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KAMSAR HOUSING STUDY

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EXECUTIVE SUMMARY

At the request of the Compagnie des Bauxites de Guinee(CBG), the Office of Housing of the United States Agency for International Development sent a four-person team to study the shelter situation in Kamsar, a bauxite processing and shipping center in the Province of Boke, Republic of Guinea. The team was asked to assess the housing needs of the workers of CBG and OFAB (Office d'Amenagement de Boke), and to evaluate the costs, affordability and acceptability of two different approaches to housing:

A. company built, owned and managed housing, and

B. company provided serviced lots with limited infrastructure and company supplied credits, materials and supervision for use by workers to build their own homes.

The team consisted of Dr. John B. Tomaro (Team Leader) and Dr. James S. McCullough of the Research Triangle Institute; Dr. David N. Kinsey of Rivkin and Associates; and Ms. Carol S. Ayad, private consultant. During a three-week assignment in Guinea, the team completed the tasks specified in the Scope of Work. The team conducted briefings with, and provided drafts of the final report to the President of CBG and to the Director of the Regional Housing and Urban Development Office for West Africa (RHUDO/WA) of USAID.

The team found that less than one-half of CBG/OFAB workers were housed and that the greatest percentage of those non-housed were workers in the lowest salary category of the company. Although given an allowance to defray housing costs, the amount was insufficient to meet local shelter costs and did not equate to the benefits received by CBG/OFAB workers provided with company housing.

The team found that the flow of benefits to CBG from the housing stock did not justify the capital investment, and that no Guinean worker could afford to pay the actual costs of the shelter benefits provided by the company.

The team recommended that CBG discontinue the practice of building and managing houses. In proposing the adoption and implementation of a program based on the premises outlined in Option B, the team emphasized the importance of defining and promulgating a company housing policy that (1) specifies strict criteria for assignment in company housing and/or access to rental or home construction programs; (2) fixes allowances more equitably across all workers; and (3) emphasizes the principle of having users pay full costs for utility services consumed.

In addition, the team recommended that CBG/OFAB support the establishment of a housing authority that would finance home loans and provide, for a fee, the supervision and materials needed for home construction. Finally, since workers do not appear to have incomes sufficient to purchase the large houses suited to the traditional extended family, much less CBG-built houses, the team recommended that CBG explore the prospect of offering workers the chance to finance the purchase of the materials and technical assistance needed to build a somewhat smaller house, one in the range of 30-50 square meters. A comparison of costs and incomes suggests that a house of this size would be affordable to all workers, especially those in the lowest category who are presently not housed and have the most urgent need for shelter.

KAMSAR HOUSING STUDY

1.0 INTRODUCTION

1.0.1. STUDY TERMS OF REFERENCE

The Kamsar Housing Study has been carried out under a work order with the U.S. Agency for international Development (USAID) Regional Housing and Urban Development Office for West Africa (RHUDO/WA), Abidjan, Ivory Coast. The study Terms of Reference were developed by Mr. Michael Lippe, Director of RHUDO/WA in collaboration with staff of the Compagnie des Bauxites de Guinee (CBG) and the Office d'Amenagement de Boke (OFAB). The purpose of the Kamsar Housing Study, as stated in the study Terms of Reference, was:

> "to examine the housing needs of CBG and OFAB workers living in the Kamsar Area as well as housing policies currently in effect and to assess alternative options for meeting bothworkers and employers needs within a specified budget."

More specifically, the study was originally intended to evaluate two different strategies for housing workers of CBG/OFAB which were described as:

- the provision of new company built, owned, and managed housing to be situated in Kamsar town (Option A);
- the provision of serviced lots with limited infrastructure on which workers could construct housing with construction credits/ materials (Option B).

Upon the request of the RHUDO/WA Director during the initial days of the study team's visit to Kamsar, the study was expanded to include an examination of how best to implement the recommended option and to provide guidelines for an implementation plan.

Kamsar is the site of the ore port and ore treatment plant of the Compagnie des Bauxites de Guinee (CBG). CBG is a private, profit-making enterprise that was established to mine the bauxite deposits of Sangaredi (85 miles inland) and is composed of a consortium of multinational corporations and the Government of Guinee. The government holds 49% of the shares of CBG and receives 65% of the profits.

The Office d'Amenagement de Boke (OFAB) is the government agency, established and financed by CBG and international

lenders, that owns and operates the infrastructure and services needed to transport the bauxite, and house those involved in the production and shipment. The management of the port, railroad and Kamsar town are the principle responsibilities of OFAB.

1.0.2. Shelter Availability and Conditions

Economic Activity and Demand for Shelter in Kamsar

The operations of CBG have had a dramatic and positive impact on the level of economic activity in the Province of Boke and expecially the Kamsar, Boke and Sangaredi locations within the province. CGB's presence has been an economic magnet. Guineans have left other regions of the country to come to Kamsar to search for work and improved socio-economic well-being.

Like Conakry and other urban and industrial centers in Guinea, Kamsar has experienced dramatic population growth over the last decade, approximately 6% annually, and has a current population of more than 37,500 inhabitants. While CBG has been the main economic attraction and principal employer, there are other, far smaller enterprises in the region that offer income-producing opportunities for local residents and those migrating to the region. These enterprises are principally food sales, home construction and transportation.

The economic boom of Kamsar has, therefore, created an urgent and increasing demand for shelter. Through the establishment of OFAB CBG has put in place programs to build and service shelter for workers and their families. Faced with a large demand and no suitable housing when operations began more than a decade ago, CBG has tried to accommodate an annually increasing demand for shelter. Inspite of the implementation of regular and expensive shelter construction program, CBG/OFAB have not been able to provide housing for all employees.

CBG's inability to provide housing for all employees has prompted the company to give allowances to enable workers to rent space in locations outside Kamsar town, the site of the company-built and maintained housing. Non-housed company employees compete with non-CBG/OFAB workers to housing in the area. This competition undoubtedly inflates the price of rental housing and gives those seeking shelter limited ability to influence the quality of the living conditions. In short, the demand for housing is so great that workers have to accept whatever is available.

Housing Supply and Demand among CBG/OFAB workers in Kamsar

There is a great disparity between the demand for and supply of adequate housing in Kamsar town, the principal site of company housing and the location of the production and transportation facilities, i.,e., the factory, port and railroad. The table

below lists the current inventory of dwellings in Kamsar town by type, number and category of company employee entitled to reside in each type of housing.

CBG/OFAB Houses by Type, Number and Employee Category

Type	Number	Employee Category
A	2	general managers
B	40	managers and superintendants
P	26	supervisers and foremen
C	140	supervisers and foremen
M	47	foremen and managers
X	41	foremen and ass't foremen
XX	10	ass't foremen/engineering ass't.
Y	166	ass't foremen/engineering ass't.
V	6	ass't foremen/engineering ass't.
L	14	foremen
D	245	team leaders and technicians
E	190	workers
N(rooms)	72	mgm't staff and single women
R(mobile)	53	mgm't staff
CB(Z)	100	single workers and trainees
G(Minel)	281	workers
BM(W)	4	managers
Total	1,437	

These figures show an actual decline in the number of CBG/OFAB housing units over the past few years caused mainly by the scrapping of some of the mobile housing units and the conversion of multiple rooms in Minel into single dwelling units. Given the current conditions, we would expect the total number of units to continue to decline unless new housing is constructed.

Of the total of 1,437 dwelling units in the inventory, 334 are left from the construction camps and are classed as substandard (for Kamsar town). This represents about 23% of the total CBG/OFAB housing stock.

According to a study of the CBG Department of Engineering, more than one-half of the CBG/OFAB workforce was not in company-supplied housing in 1982. Given the increase in the total CBG/OFAB workforce over the last two years, and the absence of a program to meet the total demand for shelter, the imbalance continue .

Housed and Non-housed CBG/OFAB Employees, 1982
(Kamsar)

	Housed	%	Non-housed	%	Total
CBG	837	53	738	47	1575
OFAB	408	41	591	59	999
Total	1245	48	1329	52	2574

Housed and Non-Housed CBG/OFAB Employees, 1984
(Kamsar)

	Housed	%	Non-Housed	%	Total
CBG	959	54	808	46	1767
OFAB	416	37	710	63	1126
Total	1375	48	1518	52	2893

As the tables above indicate, the current housing distribution practices favor CBG employees. However, within the distribution system, the upper level employees are given preference. While there are reportedly 1,412 employees in the "worker" category, there are fewer than 600 places available for this category of employee. When OFAB employees are included, the current allocation practices are even more unfavorable to the lowest categories of employee.

In addition, given cultural preferences and the strength of traditional practices in the African milieu, the size and furnishings of shelter provided by CBG/OFAB is more favorable to the upper level workers who are more likely to understand and share some of the cultural values particular to societies found in Europe and the United States.

The houses of upper level managers and supervisors are well-furnished in terms of furniture and appliances. The modern conveniences provide considerable benefits to those who enjoy them. However, it is not clear that those who have access to these luxuries see them as a manifestation of the company's concern for living standards or as theirs by right of employment and position. Given the level of shelter conditions in most urban areas of Guinea, it is difficult not to conclude that the standards in place in the managers' houses are beyond anything an average Guinean could afford. Since each individual understands the purchasing power of his salary, and each knows that such standards are beyond his means, an expectation is created that each employee has a right to expect shelter conditions unrelated to job performance or income level.

In addition, there is some indication that there is an inverse relationship between demand for interior and exterior space and its availability in Kamsar town. The workers in category 8 manifest a preference for shelter that can accommodate the traditional African extended family. While crowding is a problem in houses of many of the Guinean managers, it is particularly acute in the worker units. It is not uncommon to find 8-10 persons living in the single units of Minel, or to see 4 to 6 persons living in one room of the Celibitarium.

In the traditional African setting, available shelter must respond to traditional cultural practices. Among those in the lowest employee category, and even among the better educated and better paid employees, a given shelter is always adjusted to accommodate familial obligations, not the reverse. This phenomenon is all too evident in Kamsar village where employees and non-employees of CBG are building and/or renting shelter that follows traditional shelter patterns, inspite of the proximity and example of housing in Kamsar town.

As a final point, it should be noted that the disparity between all levels of erployees who have housing in Kamsar town and those who do not is enormous. Measured in services provided -- infrastructure and housing -- the value of benefits to Housed CBG/OFAB enmployees is approximately ten times the value of the housing allowance given to Non-Housed employees. (See Section 1.1 Cost Analysis)

Shelter Conditions outside Kamsar Town

In terms of interior and exterior space, housing in Kamsar village, Kawass and Filima is more commodious. Houses are built along traditional lines in compounds that feature a well, pit latrine, cooking hut and vegetable garden. The space and number of rooms are usually sufficient to meet familial demands. Each house usually has a room for each wife and her children, a private room for the husband, and space available for other family members, guests or lodgers.

While the village houses are furnished very simply and do not have electricity or piped water, most are clean and well maintained. Structures appear to be durable and well-constructed, although the sites often have drainage and sanitation problems.

CBG/OFAB workers who do not have housing in the town frequently rent space in the village. Some even manage to buy a parcel of land and begin to construct a house. There are reports that some workers, who already have housing in Kamsar town, leave CBG/OFAB housing and rent larger units in the village. An undetermined perecentage of workers appear to prefer the space and ownership possibilities in the village to the small rooms and service

amenities of the town. Without a more thorough survey of attitudes and practices, it is difficult to quantify the extent of this preference. Still, anecdotal data seem to confirm an overwhelming preference for space and home ownership.

At current market prices a non-housed CBG/OFAB worker can rent a 10 square meter room in the village for approximately GS350, slightly more than the housing allowance for a single man. Frequently, two single men will rent one room. The housing allowance for married men, (GS500), will cover this rental requirement but the space becomes inadequate as children and family arrive. There are indications, therefore, that non-housed CBG/OFAB workers find it difficult to meet shelter costs in the village. This may explain why some workers live as far away as Boke. Housing more distant from Kamsar may be more affordable to the non-housed workers. In any event, it is clear that the housing allowance is not equal in any sense to the amenities provided to those who reside in company housing in Kamsar town.

Visits to Kawass, Filima and Kamsar village reveal the measurable amount of house construction underway at all locations. In Kamsar village alone an estimated 140 houses are under construction. Most have large foundations and all are in various stage of completion. Interviews with builders and owners suggest that the absence of building supplies is the principal obstacle to completing the work. New house construction is less prevalent at Kawass and Filima and locations more distant from Kamsar town. Still, it is difficult to travel the main road from Kamsar to Boke without being aware of the demand for housing illustrated by the extent of new construction.

1.0.3 DEFINITION OF HOUSING STRATEGY OPTIONS

The study focusses on two strategies for housing company workers, company built, and owned, housing and worker-owned housing. An examination of the two options revealed that there were a number of sub-options, particularly within Option B, the sites and services option. These sub-options include a number of variations concerning the level of infrastructure, house and lot size, location, and other factors. In order to address these variations, we have constructed a table showing the major variables which might come into play on a sites and services project. The table is presented in Figure 1.0.1. below.

Figure 1.0.1. MAJOR VARIABLES FOR SITES AND SERVICES OPTION

A. LOCATION

1. Scatter Site
2. Kamsar town extension
3. Kawass village
4. Fitma village
5. Kayenguisa village
6. Borobof village

B. INFRASTRUCTURE LEVEL

1. Low (roads, ditches, septic tanks)
2. Mid (1. above plus piped water points)
3. High (2. above plus electricity service)

C. HOUSE SIZE

1. Core unit (50 square meters)
2. Full size unit (100 square meters)

D. LOT SIZE

1. Small (400 m2)
2. Medium (600 m2)
2. Large (1000 m2)

E. BUILDER/CONTRACTOR

1. CBG or foreign contractor
2. Local contractor(s)
3. Owner & family

F. COST RECOVERY

1. Owner pays all house & infrstr costs thru mortgage
2. CBG pays infrstr costs & owner pays house mort.
3. Same as 2. above with CBG paying part of mort.

These variables were chosen after reviewing the actual situation in Kamsar. For example, a number of workers have already bought lots in Kamsar village or surrounding areas and prefer to build there rather than in a new project site. With respect to lot size, the stated preference of workers is for lots larger than those found in Kamsar town so that gardening can be carried out by their families. Also, houses constructed in the villages are considerably larger than those built most recently by CBG, running to 100 square meters and larger. Large houses are desired in order to accomodate the large extended families that number twelve to twenty persons.

The number and range of variables in the Figure suggest a large number of potential alternatives. In addition, there are alternatives within the infrastructure variables which are not described on the table. A discussion of infrastructure alternatives (design options and costs) is presented in Appendix A.

In order to have a reasonable basis for comparing the alternative strategies for new housing, six basic alternatives have been selected. These are considered the most likely alternatives to be implemented. The six include:

- Alternative A -- construction of CBG owned and operated houses, 70 square meters in size, on lots of approx. 400 square meters, with paved roads and concrete drainage ditches, piped water and electricity in each unit, inside toilet and bath facilities connected to sewer network; located in North Zone, Kamsar town.

- Alternative B1 -- loans of materials and construction financing for large house, large lot construction by workers and local artisans on scattered sites (normally on sites already purchased by workers in one of the villages); no infrastructure other than septic tank provided.

