in a comprehensive and systematic manner, we present here our general impressions. A good overview, literally, of the area is obtained from a low flying aircraft, or failing that, by an examination of the survey of Kenya aerial photographs, on a 1:2,500 scale (these are the base for the Land Adjudication maps presently being prepared). Although these photographs were taken in 1966, they give an excellent idea of the basic patterns of settlement and land-use. In the intervening 13 years, the population has probably increased nearly 50%, so we now see a greater density of population and more land under cultivation. (The estimated population growth for Siaya Districts is 3.65% p.a.) Even in 1966, well before the Land Adjudication process had started in Siaya District, the area had well defined

boundaries. The basic residential unit is the dala or compound, which usually but not always corresponds with the household, as defined by CBS. There may be more than one household in a compound where, for example, a married son remains within his father's compound but makes his own decisions in domestic and agricultural matters.

All but the poorest compounds are fenced, and quite often there is a neat lawn between the houses. Compounds vary greatly in the following features:

- o number and type of structures;
- o number of inhabitants;
- o number of livestock;
- o wealth; and
- o size of fields.

Sleeping houses were originally round, with a thatched roof; now many are square, and some have iron roofs. The diameter of the round houses varies from 4-8 meters. Granaries are conical, about 2 m high and 1 m in diameter, and they are raised from the ground. They are used mainly for sorghum, but also for maize.

Additional structures may include kitchens, extra houses for wives or married sons, and lavatories. Although outside the impact area, we should mention the remarkable dala of senior

chief Omoth, of Central Alago. Situated near the divisional headquarters at Boro, this is a complete village rather than a compound, as the chief has thirty-six wives and over 100 children. This dala is probably a fairly close approximation of an old type except for an occasional iron roof.

Livestock consists largely of cattle, sheep, goats and chickens. A few households own pigs, and nearly every compound has at least one dog. Some of the poorer households have no livestock, while at the other end of the scale a few men own large herds. Social stratification is an important and immediately visible feature of the community: the CBS surveys should provide interesting details on the exact lines of stratification.

Although we have no precise demographic data as yet from the CBS survey, we have some 1978 estimates from the Siaya District Development Plan:

	<u>Male</u>	<u>Female</u>
Total	237,000	279,000
20-49 years	55,000	99,000
25-29	8,500	20,000

These figures confirm our casual observations, that there is a higher proportion of women especially in the most active working years, as many young men migrate in search of employment.

II. ENVIRONMENT

A. Soils

Except for some low lying areas of black cotton soil, or gravel, most of the soils are red brown friable clays and sandy loams. These are basically suited to agriculture, except that most are worn out. It is clear that the area is over populated, in the sense that with present technology, the population exceeds the carrying capacity of the land. The result is that there has been over cultivation.

Depressing confirmation of this comes from the widespread presence of certain notorious weeds, especially: *Striga hermonthica*, known in English as Witchweed and in Dholuo as Havonzo. This semi-parasitic herb, with its pretty mauve flowers, is a common sight in maize fields. In addition, local weeds include: *Lantana camara* (Nyanridhi); *Lantana trifolia* (Nyanridhi); *Tagetes minuta* (Mexican marigold, Khaki weed or Ang've) and *Tithonia* (Mexican sunflower or Akech). All these are common weeds in cultivated land, and are indicators of overworked soils. All the local people with whom we discussed these matters were adamant in saying that thirty years ago these weeds were either unknown (lantana) or very rare.

B. Water

According to the Siaya DDC rainfall map, the area lies between the 1524 mm. and 1270 mm. isohyets, nearer to the former. This should be enough rainfall for normal cultivation, especially as the rain follows a bimodal pattern, and the distribution throughout the years appears to be fairly even. (These notes will be amplified in our next year's report when we have checked the meteorological records in Nairobi.)

Surface water is not a major problem, as the area is bound on the north by the Wuroya River, and traversed by the Sese River and several streams. There are also many wells. Even in the dry season, no person would need to walk further than 3 km. for domestic water. This still poses a hardship but the area is relatively well-off, at least compared to vast areas in Eastern Province and elsewhere where women have much longer distances to cover when they collect water in the dry season. There is one dam, just outside the impact area (near Ndere) built by Aldev (the Colonial Development institution) in the 1950's, and intended for cattle.

