USAID

SOMALIA

PROJECT PAPER

KURTUNWAARE SETTLEMENT PROJECT

PROJECT NUMBER

649-0103

AGENCY FOR INTERNATIONAL DEVELOPMENT

PROJECT PAPER FACESHEET

1. TRANSACTION CODE: [A] (A = ADD, C = CHANGE, D = DELETE)

PP

2. DOCUMENT CODE: 3

3. COUNTRY/ENTITY: Somalia

4. DOCUMENT REVISION NUMBER: [1]

5. PROJECT NUMBER (7 digits): 649-0103

6. BUREAU/OFFICE: A. SYMBOL: AFR; B. CODE: 06

7. PROJECT TITLE (Maximum 40 characters): Kurtunwaare Settlement Project

8. ESTIMATED FY OF PROJECT COMPLETION: FY 81

9. ESTIMATED DATE OF OBLIGATION: A. INITIAL FY 79; B. QUARTER 2 (Enter 1, 2, 3, or 4); C. FINAL FY 80

10. ESTIMATED COSTS ($000 OR EQUIVALENT $1 =)

A. FUNDING SOURCE	FIRST FY B. FX	FIRST FY C. L/C	FIRST FY D. TOTAL	LIFE OF PROJECT E. FX	LIFE OF PROJECT F. L/C	LIFE OF PROJECT G. TOTAL
AID APPROPRIATED TOTAL	1,000	0	1,000	2,100	0	2,100
(GRANT)	1,000	0	1,000	2,100	0	2,100
(LOAN)						
OTHER U.S. 1.						
OTHER U.S. 2.						
HOST COUNTRY	0	800	800	0	1715	1715
OTHER DONOR(S)						
TOTALS	1,000	800	1,800	2,100	1715	3815

11. PROPOSED BUDGET APPROPRIATED FUNDS ($000)

A. APPROPRIATION	B. PRIMARY PURPOSE CODE	PRIMARY TECH. CODE		E. 1ST FY 79		H. 2ND FY 80		K. 3RD FY	
		C. GRANT	D. LOAN	F. GRANT	G. LOAN	I. GRANT	J. LOAN	L. GRANT	M. LOAN
(1) SDA	701-B	130		1,000	0	1,100	0		
(2)									
(3)									
(4)									
TOTALS									

A. APPROPRIATION	N. 4TH FY		O. 5TH FY		LIFE OF PROJECT	
	O. GRANT	P. LOAN	R. GRANT	S. LOAN	T. GRANT	U. LOAN
SDA					2,100	0
(2)						
(3)						
(4)						
TOTALS						

12. IN-DEPTH EVALUATION SCHEDULED: MM YY 0 5 8 0

13. DATA CHANGE INDICATOR. WERE CHANGES MADE IN THE PID FACESHEET DATA, BLOCKS 12, 13, 14 OR 15 OR IN PRP FACESHEET DATA, BLOCK 21? IF YES, ATTACH CHANGED PID FACESHEET.

[1] 1 = NO 2 = YES

14. ORIGINATING OFFICE CLEARANCE

SIGNATURE: Charles P. Campbell

TITLE

DATE SIGNED: MM DD YY 12 16 79

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

AID 1330-1 (3-78)

TABLE OF CONTENTS

PROJECT DEVELOPMENT TEAM

DESIGN OFFICER	G. NELSON	USAID
FIELD ASSISTANT	A.K. ASHUR	USAID
ARCHETECT PLANNER	P. GABELE	CONTRACT
MATERIALS AND CONSTRUCTION	E. ROXBY	CONTRACT
SOCIOLOGIST	N. GREELEY	REDSO/EA
ENVIRONMENTALIST	E. McGOWAN	CONTRACT
HEALTH	A.A. COLE	USAID
AGRICULTURE	M. LAU	USAID

I. PROJECT DESCRIPTION

From 1973 to 1975 Somalia was severely affected by a widespread drought. The drought was particularly devastating in the northern and central portions of the country where the majority of the population are nomads following their herds in search of water and grass. Livestock losses were immense and many families were left destitute with no means of support.

In 1975 the government established 21 relief camps throughout the most severely affected area to provide havens for the destitute nomads where they could receive food and medical assistance. Ultimately the government decided that these camps could never be a permanent solution since the people living there had no means of livelihood. Therefore, in view of their long-term policy of encouraging the sedentarization of nomadic and semi-nomadic groups, they adapted the solution of resettling these people to areas of the country where they could be provided with the means to earn a reasonable living. With Russian assistance, the nomads from the 21 relief camps were settled into three agricultural villages, two on the Shebelli river and one on the Juba, and into three coastal fishing villages.

Relief activities continued in the resettlement villages but emphasis was placed on the permanent nature of the new settlements and on the development of an economic base in the villages.

Numerous donors are assisting with the resettlement program in a truly multidonor effort coordinated by the Settlement Development Agency. Various Arab groups and the IBRD are active in the development of agricultural lands for the settlements, the Federal Republic of Germany has provided mechanical and vehicle support, the Scandanavian countries are active in the fishing villages, the World Food Program has provided both relief supplies and food for work, the African Development Bank and UNICEF have provided assistance in the Health Sector and the Dutch government and the UNDP are cooperating with USAID in the shelter sector. This massive donor contribution has supplemented the major resources contributed by the Government of the Somali Democratic Republic to get the program moving.

Kurtunwaare with a settlement of some 4,000 families was one of the three agricultural villages established under the resettlement program by the Settlement Development Agency (SDA). The SDA has emphasized a comprehensive approach to development in the resettlement villages. Agricultural development provides the means of livelihood for the people in the village while social services, such as health and education, serve as strong incentives to the people up to the time the economic incentives are more evident. Infrastructure programs such as access roads and the proposed housing program are being instituted to make the villages more permanent and pleasant. Ultimately the productive activities will eliminate the need for relief activities and the village will become self-sufficient.

In Kurtunwaare the agricultural program has been begun under joint financing from the IBRD and the Arab League. Initially 3,000 ha. of irrigated land and 3,000 ha. of dryland crops are planned with ultimate expansion up to 15,000 ha. and 30,000 ha. respectively under cultivation. Land is presently under development with 800 ha. completed and is being farmed collectively. Long-term plans call for the land to be subdivided into three hectare individual plots for irrigated land and six hectare plots for rainfed land after sufficient land is developed to allow complete and equitable distribution to all villagers. Present crops range from fruits and vegetables to oil seeds and cotton and include substantial areas of subsistence cereal crops. Ultimate plans call for the village to be more than self-sufficient in cereals and to produce significant cash crops. See Annex 12 for a short description of the agricultural program.

For social services, the existing village is providing primary and middle school education for all. It is planned that primary education will be provided on a decentralized basis in each satellite village while higher level education will be centralized in the principal village. Plans call for the construction and staffing of a vocational school within the next year and expansion of the existing educational facilities.

The health sector has, up to the present, been addressed through the construction and staffing of a 140 bed temporary hospital and the training of 400 Community Health Workers in a crash program. This proved effective in the emergency program necessitated by the debilitated physical state of the nomads when they were initially resettled. However, at present a greater emphasis on training and supervision of health workers to begin incorporating preventive medicine in a primary health care module is needed. The Ministry of Health has agreed to begin this transformation utilizing funds from their annual budget, from UNICEF programs and from USAID Title I local currency proceeds. See Annex 13 for the Title I proposal.

In addition to the production and social services required for the village, it is essential to provide the villagers with minimum standard housing before the village can become truly permanent in nature. Their present units are temporary shelters built of mud and wattle in very crowded conditions. They were constructed as a suitable short-term solution and now need to be replaced with a permanent shelter unit.

The crude temporary units were built rapidly with little or no planning due to the need to move the people from tents into some form of longer lasting, temporary shelter. The mud and wattle is rapidly deteriorating due to insect damage and heavy rains over the past two years. Several of these units have reached a point where they no longer offer sufficient protection from the elements and are virtually uninhabitable. The houses

were built without grading and site work so drainage is causing severe problems. Insufficient provision was made for waste disposal which represents a serious health hazard.

In short the present village was intended to solve the short term shelter problems with the objective of establishing permanent structures as the long term solution. The proposed A.I.D. project begins implementing an acceptable long term solution.

U.S. involvement with the settlement program in Kurtunwaare dates from our earliest reinvolvement in development in Somalia in 1976. The initial U.S. assistance exploratory Mission in 1976 identified the Kurtunwaare settlement as one program given highest priority by GSDR that the U.S. should consider assisting. Subsequent Missions narrowed the scope to shelter. The GSDR repeatedly emphasized the importance of the shelter program in Kurtunwaare in discussions with U.S. officials up to the level of Assistant Secretary of State. It is obviously a program which ranks high in GSDR priorities over all and particularly in terms of their expectations for assistance from the U.S. Government. The project presented in this PP represents our response to this high priority request.

The goal of the project is to develop the housing and social services needed for the entire settlement of Kurtunwaare to support the overall GSDR program of encouraging the sedentarization of nomads. Present estimates call for some 5,200 houses required for the resettled people in Kurtunwaare. These houses must be of a suitable standard, culturally and environmentally suitable, locally adapted, sufficiently durable, maintainable by the local inhabitants and placed according to a plan which permits rational use of the area. Adequate social services such as health and education which serve as major incentives for families in the village will be provided.

The major assumptions to achieve this goal are that first given the high capital investment in the agricultural program, the scheme is supported until it becomes viable and self-sustaining. Secondly, we assume that after the pilot project is completed it will be sufficiently attractive to draw additional donor resources to finance the continuing construction program for the remaining units needed for Kurtunwaare. Thirdly we assume that given the importance accorded to the social services by the government that these services will be expanded also to include the entire settlement.

The purpose of this project is to test and further develop a suitable, low cost, minimum shelter housing unit for Kurtunwaare and prove its suitability in the local milieu and to provide suitable minimum shelter for 400 families. A master plan and house design have already been

developed and prototypes are under construction as part of the preproject planning and design effort. Options for building layout and site plan, unit design, construction materials and methods, etc., have been narrowed to a minimum of solutions.

The present plan as more fully described in Annex 7, Architectual and Planning Analysis, defines the settlement as consisting of the principal village and three satellite villages laid out in a linear fashion. The pilot project will develop one-third of the first satellite village. The 400 units to be constructed constitute one "Beel" or neighborhood of the village. The "Beel" will share a commons area incorporating an intermediate school, a health care facility, a recreation area, and a market with the other two "Beels" in the village. The "Beel" to be constructed will include areas for its own elementary school, mosque, Koranic school and day care center. The "Beel" is in turn made up of eight "Ududs" or subneighborhoods each containing 50 families. The "Udud" contains its own green areas and water supply. The "Udud" is then divided into five "Xubins" or blocks, each containing ten housing units. The individual residential units are grouped to face in towards a central common area with alleyways and access roads separating the "Xubins".

Summary of Socio-Political and Housing Units

	Houses	People
Village (Kurtunwaare)	5,200	26,000
Satellite	1,200	6,000
Beel (A.I.D. pilot)	400	2,000
Udud (A.I.D. pilot)	50	250
Xubin	10	50
Residential Unit	1	5

The residential unit itself consists of a plot of approximately 180 sq. meters surrounded by a small wall. The plot includes a two-room house with space for a third room if desired in the future, a cooking area, a toilet, an outdoor living area and a small garden area. Annex 7 provides floor plans and sketches of the unit.

The house is to be constructed of CINVA ram blocks laid on a cyclopean, mortarless foundation of coral rock topped by a grade beam. In black cotton soils where expansion is likely to cause undue cracking of the walls, the grade beam will be set on bored piles rather than the rock footing. Cross ventilation is provided for by the orientation of the house perpindicular to the prevailing winds and adequate windows and vents. The roof will be constructed of dimension lumber rafters and local wattle purlins topped by tar paper and local thatching. Plot walls

will be of local mud and wattle construction. The cooking area will consist of a water basin and charcoal grill with a flue for fire protection and will be roofed. The toilet will be an individual aerobic digester fabricated on site.

Since this is an innovative project it will be necessary to make minor modifications in design, methods, etc., during the 50 unit test program as part of the "successive approximations" approach to reaching final design. To a large extent changes during the project will be a result of social perceptions of the units. Despite extensive discussions with the residents and administration of Kurtunwaare it is not possible to make definitive statements concerning the final details of the units until the people have seen and lived in the units and experienced the relationships within the blocks. The people of Kurtunwaare, like most others in the world, cannot relate to floor plans and drawings and therefore must have experience with the physical unit before forming definite opinions.

On the technical side the design effort has also defined materials and methods which are the design team's best theoretical judgement, but empirical analysis may require some modifications in the construction materials and methodologies.

The pilot project will accumulate this empirical knowledge in a test phase and then go on to prove the final design. As discussed in the implementation and evaluation sections, the project begins with a test phase which will construct 50 units, the smallest complete block. These fifty units will serve as the training ground and the experience base to arrive at the optimum design. The remaining 350 units will serve to sharpen skills and prove the validity of the final design and approach.

The only critical assumption in achievement of the project purpose is that the design work done by A.I.D. under this project will be accepted as a basis for future housing activities. We have already been beseiged with consultants from other donors who have been sent by several ministries of the government to view the results of our preliminary designs. This indicates that we are indeed setting the standard for low cost housing.

The outputs of the project are the following:

1. A final design and material recommendations for the construction of low cost minimum shelter housing in Kurtunwaare and other areas having similar social and physical characteristics;

2. Completion of 400 housing units with its related site and services.

3. A minimum of 90 trained skilled workers.

The final design and material recommendations will be an output of the program for construction of the initial 50 unit test activity. As discussed above this final design will not be significantly different from the present design but is likely to incorporate numerous minor modifications to better adapt the unit to the local milieu.

The 400 housing units will be constructed according to the plans discussed in detail in Annex 7. The site and services work includes excavation and grading for drainage, construction of access ways and installation of the water system.

The development of a cadre of trained skilled and semi-skilled workers is critical not only to the construction program under the project and future construction programs to complete the Kurtunwaare program, but also to the on-going continual maintenance of the units. Since the overall approach emphasizes low cost construction, maximizing utilization of indigenous materials, there will be a need for regular maintenance of the units. Masons will be required to point up cracks, carpenters to replace purlins, roofers to replace tar paper and thatch, etc. Therefore the trained cadre is essential to the long-term success of the project.

The critical assumption for achieving the outputs is that the skilled and semi-skilled workers will remain in Kurtunwaare. The SDA has instituted an incentive pay program, based on skill, with the scale varying from two to ten shillings per day in cash plus the food allowance. This in itself will probably be sufficient to maintain the skilled and semi-skilled work force. Furthermore, the skilled and semi-skilled workers will be in demand for maintenance and possible expansion of other individual's houses in the village and thus can have some outside income.