- Alternative B2 -- loans of materials and construction financing for core house (30 m2), large lot (1000 m2) construction by workers and local artisans on a concentrated project site (Kawass Village) with low level infrastructure provided (gravel roads, earthen drainage ditches, wells with hand pumps, septic tanks.)

- Alternative B3 -- loans of materials and construction financing for large house (100 m2), large lot (1000 m2) construction by workers and local artisans on a concentrated project site (Kawass Village) with mid level infrastructure provided (gravel roads, earthen drainage ditches, piped water to standpipes, septic tanks.)

- Alternative B4 -- loans of materials and construction financing for large house (100 m2), large lot (1000 m2)

construction by workers and local artisans on a concentrated project site (Kawass Village) with higher level infrastructure provided (identical to B3 with 2 KW electric service to each house added.)

- Alternative B5 -- loans of materials and construction financing for small house (50 m2) on large lot (1000 m2) construction by workers and local artisans on a concentrated project site (Kawass Village) with low level of infrastructure provided (gravel roads, earthen drainage ditches, wells with hand pumps, septic systems.)

The alternatives vary according to the size of house and lot, level of infrastructure, location and whether the housing is built and owned by CBG or the workers. Methods of financing are considered separately.

The Kawass Village (Airport Road) site is used as the preferred location for a concentrated project site. It seems to provide the most desireable combination of site amenities, closeness to town and a large enough area to accomodate large lot development.

The lowest level of infrastructure considered viable in the concentrated project site is the "low level" consisting of gravel roads, earthen drainways, protected water supply (wells or piped water), and septic systems for each house. The heavy rains make gravel roads and drainways essential. Selecting an acceptable water supply system forces a trade off between the use of local wells and the establishment of household sewage disposal. Drinking water from wells may not be acceptable for health reasons, because of the high water table and common use of pit latrines. However, well water may be acceptable if suitable treatment of human wastes, other than pit latrines, can be found. Water-tight septic tanks which are pumped periodically, or water-tight composting privies may be an acceptable alternative. If the wells can be protected from surface water pollution, they provide the least cost alternative for water supply in the sites and services options.

Septic tank systems or composting privies, both of which require periodic removal of wastes, are indicated as the best waste treatment alternative available for the B options, given the high water table. Electricity is considered an non-critical option; however, since electricity is already provided in company housing, not providing it does raise questions of equity. On the other hand, electricity is not available to most of Guinea's urban population and does not appear to be essential to daily life. Furthermore, the high cost of supplying it through deisel generators in Kamsar makes it an expensive service.

The six alternatives listed above form the basis of the evaluation of housing options for CBG/OFAB. The following sections examine the options on a number of criteria, ranging

from cost (for CBG and for the worker) to the impact on family life. The following sections describe these evaluation criteria and compare the options. Much of the analysis is necessarily qualitative, owing to the nature of some of the criteria.

The use of the six options is not meant to exclude consideration of the housing situation in Sangaredi. The options are selected as representative of what could be carried out, either in Kamsar or in Sangaredi. The options are used as a basis for comparison only; they do not constitute actual proposals for housing programs. Recommendations for implementing a housing program appear in Part 2 of this report.

1.1 COST ANALYSIS

The cost analysis compares total costs and benfits among the six options. Since CBG/OFAB does not dissagregate budget data for housing and infrastructure maintenance, nor report maintenance expenses separately for different housing groups, estimates are based on aggregate cost. These data necessarily obscure some significant variation. Furthermore, some costs are reported in dollars while others are in Sylis, making translation difficult because of the exchange rate problem. Nevertheless, the following cost estimates are fairly accurate and representative.

Most of the costs have been provided by the CBG Engineering Department or based on materials costs and labor charges provided by the department. Where possible, actual costs of previous construction have been examined as reference points for future construction costs. These historical costs, however, must be used with caution since there is indication that some of these costs represent either over-charges or over-design for earlier contracted construction. Appendix A provides a discussion of infrastructure and house design variables with associated costs.

The major elements of the cost analysis include:

- capital costs of infrastructure
- capital costs of housing units
- operating costs of infrastructure
- operating costs of housing units

Figure 1.1.1. shows the capital costs of infrastructure and housing units for the six options. For comparative purposes, 240 housing units have been assumed for each option. Alternative A, company owned and operated housing, assumes the same level of infrastructure currrently in place in CBG-owned housing developments in Kamsar town.

Alternative B.1, the scattersite option, has few infrastructure costs since it is impractical to furnish infrastructure to widely situated lots. In this option, only site grading and septic tank sewage systems are assumed. In the other B options, cost estimates vary according to the level and quality of infrastructure provided.

The large lot developments (B2, B3, B4, and B5) require longer roads, drainways, and, water trunk lines (where piped water is indicated) than the small lot project of Option A. At the same time, earthen drainways can replace concrete drains on larger lots and lower the per unit costs of drainage. Under the B options, there are no water connections to individual houses;

Figure 1.1.1 Cost Comparisons of Six Alternatives

	ALT. A1	ALT. B1	ALT. B2	ALT. B3	ALT. B4	ALT. B5
. HOUSES	240	240	240	240	240	240
PITAL COSTS						
INFRASTRUCTURE						
ROAD COST/m	77.5	0	25.5	25.5	25.5	25.5
ROAD LNGTH(m)	2288	0	3118	3118	3118	3118
ROAD COST	177320	0	79509	79509	79509	79509
DRAIN COST/m	20	0	2	2	2	2
DRAIN LGTH(m)	4576	0	6236	6236	6236	6236
DRAIN COST	91520	0	12472	12472	12472	12472
SITE PREP	24000	24000	24000	24000	24000	24000
WATER TRUNK	35551	0	54000	49783	49783	54000
WATER CONNECT	36000	0	0	21600	21600	0
SEWAGE SYSTEM	115920	198000	198000	198000	198000	198000
ELECTR MAIN	594000	0	0	0	210953	0
ELECTR CONNEC	0	0	0	0	0	0
TOTAL INFR.CO	987367	222000	361745	379128	590081	361745
TOT PER HSE	4114.029	925	1507.271	1579.7	2458.671	1507.271
HOUSE						
COST/m2	432	150	150	150	150	150
TOTAL m2	70	100	30	100	100	50
HSE COST	30240	15000	4500	15000	15000	7500
LOT						
COST/m2	1	1	1	1	1	1
TOTAL m2	400	1000	1000	1000	1000	1000
LOT COST	400	1000	1000	1000	1000	1000
T. CAP COSTS/HSE	34754.03	16925	7007.271	17579.7	18458.67	10007.27
ERATING COSTS						
TRANSPORT	0	0	0	0	0	0
WATER	497	0	0	99.4	99.4	0
ELECTRICITY	1051	0	0	0	1051	0
GEN MAINTENANCE	555	0	0	0	0	0
T OP. COSTS/HSE	2103	0	0	99.4	1150.4	0

this reduces the water system capital costs.

Under the B options, sewage system costs are estimated to be higher than under Option A. The A option can make use of the existing sewer system network while the B options require individual septic tanks. While these tanks can be built to modest specifications, their unit costs make them more expensive than the Option A.

The provision of electric service greatly increases the capital cost of the infrastructure in options A and B4. The estimated costs per house of those two options are quite different, even though the same level of service (2 Kva) is provided. The difference is caused by assuming underground installation of option A (the existing practice) which is more expensive than overhead cables, assumed in Option B4. Furthermore, the cost estimate for Option A electric service is based on historic cost of the "Y" house development, while Option B4 costs are based on estimates prepared by the CBG Engineering Department (see Appendix A).

Figure 1.1.1. shows that the total infrastructure costs are most expensive for Option A and least expensive for the scatter site option B1. Infrastructure costs are roughly the same for B2, B3 and B5 with B4 being about $1,000/house more expensive due to the added cost of electric service.

The higher infrastructure costs of Option A are compounded by higher housing construction costs. Using historic costs for the "Y" houses, inflated to 1984, we have an estimated cost of about $432/m2 for Option A (see Appendix A for historic costs of CBG housing construction.) The CBG Engineering Department has estimated a cost of $150/m2 for constructing an owner-built house under the B options. This estimate has been confirmed by independent estimates of the authors, as presented in Appendix A. The differences in housing costs per square meter between Options A and B reflect the current state of housing costs in the region.

Housing construction costs in the Kamsar region vary greatly depending on the quality of house and method of construction. There are three basic categories, with attendant levels of quality and costs. These categories include:

- village built house -- all local materials (mud brick walls, mud stucco, thatch roof, mud floor, wood doors and solid wood shutters); built by village artisans in traditional style; may be round or rectangular in shape; cost is 20 to 30 dollars per square meter, with all costs comprised of labor.

- town built house -- use of local fired bricks, with imported cement for mortar, stucco and poured concrete floor on a built-up foundation slab; imported galvanized metal roofing;

either locally made or imported low quality doors and windows; built by local artisans with owner contributing some labor; cost is 150 to 200 dollars per square meter with approx. 60% to 75% for purchased materials and the rest in labor charges.

- company built house -- made of all imported materials, using concrete slab, concrete block walls, galvanized metal roofing, dropped ceilings, aluminum frame windows and doors, interior plumbing and electrical fixtures; built by foreign contractors using local skilled labor; cost is 350 to 450 dollars per square meter with approx. 70% for imported materials and 30% for labor.

Figure 1.1.1 also shows the operating cost comparisons of the six alternatives. The operating costs of Option A are are much higher than the other alternatives. These high operating costs are due to the high cost of maintenance of company houses and the high consumption of water and electricity. (The latter rate of consumption is extraordinarily high for an African town.) These costs are reduced for the B options by simply lowering the level and/or amount of services. In addition, housing maintenance costs should be reduced by better upkeep by the owner-occupants. This aspect of housing maintenance is discussed in section 1.3 below.

The estimates of total capital and operating costs may be used to calculate yearly total housing costs. In this calculation, the capital costs of the house and infrastructure are assumed to be amortized over a period of 15 years. Figure 1.1.2 presents the yearly housing cost, assuming a fifteen year mortgage and a cost of money at 13% per annum (the current rate of the USAID Housing Guarantee Program for fixed rate loans).

FIGURE 1.1.2 YEARLY HOUSING COSTS AMORTIZING HOUSE AND INFRASTRUCTURE

	AMORTIZATION PAYMENT	OPERATING COSTS	YEARLY COST TOTAL
Option A	5377.90	2103.0	7480.90
Option B1	2619.00	0.0	2619.00
Option B2	1084.32	0.0	1084.32
Option B3	2720.31	99.4	2819.71
Option B4	2856.33	1150.4	4006.73
Option B5	1548.54	0.0	1548.54

Comparison of Benefits

It is somewhat difficult to quantify accurately the benefits of the housing options because there are no good measures of what the housing and other public services received by CBG housing residents are worth to the residents. That is, since there is no charge for service, there is no way to measure how these services are valued against any other standard. However, the benefits can be described and some comparisons can be made.

The workers who live in CBG housing receive benefits of the house and public services. Workers who are not housed get a housing allowance: 300 Sylis per month for unmarried men and 500 Sylis per month for workers with families. Figure 1.1.3 shows a calculation of benefits for the two classes of workers. The figure requires some explanation.

A value is imputed to CBG housing based on rents in Kamsar village for comparable space and quality. A premium is added to CBG housing for amenities, e.g., proximity to the hosptial. (There is some evidence that the lower level workers prefer living in Kamsar village because of the proximity to the market, other forms of employment for family members and more diversions.)

Figure 1.1.3 HOUSING BENEFIT COMPARISON OF CBG WORKERS

	Housing Value	Services Value	Total Value
Worker in CBG House	$91.12 (1)	$231.25 (2)	$322.37
Worker with CBG allowance	$25.00 (3)	0	$25.00

(1) Based on comparable value in Kamsar village of 70 square meter house at $1.04 per meter increased by 25% premium.
(2) Based on actual costs of water and electric service per house in Kamsar town.
(3) Based on housing allowance of 500 Sylis.

The figure shows that the benefits of living in CBG housing are more than ten times those of receiving only the allowance. Even assuming the value of municipal services may be overestimated, the disparity remains great.

It is difficult to compare benefits quantitatively among the different options in any meaningful way. The large house alternatives provide more housing value than the smaller house. In addition, the larger lots provide additional value, although it is difficult to place a value on lot size. The stream of current benefits under the B options is somewhat less than the benefits under Option A because the value of public services is lower. However, at the end of 15 years, the worker will own his house under Option B while CBG would still own the worker housing under Option A.

The value of housing to CBG can be calculated using a simple net present value approach. The flow of benefits derived from the house on a yearly basis is estimated, along with a present value calculation. In this approach, the flow of benefits is estimated to be the imputed housing value derived in Figure 1.1.3. above, or $91.12 per month. CBG should theoretically be able to rent one of its houses for this amount. The amount CBG pays to maintain the house is substracted from the imputed value to produce a net benefit stream. Figure 1.1.4 shows this calculation.

Figure 1.1.4. Net Present Value of Option A Housing

Assumptions: net benefits = $91.12 - $15.00 (rent - maintenance) per month, inflated by 10% per annum.
period = 20 years

discount rate = .13

Net Present Value = $16,608

The analysis may be reversed in order to calculate what the rental value should be to justify the investment of $34,754 per house, as indicated under Option A. This calculation produces an average monthly rental of $174.29, or roughly twice the imputed rent of the Option A housing. Alternatively, we may calculate the "internal rate of return" on $34,754 which produces an imputed net rental income of $912.44 a year (imputed rent minus maintenance) over a period of twenty years. This calculation indicates a return of 3.19%.

It should be noted that these analyses do not take into account the cost of municipal services to each house in Kamsar town. Building more houses in Kamsar town adds to the obligation to provide municipal services of water, electricity, sewerage, and solid waste collection. These services add about $3000.00 per house per year to CBG/OFAB's cost of housing. This type of obligation is often referred to as "operating leverage", being the fixed operating costs that a capital investment incurs. For CBG/OFAB housing, this operating leverage appears to nearly as important as the financial leverage of the capital investment.

The cost analysis above suggests that the current housing policy and construction practice, Option A, produce significant inequities between housed and non-housed CBG/OFAB workers. In addition, each house constructed under this policy represents a cost to CBG that is twice what the benefit stream would justify. Furthermore, the current high standards of municipal services add considerable costs to CBG/OFAB's net obligation -- costs which are hard to justify in light of the real value of those services and their unequal availablity to CBG/OFAB employees.

1.2. AFFORDABILITY ANALYSIS

This section addresses the question of how much should a CBG/OFAB worker be able to pay for housing. Since this study is secondarily concerned with extending the housing program beyond the company's workforce, a corollary question is how much should a non-CBG/OFAB household be able to pay. Finally, the options are evaluated on the basis of affordability by workers.

To estimate affordability, workers' salaries and household income must be estimated. This is complicated for company workers because of the "revitaillement" program, which is essentially a food stamp program for CBG/OFAB Guinean workers. Under the "revitaillement" program, workers are allowed to purchase food commodities imported by the company which are not readily available on the local market. While access to the food purchase program confers benefits on the participants, it is very difficult to put a value on that access. Furthermore, the fact that Guinea is likely to convert its currency to the CFA system in the near future should reduce the value of the "revitaillement" program considerably.

