



Aided Self Help Housing in Africa

PREPARED FOR THE
AGENCY FOR INTERNATIONAL DEVELOPMENT

BY THE OFFICE OF INTERNATIONAL AFFAIRS

DEPARTMENT OF HOUSING AND URBAN DEVELOPMENT WASHINGTON D.C. 20410

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FOREWORD

Aided self-help housing in Africa has tremendous potentialities but relatively little has been accomplished in this field so far. Some governments have carried out modest programs either by themselves or with United Nations technical assistance, but little is known of the techniques applied or the degree of success achieved.

Starting in 1961, the Agency for International Development assisted in the organization and execution of three aided self-help projects in Africa which, though small, are worthy of recording. The countries concerned were Rhodesia, Zambia, and Mali.

Of the three, the project in Rhodesia is perhaps the most significant because A. I. D. technicians succeeded in promoting the idea of home ownership. Thus, Africans could purchase a house of their own in an urban area. The project is still in fine condition after years of occupancy and has become a popular landmark with the people of Dzivaresekwa.

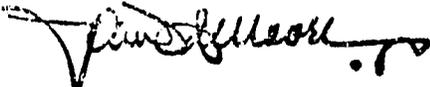
The Mali project at Djoliba was a rural aided self-help program demonstrating modernization of an existing village and the introduction of handicraft-type small industry to diversify its economic base. It was a success and is now serving as a training center for personnel in charge of additional rural development schemes.

The Zambia project was a training effort at the outset, teaching the people in rural areas the principles of aided self-help housing. Although only two houses resulted in the process, those who were trained went out to different parts of the country to train others who in turn trained still more. Thus, how many houses really resulted no one knows, but we hope they are still being built.

The Agency for International Development has since "phased out" these programs and has recalled and transferred its technicians to other areas. However, they left behind the visual evidence of their work and have planted useful ideas as seeds in the minds of their African friends and co-workers who will carry on the good work. The names of the technicians involved were as follows: in the Rhodesia project: J. David McVoy, Thomas R. Callaway, and Steven M. Staples (local staff); in the Mali project: Hermon S. Davis, Walter F. Evans, Thomas R. Callaway, Richard H. Slater and Phil D. Oviatt; in the Zambia project: Richard H. Slater. Summarizing their reports, this booklet was prepared by the Division of International Affairs, Department of Housing and Urban Development.



Osborne T. Boyd, Acting Director
Industrial and Urban Development
Service
Office of Technical Cooperation
and Research
Agency for International Development



James A. Moore
Director
Division of International Affairs
Department of Housing and Urban
Development

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AIDED SELF-HELP HOUSING IN RHODESIA

INTRODUCTION

This report outlines a general description of the objectives, organization, planning and implementation of the Aided Self-Help Housing Program as carried out in Rhodesia. At Dzivaresekwa Township, near Salisbury, 28 dwellings were constructed, following the completion of a prototype unit in Highfield Township.

The program, begun in October of 1961 and completed in 1962, demonstrated that urban families in Central Africa can build their own homes to a good standard, given adequate guidance and supervision. They could buy houses in an urban area and gain title by paying off a long-term loan secured by a mortgage. The land was made available by the Government on a 99 year lease. Though slower than conventional construction, due to part-time work by the owner/builder, the savings due to this volunteer labor were considerable. In addition, and perhaps more important, the members not only acquired new skills, but showed a marked increase in initiative and community spirit.

OBJECTIVES

The objectives of the self-help project were:

- a. To add to the existing stock of lower and middle-income housing in view of the acute shortage in the urban areas.
- b. To build homes at the lowest initial cost by omitting part of the cost of labor - that is, the labor provided by the builder-owners themselves.
- c. To train urban workers to assume more responsibility for managing their own affairs through home and land ownership.
- d. To train participants in technical and administrative skills.
- e. To develop community cooperation and responsibilities through cooperative group action in the building of houses.
- f. To establish a continuing Aided Self-Help Housing organization and program of home-ownership for Africans.

HOUSING SURVEY

As an aid to site and house planning a survey was made of a group similar to the one by which the houses were to be constructed. The kind of information sought included such data as family income, occupation, family size, tribal grouping, and desires and ideas concerning the layout of their accommodation. As account was taken of these factors and local social customs in the house design, not only were the functional needs of the prospective occupants better met, but their relationship with the organization was put on a basis of confidence.

The Design Data Survey was carried out at the Mbizo Township in Que Que, and involved families moving from slum conditions to newly constructed government housing. The group consisted of 32 families, who derived their income from 18 varieties of employment, including nursing, orderly, clerk, cook, railroad worker, postman, driver, laborer, policeman, domestic servant, and painter. The wide variety of employment types and income levels, as well as a great range of tribal backgrounds and length of time spent in the urban area made this group an ideal one for research purposes.

The 32 families represented 176 persons, giving a design base of 5 1/2 persons per household. Thus, family size and composition called for the necessary separation and privacy with the provision of 3 bedrooms. In the bedroom areas, a need for better ventilation and adequate storage was voiced. As a solution to crowding, the suggestion of bunk beds was generally acceptable.

A general desire was voiced for an internal kitchen rather than the partially open shelter usually provided. Children generally do not eat with parents, so that a separate dining area is necessary. Fully one third of the occupants ate in the kitchen shelter or a bedroom, indicating that the size of the kitchen needed careful study. The use of the living-dining room as a cooking area (as provided in government housing) was found to be unacceptable. Though solid fuel was found to be most used in cooking, kerosene units or open wood fires were often found as supplements, due to the small size of the stove normally provided.

In the WC/shower area, it was generally felt that some means of separation should be used, and that adequate light and ventilation were a problem. Due to the taboo related to the mother-in-law seeing the wife enter the WC/shower area, some means of screening this entrance was necessary.

As to lot size, most were willing to settle for a small normal plot (due to the cost of securing additional property) in spite of the need to grow vegetables - particularly corn. Twenty-nine of the householders owned bicycles, for which storage was needed, while all voiced the desire to eventually own automobiles and showed a distinct preference for off street parking.

Fencing was indicated as a necessity, the main reason being protection for children and livestock. Its use as a legal division of land was a secondary consideration.

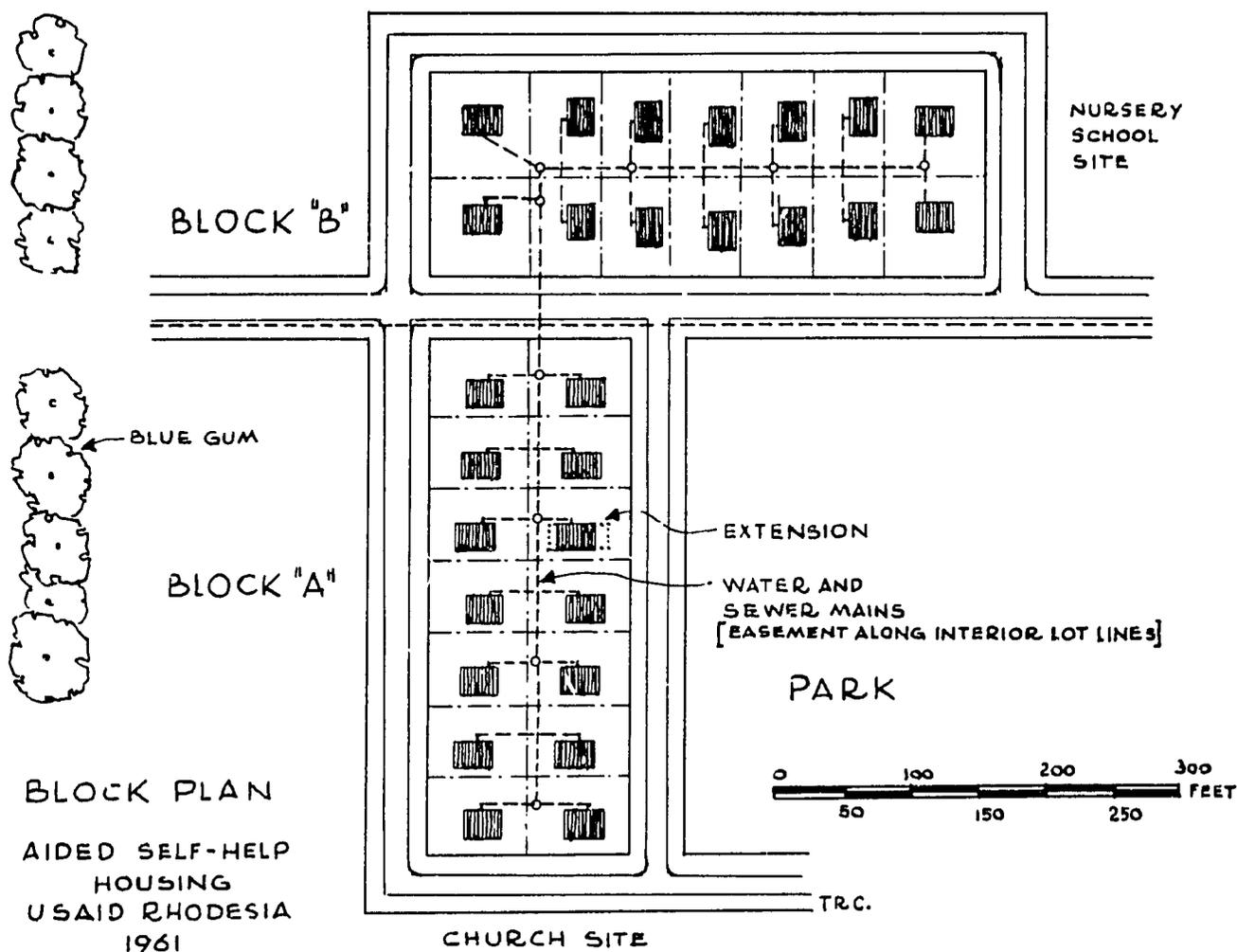
While the husband entertains his guests in the living area, the wife uses the kitchen or kitchen yard for this purpose, indicating a need for careful garden planning.

It was found that much of the social life of the community was centered in organized groups, with churches ranking high on the list. Also noted was participation in taxpayers associations and unions. Many travelled to other centers to attend meetings of their various organizations, indicating the need for intensive community planning and adequate institutional sites in any new township.

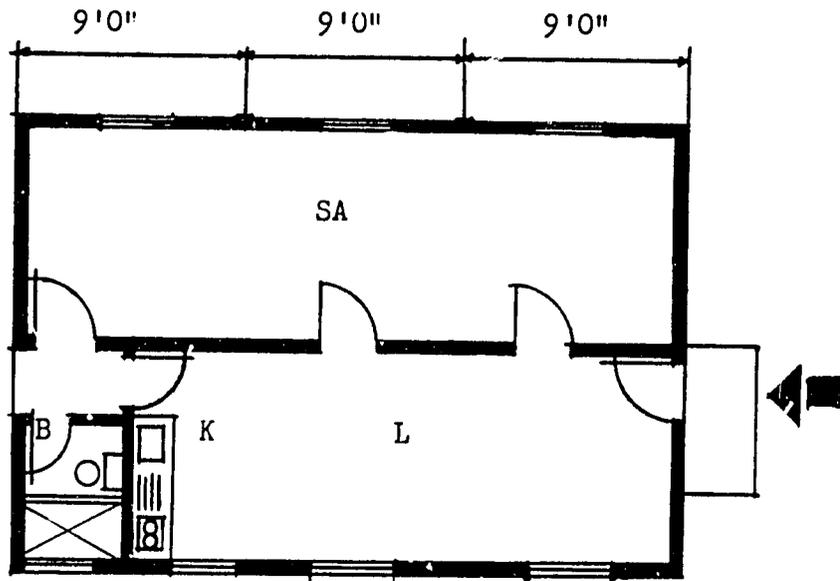
SITE PLANNING

The Aided Self-Help project was constructed as part of a new town, and most of the community facilities were planned for provision at a future date. Sites for schools, churches, community centre and limited shopping were incorporated in the master plan. At one end of the site was a plot for a church and at the other a nursery school was to be built. The dwellings enclose two sides of a park area and are on the outer edge of the residential area overlooking a small valley and windbreak of Blue Gum trees.

The relationship between lot size and shape, and the cost of services was investigated to determine the best layout obtainable for the amount of money available. The special nature of the self help method of house building, where pride in home ownership is one of the main objectives, meant that detached houses on their own lots were most desirable. To this end a lot of 70 ft. by 50 ft. was found adequate to ensure light and air, as well as room for expansion and gardening. (See Block Layout)



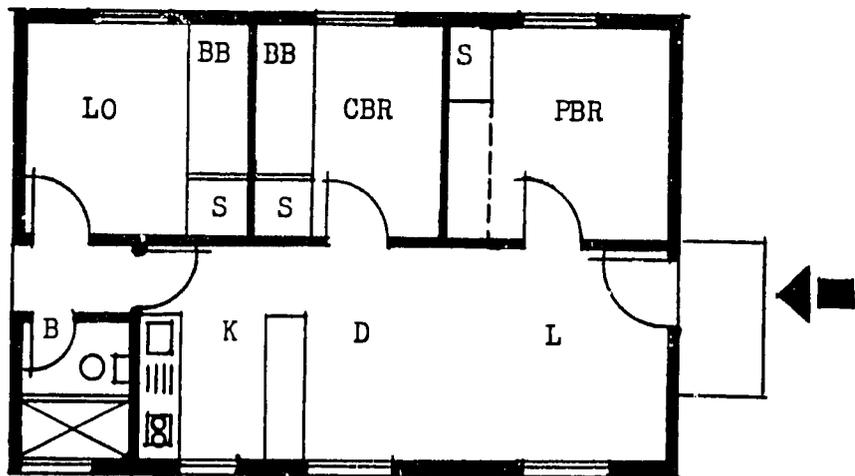
DZIVARESEKWA TOWNSHIP, SALISBURY



LEGEND

- L Living Area
- SA Sleeping Area
- K Kitchen
- B Bathroom
- D Dining
- PBR Parents
- CBR Children
- LO Lodger
- S Storage
- BB Bunk Beds

BASIC HOUSE SHELL 513 sq. ft.
 sleeping and living areas are not subdivided
 until after consultation with the family



BASIC HOUSE PLAN 513 sq. ft.
 suggested normal subdivision; movable
 partitions with built in bunk beds and
 storage and kitchen unit included in cost
 of house

HOUSE PLAN
 Scale: 1 inch equals 8 feet

The project site was near the temporary homes of the prospective owner-builders because the amount of time they could spend on the job was limited. In most cases they did not have to waste time travelling excessive distances to and from their residences.

DESIGN OF THE HOUSE

In designing the house the first and obvious aim was to provide as much and as good accommodation as the prospective occupants could afford. To get as much as possible out of the limited resources available meant arriving at a plan, simple in shape, which lent itself to easy construction techniques and to the use of simple durable materials.

A useful device in testing these factors was building a scale model and a demonstration house which allowed the prospective occupants to actually experience what was proposed and to make any criticisms and suggestions they had. These were incorporated in the final house plan as far as was reasonable and possible. Another benefit of the demonstration house was in training the supervisor and home building instructors in the construction methods to be used.

The plan evolved for the demonstration house (See basic house plan) and used at Dzivaresekwa took into account all possible information derived from the design data survey as well as discussions with individuals and groups of many types, and included the economic limitations relevant to the peoples' income. Some of its characteristics are listed below:

a. It has a separate and internal kitchen with all working surfaces at the normal convenient working height.

b. The dining and living spaces were provided in the same volume, but in order to allow for the local custom of children and adults eating separately, there was also dining space in the kitchen.

c. The average family size in the project and accepted occupancy standards indicated a minimum of three bedrooms. To increase privacy in these rooms latches were provided for the doors.

d. Storage space was provided in each bedroom and in the kitchen.

e. There are separate showers and WC compartments in the bathroom, allowing for greater traffic and more pleasant conditions than provided by the normal combined facility provided in government housing.

f. The entrance to the third bedroom was so arranged that the occupant has access to the bathroom without having to pass through the rest of the house. Thus, when this bedroom is occupied by a lodger, the family maintains its privacy and security in the rest of the house.

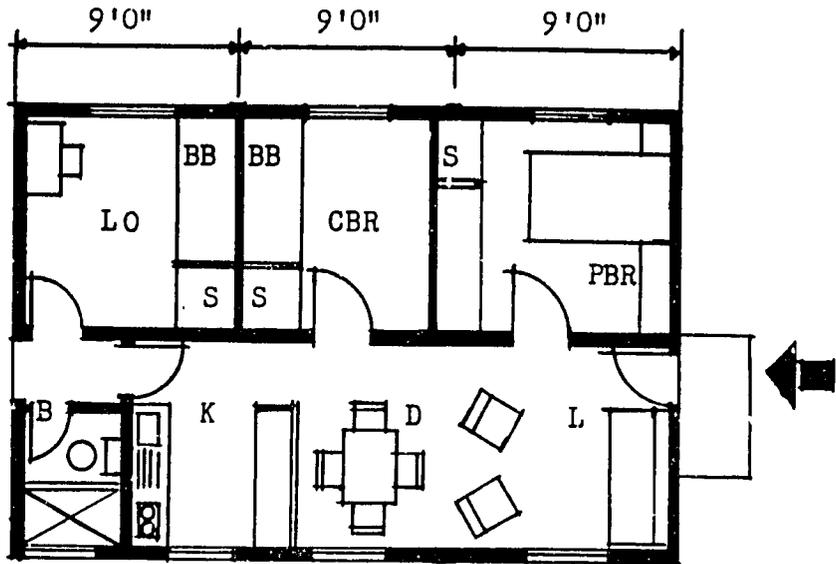
g. The use of light movable partitions allows for flexibility in internal arrangement, so that the accommodation can be fitted to individual family needs.

h. The house is expandable on the long axis at both ends with no disruption to the existing portion.