The inputs required to undertake this project are:

1. Overall site plan and preliminary design,
2. Technical assistance,
3. Training program,
4. Equipment,
5. Materials,
6. Labor,
7. Other.

The overall site plan and preliminary design has been developed as part of the PP effort. As discussed earlier, the plan and design is the best theoretical approach which can be developed at this point. We recognize that minor changes in design could occur as a result of initial experience in constructing the first 50 units but do not expect any major modifications.

The technical assistance team will be tasked with supervising and managing the effort and training skilled and semi-skilled workers and management staff to carry out the work. We estimate a need for nine technical assistants, one for the full period of the project and the remainder for shorter periods. The recommended team and the length of time required are as follows:

Project Manager	16 months
General Superintendent	12 months
4 Assistant Superintendents	8 months
Office Manager	8 months
Comptroller	6 months
School Superintendent	8 months

All members of the technical assistance team will have counterparts or Somali assistants who will assume their tasks as they depart. Although most of the team have functional titles, they will all be involved in on-the-job training and all but the Comptroller and Office Manager will be teaching formal training courses as well.

The training program is the key to the project since skilled and semi-skilled workers are essential in a self-help approach such as this. In this case we are beginning from base zero and working to a level of 10 units per week as the target output. In order to accomplish this an "assembly line" approach will be used. Workers will be taught their particular skill, laying block, doing cement, thatching, etc., very well using a short formal but practical training program followed by continuing on-the-job training by the supervisors. Bi-lingual teachers provided by the SDA and supported by the Technical Assistance Team will be the teachers of the training courses. As skilled workers develop their skills, they will in turn pass on skills to other workers in an accelerated apprenticeship type program.

In addition there will be a "leadership" training program to provide foremen and supervisors with the management skills required to supervise construction crews. These supervisors will be selected from among those skilled workers who show an aptitude for leadership in the early months of the project. A precise curriculum for this training will be developed by the Technical Assistance Team. See Annex 8 for additional details on the training program.

The equipment required for the project consists of two pieces of earth-moving equipment to undertake the major site work excavation and grading, thirteen units, trucks, tractors, trailers, etc., for transporting materials, 10 vehicles for personnel and a quantity of construction tools and equipment. Due to the long lead time for equipment procurement, funds are provided in the project for local contracting of some excavation work and hauling in the early months of the project. See Annex 11 for additional details.

The materials to be procured for construction under the project include steel, coral rock, cement, lumber, fasteners, and fiberglass. See Annex 8 for additional details on materials.

Other items include local contracting for survey work and installation of the well and water distribution system.

The major critical assumption concerns whether imported materials can be supplied in a timely manner. The section of the PP on implementation deals with this issue and defines the approach that has been developed.

II. ANALYSES

Social

The social analysis for the project was undertaken in two phases, first a preliminary, preproject design effort which focused on general sociological concerns of housing development in Kurtunwaare and a second analysis done during the architectural design which focused more-directly on the needs and desires of the villagers.

The final analysis incorporates the findings of the preliminary analysis and its general findings can be summarized as follows:

1. Nomadic peoples of Somalia despite their semi-settled nature have not traditionally exhibited a desire to become fully settled farmers except in times of extreme duress. The past century has seen an increased spontaneous shift of nomads to settled life as farmers and the droughts of 1975-76 caused the environmental pressures which permitted consideration of the idea of transforming large numbers of nomads into farmers and fishermen;

2. The older males of the nomadic families appear to have clung more tightly to some of their traditions of spending long periods away from their families;

3. The nomads came to the camp because of extreme climatic hardship but have remained despite very difficult living conditions, largely because of the strong attraction of social services, particularly education, offered in the village. The provision of suitable minimum standard housing in an attractive setting will be yet another incentive for them to remain in the village.

4. The government has committed large amounts of its meager resources to making this program work and has, up to now, carried out a rational, humanitarian program in the area. This makes it appear possible to accomplish the difficult task of developing a successful, self-sustaining, socioculturally feasible project based on the relocation of nomadic peoples to farming settlements.

More specifically the social analysis identified certain design considerations which were incorporated into the final design. These include:

1. The preference of the people for a feeling of openness;
2. The need for numerous open areas for meeting places;
3. The perception of the whole plot as part of the residential unit thus giving the added importance to the outdoor areas.

These considerations along with others were included in development of the design and the definition of the "successive approximation" approach to final design. The complete social analysis is included as Annex 9.

The Role of Women

Women are directly integrated into the economic and socio-political life of the village. They are full participants in the agricultural scheme and by law are equals in sharing the benefits of the scheme. They are active participants in the sociopolitical structure and in addition to their representation through the overall political structure, two representatives of the very active women's organization sit on the central committee which governs the village.

In the nomadic culture the house has always been the full responsibility of the women thus this project has direct impacts on the women in the village. The improved housing constructed will be easier to clean and maintain. Spreading the village allows space for the women's home gardens and for domestic fowl. The provision of water in relatively close proximity to the houses decreases her work load and the creation of satellite villages places her closer to sources of firewood.

The women of the village have made a major contribution to the present housing design by suggesting location of facilities, size and orientation of rooms, etc. During construction of the first prototype, women played an active part on the construction crew and they will continue to be active during the project.

It is apparent that in the creation of these "new villages" the GSDR has made a strong effort to promote the equality of women as established by law. They hope to make these villages examples of the validity of this premise as a demonstration to other parts of the country. In the settlement program, which by nature entails a socio-cultural change in attitudes, the development of an attitude of equality for women may be possible. The project will encourage this development wherever possible.

Architectural and Planning

The architectural and planning activity was undertaken as an intensive design activity. Data were collected and opinions solicited from numerous sources including the people at Kurtunwaare, government officials in Kurtunwaare, the Settlement Development Agency, Ministry of Public Works and other consultant and engineering companies. As a result of these initial investigations a series of design considerations and constraints was identified.

This Analysis identified certain givens in the project including:

1. The agricultural scheme with its large investment.
2. The existance of the principal village.
3. The sociopolitical organization of the village into an established hierarchy.
4. The physical characteristics of the area such as temperature, humidity, rainfall, wind velocity and direction, etc.
5. The expansive nature of the black cotton soils, and
6. The agricultural value of the land upon which the housing is to be constructed.

These givens, along with the social considerations concerning the villagers' perceptions of what a living unit should be, tempered by opinions of other government officials were then blended by the architect planner into a functional plan for the village and designs for the residential units. The approach utilized was to begin from the macro level and work to the micro level assimilating the basic design considerations and overcoming the constraints at the proper level to reach, as an end result, a series of design recommendations for the development of an optimum total environment in the village.

The principal design recommendations for the master plan can be summarized as follows:

1. Due to the size of the agricultural scheme and the distances involved plus the large number of people in the scheme a decentralized approach is called for.

2. Considering the GSDR investment already in place in the principal village it will continue to be the principal village, and

3. In light of the location of the principal village at one end of the agricultural scheme, the satellite villages will have to be arranged in linear fashion with the principal village as the gateway village.

The major design recommendations for the satellite village master plan are as follows:

1. Considering the socio-political hierarchy, three "Beels" of 400 families each will be grouped around a central commons area.

2. The "Beels" will be oriented to take advantage of winds for ventilation and for maximum shading of doors and windows.

3. Considering the low slope surface, drainage has been planned by utilizing walkways and road drains as collectors dumping into an excavated lagoon. The fill from the lagoon will be utilized to grade up the houses giving a slightly improved slope for drainage.

4. In view of the villagers' preferences for open areas, "green areas" are included in the plan for the "Beel".

5. Housing development will be concentrated as far as possible on the portion of the site having good bearing soils to decrease the costs of the foundation work.

The primary design recommendations for the "Beel" are:

1. In light of the socio-political structure the "Beels" shall be composed of 8 multiples of 50 thus including 400 households.

2. Due to the stated preference for openness, the "Beel" is designed to allow access from all sides through roads and/or walkways.

3. Given the need for centralized services, schools, mosques, etc., would be provided for at the "Beel" level.

The principle design recommendations for the "Udud" are:

1. Due to the socio-political structure, the need for openness and the need for some limited grouping, 50 families have been amalgamated into the "Udud".

2. Given the nomad's traditional view of water and the need for a reasonable cost of water supplies water is provided at the "Udud" level.

3. In light of the need for meeting areas for the "Udud" and green areas within the village a park area has been incorporated.

The major design recommendations for the "Xubin" are:

1. The socio-political structure defines a group of ten households as the smallest decision-making group, therefore this has been the guide in creating the "Xubin".

2. Due to the proclivity for outdoor living and the need for meeting spaces the "Xubin" is designed with an open commons area in the center.

3. The requirement for a feeling of openness has been addressed by designing the "Xubin" with access from either end to the common area.

4. Due to the need for a strong sense of community the residential units open onto the central commons area.

5. Because of the need for good ventilation and the need for small units to gain structural integrity on shifting soils, the housing units are staggered, yet in consideration of the value of land all units are contiguous.

The design of the residential unit was governed by the following recommendations:

1. Due to the outdoor orientation of the villagers' lives, the outdoor portion of the plot is made large enough to permit adequate space.

2. Since the villagers and the SDA expressed a strong desire for a home garden, adequate space is incorporated.

3. In consideration of the villagers expressed need for a wall for security, a perimeter wall is included but due to their request for a feeling of openness it is low enough to see over.

4. The kitchen location was chosen based upon the villagers' request for it to be separated from the house, yet accessable.

5. Because of the villagers' stated preference for entry into the courtyard rather than the house proper, this was incorporated into the design.

6. Due to the need for ventilation, cross ventilation has been allowed for.

7. Because of the temperatures encoutered, an insulating roof of tar paper and thatch has been designed.

8. Due to the need for privacy and insect control matting has been defined as a window covering.

9. The sizes of the rooms have been defined by determining the useage and needs as stated by the villagers.

10. Since there appeared to be a demand for a third room, space is allowed for construction in the future of the third room.

Additional details of how the final design was arrived at plus drawings showing the final design are included in Annex 7.

Materials and Construction Analysis

This analysis was undertaken by first surveying the existing information base through discussions with local and expatriate construction engineers and government engineers in the SDA and Ministry of Public Works. This exercise narrowed the realm of possibilities and defined parameters so that a combination of limited tests of materials and prototype construction could redefine the recommendations. The "successive approximation" approach thus begun will continue through the construction of the first 50 units to define the final unit plan.

The primary considerations in developing materials recommendations were:

1. Minimize costs while maintaining acceptable durability standards.

2. Maximize the use of indigenous materials and minimize reliance on imported items.

3. Utilize materials which require minimum sophistication in construction expertise.

The selection of construction methodologies were governed primarily by the minimally trained character of the work force and the basic physical characteristics of the bearing soils in the area.

The results of the analysis are as follows:

1. Due to the expansion and contraction of the black cotton soils, it is preferable to build on those areas where sands and clays are found and a cyclopean foundation structure could be used. However, if it is necessary to build on the deep black cotton areas, a bored pile foundation will be necessary. Past experience indicates that piles to a depth of one and a half meters will be sufficient as the moisture content at that depth is

stable. The foundation solution was developed in consideration of costs and durability. They are designed to ensure structural integrity but we are prepared to accept minor cosmetic cracking.

2. For the walls it has been determined that the only workable solution is to utilize locally manufactured brick or CINVA ram blocks. The brick does not require as much labor in manufacture but the energy requirements for firing make them expensive. Also the uneven character of the brick requires more sophisticated masons. It is possible that a Somali Development Bank supported project will install biogas generators based on cattle manure which might provide a suitable low cost energy source but this is not proven at this time. The CINVA ram block based on a lime or cement stabilized soil fabricated under pressure requires more labor to run the pressure apparatus but appears most feasible at the present time. The project will begin using CINVA ran blocks during the testing period and then evaluate the status during that period. Either of the two materials would require the same sort of construction skills and final selection depends upon reactions of the workers and the villagers to the two materials and relative economics.

3. In consideration of the need for insulation and water resistance and in light of traditional methods of roofing, a modified thatch roof has been defined as the best solution. Zinc roofing was eliminated due to cost, esthetics and heat problems, and the use of asbestos roofing was environmental implications. The thatch roof will be laid over tar paper to reduce the problem of vermin and water seepage. The roof structures will be dimension lumber gables and rafters with local wattles as purlins. This roof is light, more durable than traditional roofs and easily repairable.

4. The problem of waste disposal was one of the most difficult encountered. Typical water-borne systems are too costly both for installation and maintenance. Systems relaying on leaching such as septic systems, cesspools and pit privies are not acceptable due to the low percolation rates. Therefore, the solution must be an innovative one. The recommended aerobic digesters seem perfectly adapted to the physical characteristics in Kurtunwaare. They are in a closed system not affecting groundwater. Natural bacterial action breaks the wastes down into useable organic fertilizers. They are more costly than septic systems but seem to be the only feasible approach.

5. The critical consideration in defining the methodology for construction once the materials were defined was the availability of manpower. In order to efficiently organize the construction activity it is essential to proceed with an 'assembly line'

process. Craftsmen will be trained in one particular skill which he will perform over and over again on numerous houses. Skilled and semi-skilled workers will be specifically trained for specific tasks in constructing the unit, when his crew finishes its task on that unit it moves to the next so that by repetition he becomes quickly proficient at his task. The keys to this type of program are: first, a good basic training, and second, good management and supervision. The project includes a training program to provide the first and a technical assistance team to provide the second until Somalis can be trained to take over. Additional details on the construction materials and methodologies can be found in Annex 8.

As part of the design process a prototype unit has been constructed based on the design, materials and methodologies recommended. The lessons learned in constructing this prototype have been incorporated into the recommendations for design and materials and for the training program. The reaction to the prototype as the first permanent structure which is to be a housing unit for the villagers has been uniformly positive. It has been a focal point of attention in the village and villagers have been free with suggestions. Between now and when the project is underway additional prototypes will be constructed to provide further empirical testing of ideas and socio-cultural acceptability and to maintain the momentum and enthusiasm already generated among the villagers.

The engineer on the design team has reviewed the plans and cost estimates developed in the design of the project and finds them adequate to meet the requirements of section 611 of the Foreign Assistance Act.

Administrative Analysis

The Settlement Development Agency (SDA) was created in 1976 and tasked with managing the entire program to resettle the destitute nomads into sedentary villages. It was staffed by pulling senior administrators from numerous ministries to give it a very high quality staff to manage this high priority program. It was able to mobilize almost unprecedented resources to undertake the task. In 1977 the GSDR budget for resettlement ranked second only to defense in total GSDR resources. See Annex 12 for details of the GSDR contribution.