A CBG/OFAB worker also receives other allowances, e.g., a housing allowance, which must be added to the salary. In addition, income from other household members must be included to arrive at a total household income. A 1980 USAID Shelter Sector Study for Guinea, using income data from a 1977 UNDP study, estimated that about 50% of household incomes in Conakry comes from sources other than the head of household salary. Using an average salary of GS 3500 per month for the category 8 worker, we may estimate that the household income for a worker in that category is about GS 7500 to GS 8000.

This estimate of household income for CBG/OFAB workers compares favorably to estimates developed the USAID Shelter Sector Study team in 1980 who determined that median household incomes in Conakry were between GS 7,000 and GS 7,500 while median HH incomes in secondary cities were between GS 4,000 and GS 4,500 (in 1980 Sylis).

We would expect non-CBG/OFAB workers to have a somewhat lower household income than CBG/OFAB workers. However, we would not expect these incomes to be a great deal lower because of the strong economic base provided by CBG activities in the region. Therefore, we may estimate that average non-CBG/OFAB household income in the region is between GS 6000 and GS 7000 per month.

These average income estimates have been used to construct the following table of typical income and housing affordability for CBG/OFAB workers (Category 8) and non-company workers in the region (Figure 1.2.1). The standard "rule of thumb", 25% of household income, has been used as the affordable figure. This seems reasonable since the USAID Shelter study found actual

expenditures were running about 18% in the Conakry sample of households; and, in the Kamsar region, household size is about 20% larger, on average, than found in Conakry.

Figure 1.2.1. HOUSEHOLD INCOME AND HOUSING AFFORDABILITY COMPARISONS FOR CBG/OFAB WORKERS AND NON-COMPANY WORKERS

	EST. HH INCOME	AFFORD. HSG COST (25%)
CBG/OFAB Worker	GS 7500	GS 1875
Other Worker	GS 6500	GS 1637.50

Comparing these figures to the yearly housing cost estimates developed for the six housing options in section 1.1 above (see Figure 1.2.3.), we find that none of the options with the exception of the core housing options (B2 and B5) are within range of CBG/OFAB workers; none of the options is affordable by non-company workers.

FIGURE 1.2.3. AFFORDABILITY ANALYSIS OF THE FIVE HOUSING OPTIONS

	AFFORDABLE AMOUNT	TOT. HSG COSTS
CBG/OFAB Worker	GS 1875/mo.	
Other Worker	GS 1637/mo.	
HOUSING OPTIONS		
A		GS 12,468/mo.
B1		GS 4,365/mo.
B2		GS 1,807/mo.
B3		GS 4,700/mo.
B4		GS 6,678/mo.
B5		GS 2,581/mo.

This comparison has several implications. First, only the B2 option, the 30 m2 core house, is close to the affordable range for non-CBG households. Second, only the B2 option is strictly affordable for CBG/OFAB households under the assumptions made about household income. However, the B5 option is close to the

affordable "threshold" and probably within range of many of the CBG/OFAB worker households.

Proposed changes to the Guinean currency system could have profound impact on CBG/OFAB household incomes, and consequently on the affordability analysis. If the government adopts the CFA Franc, the inflated value of the commodities received under "revitaillement" should drop immediately. Although it is difficult to say with authority if this change will occur and what the size of the impact will be, it is possible that real household income will "drop" to the level of non-CBG/OFAB households in the region, or about GS7,000/mo. There is little reason to think that household income would drop below this figure under the revised currency system. This figure then may be used as the alternative household income estimate for CBG/OFAB category (8) workers under a revised system. Therefore, the estimates used in Figure 1.2.3 for CBG/OFAB and non-CBG/OFAB workers may also be used to represent "before and after" estimates of the impact of conversion to the CFA system.

1.3 MOTIVATION OF WORKERS

The impact of Options A and B on worker motivation may be analyzed in terms of:

1. house maintenance
2. worker productivity and absenteeism
3. theft of materials

1. House Maintenance

Maintenance costs of company houses are extremely high. Although the OFAB department concerned with maintenance has not kept records until this year on individual house maintenance costs, a conservative estimate, based on four months'data, puts that cost at between $1000 and $2500 per house per year. Average total expenditures of municipal services and housing maintenance run about $4000 per house per year (excluding costs of the hospital). Of this amount, about 70% is devoted to municipal service expenditures and 30% to housing repair and furniture and appliances replacement.

Under Option A, which would build relatively low cost units (similar to the "Y" houses built in 1980), the maintenance costs should be somewhat lower than the average of all CBG/OFAB houses. A sample of maintenance expenditures on the existing "Y" houses reveals a yearly estimated repair cost of $180.00. Added to this is an average of $375.00 per house per year for furniture and appliance replacement, based on 1984 budget estimates of the town administration. We have no reason to believe that maintenance costs of any new company built housing will be much lower than these figures.

Option B, which provides the occupant with ownership of the house should foster much greater preventive maintenance and care of the house. Observation of maintenance practices in nearby villages (including Kamsar village) shows that owner occupied houses are very well kept, evidently at little out-of-pocket expense to the owner. The high maintenance costs of CBG/OFAB owned houses belies the contention that expensively constructed housing should have fewer maintenance costs. Evidently, the quality of construction (and the high costs of fixtures and appliances) leads to high replacement costs, not to durability.

Under homeownership, occupants will have every incentive to maintain their houses. This should reduce overall maintenance costs; it would certainly reduce CBG/OFAB's cost, since the company would no longer be responsible for maintenance of those units.

2. Worker Productivity and Absenteeism

It is difficult to say what effect either option will have on worker productivity. Under a owner-builder program, we would expect an increase in absenteeism during construction, even if most of the work is contracted out. During construction, the owner will want to spend time supervising construction and guarding materials.

On the other hand, there is a fair amount of absenteeism now that can be traced to the current housing situation. Already a considerable amount of owner-built housing is being constructed by CBG/OFAB employees. In addition, many of the company houses have had additions built by occupants, mainly with scrap materials.

Since CBG/OFAB houses are not large enough to accomodate the size family that most workers need to house, there is considerable pressure to add additional rooms and outbuildings. Furthermore, many residents have added outside cooking shelters. All of this clandestine building activity on the part of company workers has undoubtedly contributed to absenteeism of workers. It is likely that a core housing program, Option B2, may lead to additional absenteeism as houses are expanded to full size to accomodate large families.

3. Theft of Materials

Theft of materials is significant problem for CBG and OFAB. The scarcity of all commodities in the country makes theft appealing. Many of the stolen items are used in house construction and furnishings. A program to spur housing construction may lessen the need for stolen commodities, although a modest program in Kamsar is unlikely to affect the national housing stock significantly. However, by transferring responsibility for materials to owner-builders or owner-occupants, CBG/OFAB will lessen its own exposure and enlist the new owners in theft prevention. Furthermore, by providing materials to company workers, the motivation to steal building materials should be somewhat reduced.

1.4. AFRICANIZATION AND COMMUNITY SELF RELIANCE

The development of option A, company owned and operated housing, would continue the pattern of company town housing in all dimensions. Physically, the new housing would be a direct extension of the existing community and would fill up the dead-end peninsula surrounded by the River Nunez and the wetlands of its tributary streams. The extension is likely to continue the western-style pattern of street layout and housing types. Culturally, option A is unlikely to meet Guinean preferences. Nor are Guineans likely to gain any sense of stability since they would be maintained in the dependent status of renters (although no rent is actually paid.)

Economically, manpower skills are unlikely to be increased as CBG/OFAB would probably seek a non-Guinean contractor to build the housing. This option would not likely employ local labor in any supervisory capacity.

Municipal services would likely continue to be provided by OFAB at no charge to consumers. This would perpetuate the overuse of services (particularly water), a pattern which usually occurs in a no-charge situation. Furthermore, imposition of user charges for a service is always difficult once the public is accustomed to receiving the service free.

In summary, Option A would continue the paternalistic pattern of the enclave company town, which is the antithesis of Africanization. On the other hand, option B provides several opportunities for furthering the Africanization program, and, at the same time, providing for more community self reliance. First, house types, plot sizes, and community settlement patterns can better approximate local Guinean preferences.

Second, local building cooperatives and CBG/OFAB construction personnel can perform the vast majority of the site development, infrastructure and housing construction. Third, the development of a local mechanism, or institution, to develop infrastructure and assist in house construction can become the basis for a local urban development/housing agency. Finally, municipal services can be placed on more of a self-financing basis; service levels would determined more by actual demand than by fiat. This should increase not only the responsiveness of services, but also bring service levels in line with what is affordable in the long run.

1.5 Demand for Public Services

The impact of Options A and B on demand for public services has been analyzed with respect to:

- overall population growth
- transportation services
- water and sewerage service
- electricity service
- health and education services

1. Overall Population Growth

There is a high rate of population growth in the Kamsar Region created by natural increase and in-migration. Population growth rate estimates vary (5.25% to 8%), because the database is incomplete. Table 1.5.1 shows population projections at different growth rates. Even at the lowest rate of growth, demand on all services will increase dramatically.

Given the limited amount of habitable land in the Kamsar region, population density should increase greatly adding to problems of environmental health, pressures on farm land and limitations on land for industrial expansion, particularly new major ore processing facilities.

The selection of one housing option over another should have little differential impact on overall population growth. In fact, the creation of additional housing stock, under either option, may increase in-migration since the current housing scarcity probably acts as a deterent to settlement in the region.

2. Demand for Transportation

Demand for transportation services must be divided into (a) workers' travel to work, and (b) family members travel. Cost data assembled by the CBG Engineering Department reveal that costs of transporting workers varies according to the number of persons transported, and the length of the trip.

A housing development located within ten kilometers of Kamsar should produce about the same cost per trip to work as a development within Kamsar town. Furthermore, approximately 210 workers are bussed from far outlying areas (Boke, Kolaboui and Diaasiya) at an estimated total cost of $65,000 per year or $1.28 per passenger trip. Bussing those same numbers from a site within 10 km of Kamsar could reduce the cost by one-half, to approximately $0.67 per passenger trip.

Figure 1.5.1 Population Projections under Differing Rates of Growth, Kamsar Arrondissement

	YEAR				
	1980	1985	1990	1995	2000
tal Population (1977) 27160					
rowth Rate					
5%	31441.09	40127.69	51214.23	65363.78	83422.59
8%	34213.78	50271.26	73864.98	108531.9	159469.0
10%	36149.96	58219.87	93763.69	151007.4	243198.9

The recorded population in 1983 was 37,688 which indicates a growth rate of slightly less than 5% per annum.

Family travel presents a different set of cost variables. Journey to the Kamsar Village market or the hospital from an outlying housing development will require transport. CBG/OFAB may be able to provide scheduled bus service during the time that busses are not used for travel to work. On the other hand, since the operating costs of the busses are high (about $0.56 per passenger/trip), CBG may not wish to assume the burden of providing non work related transportation, leaving it to the the private sector to provide transport.

3. Demand for Water and Sanitation Services

The option of providing company housing, Option A, will put large demands on an already overstressed water system. CBG will have to provide water connections equivalent with existing company housing. In such a case, the same high rate of water consumption found in the other company-provided housing can be expected.

Current consumption is approximately 378 litres per person per day in the rainy season and 649 litres a day in the dry season. Since normal consumption in Africa is 65 litres per person per day, these figures are six and ten times higher respectively. Since the least cost alternative of adding additional supply is estimated to be $0.46 per cubic meter(capital and operating costs), every new house added to the company housing stock will cost the company about $500.00 a year in water costs alone.

Any option which locates housing away from Kamsar town should be able to reduce potable water consumption. At the lowest level of service, shallow dug wells could be used to provide water. (This is the custom in Kamsar Village and the other villages). However, this option may present health risks since the water table is quite high (10 to 12 meters below the surface in the dry season and about one meter in the rainy seson) and subject to surface water contamination.

One of the most important factor contributing to over consumption of water in CBG/OFAB housing in the dry season is the watering of gardens. Since piped water is provided without charge, there is no disincentive to using piped, treated water where well water would be just as suitable. If piped water is supplied to a new housing development, such as envisioned under Option B, the water system should be protected against gardening usage. This suggests that the potable water system should either be metered, so that price deters its use for gardening, or made inconverient to use for gardening. Central water standpipes with automatic shutoff faucets or protected cisterns with handpumps might prove effective in reducing rates of consumption.

Given the high water table, proper treatment of household waste water, particularly human wastes, is essential. Simple septic systems can be readily accommodated on medium-size lots

envisioned in Option B alternatives. The size of the septic system and cost are determined by the amount of water flushed through the system. Reduced potable water consumption in the household should keep the size requirements of the system to a minimum, especially if the "gray water," (non-toilet) discharge, can be diverted to the garden area rather than allowed to go into the septic system.

4. Demand for Electricity

Option A will require extension of electric service to all new houses since this service is already supplied to other CBG/OFAB houses. However, the actal usage of electricity among Guinean families appears to be quite small so the "real demand" for electricity is questionable. Currently, electricity is used for lighting, some cooking (hot plates), entertainment (radios, phonographs, televisions), and air conditioners, where they exist.

Adding more houses to the CBG grid should present no immediate problems of capacity. The present system has excess capacity and household usage, in the lower level worker housing, is not high. However, the capital costs of transmission lines, transformers, household connections, and house wiring are substantial. Using actual cost data from the "Y" house construction, the capital costs of electric service is over $2,000 per house, assuming underground installation which is the standard in Kamsar town. In addition, generating costs are high at approx. $0.09 per KWH. Including depreciation on plant, the total cost of electricity is about $0.12 per KWH. Using the estimated consumption of 24 KWH's per day per house (for houses without airconditioning), electricity usage in option A housing would cost about $1051/house per year. The demand and costs for electricity under Option B4 should be the same as Option A.

5. Demand for Health and Education Services

Depending on the size of a housing project developed under Option B, there may be the need for construction of a school and health post within or close to the site. Option A should be able to make use of existing facilities in Kamsar town. The cost of building a school and health post may, or may not, be considered infrastructure cost. Since it is the responsibity of the government to provide these services, we would suggest that both the capital costs and operating costs should be the responsibility of the national government.

In a strict sense, implementing either option should have little impact on total costs of these services. The same population would be served regardless of the location of the housing. Under option A, however, more demand is likely to be placed on the hospital for non-emergency services. Under option B, emeregency services could be provided by a health post. If the hospital becomes overcrowded, this could become an issue.

1.6. Health Considerations

Option A would put in place the same environmental sanitary standards in Kamsar town. This option would provide piped water and waste disposal systems, as well as well-guttered roadways and regular solid waste pick-up. Although unconfirmed by any systematic prevalence studies, hospital personnel at Kamsar suggest that residents of Kamsar town use clinical services less frequently than residents of the village and the surrounding areas. Construction of shelter according to the standards of Option A could lead to slower increases in utilization rates and reduce recurrent hospital costs.