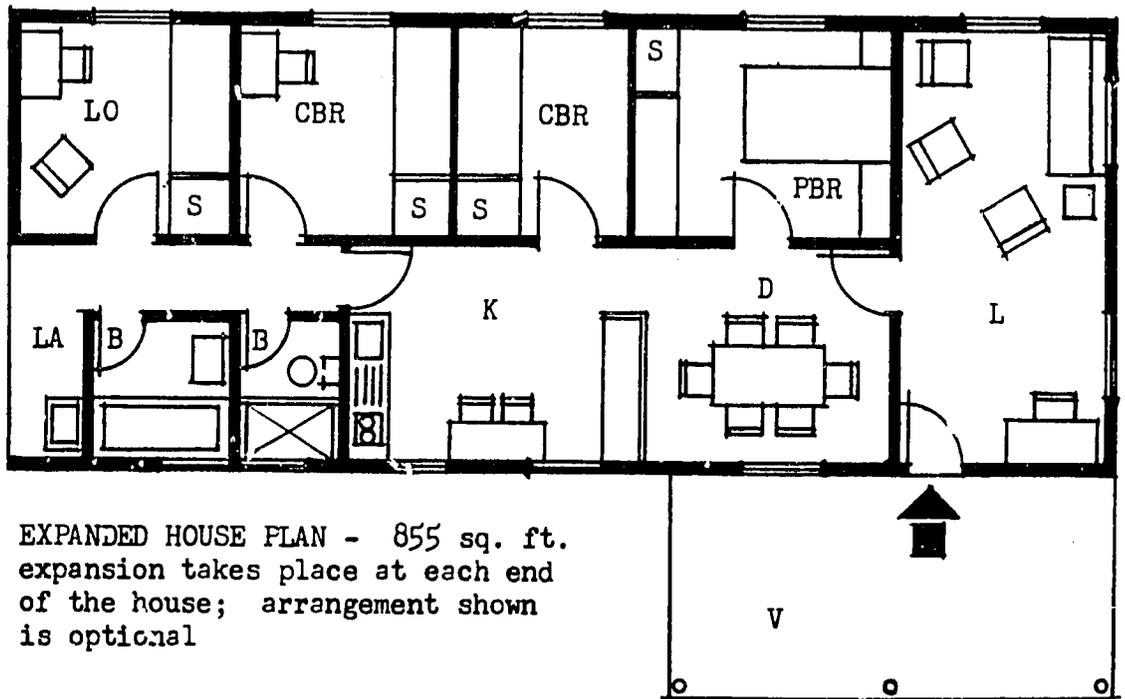
DZIVARESEKWA TOWNSHIP, SALISBURY

LEGEND

- L Living
- D Dining
- K Kitchen
- B Bathroom
- PBR Parents Br.
- CBR Children Br.
- LO Lodger
- LA Laundry
- V Verandah
- BB Bunk Beds
- S Storage



BASIC HOUSE PLAN - 513 sq. ft.
showing possible furniture arrangement



EXPANDED HOUSE PLAN - 855 sq. ft.
expansion takes place at each end
of the house; arrangement shown
is optional

HOUSE PLAN

Scale: 1 inch equals 8 feet

STRUCTURAL SYSTEM

Any structural system used for African lower and middle income housing should of course be as economical as possible, and the system used for self-help housing must be adaptable to unskilled labor under supervision. The system used at Dzivaresekwa Township involved the use of pre-cast reinforced concrete columns, cast on the site, and set on a 9-ft grid. This system allowed the use of a variety of materials for the infill walls. The columns, after having been set, were tied into stub piers by means of reinforcing bars (projecting down from the columns) which were hooked and tied to the reinforcing for the strip footings. The piers and footings were poured in one operation.

The next operation was roof framing, which consists of timber rafters spanning from the central to the outer row of columns, thus eliminating the need for built up roof trusses. Timber purlins were placed to receive corrugated asbestos roof sheeting. The exterior walls and spine wall at Dzivaresekwa are non-loadbearing and are constructed of site-made concrete blocks (18" long, 5" wide), plastered on both sides. The columns simplified laying up the block walls for unskilled builders since they acted as true and plumb guides. Wires were cast into the columns at block course levels to act as ties to the infill walls (see illustration).

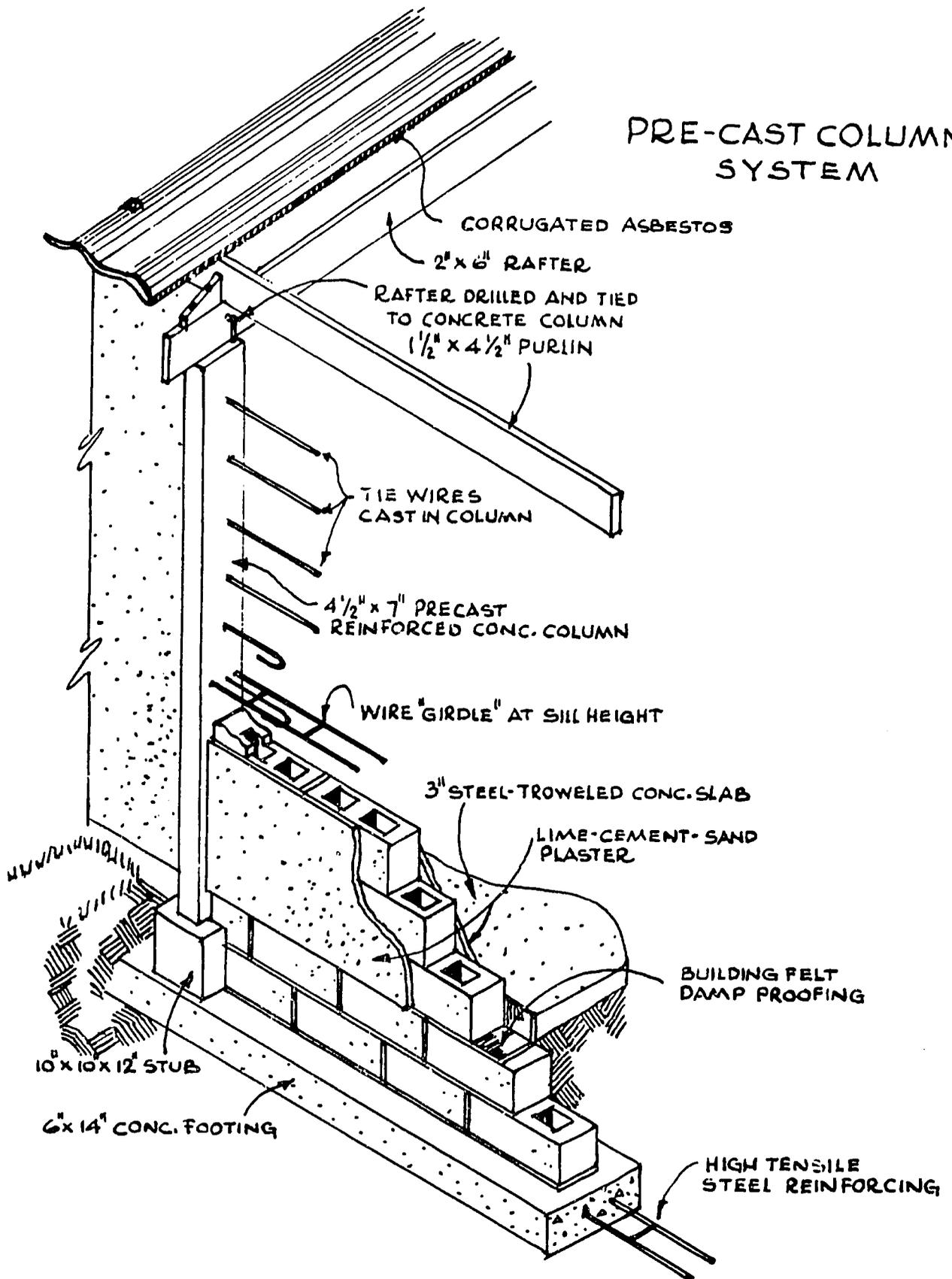
After the walls had been plastered, the floor slabs were cast and given a steel trowel finish. The final operations were the placing of the interior movable panel walls (which are 3/4" veneered chipboard), glazing and painting, and placing bunks and closet rods.

An alternate panel wall construction system uses expanded metal lath ties to the coursing wires projecting from the reinforced concrete columns and spiked to the purlins or wall plate at roof level. Two vertical steel angles, spiked to the purlin or plate and held by the foundation courses, take the windows and act as bracing for the lath. Plaster scratch coats are then applied to both sides of the lath and finished with skim coats to a total thickness of 2-1/2 to 3 inches. This system gives an extremely strong monolithic structure but its main advantage lies in cutting the construction time about 20% over the system used, while still being adaptable to unskilled labor.

Though actually demonstrated on site, the alternate panel wall system was rejected by the group as being reminiscent of wattle and daub, and thus representing a "backward movement" in standards. On the other hand, all were delighted with the system actually adopted, although more steps and thus more time and work were involved. This is an indication of the care which must be taken in planning for the needs and desire of a specific group and the desirability of allowing those concerned to voice their opinions at an early stage.

An alternate framing system could use lightweight steel columns instead of reinforced concrete. These columns may either be set in place and anchored directly into the floor slab (with outside edges thickened) when it is poured, or bolted to anchors which are set in the floor slab. Setting the anchors first needs a higher degree of skill than anchoring the columns directly into the floor slab. With this system steel rafters and purlins would probably be used for roof framing. The exterior and spine walls would use the lath and plaster system described above. The advantage of this system

PRE-CAST COLUMN SYSTEM



over the one used would be to cut construction time about 50% and yet still be within the capabilities of supervised unskilled labor.

Other structural systems which were investigated and could well be applicable in other circumstances include:

a. Reinforced concrete walls poured in place, which was rejected because a greater number of houses than planned is needed to write off the cost of the formwork.

b. Tilt up reinforced concrete panels cast on the site, which was rejected for the same reason as in (a). Both these systems would become economical when 100 houses or more are to be built.

c. Walls of rammed lime-stabilized earth, which is either rammed in situ or in blockmaking machines. This system was rejected by local government, although impact and water penetration tests showed it to be superior to the local bricks normally used in African houses.

The construction system at Dzivaresekwa Township worked out well and appeared to be easily handled by the unskilled workers under supervision. The great advantage of the system was in providing early shelter against the weather, since the roofs went on before the walls were built and the floor slabs cast. Most important, it gave the group members a morale boost by seeing their houses take shape quickly.

Concern was expressed regarding the care and security of building materials and tools. In spite of these warnings, materials were carefully handled and tools properly used. The care exercised was partly due to the emphasis placed on the fact that all materials and tools were chargeable to the cost of the houses. Therefore, each member treated them as though they were his own.

Starting in October 1961, construction of the 28 houses was not completed until 10 months later. However, for the first two months the project members were only able to work about 10 hours a week since the temporary government housing they were to occupy near the project site had not been completed. When this housing was completed, the average weekly hours moved up to about 20. The seasonal rains also hampered progress. However, in view of these drawbacks, the progress achieved was quite satisfactory.

COSTS

The total unit cost of the houses at Dzivaresekwa Township was £350 (\$980). This figure is divided into two parts; firstly, £300 to cover the cost of building materials, tools and equipment, the wages of the self-help building instruction staff, and other incidental costs; secondly, £50 to cover the cost of land, legal fees and contingencies.

These costs were financed by a 30-year government loan at 6-3/4% interest which is being repaid by the home builder-owners at the rate of £2.5.9. a month. Payment was begun only on completion of the dwellings.

A tax of £1.12.6 a month is charged to cover the capital and maintenance costs of township sewage, water and road systems. A complete and detailed cost breakdown follows below:

AIDED SELF HELP HOUSING PROJECT, DZIVARESEKWA TOWNSHIP,
SALISBURY, RHODESIA

COST AND MATERIALS BREAKDOWN

Note: £1 = \$2.80.

<u>ITEM</u>	<u>UNIT COST*</u>	<u>TOTAL COST</u> 28 Units
A. <u>Administrative Costs and Overheads</u>		
1. Wages - Program Supervisor 2 Building Instructors 1 Watchman	23. 4. -. .	650. -. -. .
2. Hand Tools and Equipment (Capital Cost)	10. 14. -. .	300. -. -. .
3. Water and Transport	2. 18. -. .	80. -. -. .
4. Concrete Mixer Operation and Maintenance	1. 5. -. .	35. -. -. .
	<u>£38. 1. -. .**</u>	<u>£1,065. -. -. .</u>
B. <u>Construction Materials and House Equipment</u>		
1. Reinforcing steel	2. 3. -. .	60. -. -. .
2. Brickforce	2. 6. -. .	65. -. -. .
3. Cement and lime	42. 17. -. .	1,200. -. -. .
4. Sand and gravel	26. 16. -. .	750. -. -. .
5. D.P.C. Malthoid	18. -. .	25. -. -. .
6. Ant poison	8. -. .	11. -. -. .
7. Roof frames	12. 10. -. .	350. -. -. .
8. Roof sheets and hardware	29. -. -. .	808. 11. -. .
9. Canopy sheets	15. -. .	21. 6. 9. .
10. Canopy hangers	17. -. .	24. -. -. .
11. Door and window frames	27. 16. -. .	778. -. -. .
12. Glazing	3. 6. -. .	92. -. -. .
13. Fly screen	7. -. .	10. -. -. .
14. Doors	10. 2. -. .	283. -. -. .
15. Latches	2. -. -. .	56. -. -. .
16. Screws	5. -. .	7. -. -. .
17. Wire and nails	1. 1. -. .	30. -. -. .
18. Paint	7. -. -. .	196. -. -. .
19. Creosote	17. -. .	23. 1. -. .
20. Plastic paint	10. -. .	14. -. -. .
21. Sinks	2. 3. -. .	60. 13. 4. .
22. Partitions (veneered alcolite and strip)	20. 16. -. .	582. -. -. .
23. Bunk beds (4 per house)	6. -. -. .	168. -. -. .
24. Stove, 2 burner kerosene (1 per house)	3. 18. -. .	108. 10. -. .
25. Fencing	2. 3. -. .	60. -. -. .
	<u>£206. 11. -. .**</u>	<u>£5,783. 2. 1. .</u>

COST AND MATERIALS BREAKDOWN (continued)

<u>ITEM</u>	<u>UNIT COST*</u>	<u>TOTAL COST</u> <u>28 units</u>
<u>C. Plumbing Fixtures, Materials and Installation</u>		
1. Water and waste system by Department of Engineering & Construction (in dwelling & on site work & materials)	£ 53.11. -. .	£1,500. -. .
<u>D. Construction Contingency</u>	11.10. -. .	321.17.11.
TOTAL ALL CONSTRUCTION COSTS	£309.13. -. .	£8,670. -. .
Less 90% recovery on Tools and Equipment	<u>9.13. -. .</u>	<u>270. -. .</u>
ADJUSTED TOTAL CONSTRUCTION COSTS	£300. -. .	£8,400. -. .
Land Cost	25. -. .	700. -. .
Legal Fees	15. -. .	420. -. .
Contingency	<u>10. -. .</u>	<u>280. -. .</u>
GRAND TOTAL ALL COSTS	£350. -. .	£9,800. -. .

* Unit cost is obtained by dividing Total Cost by 28 and rounding to nearest shilling

** The sum of all the items does not equal the total figure because of rounding

ORGANIZATION AND ADMINISTRATION

As the ultimate responsibility for an Aided Self-help program of the type carried out in Rhodesia rested with the Central Government, the normal arrangement would have been for the agencies whose areas were involved to act in an advisory capacity in matters of planning, construction, engineering services and procurement of material. In the case of Rhodesia, however, the Aided Self-Help organization operated as a semi-independent agency, reporting directly to the Ministry of Labor, Social Welfare and Housing. For purposes of bookkeeping and use of government bidding procedures in materials procurement, contact was maintained with the Engineering and Construction Agency of the Rhodesian Government.

Equipment for the project, in the form of a Land Rover truck, an automobile, a two-wheel trailer and a small gasoline-powered concrete mixer, as well as a fund for the purchase of hand tools, was provided by the Ministry of Labor, Social Welfare and Housing.

The A.I.D. Housing Advisors, as well as advising the local government agencies of progress in all phases of the program, carried out the training of local staff, designed the dwelling, and supervised the overall construction.

The local program supervisor acted as general liaison between the builder-owners and the administration. He was responsible for the fieldwork in screening applicants for membership in the group, and carried out the administrative work directly

concerned with the participants and records of materials purchased. The program supervisor acted as the "sounding board" in receiving participants' opinions, desires and complaints, and actively took part in all meetings of the group. He also encouraged and worked with the clubs formed by members and their families.

The two building instructors carried on the daily on-the-job training of participants, and kept records of materials used and equipment needed. As part of their training, these men built the demonstration house in Highfield Township. These aided self-help skills, plus their own very good general knowledge of construction were passed on to the participants through demonstration and guidance.

PROJECT MEMBERSHIP

It is important to stress that throughout the scheme, the interests and responsibility of members were encouraged in order to maintain the momentum of "self-help." If direction, other than that required by law and to insure safe construction had passed to the government agencies, the principle of self-help would have been lost and enthusiasm would have suffered.

Because of the nature of self-help housing, participation was on a completely voluntary basis. Initially, the potential members were recruited from a limited group, in order to avoid the possibility of being swamped by a flood of applications, which would have been administratively impossible to deal with, and to avoid raising the hopes and expectations of too many people. The greater part of the potential membership group was geographically concentrated and living reasonable close to the proposed project site. A large number of the people in the subject group were able to meet most of the eligibility criteria established, with members being chosen only from those meeting all requirements listed below:

1. Must be legally married.
2. Must be resident in the Dzwaresekwa region.
3. Must have been born in Rhodesia or in residence for ten years or more.
4. Must be permanently employed or self-employed.
5. Must have a salary or average income within the allowable range (approximately £12 to £18 per month).
6. Must be of good character (checked by reference to employers, police and neighbors).
7. Must be physically able to carry out any construction task assigned.
8. Must be willing to work at night and on weekends for a minimum of 20 hours per week.
9. Must be willing to cooperate with rest of team members and accept decisions of elected officers within the group.

Once the overall policies and eligibility criteria had been established and a clear cut proposition developed which would make a specific agreement between the members and the government agency possible, the program was publicly presented to the potential membership group.

The total program and the details of the obligations of members and the government agency were carefully, clearly and thoroughly explained in order to minimize misunderstandings and misconceptions. One a misunderstanding was observed it was immediately cleared up. The self-help method demands that there be complete and mutual trust between the parties concerned and that they must be prepared to completely fulfill the obligations mutually agreed upon.

Once the program had been presented, applications were received with time allowed for the ideas to be absorbed and understood. When the application period was closed, each applicant was carefully investigated with regard to eligibility and personal character and dependability. Final selection of the membership group included 3 additional alternates who could be moved in to the group in case any of the original members dropped out.

As is desirable in self-help programs, the men of the group formed a "brotherhood" which was concerned not only with the immediate affairs of the construction program, but also planned other activities such as gardening, a taxpayers association, and social evenings for members and their families. The wives of the group organized a womens' club and conducted classes in child care and sewing, as well as other home-making projects. The two clubs were quite successful, and as a result, the project was asked to provide two men and one woman to serve on the communities advisory board - a far greater representation than allowed the remainder of Dzivaresekwa's populace.

In all matters concerning replacement of members, working schedules, etc., the group membership was consulted through their elected officials, in order to get their reactions and recommendations and to give them a genuine feeling of direct participation in the conduct of the program. This aided in fostering a true group spirit which carried over into community cooperation and organization.