Temporary villages using field tents were erected on six different sites and 100,000 nomads with their property including the few sheep and goats they had managed to keep alive were moved by plane and truck to the new villages.

Upon arrival of the nomads the most critical needs were for emergency health care and food. Within months the health and nutritional standards had improved to a point where productive work could begin to be considered.

Financing was arranged for development of the agricultural lands and the fisheries industries and the retraining of the nomads began to fill their new roles as farmers and fishermen. The SDA managed the retraining programs while at the same time they organized the villages into a sociopolitical structure to begin creating a sense of community. Simultaneously, schools were constructed and staffed and more sturdy temporary shelters developed for the villagers.

From day one of the settlement program up to present, the primary task has been providing sufficient food for the settlers. SDA has had full responsibility for assuring a reliable supply of food to the villages. Transport from Mogadiscio to six remote villages over difficult terrain has required a great logistical effort and one which the SDA has handled with laudable success.

The SDA's sensitivity to the needs and desires of the settlers has been demonstrated in their rational and humane approach to the very difficult task of resettling people to a new and different life under radically different climatic and ecological conditions. Their management capability has been demonstrated by their accomplishment of the very difficult task of creating large rural villages where none has existed in the past.

SDA capabilities are amply demonstrated by a brief description of what Kurtunwaare was three years ago compared to what it is now. Three years ago it was an empty plain having two small villages of 100 families. First a tent city sprang up and 15,000-20,000 people were moved in. Within months temporary shelters were under construction. Within a year the tents were gone, schools were operational and improved health services provided. The agricultural production program began on a small scale within 18 months and the sociopolitical structure was beginning to give a sense of belonging.

Today, less than three years later, the village has 800 hectares under cultivation and the first major harvest, which looks to be very good, will be forthcoming in January. Primary education has been introduced for all settlement children and there are plans to expand education to the higher grades and to include a vocational school. Permanent administration structures have been constructed and with the assistance of the A.I.D. design team a master plan for the village has been created. The people are beginning to develop a sense of permanence which is critical to the long term success.

If we multiply the efforts needed to cause this transformation by six to include all the villages it gives a good picture of the magnitude of the effort and depth of managerial competance which the SDA has demonstrated in developing the resettlement villages. This competance will go a long way in assuring success in implementing the proposed shelter project. SDA logistics experience is critical to managing the materials and their success in organizing people crucial to the construction program. We are convinced that they will continue to function in an effective fashion.

Financial Analysis

The financial analysis of the project focused on two items, the project cost and the costs of replicability of the housing units.

Tables 1 and 2 present the detailed budget and the A.I.D. contribution respectively.

TABLE 1

DETAILED COST SUMMARY

ITEM	TOTAL	A.I.D.	GSDR BUDGET (WFP)	GSDR TITLE I PROCEEDS
Materials				
Lumber	55,000	55,000	--	--
Steel	52,000	52,000	--	--
Cement	220,000	220,000	--	--
Fasteners	23,000	23,000	--	--
POL	12,000	--	--	12,000
Tar Paper	12,000	12,000	--	--
Thatch	14,000	--	--	14,000
Doors	6,000	--	--	6,000
Toilets	140,000	140,000	--	--
Coral Rock	14,000	--	--	14,000
Plantings	4,000	--	--	4,000
Shipping and Miscellaneous	100,000	100,000	--	--
Sub-Total	(552,000)	(602,000)	--	(50,000)
Food for Work	)		820,000	
Labor	) 1,000,000	--	100,000	--
Staff	)		100,000	
Services (Contract)				
Well and Distribution	50,000	--	--	50,000
Survey	15,000	--	--	15,000
Materials Tests	20,000	--	--	20,000
Excavation	100,000	--	--	100,000
Hauling	50,000	--	--	50,000
Sub-Total	(235,000)	--	--	(235,000)

Table 1 (Continued)

ITEM	TOTAL	A.I.D.	GSDR BUDGET (WFP)	GSDR TITLE I PROCEEDS
Tools and Equipment	631,500	631,500	--	--
Equipment O & M	130,000	---	--	130,000
Technical Assistance	600,000	600,000	-	--
Miscellaneous	40,000	40,000	--	--
Inflation	290,000	150,000	100,000	40,000
Contingencies	216,000	76,000	100,000	40,000
TOTAL	3,815,000	2,100,000	1,220,000	495,000

TABLE 2

A.I.D. CONTRIBUTION
(000 Dollars)

ITEM	FY 79 YEAR 1	FY 80 Year 2	TOTAL
Materials	200	402	602
Technical Assistance	168.5	431.5	600
Tools and Equipment	631.5	--	631.5
Miscellaneous	--	40	40
Contingency and Inflation	--	226.5	226.5
TOTAL	1,000	1,100	2,100

The project is budgeted for A.I.D. to pay the costs of imported items while labor is paid by the GSDR and Food for Work provided by the govenment from WFP and other supplies. Local costs aside from labor will be paid from GSDR's local currency proceeds of the PL 480 Title I program. The agreement for the Title I program includes this project as one of those to be supported by the program and the Ministry of Planning and Finance are in agreement.

The A.I.D. contribution to the project amounts to 55 percent of the total project costs. The GSDR contribution in total is equal to 45 percent of the project of which 24 percent is cash and 21 percent is food.

The A.I.D. contribution is budgeted very tightly for FY 79 due to overall budgetary constraints. Critical U.S. procurement of tools and equipment and essential U.S. source materials such as steel, start-up cement,

etc., must be effected immediately upon obligation of funds due to the lead time for getting these items in country. The technical assistance component is budgeted at only the amount needed to carry the contract until October. Year two funding will have to be obligated in October of 1979 to allow the project to proceed on schedule. If additional funds become available during FY 1979 the project could well utilize a cushion of $500,000 to more fully fund the T.A. contract and to advance the procurement of materials to give a stockpile in the interest of assuring a smooth progression of the work.

Many of the costs of this project are start up costs to provide essential equipment and management and training expertise. These costs, although essential to this project should not be charged against the individual units but rather spread over additional units to be constructed under future projects. The $600,000 of T.A. should be split at an estimated rate of $100,000 attributable to this project and $500,000 as laying the groundwork for future projects. The equipment and tools will have approximately an 85 percent salvage value after this project giving a net cost of about $100,000 to this project. This results in a cost per unit as follows:

Materials	$1600
T.A.	250
Tools and Equipment	250
Transport, etc.	200
Labor-cash	250
	$2550 per Unit

The food cost of $200 per house is not included because this charge would accrue to SDA whether the person was working or not.

The above indicates that these units could be replicated at a cost of some $2,500 at 1978 dollars in future projects. This is considered to be a very reasonable cost for minimum standard shelter.

Economic Analysis

The economic analysis in this project focused on identifying the least cost alternative in various proposed solutions. In all cases cost was a major determinant in defining the design and materials to be used. Other considerations are of an aesthetic and environmental nature, tin roof versus thatch, and desire to use local materials to extent possible thereby reducing import and the lead time requirements. To illustrate the approach taken, the following Table presents a summary of several alternatives which were considered and comparative costs of the present temporary shelter.

COST EFFECTIVENESS COMPARISON

ITEM	PRESENT UNIT	USAID DESIGN	IMPROVED VERSION I*	IMPROVED VERSION II**	SMALLER UNIT***	PREFAB
MATERIALS						
Foundation	-	442	475	700	402	400
roof	100	187	500	500	170	2600
Other	100	621	825	825	560	
Total Cost	200	1350	1800	2025	1232	3000
LABOR	3600	1117	1300	1400	1000	400
SKILLED LABOR (Hours)	10	350	400	550	315	150
PERCENTAGE IMPORTED (FX) (Hours)	10	80	90	90	80	98
USEFUL LIFE (Years)	3	15	15	15	15	20
ANNUAL MAINTENANCE ($)	50	30	15	5	25	10
TOTAL YEARLY COST ($)	116	125	135	140	107	160

*Improved version I
(1) Metal roof w/ceiling

**Improved version II
(1) Metal roofing
(2) Improved foundations

***Smaller Unit
(1)25 percent decrease in size

It is clear from this summary that all alternatives to the existing structure are more costly if the opportunity cost of labor is assumed to be zero. However, the existing temporary structures deteriorate rapidly and have had to be completely rebuilt either once or twice during the past three years. Even then they are barely habitable. They require a great amount of labor to construct and are heavy users of scarce resources such as wattles in a dense village setting. If we were to calculate the cost of getting the wattles as other than a free good the costs would escalate sharply. Most important, the people of the village view these traditional structures as temporary and they do not accomplish the goal of giving the village a sense of permanence.

The present USAID designed project is based on a tradeoff between a lower initial cost with higher maintenance costs versus a high initial cost with lower maintenance costs. On an undiscounted basis this gives the design a lower annual cost than other designs which were considered. Since in Somalia the opportunity cost of capital is probably lower than the inflation rate for imported materials more sophisticated calculation would probably increase the difference. Furthermore improved designs incorporating metal roofs were esthetically less pleasing, required additional imported materials both for repair and replication and even with a ceiling beneath them were unlikely to provide sufficient thermal insulation while at the same time harboring vermin.

The strengthening of the foundation to make the units less likely to incur cosmetic damage was considered but rejected due to first the increased initial cost and second uncertainty as to whether they would be that much more effective.

Another alternative given serious consideration was decreasing the size of the units to further decrease the costs. Careful analysis showed that decreasing the floor area of the houses by 25 percent would only give about an 8-10 percent decrease in materials costs and considerably less than that in overall project costs. It was therefore decided that the larger unit which is much more attractive to the villagers would be recommended.

The use of prefabricated units had been suggested by USAID at one point. This alternative was considered but rejected primarily due to excessive cost even when estimated on a very conservative $2.00 per square foot for the unit. A second major consideration was the total reliance on an imported item which would make it difficult for the GSDR to even replicate the activity.

A further consideration in the economic evaluation of the project was to look at the employment effects of the project. The construction of one house according to the design estimates requires approximately 150 to 200 person days of labor, one-third of which is skilled labor. The project

plans to employ some 300 people at the peak of the program. At an average cash wage rate (in addition to food) of 5 shillings a day some $60,000 will be pumped into the microeconomy of the area during the life of the project. The multiplier effect of that money in the area will be significant as the cash circulates. Furthermore that flow is likely to grow as the construction program expands following the pilot program. Over the next 5 years while the initial 4,500-5,000 houses are constructed it is expected that up to a thousand people could be employed in the construction trade. Following the initial construction period some 300-500 could be assured of continual employment in maintenance and expansion of existing facilities. If the project is replicated in other areas even more could be employed (1,000-2,000 people).

Environmental Analysis

An environmentalist was an integral part of the design team and participated in the data and information gathering phase as well as consulting with the team while they were preparing the final design. The primary environmental concerns of drainage, sewerage disposal, and environmental health formed part of the design considerations which were the basis for the final design. The project will have positive environmental effects in improving the present situation and a negative determination is recommended. A complete IEE is attached as Annex 2 to this paper.

III. IMPLEMENTATION

As discussed earlier in the project description, the implementation approach to be utilized in this project is one of developing and subsequently evaluating a 50 unit test unit during which the design for the remaining 350 units will be finalized by "successive approximation".

The project, as it is presently designed represents the best theoretical approach to the solution. However, the only way to fully define the practical solution is through the accumulation of empirical knowledge. This test period, during which the technical assistance team is fully involved, will serve to provide us with empirical knowledge. During this period both social reactions and the suitability of materials and methodologies will be monitored as defined in the evaluation section of this paper. This test period will also serve as a training ground for skilled and semi-skilled workers so that when the remaining 350 units are begun, the rate can accelerate to a minimum of 7 units completed each week.

When the test phase is completed, the remainder of the project will serve as the proving ground for the methodologies developed, the project will have a trained staff, fixed materials, design and methodology, support systems established, etc., which allow for the accelerated rate of completion. It is estimated that by the time the entire 400 units are

complete the rate could go as high as 10 completions per week. It is the final 350 units which will demonstrate the validity of the design and methodologies and which will serve as guidelines for other minimum standard, low cost shelter projects.

It is clearly understood by the SDA and the design team that maintaining a constant stream of supply is critical to progress in the project. The SDA is already involved in a massive program of supplying all the food items required by the villagers and therefore have great experience in the area of logistics supply, stockpiling, etc. This experience coupled with assistance from the technical assistance group in procurement and management, supplemented by provision of funds in the project for both hiring transport and purchasing needed transport vehicles will ensure solid supply lines. The project relies on a minimum of imported materials. These commodities will be supplied as far as possible by an initial large shipment to permit the collection of a large enough volume to allow a U.S. shipline to call at Mogadiscio and eliminate transshipping. At the same time, East African supply sources of certain supplies, cement and wood in particular, will be identified to allow expeditious service.

In order to assure the close coordination and timely provision of all needed inputs, we feel that the best implementation approach in this project will be to utilize one contractor in an overall technical and managerial contract. The technical assistance team will be responsible for managing all inputs under the project. They will assist the SDA in procurement of needed materials and equipment, provide all training, provide technical supervision and general management. U.S. based architect and engineering firms have the capability to undertake this type of program in a competent manner. The design team is preparing a RFP for this team and will move toward the contract concurrent with project approval.

The timing of the provision of inputs to the project and the realization of the related outputs is addressed in Annex 8 in the form of a PERT network. The critical constraint identified was the time-lag in U.S. procurement.

In order to prevent a long delay between completion of the prototypes under the design phase and beginning the test phase under the project, funds have been set aside in the project for the local contracting of excavation and site work, for hauling materials and initial rental of vehicles. This will permit the project to be initiated without waiting for equipment and vehicles from the U.S. to arrive at the site. This is particularly critical since the early stages of the project requires excavation, grading and transport of materials before the construction program can begin even at a minimum scale.

All contracts under the project will be host country contracts with the SDA as principal executing agency. We anticipate utilizing an advertized RFP for the overall contract with solicitation for local items and Code 941 materials. The technical assistance, equipment and tools (a total of $1,200,000) will be procured in the U.S. and materials will be procured in Geographic Code 941 countries in East Africa where expeditious supply connections exist.