The topography is undulating, with no marked mountainous or geological features. Some alluvial gold was mined in the 1940's in the south-eastern corner of the area, near the Jaggery factory.

C. Vegetation

Not much is left of the indigenous large woody vegetation. The dominant trees on the horizon are Olua (*Chlorophora excelsa*, or Mvule), with a few magnificent specimens remaining. A few examples of Ober (*Albizia coriaria*), another large and valuable tree, are also seen. Numerous fig-trees remain, but only few other large indigenous trees exist. Compounds and boundaries of fields or even paths and roads are sometimes planted with exotic trees. Siala (*Markhamia platycalyx*) is common in compounds. It grows easily and has many uses, especially in house construction.

Fuelwood (used to include both firewood and charcoal) is one of the most pressing environmental concerns, both in Siaya district and also in most other parts of Kenya - and, indeed, of the tropical world generally. Our observation in the impact area showed that fuelwood is in increasingly scarce supply. Further confirmation was provided by statements from several officials, and by the emphasis, in the District Development Plan, on re-afforestation projects. For example the District Commissioner, Siaya, "warned against indiscriminate felling of trees for charcoal burning" --- "he said that the reckless felling of trees, particularly in Alego, defeated the Government policy and afforestation and soil conservation." Mr. Thuo said that shs. 560,000/- (\$72,000, or 79% of the total district development budget) had been allocated for afforestation and soil conservation. (Daily Nation, 16 July 1979).

There is very little bungu (forest) left in the area. Land Adjudication has further restricted access to the few patches of bush remaining, as owners of individual plots are reluctant to allow other to use their land to gather firewood, to burn charcoal, to graze livestock, to collect thatching grass or indeed to use the vegetation, now regarded as private property, in any way.

The net effect is that firewood and thatching grass have, only recently, become commercial properties, the former selling at Shs 3/- to Shs 5/- (about 60 cents) a bundle. The costs of grass for thatching a small house is now about Shs 50/- (\$7.00), and some people claim that, with the added costs of transport and labor, it will soon cost less to roof a house with corrugated iron than with thatch.

The new roads are bound to have an effect on the fuelwood situation, both by improving access to trees, and also by increasing demand as commercial establishments open. In considering environmental effects of roads, we should not merely consider the possible adverse effects, but should go much further, and think of a positive integrated programme for improving the environment, or at least for arresting deterioration.

D. Wildlife

Although the RAR will not greatly effect wildlife, we note this aspect briefly. The draft District Development Plan notes there are severe problems with leopards and hippos. The assistant warden and the eight game rangers, who are stationed in Siaya District, spend much of their time responding to appeals for help from people whose livestock, own lives or crops have been threatened by these animals. Also present in some numbers are vervet monkeys, hyaenas, wild cats, cheetahs, serval, civets, mongoose and porcupine, all of which attack crops or livestock. The assistant warden also mentions warthogs, foxes and duikers as being present in Siaya.

A 12-year old girl was killed by a leopard at her homestead in E. Siaya in July 1979. The same leopard reportedly killed two sheep and a goat, and was captured a few weeks later. During our walks in the impact area, farmers complained that they had recently lost chickens, goats, sheep, calves and dogs to predators.

No doubt the rural access roads, together with other developments such as fercing and bush-clearing, will result in diminution of the predators. While this will be welcomed by local farmers, the game animals are a natural resource and they should be considered. We also mention that the district is

particularly rich in bird life: our casual observations produced 50 different species without including the numerous birds that inhabit the swamps and lake-shore. Some of the birds doubtless play a useful role in keeping down rodents and other pests, though others especially the birds of prey, might also attack domestic chickens. In any event, roads and development may well cause changes in the bird population.

III. SOCIAL ORGANIZATION

A. Basic Social Structure

As elsewhere in Kenya, the basic social institutions retain much of their strength among the rural Luo. The lineage, which is patrilineal, is particularly strong, and embraces primary ties and values. We mention briefly some enduring traditional aspects that are of importance in considering income and expenditures, and in looking at household economic organization.

Bridewealth passes from the family of the bridegroom to that of his bride. Many parents prefer the traditional cattle, though some are changing to payments in cash. One major change in bridewealth payments is variation according to the bride's schooling: the higher standard of education, the greater will be the bridewealth.