During the initial stages of the construction work, it was necessary to replace 5 of the originally selected project members. Two of the members were deemed to be ineligible because their residence in close proximity to the project site did not come about as expected. Two failed to show up for work from the very beginning, and were expelled after consultation with the Executive Committee. One member resigned and withdrew of his own accord. Names of alternates were submitted to the Executive Committee and, on their recommendation, were brought into the Brotherhood. Since only 3 alternates had been designated, 2 additional ones had to be selected from those already processed and on the waiting list.

Any member who withdrew, or was rejected for failure to work, automatically forfeited his working hours, while any new member started "from scratch" and could not "inherit" working hours from his predecessor. Although the new members were behind in working hours, they did very well in catching up by putting in overtime each week.

In spite of the initial turnover of participants at the beginning of the project, the group settled down and worked well together to the completion of the project. Each member knew that there were any number of applicants eagerly waiting to get into the project should he fail to meet his responsibilities.

A graph showing the cumulative total working hours of each project member was kept posted on the project site at all times. The graph was brought up to date each week. When the first project member had satisfactorily completed 100 working hours,

a presentation ceremony was held and the president of the Self-Help Home Builders' Brotherhood presented him with a membership badge and certificate. As each member thereafter reached the 100 working hour mark, he was also awarded the badge and certificate. At this point the worker became a full member of the Brotherhood.

Although no money is earned by the self-help builder, it is pointed out that if his unskilled labor were worth say 2s. per hour (about \$.28), he would at this time have invested £10 (\$28) in value in his new home. This is considered his deposit and equity in his new house.

The cloth badges, which were awarded, were designed to be worn on shirt or coat. The Aided Self-Help Housing Staff members were provided with badges marked "S" to indicate staff. The badges awarded the project members were marked "M" to indicate member.

It was interesting to note the pride that developed. Badges could be seen on shirts and coats in the Township, while they were at work on the project site, and while they were at their regular jobs. The presence of these new badges created considerable interest and curiosity and the emblem began to take on a real significance and meaning to the workers as well as to the other people in the township.

CONCLUSION:

Before the project at Dzivaresekwa started there were serious doubts about the interest of the individual participant in building his own home in his spare time. Some felt that he was not that concerned about improving his own living conditions. Others felt that he wanted better housing, but wanted others to provide it for him. Still others felt that even though he might be interested he would not be able to continue this interest long enough to finish the job.

Experience with this particular project has shown that the prospective applicants were slow to respond to the new idea, but once they had thought it over for a while, they were willing to come forward and give it a try. After the final members had been selected and organized and they had gotten to know and trust each other and the members of the Aided Self-Help Housing Staff, the spirit of cooperation began to develop. When they saw that the whole idea was beginning to take on physical form and the commitments made to them were being fulfilled, they responded wholeheartedly.

Their work record of long hours after they had already done a full day's work, often in unpleasant weather conditions, indicated a strong desire to achieve better homes for themselves and their families.

It was also doubted whether participants in general had the ability to acquire the necessary skills to do a satisfactory construction job. Experience has shown that they were quick to learn and develop new skills when properly and patiently trained and guided and that project members became very conscientious about the quality of work since they knew that the houses they were building would be their own homes for many years to come.

A genuine spirit of cooperation was created among the project members. Each member demonstrated his willingness to do any of the jobs, regardless of the desirability of any particular job, and to work together in teams to accomplish their common purpose.

PHOTOGRAPHS ILLUSTRATING CONSTRUCTION SEQUENCE
AIDED SELF-HELP HOUSING PROJECT, SALISBURY, RHODESIA

The first twelve photographs in this sequence, illustrating the earlier phases of construction, were taken at the Dzivaresekwa Township project near Salisbury. Since the project was not complete when this report was made the remaining nine photographs, illustrating the later phases of construction, were taken at the Demonstration House in Highfield near Salisbury. The last was taken three years after the units had been occupied.

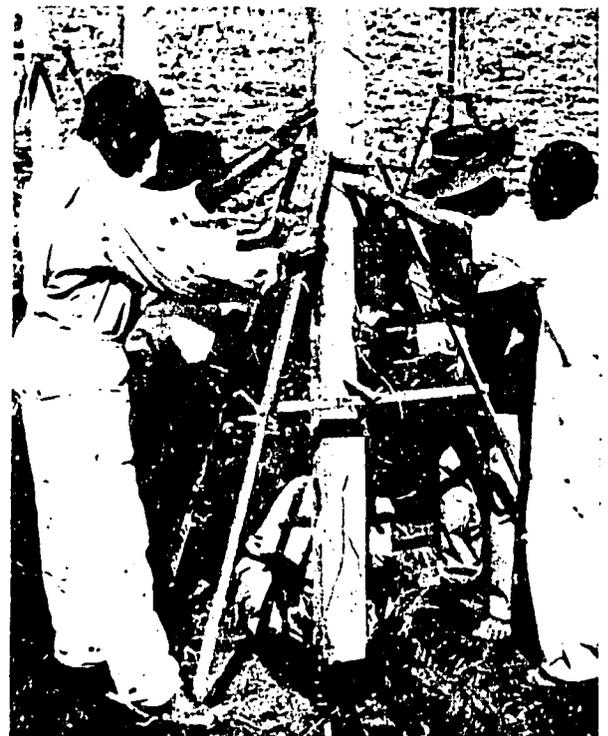


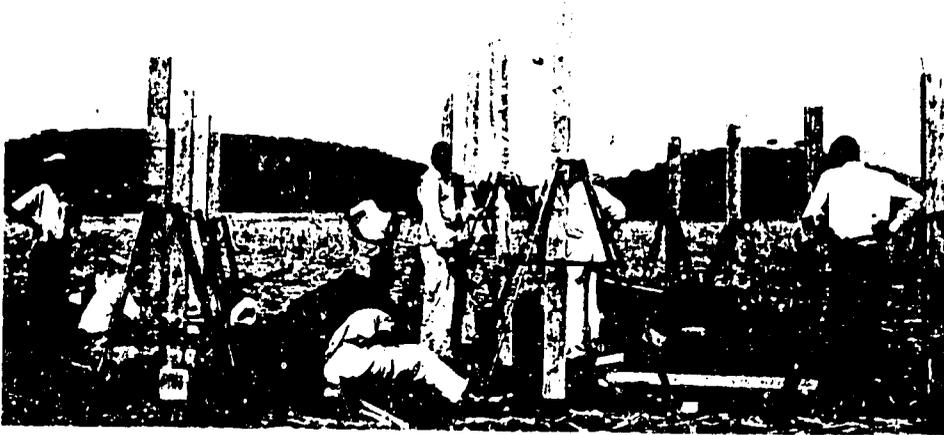
DZIVARESEKWA PROJECT

Construction team at work, foreground to background: concrete block making area; precast column casting area; roof frame fabrication area. At left a column setting team is removing "A frames" from columns. In the far background is the terraced austerity rental housing where most of the project members are living while building their own homes.

DZIVARESEKWA PROJECT

Column placing team sets a column. Note the pipes cast in the column and used for handling, and support of the column on the "A frames" until the column is set. The pipes are then removed. Note also the reinforcing rods protruding from the bottom of the column bent horizontally and tied to the "Brick force" strip foundation reinforcing.





DZIVARESEKWA PROJECT

Column placing team raising the final interior column. Foundation pouring is proceeding at left. Note metal form for stub pier at second column from the left. As soon as foundation has set, columns will be ready to receive roof frame.

DZIVARESEKWA PROJECT

The first eight members of the Self-Help Home Builders' Brotherhood to receive badges and certificates for the satisfactory completion of 100 hours of spare time work.

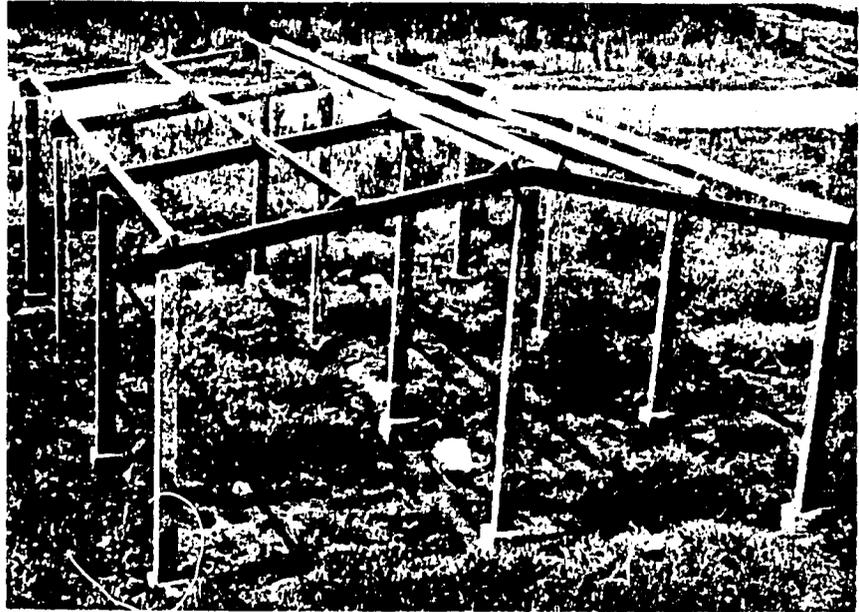


DZIVARESEKWA PROJECT

Roof framing in progress. Rafters are fixed to columns by rod projecting from top of column which is bent through hole bored in rafter and the blocking piece. The blocking piece prevents rotation of the purlin.

DZIVARESEKWA PROJECT

Column setting, foundation pouring, and roof framing are complete and ready for the next stage of roof sheeting.



DZIVARESEKWA PROJECT

Detail at eaves corner. Note the temporary blocks nailed to the end rafters and between which a cord is stretched to line up roofing sheets.

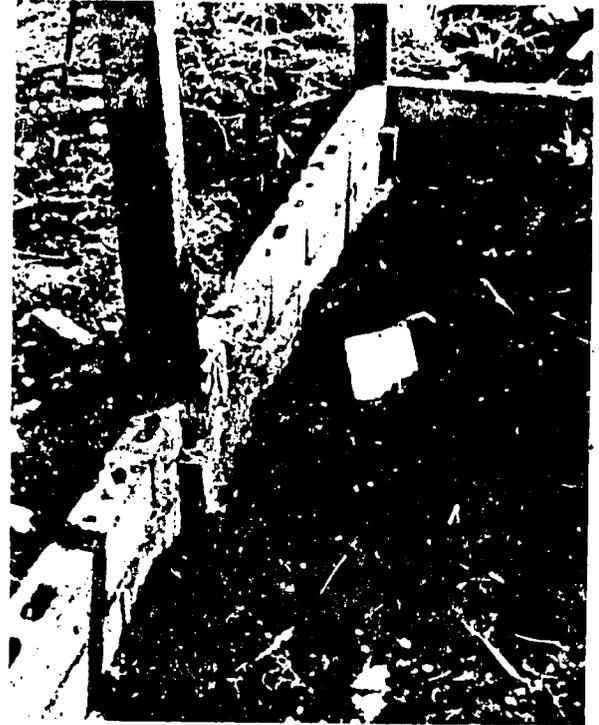
DZIVARESEKWA PROJECT

Roof sheeting in progress in the foreground and roof framing in the right background. Early completion of roofs provides storage under cover as seen in left background, and gives the project membership a morale boost because the outline of their houses quickly becomes apparent. Laying up of block walls can also proceed under cover.



DZIVARESEKWA PROJECT

Foundation wall detail. Hollow concrete blocks are poured solid before laying bitumenous damp-proofing course.



DZIVARESEKWA PROJECT

Exterior panel wall detail showing junction with column by means of wires cast into the column at block course intervals. Note the reinforcing ties to coursing wire at window sill level. Reinforcing is placed in all exterior walls at this level except at front and rear entrances where it is placed at door head height.

DZIVARESEKWA PROJECT

Exterior masonry almost complete. The window at the right is to the living area; the central window is to the dining area; behind the uncompleted panel will be the kitchen and bathroom. The three bedroom windows are visible in the far wall.





DZIVARESEKWA PROJECT

Detail of junction between panel wall, standard metal window and last purlin which also acts as a wall plate. The window is tied to the wall with metal straps bolted to the window at block courses. The window head is spiked to the plate.

DEMONSTRATION HOUSE, HIGHFIELD

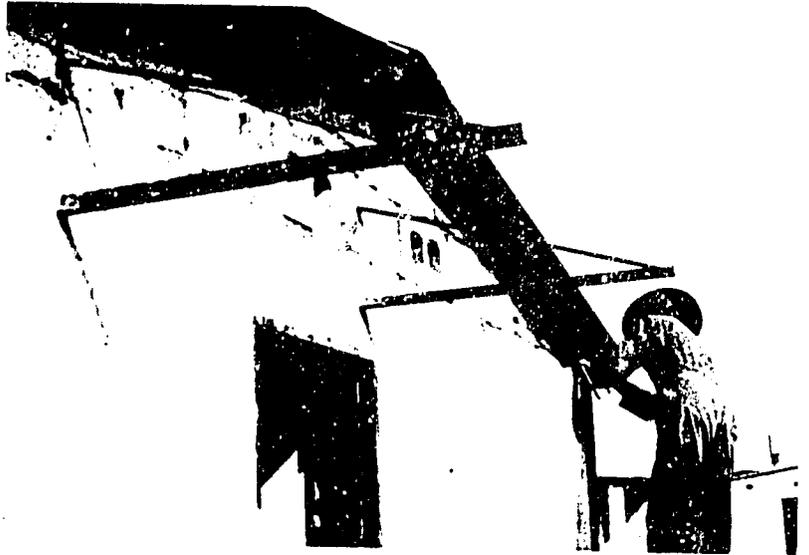
Tamping fill for living room area slab. At this stage, plastering was started in same area.





DEMONSTRATION HOUSE HIGHFIELD

Last panel of exterior plaster at rear entrance. Surface is finished with wood float.



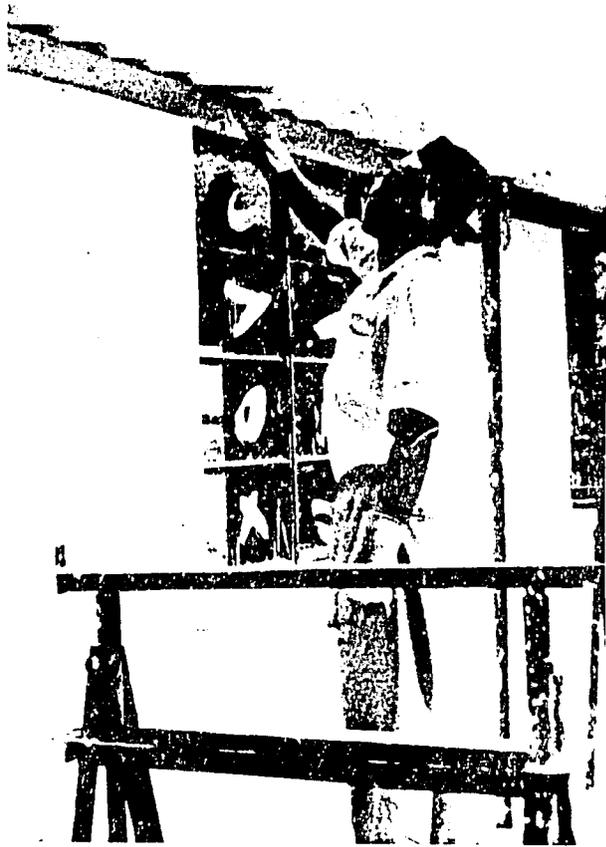
DEMONSTRATION HOUSE, HIGHFIELD

Placing expanded metal lath over end rafters to take exterior plaster. Plaster is butted against roof sheets. Note block-on-edge with fly screen fixed to inside and used as ventilator. Brackets over front door will take asbestos roofing sheet to shelter stoop.



DEMONSTRATION HOUSE, HIGHFIELD

Finishing floor of bedroom area. 3 inch slab has steel trowelled finish. Walls already plastered.



DEMONSTRATION HOUSE, HIGHFIELD

Painting exterior. Glazing was completed four days previously. Internal painting being done in readiness for arrival of internal movable partitions.



DEMONSTRATION HOUSE, HIGHFIELD

Setting fence posts. Note that butt has been treated against white ants. Upper portion of post in background has been treated in place.

DEMONSTRATION HOUSE,
HIGHFIELD

Panels, visible at right of entrance, received for internal partitions. Major portion of painting, except for columns, is complete. Flyscreen to be placed in bathroom window, entrance canopy to be hung and movable interior panels to be placed.

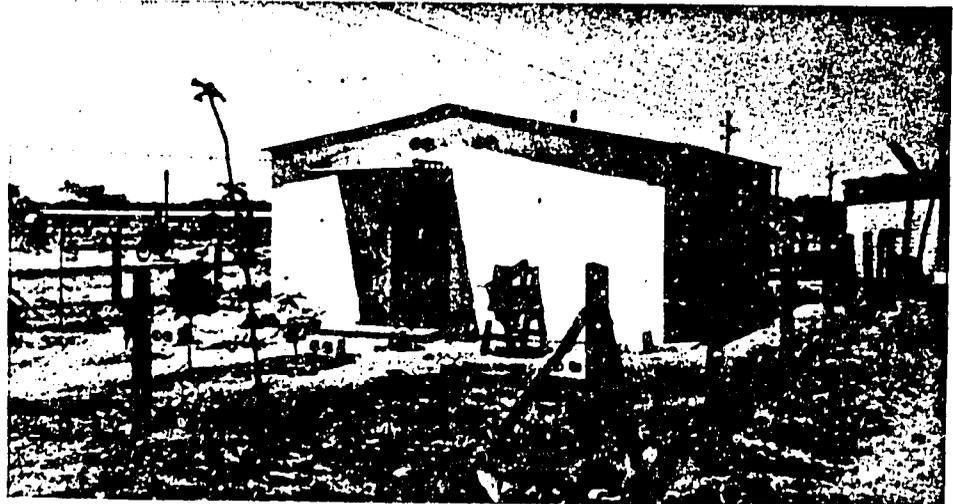




DEMONSTRATION HOUSE, HIGHFIELD

Interior of living-dining room looking toward kitchen which is beyond movable storage wall. Furniture designed and made by the Aided Self-Help Housing Staff. Color schemes, curtains and bedspreads selected and made by members of the Yamuranayi Women's Club of Highfield Township.

Left to right: Enoch Godfrey, Housing Staff Program Supervisor, Mrs. Godfrey, Mrs. Maringanise, domestic science teacher and member of Yamuranayi Women's Club.



DEMONSTRATION HOUSE, HIGHFIELD

House completed, furnished, and ready for exhibition. Note the home made washing machine to the right of the entrance door, and the concrete blocks in the yard which outline possible future additions.



Typical Dzivaresekwa unit after 3 years of occupancy. Pride of ownership is evidenced by the fine garden and care of the area generally. Photo—Courtesy Ministry of Information, Salisbury, Rhodesia.