The shelter improvements proposed in Option B, alhtough not of the same magnitude as Option A, would produce significant improvements in community health status and reflect standards beyond those already in place in Kamsar village. At the moment, houses in the village rely on hand-dug wells for water and pit latrines for waste disposal. All too often the wells and latrines are located very close to one another (3 meters), suggesting that well-water is contaminated. Roads in the village are unpaved and ungraded. Rain and kitchen wastewater frequently form stagnant pools which serve as breeding sites for mosquitoes. Great quantities of solid waste are a frequent sight in the village. While household compounds are clean and well-kept, roadsides and vacant lots are littered with solid, often organic, waste that is an ideal breeding and feeding material for rats, flies and mosquitoes.

Option B would produce direct improvements in the environmental sanitary conditions of Kamsar village and the other proposed settlement locations. Graded roads and gutters, and regular solid waste pick-up, would reduce insect breeding sites. More significantly, protected wells and septics tanks, that are regularly pumped and properly utilized, would reduce the risk of water-borne illness.

Implementation of the standards specified in Option B would produce dramatic and measureable improvements in health status. These would be documented by reductions in the incidence of malarial, respiratory and gastro-intestinal cases among children aged 0-15 years.

Implementaion of both options will produce improvements in community health status. However, the interventions associated with Option B require more response from and participation by the beneficiaries in order to achieve maximum efficacy. Choosing Option B requires the implementation of programs that teach the villagers how to use and maintain the pumps and septic systems.

1.7 Community Economic Impact

1.7.1. Short Term Employment Generation

Maximum local employment generation will be created by contracting construction to local contractors and building cooperatives. A lower level of employment generation can be expected if CBG/OFAB follows the previous pattern of contracting with foreign contractors to build company-owned housing. Still, contractors could use local skilled and unskilled labor, and bring in only foremen and supervisory personnel. If this practice is instituted, the total amount of job creation should not vary a great deal between foreign contractor built housing and local contractor built housing.

The major impact should be found in the distribution of new jobs between CBG/OFAB worker families and non-CBG/OFAB families. To the extent that occupants substitute their own labor for contract labor, the net number of new jobs will be decreased. Furthermore, owner-built housing usually employs family members in construction; employment (albeit non paid) is kept within the owner's family. This has the effect of increasing real family income of the CBG/OFAB worker.

1.7.2. Long Term Economic Activity Generation

The proposed housing option strategies may have different impacts on:

- housing rents and sale prices
- local building practices
- opportunities for gardening for home consumption and/or the local market

<u>Impact on Housing Rents and Sale Prices</u>

The scarcity of building materials in Guinea has kept national housing supply from meeting overall demand. Although building materials are more available in the Kamsar region than most other urban areas of Guinea, the high population influx has created a tight housing situation. Furthermore, the relatively high incomes of CBG/OFAB workers has tended to inflate rents. A booming rental market is emerging in Kamsar village. A number of owner-builders are building rental units; owner-occupants even set aside one or two rooms for rent.

The current situation of high population influx and slow growth of the housing stock should only drive rents higher in the near future. At an estimated population growth rate of 6 to 8%, the

housing stock needs to increase at 200 to 250 units per year in order to meet current growth in demand. Since no new CBG/OFAB housing has been added to the stock since 1980 and current additions to the non-company stock are estimated at about 120 new units per year, there is a backlog of 300 to 500 units and a yearly accumulating deficit of about 100 units.

Since there appears to be little or no market fornew house sales or resales, determining market prices is difficult. At present, all housing units are being built for owner occupancy or for rent. In addition, since almost no house construction is contracted out in entirety, it is difficult to determine new house construction costs. Typically, the owner acquires materials and contracts skilled labor from different sources, in addition to family-provided labor and material.

Improvement in Local Building Practices

Housing construction practices in the region are in need of upgrading with respect to (a) site preparation (primarily drainage), (b) foundation design, (c) quality control in brick laying and mortar and cement plaster mixing, and (d) roofing materials. These present poor conditions appear to result from lack of materials and skill on the part of local artisans.

Present construction practices create housing that can deteriorate quickly, particularly in the rainy season. Given the high costs of house construction, practices should be adopted that produce more durable dwellings, and use costly imported materials (such as cement) more efficiently. For example, local masons tend to use very thick (5 cm) mortar joints on block wall construction; at the same time, they may reduce the cement content in stucco below the acceptable minumum to stretch the available supplies.

Previously constructed CBG housing has had no evident impact on local building standards. A program which trains local craftsmen in proper building techniques should have some impact on local practices. At the very least, this approach would convince consumers that durable housing can be constructed locally, create a demand for higher quality workmanship. This approach would require training programs for artisans and close supervision on the job. Since continued scarcity of building materials country-wide will encourage short-cuts in the amount and quality of materials used, supervision is critical.

Opportunities for Gardening for Home Consumption and Market

Existing CBG/OFAB housing provides very little space for gardening and keeping livestock. Housing built on larger lots could provide such opportunities for CBG/OFAB worker families. Since these families are generally large, each has considerable

labor potential which could be used in gardening. This activity would raise the net incomes of families and lessen dependence on market purchases. Since food prices in the market are quite high, this represents a substantial economic potential for the worker.

The opportunity for gardening depends on the amount of available land, not on tenure or ownership. However, if the worker owns the land, he should be more concerned with long term development (e.g., planting of fruit trees) and soil building/conservation practices.

It should be noted that gardening will increase the demand for water during the dry season. This emphasizes the need to protect treated water supply, which is already overstressed, from gardening and livestock use. This will become a major design issue in any project providing large lot housing.

1.8 Environmental Impact

Options A and B would have similar impacts on the natural environment of the Kamsar region (the area within fifteen kilometers of milestone zero) and of the Boke region (Sangaredi to Kamsar), depending generally on the level of services that would be provided under option B.

The water supply system of CBG/OFAB is already stressed today. Any increase in potable water consumption under options A or B could be offset by measures proposed to conserve water and to increase supplies, as suggested by the CBG Department of Engineering -- e.g., replacement of leaking distribution lines between mains and dwelling units, public education measures, and introduction of water fees, creation of storage impoundments, new dams, and reopening of artesian well.

The public health advantages of an improved water supply system, and the provision of potable water under Option B, are significant. These advantages would be noticeable, particularly in the low lying, marshy terrain of the Kamsar region, where the water table rises to near the surface in the rainy season. Furthermore, the combination of pit latrines and shallow drinking water wells in Kamsar village (and as would be found in a low level of infrastructure version of option B) invites water pollution and public health problems.

Option A is likely to induce further spontaneous housing development in Kamsar village, along the Kamsar-Boke road, and around existing nearby villages. This will further the rapid conversion of agricultural land to urban use since the expansion of Kamsar town is unlikely to satisfy Guinean housing preferences or meet growing housing demand. This impact may be contrasted to the opportunity under option B to identify appropriate lands with agricultural potential that may be conserved and exploited under the large lot alternatives of option B. This would require more innovative site planning than the traditional grid layout.

The two options will also have somewhat different impacts on solid waste collection needs. The large lot alternatives under option B will allow for composting of organic wastes on site, and reduce the amount of solid waste that must be removed from the project site. Currently, solid waste from Kamsar town is dumped in pits dug by sand mining on the proposed site of option A. A different dump site would have to be developed if option A is selected.

1.9. Regional Development and Settlement Patterns

Option A would continue the existing formal settlement pattern of the company town. This would indirectly lead to the continuation of the existing informal settlement pattern of the Kamsar region. Those attracted to the region would continue to expand Kamsar village and other nearby settlements, particularly along the Boke road. Kamsar village appears to be a thriving village, market center, and distribution point for people and goods. Yet its expansion possibilities are limited by site conditions, particularly the low lying terrain and wetlands.

The Kamsar region has a total land area of 17,000 ha., but only 38%, or 6,500 ha., are outside the flood plain. Much of this high ground is cut off by wetlands and streams and not accessible from the Boke road, which acts as the spine of the region.

The existing CBG/OFAB industrial-port-urban complex, including areas reserved for expansion, occupies about 1,000 ha. At most, about 3,000 ha. of developable land remains within the Kamsar region. Option B represents an opportunity to guide this regional development and structure the development pattern in a manner that can provide for both residential and agricultural land uses. At the same time, this option would reserve the prime 65 ha. North Zone site for the future production purposes of CBG/OFAB.

Kamsar village is unplanned and rapidly reaching the limits of acceptable density from a health and cultural standpoint. Further scattered development along the Boke road will likely lead to a settlement pattern of unserviced (and unserviceable) lots. Option B has the potential to guide residential development, and provide acceptable levels of infrastructure. Indeed, implementing this option can begin the process of transforming the region from a company town enclave to a more integrated region. Option A does not offer this potential.

1.10 Creation and Ownership of Wealth

Both options A and B produce a capital good -- housing for workers. However, as shown in the cost analysis, section 1.1. above, the value of the good produced by option A is much less than the amount invested, primarily because (a) the level of service is higher than demanded, and (b) the cost to maintain the housing is excessive. Furthermore, in the housing sector CBG is investing heavily in a capital good that is not really part of its productive capital (i.e., produces bauxite.) Finally, under option A, CBG retains ownership of the housing stock, continuing a concentration of wealth in the company and not in its workers.

Under option B, each owner-occupant is accumulating wealth in the form of equity in his house. Furthermore, that equity should appreciate in value as the value of housing rises. In theory, the value of the CBG housing stock is also rising, but the high maintenance and operating costs actually generates a greatly reduced net present value of the CBG investment, as demonstrated in section 1.1 above.

The creation of wealth for workers is important because retirement income is severely limited. The equity accumulated in the owner-occupant's house is likely to be a major source of retirement income (as discussed below).

1.11 Family Security

Option A, CBG/OFAB-owned housing, meets only the immediate shelter needs of the worker and his family. Implementation of Option A would continue the dependency relationship whereby the company provides furnished housing and services only as long as the worker remains with CBG. On retirement the worker becomes dependent on the extended family, a time when traditionally the worker is expected to have the resources necessary to support the younger generation.

Option A also encourages workers to look to the company to solve the range of human problems. At retirement, the worker is forced to rely on himself alone. If he has built no retirement home elsewhere, he may have to rent in Kamsar. This practice would contribute to housing pressures in greater Kamsar, outside the CBG/OFAB enclave. Tensions between the spontaneously settled urban area and the CBG/OFAB-owned worker's community would be augmented.

Option B encourages the formation and safeguarding of equity for retirement security. Wealth is acquired in the building and furnishings. Although an informal survey of workers indicates that many wish to retire to their place of birth and suggests that many have started or intend to begin construction of a retirement home, the acquisition of equity in Kamsar provides for future family security. The sale or rent of the house in Kamsar can generate the resources needed to maintain retirement shelter elsewhere in the country. This pracatice alleviates the demand for housing in Kamsar and, over time, distributes the wealth generated in the arrondissement to the other regions.

Some workers may remain in Kamsar on retirement, especially if they already own a permanent dwelling in the village. Long-term residence in Kamsar may become more prevalent as children grow up and find employment in the community. With employment in the city, the offspring will marry and settle in Kamsar as "natives;" in time, many will take over the parental home or build housing of their own. In either case, Option B ensures family security and the worker's obligation to the extended family network.

1.12. LABOR RELATIONS

Three aspects of labor relations are considered important with respect to the selection of options A or B. First, the selection of option B supports a fundamental change in the relationship between CBG/OFAB and its workers which is now characterized by total dependency of workers on the company for all aspects of their welfare (work related or not.) This has a profound impact on labor relations in that many problems that have little to do with actual employer-worker relations can become points of dissension in the realtionship. The option B approach, in lessening the dependency of workers on the company, should improve overall labor relations by helping to divorce non work related issues from the real work issues.

Second, provision of housing in any form will satisfy a growing demand for needed housing. Option B, which is vastly preferred over option A by the workers, should be very popular with workers, improving labor relations. In particular, the large lot, large house options, which are directly responsive to worker preferences should demonstrate company sensitivity to worker desires.

Third, any of the options will serve to reduce the inequity in the current system where some workers get a housing allowance with one tenth the value of company housing and municipal services. It has been pointed out that it is the lowest category workers who are in the disadvantaged position of having to take the allowance. It has also been noted in interviews with a sample of these workers that they perceive that the higher level cadres have access to building materials and have opportunity to build their own houses. This is in contrast to the lower level workers who get neither company housing nor access to materials. Option B, aimed at the lower level workers, would do much to redress this problem.

1.13 Social and Cultural Impact

Historically, the idigenous peoples in the Kamsar region were the Baga, Landouma and Nalou who, though ethnically diverse, were brought together linguistically through the use of Soussou, the common commercial language. Some Peul enclaves were found in the area, notably in the north and east. Since the arrival of CBG/OFAB, additional Peul and other Guinean ethnic groups (Malinke, Bag, Soussou and tribes from the forest region) have migrated to the Boke region.

Certain commonalities are characteristic of the traditional social organization of this multi-ethnic society, including polygymy, patrileanlity and patrilocality. Most men have or aspire to have least two wives. Offspring from these unions reside with the father, even when the wife leaves her husband. Monogamy is beginning to emerge as a new cultural ideal among younger unmarried workers, especially those in the middle and upper cadres.

At marriage a woman goes to live in husband's house. Traditionally this was separate dwelling built near the husband's father's house. Since Kamsar is a relatively new town, the partilocal ideal of living at the husband's birthplace is put off until retirement, unless the ancestral lands are located in the Kamsar region.

Options A and B must be examined in terms of their impact on the Guinean extended family. Moreover, project planning must take into account the importance of this value to the society. Option A provides no way for an individual to fulfill his obligation to sustain the current social organization. In addition, the space required to houses members of the large extended family is inadequate. On the other hand, Option B more clearly responds to spatial concerns and allows the creation of a sub-community which closely resembles current development in Kamsar village. Option B appears to offer the prospect of integrating CBG/OFAB workers into a city which is evolving from a company enclave to a more broadly-based community.

A new CBG-owned community would perpetuate the current Kamsar town plan of western-oriented street plans. These workers would be better off materially than the residents of the spontaneously settled Kamsar village. However, they would also be isolated from the ambience of the rest of the city. Option A housing encourages residents to look to the company to solve communal infrastructure problems. It does not prompt workers to participate in the urban development activities of greater Kamsar.

Option B integrates workers into the larger community and

fosters communal self-reliance rather than dependence. In the Guinean point of view, neighborhoods which include planned space for educational, recreational, religious and economic activities respond to the concept of the community. Such neighborhoods might include a food market and small entrepreneurial or artisanal shops.

Designs of neighborhood settlement patterns should mirror the traditional circular spatial configuration of the village. Homes would be grouped around a central communal area. In this cul-de-sac pattern, a road would link the neighborhood to a main street that bisects the community. Each neighborhood would be close to the main street, yet sufficiently distant to ensure the safety of small children who play in the open areas. Option B housing could replicate this settlement pattern, one similar to that found in the neighborhoods of Kamsar village.

An informal survey of CBG/OFAB workers indicates that people are not concerned about the ethnic composition of the neighborhood. Ethnic heterogeneity is an accepted urban settlement pattern in Kamsar, even though workers are originally from more homogeneous communities. The possible divisive results of ethnic diversity are mitigated by the emmployment of Soussou as a lingua franca in the Kamsar region. Workers note that neighborhood socio-ecnomic homogeneity and similarity of social values and behavioral compatibility are more valued than neighborhood ethnic composition per se.