Funeral expenses and donations constitute another major category of ceremonial expenditure. The CBS enumerators will provide some details from their 120 sample households. On the basis of these figures, we shall monitor changing patterns of expenditure on funeral and on other ceremonies.

Polygyny is still widespread though it appears to be declining. We propose to investigate this, with the help of CBS basic data, and to correlate marital status with income and wealth. People speak in a mixture of amusement and respect of

such men as the famous Akuku Denja of South Nyanza, with his 84 wives and 180 children, or of Senior Chief Amoth of Central Alego, who has 36 wives. We shall be finding out if polygyny aids a farmer in any way, such as, for example, in helping to have available an adequate labour force for his agricultural tasks.

We have already mentioned the important phenomenon of rural social stratification, which clearly exists in this area. Here is a tentative scale applicable in Kakum-Kombewa. At the top are those who have a salary and status earned outside the area, but who spend some time in the area and who have built impressive houses for themselves locally. If there were a Member of Parliament who had a house in the area, he would be a dominant figure. There is no M.P., but there are a surprising number of "local sons" who have done well. Either within the impact area, or within a km. of it, there are imposing houses belonging to:

- o- two medical doctors, one of whom is retired;
- o a University lecturer;
- o several senior officials in para-statal businesses or in government (Post Office, Railways).

We emphasize that local status depends on at least part-time residence. A local man who is prominent in Nairobi or elsewhere, but who never comes home, would be regarded as being virtually outside the system.

There is a second group of rich people who derive their income from local enterprises such as trading, lorries, shops, posho mills, bars or cattle dealing: these are the local "Big Men".

Next, in an ambiguous position, are middle-or junior - level salaried people who live in the area. Prominent among these are teachers, who occupy a marginal position in local society if they are not natives of the area.

Next is a group of men who lack regular salaries, and who have little or no formal education, but who have status by virtue of age and position as traditional leaders. Notable here are the clan elders who are members of the land adjudication committee, whose present functions have given them power and influence.

They would be followed by good farmers, men who have had the benefit of one or more of these - opportunity to save money from a regular salaried job or pension; generous land-holding, by virtue of father's position or from favourable allocation in recent division of land; good "in-law" connections; help from educated children. In addition, such men are normally efficient organisers.

Near the bottom of the social spectrum are those who have small farms, who lack a regular source of non-farm income, and who have no wealthy relatives nor other advantages. They may

be further handicapped by poor health, or old age, or by being women. We have not mentioned women in this scale as in nearly all cases their social positions depend on their husbands. These are followed by landless people.

Right at the bottom of the scale, but still within society, are the marginal people who are no longer productive, who are handicapped by physical or mental defects.

Officials for the most part are outside local society, even though they impinge on it. Some, like the District Commissioner or District Officer, may wield wide powers, yet they are still regarded essentially as outsiders. Others, like chiefs and assistant chiefs, have ambiguous roles as they function both in local society and in the wider world, and they have loyalties, expectations, and obligations in each world.

B. Political and Administrative

All of the impact area falls within one location, Central Alago, but it spreads over three sub-locations: Kakum-Kombewa, Koyeyo, Kochieng B each of which has an assistant chief and a clearly demarcated area. Assistant chiefs perform crucial roles in Kenya's rural administration, and in development policy. They are key brokers between government and the people. The assistant chiefs in the impact area are restless people, committed to development projects both from conviction and also as a way of strengthening their own positions.

Other government departments appear to have little visibility in the area, and indeed there is none specifically assigned to the sub-locational level. At the level of location, Agriculture has one officer and two cotton demonstrators, as well as a demonstration farm at Madurume. There is one Community Development Assistant for the location, which comprises eleven sub-locations, so she can spend little time in any one sub-location. Other departments send in officials only in a crisis or for some special purpose, not on a regular basis.

C. Economic

The economy of the area is characterised, as are most of the two Western Provinces, by a high density of population, small farms that cannot support all the people, and consequent high out-migration, especially by adult males.

The main subsistence crops are maize, sorghum and cassava, with smaller amounts of beans, sukuma wiki (kale) and sweet potatoes. Cash crops are cotton and sugar-cane, with surplus maize also being sold. The bimodal rainfall allows for two crops each year.