RURAL AIDED SELF-HELP IN MALI

INTRODUCTION

The government of Mali, with 92 percent of its people on the land, and with little in the way of mineral and other resources, recognized the necessity of keeping its population from drifting to urban centers. This realization was based on the fact that agriculture is the backbone of the Mali economy, but also on the fact that only one major urban center exists, i. e. , Bamako, with 120,000 persons, and that this city has no major industry, and little in the way of service industries.

To combat the drift to the cities, it becomes apparent that the small rural community must offer competition on the cities' own ground - increased opportunity for economic advancement, education, improved housing, etc. This solution offers the best of both worlds, in that traditional ties of family and the land can be maintained, without competing with the limited resources of the expanding city.

As a result, the government of Mali consulted with the A. I. D. Mission and the A. I. D. Regional Housing Advisor, and a series of events was set in motion that led to the assignment of a village development team. The report that follows describes the activities of this team which are reflected in the development and construction of an actual model village utilizing an old existing village, called Djoliba, as an example.

CHOOSING OF THE VILLAGE

The village of Djoliba was chosen from a final group of six as best meeting the criteria for a sound first experiment in model villages for Mali.

As the project was not purely housing, but based upon future economic development, present and future potential in the area of agriculture, manufacturing and transport were studied.

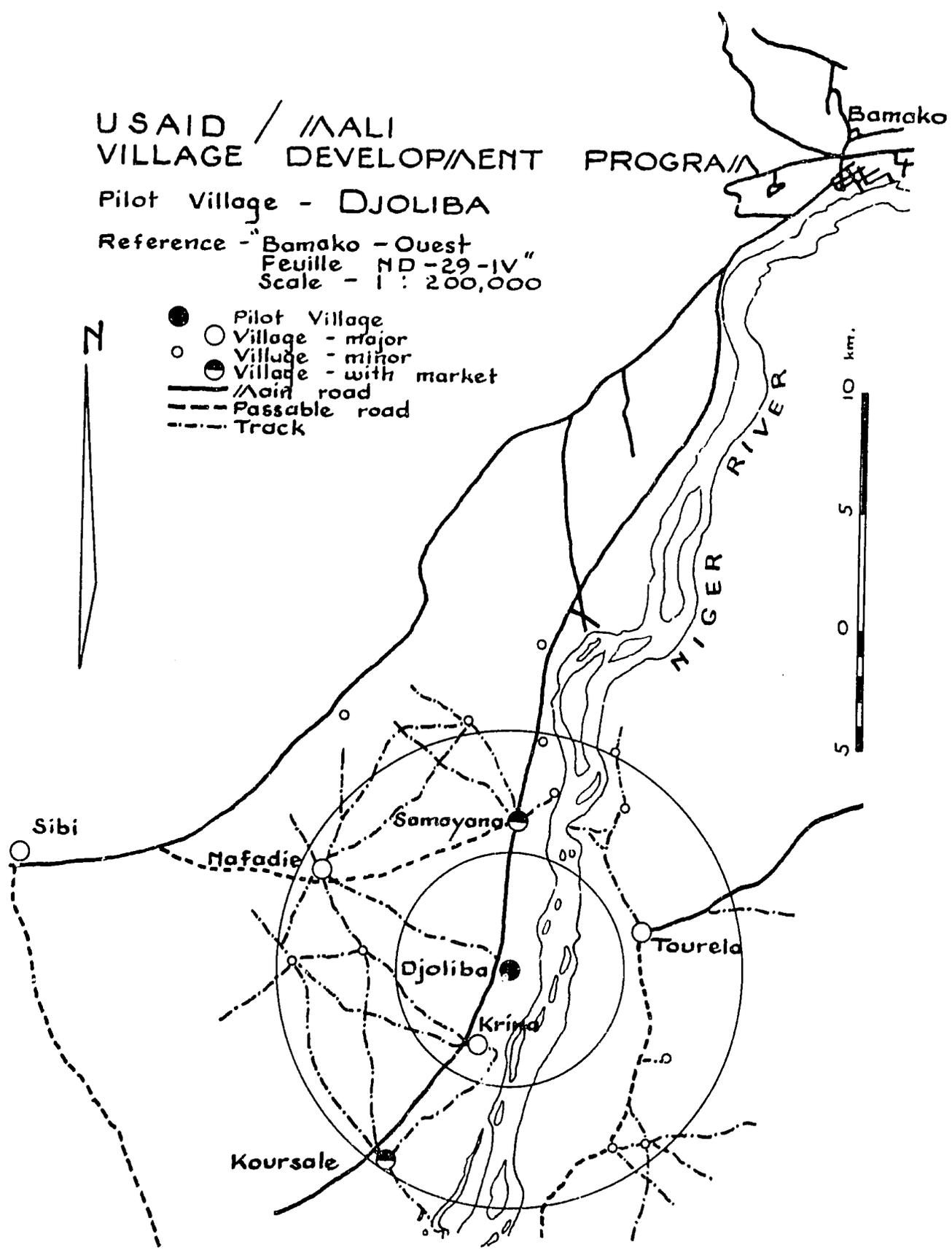
For example, it was found that Djoliba was one of only three villages within a 10-kilometer radius possessing a market, and of these, it is the best organized. Within the "initial impact" area of 10 kilometers are five other villages of fair size, and eight other small communities. Ten kilometers was taken as the "initial economic impact" area as this is the distance a man can be expected to walk to Djoliba and return home in the same day, after carrying out sale or purchase of produce or manufactured items that he is capable of carrying on his back. Bicycle, cart, truck and pirogue transport extend this circle to actually overlap the Bamako area (see map).

The distance of approximately 45 kilometers from the center of Bamako is short enough to allow reasonable easy transport to this center for sale of "export" items, etc. On the other hand, and of equal importance is the fact that the distance is great enough to prevent Djoliba from becoming a "dormitory" area for Bamako.

USAID / MALI
VILLAGE DEVELOPMENT PROGRAM

Pilot Village - DJOLIBA

Reference - "Bamako - Ouest
Feuille ND-29-IV"
Scale - 1 : 200,000



- Pilot Village
- Village - major
- Village - minor
- Village - with market
- Main road
- - - Passable road
- · · Track

Population size is a factor in choice, and although Djoliba's 1600 people formed a slightly larger than desirable unit, other suggested sites were either in excess of this figure, or were ruled out for other reasons. One advantage of this size of community is the variety of skills to be found, as well as potential skills and resources.

Availability of water alone ruled out one of the best prospects for the model village site. In Djoliba, water is no great problem. Wells rapidly reflect the level of the nearby river, but the quantity available never drops to a critical point. For agricultural purposes, the type of soil in the area appears to have reasonable water holding properties, and a simple irrigation scheme is feasible over quite a wide area.

There is in Djoliba no particular health menace which would prevent the development. (For example, one possible village was ruled out due to the presence of large number of tsetse flies). Djoliba was an extremely clean village, and with relatively few exceptions showed no potential health hazards, other than those normally related to possible water pollution through open wells and other factors which can be corrected by good planning, and do not reflect on the standards of the people themselves.

The present development pattern of a village is an important factor, in that it gives a barometer as to the industry of the people, and their desire to help themselves. There was reflected in Djoliba a willingness to improve, and tangible evidence of effort, both in terms of agriculture and building.

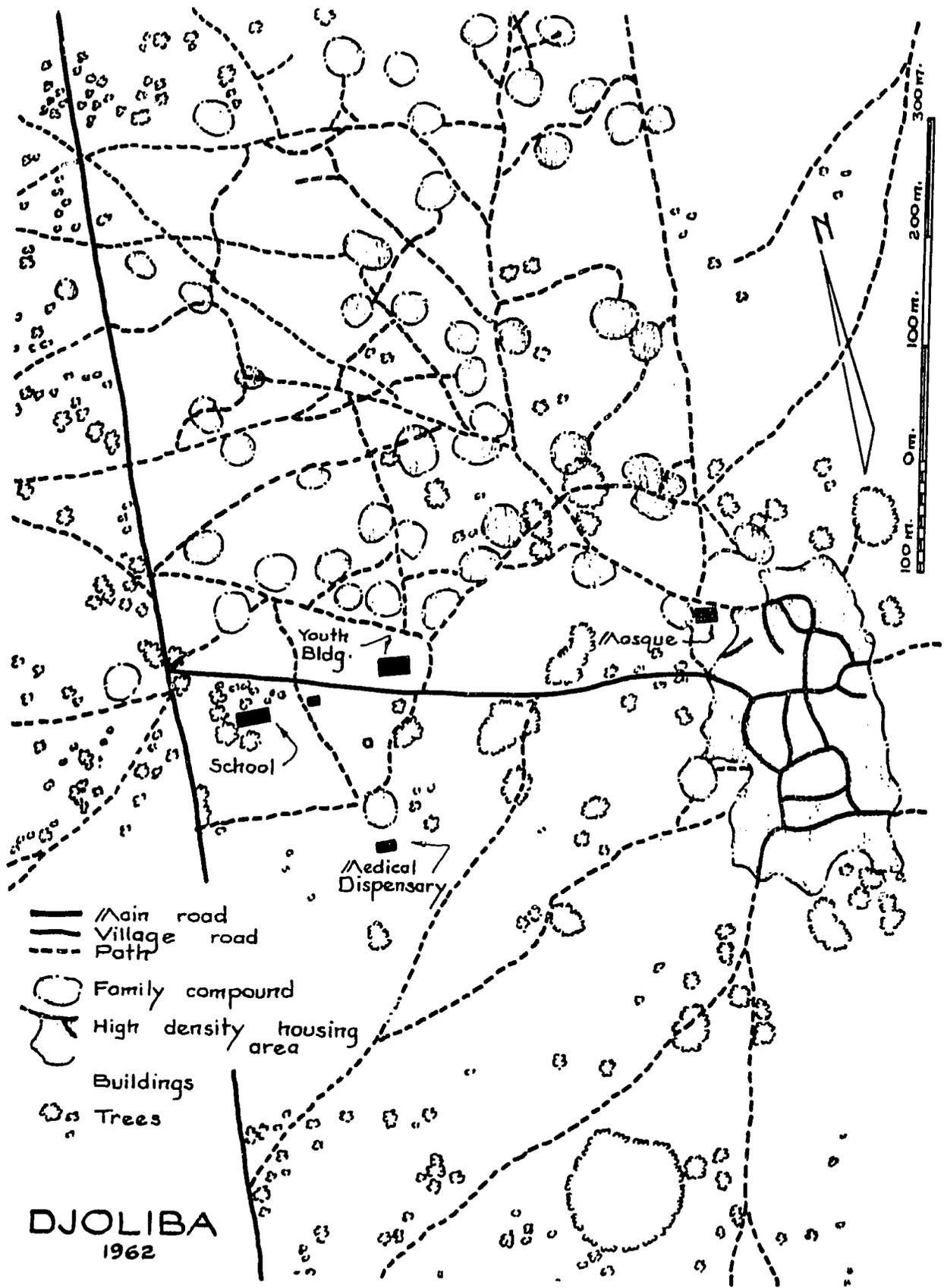
As to the willingness of the village to undertake a comprehensive village development project, the reception given the A. I. D. Housing Advisors on their first visit to this area gave evidence of their readiness to cooperate. During the research phase and topo and layout work in the village the people showed real interest, and eagerness to help. One problem was that of holding their eagerness within bonds until it could be put to productive use.

The visit of President Modibo Keita to the village on January 3, 1963 and his whole hearted endorsement of the scheme augured well for the future of the project.

DESCRIPTION OF DJOLIBA, AND GENERAL DETAILS FROM QUESTIONNAIRE

Djoliba, a village of close to 1,600 persons, lies some 45 kilometers southwest of Bamako. The site is bounded on one side by a secondary dirt road, which runs roughly parallel with the Niger river and connects Bamako with the Guinea border. The river itself forms a major boundary line, lying as it does approximately one-half kilometer from the old major building area at high water, and nearly one and one-half kilometer at low water. (The year 1962 saw a rise in the river somewhat above normal, with the result that water came within 30 yards of the building area, at which point a rise in the land prevented further encroachment).

The major building area of the old village was composed of a high density area of family compounds, approximately one-half kilometer from the road. To the north and west was an area of low density, comprising single family compounds separated by garden plots and connected by paths. The region as a whole consists of sparse scrubland, with cultivated areas and unimproved grazing land. A portion of the grazing area and some cultivated land lies across the road from the village proper. In all, the area accepted as belonging to the village comprises 4,650 hectares, of which 1,000 hectares



is, or has been, used for grazing. It is estimated that 420 hectares are flooded by the annual rise of the Niger.

Circulation within the high density area of the old village was via winding foot-paths, approximately two meters in width. These routes encircled the family compounds, which appeared as enclosures, fenced by huts and connecting mud walls, with one, or possibly two, opening into adjoining paths. Due to the irregular size of the compounds, paths opened at times into larger open areas at "intersections," creating a pleasant and everchanging vista. Outside the heavily built-up area, paths took the most direct route to the intended destination and formed an irregular pattern. A track 3 to 4 meters wide extended in an almost straight line from the road to the edge of the village and ended near the Mosque, a tin-roofed mud structure with a pleasantly proportioned, typically cone-shaped earth tower with a pattern of projecting timbers. Along this path lay the small school, the Maison de la Jeunesse (a fairly large earth structure used by the youths of the village), and the market, sited in a pleasant grove of trees. Each village in the area holds its market on a different day of the week, allowing visits by anyone in the region to purchase any "specialty" article grown or made in a particular village. This system also allows a few "traveling merchants" to display their wares in each village in turn (bicycle parts, coffee, matches, etc.).

The government of the community consists of a village council with seven members. Also having a say in village matters are the 135 "chiefs of family;" the custom being that all the members of a family, regardless of age or position, look to the elder of the group for guidance, and to act as spokesman.

A family unit, as mentioned above, forms the basic unit in determining the size of a compound and the number and nature of buildings contained therein. Members of a family compound unit include the head of household, his wife or wives (four are allowed), unmarried daughters, sons and their wives and children, etc. Thus, a compound may contain as few as 3 or 4, or as many as 30 or 40, or more, individuals. The age of heads of household in the families sampled ranged from 32 to 79, while that of the wives ranged from a low of 12 to a high of 71. The number of children per family ranged from 1 to 17, with the largest single group (14 families) having 3. Only 3 families of the 82 had no children, while the total for the group is 470, for an average of almost 5.9. 90% of all offspring of all ages resided in the family compounds.

The greatest part of the population was engaged in farming, from which almost all the "cash" income of the village was derived. The major products of the village consist of rice, corn, tomatoes and peanuts. Also grown in limited amounts are a type of sweet potato, manioc, beans, papaya, mango and bananas, as well as peppers and other "sauce" ingredients. Just over half the families owned some cattle, ranging from 1 to 12 in number - among the group sampled there were 18 milk cows. There were also small numbers of sheep, goats and donkeys, as well as one horse - the majority of these grazed on land considered by the householders as their own, while others grazed on communal ground. Due to the nearness of the village to the river, a small number of families gather their income in the form of fish, and several have some skill as blacksmiths. Hunting still forms the major occupation for a few men.

Garden and farm tools are few in number and simple form. An inventory of the most important ones was made for the purpose of providing sufficient space for them in the new house. Furthermore, some of these tools were used in building the



A Djoliba blacksmith prepares plows, hoes and other digging and cutting tools with the assistance of his son on the goatskin bellows.

new village and AID advisors had to become familiar with them. The villagers' tools and their use partially determine their way of life and the requirements for space in their dwelling or workshop.

A heavy, machete-like knife is used for cutting grass, corn stalks and small firewood, etc. A hatchet, with a handle approximately 50 cm in length, supports a long (approximately 20 cm) narrow blade. These same proportions are kept in the axe, which sometimes reaches almost a meter in length. A short handled, curved bladed hoe is the most common earthworking tool. Its handle, like that of the hatchet, is about 50 cm in length, with a blade 15 or 20 cm in width. A "shovel," with a large underslung blade, allows the lifting and carrying of earth with the load almost under the center of the handle — most effective. A common woodworking tool is the tiny adze, with an extremely narrow blade, similar to that of a hatchet, set at a right angle to the axis of the handle.

Ploughs are rare and simple in form. Ploughing is done with oxen, while the lowly donkey is used for the drawing of two-wheeled carts, often with rubber tires. A digging stick serves for placing fence posts, as well as "pegging in" tomatoes and tobacco.

Blacksmith tools include heavy, short handled hammers, cutting wedge, pincers, and a mushroom shaped anvil, perhaps 20 cm in diameter, set close to the ground. A skin bellows supplies a small charcoal fire in a dished hollow with air. With these, the Malian smith (working seated) creates both useful and handsome tools, albeit slowly.

The tools of the fisherman include both net and trap. The former is made of nylon cord, woven and repaired with nothing more than nimble fingers, a ball of twine and a wooden shuttle. Traps are of heavy gauge wire and are approximately one and one-half meters in diameter, and a little more than that in length, with a funnel opening. Boats are of two forms. The simplest is a hallowed log, narrow and graceful in form. A wider variety is made of hardwood planks, approximately "hard chine" in form.

The hunter is equipped with musket or shotgun. The former is the long barreled, heavy caliber cap and ball weapon of the frontier. Shotguns range from double barrel, open hammer cap and ball models to modern single or double barreled 12-gauge weapons. The hunter also carries one or two finely shaped knives in wooden sheathes. Some wear handsome leather shirts, heavily decorated, and hats of animal skin or tanned leather.

A typical compound, generally circular, contained a sleeping hut for each wife, head of household and, depending on age, children. Each wife had her own kitchen, which contained a "fireplace," formed of 3 stones or fire hardened earth blocks. One or several circular storage bins at one side of the hut held a portion of the food supply — usually under a meter in width and up to one and one-half meters or more in height. Cooking utensils are of four materials and many sizes. Iron pots, enameled pans, gourds and earthen jars are used for storage, mixing, cooking and serving of food. One or two earthen jars hold the "ready" water supply of 35 to 60 liters, which is carried from the open dug well in a large calabash. A rack of branches is used for storage of pots and a day's supply of firewood. Pots are aired on an outside wood pile or on the ground.



Typical compound in old Djoliba. Note hand wrought plant door at right. Thatch roofs are replaced each 3 to 5 years, and are thinly and loosely applied.

Sleeping huts contained a bed, mats or hammock, a circular earth "chest" for clothes, etc., and usually a box or chest for prized possessions and best clothes. Pegs held clothes, bush knife and possibly a musket, while a triangular hanging device of cords held a pan or gourd for water storage or washing, and possibly a lamp. Beds were often a platform supported by 5 or 6 ridges or earth blocks, approximately the width of 3/4 or double bed. A mosquito net is often in evidence, due to the prevalence of malaria. Few factory-built beds are found, while an older and more prevalent form is a solid platform of packed earth, or a wooden platform on earth ridges.

One or more huts in each compound had an adjoining structure of poles, which when covered with mats or thatch formed a veranda for the noon rest.