IV. EVALUATION

Evaluation in this project is broken into two distinct activities. First and of primary importance is the evaluation of the test program. Since the test program of the first 50 units is designed to make adjustments in the design and materials and develop the final design by a process of "successive approximation" it is essential that continual evaluation be undertaken during this time. The items identified by the design team as being of critical importance are:

1. The functional effectiveness and social acceptability of the house design,
2. The validity of the waste disposal solution,
3. The effectiveness of the proposed units in ameliorating the insect and vermin problems,
4. The validity of the village drainage solution,
5. The suitability of the Cinva-ram block,
6. The adequacy of the training program,
7. The sufficiency of the logistics and supply network, and
8. The adequacy of the technical assistance team and training program.

Most of these items will be monitored on a continual basis by the technical assistance team and A.I.D. staff. A.I.D., using the resources of the Mission and REDSO, will work with the T.A. team and the SDA to review the results before moving into the larger phase of constructing 350 additional units.

The final evaluation will be conducted after most of the 350 units are complete. Of critical interest at that time are the following points:

1. The effectiveness of the Somali counterparts in taking up the management of the program,

2. The villagers perception of the "Beel" concept and the sufficiency of services in the satellite village,

3. The costs of construction and costs of replication,

4. The level of donor assistance required to continue the program, and

5. Preparation of documentation for follow-on funding.

V. CONDITIONS, COVENANTS AND NEGOTIATING STATUS

The project has been designed in cooperation with the Settlement Development Agency and the Ministry of Public Works. The master plan, unit design, materials and methodologies have been agreed upon by all parties concerned. The sizeable government contribution has been discussed with the Ministry of Finance and the State Planning Commission. All parties are in basic agreement with the project in its present form and emphasize the high priority placed on the program.

We do not foresee a need for any extraordinary conditions in the project. As conditions precedent to initial disbursements, specimin signatures and a legal opinion should be adequate. We recommend the standard language concerning A.I.D. approval of contracts prior to disbursement of funds for those contracts.

In terms of covenants we see no requirement for extensive covenants beyond making funds available in a timely manner.

The Project Paper has been provided to the government and the draft project grant agreement will be provided while the PP is under review in AID/W. The GSDR has executed one agreement in the project grant agreement format and we foresee no problems with this project.

The bilateral agreement is under negotiation at the present time but signature of the agreement for this project are covered by the authority of the circular 175 Procedure Memorandum signed in September by the Deputy Administrator, State 245297, paragraph 1-C.

ANNEXES

1. LOGICAL FRAMEWORK
2. INITIAL ENVIRONMENTAL EXAMINATION
3. STATUTORY CHECKLIST
4. PID APPROVAL CABLE
5. LETTER OF REQUEST
6. 611 CERTIFICATION
7. ARCHITECTURE AND PLANNING ANALYSIS
8. MATERIALS AND CONSTRUCTION ANALYSIS
9. SOCIAL ANALYSIS
10. AGRICULTURE DESCRIPTION
11. HEALTH TITLE I PROPOSAL
12. GOVERNMENT BUDGET FOR SETTLEMENT DEVELOPMENT AGENCY

LOGICAL FRAMEWORK
KURTUNWAARE SETTLEMENT PROJECT

NARRATIVE	OVIs	ASSUMPTIONS
GOAL: Provide adequate hoiusing and social services for the resettled nomads at Kurtunwaare	20,000 people living in suitable housing in the village and suitable health and education services provided.	The agricultural scheme will be supported until it is selfsufficient Additional donor financing will be forthcoming to finance the continuation of the construction program. Social services will continue to receive high priority form the government.
Purpose: Test and develop a socioculturally, environmentally suitable low cost minimum shelter unit for Kurtunwaare and prove its suitability.	400 units constructed financing arranged for further units based on USAID plans	The design developed in the project will prove attarctive enough to encourage other financial interest.
OUTPUTS: Final design and material recommendations Trained craftsmen Trained leaders	50 unit test completed with agreed design. minimum of 90 trained workers At least 15 supervisory workers on the job.	Skilled and semiskilled workers will re-remain in Kurtunwaare.
Inputs: Technical Assistance Training Program Overall site plan Equipment Materials Labor	See Budgets	Materials and tools will arrive at site in a timely manner Initial prototypes prove validity of basic design precepts.

Annex 1

Annex 2

INITIAL ENVIRONMENTAL EXAMINATION

Project Location: Kurtunwaare, Somalia

Project Title: Kurtunwaare Settlement Program

Project Number: 649-0104

Funding (Fiscal Year and Amount): $1,750,000

Life of Project: Two years

IEE Prepared By: Mission/McGowan Date: 12/15/78

Environmental Action Recommended: Negative determination

Concurrence: Charles P. Campbell Date: 12/16/78
AID Representative, Somalia

Assistant Administrator's/Director's Decision: Date:

INITIAL ENVIRONMENTAL EXAMINATION

I. PROJECT DESCRIPTION

In concert with the villagers at Kurtunwaare and the Somali Government, a 400 unit low-cost dwelling demonstration pilot project will be implemented. The pilot project is based on a master plan for the village and house plans developed during the design phase. The pilot project, if successful, will be replicated for the remaining 4,000 units needed by the village, and possibly other urban fringe areas of Somalia.

II. DISCUSSION OF IMPACTS

A. Land Use

The project will not alter the existing land use. The Somali Government, through other donors, has developed the area for intensive agricultural production. The project will be a decentralization of the existing highly congested nomadic refugee camp of 18,000 persons. Under the master plan, more land may be used in designing and construction of the projects' houses than is currently allotted in the refugee camp. The total area of the Kurtunwaare agricultural development is so vast (18,000 ha) that the small amount of land lost in the exchange is insignificant compared to the immense gain in human welfare.

B. Physical Changes in the Land

The ultimate design, as chosen by the Somali government from project alternatives, will have provisions for water delivery, waste disposal, primary and secondary streets, drainage control, and community and public facilities.

Placement and construction of these basic services will be designed prior to project authorization. Principal consideration will be the virtual lack of slope in the area and associated drainage and infiltration problems. The area covered by dwellings will reduce the overall area for infiltration of rain, while the roofs will collect and concentrate the water into the streets. To offset this, a drainage system must be designed and developed in concert with the area. The design recognizes this problem and is aware of the need to control silt, standing water and the movement of contaminants.

C. Roads

Because of the pre-existing extensive levee road network, there will be little need for road construction leading to the project site.

The ultimate route chosen will require some surfacing but this is expected to have a minimal and short-term effect on the local environment.

D. Surrounding Lands.

Depending on the ultimate site of the project, and development of alternative energy sources, there may be some degradation of the surrounding forests by fuel wood collection. Much of the potential for any degradation can be overcome by utilizing the vast tonnages of corn stalks and cobs produced by the surrounding agricultural project. This use will require some retraining as the traditional fuel source is wood. Enforcement of the local regulation against cutting green wood seems adequate at this time. In addition, the Somali government is constructing and testing biogas generators at the site. Energy from these units will furnish industrial as well as domestic needs.

E. Water Quality

With respect to draw on existing wells, the project will have no net effect as it is merely the transfer of people from one point to another. The principal use of water in the area is for irrigated agriculture; human use under these conditions is insignificant.

Groundwater in the area is separated from the surface by an impervious layer at about 50 meters depth. Water extraction systems above this impervious layer must consider contamination from waste disposal systems. Provisions for rain water catchment such as roof gutters and cisterns should be investigated as groundwater is high in mineral content.

Within the present village of Kurtunwaare, there are inadequate provisions for disposal of human waste. As a consequence, a deplorable situation exists from the human excrement of the 18,000 inhabitants. During the wet seasons, vast areas of the existing village are awash. Even though there are wells, this standing water is used to some extent, presumably because of the high mineral content of well water.

The project will consider several alternate design for water delivery and waste disposal which will help eliminate the current problem. Proper design of water works will include mechanisms to prevent standing water or soil moisture levels capable of harboring soil-borne diseases. Drainage designs for control of flooding and runoff will incorporate provisions to eliminate silt and waterborne contaminants. The project design will consider the merits

of planting useful vegetation at points of high soil moisture. The use of certain grasses for surfacing streets and walkways will also be considered. Data from government sources on hydrology will be investigated prior to designing waste disposal systems to insure that intermediate groundwaters are not contaminated. Future well drilling should be based on hydrological and chemical analysis to obtain water with the lowest salt content.

F. Atmosphere

Some air and noise disturbances are expected during construction of the project. The levels of disturbance are expected to be environmentally insignificant and will abate upon completion of the project. Emissions to the atmosphere from cooking fires are not expected to be any greater than exist in the general area, and therefore have no significant environmental implications.

G. Natural Resources

The project is expected to conserve on the natural resources of the area. Dwellings will be of a permanent nature. This will substantially reduce the need to cut vegetation for wattle houses which last but a few years. A shift to burning crop residue will further reduce the impact on the surrounding environs. The principal function of the project will allow utilization of the human resource by providing clean decent housing, thus eliminating much of the labor waste caused by sickness. The settlement will provide useful employment for nomads who are displaced by the increasing environmental pressures on nomadic life. This has a two-fold effect as it also allows for recovery of the range by reduced usage.

H. Cultural

Although the project will present the former nomadic peoples of Kurtunwaare with a substantially changed life style, it is designed with their input. Settling of these nomads is a pre-existing governmental decision. Cultural and religious preferences will be built into the project. The overall concept and design will be chosen from a series of alternatives. Adoption of the ultimate design will be by a committee of residents and the Somali Government.

I. Socio-Economic

The project is expected to have little effect on the existing overall socio-economic pattern. Some substantial beneficial changes in cultural patterns will be discussed under Health.

when the project is completed, it may engender the spontaneous development of a fringe community. Should this happen, the project is designed to be replicated. Such a fringe community, although in itself undesirable, does provide an indicator of success for the project.

J. Health

Settlements of nomads is a pre-existing governmental program. The construction of housing will not affect this to an adverse degree. The project will substantially benefit the people who now exist in deplorable conditions. The existing village area has a high concentration of vertebrate pests, flies and mosquitos, a high humidity, and a substantially higher rate of precipitation than these people are accustomed. Malaria is endemic in the area. Shistosomasis exists but at a low level. In the dry season dust may present a problem. An analysis of government records relating to dust-borne diseases should be conducted by the local health agency.

Prior to the current agricultural development, a small village, Kurtunwaare existed. It acts as a focci for Shistosomasis, the population having a relatively low level - 5 percent. Surrounding areas upstream on the Shebelli are showing infection levels ranging in the 50 to 60 percent bracket. Snail infection rates range from 1.4 to 4 percent. Thus it can be seen that the introduction of the disease at a relatively low level in snails has a substantial effect on human health.

The infection rate in humans can be dramatically reduced with simple procedures. In villages where people have been instructed to stay out of the water, and where vegetation is continuously removed from the water, the infection rate is one-half the area average.

Because the currently available well water at Kurtunwaare is extremely hard and has a high sulfur ion content, people will tend to use the softer less mineralized river water. The project must consider designs for filtering river water, catchment of rain water and better hydrologic surveys to locate better groundwater. Solar stills might be applicable for community buildings but will require appropriate technological design considering the capacities of the users.

There is a constant flooding of existing dwellings during the wet season and an almost total lack of sanitary facilities, save for the piped well water, which is drawn from stand pipes. All these conditions are ripe to cause a high disease rate in a susceptible people such as these. Diarrhea, usually infrequent among nomads, is a common complaint among the inhabitants.

The project will address many of these problems. It will incorporate adequate ventilation into the houses to offset the high humidity.

Because of the high insect population, adequate provision for exclusion of insects will be necessary. Design of toilets will incorporate ease of operation and maintenance, as these people are almost totally unfamiliar with these concepts and processes. Placement of cooking facilities in relation to waste disposal is of utmost consideration. A nomadic people travelling from one area to another did not need to give great consideration to waste disposal. Waste was never concentrated nor was elimination near food preparation a problem or a consideration. The project may wish to incorporate a training schedule to include sanitary programs. This program could be conducted by the existing government health teams at Kurtunwaare.

The villagers' concept of preventive health measures is primitive, if not dangerously false. As an example, villagers were seen to defecate in a field partially flooded with a recent rain, then dip into the water to wash and rinse their teeth. Another example - a teacher used as an interpreter carefully washed a community cup then dipped it into a common drainage canal to obtain a drink.

K. General

1. There are no significant adverse environmental impacts of an international nature which are foreseen by this project.

2. There are no significant adverse environmental impacts of a controversial nature attached to this project.

3. A successful project will have a beneficial impact which will be capable of replication. Replication is one of the points of the project.

III. RECOMMENDATION FOR ENVIRONMENTAL ACTION

The overall project activity is to provide a pilot housing program capable of replication. The project will have a definite positive impact. The project from a narrow perspective of providing 400 houses, will not have an adverse impact and therefore a negative determination is recommended.

5C(2) - PROJECT CHECKLIST

Listed below are, first, statutory criteria applicable generally to projects with FAA funds, and then project criteria applicable to individual fund sources: Development Assistance (with a sub-category for criteria applicable only to loans); and Security Supporting Assistance funds.

CROSS REFERENCES: IS COUNTRY CHECKLIST UP TO DATE? IDENTIFY. HAS STANDARD ITEM CHECKLIST BEEN REVIEWED FOR THIS PROJECT?

A. GENERAL CRITERIA FOR PROJECT.

1. App. Unnumbered; FAA Sec. 653(b)

   (a) Describe how Committees on Appropriations of Senate and House have been or will be notified concerning the project; (b) is assistance within (Operational Year Budget) country or international organization allocation reported to Congress (or not more than $1 million over that figure plus 10%)?

   The project is included in the FY80 Congressional presentation, a notification to Congress will be made for the FY79 portion of the project.

2. FAA Sec. 611(a)(1). Prior to obligation in excess of $100,000, will there be (a) engineering, financial, and other plans necessary to carry out the assistance and (b) a reasonably firm estimate of the cost to the U.S. of the assistance?

   Yes, an engineer reviewed all the plans and cost estimates and finds them adequate.

3. FAA Sec. 611(a)(2). If further legislative action is required within recipient country, what is basis for reasonable expectation that such action will be completed in time to permit orderly accomplishment of purpose of the assistance?

   No further legislation is required

4. FAA Sec. 611(b); App. Sec. 101. If for water or water-related land resource construction, has project met the standards and criteria as per Memorandum of the President dated Sept. 5, 1973 (replaces Memorandum of May 15, 1962; see Fed. Register, Vol 38, No. 174, Part III, Sept. 10, 1973)?

   N/A

5. FAA Sec. 611(e). If project is capital assistance (e.g., construction), and all U.S. assistance for it will exceed $1 million, has Mission Director certified the country's capability effectively to maintain and utilize the project?

   Yes see annexsix of the PP

A.