"We are very good farmers. Ourselves, followed by the Abaluhya, are the best farmers in Kenya." This statement was made by some elders with whom we had been discussing local agriculture. We had tentatively suggested that perhaps in some cases low levels of knowledge, skill or application might be responsible

for low levels of production. We suggested this because many fields were in poor condition badly planted and inadequately weeded: it seems to us that agriculture is not a primary value of all local people.

Poor fields may be related to the absence of so many adult males, although subsistence farming depends heavily on women's labour. Whatever the reasons, there is a sharp contrast between local fields and the few good fields where crops are properly spaced, include improved varieties, have been manured or fertilised, are weeded, and are sometimes even fenced. We shall be exploring such differences and the reasons for them, in more detail next year. Is there a threshold for plot size? For people to be efficient farmers, do they need a minimum acreage of land? Or a minimum amount of capital or income? How important is education? Family size? Non-farm income?

People earn money by selling cash-crops, a few by selling fruit and vegetables, and some by trading in cattle or by working as drovers for cattle-dealers. Local people have a variety of ways of earning non-farm income, which include: (a) working for wages outside the impact area, in occupations that range from physician to unskilled labourer, and for periods ranging from a working life to a few days; (b) working for wages within the impact area. Without doubt, the employment of over eighty

people on the Rural Access Road each earning shs. 7/90 per day or just over shs 200/- (\$27) per month, is the largest wage-earning opportunity ever offered in the area. The only other employer of any size is the Jaggery factory in the south-east corner, employing sixty people. The two primary schools employ a few people as night-watchmen or general handymen, and the only other employers are farmers who use wage labourers, usually at low wages. Such wages are difficult to determine precisely, as they are often on a contract basis, sometimes on a monthly basis with fluctuating demands on the labourers' time. We heard of people receiving Shs 4/- of 5/- (60 cents) per day, and one man was paid Shs. 150/- (\$20) per month to look after the farm of the owner, who was away in Nairobi.

Apart from paid employment, there are a number of opportunities for self-employment, either in the impact area or within walking distance. These include traditional skills such as pottery, or black-smithing, practised on a very limited scale. Herbalists could be included here. There are also many new skills, including bicycle-repairers, brick makers, carpenters, sawyers, tree-fellers, stone masons and builders.

Of commercial establishments, there are two tiny dukas (shops), each selling a range of twenty or thirty items, none costing more than Shs. 10/- (\$1.35). Within four kms. of the impact

area are four market centres - at Ugunja, Rang'ala, Kobare (this is marked as Uyoma on the map) and Ndere. All of these four markets have regular busy market days and a posho mill. Most include a rural bakery (a thriving one at Ugunja, owned by a man who was trained by an Asian baker in Uganda), a butcher, a bar, and specialised shops that sell such items as timber, or mattresses. Most major items, however, have to be purchased at Siaya (about 12 kms. distant). Items not available at local markets include all farm inputs, cement, corrugated iron, beds, bicycles, radios and nearly everything costing over about Shs 200/- (\$27). (This would exclude pieces of furniture. One carpenter at Ugunja does a good business making and selling more expensive items.)

One unusual local enterprise should be singled out for special mention, as it belongs to a keen local entrepreneur using highly appropriate technology to fill, very successfully, a commercial niche. This is a maize meal mill operated with a water-powered wheel, located on a tributary of the Sese River, just outside the impact area. The mill wheel, which came from India, was set in place in 1926 by a local man whose son still operates it. The original owner constructed an artificial dam so that he could more efficiently regulate the flow of water in the special wooden channel. It is a busy and popular enterprise: local women prefer their cereal to be ground at this mill, as

the meal is finer than that produced at the usual diesel-powered mills. This mill raises many questions. How and why do such ingenious local entrepreneurs flourish? What can be done to encourage them? Are there other ways of using such durable and energy-efficient machines, and of making more use of water-power.

Another source of non-farm income is vegetation, in the form of timber from chloroflora excelsa, and other exploitable species, and also from charcoal. Both are officially discouraged, or people are urged, for environmental protection at least, to replace vegetation removed, but with little apparent effect.