An important hut in many compounds was the "vestibule," where the head of the house received guests. This was generally the only structure having two doors — one of which lead to the path adjoining the compound. This room was furnished with a seat or two and mats, and occasionally served as storage for a prized farm implement.

Other huts were used for storage, while granaries, usually a few inches off the ground, formed of wattle and daub with a thatched roof, formed the major repository for corn. Low huts, with walls often not over 30 to 50 cm high, with thatched roofs, formed shelters for the family chickens. Many compounds contained a dug well, about one and one-half meters in diameter and possibly 10 meters in depth. This was partially covered by a network of hardwood logs, or in rare instances, by a concrete platform. Bathing facilities were in the form of an enclosed court adjoining the sleeping huts, with a hole at the base of the wall and a small sump to allow for drainage from the shower. "W. C." facilities were in the same or a similar enclosure and consisted of a pit several meters deep, covered with a framework of logs and earth, with an opening formed by a bottomless earthen pot.

The village contained a dozen metal-roofed dwellings and one two-storied structure with an enclosed court. This latter dwelling had a sleeping chamber and bath enclosure at the upper level, reached by an open earth stairway.

Construction was of mud brick, often with a plaster of earth and cow dung or antheap material. The floor was of well beaten earth and was generally 10 to 20 cm above the surrounding ground level. Roof structure was of small poles or bamboo in conical form, laced together and supporting a thatch cover. The latter was generally thinner than that found in the southern regions of Africa, and lasted for 3 to 4 years in good condition. The framework often outlasted several thatchings. Connecting walls were generally built in an arc for strength, while some few took a serpentine form. Structural failure was generally in the walls, due to erosion of the unstabilized block. Thin layers of "plaster" tended to give longer protection than those more liberally applied, as the latter tended to flake away where too thick. Roof and door lintel failure was not unknown, and was often the result of termite damage.

There were a number of rectangular huts in the village that will bear note — a flat, or slightly pitched roof, formed of hardwood logs supporting a heavy layer of earth generally covered this form; a low parapet wall surrounded this platform and was pierced by several slots, with wooden or tin "gargoyles" for drainage.

One circular structure, with flat roof, was of particular interest. This dwelling had an interior cross wall forming two rooms. Its good proportions and heavy timber roof formed a pleasant interior, but awkward exterior.

Doors were often extremely interesting in form, with shaped timber strips forming a paneled appearance. Large wooden locks were not only finely made, but quite secure when turned by a large iron key. In some cases, doors showed influence of the industrial world, being faced with flattened corrugated iron over a wooden frame. Window openings were both few and small. These were often equipped with wooden shutters, opening from the inside. Most circular dwellings had no window openings, while some few circular or rectangular structures had small irregularly shaped vent holes near the roof.

A feature of some rectangular structures was a partially enclosed veranda. Though relatively rare, these generally had thick walls, with high, narrow openings, arched or corbeled at the head. Less finished models used a wooden lintel. Otherwise, blank veranda walls were sometimes pierced by triangular or other geometrically shaped openings, forming both a pleasant pattern and a stark contrast in light and shade.

AIR RECONNAISSANCE

Air reconnaissance was carried out over the village with the use of a slow moving biplane, giving adequate time for visual study of the surrounding countryside, as well as a series of air photos. As this reconnaissance was carried out at near high water, it was of real value for flood control, irrigation and drainage studies.

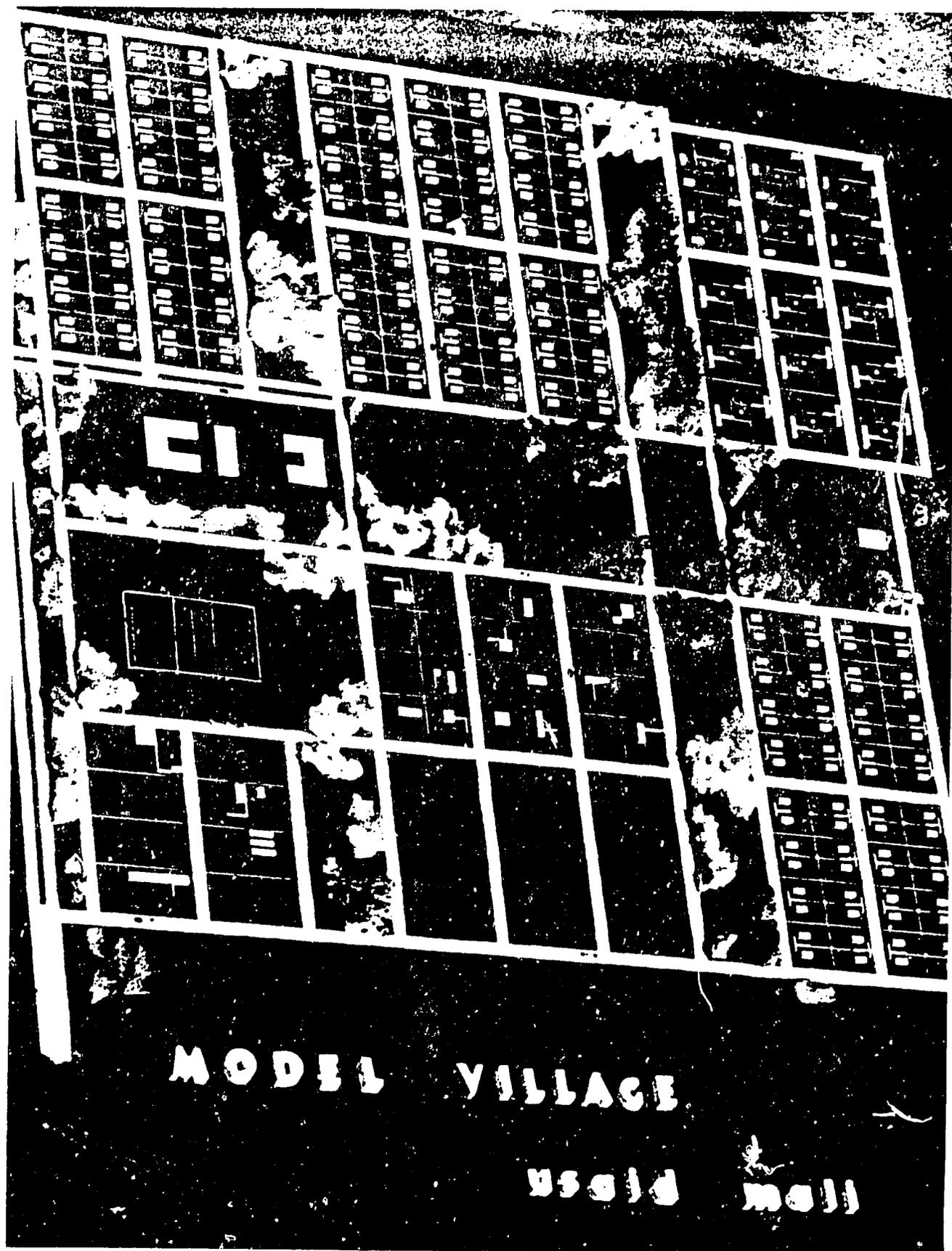
The main purpose of the air study was carried out immediately in the production of a detailed map of the village as it then existed, showing building areas, roads, paths, tree areas, etc. (see enclosed map). This was the basis for later detailed studies in land usage and the master plan of the village, allowing full recognition of present development patterns and trends, density, compound layout, etc.

The information thus gleaned will be of value in future planning of Malian villages.

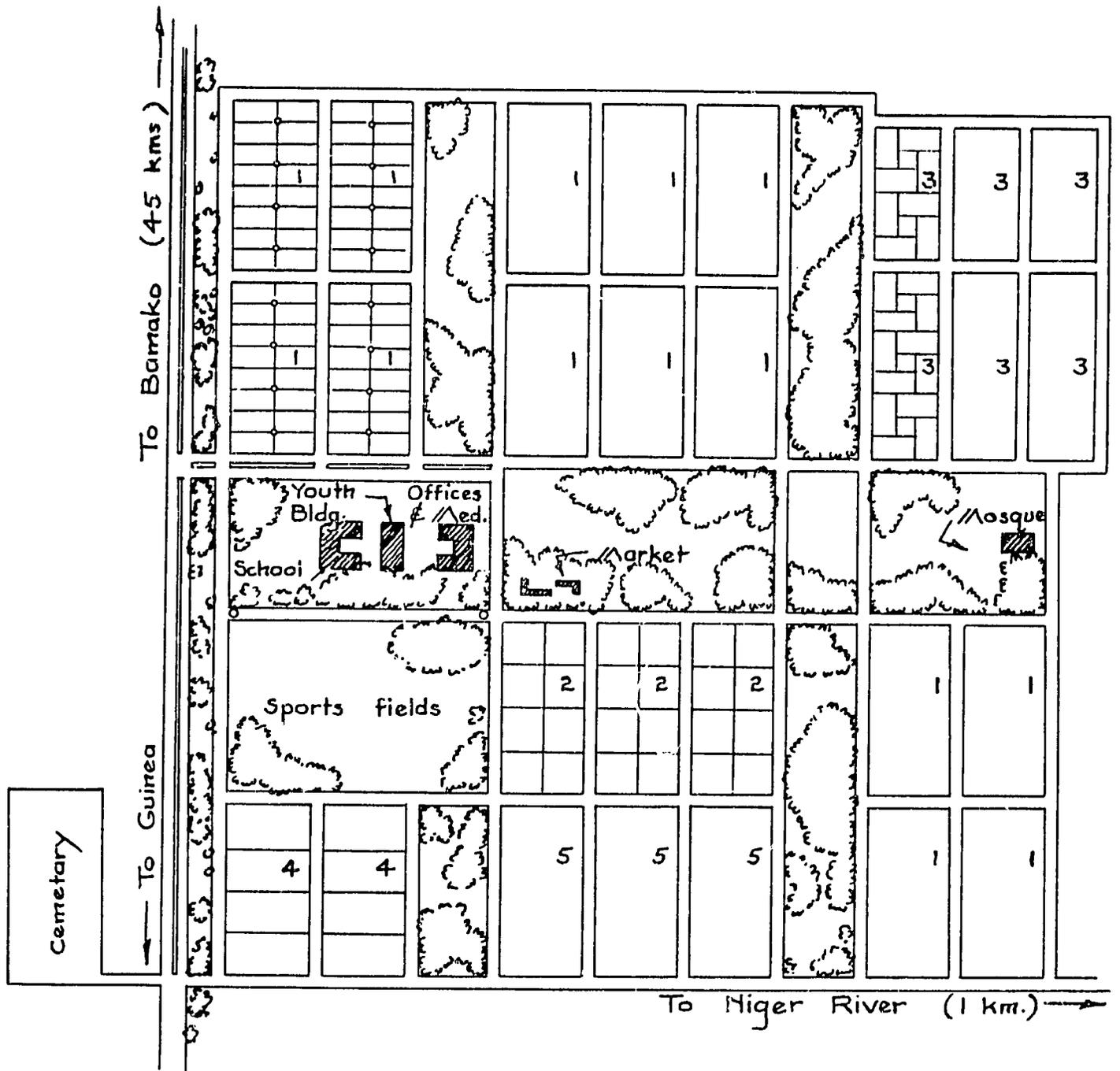
PLANNING OF NEW DJOLIBA

Entry to the village was at a traditional point, by the "meeting tree." The main internal road ran between the Youth Building and the school. The new road takes off at the same point at right angle to the Bamako-Guinea road, placing the youth building and school, on the right of entry. This is the beginning of a new central mall, a 120 m. wide strip stretching through the village from the main road, giving a pleasant vista toward the river. Also within this mall are the present and proposed Mosque sites, and the market. The market, set in a magnificent grove of trees, remains in its original position, while further tree planting and "booth" structures will extend its size and usefulness. (See site plan.)

To the right of the mall is the present site of the dispensary and athletic field. A part of the present athletic field will be incorporated in the school site, while the rest, across a new service road, will form a portion of a much larger athletic area. The dispensary site will be between the youth building and the market, separated from the latter by a major cross street.



Model of new Djoliba. (See annotation of village plan.)



DJOLIBA

PHASE I

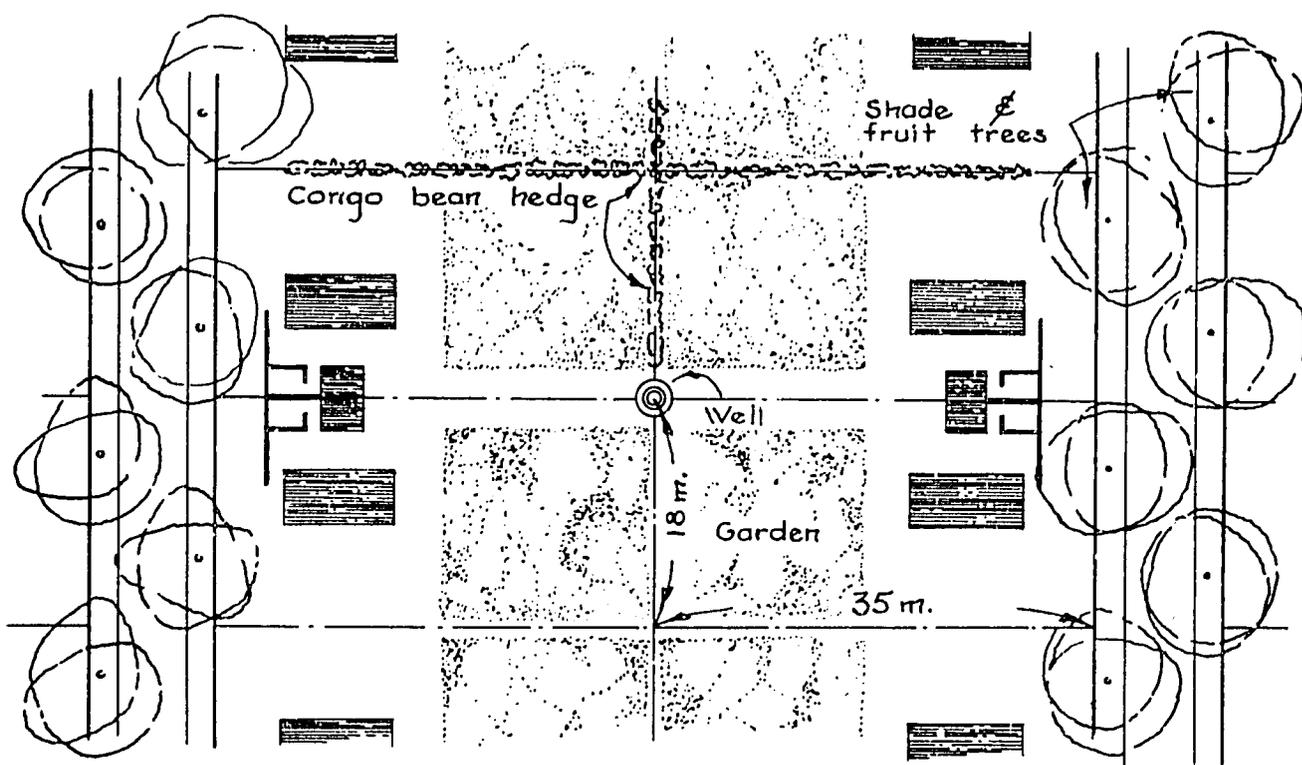


- 1 Aided self help housing
- 2 Double lots
- 3 Experimental self help lots
- 4 Small industries
- 5 Future housing

The entry street as far as the market is dual laned, and will carry all internal heavy traffic other than that in the industrial area itself. Extreme penetration for truck traffic is the market, where these vehicles are routed out on the same main artery.

Five major housing areas were planned, three of which are to the left (north) of the mall and two to the right. Four of these sites are aided self help schemes, ranging from a minimum of 60 units to a maximum of 96. Three of these areas have a family plot size of 18 by 35 meters, with one well for each four families, placed at the axis of the four lots. The houses in this area are of a "semi-duplex" nature, in that they will have a party wall, with kitchen back to back. Sleeping areas are across a small courtyard, allowing maximum separation between adjoining units. The "duplex" arrangement is not objectionable, as traditionally lots are very close, with relatively low walls used for separation. This plan has several advantages. A saving is made in material by using as a parting wall one of the largest areas of masonry in the complex. Also this arrangement allows a maximum of usable side yard for home industry, such as weaving or for planting or small animal yards.

The depth of the lot was dictated not only by possible land use, but by the distance between water source (open well) and sanitary facility (pit latrine) -- this latter distance being 30 m. or approximately 100 ft.



PLOT PLAN (16 plots per block)
 DJOLIBA
 USAID / MALI, Village Development



The bath area is adjoining the sanitary facility. Runoff from the "showers" of two adjoining units is collected in a trench which discharges into a roadside ditch, designed not only to keep standing wash water off the plots (at present a health problem) but also to adequately handle rain water. The roadway is to be 5 meters in width (on a 10 meter right of way) with a ditch on either side, and a walkway and tree planting area adjoining the property lines.

The 4th Aided-Self-Help area has plots 20 m. x 35 m., with each group of four arranged around a small common plot, containing the common well. Both the "semi-duplex" and detached dwellings are planned for this scheme. Although more land is used per dwelling, and more street length per unit necessary, this system is used experimentally as a possibility for small village groups.

The 5th housing area consists of double-size parcels (36 m. x 35 m.) and will be used by those in the village who are able to pay for a more pretentious dwelling than those intended for the Aided-Self-Help area. All neighborhood units adjoin the central mall, allowing easy access to market, Mosque, school, dispensary and other public areas. The neighborhood units, as well as the mall, are bounded by 60 m. wide park strips, which give not only visual relief, but large off street play areas. Internal streets "dead end" on these park strips, tending to slow traffic within the housing area (a necessary factor in view of local driving habits).

All major areas are connected by through roads, but thoroughfares have been kept to a minimum. From the point of view of safety, traffic control and appearance, there is only one major entrance to the village as before described, and one minor entrance on its southern boundary. The latter runs from the industrial sites at the South West corner of the village, adjoining the main road, to the river. The industrial sites in this position allow easy access for vehicles bringing raw materials or taking away manufactured products. Stadium and park areas serve as noise and visual barriers between these sites and housing, school site, etc. It should be made clear that these sites are not "factories" in the normally accepted American sense, but enlarged home industries such as blacksmiths, weavers, potters, etc. The river road from this site allows easy access to transport by canoe or other type of boat.

At the moment, canoes exist in the village that are capable of carrying 3-1/2 metric tons. As the village is upstream from its major export market (Bamako) and downstream from major sources of raw material (all the agricultural area from Djoliba to the Guinea border) this river transport should be of increasing value. In addition, a large area across the river, at present poorly serviced by road from Bamako, might well be tied economically to Djoliba by a "ferry" service of an elementary nature.