6. FAA Sec. 209, 619. Is project susceptible of execution as part of regional or multilateral project? If so why is project not so executed? Information and conclusion whether assistance will encourage regional development programs. If assistance is for newly independent country, is it furnished through multilateral organizations or plans to the maximum extent appropriate?	The is no possibility of implementing the project as a regional project. The project sets the stage for a multilateral approach in the furtre.
7. FAA Sec. 601(a); (and Sec. 201(f) for development loans). Information and conclusions whether project will encourage efforts of the country to: (a) increase the flow of international trade; (b) foster private initiative and competition; (c) encourage development and use of cooperatives, credit unions, and savings and loan associations; (d) discourage monopolistic practices; (e) improve technical efficiency of industry, agriculture and commerce; and (f) strengthen free labor unions.	The project will directly encourage a,b,d and f through the skilled craftsmen training program.
8. FAA Sec. 601(b). Information and conclusion on how project will encourage U.S. private trade and investment abroad and encourage private U.S. participation in foreign assistance programs (including use of private trade channels and the services of U.S. private enterprise).	Their will be a major procurement of tools and equipment in the US and a large amount of materials will be procured in the US.
9. FAA Sec. 612(b); Sec. 636(h). Describe steps taken to assure that, to the maximum extent possible, the country is contributing local currencies to meet the cost of contractual and other services, and foreign currencies owned by the U.S. are utilized to meet the cost of contractual and other services.	The US dollar contribution to this project is entirely for offshore procurement.
10. FAA Sec. 612(d). Does the U.S. own excess foreign currency and, if so, what arrangements have been made for its release?	No

B. FUNDING CRITERIA FOR PROJECT

1. Development Assistance Project Criteria

a. FAA Sec. 102(c); Sec. 111; Sec. 281a. Extent to which activity will (a) effectively involve the poor in development, by extending access to economy at local level, increasing labor-intensive production, spreading investment out from cities to small towns and rural areas; and (b) help develop cooperatives, especially by technical assistance, to assist rural and urban poor to help themselves toward better life, and otherwise encourage democratic private and local governmental institutions?	The resettled nomads are clearly among the poorest of people in Somalia and the project will help to expand the microeconomy of the area. The housing units are designed to encourage interaction between groups and are designed around the cooperative groupings already established.

B1

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

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

(2) [104] for population planning or health; if so, extent to which activity extends low-cost, integrated delivery systems to provide health and family planning services, especially to rural areas and poor;

(3) [105] for education, public administration, or human resources development; if so, extent to which activity strengthens nonformal education, makes formal education more relevant, especially for rural families and urban poor, or strengthens management capability of institutions enabling the poor to participate in development;

(4) [106] for technical assistance, energy, research, reconstruction, and selected development problems; if so, extent activity is:

(a) technical cooperation and development, especially with U.S. private and voluntary, or regional and international development, organizations;

(b) to help alleviate energy problem;

(c) research into, and evaluation of, economic development processes and techniques;

The project will contribute to developing an economic shelter solution

(d) reconstruction after natural or manmade disaster;

The project is directly aimed at assisting recovery from the droughts on 1976.

(e) for special development problem, and to enable proper utilization of earlier U.S. infrastructure, etc., assistance;

(f) for programs of urban development, especially small labor-intensive enterprises, marketing systems, and financial or other institutions to help urban poor participate in economic and social development.

B1

(5) [107] by grants for coordinated private effort to develop and disseminate intermediate technologies appropriate for developing countries.	The project will transfer US technology in construction to resettled nomads
c. FAA Sec. 110(a); Sec. 208(e). Is the recipient country willing to contribute funds to the project, and in what manner has or will it provide assurances that it will provide at least 25% of the costs of the program, project, or activity with respect to which the assistance is to be furnished (or has the latter cost-sharing requirement been waived for a "relatively least-developed" country)?	The government support of the resettlement program has been enormous, See annex 10. The government is providing more than 25% of the costs of the project
d. FAA Sec. 110(b). Will grant capital assistance be disbursed for project over more than 3 years? If so, has justification satisfactory to Congress been made, and efforts for other financing?	No
e. FAA Sec. 207; Sec. 113. Extent to which assistance reflects appropriate emphasis on; (1) encouraging development of democratic, economic, political, and social institutions; (2) self-help in meeting the country's food needs; (3) improving availability of trained worker-power in the country; (4) programs designed to meet the country's health needs; (5) other important areas of economic, political, and social development, including industry; free labor unions, cooperatives, and Voluntary Agencies; transportation and communication; planning and public administration; urban development, and modernization of existing laws; or (6) integrating women into the recipient country's national economy.	The project is part of an overall GSDR program to integrate the ex-nomads into a social fabric. It will train large numbers of skilled craftsmen and esaablish the basis for an apprenticship program. The project will encourage the official GSDR policy of equality for women as they will participate in the construction program.
f. FAA Sec. 281(b). Describe extent to which program recognizes the particular needs, desires, and capacities of the people of the country; utilizes the country's intellectual resources to encourage institutional development; and supports civic education and training in skills required for effective participation in governmental and political processes essential to self-government.	The project was developed as the result of a direct request by the government It is aimed at assisting in the assimilation of the ex-nomads into the social and economic fabric of the nation.

B1

g. FAA Sec. 201(b)(2)-(4) and -(8); Sec. 201(e); Sec. 211(a)(1)-(3) and -(8). Does the activity give reasonable promise of contributing to the development: of economic resources, or to the increase of productive capacities and self-sustaining economic growth; or of educational or other institutions directed toward social progress? Is it related to and consistent with other development activities, and will it contribute to realizable long-range objectives? And does project paper provide information and conclusion on an activity's economic and technical soundness?

The project falls within the realm of social development activities. It is critical to the productive endeavors in the village which are making a more direct input to economic growth. It contributes directly to the longrange objective of sedentarizing the nomads. Conclusions regarding the technical and economic soundness of the project are included in the PP in section II analysis.

h. FAA Sec. 201(b)(6); Sec. 211(a)(5), (6). Information and conclusion on possible effects of the assistance on U.S. economy, with special reference to areas of substantial labor surplus, and extent to which U.S. commodities and assistance are furnished in a manner consistent with improving or safeguarding the U.S. balance-of-payments position.

Nearly all the AID funds in the project will be utilized for US procurement of technical assistance, equipment and materials.

2. Development Assistance Project Criteria (Loans only)

a. FAA Sec. 201(b)(1). Information and conclusion on availability of financing from other free-world sources, including private sources within U.S.

N/A

b. FAA Sec. 201(b)(2); 201(d). Information and conclusion on (1) capacity of the country to repay the loan, including reasonableness of repayment prospects, and (2) reasonableness and legality (under laws of country and U.S.) of lending and relending terms of the loan.

N/A

c. FAA Sec. 201(e). If loan is not made pursuant to a multilateral plan, and the amount of the loan exceeds $100,000, has country submitted to AID an application for such funds together with assurances to indicate that funds will be used in an economically and technically sound manner?

N/A

d. FAA Sec. 201(f). Does project paper describe how project will promote the country's economic development taking into account the country's human and material resources requirements and relationship between ultimate objectives of the project and overall economic development?

N/A

e. FAA Sec. 202(a). Total amount of money under loan which is going directly to private enterprise, is going to intermediate credit institutions or other borrowers for use by private enterprise, is being used to finance imports from private sources, or is otherwise being used to finance procurements from private sources?

f. FAA Sec. 620(d). If assistance is for any productive enterprise which will compete in the U.S. with U.S. enterprise, is there an agreement by the recipient country to prevent export to the U.S. of more than 20% of the enterprise's annual production during the life of the loan?

3. Project Criteria Solely for Security Supporting Assistance

FAA Sec. 531. How will this assistance support promote economic or political stability?

4. Additional Criteria for Alliance for Progress

[Note: Alliance for Progress projects should add the following two items to a project checklist.]

a. FAA Sec. 251(b)(1), -(8). Does assistance take into account principles of the Act of Bogota and the Charter of Punta del Este; and to what extent will the activity contribute to the economic or political integration of Latin America?

b. FAA Sec. 251(b)(8); 251(h). For loans, has there been taken into account the effort made by recipient nation to repatriate capital invested in other countries by their own citizens? Is loan consistent with the findings and recommendations of the Inter-American Committee for the Alliance for Progress (now "CEPCIES," the Permanent Executive Committee of the OAS) in its annual review of national development activities?

5C(3) - STANDARD ITEM CHECKLIST

Listed below are statutory items which normally will be covered routinely in those provisions of an assistance agreement dealing with its implementation, or covered in the agreement by exclusion (as where certain uses of funds are permitted, but other uses not).

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

A. Procurement

1.	FAA Sec. 602. Are there arrangements to permit U.S. small business to participate equitably in the furnishing of goods and services financed?	Yes, Procurement will be advertised
2.	FAA Sec. 604(a). Will all commodity procurement financed be from the U.S. except as otherwise determined by the President or under delegation from him?	Yes
3.	FAA Sec. 604(d). If the cooperating country discriminates against U.S. marine insurance companies, will agreement require that marine insurance be placed in the U.S. on commodities financed?	N/A
4.	FAA Sec. 604(e). If offshore procurement of agricultural commodity or product is to be financed, is there provision against such procurement when the domestic price of such commodity is less than parity?	N/A
5.	FAA Sec. 608(a). Will U.S. Government excess personal property be utilized wherever practicable in lieu of the procurement of new items?	Yes
6.	MMA Sec. 901(b). (a) Compliance with requirement that at least 50 per centum of the gross tonnage of commodities (computed separately for dry bulk carriers, dry cargo liners, and tankers) financed shall be transported on privately owned U.S.-flag commercial vessels to the extent that such vessels are available at fair and reasonable rates.	Yes
7.	FAA Sec. 621. If technical assistance is financed, will such assistance be furnished to the fullest extent practicable as goods and professional and other services from private enterprise on a contract basis? If the facilities of other Federal agencies will be utilized,	Yes

A7

are they particularly suitable, not competitive with private enterprise, and made available without undue interference with domestic programs?

3. International Air Transport. Fair Competitive Practices Act, 1974

If air transportation of persons or property is financed on grant basis, will provision be made that U.S.-flag carriers will be utilized to the extent such service is available? — Yes

B. Construction

1. FAA Sec. 601(d). If a capital (e.g., construction) project, are engineering and professional services of U.S. firms and their affiliates to be used to the maximum extent consistent with the national interest? — Yes

2. FAA Sec. 611(c). If contracts for construction are to be financed, will they be let on a competitive basis to maximum extent practicable? — N/A

3. FAA Sec. 620(k). If for construction of productive enterprise, will aggregate value of assistance to be furnished by the U.S. not exceed $100 million? — N/A

C. Other Restrictions

1. FAA Sec. 201(d). If development loan, is interest rate at least 2% per annum during grace period and at least 3% per annum thereafter? — N/A

2. FAA Sec. 301(d). If fund is established solely by U.S. contributions and administered by an international organization, does Comptroller General have audit rights? — N/A

3. FAA Sec. 620(h). Do arrangements preclude promoting or assisting the foreign aid projects or activities of Communist-Bloc countries, contrary to the best interests of the U.S.? — Yes

4. FAA Sec. 636(i). Is financing not permitted to be used, without waiver, for purchase, long-term lease, or exchange of motor vehicle manufactured outside the U.S. or guaranty of such transaction? — Yes

C.

5. Will arrangements preclude use of financing:

a. FAA Sec. 114. to pay for performance of abortions or to motivate or coerce persons to practice abortions? **Yes**

b. FAA Sec. 620(g). to compensate owners for expropriated nationalized property? **Yes**

c. FAA Sec. 660. to finance police training or other law enforcement assistance, except for narcotics programs? **Tes**

d. FAA Sec. 662. for CIA activities? **Yes**

e. App. Sec. 103. to pay pensions, etc., for military personnel? **Yes**

f. App. Sec. 106. to pay U.N. assessments? **Yes**

g. App. Sec. 107. to carry out provisions of FAA Sections 209(d) and 251(h)? (transfer to multilateral organization for lending). **Yes**

h. App. Sec. 501. to be used for publicity or propaganda purposes within U.S. not authorized by Congress? **Yes**

NNNVV ESB022ERA571
PP RUQMDI
DE RUEHC #3820 1920756
ZNR UUUUU ZZH
P 102344Z JUL 78
FM SECSTATE WASHDC
TO RUQMDI/AMEMBASSY MOGADISCIO PRIORITY 1878
INFO RUVQC/AMEMBASSY NAIROBI PRIORITY 1663
ST
UNCLAS STATE 173820

UNCLASSIFIED

STATE 173820

AIDAC FOR NAIROBI REDSO AND RHUDO

E.O. 11652: N/A

TAGS:

SUBJECT: PID APPROVAL, KURTUNWARRE SETTLEMENT PROJECT 647-0173

REF: STATE 144869

1. PROJECT COMMITTEE WITH PARTICIPATION SENOLD AND ES/H STAFF REVIEWED AND ENDORSED IN PRINCIPLE SUBJECT PID JUNE 6. COMMITTEE SEES PROJECT AS OPPORTUNITY TO RESPOND POSITIVELY TO HIGH PRIORITY PROGRAM OF GSDR AND TO TEST PROPOSITION THAT PROVISION ADEQUATE HOUSING TO EX-NOMADS (ALONG WITH OTHER SERVICES) WILL PROVIDE SUFFICIENT INDUCEMENT FOR THEM TO REMAIN SEDENTARIZED AND BECOME SELF-SUFFICIENT FARMERS. PROJECT ALSO PROVIDES OPPORTUNITY TO DEVELOP INNOVATIVE CONSTRUCTION TECHNIQUES USING LOCAL MATERIALS AND DEVISE METHODS AND PROCEDURES WHICH COULD BE ADOPTED AND EXTENDED BY HOST GOVERNMENT AND POSSIBLY OTHER DONORS ON SUBSEQUENT SOMALI RESETTLEMENT PROJECTS.

2. COMMITTEE RECOMMENDS THAT PROJECT DURATION BE EXTENDED TO THREE YEARS FROM PROPOSED EIGHTEEN MONTHS IN RECOGNITION OF (1) LONG COMMODITY PIPELINE COUPLED WITH HEAVY OFF-SHORE PROCUREMENT BUILDING MATERIALS; AND (2) REQUIREMENTS FOR A PERIOD OF EXPERIMENTATION/DESIGN INNOVATION PRIOR TO ACTUAL CONSTRUCTION. FYI WE CONCERNED THAT IF LARGE PORTION BUILDING SUPPLIES IMPORTED OR MUST COME LONG DISTANCE TO SITE, THEN PROJECT MAY NOT BE REPLICABLE OR EVEN LOW COST. END FYI.