The market centres offer numerous opportunities for employment, mostly of a casual and periodic nature, some jobs being held by people from the impact area. Jobs include shop assistants, bar-girls, waitresses, market porters, market sellers, garage attendants, beggars, lorry and rural bus assistants, barbers, bakers, cooks and others.

D. Religion and Values

The Catholic Church was established at Rang'ala and at Mbaya in the early 1920's. Each mission now has an imposing church that dominates the landscape and is very important in the impact area, Sunday masses drawing 3,000 people. The C.M.S. (Church Missionary Society) is also active in the area, as are about eight

small sects including Legio Maria, Apostles, and others.

Some of the older people have no formal allegiance to any Christian institution, and traditional beliefs and practices are found, in varying degrees, among most of the people. The Catholic church has problems that arise from two main traditional practices, polygyny, and widow-inheritance, both of which are forbidden to Catholics.

E. Community

What are the principal bonds that link people to each other? First there is the shared Luo culture and language, but of stronger effect are the localised clans, membership in which is essential for full acceptance in local society. There are some cross-cutting associations, related to church especially: all the churches have strong groups, particularly among the women. There are also ties based on social class - on education, occupation and income. Class-based ties are situation-specific, and are: at least in the local society, often overridden by ties of kinship and affinity, by respect for elders or by a desire to emphasise solidarity rather than differences.

Given the high rate of labour migration, especially for males in the 25-49 age group, what are the effects on attachment to community? If a man stays away from home for a long time, is

he still a member of his home community? As stated above, periodical return visits home are essential in order to maintain an active status. If this is done, it is our impression that migration does not necessarily impair relationships at home. This indicates that the shared values and the shared sense of community are strong and enduring. Put in another way, the logical way to look at such a community is to think of a total social field which embraces absent members as well, because of the primacy of home values. While away, a man has many roles-- as defined by occupation, residence, religion, friendship, membership of voluntary associations or ethnicity or even nationality-- but he may remain primarily bound by his home ties, which are the most basic and most enduring.

Although we have been speaking of community, we should emphasize that this is a social unit which does not have precise geographical boundaries, and that the whole impact area does not form one neat, distinct community.

F. Health

We include some brief notes on health and disease, based mainly on interviews at Rang'ala Hospital (with Sister Leila, who is in charge, and others). This hospital, located a few kms. outside the impact area, is certainly one of the most important health facilities for the residents, with its maternity and general wards and a full-time nursing staff of eight persons.

Malaria is extremely common, 60% of the people seen having malaria, often in combination with other diseases. Children are much effected by intestinal infections (especially roundworms) and by diarrhoeal disorders. Measles, eye infections and respiratory problems are also common and related to all of these is a high incidence of malnutrition. There were several severe cases of kwashiorkor and marasmas.

To visit the hospital is to be forcibly reminded that there is a distinct situation of extreme poverty in the area of families trapped in the familiar cycle of small fields, poor diets, malnutrition, and illness. These people seldom have the time and/or money to spare for the rest and medicine that they so urgently need, and it is difficult to see how the RAR project alone can alleviate their grave condition.

IV. LAND

Land adjudication is currently under way in the area. Officials say it may be complete by 1980, but given the amount of litigation and experience elsewhere, title-deeds may not be issued until 1982. So this must be regarded as a transition period.

Each sub-location has a land adjudication committee, consisting of 25 members. We were able to meet with the Kakum-Kombewa committee, all of whom were men, 20 of them over 60 years old, the others in their 50's or 40's. They represented the major clans in the area. Clans are localised in that they have a recognized territory, which is in one parcel, though clans are also represented in other sub-locations. They vary in number of members, in amount of land, and in geneological importance, or alleged closeness to founding ancestors. Well before the formal adjudication process, there had been informal (i.e. without title-deed) demarcation of compounds and fields, with many existing fences. Disputes sometimes arose as to whether a particular piece of land really belonged to the resident, or whether he (or his father) had merely been given permission to cultivate for a season or two.) One old man said that the disappearance of the traditional oath, and the advent of lawyers, had both increased land problems. Committee members said that each clan member - even if he were in Nairobi, "even in Europe" - was entitled to his share; that in

most cases land was allocated to the head of a household whose responsibility it was to allocate shares to his sons, that women could be given land (several plots so allocated were shown to us) especially if she were a widow who had sons and who had not been inherited by a husband's brother.