Company constructed housing has not adequately responded to workers spatial needs in terms of lot size and house plan. Also, housing built and owned by the company precludes the acquisition of equity needed for retirement. Realizing these dual objectives have prompted some workers living in company-owned housing to construct housing in Kamsar village. When the new house is complete, usually after several years, the worker is able to leave CBG/OFAB housing and lodge in shelter that is more compatible with felt needs and located within a communal setting corresponding to the preferred cultural ambiance.

The inadequacy of company built housing has been reflected in several surveys conducted by the CBG Engineering Department as well as the more in-depth interviews conducted by the present study team. A discussion of the interview findings, which are summarized here, is included in Appendix C.

Housing constructed and owned by workers with the aid of CBG/OFAB would satisfy social roles as defined in the context of the Guinean extended family. Ownership would provide for the retirement security the worker requires. Spatial concerns with regards to lot size and house design can also be addressed.

The informal survey of workers, and impressions gleaned through

visits to rural areas and Kamsar village, suggests that a house design, corresponding to minimum needs, must include three bedrooms and a living room. Assuming an average two-wife completed family size, one bedroom would belong to the husband; the others would be occupied by a wife and her children. One model preferred by workers surveyed groups the three bedrooms around a central indoor living room. Another suggested model has three divided rooms; each opens onto a long covered veranda. Both models place the covered kitchen area (conical in shape) and a shower/WC outside. Wells are planned as the water source.

In order to accommodate the elasticity of the Guinean family the suggested housing models are very large, even as the first home of a younger worker. The house is seldom under-utilized. It serves different uses depending on the point in the domestic cycle of the larger extended family. Initially, an unmarried or newly married worker will house a number of relatives, frequently younger boys and girls from his home region who may be attending school in Kamsar. As family size increases, e.g., children, a second wife and more children, domestic space is adjusted to accommodate needs. Nevertheless, even when the immediate family appears to occupy all available space, the door remains open to relatives in need of terporary or permanent housing. Each individual is obligated to meet familial responsibilities to the larger extended family, even if these burden his individual resources.

In order to occupy all available space in a new house as soon as possible, Guineans prefer to build their houses vertically. The foundations are laid and walls are constructed of bricks and mortar. Even though corrugated metal is the preferred roofing material because of its durability and low maintenance, this roof offers far less protection against the sun's heat than the naturally coo, traditional thatch. Once the roof is installed, the house is ready. House construction is a time-consuming process -- one to three years due to the absence of building material. During the building period, the individual must find housing with other relatives or rent. In spite of the time required to build a large Guinean house, people prefer to build the entire house all at once rather than to construct a "core" unit to which rooms could be attached in the future. In the Guinean context, "core" construction is not likely to find ready acceptance.

Option B responds closely to socio-spatial needs for large, vertically constructed homes. Enabling the worker to continue what amounts to a traditional shelter practice would ensure that each individual has an opportunity to fulfill his defined social roles and to meet familial obligations.

1.14. Impact on GOG Revenue

The Government of Guinea is a partner in CBG, along with a consortium of multi-national corporations. The government owns 49% of the shares of CBG and receives 65% of the profits plus $13 for each ton of bauxite shipped out of the country. At 1982 production levels (7.9 million tons), the GOG earned approximately $104 million from the severance tax. In the same year, the government received approximately $50 million in profits and $2.5 million in other taxes, an amount equivalent to 5.6% of the cost of materials imported by CBG. Total estimated revenues to the GOG for 1982 were approximately $156.5 million of which $154 million were paid in foreign exchange.

The amount received by the GOG as a severance tax is tied to the tonnage shipped and is a cost to the company. This amount would not be affected by the expenses of a housing program. Only the amount of total profits, and taxes received as payments on imported materials, would be influenced. While the loan would have a negative effect on the profits available for distribution, increasing the amount of imported materials would have a positive impact on the revenues earned as import duties. The increase in import duties is not likely to offset the amount paid as interest and principal.

While the exact amount needed to finance the housing program has not been determined, the amount is estimated to be somewhat less than $5 million. A Housing Guaranty Loan (HG) at a fixed rate of 13% annually for 30 years would require CBG to pay slightly more than $667,000 annually. At a 10% variable rate the annual amount would fluctuate.

Interest paid by CBG on loans outstanding in 1982 was $16.7 million. The addition of principal and interest payments on the HG loan at the fixed rate of 13% would increase the total interest payment less than 5% year and reduce the amount paid annually to the government in profits by approximately $434,000. This annual loan payment should have a negligible effect on the profits distributed to the Government of Guinea, especially since production has increased to 9 million tons/year. Moreover, since implementation of the housing program will require the importation of a substantial amount of material not avaiable in Guinea, the import duties will reduce the amount the government will lose as profits.

1.15 Administrative and Logistical Requirements

CBG/OFAB administrative and logistical systems are already stretched by the demands of running the bauxite complex and support services. Therefore, consideration must be given to additional demands that may be placed on these systems by the housing options. If option A is pursued, it is likely that an outside contractor will be engaged to handle all construction. CBG/OFAB will have to handle materials importation and would have to assist and orient the contractor, particularly with respect to hiring local labor and housing supervisory personnel. In addition, CBG/OFAB has to monitor the work closely and runs the risk of having to complete, or redo, work not done satisfactorily by the outside contractor. This has been the recent experience of the company. Indeed, given such problems, the CBG Engineering Department now states that it prefers to handle construction itself.

The extent to which locally available materials can be substituted for imported materials, the less strain will be put on the CBG/OFAB importing logistics system. On the other hand, we expect that most building materials, with the exception of sand and gravel, will continue to be imported in the near future. Therefore, under any of the options, the CBG/OFAB logistics system will be taxed.

The current system exacts an administrative cost through having to deal with requests for housing, transfers, and the general supervision and maintenance of being a large landlord. Under the current system, and presumably under option A as well, any housing problem of an employee can become a problem to be dealt with by top management. On the other hand, setting up the mechanism to carry out the B options requires a considerable administrative effort at the outset. Following that, however, the administrative problems should lessen since the company will be less directly involved in housing management. Should the B option be pursued, the administrative burden should be lessened by careful planning and policy development at the outset. This is not to minimize the amount of effort required. To set up the B option requires major administrative work in:

- establishing the organization or unit to oversee the program
- developing priorities for selecting participants
- importation of materials
- carrying out the construction programs (infrastructure and housing units)
- setting up and administering the cost recovery scheme

These issues are discussed in more detail in the second part of this report, section 2.0 below.

1.16 Conclusions

The current shelter situation in the Kamsar area has been elaborated in the sections above. In essence, the situation can be summarized as follows:

1. There is a great disparity between the demand for and the supply of adequate shelter. Less than one-half of the workers of CBG/OFAB are currently served by company housing. Those who are without housing are principally the lowest categories of workers at CBG/OFAB. Although given an allowance to defray the cost of shelter in Kamsar village and surrounding areas, the amount is generally insufficient to meet local costs and does not equate to the amenities received by those in company houses. Workers in company housing receive approximately ten times the benefits of those who are not housed.

2. The infrastructure in place in Kamsar town has been designed to serve less than one-half the number of CBG/OFAB households who currently reside in the region. Already stretched to the limit by existing demands, the services (water, electricity, hospital, roads and school) are likely to encounter increasing annual demand for more service of the same or better quality.

3. In terms of return on investment, the flow of benefits from CBG housing stock cannot justify the capital investment. Not only has the cost of construction been excessive, but each house built by CBG commits the company to operating costs which are extremely high. The problem is compounded by high costs of production of municipal services (particularly water and electricity) and over consumption by residents.

4. The amenities enjoyed by the housed employees of CBG are of great value but unaffordable if calculated in terms of a given household's purchasing power. If the operational subsidies provided by CBG were removed, no worker would be able to pay the actual costs of the current benefits received by those in company housing.

5. The existing housing designs and plot layouts in Kamsar town are not well suited to family life and patterns of worker households. In order to accomodate large families and gardening activities, workers desire larger houses and bigger plots, even at the expense of better municipal services.

6. The economic vitality of the region has attracted people seeking opportunities to achieve a higher standard of living. Although not employed by CBG/OFAB, they benefit directly or indirectly from the ecnomic activity at Kamsar and contribute significantly to the infrastructure burden and the demand for housing.

7. Municipal services in Kamsar town are delivered effectively

by OFAB. However, outside the town, almost no public services are delivered at all, placing an increased burden on CBG/OFAB services. This disparity in the availability of public services has led to the demand for extending services into neighboring communities. At the same time, those demanding extension of services do not seem to appreciate the true costs of providing such services.

8. While the Government of Guinea may have, or be in the process of developing, the capacity to creat infrastructure and deliver the services necessary to maintain investments, presently only CBG/OFAB can create and maintain the municipal infrastructure and services. In the short run (2-3 years), this situation is not likely to change.

9. In the long run, continuing the current housing and infrastructure development practices is of little benefit to the company, the worker or the region. The company cannot continue to subsidize workers at current levels and meet the demand. While workers have a right to expect a "just wage, decent working and living conditions and an opportunity for advancement," each must understand his obligation to pay (directly or indirectly) for the services he receives. Finally, since the Government of Guinea ultimately receives the total benefits of the instrastructure services developed by CBG/OFAB, and has a vested interest in the long-term development of the region, it must begin to take the steps necessary to develop and provide services that support the region's exploitation and improve the standard of living of the resident population. In short, the company, the worker and the government have a vested interest in changing the current shelter practices of CBG.

2.0 Recommendations for Kamsar Housing Program

This section expands on the finding that worker owned housing is the preferred option for meeting the housing needs of CBG/OFAB workers. The section is divided into two main parts:

- Critique of the overall CBG/OFAB housing policies.

- Development of a program and implementation plan for worker owned housing;

In developing the housing program, a number of factors must be considered, many of which have been discussed in section 1.0 of this report. Two considerations are of paramount importance in developing the housing program. First, focus must be placed on the lower level workers, who are the most disadvantaged under the present system. This does not mean that higher level employees will be excluded, but the program should be designed to serve the immdeiate needs of the category 8 workers.

The second major consideration is the conflict between affordability, calculated as a proportion of household income, and the cost of the desired house size, which is quite large. The current practice is to build a complete large house (minumum of 100 m2) over a period of years rather than build a small house quickly and expand it later on. Therefore, a small house option, which is affordable by normal income proportioning techniques, may not be acceptable to most workers. On the other hand, in order to be sure that the lowest level of worker can be served, a relatively small house option must be included. This argues for a program that includes a range of house sizes.

The following sections discuss the current housing policy of CBG/OFAB and development of the worker owned housing program.

2.1. CBG/OFAB HOUSING POLICY ANALYSIS

2.1.1 Current Policy Situation

Until the current year, no written policy has existed on CBG/OFAB housing. A draft policy statement has been prepared in February 1984 for review by CBG/OFAB management. The policy covers:

1. Company housing assignment
2. Revision of housing allowances
3. Establishment of formal rental contracts and rent schedules
4. Furniture provision, replacement and sale

The following sections discuss the current situation and proposed policies with respect to each of these items.

1. HOUSING ASSIGNMENT IN COMPANY OWNED UNITS

Since housing demand far exceeds supply, the housing allocation process is central to equitable treatment of CBG/OFAB employees. Housing assignment is highly stratified, with certain types of housing only avaialable to certain ranks of employees. Since housing (and associated municipal services) confers great benefits on those that are assigned to housing, this policy tends to increase the total benefits received by upper level cadres of the company.

Furthermore, CBG/OFAB lacks independent control over access to all of its own housing as an estimated 80 to 100 units are occupied by persons with no legal right to company housing.

The formal system of assignment to company housing considers an applicant's length of time on the waiting list, job title, job requirements, family status, and seniority in his position and with the company. A Housing Allocation Committee, with representative from CBG Administration, City Maintenance, CBG/OFAB Personnel Department and the labor Union, are charged with making allocations. The role of the Committee is formalized in the draft housing policy statement. We have not been able to determine whether the Committee has indeed been functioning structly within the criteria cited above. The policy statement itself makes no mention of such criteria.

SUMMARY RECOMMENDATIONS

CBG/OFAB should draw up the guidelines for housing assignment, incorporate them in the housing polcy statement and publicize them among the work force.

CBG/OFAB should negotiate with the Government of Guinea to gain control over all company units.

2. HOUSING ALLOWANCE SYSTEM

CBG/OFAB policy toward workers not housed in company units is to provide a modest allowance, which is currently GS300 for unmarried employees and GS500 for married employees. The draft policy proposes to raise those amount to GS500 and GS600 respectively. The draft housing policy does not discuss the method for determining the level of the allowance.

The current system has considerable inequity built in, with employees in company housing receiving about ten times the benefits of workers on the allowance. Furthermore, since no rents or utility fees are charged to those occupying company housing, employess are not really aware of the size of benefits received in their housing.

CBG/OFAB should consider creating a unitary allowance system with (a) standardized levels of allowance based on real market rents and other criteria deemed pertinent by the company (e.g., company rank and seniority) and (b) a policy of providing housing allowances to everyone with those in company housing paying rents based on some formula of costs and benefits received in housing and municipal services. The system of charges is discussed below.

The allowance should bear some true housing costs in the Kamsar region. With an average room rent of GS350/rm per month and an average family size of ten persons, an adequate amount of rent for the required four room dwelling is about GS1400 per month. Given this estimate, the company must decide what proportion of a worker's housing cost should be underwritten by the company.

The following table shows how a schedule of allowances might be constructed reflecting rank and seniority, producing a median allowance of about GS 1000 per month, which represents about 70% of the estimate of GS1400/mo. calculated above as a reasonable average housing cost. (Note: we do not recommend using family size as a criteria for the allowance schedule since family size fluctuates and is relatively meaningless with respect to equity considerations.)

Figure 2.1.1. ILLUSTRATIVE HOUSING ALLOWANCE SCHEDULE

RANK	YEARS WITH COMPANY			
	0 - 2	2 - 5	5 - 10	10+
Category 2,3,4	1200	1300	1400	1500
Category 5,6,7	1000	1100	1200	1300
Category 8	800	900	1000	1100

The figure is intended to be primarily illustrative. Actual criteria for establishing different levels should be determined by CBG/OFAB management, and will necessarily reflect a determination of what proportion of an employee's housing expenses the company should underwrite.

All employees should receive the housing allowance with the individual employee responsibe for selecting the method of securing housing:

- rent company housing from CBG/OFAB (existing housing)
- rent housing on the private market
- participate in the housing construction assistance program

Employees electing to rent housing on the private market would take the housing allowance and dispose of it as they wish. Participation in the housing construction program is discussed in detail in the following chapters of this report. CBG/OFAB rent policy is discussed in the following section.

SUMMARY RECOMMENDATIONS

The company should institute a unitary allowance scheme based on actual rental values, adjusted for rank and seniority and/or other criteria deemed relevant. The provision of housing should be separated from the allowance by having a distinct rental program and housing construction assistance program.

The written company housing policy should make clear the basis for determining the housing allowance and the amount of support which the company will provide to the employee.