The village as described above will serve not only the present population of 1600 persons, but is planned for 3000 people without further extension. If the population should increase beyond this point, other housing areas to the north, and industrial sites to the south are proposed.

It might be noted that a 6th housing area on the southern boundary of the village is outlined, but not planned in detail. As the village expands, this area, depending on the economic level achieved, might become either a "double parcel" individual building scheme, or an "industrial park" housing development.

In regard to the new plan aiding industrial development, several points might well be noted. Firstly, as previously stated, the major portions of the village population lived in a high density area, consisting of compounds of various sizes and roughly circular, or sometimes irregular shape. Due to the number of structures within each compound, their placement and the lot limit imposed by paths and neighbouring walls, very little excess space was available for home industry.

It was not uncommon to see thread being laid out for weaving, or straw for mats, in the public pathway for lack of another area. This problem gradually being aggravated by the growth of population and the traditional custom of having the sons build within the same compound as they marry and have children. The new plan not only allows sufficient space for home industry, but encourages each smaller family unit to build its own home, while keeping the traditional "family neighborhood unit" by utilizing adjoining plots. This is also aided by the "party wall" system and centrally located wells. Thus, while keeping the necessary family tie, each man is given individual incentives to develop his resources.

Also, due to the family compound, skills tended to be centered in the family group, and were seldom shared with the larger community. Although this is not universal, the new plan will make each man more a part of the larger community; better able to serve it, and himself, economically.

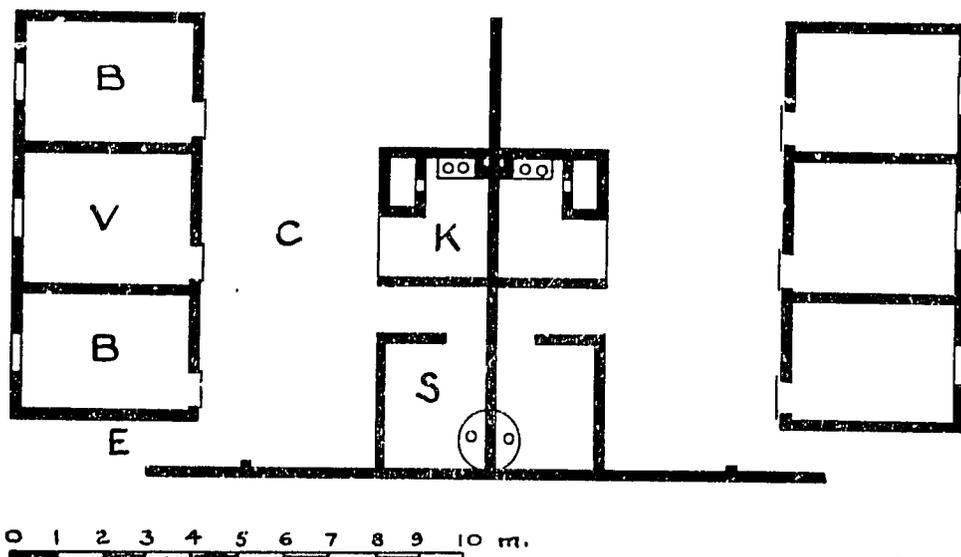
For the reasons outlined above, it was often difficult, if not impossible, to allow sufficient distance between source of water and privy. Also, bath and wash water could only be discharged into the public paths, which in some instances, received raw sewerage as well. The greater lot depths and street drains of the plan, combined with pit privies of proper depth, improve health conditions, general atmosphere, and quality of water for all uses.

In the old village, circulation by means of the picturesque, but narrow paths was limited to pedestrians, donkeys and cows. As most industries will for some time to come be of the "in the home" type, adequate streets are necessary to facilitate even the simplest supply and transport.

The desire for small garden plots was readily evident in the developing low density area of the village. The majority of householders (all those in the high density area) were unable to have even the simplest kitchen garden, although most had cultivated land near the village. For those turning to "home" industries, such plots form an important food source and maintain contact with agriculture.

In a reasonably high rainfall area, random development creates drainage problems, not only for built up areas, but for the smaller agricultural plots as well.

To meet the above problems, streets wide enough for vehicular traffic, incorporating drainage of proper depth, direction and grade, combined with properly zoned building and kitchen garden plots were planned.



Key:

- E Street entrance
- C Courtyard
- V Man's living - bedroom
- B Bedroom (wife & children)
- K Kitchen w/ grain storage (tool storage over) & 2 point stove (chula)
- S Shower area & W.C.

Duplex dwelling (Village)
 DJOLIBA, Republic of Mali
 USAID / MALI
 Aided Self Help Construction



A two point wood burning chula and chimney as provided for each dwelling. Chula construction is of soil cement blocks, and contains a "throat" between the firebox and chimney to increase draft.

PLANNING OF DWELLINGS

The plan for the first units (see drawings), as evolved from the Design Data Survey is a "Semi-duplex" dwelling, with a central party wall, and continuous street wall. Entrances are at maximum distance apart, for privacy, and to reflect individual ownership. This system not only allow a substantial saving in materials, but also allowed a maximum side yard. From the point of view of appearance, the long, low, silhouette reflects the character of traditional compounds while also giving a clean "up-to-date" orientation with street and neighbouring units.

The dwelling contains three chambers which will serve as sleeping quarters. One of these replaces the traditional vestibule as a place of greeting and entertaining guests. The three volumes are within a separate, single structure, across a small court from the wall common to the adjoining dwelling, and forming the back of the kitchens. All three chambers open into the court, without interleading doors, to provide maximum privacy and maximum variety of use.

The kitchen shelter incorporates a grain storage bin, with general storage above. A stabilized earth cooking unit, similar to the Indian "chula", with cooking point and water heating point is provided. The flues for the two adjoining kitchens are combined in one stack in the party - wall. Wood storage is located by the cooking unit, and under a small working surface. The two kitchens have a common roof ridge and eave line, supported at the centre by the party well, and at the outer end by the grain storage unit.

Between the kitchen and the street side of the plot is a solid wall, dividing the cooking and bath areas. A screen wall, entrance wall, and party wall complete the privacy enclosure of this area, which also contains the pit privy. The pit of two adjoining units is combined, with openings approximately one meter apart.

On the other side of the kitchen is an arm of the courtyard which might well become a storage room if roofed. In the latter case a second stove could make use of the existing chimney. Extension of the "bedroom wing" is accomplished by added chambers toward the rear of the lot.

A single well services four dwellings, and is in essence the traditional hand-dug reservoir, with the addition of a raised concrete top to prevent kicking of trash into the opening. A removable lid is an additional feature to prevent pollution from ground level.

Construction of the dwelling is of stabilized block, using earth from the site and cement (approx. 10%). The Cinva - Ram machine is used for fabrication of the bricks, with a crew of four men per machine. Floors are of rammed earth, 4 to 6 inches above surrounding grade. The roof frame is of sawn timber for ridge and plates. The roof cover is of galvanized iron.

COST OF DWELLING UNITS

<u>Item</u>	<u>Mali Francs</u>	<u>U. S. Dollars</u>
Technicians, Tools, Equipment, Transport	6,832	28.00
Lumber	13,121	53.00
Roof-Sheets	53,333	214.00
Cement	38,579	157.00
Miscellaneous	2,635	11.00
TOTAL	114,500	463.00

Note: Total cost figures do not include the value of self-help labor (estimated at \$192), land costs (village land), the costs of government-paid officials and overhead and the salaries of AID technicians.

ECONOMIC DEVELOPMENT

Although housing is an important factor in improving man's environment and way of life generally, an essential element in the "countermagnet" concept (creation of an improved rural-urban environment to reduce the drift to cities) is the parallel development of economic opportunities. In Djoliba, this process involved both agriculture and industry, and like the houses, school, maternity complex, market and training center, was aided self-help in character.

From the air photos mentioned earlier, supplemented by soil tests and assessments by agricultural experts, a master production plan was evolved. New crops were introduced, and increased productivity achieved for the old.

Congo beans provide goat-proof hedges, whose beans form a high protein food for humans, and whose dried leaves are looked on as a delicacy by chickens. Tomatoes, formerly a minor garden crop, grew in three years to a 300 ton per year "export" item to be converted to tomato paste in Bamako - replacing a costly import item. Eggs, a compact, highly nutritious and valuable product are now produced in quantity for shipment to Bamako, while improved chickens supplement a normally low-protein diet.

Industries have been introduced, using agricultural produce as raw material. Two small mills grind flour from millet and corn, while oil is ground from peanuts and wild oil nuts in another simple plant. The byproducts of oil and flour mills are combined to form a concentrated feed for livestock.

Blacksmiths combine their talents to produce an excess of tools for sale outside the village, as well as to undertake more ambitious projects than they are capable of individually.

To assist not only Djoliba, but other Malian villages to increase their building and industrial skills, a training center was established in the small industries area of the village. Here, some 58 students were trained in carpentry, blacksmithing, mechanics and electricity in the summer of 1966. (The village's first electricity is provided by two generators in the teaching center)

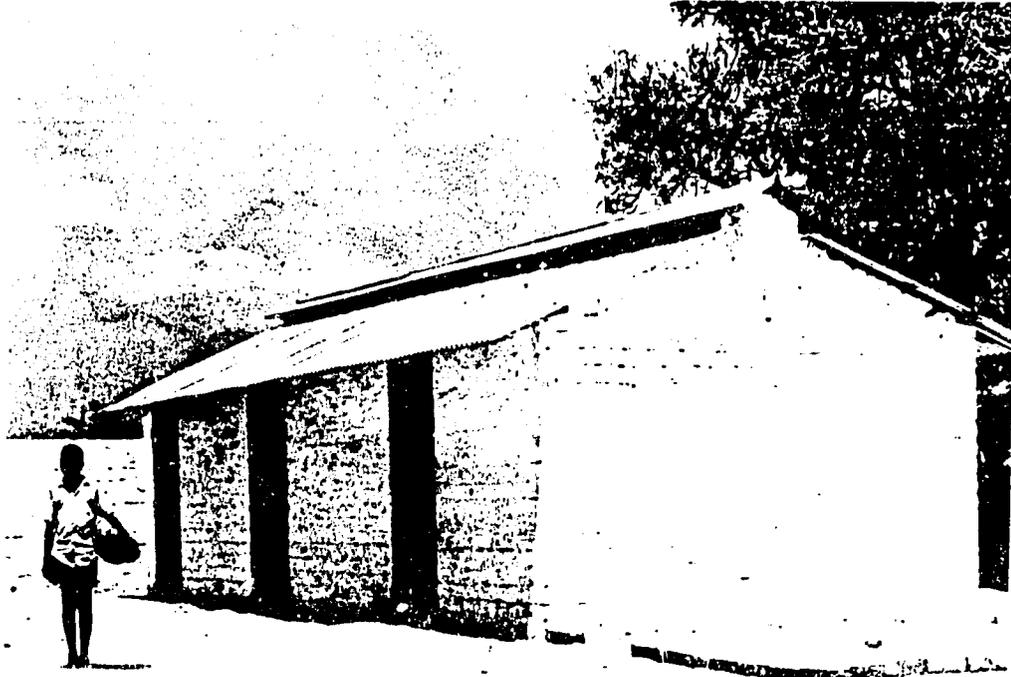
Djoliba is now well-established as a regional center, and hopefully will serve as a model for village development through aided self-help in other areas of the country.



Well, seven to nine meters deep, are lined for the first two meters below ground and extended approximately one meter above grade to exclude ground water and trash. All exposed masonry surfaces are plastered, and a circular walkway is provided to keep the immediately surrounding area dry.



AID Housing Advisor pointing out wall carving which marks "the house of the Gazelle" in lieu of a street number. This unit shares a wall with "the house of the mask."



Three bedroom block in new Djoliba. The kitchen and sanitary facilities are across the courtyard to the left. The wall in the background screens the dwelling from the street. Bricks at the right outline possible future additions.



Duplex dwelling under construction in new Djoliba. Note the kitchens back to back in center of picture. Chimney carries two flues for the wood burning chulas.

TRAINING IN AIDED SELF-HELP HOUSING IN ZAMBIA

INTRODUCTION

Though not an answer to the total housing needs of any nation, aided self-help can provide houses for a large number of people, including, under some circumstances, entire communities. A well organized aided self-help housing program can:

1. Make use of traditional family, neighborhood, or tribal arrangements for group construction.
2. Adapt many traditional and "modern" means of construction for effective use by unskilled labor.
3. Be adapted to many social, climatic or material environments.
4. Make effective use of both spare time as well as the time normally spent in building and/or repairing traditional dwellings.
5. Not only make possible, but encourage home ownership, with an increase in community stability and responsibility.
6. Result in a saving in the cost of dwellings through the use of the future householders' volunteer labor.
7. Provide a means of meeting housing needs in areas where lack of economic resources and skills will allow no other solution -- the case in vast areas and for large numbers of people in Africa today and probably for years to come.

Though good organization is the key to aided self-help housing, it is also the most difficult element in this type of operation. For this reason, at least a limited number of persons trained in building techniques and well-versed in aided self-help methods are necessary before such programs can (or should) be attempted. To develop such a cadre the A. I. D. Housing Advisor prepared and carried out a training program in aided self-help organization, planning and construction for African Development Area Center personnel from various parts of Zambia (formerly Northern Rhodesia). * These men were then prepared to provide the necessary leadership for aided self-help programs wherever the demand might occur.

* The program described in this report was developed before independence (October 24, 1964). It was carried out during 1961-1963.

TRAINING COURSE FOR AFRICAN TECHNICIANS IN VILLAGE PLANNING AND AIDED SELF-HELP BUILDING TECHNIQUES

Instructional courses for African trainees in the fundamentals of aided self-help building techniques and village planning were organized at Monze Development Area Training Center on January 8, 1962. The Government furnished housing and classroom space for the A. I. D. Advisor and the students, as well as equipment and textbooks for the course. It also paid the salaries of the students while in training and their transportation to Monze.

The trainees, who on completion of the course at Monze, became aided self-help home building organizers and instructors, came from all parts of the country. They had completed eight years of formal education, attended two- or three-year courses in building crafts and techniques at Lusaka's Hodgson Technical College, and had experience at development Area Training Centers as instructors in the building trades at the village level.

The course as conducted consisted of three phases as follows:

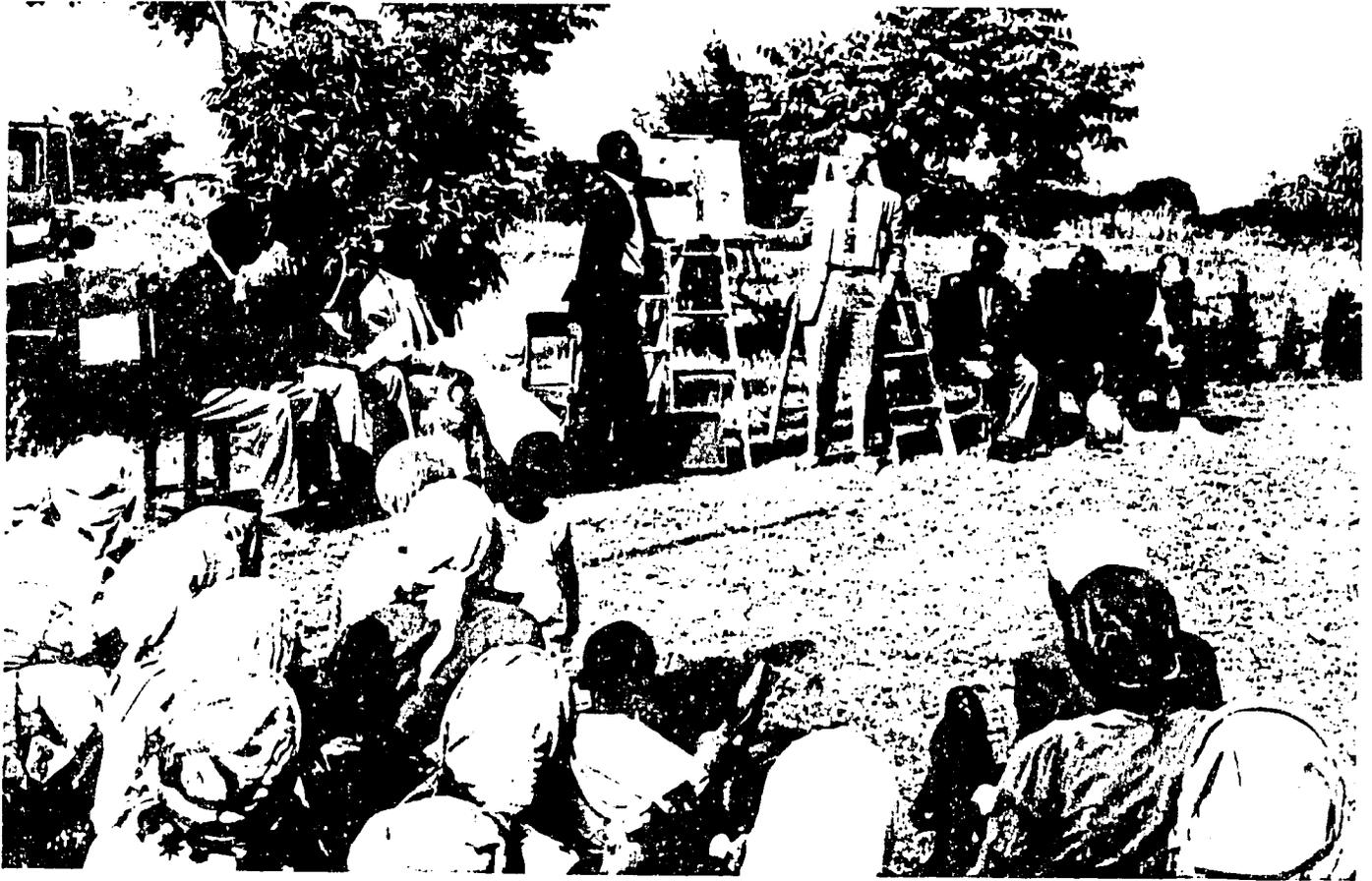
First, a general review and instruction phase covering such subjects as building nomenclature, techniques of building, construction estimating, architectural drafting and design, taking into account the suitability of materials, site, climate control and budget factors. The purpose was to bring all of the students to the same general level of knowledge. In an attempt to instill a spirit of teamwork at the very beginning, the class was divided into three teams of three men each. The teams were then assigned problems to work out together. Each team worked together throughout the training period on problems assigned them, as well as on out-of-class tasks assigned them by the Community Development Officer.

The first drafting problem consisted of measuring a building on the Center and completing "as built" drawings showing plan, elevations and a typical wall section. It was found a number of students, with some additional experience, could become first class architectural draftsmen.

The course of instruction in building materials, their price, availability and suitability, included visits to a building materials dealer in the neighboring town of Mazabuka, both to familiarize the students with materials suppliers and their method of operation, and to overcome any timidity the men might have in dealing with such purveyors. Later, during the course in building, students were taken singly to suppliers for the actual ordering of materials. Most of this work was done in Lusaka.