Consolidation had not been enforced in this area, so that most people have more than one plot - "many have 5 or 10 different fields" (precise information will not be available until registration is complete). We did see for the areas where adjudication was complete for the areas the 1:2500 aerial photographs that had been marked with plot boundaries. In one part of Kombewa, there were 98 plots in an area of 69 ha., giving an average of .7 ha.; the average is misleading, as the largest plots measured 8 ha., the smallest not more than .1 ha. People originally had scattered plots because of micro-climatic and micro-environmental differences. They like to have different areas, in case one field was threatened by insect pests, animal marauders, hail or shortage of rain, which can be quite localised.

Some people who do not have land, or whose fields are inadequate for their needs, may rent a small plot at approximately shs 50/- (\$7) for a year, with no rights to permanent cultivation. Land values have increased in recent years, land now fetching Sh 2500 (\$330) per hectare, or more. The Government "suggested price" of shs. 1000/- (\$140) is often

exceeded. Asked about the dangers of people selling land to rich men (in order to get money for school fees or other commitments, or simply for a desire to have cash), the committee had no sympathy. "It is usually a man without sons who would do that. It is in any case his own foolishness. No one can stop him."

One man told us that his son, who works in Nairobi, had been dismayed at the shortage of land, even to build a home. He had suggested, half-seriously, that the father allow his sons to build their homes as upper storeys on his existing brick house.

As stated, land is in a transitional phase, with some bitterness arising from the quarrels. This is likely to be temporary. As cases are settled, people will "settle down," according to one elder.

V. SUMMARY

Given this ethnographic profile, what are our perceptions regarding the constraints on and prospects for rural development?

We start with the draft Siaya District Development Plan which lists the following constraints on development in the district, most of which apply to the impact area:

1. Physical environment - intractable factors. Unreliable short rains; gravelly soil (common in lower areas, e.g., near Wuroya River);
2. Physical environment - factors subject to control. Tickborne diseases; soil erosion; army worms (prevent groundnut cultivation);
3. Poor roads; lack of inputs;
4. Low motivation, late planting.

All these combine to produce low crop yields. The four groupings are ours, not the DDO's. The first is related to the physical environment. These are the "natural constraints" of the Siaya Road No. 1 Impact Area "that cannot be moved by man." The second group, while related to the physical environment, are all subject to control. For example, a program of cattle-dipping would reduce the incidence of tick-borne diseases, and soil conservation measures, especially afforestation, are needed to combat soil erosion. Group

3 includes those other factors that are susceptible to outside influence. Roads can be improved, as with the RARP: inputs can be made more available. Group 4 seems to us to include the crucial factors. We considered above the question of motivation, and return to it here. The Evaluation report of the road states that "There appears to be a positive attitude (among) the local population towards modernization of their agricultural production except for the lack of agricultural input" and recommends providing credit to increase the latter. We would refine this statement and say that local attitudes are (a) selective towards modernization, many people prizing social services (education, health) above agricultural production; (b) highly variable among individuals. The "winners" (as described in the two case-studies) are highly dedicated to modernization, as they see real advantages for themselves if they plan rationally. But the "losers", who are short of capital, land, skills and labour, are often pessimistic about their prospects, and see little hope of change.

At least some of the area residents show a dependency syndrome. For example, asked about benefits of the road, several said, "yes the road will help us all. Then the government will send people in and build hospitals and development will result." The emphasis is heavily on government doing things, not on people taking advantages of opportunities provided. Many others, when

asked about constraints on development, named "money" as the main need. Our point is that money alone will not necessarily help the local farmers unless they have the requisite skills plus the capacity to plan and organise: many farmers have this capacity. It will be difficult to help those who lack it.

If money alone is not the answer, what is needed? This question is addressed in the preceding section, where we stress the need to integrate RARP into a comprehensive investment package. Some specific promising programs for this area include, according to the DDO, soil conservation and afforestation; credit facilities; more horticulture, more hybrid maize, more sunflower and improved ground-nuts.

At this stage our comments and conclusions are necessarily tentative. Next year, and in succeeding years, we shall be observing the dynamic processes of change in this community, adding our qualitative and quantitative data to those collected by the CBS enumerators.