3. A THOROUGH SOCIAL SOUNDNESS ANALYSIS MUST BE UNDERTAKEN, PARTICULARLY ADDRESSING QUESTION WHETHER PROVISION OF PERMANENT HOUSING AND OTHER SERVICES WILL INDUCE NOMADS TO REMAIN AS SEDANTARIZED FARMERS. SINCE HOUSING ONLY ONE OF A NUMBER OF FACTORS INFLUENCING SETTLEMENT OF NOMADS, SOCIAL ANALYSIS MUST EXAMINE TOTAL GSDR KURTENWARRE SETTLEMENT SCHEME AND HOW HOUSING FITS INTO THAT SCHEME. ANALYSIS SHOULD ALSO HAVE TO ADDRESS HUMAN RIGHTS CONSIDERATIONS OF GOS SETTLEMENT POLICY AND FARMING ORGANIZATION WHICH APPEARS MUCH LIKE STATE FARM. WE RECOGNIZE THAT SOCIAL ANALYSIS QUESTIONS WILL REMAIN AND WILL CONTINUE TO BE ADDRESSED DURING LIFE OF PROJECT BUT INITIAL ANALYSIS SEEN AS CRUCIAL.

4. AN INITIAL ENVIRONMENTAL EXAMINATION (IEE) NEEDS BE PREPARED PRIOR TO DEVELOPMENT OF PP. PROPOSE KURT ANDERSON/REDSO PREPARE IEE. SUGGEST MISSION ALSO PLAN THAT ENVIRONMENTAL IMPACT OF PROJECT BE ADDRESSED AS PART OF ENVIRONMENTAL COUNTRY PROFILE (ECP) TO BE SOON DEVELOPED. SOW FOR ECP BEING PREPARED BY AID/W. TRYING TO FIELD MCGOWAN BY 24 JULY TO COMMENCE ECP.

5. SUGGEST AGRICULTURE PROJECT DESIGN TEAM PRESENTLY IN SOMALIA ASSESS IF POSSIBLE DEGREE TO WHICH THERE EXISTS AN AGRICULTURE PACKAGE FOR EXTENSION TO AND ADOPTION BY KURTUNWARRE SETTLERS AND WHETHER PACKAGE COULD BE IMPROVED THUS STRENGTHENING PROSPECTS FOR LONG TERM SUCCESS OF RESETTLEMENT EFFORT. ALSO PROPOSE HEALTH PROJECT DESIGN TEAM INCLUDE IN ITS TERMS OF REFERENCE AN ASSESSMENT OF THE ENVIRONMENTAL HEALTH NEEDS OF THE SETTLEMENT VILLAGES AND HOW SUCH NEEDS MIGHT BE MET WITHIN FRAMEWORK OF HEALTH PROJECT. WE RECOGNIZE THAT ALTHOUGH KURTUNWARRE PROJECT IS BEING ORGANIZED AS A PILOT WE HAVE AN IMPLIED LONG TERM COMMITMENT TO THERESETTLEMENT EFFORT AND OUR ACTIVITIES IN RESETTLEMENT MUST BE CLOSELY INTEGRATED WITH OTHER USAID ACTIVITIES IN AGRICULTURE, HEALTH, WATER DEVELOPMENT ETC.

6. DS/HEG IS DEVELOPING SOW FOR DESIGN TEAM. MAKEUP OF TEAM, CVS, PROPOSED ETA TO FOLLOW ASAP. VANCE
RT
#3327

UNCLASSIFIED

D/O Annex 5

Jamhuuriyadda Dimuq. Soomaaliya
Hay'adda Mash. B. B. Danwadaagta
BEERALAYDA
Muqdisho - S. B. 1407 - Tel. 1240, 4386, 4469

[illegible]

Somali Democratic Republic
Settlement Development Agency
Mogadiscio - P. O. Box 1407 - Tel. 1240,
4386 - 4469

Sum. ..UP/3514/78.......... **Taariikh** ..[illegible]/1978..........

Ujeeddo :

TO: [illegible]

[illegible]

[illegible]

[illegible]

[illegible]

AUG 3 0 REC'D

Annex 6

611-E CERTIFICATION

SOMALIA - KURTUNWAARE SETTLEMENT PROGRAM

PROJECT NO. 649-0103

The purpose of this project is to construct 400 residential units to serve as a pilot program to prove the validity of the Settlement Development Agency (SDA)/USAID design for the village and residential units while at the same time providing suitable, socioculturally and environmentally adapted shelter for 400 families. The project places heavy emphasis on training Somali craftsmen and supervisors to give them the technical capability to construct the remaining 4,000-5,000 units required in the village. A.I.D. inputs to the project include technical assistance, equipment and imported materials.

Somalia's ability to main and utilize the project with respect to financial and manpower capability is successfully demonstrated by two A.I.D. financed major projects in the 1960's namely Mogadiscio Water System and Kismayo Port which are functioning effectively. With regards to the building activities, A.I.D. financed Institute of Public Administration in Mogadiscio in 1969 is well maintaned and functioning extremely well.

I, Charles P. Campbell, A.I.D. Representative in Somalia, certify that the Government of Somalia will have at the end of the project period, financial and human resources capability to operate and maintain the project activities provided under this Kurtunwaare Settlement Project. The GSDR has demonstrated in the past its capability to utilize and maintain A.I.D. project activities established in prior years.

Date December 16,1978

Charles P. Campbell

Charles P. Campbell
AID REPRESENTATIVE

KURTUNWAARE SETTLEMENT PROGRAM

ARCHITECTURE AND PLANNING ANALYSIS

INTRODUCTION

The data gathered for this Architecture and Planning Analysis represents the collective results of research gathering and interviews held between the A.I.D. Design Team and the Somali Government, the private sector and the inhabitants of the Kurtunwaare Settlement. The contributing government agencies include the Settlement Development Agency, Ministry of Public Works and Ministry of Agriculture. The private sector contacts include local architects, engineering consultants and building contracting agencies. The interviews with the Kurtunwaare inhabitants include individual household occupants, community leaders and representatives of the local women's association. As a result of these initial investigations and field observations a series of design considerations and constraints were identified.

PART I - DESIGN CONSIDERATIONS AND CONSTRAINTS

A. FUTURE DEVELOPMENT PLANS

An important consideration relating to project design is the extent of the Somali Government's commitment in resources, personnel and established agricultural development plans. The total area of planned agricultural development is vast and would require traveling distances from the principal village to remote fields of more than 12 km. Plans call for a decentralization development of 3 to 4 new satellite villages of 1000-1200 families each, and reducing the current principal village nucleus in size. Each satellite village would have the necessary community services but would still be reliant upon the principal village for major services and administration. Such a development will bring the families closer to the fields in which they are working and will relieve the present congestion of the principal village.

Since agricultural development plans would have these satellite villages located equidistant from the planned irrigated lands and rainfed lands, some of the land most suitable for agricultural development will be used for the purposes of housing. Such housing development plans must, therefore, be land conservative in nature. It is envisaged by the SDA that individual plots will be relatively small, sized sufficiently to support the family's indoor and outdoor living requirements, and to include small private vegetable gardens. No animals (goats or sheep) will be permitted within the housing compounds other than domestic pets and poultry.

Ideally, the existing principal village should act as a nucleus around which the satellite villages would be located. Current agricultural plans have dictated that all future development will be downstream only, thus placing the principal village at the extreme upstream end of the settlement area. There are, presently, no immediate plans for developing the north bank of the river, however long term plans may include this section also.

B. SOCIO-POLITICAL ORGANIZATION

Kurtunwaare's highly organized hierarchial system of leaders and sub-leaders in the settlement has been reviewed in the Social Analysis and by Lewis (1978). Since it is the desire of the SDA to have this system reflected in the village master plan we shall briefly outline the village organizational structural constraints.

The smallest organizational unit is the "Xubin", or group of 10 families who are responsible for monitoring their own security, education, health, finances, construction and agricultural production. Five such groups form an "Udud" of 50 families which are currently responsible for farming 12 hectares. Similarly, two such groups make up a unit of 100 families called a "Birjeex" and two groups of these form the 200 family group called a "Bulsho". Ultimately two such groups form to make a unit of 400 families, constituting a village, or "Beel", with the responsibility of managing a large cultivated area (currently about 100 hectares) and constituting the major political unit. Meetings of each group, from 10 families to the village of 400, take place every 48 hours. These are

presided by chairmen at each level, submitting written reports to three senior village officers, representing the Party, police and security. The resulting tight social, political and economic structure is not unlike the model of an Israeli Kubutz.

C. SOCIAL AND CULTURAL

In order to determine a suitable approach to dwelling design and settlement planning which shall be socially and culturally compatible with the Kurtunwaare inhabitants we must first have a look at the local building and settlement traditions. An investigation of the traditional Somali house types illustrates the selection of locally available building materials and the general level of building skills of the people. The basic Somali house types are the Agal, the Mundul and its urban derivative, the Arish. Each type has its own characteristic structure inspired by the life style of the people in different parts of Somalia and, generally speaking, are all suited for the tropical climate.

The Agal, used nearly exclusively by the nomads, is in practical terms a portable hut constructed of curved sticks covered either by leather, grass mats or cloth. Three to four agals are usually grouped together to form a loose compound for the extended family. Cooking and eating are done in the yard, which is enclosed by a fence, constructed primarily for the purpose of retaining animals at night. Meetings between different compounds are organized under a large tree, where problems of mutual interest are discussed. This tree is the focal point of the nomadic campsite.

The Mundul is the traditional dwelling of the farming villages along the Juba and Shebelli rivers. It is a cylindrical, one room, wattle structure with a grass roof. The building materials are all of local origin and, if well constructed, the Mundul can be a reasonably durable structure, however the wattle is quite vulnerable to termite attack.

The Arish is the urban version of the Mundul and is constructed of the same materials but is rectangular in layout. The grass roofing is frequently substituted by "Makuti" which is produced from palm fronds and is considerably more durable than grass. The design consists of 3 to 4 rooms facing a common courtyard to which the kitchen and toilet is established. It is, in many respects, a very functional house type; the open courtyard reflecting the Somali desire for privacy and security and providing an outdoor living area which is an extension of the house. The Arish arrangement has evolved as the most widely accepted dwelling layout found in most Somali houses.

During the social and cultural data gathering period of the project design phase specific considerations have been identified, many of which form a basis for various design concepts in the master planning and dwelling design stages. These considerations have resulted from direct consultation with the village inhabitants, community leaders, and representatives of the women's organization. As reviewed briefly by Lewis (1978), "the available educational opportunities of the settlement are highly val by the nomads" and this was in fact confirmed by the people interviewed

Part of the "settled" nomad's commitment to Kurtunwaare appears to depend upon its provision of schooling for his children. With over half of the Kurtunwaare population being of school age or pre-school age it is not surprising that this is a high priority in the eyes of the people. Religious preferences have suggested that the neighborhood mosque and Koranic school should also prove an important unifying element to the community.

A strong preference was indicated for spaces of social gathering, relating to one's neighborhood, yet preserving the identity of the individual family. Spaces with a clearly defined sense of passage were preferred to the "contained" cul-de-sac method of grouping plots. The reaction against this type of arrangement was frequently described as "too confining" or "like a prison" -- a somewhat predictable reaction coming from a group of ex-nomads. Rectangular grouping was preferred to a circular arrangement. Reaction of both men and women alike was rather strongly opposed to the concept of communal bathing and toilet facilities. This reaction seemed mostly due to personal and cultural reasons and the Somali's strong desire for personal privacy. Concern was also expressed regarding the maintenance of such communal facilities.

The discussions concerning dwelling design and functional layout generated a more specific set of responses and problem areas. Traditional living and sleeping patterns would have a separation of the younger and older children with a separate room for the parents. The villagers felt if

the government could provide them with no more than two rooms, that provision be made for the addition of a future third room. The women indicated a preference of separate and not connecting rooms. The entire group seemed unanimous regarding room shape -- rectangular over circular. The Somali conception of a house appears to be that of the entire indoor and outdoor living areas and not necessarily confined to the enclosed structure. The entry should be clearly defined and into the outdoor courtyard, not into the house directly. This concept would preclude any use of a rowhouse layout. All agreed that small private garden plots should be provided within the family compound. There has been a good deal of discussion regarding the walled compound and its primary function. However, the group surveyed determined that the function was primarily for security purposes (children, animals and vegetable garden) rather than privacy. When questioned how high they would build a wall the answer was usually about 1.5 meters high. They want to be able to see out (who is coming and going) and also feel that a high wall blocks the badly needed flow of ventilation through the open court. Aside from the durability of their present temporary dwellings the villagers see insects and vermin, ventilation, and waste disposal as the greatest housing problems now confronting them. Functional layout preferences were for a kitchen separate from the house but within easy access and the toilet to be private and away from the house and kitchen.

D. PHYSICAL CONSIDERATIONS

This section is a review and analysis of the physical factors which are viewed to have significant impact upon the design and implementation of the shelter program at Kurtunwaare. Although scant specific data exists regarding the Kurtunwaare area, observations and testing at the project site by the A.I.D. team and response from local inhabitants have confirmed several physically correlated patterns and conditions which prevail at the regional level. These observations and testing, combined with a process of judicious extrapolation from known nearby phenomena, have provided the basis for the relevant physical conditions which affect the project design:

1. Geographical Location - Kurtunwaare is located along the Shebelli river at approximately 1^{o} 40' N. latitude and 44^{o} 15' E. longitude. It lies about 150 km. west/southwest of Mogadishu and the Indian Ocean is about 25 km. to the southeast. There is minimal relief between the Shebelli river and the settlement area and measurements provided through the irrigation survey and the topographic survey indicate an elevation of 59.5 meters above mean sea level near the river, and an elevation of 60.22 meters at the entrance to the existing village. The entire area of planned development does not vary more than 4 meters in elevation.

2. Climate - Climatic fatigue has been suggested as one of the main causes for the slow progress of technological and economic development

among some of the nations of the tropics and extreme north. Work under conditions of extreme heat or cold is easier when the worker has the prospect of returning to the haven of a house with a good climate where rest and recovery are possible.

Kurtunwaare has a semi-arid, monsoon climate with a seasonal rainfall pattern. The monsoon winds from the southwest, the "Gu" season (mid-March to mid-May), bring the heavier rains; monsoon winds from the northeast, the "Der" season (October to mid-December), bring lighter rains. Average annual precipitation is 460 mm or approximately 18 inches of rain. Rainfall is unreliable and comes in the form of intermittent and sometimes heavy localised showers. Also experienced were an occasional extended rain of 3 to 4 hours duration.