3. RENT AND MUNICIPAL SERVICE LEVELS IN COMPANY HOUSING

The draft housing policy proposes to impose rents for company owned housing. However, the relationship of the rent structure to cost recovery or benefits received is not clear. Moreover, the proposed rent schedule has several significant flaws. First, the proposed rents seem to bear little relation to the benefits received or to any consideration of actual cost recovery. Second, the rent schedule perpetuates the inequities among classes of workers which the company is trying to overcome. For example, the proposed rent for a type B house (150 m2) is GS 1,000 or GS 6.6/m2. The proposed rent for type CB rooms of 16 m2 is GS 400, or GS 25/m2. This is four times the proposed rent for type B housing which is much more costly.

For employees electing to rent company housing, the true costs of providing that housing greatly exceeds GS1400 per month. However, CBG would find it difficult to impose rents greater than the housing allowance since the current practice involves no charge for rent or municipal services. Imposing a charge in excess of the allowance would effectively be a salary reduction.

CBG has two options for dealing with this issue of real rents that exceed a reasonable allowance: (a) raise the allowance for employees in company housing to the level of true costs (the rent), or (b) lower the rent charged to equal the allowance. Both options have pitfalls. The former option will draw attention the inequity in the system and may become a point of dissension in salary negotiations. The latter option perpetuates the hidden subsidy and makes difficult keeping track of just what housing is costing the company.

We recommend the latter option be followed initially, primarily to avoid introducing such a wide range of allowances that could create friction and, indeed, become institutionalized. Rather, initial rents should be set at the level of the allowance; over time, rents could be raised incrementally to approach true cost recovery.

In order to raise rents over time to recover a greater proportion of actual costs, CBG/OFAB first needs to determine what total costs of housing really are. During this study we have made estimates of total operating and capital costs of housing; these estimates need to be much better refined by CBG/OFAB management.

While the initial rent schedule should roughly equal the housing allowance, CBG/OFAB should move quickly to increase rents in step with house size and quality.

To better manage total housing expenditures, CBG should separate housing costs from municipal services and furniture costs. A charge for municipal services should also be

instituted, again with a matching allowance.

Given the very high production costs and high levels of consumption of water and electricity in company housing, the allowances for those two services should be set at target figures which promote conservation while being adequate to run a household. We would suggest an electricity allowance pegged to an electricity consumption of 1000 to 1200 KWH's per month (vs. a city wide average now of about 1550 KWH). The water allowance should be pegged to 50% to 60% of current average levels of consumption, which are running about 90 m3 per month per household.

Water and electricity rates should be set at actual costs of production and distribution (total operating and capital costs). This will involve some changes in current cost accounting practices, but is necessary to put the water and electricity systems on a sound financial footing. Furthermore, this should result in considerable decreases in consumption, which will save the company on both current operating costs and future avoided capital investments.

If these pricing measures do not result in the desired level of conservation, CBG/OFAB should consider imposing a rate schedule based on higher unit rates for higher levels of consumption. Indeed, since over consumption creates the need for more capital investment, CBG/OFAB would justified in imposing a differential rate schedule to penalize high consumption.

SUMMARY RECOMMENDATIONS

The company should introduce a rent schedule based on differences in floor area and quality. Rents should be set at the housing allowance level initially, but raised to recover an increasing proportion of true costs.

Charges for water and electric service should be imposed as described above, with concern for conservation and pricing at true costs.

4. FURNITURE PROVISION

Furniture replacement has become a major expense for the company in time and money. Consequently, the draft housing policy devotes much effort to spelling out the proposed policy. In essence, the proposed policy is to furnish furniture and major appliances under a lease/purchase arrangement with the company forgiving the purchase amount over a period years equivalent to the useful life of the individual items of furniture.

The new CBG/OFAB draft housing policy proposes a workable system for dealing with the furniture issue. However, it is not clear in the written policy if employees not lodged in company housing are eligible to purchase furniture. For equity reasons,

we suggest that access should open to all company employees.

SUMMARY RECOMMENDATION

Sale of furniture should be open to all company employees, under the terms stated in the draft housing policy.

CONCLUSIONS

The thrust of the recommendations is to introduce more equity into company housing policy while making more rational the system of allowances, rents, and charges for utility services. In addition, criteria for establishing allowance levels, assignment of company housing, and the general responsibilities of the company towards it work force needs to be more precisely spelled out. Without such clear guidelines, company policy will continue to be suspect by employees and open to abuse.

2.2 Recommended Housing Program

2.2.1. Program Description

We recommend that CBG institute a program of worker-owned housing in which the company assists in providing basic infrastructure, and makes available to workers (a) building materials sufficient to construct a small house ranging from 30 m2 to 50 m2; (b) small cash loans sufficient to hire necessary skilled labor to assist in the building (e.g., masons and carpenters); and (c) technical assistance in the construction. The institutional mechanism by which the company should carry this out is discussed in section 2.3. below.

The program should have two distinct applications:

- development of a subdivision at Kawass Village with a modest level of infrastructure

- modest infrastructure upgrading and house construction assistance to CBG workers in Kamsar Village

1. Kawass Village Subdivision

The 100 ha.site identified by the CBG Engineering Department is sufficient for 800 plots of 1000 m2 each, which allows for 20% of the total area to be left free for roads, school, market areas, and other public areas. Although the actual site plan should be developed later, we recommend a cluster development with 8 houses in each cluster, served by two wells, or water stanpipes (depending on which type of water system is selected.) This arrangement is in keeping with the typical housing cluster arrangement normally found in local villages, and indeed in Kamsar Village.

The development should proceed on two tracks: (1) basic infrastructure construction (plot demarcation, road and drainage system construction, and, if a piped water system is selected, installation of the main water lines) and (2) housing cluster development, which consists of well, or standpipe, installation and the construction of individual houses.

The 800 plots should not be developed all at once, but in stages of 200 plots. This will spread out the infrastructure costs and allow the program to smooth out operating procedures over time.

House size will vary from 30 m2 to 50 m2, depending on the needs of the worker and his ability to repay the loan. The actual house construction will be something of a "joint venture" between the owner-occupant and the housing development agency. The agency will provide materials; provide alternative house plans; perform site engineering (house location, site grading,

and foundation layout); provide training in basic building skills and sub-contracting; advise owner-builders on selecting and supervising local artisans; and provision of limited financing for artisan labor costs. The owner-builder will take financial responsibity for all materials and loan funds received and be responsible for actual construction of the house.

The materials and construction labor loan will be treated as a loan with a repayment schedule developed like a conventional mortgage with a recommended repayment period of 15 years at the actual rate of interest that CBG acquires the funds. Financing is discussed in section 2.2.2 below.

We recommend that the construction process on each house be carried out in four steps, with materials and financing provided for each step after on-site inspection shows that the previuos step has been completed. The four steps are:

- completion of foundation and floor
- completion of walls
- completion of roof
- installation of windows/doors and completion of all finish work

Since diversion of materials from the program to the "parallel market" is of concern to the company, the pricing of materials in the four "tranches" described above could be skewed to make the prices charged for the first and second tranches more expensive than the prices in the third and fourth tranches. For example, if the true value of materials in each tranche is 25% of the total, the first tranche could be priced at 40% and the second at 35%. This may not discourage diversion of materials entirely, but it does impose a financial incentive not to divert materials.

2. Upgrading Program in Kamsar Village

In addition to the subdivision development at Kawass Village, we recommend that infrastructure upgrading and house construction assistance be provided to CBG employees who elect to live in Kamsar village. Since a number of CBG employees apparently already own housing or building plots in the village, some provision should be made for them.

The house construction assistance should be provided under this alternative on the same terms as described above. The major difference from the subdivision approach above is that roads and drainways will have be provided in Kamsar village along already established "thoroughfares". These roads and drainways will serve the entire village, not only CBG employees. This means that the method of financing will have to be somewhat different from that possible in the subdivision.

The roads and drainway upgrading should be at the level of the proposed subdivision: gravel roads (10 cm laterite) and earthen drainways. Septic systems and protected wells (concrete aprons and handpumps) would be included as part of the individual house construction packages.

2.2.2 Estimated Program Costs

The program costs are divided into (1) administrative costs, (2) infrastructure costs, and (3) individual house construction costs. Following a discussion of these cost elements, a discussion of financing options is presented.

1. Administrative Costs

The program should have significant costs of administration, given the logistical requirements and technical assistance needs. Based on the technical requirements alone, the program will require the following staffing:

1. Director and financial officer (1 professional)
2. Materials Supply and Distribution (2 professionals)
3. Field Engineer/Architect (2 professionals)
4. Administrative/Secretarial (1)

There are several options for staffing the program. CBG may second some professional staff, at least initially to start the program. Guinean professionals may fill some positions if they have the necessary experience in similar housing programs. Prior experience, for the top positions, is deemed critical. The Director should be fairly senior and very experienced in sites and services programs. One of the Materials Supply positions and one of the Field Engineers should also have considerable field experience. The other two positions can be filled by persons with relevant training and some field experience.

In order to estimate the administrative cost of the program, we hasve assumed that all positions will be filled by expatriates initially. This assumption was made in order to determine the maximum cost for administering the program. It is expected that actual administrative costs can be lower. Figure 2.2.1 shows the cost estimates of the Program administration per year, assuming a multi-year program.

2. Infrastructure Costs

The capital costs of infrastructure are shown in Figure 2.2.2 for the Kawass subdivision and the Kamsar Village upgrading. For

Figure 2.2.1 Program Administrative Costs*

Labor Costs	Base Salary	Incentive	Overhead	Total/yr.
Director	$40,000	$10,000	$25,000	$75,000
Logistics Supervisor	36,000	9,000	18,000	63,000
Engr. Superv.	36,000	9,000	18,000	63,000
Logistics Jr.	25,000	6,250	16,000	47,250
Engr. Jr.	25,000	6,250	16,000	47,250
Secretary	15,000			15,000
TOTAL LABOR				$310,500

2. Other Direct Costs	
Office space (inc. utilities & furniture)	$25,000
Vehicles 4 at $2500 ea./yr over 4 yrs.	10,000
Vehicle Operating costs $100 ea./mo.	4,800
Communications & misc.	15,000
Travel (international)	20,000
Warehouse Space	0
TOTAL ODC	$74,800
TOTAL ADMINISTRATIVE COST PER YEAR	$385,300

*Assumes staffing with all expatriate professionals

Figure 2.2.2 Recommended Program Infrastructure Costs

1. Kawass Subdivision

		Total/200 hses
Gravel Roads	2700 m at $25.50/m =	$68.850
Drainways	5400 m at $2.00/m =	10,800
Wells	50 at $900 ea.	45,000
Septic tanks	200 at $825 ea.	165,000
TOTAL		$289,650

2. Kamsar Village Upgrading

		Total/Village
Gravel Roads	5000 m at $25.50/m	$127,500
Drainways	10,000 m at $2.00/m	20,000
Wells & septic tanks (inc. w/ house cost)		0
		$147,000

the Kawass subdivision, costs are shown in terms of the 200 lot staged development. For Kamsar Village, the entire road and drainway construction is presented. The estimates of infrastructure costs are based on the per house costs presented in Appendix A.

3. Individual House Costs

Individual house capital costs are based on the estimates presented in Appendix A. We are assuming a cost per square meter of $150.00 which produces a range of house construction costs from $4500 (30 m2 house) to $7500 (50 m2).

4. Financing the Program

The major variable in the program's financing is the extent to which CBG wants to underwrite the program and the limit of individual employee debt liability that can be allowed. For equity reasons, CBG's contribution should probably be limited to the housing allowance mechanism. In addition, CBG may contribute to certain initial costs such as provision of the basic infrastructure and/or the administrative costs. However, this would represent a subsidy that is not shared equally by all company employees.

Financing of the administrative costs of the program raises some additional issues. We suggest that the housing development agency consider recovering its administrative costs through surcharges added to the cost of building materials. This practice is already used by CBG for third party sales of materials in which a 60% charge is added for administrative costs and local taxes. Given the very high costs of building materials on the "parallel market", such a surcharge should be acceptable. A 30% surcharge on materials would increase total housing costs by about 16%.

The impact of this surcharge is shown in Figure 2.2.3 which shows the total costs of the two house sizes, amortized over a fifteen year period at an interest rate of 13%. The figure also shows the impact of a GS1000/month housing allowance on th total payment of the homeowner participating in the program.

In summary, the figure shows that CBG, with the GS1000 allowance would be subsidizing about one half the housing payment on the 30 m2 core house and about one third the payment on the 50 m2 house. The residual amount to be paid by the CBG worker is within the affordable range for the 30 m2 house and almost within range on the 50 m2 house.

Figure 2.2.3 Monthly Costs of Housing Loan Program
Recovering All costs

COST ITEM	CORE HOUSE (30 m2)	HOUSE (50 m2)
Infrastructure/hse	$1507	$1507
Lot*	1000	1000
House Cost		
Materials	3750	6250
Purchased Labor	750	1250
Admin. Surcharge		
(30% of materials)	1125	1875
TOTAL COST	$8132	$11882
Mortgage Payment/month (Assuming 15 yrs at 13% interest rate)	GS 2097	GS 3064
Less CBG Housing Allowance	GS 1000	GS 1000
Net Cash Payment by Worker per month	GS 1097	GS 2064

*Lot price may not be charged depending on how land is acquired.

2.3 Program Implementation Options

The above analysis and program description suggests that CBG/OFAB should abandon current shelter practices and adopt the approach outlined in Option B. A number of key tasks must be accomplished, as summarized briefly below. A discussion of the two institutional approaches that could be employed to accomplish each task follows that discussion.

In order to improve the shelter conditions in the Kamsar region, the responsible institution would have to:

1. develop the infrastructure and housing sites

2. administer the housing finance programs

3. monitor the importation, distribution and utilization of materials needed to build new houses and/or upgrade existing ones

4. implement new house construction or upgrading

5. train nationals in culturally appropriate and practical home-building techniques.

CBG/OFAB could accept the responsibility for implementing all these tasks, or the company could participate in the establishment of a local housing authority (HA). Initially the HA would carry out a few selected tasks; in time, with experience and acquired expertise, the HA could discharge all of the tasks. There are advantages and disadvantages to each institutional approach.

2.3.1 Implementation Plan 1: CBG/OFAB Housing Program

If CBG/OFAB continues to carry primary and total responsibility for the housing program in the Kamsar region, the tasks would most likely be executed in a more timely fashion than the alternative would suggest. In addition, CBG/OFAB would ensure quality control of house construction, site development and infrastructure establishment, and be able to guarantee that all workers will benefit from the housing assistance program.

On the other hand, CBG/OFAB's total control of the housing program would require the company to increase its social service activity and to face the prospect of incurring high and ever-escalating costs in order to meet shelter demands. Development of a more extensive shelter program would likely dilute the production focus of at least two departments at CBG: Engineering and Construction. In addition, CBG/OFAB's direct involvement would perhaps allow the Government of Guinea to avoid or to delay meeting its responsibility to serve the total population.

Control by CBG/OFAB would make it difficult to introduce housing standards that are different from those already in place in Kamsar town. High visibility by CBG/OFAB would also likely prolong the current practices in shelter provision by which beneficiaries are served but do not actively participate.