In the second phase, practical instruction was given in village planning through the use of simple scale models of typical village structures. Hypothetical problems were assigned and their solutions worked out with the models on a sand table. Again, the students acting in teams worked out the planning problem and presented the solution to the other teams who would act as the villagers. The latter set themselves up as chiefs, counselors and villagers and quizzed and criticized the presenting team as to the reasons behind their planning solution. It was found the students were natural actors and gave convincing performances.

As added experience, the students made presentations on solutions to village planning problems before classes conducted at the Monze Development Area Training



Using visual aids and an interpreter, the A.I.D. Housing Advisor explains and discusses a proposed aided self-help housing scheme to the people of Mukobeko. These discussions which also included a brief summary of community development work, were attended by members of the Mukobeko Development Committees, the Township Management Board, the housing advisor's counterpart, the Provincial Community Development Officer and a large number of Mukobeko's residents. Several meetings of this type took place.

Center for district managers, chiefs, chiefs' counselors, agricultural officers, as well as before visiting government officials. At each of these sessions, it was explained that the men were available to help in actual village planning and an explanation was given as to the ultimate purpose of instructing aided self-help housing organizers.

As the final phase of the course, the students acted as participants in the construction of two pilot demonstration houses at Monze Development Area Training Center. They gained experience in all aspects of aided self-help, including organization, location of projects, explaining the program to prospective participants, screening applicants, financing, setting up time and materials schedules, keeping of accounts, and supervision of construction. For this phase students were divided into two groups of four each with the representative of the Monze District Area Training Center acting as coordinator. The division was made according to the language the man spoke and the location of this home, i. e., those whose native tongue and home



Photomontage of the title of the training film produced at Monze during the building organizers course.



The opening of the Nchelenge house was the event of a local celebration. The festivities were presided over by the Mwata Kazembe Kayembo VI, senior chief of the Lunda Tribe. In his speech he endorsed the house design, complemented the builders and urged his subjects to improve their living conditions by participating in an aided self-help housing scheme.

was predominantly Bemba were in one group, and the other group consisted of those from the Southern, Barotseland, and the Northwestern Province. Each team worked as a unit on a house. Jobs were rotated every two weeks; this gave each man experience in serving as foreman, timekeeper, and materials supply and record keeper.

The houses were designed to become demonstration houses for domestic science trainees and were financed by the Government. Tools, transport and plant for the construction were furnished from the facilities of the Monze Development Area Training Center. They were also intended to demonstrate the advantages of self-help methods relative to costs and community effort. In the future, they will be shown potential participants to generate interest in aided self-help housing schemes in the area. Prior to construction, the visiting classes in domestic science were shown the plan and model of the house, and comments as to design and cost were solicited. During construction, many people visited the site and much interest was manifested in the work.

A twenty-minute training film of this phase of the work to demonstrate in detail the process of building and the setting up of aided self-help housing schemes for rural villages was produced in conjunction with the UNESCO Visual Aids Expert, John A. Willings, stationed at Monze Development Area Training Center. Music for the film was written and sung by the nine housing demonstrators who were joined by five women Development Assistants, currently in training at Monze. Rehearsals and recording sessions took place during the evenings, thus becoming an extra-curricular activity for the students.

In addition to the above outlined training, the class had lectures in rural sanitation presented by the resident hygiene instructor, seminars with the A. I. D. Housing Advisor, and interviews and discussions with the A. I. D. Community Development Consultant and others. The class became familiar with communications media through lectures and demonstrations presented by the UNESCO Visual Aids Expert and his staff at Monze. Text books, which were furnished by the Northern Rhodesia Government and became property of the demonstrators were as follows:

- HOW TO PLAN YOUR VILLAGE, by A. E. S. Alcock and Helga M. Richards, Longmans, Green & Co., 1953
- HOW TO PLAN YOUR MARKET, by Helga M. Richards, Longmans, Green & Co., 1957
- HOW TO BUILD (READING PLANS), by Helga M. Richards, Longmans, Green & Co., 1960
- HOW TO BUILD (SETTING OUT), by A. E. S. Alcock and Helga M. Richards, Longmans, 1960
- HOW TO BUILD TO SIZE AND SHAPE, by A. E. S. Alcock, Longmans, Green & Co., 1958
- HOW TO BUILD FOR CLIMATE, by A. E. S. Alcock and Helga M. Richards, Longmans, 1950

Textbooks, which were furnished by A. I. D. and became the property of the demonstrators were as follows:

- LEADER TRAINING FOR AIDED SELF-HELP HOUSING, by Keith H. Hinchcliff, I. C. A.

ORGANIZATION OF INDIVIDUAL AIDED SELF-HELP
HOUSING PROJECTS IN PUERTO RICO, IME No.
55, HHFA

THE DEVELOPMENT OF AN URBAN AIDED SELF-
HELP HOUSING PROGRAM IN GUATEMALA CITY,
IME No. 50, HHFA

THE PROGRAM OF INTER-AMERICAN HOUSES, ICIV,
GUATEMALA CITY, 1960

AIDED SELF-HELP ORGANIZATION

The following outline was designed as a guide for the students in understanding the steps leading to the formulation and execution of an aided self-help housing project. The outline indicates the areas which were stressed in the lectures and research carried out at the Monze Training Center.

It should be noted that a great deal of time and effort is indicated in the preparation phase. In fact, more time is spent, and more problems are encountered and solved in preparing for such a project than during the actual construction phase. This fact is of great importance as the thoroughness and accuracy of preparation is reflected in the intensity of initial (and sustained) interest and the cooperation on the part of the project members. Also, of equal importance, the long-term satisfaction with both physical and social aspects of the completed scheme depends on the care taken in the research and design phases of both the dwelling and the organization of the community. Maximum participation in the preliminary phase of a project by potential participants is essential.

ORGANIZATION OUTLINE

I. Preliminary Investigations

A. Selection of a suitable area

1. Make purpose and advantages of scheme known
 - a. Talk to people in charge of area
 - 1) Chief's, headmen, villagers and important people of the area such as school masters, merchants, builders, etc.
 - 2) Governing bodies such as local management boards and the district government
 - b. Publicize scheme
 - 1) Give lectures on aided self-help procedures
 - 2) Hold discussion groups
 - 3) Show aided self-help housing films
 - 4) Discuss success of the projects elsewhere
2. Know available financing of housing schemes
 - a. Amount of loan money available and its source
 - b. Qualifications required for those seeking loans

3. Get to know people
 - a. Their source of income
 - b. Their felt needs and desires
 - c. How they would react toward such a scheme; would they be willing to participate?
 - d. What they can afford to put into housing
 4. Have land made available with a written title and select site accordingly. Word through the local authorities and district government
 - a. How many lots available?
 - b. Water supply
 - c. Roads and transport to the area
 - d. Surveys of lots
 - e. Drainage
- B. Design of a house for the area**
1. Make a thorough study of the peoples' living habits
 - a. How do they WANT to live?
 - 1) Cooking methods and their diet
 - 2) Sleeping arrangements
 - 3) Taboos - colors, window openings, etc.
 - 4) What do they desire to store in the house?
 - 5) Furnishing requirements
 - 6) Farming and herding requirements
 - b. Family structure
 - 1) Matrilineal? Patrilineal?
 - 2) Customs of inheritance
 - 3) Average size of family
 2. Study materials available in the area
 - a. Costs of materials
 - b. Materials available locally and transport costs
 - c. Ability to use the materials
 3. Budget restrictions
 - a. How much can the average family afford to pay back monthly?
 - b. What sort and size of dwelling can they get for the money?
 - c. How much of the cost can be offset by the participant's labor?

II. Stimulation of possible participants for a specific project

A. Publicity

1. Announce in the area the possibility of a housing scheme for the people
 - a. Through posters placed in the area written in their vernacular announcing a preliminary meeting for all those interested
 - b. By work of mouth
2. Hold a meeting for all those interested to outline the proposed scheme
 - a. Show films and discuss them
 - b. Show model of house and explain it in detail
 - c. Discuss procedure and advantages of aided self-help building scheme
 - d. By all means allow for criticism and let everyone have his say. Be TACTFUL. Don't set yourself up as an authority on their problems; merely offer to help and offer suggestions. A successful meeting will be one at which the persons, not the speaker, will feel they have contributed; that it was all their idea in the first place and that you are there to carry out their idea.
3. If possible, build a pilot demonstration house to show exactly what the people will get for their money.
 - a. Conduct tours through the house
 - b. Furnish the house with furniture they like and can afford to show them how it would look furnished in their taste
 - c. Have a "model family" living in the house.

B. Make an announcement when applications will be available and for how long

1. Make out application forms in the local vernacular
2. Have people who know the language help fill in the form
3. Get the help of the local citizens of responsibility to help make the selection of the applicants

THE BEST THING YOU CAN DO IS TO GAIN THE PEOPLES' CONFIDENCE AND KEEP IT BY STANDING BY YOUR PROMISES AND INTEGRITY. IF YOU MAKE AN ERROR, BY ALL MEANS DON'T TRY TO COVER UP FOR IT. BRING IT OUT IN THE OPEN AND MAKE AMENDS; AN UNTRUTH NO MATTER HOW SMALL IS ALWAYS FOUND OUT AND NEVER FORGOTTEN.

COURSE CONTENT

In order to adequately cover the basic background material necessary for the training of aided self-help organizers, a careful outline was prepared and issued weekly to the students involved. Though perhaps not directly applicable to other areas, the preparation and presentation of a similar detailed outline is essential, not only to guide the student and give him an overall picture of what is to come, but in allowing the instructor to adequately prepare in advance for the lectures involved. Planned continuity allows for a high degree of concentration and the best use of limited time. The outline for a 6-week course is shown below:

1st Week

Mon.	Tues.	Wed.	Thurs.	Fri.
<p>Meeting Students</p> <p>Intro. of individuals</p> <p>Distribution of Materials</p> <p>Lecture on meaning of Aided Self-Help</p> <p>General Adm. problems and discussion of the course Program</p>	<p>Exercise in measuring buildings to produce "asbuilt" drawings of floor plan</p> <p>Exercise in general building terms and jargon by field trip and other visual means</p>	<p>Put Tuesday's measurements on paper -</p> <p>Complete data on drawing board</p>	<p>Make measurements for evaluation</p> <p>Study Chapters 1, 3, 4 of READING PLANS</p> <p>Discussion</p>	<p>Drawing Elevations</p> <p>Test on week's work</p>

2nd Week

Mon.	Tues.	Wed.	Thurs.	Fri.
<p>Discussion on making scale models</p> <p>Begin making scale models - 1/8" = 1' -0"</p> <p>Study Chapter 2 of READING PLANS & 1 & 2 of HOW TO PLAN YOUR VILLAGE</p> <p>Discussion</p>	<p>Complete scale models</p> <p>Set up sand table</p>	<p>Study Chapters 4, 5, 6 of HOW TO PLAN YOUR VILLAGE; also "difficult words."</p> <p>First demo. problem on sand table</p> <p>Exercises on sand table</p>	<p>Exercises on sand table</p> <p>Lecture by Community Development Officer</p>	<p>Exercises on sand table</p>

3rd Week

Mon.	Tues.	Wed.	Thurs.	Fri.
<p>Exercises on sand table</p> <p>Review and Discussion</p>	<p>Examination</p> <p>Exercises on sand table</p>	<p>Exercises on sand table</p> <p>Study Chapters 1 & 2 of HOW TO BUILD FOR CLIMATE</p>	<p>Problems on bad village & appraisal; problem on good village & appraisal</p> <p>SAND TABLE</p>	<p>Study Chapter 5 of HOW TO BUILD FOR CLIMATE</p> <p>Discussion on whole book HOW TO BUILD FOR CLIMATE</p> <p>Test on BUILDING FOR CLIMATE</p>

4th Week

Mon.	Tues.	Wed.	Thurs.	Fri.
<p>Study Chapters 1 thru 6 & 8 of HOW TO BUILD TO SIZE AND SHAPE</p> <p>Design Problem: Design a house for each individual's area. 500 sq. ft. using local materials</p>	<p>Continue with Monday's design problem</p>	<p>Continue with Monday's design problem</p>	<p>Continue with Monday's design problem</p>	<p>Lecture by Community Development Officer on Methods of Approach</p> <p>Study book on SETTING OUT with a view to using it as a reference.</p> <p>Continue above study-Discus. on SETTING OUT</p>

5th Week

Mon.	Tues.	Wed.	Thurs.	Fri.
<p>Lecture on Estimating</p> <p>Discussion on Estimating</p> <p>Student to prepare estimates on their individual home designs</p>	<p>Continue Estimating</p> <p>Lecture on Aided Self-Help scheme organization</p>	<p>Film</p> <p>Discussion on Self-Help Schemes</p> <p>Review of all work</p>	<p>Examination on Estimating</p> <p>Discussion</p> <p>Instruction by Community Dev. Officer on approach for a definite area</p>	<p>Discussion on previous day's lecture and method of approach.</p> <p>Role play by class on approach</p>

6th Week

Mon.	Tues.	Wed.	Thurs.	Fri.
	<p>← Field work on self-help housing site investigations →</p>		<p>Evaluation of data/discussions on data with the Community Development Officer. How to correlate data collected.</p>	

EXAMINATIONS

In order to make a formal assessment of the student's progress, as well as to give him some incentive and a continuing sense of accomplishment, periodic examinations of some form are necessary. Since the aided self-help training course given at Monze covered a wide variety of subjects, tests were given at frequent intervals. Needless to say, the tests must not only be tailored to the material covered, but to the level of experience of the student as well.

DESIGN OF AIDED SELF-HELP DEMONSTRATION UNIT

As well as forming the construction phase of the Monze A.S.H. training course, it was decided to place a demonstration unit in an area where it would have the greatest multiplier effect. As a result, a site had to be chosen where the house would be seen and coveted by large numbers of people both wanting and needing improved housing. Nchelenge, on the shores of Lake Mweru appeared to meet the requirements of such a location, and as such was used as both an area for preliminary research and as a demonstration construction site.

Nchelenge is near the center of one of the largest ribbon developments in Northern Rhodesia which extends from the northernmost point of Lake Mweru down the Luapula Valley for a distance of some 160 miles. This region, the Kawambwa District, is densely populated (1960 population: 125,700) with Bemba speaking tribes. It is subtropical in climate. Its people gain their livelihood largely from fishing; the catches are marketed on the Copperbelt. There is also some agricultural activity and lumbering.

Nchelenge Development Area Training Center, the site of the pilot demonstration house, is in one of the remote districts of the country. As it is 293 miles from the line of rail, all supplies must be trucked in over tortuous roads, a portion of which includes 40 miles through Katanga. It is three miles from Kashikisi, the center of the Lake Mweru fishing industry, the proposed site for a future aided self-help housing scheme. The dwelling, which was financed through the Commissioner for rural development, became a training house for the Centre. It was further planned to encourage the participants of the neighboring housing scheme to undertake training at the Centre in such endeavors as sewing, cooking, household crafts, etc., as a part of the program.

The Africans of the Luapula are keen builders; however, the quality of their structures shows the lack of refinement and durability which is only attained through technical knowledge and assistance.

DESIGN CONCEPT

1. The design of the prototype house resulted from numerous interviews and studies throughout the Country. Several preliminary plans were produced, cost estimates made, and the proposal discussed with the people of the area. The design was finalized November 20, 1961 and working drawings begun. Factors which influenced the design were as follows:

a. An investigation to determine the felt needs of the people living in the area. This was accomplished through several interviews with the people of Kashikisi and the

African staff of the Center. It was found that the people preferred a rather "compartmented" type of dwelling, i. e., several rooms, one for each activity or person. A compromise as to the size of rooms was acceptable due to budget restrictions. A premium was placed on privacy. The villager prefers to spend many of his daylight hours in the open; he considers his place of dwelling a shelter from the elements and a place to rest in safety during the night. He is very covetous of his possessions and goes to great lengths to protect them.

b. There are many taboos regarding a person's parents-in-law; to name a few: a young wife may not be in the same room with her father-in-law; the wife must not be seen by her mother-in-law entering a latrine and vice-versa; the mother-in-law (and other guests) generally sleep in the kitchen as it is not proper to sleep under the same roof as her son and daughter-in-law. Although these taboos are discredited by the more modern, educated people, they are very much alive with the rural African.

c. Polygamous marriages are not uncommon. Wives are usually placed in a detached house of their own with their children; the husband, who is sometimes a martinent, occupies his own quarters which are generally larger and more grand. When children are of walking age, they are usually furnished with a hut of their own.

d. Household furnishing and possessions are generally very scant. This is due to their unavailability, their cost, and also due to traditions. Most families, however, own a bed which is used by the husband; others sleep on mats on the floor. The average family owns pillows, blankets, a few sheets, a few pots and pans, two or three outfits of clothing per person, a few wooden chairs or stools, occasionally a divan, a table, and one or two small cabinets for storage. The average family has one or two suitcases as there is usually someone on the move. When he can afford it he owns a bicycle or relies on commercial transportation for his travels; more often than not, he sets forth on foot. A most prized possession is the transistor radio.

e. The principal diet of the Luapula area is cassava and fish. Bananas and mangoes are also abundant in the region. Most cooking takes place outside during the dry season over wood fires; however, the Development Area Training Centers are doing much to improve cooking methods and dietary habits. Chickens and goats are common in the Luapula; however, if they are eaten at all they are usually reserved for special occasions. In some regions there is a taboo against women eating eggs. By custom, cooking is usually conducted in a thatched hut located to the lee side of the main house. This hut is also used as a guest house for visiting relatives and friends.

f. The main occupation of the area is fishing. Fish are marketed to the Copperbelt, to Katanga, and some are sold locally. Catches are made by netting, and there is much activity in the maintenance and repair of nets. The more affluent of fishermen own outboard motors, while others depend on their "own steam" in getting to the fishing grounds. Before shipping, fish are sometimes dried on racks outside the homes. An ice plant at Kashikisi supplies ice for fresh fish shipments.

g. A custom which is beginning to die out -- unfortunately -- is that of decorating buildings with murals and other traditional designs. For the most part the various hues are derived from indigenous sources, such as the local clays and plants. Investigating the colors preferred by the people of the area, it was found that there was a great preference for yellows, reds, beige and pastel hues. There was a decided antipathy to dark blue and dark green.