Temperature is tropical with a range of mean monthly maximums from 34.0°C (March) to 28.4°C (July) and a range of mean monthly minimums from 23.6°C (April) to 21.5°C (July and August). Relative humidity is high, remaining in the 70-75 percent range during most of the year and dipping below 70 percent during the driest months (December through March).

Although no local recorded wind data exists for the Kurtunwaare area, site observations and the local inhabitants have confirmed the prevailing wind pattern along a general axis southwest/northeast. These winds can be quite brisk and constant, providing a refreshing cooling

effect during the more humid months. During the dry months, however, the problems of wind-borne dust presents a significant design problem.

Analysing the aforementioned climatic considerations which affect housing design, we have used a method which does not require assumptions. Various known climatic data have been assembled and entered into simple tables known as Mahoney Tables. The comparison of these tables with a theoretical ideal for the region in question, known as the "comfort" zone, makes it possible to identify at a glance groups of dominant climatic problems. The identification of these groups provides indicators for the recommendations that follow in the design stage. It is a method of forward - not of backward - analysis. The results of these tables are contained in Annex 1.

3. Hydrology - The problems of water quality and supply are discussed in the IEE. Of particular concern affecting the project design is the problem of standing water and protection of the groundwaters from contamination. Suitable drainage designs for the control of flooding and runoff will prove a most critical issue facing the project design.

4. Geology and Soils - The probability of earthquake potential in the area is very low and no visible or historic record of seismic activity exists. The problem of black cotton (expansive) soils throughout the project area dictates special considerations regarding the foundation system for all permanent buildings. The extent of this problem

and foundation design recommendations are covered in the materials design section of the technical analysis. The other critical soils problem influencing the project design is the impermeability of these soils which has considerable impact upon the design of surface drainage and waste disposal systems. Test borings have been taken and soils samples laboratory tested to determine the physical properties of the soils and their recommended stabilization techniques. The results of these soil tests are contained in Annex 2.

E. HEALTH AND ENVIRONMENTAL

This section has been dealt with in the IEE, however it is worthwhile to mention here those specific areas which can be improved upon through sound physical planning and dwelling design. These areas include the high concentration of vermin, flies and mosquitos which are prevalent and the design measures necessary to insure adequate protection against them. The design of the toilets and waste disposal system will have to incorporate ease of operation and maintenance in consideration of the nomad's unfamiliarity with waste disposal concepts. The apparent percolation rates of the soils within the area would preclude the use of most water intensive sewerage systems. In addition, the seasonal high groundwater tables encountered in the area would only tend to exacerbate the problems. Design recommendations which can reduce the effect of wind-borne dust and its related diseases will also prove beneficial.

PART II - DESIGN RECOMMENDATIONS

A. INTRODUCTION

This design analysis will attempt to relate the various design considerations and constraints, as outlined in the previous section, to a comprehensive design proposal for the Kurtunwaare Settlement. The magnitude of this project proposal is such that we must begin at the macro scale, describing the overall settlement development proposal, then move successively through the intermediate scale principal village development plan, satellite village master plan and culminate with the unit and dwelling block designs. The nature of such a design analysis would preclude the isolation of any singular design element (i.e., unit and dwelling designs) without giving due consideration to how this element relates to the total master plan (i.e., drainage, orientation to sun and winds, etc.). It is the design of the entire environment which we are concerned with here and, for example, the provision of a suitable place for people to gather and discuss matters of mutual interest may prove to have equal or greater impact upon the development of a village community than the choice of roofing material on the individual houses.

B. SETTLEMENT MASTER DEVELOPMENT PLAN - (Drawing No. SD-1)

The accompanying drawing illustrates the Kurtunwaare development plan in concept. The projected 3,600 ha. irrigated and 3,200 ha. rainfed areas depicts the extent of proposed agricultural development to date as planned by the Egyptian agricultural consulting team supervising the agriculture implementation program.

The decentralized development plan consists of 3 satellite villages of approximately 1,200 families each to be located in a linear pattern compatable with the proposed agricultural development plans. Each satellite village will be responsible for the management of 1,600 ha. of cultivation initially and the principal village of 1,600 families responsible for approximately 2,000 ha. initially. This arrangement will have the effect of providing convenient access to the irrigated and rainfed fields in which the families will be working. It is envisaged by the SDA that, ultimately, each family will have a section of rainfed and irrigated land for his own use in addition to the land which he works for the settlement.

In considering the role of the existing principal village we must respect the investment in infrastructure and administrative services that the Somali Government has already committed. Although current development plans force this village to assume a less than ideal functional relationship to the satellite villages, its strategic location regarding the shipping and receiving of agricultural production and supplies is significant. The principal village is envisaged as the "gateway" through which all vital communication flows and remains the principal center of administration.

Road construction between the villages will be kept to a minimum through the use of the pre-existing network of irrigation levees, thus conserving land and providing adequate drainage for the access road. Pedestrian traffic only will be permitted along the direct arterial route from the principal village to the first satellite village due to the strategic

location of a main sluice gate on the principal feeder canal which controls the southern portion of the irrigated fields.

The vehicular traffic will use the principal culverted levees through the northern and southern sections of the existing irrigated lands, then will join to form the main feeder road between the planned satellite villages. This route will follow the main levee which divides the irrigated land from the rainfed land. The ultimate route will require some basic surfacing in the form of crushed coral rock.

C. PRINCIPAL VILLAGE DEVELOPMENT PLAN - (Drawing No. SD-2)

The present development of permanent structures and services within the principal village presents a defined linear or "main street" character, along which most of these structures have been located. Some strategy is apparent in the placement of certain security, communications and maintenance facilities, however the siting of other significant services such as the medical facilities and "central" stores seem poorly, if not arbitrarily, chosen and by no means can be classified as centrally located. The pattern which emerges indicates most of the permanent educational, health, administrative and other public services to be concentrated within the western half of the existing village. Little permanent development is apparent within the eastern half of the village other than the "central" stores and permanent living quarters for officials and guests.

It is proposed in this design analysis that all future development of permanent housing and related services be concentrated within this western section of the existing village. The proximity of this section to the agricultural fields would also favor such location of the workers. The eastern section of the existing village should be developed as an official staff compound and principal countrol, or entry, point for the Kurtunwaare Settlement. Many of the existing permanent services (i.e., intermediate school and vocational school) are probably of adequate size and well located to accomodate the proposed 1,600 families in this main village. Drawing No. SD-2a (overlay) illustrates this development proposal graphically.

In light of this proposed development it would be deemed not advisable to concentrate any pilot project activity in the area of the proposed principal village. The reasoning here is that pilot project activity in this area would entail the removal of the families presently occupying temporary housing in the area and placing them in other temporary quarters in order to clear the land for construction. This "destroy and build" technique would most likely be received as a rather "negative" form of progress.

A more positive approach would be to concentrate on the development of the first satellite village. Such a plan would more suitably demonstrate the ideal satellite village concept and, at the same time, provide the necessary permanent housing required for the removal of families from

the principal village development areas. This plan would serve to set in motion the concept of decentralization development concurrently with the expansion of the agricultural development program.

D. SATELLITE VILLAGE MASTER PLAN - (Drawing No. SD-3).

The proposal here, as mentioned in the preceeding section, is the development of the first satellite village design and master plan; a portion of which will be selected for construction of a 400 unit pilot project. Drawing No. SD-3 represents this master plan proposal for the first satellite village, which, when completed, will encompass an area of approximately 50.2 hectares.

The basic concept arranges three "Beels", groups of 400 families each, around a commons planned to function as the village center. This center contains its own intermediate school, health care facility and stores or market, all arranged to form a common gathering space or "village square". In the initial stages the market will be simply an extension of the central government stores which exist in the principal village, and containing a government operated shop offering household and personal commodities for sale. It is envisaged by the SDA that this facility will ultimately develop into a cooperative market operation. This village center is complimented by adjacent recreation fields (soccer and volleyball) as emphasized by SDA and government policies. Future satellite village development plans should most likely include an ultimate extension to the vocational school to be located in the second satellite village.

Each of the 400 unit "Beels" would form a neighborhood and major political unit which will contain its own neighborhood elementary school, mosque and Koranic school. These neighborhoods will also be provided with conveniently located kindergarten-day care centers with adjacent recreational areas for pre-school children of the many working mothers.

The concept also calls for adequate provision of well-planted green areas and parks which will serve as social gathering and neighborhood recreation areas and as resting havens from the intense sun. These green areas, combined with a program of planting trees and useful vegetation along the access roads and walkways will greatly reduce the problem of high soil moisture during the wet seasons, and act as effective windbreaks to help control the problem of wind-borne dust during the dry seasons.

The critical issue of surface drainage is handled by arranging these three neighborhoods of 400 families around a central lagoon located adjacent to the sport fields and the village center. This drainage plan is illustrated on Drawing No. SD-4.

Side drains along the access roads act as rainwater collectors which are fed by the footpaths placed at higher grades. The plan proposes to divert about 40 percent of this rainwater runoff to the surrounding farmlands and the remaining 60 percent will be channelled into the lagoon to be used for pumped irrigation. The level of the lagoon and adjacent areas will be set so that any overflow due to an excessive rainfall period would be diverted to the recreational field area.

It is proposed to stock this lagoon with species of freshwater fish, such as talapia which will act as mosquito larvae control and perhaps generate an interest in recreational fishing. This surface drainage concept is described in detail in the technical analysis section on surface drainage and storm runoff.

The particular site for this first satellite village was chosen for its strategic location in relation to the next scheduled stage of agricultural expansion. The elevation of the site and proximity to the area of rainfed land to be soon cleared provided the basis for as well-drained of a piece of land as is likely to be found in the Kurtunwaare development area. Numerous mature shade trees exist in the area of this site and it is the intention that these shall be preserved.

During the site selection process a series of soil test borings revealed that the northeast section of this satellite village site contained a zone of deep black cotton soil deposits, as indicated on Drawing No. SD-3, and for this reason it is considered not advisable to plan any building construction in this area.

The area chosen for construction of the 400 unit pilot project is that shown shaded on Drawing No. SD-3. This area was selected primarily for its ease of access from the existing irrigation levee network during the construction stages and for its high level of visibility as a demonstration project.

E. PILOT PROJECT DESCRIPTION

1. Plot Size - Any detailed description of the pilot project design is contingent upon plot size and, therefore, must be preceeded by an explanation of how the recommended size of plot was determined. The various political, social and physical design considerations have been presented in Part I and together they form a composite picture which helps us to determine the design, size and orientation of the plots, house type and neighborhood arrangement.

In the interest of the Kurtunwaare inhabitants' living patterns and in the interest of economy of land and economic replicability it has been determined that the basic plot shall contain a house with two rooms, cooking area and toilet with provision for the addition of a future third room. This plot shall be sized sufficiently to support the families living requirements and to include an area for growing a small vegetable garden of approximately 50 square meters. There should be sufficient space between the houses of adjacent plots to ensure adequate ventilation through the house and plot. The recommended plot size that satisfies these considerations is a plot of 11 meters frontage and 16 meters deep, providing an area of approximately 180 square meters.

2. Block Design and Neighborhood Concept - (Drawing No. PP-1)

The pilot project "Beel" or neighborhood is composed of multiples of 10 plots grouped together to form the block or organizational unit,

the "Xubin". The basi design concept here is to relate five of these blocks together › form "Ududs" or sub-neighborhoods, each "Udud" with its own lc ıl park or gathering place, vehicular access and water supply. The ırea shown shaded on Drawing No. PP-1 illustrates this concept gr ›hically.

These sub-neighborhood are, in turn, tied together by a main walkway which passes throu ı each of the local parks, thus forming a a neighborhood network ›f green areas and parks. The central area will ultimately contai the neighborhood elementary school, mosque and Koranic school and ›ther green areas would harbor the kindergarten-day care center with adjacent recreation areas. Vehicular access will pass adjac ıt to the parks rather than through them.

An ideal climatic rela ionship of plot and house to sun and wind would be to orient the ıxis of the house and its openings parallel with the axis of the a : of the sun and perpendicular with the direction of the prevaili ; winds. Such an orientation would eliminate the intense radiation ' the sun's direct rays and permit an ideal flow of ventilation th ›ugh the house and cooking area. The northeast/southwest relatic ›hip of the prevailing winds to the east/west arc of the sun, althou ı not ideal, permits us to partake of the advantages of such an ·ientation. Drawing No. PP-2 (overlay) illustrates this relationsh › in both the pilot project and southernmost neighborhoods of the s :ellite village . Drawing No. PP-3 (overlay)

illustrates how the location of the house on the plot is changed to obtain an ideal sun/wind relationship in the middle neighborhood of the satellite village where the sun/wind axis is changed 90°.

3. Water Supply and Waste Disposal - (Drawing No. PP-4)

A. Water Supply - Currently the quantity of the groundwater in the principal village is sufficient, however its quality is high in salts and mineral content and must be subjected to a thorough chemical analysis. Groundwater samples from the three existing wells are presently being analysed by the Ministry of Mineral and Groundwater Resources. The groundwater supply to the pilot project can only be determined following sample core sections and as new wells are drilled in the pilot project area.

The water distribution scheme proposed here will pump water from below the 50 meter impervious layer to avoid possible contamination. The pumping would best be done by windmill power as the diesel pumps presently being used have proven costly to operate and maintain. The water will be pumped to an elevated tank which will have an adjacent overflow reservoir to be used for the watering of animals. From this elevated tank the water will be piped to 16 standpipe locations as indicated on Drawing No. PP-4. Each standpipe location will have a catchment tank to help control the inadvertent misuse of water. An area of at least two meters in diameter will be surfaced with concrete or brick and

graded to drain away from the tank. Channels or other means will prevent the runoff from the area becoming standing pools or creating muddy conditions.

Such a scheme provides each "Udud" or sub-neighborhood with two standpipes, each serving 25 families. It is envisaged that the system be upgraded in the future to supply water directly to each "Xubin", or grouping of 10 families, as shown dotted on Drawing No. PP-4. Water distribution to each "Xubin" is not recommended at the pilot project stage for reasons of water conservation, not economics. The nomads have traditionally been accustomed to walking for hours in search of water and it cannot be determined at this stage to what degree precious water will be wasted when the supply is made overly convenient by placing it at their doorstep.

B. Waste Disposal - As outlined in the physical and environmental considerations in Part I of this design analysis, the system of toilets and waste disposal chosen will have to incorporate ease of operation and maintenance while the percolation rate of the soils would preclude the use of most water intensive systems.