Finally, any approach in which CBG/OFAB controls all facets of the program does not encourage the development of local entrepreneurial activities in the shelter sector. In the light of the recent change of government, and the prospect for adopting new approaches for developing Guinean society, it would be useful to propose new practices in shelter design, construction and financing that could have a significant impact on regional development.

2.3.2 Implementation Plan 2: Kamsar Housing Authority

The alternative implementation plan calls for CBG/OFAB to assist in establishing a housing authority (HA) that would initially be responsible for home financing, building and local training. In time, the HA would discharge all the tasks mentioned above. The staffing of the HA is described in Section 2.2; the advantages and disadvantages of this approach are outlined below.

The HA would be developed in two phases. During the first phase the HA would: (1) build and upgrade culturally appropriate, affordable houses, (2) monitor the control and use of building materials imported by CBG/OFAB, (3) finance house construction and ownership, and (4) train local builders and craftsmen. In phase 1, the transition phase, CBG/OFAB would help to incorporate the new company, recruit personnel and provide a loan in the amount needed for operating capital. CBG/OFAB would import and supply the building materials at cost to the HA, and continue to develop appropriate levels of infrastructure at the housing sites, for which it would be reimbursed.

In phase II, the HA would be responsible for the importation and distribution of building materials and for house site and infrastructure development.

Unlike Implementation Plan 1, the advantages and disadvantages of Implementation Plan 2 must be reviewed in terms of their impact on a number of actors in the shelter sector: CBG/OFAB, the GOG, the HA and the workers.

It is suggested that this approach would allow CBG/OFAB to ensure greater equity in the housing program while fixing expenses per worker for housing and reducing recurrent costs. Given the current formula for distributing CBG profits between the GOG and the B partners, CBG's investment in housing and infrastructure is borne 65% by the GOG and 35% by the B partners; therefore, the GOG would have a vested interest in ensuring that

infrastructure design is economical and installed in the most cost-effective manner.

The HA would be a new enterprise in the region. It would contribute to local and regional development and offer new employment opportunites for a range of local craftsmen and managers. In addition, it would be able to train Guineans in skills that are more quickly learned than those in demand at CBG/OFAB, and which are in great need throughout Guinea. Finally, the HA would focus on shelter concerns alone and be able to respond immediately and fully to the Guinean demand for affordable housing.

Under this approach the worker would be an active and involved participant in the site development and home building tasks. As suyggested elsewhere, the individual homeowner would have a major responsibility for safequarding the house site and the building materials, meeting his mortgage obligations, and constructing his house. Finally, and most importantly, the worker would have a clearer comprehension of the benefits and costs of home ownership and be able to make better informed investment decisions by relating his housing needs to his income level.

While there are signficant advantages, there are some potential drawbacks to Implementation Plan 2. These should be reviewed. It will take some to establish the HA. During the period of establishment, shelter demand will likely increase. Shelter is already in short supply. Additional delays in launching a building program may be unacceptable to non-housed CBG/OFAB workers. If this implementation approach is recommended, some interim action will have to be taken to respond to the needs of the non-housed workers.

The advantages to CBG/OFAB, the GOG and the region are apparent. However, the worker may not initially accept a shelter program proposing standards different from those in Kamsar town. Individual home ownership is highly desired but it is not certain that the workers will accept housing that has infrastructure and construction standards signficantly different from traditional company housing. While this approach represents a more equitable and affordable shelter program, there may be some resistance to accepting the proposed standards. At the same time, since it is the HA and not CBG/OFAB that will be responsible for the shelter program, the standards may be seen as appropriate.

A review of the advantages and disadvantages of both plans would recommend the adoption of Implemention Plan 2. Although not without difficulties, this approach seems to promise a long-term solution fo the shelter needs of the region while actively involving all who are concerned about the problem -- namely, CBG/OFAB, the Government of Guinea and the residents (workers and non-workers) of the region.

2.3.3 Summary Implementation Plan

Analysis of the implementation options emphasizes the importance of establishing an independent housing authority to carry out the housing program in Kamsar. While it is premature to define the authority in detail, it is timely to suggest the outlines of the constitution of the HA, the administrative structure and the initial implementation schedule.

CONSTITUTION

It is suggested that the HA should be organized along the lines of a not-for-profit organization and composed of representatives with a vested interest in shelter programs in the Arrondissement of Kamsar. The Board should have representatives of the GOG, CBG, OFAB, as well as one or two individuals who have special expertise in housing and sites and services programs. Initial capital for the HA would be provided by CBG. The amount would be equivalent to, or a portion of, the HG loan accepted and guaranteed by CBG. Whether CBG should pass the HG loan to the HA under the same or different, less expensive terms, needs to be discussed.

ADMINISTRATIVE STRUCTURE

The skills levels and number of persons needed to staff the HA are set forth in Section 2.2, along with an estimate of the salaries and allowances (housing, vehicles, etc.) required. The estimates are based on the assumption that ex-patriates would initially be hired for all positions. These costs are for illustrative purposes and presented to give an estimate of the maximum expense that could be incurred. Naturally, costs could be cut if the salary levels can be reduced.

It should be kept in mind, however, that this is a new and untried undertaking in Guinea. The scrutiny given the housing issue in Kamsar suggests that investments in the program should be at levels necessary to ensure success. Implemention of a housing program within the context of a large, well-established and quite efficient operation like CBG has been fraught with difficulties. Worker demands for access to housing, their memories of past disappointments and frustrations, and expectations of the content of the program should prompt CBG to make every effort to recruit and support the manpower required to launch and operate a successful, independent housing authority.

INITIAL IMPLEMENTATION SCHEDULE

Developing the initial schedule of implementation must take account of the time required to recruit staff and the lead time needed for ordering ansd shipping of materials. In addition, the schedule must account for the impact of the rainy season on construction between June and November.

We may assume a six month mobilization period in which staff are recruited and relocated to Kamsar. We may also assume a six month lead time required for materials to be ordered and shipped to Kamsar. Under these assumptions, for construction on houses to begin by February of 1985, the initial shipment of materials must be ordered by August 1984. Similarly staff recruitment must begin in the summer of 1984 in order to have even a skeletal staff operating by February 1985.

The time constraint on staff recruitment suggests that CBG will have to second some of its staff to the program in order to begin construction in the winter of 1984-85. The time requirements for infrastructure construction are less severe than those involved in the ordering of materials or in staff recruitment. Infrastructure construction can proceed on a piececmeal basis in the proposed subdivision, since the road network is the only element of infrastructure that needs to precede house construction . Furthermore, road construction needs to precede house site preparation by only a matter of weeks. Since CBG will be constructing the roads with equipment already in place in Kamsar, that construction can begin at any time convenient to the CBG Construction Department.

On the basis of the above stated assumptions, wehave developed an implementation schedule for the first year of the program, shown in Figure 2.3.1. The schedule presented in the Figure will require some fine tuning, once the particulars of the actual program are made firm. However, the schedule does not allow for much slippage if house construction is be started before the rainy season begins in June 1985.

Figure 2.3.1 Implementation Schedule
for First Year of Program

MONTH	ACTIVITIES
1984	
July	Order initial shipment of materials
August	Recruit Senior Staff
September	Formal opening of Program; selection of initial participants
October	Complete Subdivision Plans (1st Stage)
November	Site Engineering for Roads and Building plots (100 houses;
1985	
December	Begin Road Construction
January	Begin Training of first participants
February	Arrival of building materials; Begin house site preparation & well digging.
March	Begin House foundations (20 houses/mo.)
April	Continue house construction; start 20 more houses
May	Continue house construction at same level until rains stop work

APPENDIX A

INFRASTRUCTURE VARIABLES AND ASSOCIATED COSTS

ROAD CONSTRUCTION

Two basic standards of road construction have been used in this study. Class A paved roads are the standard in CBG/OFAB housing developments in Kamsar town. For sites and services, we assume a Class B gravel road; specifications for both classes are shown below.

SPECIFICATION	CLASS A	CLASS B
Road width	5 meters	5 meters
Rough Grading cost	$1.80/m2	$1.80/m2
Soil Compaction	$1.00/m2	none
Laterite Base (inc. materials & grading)		
10 cm depth		$3.30/m2
30 cm depth	$7.20/m2	
Surfacing type	rolled bitumen & gravel	none
Surfacing cost	$1.75/m2	
TOTAL ROAD COST	$11.75/m2	$5.10/m2
Concrete Curbing	$19.00/m.l.	none
COST PER LINEAR METER	$77.75	$25.50

DRAINAGE SYSTEM COSTS

Two standards of surface water drainways are included. Class A drainways are reinforced concrete in two sizes: (1) small with a cross section area of c. 1225 cm2 for residential streets, and (2) large with a cross section area of 4900 cm2 for feeder roads. Class A drainways are used in CBG/OFAB housing developments and the small lot option B2.

Class B drainways are earthen channels with sloping sides graded along both sides of the Class B roadway. Included is the cost of concrete culvert pipe for crossing roads and for driveways.

Class A drainways cost approx. $15.00/m (small size) and $30.00/m (large size) installed. Class B drainways cost approx. $2.00 per meter installed. Class B drainways will require regrading periodically. Class A drainways will require clean out periodically.

POTABLE WATER SYSTEM

Four basic alternatives for potable water system have been considered. Class A is piped water with individual house connections, an expansion of the CBG/OFAB treated water system. Class B is piped water to neighborhood standpipes (for each 8 houses), an expansion of the existing CBG/OFAB treated water system. Class C is the use of shallow wells (one per four houses) with protective concrete aprons at the surface, well cover and installed hand pump; well depth is ca. 15 meters, hand dug by local labor, no reinforcing of the well shaft. Class E is identical to Class D without the installed hand pump. This is the system found throughout Kamsar village today.

Note: capital costs of water treatment plant and off site distribution system is assumed to be recovered in imputed water rate of $0.46 per cubic meter .This is based on estimated least cost alternative for expanding current CBG/OFAB water system by 5,000 m3 per day. The imputed water rate includes operating cost and capital cost assuming 40 year useful plant life.

WATER SYSTEM COSTS

CLASS A

Trunk lines

Site A1:
434 m. at $17/m plus 1,854 m. at $12/m = $29,626 for 240 houses, or $123.44 per house. Contingency = 20%; total installed cost = $148.13/hse.

House Connections

$150 per house, installed.

CLASS B

Trunk Lines

Site B2:
624 m. at $17/m plus 1,854 m. at $12/m = $32,856 for 240 houses, or $136.90 per house. Contingency = 20%; total installed cost = $164.28/hse.

Sites B3 & B4:
814 m. at $17/m plus 2304 m. at $12/m = $41,486 for 240 houses, or $172.86 per house. Installation = 20%; total installed cost = $207.43/hse.

Standpipe Connections

$300 per 4 house grouping or $75 per house; installation = 20%; total installed cost = $90/hse.

CLASS C

Well (15 m.) with concrete apron and cover = $750 per 4 houses.

Hand pump = $150.00 per 4 houses.

Total = $225.00/house.

CLASS D

Well (15 m.) with concrete apron and cover = $750 per 4 houses, or $187.50 per house.

SEWAGE SYSTEM

Two basic alternatives have been examined in the study: (a) CLASS A: network of sewer pipes (outfall) connecting individual houses in option A to existing pump station; (b) CLASS B: installation of prefabricated cess tanks under privies which would be emptied periodically by collection trucks. Additional options which have been identified, but not costed, include (1) a composting privy and (2) a system of small diameter (10 cm) PVC pipes carrying the water effluent from the cess tanks into nearby "marigots".

The selection of a sewage system is interdependent with the selection of the water system. If wells are used for potable water, a sewage system that does not allow ground water pollution is essential.

SEWAGE SYSTEM COSTS

CLASS A

Connecting lines (house to secondary mains) at $120/hse; secondary mains, 1854 meters at $20/m = $37,080 for 240 houses, or $154.50/hse; primary mains, 834 meters at $60/m = $50,040 for 240 houses, or $208.50/hse. Total = $363.00 per house.

Estimate does not include any amount for expansion of pumping station.

CLASS B

Prefabricated cess tanks at $750 ea. Installation = $75; total cost = $825.00 per house.

Operating costs would include periodic pumping of contents and removal to composting or sludge drying ponds.

ELECTRICITY SERVICE

Two classes of electric service are used, with Class A service involving the placement of all cables underground in conformance with existing practices (Option A housing). Class B involves use of overhead cables on poles(Option B4 housing). Both Classes provide a capacity of 2 KVA to each house, which is sufficient for lighting, refrigerator and small appliances, but not air conditioning.

The estimated cost of providing electric service to Option A housing, which is an extension of the current housing development in Kamsar town, is based on actual cost of installation in the most recently built project, the "Y" houses constructed in 1980. Electric service was provided at a total capital cost of about $330,000 to 160 houses, or $2062.50 per house. Applying an inflation factor of 20% since 1980, we have an estimated cost for new electric service installation of $2475 per house under Option A.

For Option B4, the CBG Engineering Dept. has estimated that supplying electric service to the project site at Kawass Village, assuming the large lot layout, would cost at total of $443,000 for 504 houses, or $878.97 per house.

Both options will consume electricity at a price of about $0.12 per KWH, which has been computed by the CBG Engineering Dept. as the real cost (operating and capital) of power generation. Average consumption in Kamsar town is estimated to be 52 KWH's per day per house, based on comsumption figures provided by the CBG/OFAB generating plant. This produces a yearly consumption cost of $2277.60 per house. This figure includes all houses in Kamsar town, including all those with air conditioning. Since our two options are providing lower capacity to each housing unit, we have estimated an average load factor of 50% capacity, or 24 KWH per day. This produces a yearly cost of $1051.20/hse.

Appendix A (Cont'd)

Housing Costs

Estimates of housing costs are taken from two sources: (1) summary estimates supplied by the CBG Engineering Department, and (2) an independent estimate made by the authors based on material costs and labor.

1. Summary Costs Supplied CBG Engineering

A history of housing construction costs of CBG/OFAB units was supplied by the Department and is shown in Figure A.1. The estimate of housing costs for Option A are based on the 1980 cost of the "Y" housing units at $360/m2 (with inflation of 20% added for the period 1980 to 1984.)

The Engineering Department estimated that a partially owner-built house would cost approximately $150/m2 for any of several designs ranging in size from 75 m2 to 113 m2 (see Figure A.2).

2. Incependent Estimate of Option B Housing Cost

The reasonableness of the CBG Engineering Department estimates for Option B was confirmed by an independent estimate of materials and labor drawn up by the authors, as shown in Figure A.3.

Figure A.1 SUMMARY OF ACTUAL HOUSING CONSTRUCTION COSTS FOR CBG

Source: CBG Engineering Department

Cost per m² - Alternative "A"					
Model	Surface m2	Origin. cost	Cost m2 $	Date of construc.	Quantity
House B	150	46,000	307	1973	40
House C	135	37,750	280	1973	140
House X	106	55,000	550	1976	40
House XX	100	360 00	360	1978	10
House D	72	14,100	196	1973	247
House E	51	12,650	250	1973	191
House Y	70	25,000	357	1980	160
House Puutalo	104	-	-	1976	26

Figure A.2. ESTIMATED COSTS OF DIFFERENT SIZE AND STYLE OWNER BUILT HOUSES

Source: CBG Engineering Department

Type	Surfaces m2	Coûts	$/m2
MT 1	96	14 400	150
MT 2	78	11 700	150
MT 3	75	11 250	150
MT 4	87	13 050	150
MT 5	92	14 700	160
MT 6	113	16 850	150
MT 7	101	15 150	150

N.B. These prices do not include CBG taxes. They should be added.