2. The ultimate requirements for the design of the pilot demonstration house were determined as follows:

a. The house should be a modern concept of a traditional mode of life, incorporating as far as practicable room use and arrangement according to practiced custom.

b. Space should be provided for outdoor work, storage and activities which could be conducted in private and under supervision.

c. Local materials should be used as much as possible, and those materials which must be imported should be such that would ship easily and arrive on the site in good condition.

d. A straightforward, uncomplicated design should be employed which could be erected easily and with some speed.

e. Maximum effort should be made to render the participant as much usable space as possible under budgetary restrictions and utilizing permanent materials.

f. The design should incorporate opportunities for future additions of space and improvements of finishes.

g. A budget of £250 (\$US 700), payable at £3 (\$US 8.56) per month for ten years with a loan from the Rural African Housing Revolving Loan Fund, was set up as a beginning budget figure. This sum would include the cost of materials only. All labor would be supplied by the participant.

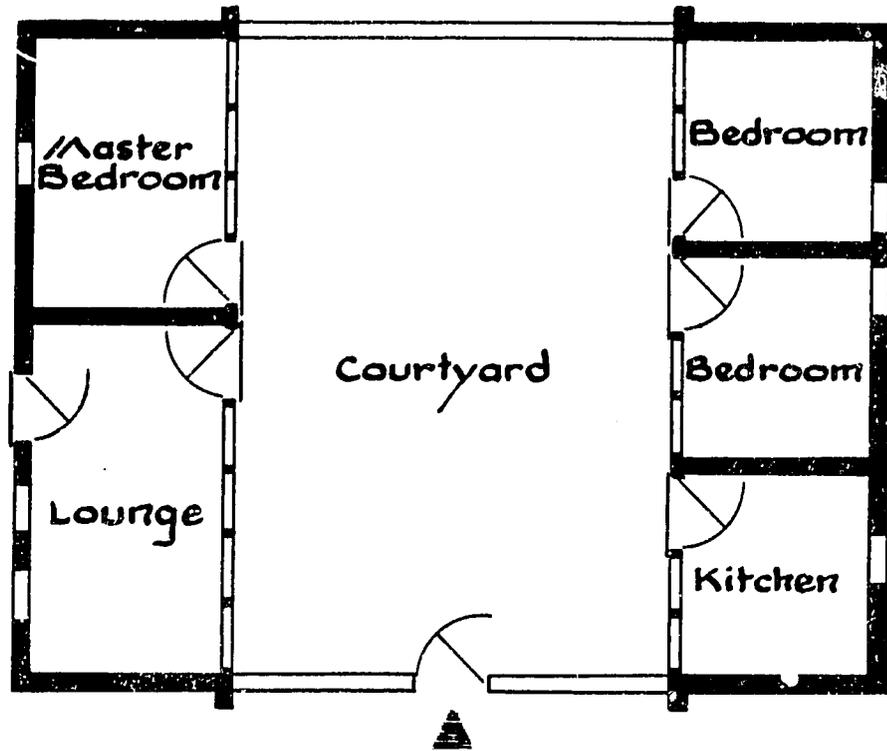
DESIGN SOLUTION

1. The Design

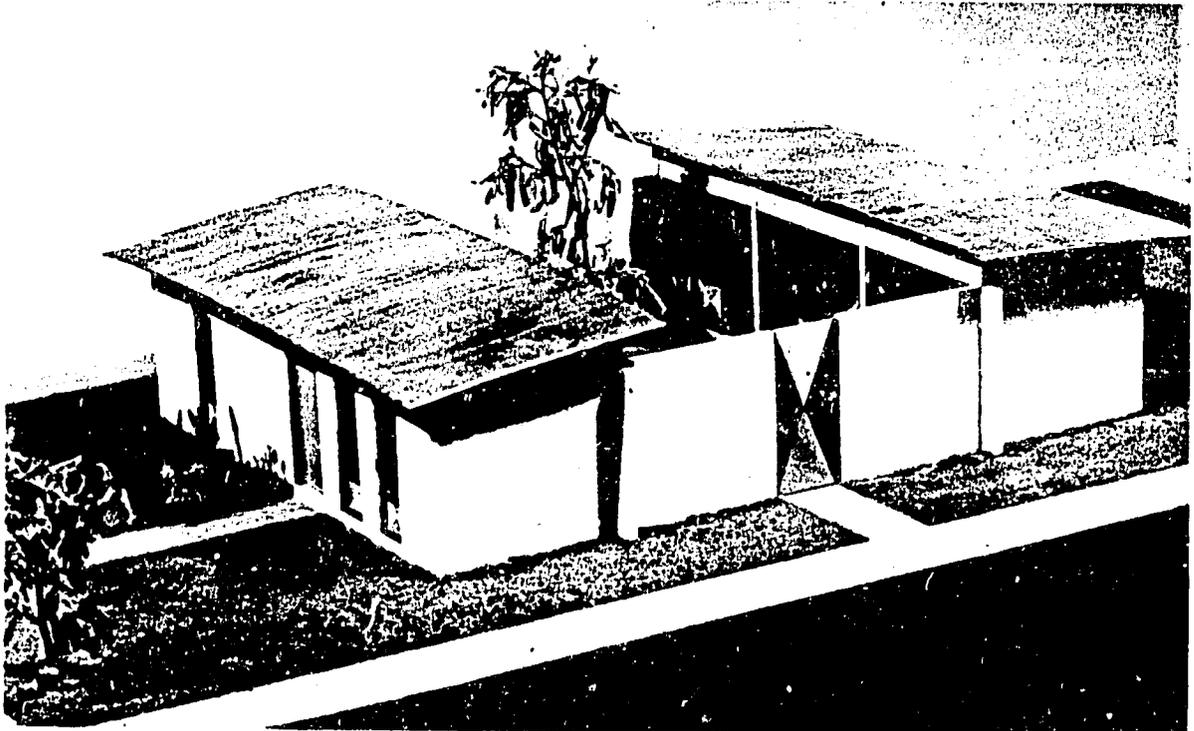
The proximity of a timber mill which processes quantities of hard, ant resistant woods, and the woodworking machinery available at the Nchelenge Development Area Training Center rendered the prospect of a good source of local material and tools to work it. An original concept for a design which seemed a natural was a wooden stilt house; elevated living quarters with space below for work, storage and recreation was a logical solution to the problem. However, it was abandoned when it was costed out and it was found the wood for supporting members was of such a density it was impossible to work with available tools.

The ultimate design, all on the same level, consists of two parallel units flanking a central courtyard. It is based on a three foot module with a span which will accommodate twelve foot sheets of corrugated galvanized iron roofing allowing for a one and one-half foot overhand all around.

The room arrangement, which includes five spaces, is intended to lend itself to the traditional rural African's mode of life. One unit which is 27' x 9' includes the sitting room and parents' bedroom; facing it across a walled courtyard is a unit of the same size which includes two bedrooms (intended for children) and a kitchen (which is traditionally used as a guest bedroom). The courtyard, which is



Plan and design model of prototype aided self-help dwelling used in construction phase of Monze Training Program for Self-Help Building Organizers.



27' x 18' and open to the sky, provides space for every day tasks, storage, supervision of childrens' play and recreation. It is sheltered from the winds by walls which exceed window head height by a few inches. This height will facilitate the future building of a roof over part of the area if it is desired and can be afforded. Additional rooms can also be built along the courtyard walls.

An attempt is made to give the building some aesthetic appeal (which appears to be lacking in most municipal and company subsidized African housing), as well as to provide an opportunity for the owner to express his individuality and to foster the custom of decorating his home. Hardboard panels under all exterior windows and openings into the courtyard are set aside for this purpose. (Pilot houses at Monze and Nchelenge carried traditional African designs in these spaces).

The dwelling is situated in a north-south orientation for sun control; it is devoid of openings, other than an outside door, on the east and west walls. This provides for a shady, pleasant courtyard most of the day.

Latrine and bathing facilities are located outside the house, and designed in accordance with the customs, peculiarities of the soil and facilities of the area where the house is built.

2. Materials

a. Walls

There is an abundance of sand and a shortage of good building clays in the Lake Mweru area; therefore, it was decided to build walls of concrete block formed by the participants in steel block molds. Concrete block could also be used to advantage in regions where there is a shortage of wood for firing brick. Forming block on the site renders a maximum of participation of the aided self-help group.

b. Floors

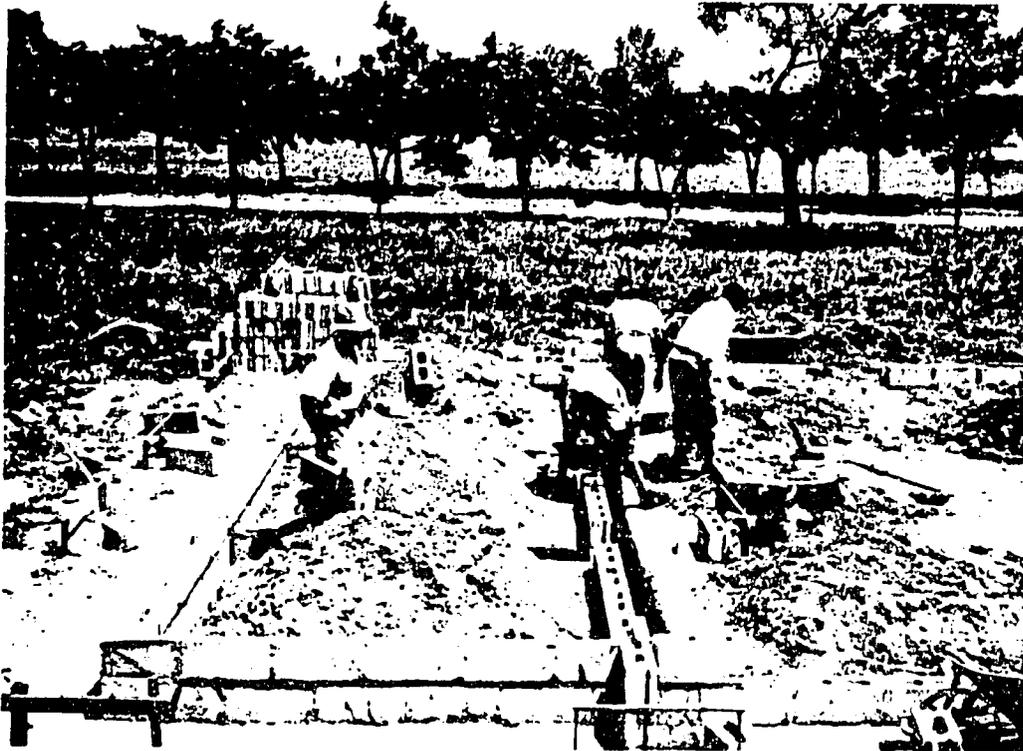
Concrete floor slabs are poured three inches thick over stone rubble.

c. Roofing

Roofing is composed of twenty-five twelve-foot corrugated galvanized iron sheets per house. In locations near the line of rail, corrugated asbestos can be used without sustaining damage if the material is properly handled.

d. Window sash

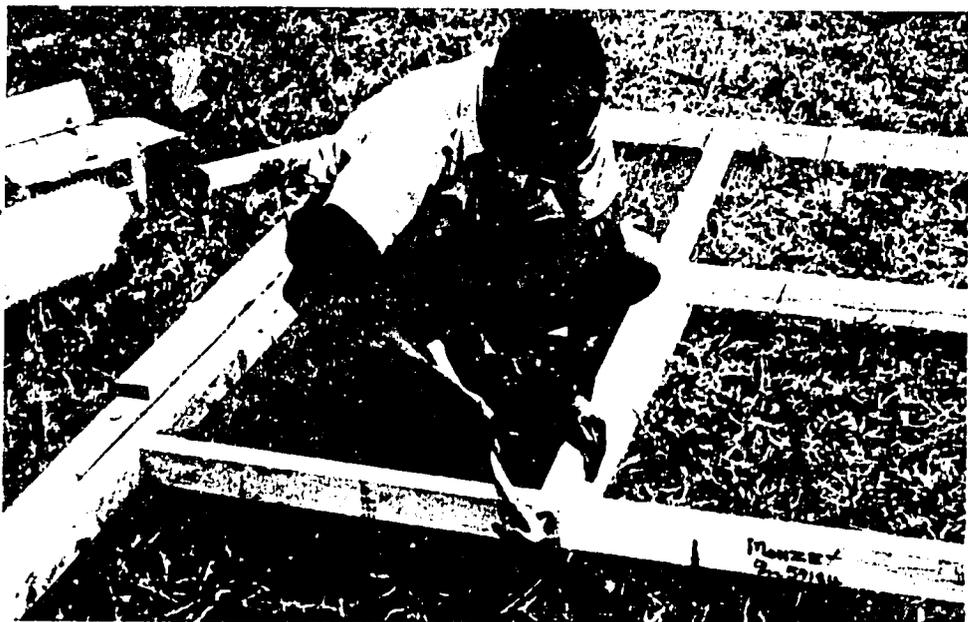
Steel operating louvre sets are placed between wood frames and glazed with 7/32" glass. Enough sets for a complete house can be shipped in a cardboard box measuring approximately 50" x 4". The customary steel casement sash required more packaging space and carries the risk of racking and bending during shipment. Reaction on the part of the villager toward the louvre type of sash has been good; they are unique and something of a status symbol and he is quick to recognize the advantages of the louvre over the steel casement with regard to breaking and entering. All window openings are screened with copper wire gauze.



Blocks were made by the students on the site, for the walls of the dwelling and courtyard enclosure. As work reached the level shown, the earth was poisoned against termite infestation in preparation for the pouring of the floor slab.

Note solid floor level blocks at left, as well as simple batter boards to determine floor level.

Prior to the construction of the masonry walls above floor level, door, window and other frames are prefabricated in the carpentry shop.

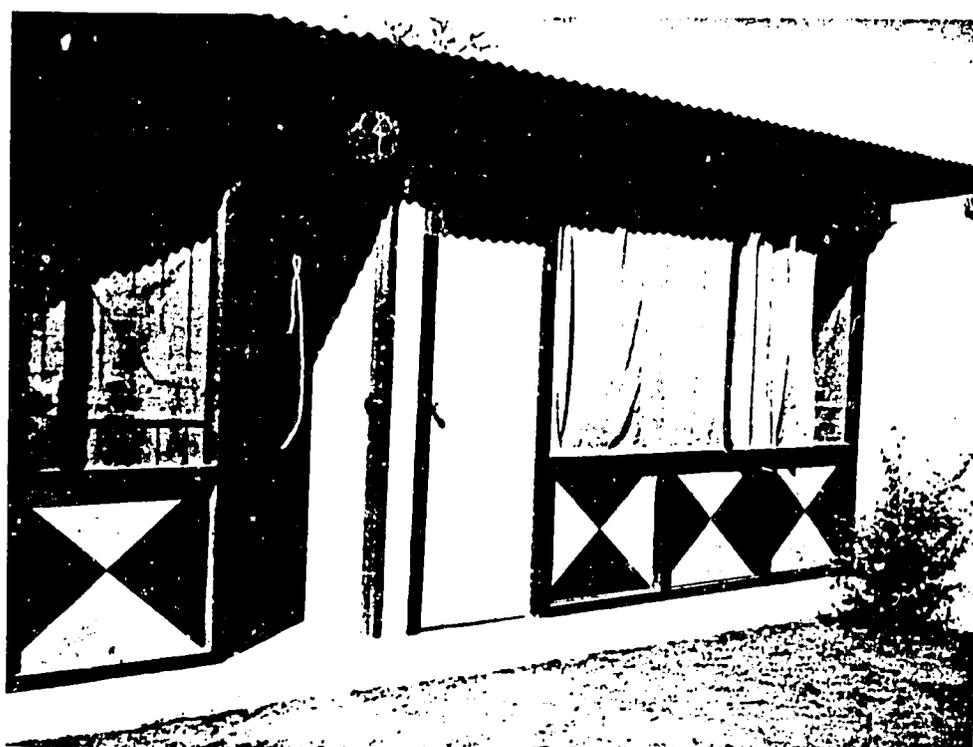




Front elevation of 5 room courtyard house. Note traditional decoration of court access door.

The courtyard provides an enclosure for work, storage and recreation, as well as exterior walls for future room additions.

Courtyard interior, showing frame inner wall, incorporating decorative panels, insect screen, ventilation panels, and canvas drop screens to provide the desired degree of privacy.



e. Timber

Hardwoods which are available locally at Nchelenge are used; in Monze the timber is of Canadian pine treated for white ants. Strangely enough there is very little difference in the price of timber between Nchelenge and Monze.

f. Paint

Enamels are used on all wood and hardboard construction. PVA exterior paint over the plastered walls were used inside and out. Colors for pilot houses were selected by a group of Africans; it was decided that inasmuch as they would be purchasing the paint it would be an opportunity to use colors which they were unable to mix from local pigments. A further saving may be effected on housing projects by using distemper paints on masonry if desired.

3. Cost Estimate

a. Before proceeding with working drawings a preliminary cost estimate was made at the site and found to be in line with budgetary restrictions. Figures based on actual construction showed the preliminary estimate to be valid. The following is a cost breakdown showing the actual cost of construction:

<u>Item</u>	<u>£</u>
Cement	39.13.8
Lime	1.11.0
Timber	64.12.2
Roofing	33.17.2
Louvre Sets	29. 2.0
Glass	7. 8.2
Fly Screen	7. 8.0
Doors	13.10.0
Locks	3. 7.2
Paint	23. 9.0
Wood Preservative	0.11.3
Misc. - hardware, nails, soil poisoning, etc.	2. 0.0
Total	226. 9.7
	(\$US 634.20)

CONSTRUCTION RECORDS

Because organization is the key to the success of any aided self-help program, careful records must be kept of such areas as hours worked and materials used. Ideally, one of the participants in the scheme should be designated time and storekeeper. As much responsibility as practically possible should be carried by the project members. This system not only extends the teaching process, but enables the members to see exactly what they are paying for and what they are saving -- as well as building a real sense of pride and responsibility within the group and for the community.

The importance of keeping material records is compounded by the need for assuring an adequate stock of everything necessary for the work to progress without interruption, as well as allowing an estimate of true value for the dwellings constructed. The most important aspect of keeping individual man hours is to assure that each project member contributes his fair share of the time. This is particularly evident when it is realized that the labor of each potential householder is a large part of, or possibly the complete down payment for his dwelling, and is his equity in the house. Also, the hours each man works reflect the degree of responsibility in helping the other members of the project.

The form illustrated on the next page was used by the Monze students during the construction of the prototype dwellings and is of a type useful for full scale projects.

AIDED SELF-HELP HOUSING SCHEME
WEEKLY TIME & MATERIALS RECORD

Location: _____ Week of: _____

	TIME SCHEDULE		ACTIVITY														
	MEN	HRS	MEN	HRS	MEN	HRS	MEN	HRS	MEN	HRS	MEN	HRS	MEN	HRS	MEN	HRS	
SUN																	
MON																	
TUES																	
WED																	
THURS																	
FRI																	
SAT																	
TOTAL																	

REMARKS:

MATERIALS USED:

MATERIALS	SUN	MON	TUES	WED	THUR	FRI	SAT	TOTAL

REMARKS:

CERTIFIED BY _____