Figure A.3 PROTOTYPE HOUSING COST

DIMENSIONS (in meters)	
LENGTH	8
WIDTH	6.25
NO. ROOMS	4

COST ELEMENTS

							TOTAL $
FOOTING	WIDTH	DEPTH	LENGTH	m3	COST/m3		
	.3	.1	42.75	1.2825	98		125.685
FOUNDATION		LENGTH	HEIGHT	AREA	BLKS/m2	COST/B	
		42.75	.4	17.1	12.5	.75	160.3125
WALLS		LENGTH	HEIGHT	AREA	BLKS/m2	COST/B	
		42.75	2.4	102.6	12.5	.75	961.875
LINTELS 20cm X 20cm X 120cm			NUMBER	COST/ea			
			12	15			180
FLOOR	AREA	DEPTH	m3	COST/m3			
	50	.05	2.5	75.1			187.75
RAFTERS	NO.	COST/ea					
	18	6					108
STRINGERS	NO.	COST/ea.					
	15	4					60
ROOFING	AREA	COST/m2					
	60	8.5					510
WINDOWS	NO.	COST/ea					
	4	25					100
DOORS	NO.	COST/ea					
	4	50					200
FRAMES	NO.	COST/ea					
	8	20					160
STUCCO	AREA	COST/m2					
	205.2	2					410.4
NAILS							100
SINK	NO.	COST/ea.					
	2	75					150
PRIVY							850

SUBTOTAL MATERIALS		4264.023
MISC.	.25 of materials subtotal	1066.006
TOTAL MATERIALS		5330.028
LOCAL TAX	.056	298.4816
SHIPPING	.2 of total materials	1066.006
SUBTOTAL		6694.515
LABOR	Rate/m2	
	25	1250
TOTAL PRICE		7944.515
PRICE/m2		158.8903

APPENDIX B

HEALTH CONDITIONS

1. Data Availability. The best data on health conditions in the Kamsar arrondissement of the Province of Boke are collected and recorded by the personnel of the Hospital at Kamsar. While these data suggest trends in illness patterns and treatment practices, they incorporate statistics on services given to more than the resident population. The hospital is a truly outstanding facility compared with other health care services in the region, the country and a good portion of West Africa. The hospital serves a large catchment area and service statistics capture demand for more than the region. The number of consultations per year -- 53,825 in 1983 -- would suggest that the hospital is serving a population almost twice as large as that actually resident.

The hospital staff does not have the capacity or authority to conduct surveys of health status of the resident population. There are, therefore, no surveys that give an impression of the prevalence of illness in the area.

Health statistics available at the provincial department of the Ministry of Health at Boke are incomplete and imprecise. Information on births at the maternities at Kolaboui and Boke comprise the largest database. Prevalence data on other conditions are sketchy at best. Since data on health conditions are incomplete, the information presented below is only a rough assessment derived from a review of extant records and visual inspection of the residential areas in the Kamsar area.

2. Social and Demographic Profile. The population of the Kamsar area probably represents the age and ethnic spectrum found in most oif the urban areas of the Republic of Guinea. While there are some differences in the census data recorded at the hospital and that kept at the government office, there is general agreement that the population of the area increased between 1977 and 1981, and that by 1981, the majority of people resided in the urban area rather than the countryside. Presently, 37,700 persons officially reside in the Kamsar district; more thn 19,000 live in the urban areas of Kamsar town, Kamsar village, Filima and Kawass. A breakdown by age and sex is not available. Indications are that 30-40% of the population is under 15 years old. Ethnically, the population is comprised of four major tribal groups -- Sousou, Malinke, Peul and Baga, who appear to reside side by side and intermarry quite harmoniously.

According to official census figures for 1977, the arrondissement of Kamsar had 27,160 inhabitants. The 1981 census records 37,688 residents. Both censuses distinguish between residents of Kamsar town and Kamsar village. In 1981, slightly more than 11,300 people were living in Kamsar town. The census

suggests that the annual rate of growth in both areas was on the order of 6% per year. This rate approximates the average annual urban growth rate for Sub-Sahara Africa estimated by The World Bank. Projection for Guinea and the Kamsar region indicate that the same rate of growth will continue through the end of the century.

While the growth rates for the two residential areas of Kamsar are similar, shelter conditions and the potential for future expansion differ significantly. Housing patterns in Kamsar village reflect the traditional residential practices of the local population. The village has large houses (100 square meters) and defined compounds where extended families reside. In addition, newly arrived, and generally younger workers are frequently housed and either pay rent or make some material contribution to the welfare of the household. In Kamsar village, the traditional cultural practices (e.g., polygamy) remain in force and the extended family provides all necessary social and economic assistance.

In Kamsar town, site of the factory and and company housing as well as all social services, shelter has been developed according to models familiar to Western Europe, Canada and the United States. The interior and exterior space arrangement is different from and smaller than the configuration familiar to the traditional African family. While the town's infrastructure services are well accepted and desireable, the space constraint requires the Guinean resident to modify traditional shelter and household practices.

Kamsar town seems to be a mixed blessing to the average Guinean worker in residence. While the household furnishings and infrastructure services are easily accepted, there is resistance to changing traditional familial practices and obligations. It is not surprising, therefore, to find considerable crowding in the housing of Kamsar town; residents frequently have more than one wife and many children and relatives, as custom requires. In addition, unlike the village, Kamsar town has a limited amount of space available for new housing construction.

Information obtained through interviews with residents suggests that shelter practices among the local population may be changing, albeit very slowly. This appears to apply more frequently tol those Guineans who are better educated and better paid than the average worker. Among those for whom housing in in greatest demand, desired family size appears to be largest and more space, not necessarily more service, is highly desirred. While only an impression, and one with little substantial data to support it, there seems to be an inverse relationship between education and income, and the desire to continue traditional family and household practices.

3. Migration. Given the average crude birth (47.5/1,000) and crude death rate (22.4/1,000) for Guinea for the years 1977-1981,

the natural annual rate of population growth is on the order of 2.5%. Migration, therefore, constitutes the largest percentage of growth in the Kamsar region.

Unquestionably, the economic activity of the district and the prospect of enjoying the benefits of living and working in the region draw many young people to Kamsar. Interviews with a small sample of workers confirm the in-migration trend and suggest that Guineans are traveling from every region of the country to work and reside in Kamsar.

Given the depressed state of the other sectors of the economy, especially agriculture, the current migratory pattern appears likely to contiue, at least in the immediate future.

Health Status. There are no prevalence and incidence data on traditional pandemics. Measures of health status can only be inferred from the records of the Kamsar hospital. These data document only a portion of the need for service in the Province of Boke, but probably do reflect a major percentage of the health services required in the arrondissement of Kamsar. Since the hospital data record sickness, and only for that percentage of the population who use the service, it is not possible to make attributions on health status to the whole population.

Unfortunately, the hospital has no data on the client's place of residence in Kamsar or the province. Since there is such a disparity between the infrastructure in the village and the town, it would be useful to guage the relationship between health status and the presence or absence of piped water and adequate sanitation measures. It is the impression of the hospital personnel that the majority of outbreaks of the traditional epidemics, e.g., malaria and parasitic infections, occur in the village rather than the town. Without thorough documentation, this cannot be confirmed.

Hospital data for the year 1981-1983 records increasing demands for service and high utilization rates of the periatric and maternity services. The ratio of outpatient visits per person served suggests that Guinean clients are adopting health care utilization practices (2-3 visits per illness incident) common to Europe and the United States rather than continuing the one visit/illness practice common in most of Sub-Sahara Africa. High rates of utilization increase demands on hospital services and imply increasing annual recurrent costs. There are no data on cost per client by illness.

The table below summarizes the four most frequent conditions diagnosed and treated at the hospital for the period 1981-1983. Since data for 1982 are incomplete, only the percentage increasee/decrease over 1981 levels is noted.

Four Most Frequent Conditions at Kamsar Hospital, 1981-1983

	1981 Jan-June	1981 July-Dec	1982a Jan-June	1982a July-Dec	1983 Jan-June	1983 July-Dec
Births	1,229		1,337		1,393	
Malaria						
0-11 months	129	347	91	51	274	182
1-4 yrs	375	895	204	108	861	530
5-14 yrs	696	416	316	142	620	792
Respiratory illness						
0-11 months	1291	1286	924	444	668	751
1-4 yrs	2231	3464	2184	1094	2221	1899
5-14 yrs	949	1342	935	567	1043	849
Gastro-intestinal illness						
0-11 months	225	275	145	125	401	353
1-4 yrs	429	464	316	173	951	1012
5-14 yrs	541	482	410	208	1122	887

a. There are no data available on services for the 4th quarter of 1982.

Percentage Change in Service: 1981-1983

Births	14
Malaria	15
Respiratory illness	(30)b
Gastro-intes. illness	89

b. The percentage decline in the number of cases with respiratory complaints in period does not correspond to overall service trends. Changes in the system used to code illness masy account for the irregularity in the trend.

c. While a higher service utilization rate would be expected in the rainy season (July to December), none is noted.

4. Environmental Conditions. There is a great disparity between environmental condtions in Kamsar town and Kamsar village. Houses in town has piped water and waste disposal systems, as well as well-guttered roadways and regular solid waste pick-up. In contract, houses in the village and surrounding areas rely on hand dug wells for water and pit latrines for waste disposal., All too often the wells and latrines are located very close to one another, a practice that increases the possibility of contamination. Roads in the village are unpaved and ungraded. Rain and household wastewater from the kitchen frequently run to

stagnant pools that become breeding sites for mosquitoes. Solid waste in large quantities is prevalent in the village. While household compounds are clean, roadsides and vacant land are littered with organic solid waste that is ideal feeding material and breeding sites for rats, flies and mosquitoes.

While there are no studies on the prevalence of disease at Kamsar village and Kamsar town, visual inspection of both sites would tend to suggest that, on average, residents of Kamsar town are healthier than the village dwellers.

APPENDIX C

WORKER PREFERENCES

An informal worker preference survey conducted among housed and non-housed workers has helped to elucidate the worker perceived advantages and disadvantages of Option A versus Option B.

Option A. Option A perpetuates the paternalistic system whereby the company offers housing and services to workers as long as the worker produces for the company. Upon retirement, the worker must leave company housing; freuently, the worker has little equity available to ensure family security.

Company-built housing has not always responded to worker preference with regard to housing style, lot size, needs for ventilation protection from the rain. Moreover, providing piped water and electricity at no cost to the workers has raised expectations on the acceptable level of services and increased the perceived disparity between those who live in CBG/OFAB housing and those who do not. CBG/OFAB houses are assigned to workers according to job category, irrespective of whether the assigned house type fits the realneeds and aspirations of the family. Workers perceive inequities in housing assigned in this fashion. In addition, an individual assigned to one housing type may not be able to move to another housing type to which he is entitled following a work promotion. Option A would likely exacerbate existing tensions.

Option B. On the other hand, Option B would allow the development of a worker community corresponding more closely to the social and spatial patterns which have emerged in Kamsar village. Housing currently being constructed on the periphery of the villaage clearly exhibits many of the housing preferences and needs expressed in the informal worker housing survey. Offering more choice in housing size and style, Option B, would satisfy preferences for large, worker-owned homes containing several rooms, surrounded by a moderate-size garden and provided with infrastructure services perceived as adequate.

There is a preference for large, permanent homes rather than worker-owned homes of a modest size -- one or two rooms (bedroom and living room). This preference is in effect even when a worker is relatively young, have only one wife and a few children. The large house is desired because space is always fully occupied. In the early years of a marriage, the house may have the worker, one wife and children, and many relative from both sides of the family. As other wives are taken and more children born, relatives are distributed among other family homes wherever space is available.

Workers expressed a preference for a moderate-size garden around the house. The garden is used for vegetable growing and

houses small domestic animals, such as chickens and goats. Workers with higher socio-economic status than those who are the primary taget group for the housing assistance program appear to prefer smaller gardens devoted to flowers. In general, agriculture produce for domestic consumption would be grown on a larger tracts of land not immediately adjacent to the house and lot. In general, people did not want a home garden that was too large to maintain easily after workhours.

Workers were asked whether piped water or electricty was the more essential service. Electricty was cited as the preferred service, almost without exception. Several reasons were given for this preference. Workers mentioned that they were accustomed to drawing well water and would not object to continuing this practice. They felt that water was readily availalbe in individual home wells, placed close to each house. This is already the case for much of Kamsar village. In the most densely populated areas, several unrelated families currently use one well and one latrine; preference is to reduce this usage to one well and latrine per family compound.

Electricity, on the other hand, was greatly desired. Those interviewed considered it an injustice that people living in Kamsar town and earning the same or, in some cases, less than others had electricity; those in the village had none. Workers see electricity as necessary for running appliance (radios, kitchen appliance, tape recorders, etc.), and producing light at night for reading and children's study. Safety from snakes at night was also mentioned. Although a social status symbol, air conditioning was not highly valued. In fact, people felt that the change from indoor cold to outdoor heat was unhealthy and a cause of upper respiratory problems. Kerosene lamps were seen as a bother, since the glass breaks frequently, or even dangerous, because children often tip them over and drink the kerosene. Since workers must purchase the lamps and kerosene, this light source is perceived to be more expensive than electric light which is provided free by CBG. Without electric stoves workers must also purchase firewood or charcoal for cooking.

In addition to gauging worker preference for housing and infrastructure, the informal survey asked for open-ended comments on other felt needs.

Increased salary and increased opportunities for income generation outside the private CBG/OFAB sector were mentioned. Additional income would secure retirement and allow workers to provided for children's well-being and to meet obligations to the extended family. Familial obligations make individuals focus on housing and retirement security issues. It was suggested that opening the economic system in Kamsar would provide opportunities for private enterprise. Commercial ventures would rapidly develop and alleviate the income shortage and, perhaps, the pilfering of company stocks.

One worker noted that prior to the change in the government people perceived a keen difference between the income-generating opprotunities in Kamsar compared with other regions of the country. He felt there were more opportunities in Conakry, for example. With an opening in the national ecnomy, people in the Kamsar region could increase trade within the country as well as with neighboring countries. It was noted that CBG/OFAB workers already feel the ripple effect of increased trade.

Several workers mentioned the transportation problem in Kamsar. Many workers come to work by bus; others hitch rides with colleagues. When buses are not operating, and especially on weekends, people have no easy way to get the hospital or to visit friends.

Finally, certain concerns of women workers emerged during the informal survey. Women are concerned about child care for infants and pre-school children, breastfeeding and limiting family size. Presently, once pre-schoolers are weaned, they are sent off to live with relatives, or relatives are brought to the house. There was some interest in having a supervised nursery near the mother's place of work. This would facilitate childcare and breastfeeding. Mothers could visit the nursery during work hours to nurse their infants.

Women also expressed interest in controlling family size. While contraceptive pills have sometimes been available at the hospital, supplies have been irregular. The need for such materials was emphasized by two women who wanted fewer children and more time to care for those already born.