The proposal here is to use an aerobic digester type of toilet which uses no water. This device operates on the principle of introducing an updraft of air through a stack vent which accelerates the bacterial deterioration of the waste, resulting in a

harmless, non-toxic, humus-like ash. The process is odorless and the ash by-product, which is extracted about once or twice a year, can be used directly as fertilizer. This concept is described in detail in the technical analysis section covering individual sewerage disposal.

The block design concept proposes the provision of three meter service "alleyways" between the backs of the plots, serving as rainwater collectors and facilitating the collection of solid rubbish and other disposables. These serviceways will also provide the possibility of group collection of the ash by-product of the aerobic toilets. This concept, of course, precludes using common garden walls at the backs of the plots, however, this presents no great economic burden on the project since the garden walls are to be constructed of local wattle.

4. Roads and Walkways - (Drawing No. PP-5)

The network of road access and walkways is designed to minimize vehicular roads, with walkways providing the principal means of circulation and access to the individual shelters. This circulation system will also serve to function as the principal surface drainage network as described in the satellite village master plan section of this analysis.

The access to the neighborhood is provided by a collector street with 15 meter right-of-way (R.O.W.) and 7 meter road surface with

side drains. Ultimately this will become a surfaced road. The 8 sub-neighborhoods or "Ududs" are served by 4 service streets with 10 meter R.O.W. and 6.5 meter road surface. These streets will have a crowned profile with side drains on both sides and should be well planted with trees as described earlier in the section of satellite village master plan. The walkway spacing between blocks of houses should be 5 meters minimum for reasons of fire-spread hazard and provision of adequate ventilation. These walkways, as the others, should be adequately planted and provided with a side drain. The actual walkway surface should be a minimum of 2.5 meters to permit the entry of emergency vehicles. The serviceways between the backs of the plots mentioned in the previous section will have a 3 meter R.O.W. with a center drain to admit service vehicles. It is suggested that the entry of vehicles into the basic block or "Xubin" be strictly prohibited and controlled by the placement of bollards or low walls which could also serve as benches.

The SDA in conjunction with the Somali Development Bank, has been constructing and testing biogas generators, using cattle dung, at the Kurtunwaare Settlement. It is hoped that energy from these units can supply much of the fuel requirements of the proposed villages. It is anticipated that this system, if proven successful, could be used to provide electric power for the pilot project schools and general street lighting. It is also recommended, ultimately, that such a biogas generator could be located to provide a fuel source for the possible operation of a local brickmaking kiln.

5. Land Use Data - Pilot Project

Total area of pilot project (w/o lagoon area)	15.4 ha.
Number of families	400
Density:	
Families per gross hectare	26
Persons per gross hectare (assuming average family of five)	130

Land Allocation:	Area	Percentage
Plots	7.4 ha.	48
Roads and walkways rights-of-way	4.8 ha.	31
Schools, religious and public services	1.1 ha.	7
Parks, recreation and green areas	2.2 ha.	14
TOTAL	15.4 ha.	100

F. RECOMMENDED HOUSE TYPES - (DRAWINGS NOS. D-1, D-2 and D-3)

The material design recommendations and their relative advantage in cost, durability and living comfort have been dealt with in that chapter of the technical analysis. These recommendations offer several alternative choices of building systems which are suitable for the Kurtunwaare climate and soil conditions. This section deals primarily with the functional planning relationships in presenting its recommendations for suitable house types.

In planning basic house types, due consideration has been given to provide living spaces which are adequately sized for the family's living requirements and properly oriented to those physical elements which make

the climate within the house as "naturally conditioned" as is possible. All of the recommended house types presented here share common functional layouts which were indicated as preferred by the Kurtunwaare inhabitants. All are of two-room configuration with a separate, but easily accessible, outdoor covered cooking area.

The rooms are separate and sized so that one large room (approximately 3.7 x 4.7 meters) will serve to house the children, providing space enough for 3-4 beds, and one smaller room (approximately 3.7 x 3.7 meters) will serve to house the parents and an infant child quite adequately. The kitchen area is kept open for reasons of proper ventilation and will be provided with an adjacent lockable storage room for food and other cooking supplies. Within the kitchen area will be a food preparation slab containing a water storage tub and a locally produced cast-iron wood/charcoal grille. The toilet type and its location have been sufficiently covered in previous sections and in the technical analysis of individual sewerage disposal.

Although preferences have been shown towards certain functional relationships, such as separate (not interconnecting) rooms, it is planned during the early implementaion stages to construct minor modifications to these recommended layouts in order to monitor the people's reaction to these suggestions.

Proper drainage, ventilation, and protection from the sun and insects were major physical factors influencing these designs. Floors and working

area around the kitchen will be elevated and paved with local brick. All rain water runoff will be either caught in rain barrels for drinking purposes or channeled through the garden and into the neighborhood drainage network.

All rooms of the house face the inner courtyard and are lined with high perimeter vents in the walls facing the adjacent plot and street, thus facilitating good cross-ventilation. Insect protection will be provided through use of local reed matting placed above the openings and rolled down at night. In the interest of shade and control of wind-borne dust it is recommended that each plot be provided with a tree which could also serve as a source of food, such as banana. The banana plant is fast growing, requires little attention and will be respected by the inhabitants for its nutritional value.

The dwelling forms presented here are basically simple modifications of the "Arish" arrangement using locally made bricks or stabilized earth blocks in lieu of the wattle walls and are recognized as a part of the traditional local culture. They are reasonably light in weight and can be easily replicable, or expanded upon, using modifications of known indigenous building techniques and materials as proposed in the technical analysis.

There exist within this overall design proposal some issues which, although technically sound in principle, are best put to the test of an objective analysis within the environment which they are intended.

These issues, as presented in the Social Analysis, fall basically into the categories of environmental, health and social recommendations and their potential impact upon the ultimate community of 5,200 families. It is therefore proposed that, during the project implementation period, the pilot project be constructed with a first phase of an "experimental" 50-unit group, introducing minor technical and functional modifications of the proposed house types and compound designs. This group, the "Udud", will occupy their houses immediately following construction of this phase, thus providing a monitoring test bed for the houses, the neighborhood concepts and their functional interrelationships.

ANNEX NO. 1

KURTUNWAARE, SOMALIA

LONG. 44° 15' E.
LAT. 01° 40' N.
ALTITUDE 60 METERS

Annex V

MAHONEY TABLES 1 TO 6

TABLE 1. AIR TEMPERATURE (°C)

	J	F	M	A	M	J	J	A	S	O	N	D	Highest	AMT
Monthly mean max.	33.7	35.4	34.8	34.1	31.7	30.5	29.4	30.1	31.6	32.0	31.8	32.5	34.8	32.5
Monthly mean min.	21.6	21.9	23.0	23.2	22.3	22.7	21.5	21.8	22.3	22.1	21.9	21.7	21.5	18.9
Monthly mean range	12	13.5	11.8	10.9	9.4	7.8	7.9	8.3	9.3	9.9	10	10.8	Lowest	AMR

TABLE 2. HUMIDITY, RAIN AND WIND

RH (percentage)	J	F	M	A	M	J	J	A	S	O	N	D	
Monthly mean max. a.m.													N/A
Monthly mean min. p.m.													N/A
Average	65	64	66	69	78	75	74	72	69	68	68	68	
Humidity group	3	3	3	3	4	4	4	4	3	3	3	3	
Rainfall (mm)	5	–	10	90	75	60	60	20	10	40	70	20	Total 410
Wind: Prevailing													
Secondary													

TABLE 3. DIAGNOSIS

	J	F	M	A	M	J	J	A	S	O	N	D
Humidity group	3	3	3	3	4	4	4	4	3	3	3	3
Temperature (°C)												
Monthly mean max.	33.7	35.4	34.8	34.1	31.7	30.5	29.4	30.1	31.6	32.0	31.8	32.5
Day comfort: Max.	33	35	34	34	31	30	29	30	31	32	31	32
Min.	23	24	25	25	24	24	23	23	24	24	23	23
Monthly mean min.	21.6	21.9	23.0	23.2	22.3	22.7	21.5	21.8	22.3	22.1	21.9	21.7
Night comfort: Max.	26	26	27	27	26	26	25	25	26	26	25	25
Min.	19	19	20	20	19	19	18	18	19	19	18	18
Thermal stress												
Day	H	H	H	H	H	H	H	H	H	H	H	H
Night	–	–	–	H	H	H	H	H	–	–	–	–

TABLE 4. INDICATORS

	J	F	M	A	M	A	J	A	S	O	N	D	Totals
Humid													
H1 Air movement (essential)											*		6+
H2 Air movement (desirable)													
H3 Rain protection													
Arid													
A1 Thermal storage											*		5–
A2 Outdoor sleeping													
A3 Cold-season problems													

TABLE 5. SKETCH DESIGN RECOMMENDATIONS

Indicator totals from table 4						*Recommendations*	
Humid			Arid				
H1	H2	H3	A1	A2	A3		
6+			5+				
							Layout
			0-10				1. Buildings orientated on east-west axis to reduce exposure to sun
			11 or 12		5-12		
					0-4		2. Compact courtyard planning
							Spacing
11 or 12							3. Open spacing for breeze penetration
2-10							4. As 3, but protect from cold/hot wind
0 or 1							5. Compact planning
							Air movement
3-12							6. Rooms single banked. Permanent provision for air movement
1 or 2			0-5				
			6-12				7. Double-banked rooms with temporary provision for air movement
0	2-12						
	0 or 1						8. No air movement requirement
							Openings
			0 or 1		0		9. Large openings, 40-80% of N and S walls
			11 or 12		0 or 1		10. Very small openings, 10-20%
		Any other conditions					11. Medium openings, 20-40%
							Walls
			0-2				12. Light walls; short time lag
			3-12				13. Heavy external and internal walls *
							Roofs
			0-5				14. Light insulated roofs *
			6-12				15. Heavy roofs; over 8 hours' time lag
							Outdoor sleeping
				2-12		X	16. Space for outdoor sleeping required
							Rain protection
		3-12				X	17. Protection from heavy rain needed

* SOILS PROBLEM LOW BEARING CAPACITY

TABLE 6. ELEMENT DESIGN RECOMMENDATIONS

Indicator totals from table 4						*Recommendations*
Humid			Arid			
H1	H2	H3	A1	A2	A3	
6+			5+			
						Size of openings
			0 or 1		0	1. Large, 40-80% of N and S walls
					1-12	2. Medium, 25-40% of wall area
			2-5			
			6-10			3. Composite, 20-35% of wall area
			11 or 12		0-3	4. Small, 15-25% of wall area
					4-12	5. Medium, 25-40% of wall area
						Position of openings
9-12						6. Openings in N and S walls at body height on the windward side
1-2			0-5			
			6-12			7. As above, but including openings in internal walls
0	2-12					
						Protection for openings
					0-2	8. Exclude direct sunlight
		2-12				9. Provide protection from rain
						Walls and floors
			0-2			10. Light: low heat capacity
			3-12			11. Heavy: over 8 hours' time lag
						Roofs
10-12			0-2			12. Light: reflective surface and cavity
			3-12			13. Light and well insulated
0-9			0-5			
			6-12			14. Heavy: over 8 hours' time lag
						External surface treatment
				1-12		15. Space for outdoor sleeping
		1-12				16. Adequate drainage for rainwater

MATERIALS AND CONSTRUCTION ANALYSIS

RESEARCH AND TESTING OF MATERIALS

The investigation of materials cannot be, in the ambient of Somalia, as impressively scientific as one could desire to bolster a report. There are two reasons: the dearth of materials testing facilities and the dearth of materials to be tested. There is a third reason that comes in two parts: the specifications and qualities of imported or manufactured materials are already known and the few useful native materials have been used before and their reaction to stress, elements, insect infestation, etc., are a part of the local knowledge.

There is a considerable list of materials useable in low-cost housing, both native and imported, that needs to be addressed here as a preamble and clarification for the ultimate recommendations of desirable materials. Because many people will be involved in the final decisions affecting these houses and some of these people have already inserted their ideas, preferences or prejudices into the proposals affecting the selection of materials it will be necessary to describe all of the possible materials.

Starting at the bottom and working up to the roofing: the first material is the soil itself, its bearing capacity and reaction to wetting and drying. Normally there is not much choice in this because a project is usually located and oriented for other reasons than the quality of the soils at the site. This is true in this case also, but the digging of nine test holes in the selected project site has revealed four distinct soil types from the surface to a depth of 1.5 meters. The types are: black cotton, clay, sandy clay and pure sand.

These strata of types are not at uniform depths, they are not in predictable sequence nor are they found in all test-hole locations. The east side of the site seems to have the heaviest overburden of black cotton to a depth of 1.5 meters and presumably deeper, while clay and sand are predominant in the north and west quadrants of the site starting at the surface with no black cotton found to a depth of 1 meter. The implications of this are that materials selection can be done even in the category of bearing soils by designing the village layout to build on the better soils and leave the black cotton areas for green areas or recreation.

The qualities of the four soils encountered are well-known in construction and no laboratory analysis vis a vis their bearing qualities is required. The clay and sand clay have been analysed for possible use in the manufacture of bricks or blocks of stabilized soil.

Foundations: where the houses can be located on good bearing soils (sandy, sandy clay) the choice of foundation materials is mostly economic: how best to do it on the cheap.

These houses will be lightweight structures, falling into this category even if relatively heavy masonry units are finally chosen for the walls. Solid cinva-ram blocks would be the heaviest of any of the possible materials. Even these would only load the bearing soil about 4 lbs per sq. in. or 300 grams per CM^2. A very light loading (this includes walls, roof and foundation on a 16" wide continuous footing) for any good bearing soil.

My recommendation under these conditions would be a cyclopean footing of coral rock 30 CM wide and 50 CM deep laid without mortar in the trench up to grade level, but filling the voids with sand. The same material to be extended 20 CM above grade but set in a 3 to 1 sand and cement mortar for this above-grade portion. Brick or block walls can be laid in a mortar bed directly on this footing. Because the bottom surface at the interface between the coral rock footing and the bottom of the foundation trench will be uneven, the loading where rock touches the trench bottom will be much higher than the 300 grams per CM^2 previously calculated. This could be avoided by putting a 2" mortar bed in the footing under the coral rock. In the interest of economy I do not recommend this. The extra loading without the mortar bed will result in some initial settlement of the wall but not enough to do more than cosmetic damage, which can be repaired, and not even cosmetic damage in every case. The saving per unit would be about one cubic yard of concrete worth about U.S.$60 with one-half of this cost in imported cement. No big deal on one unit but on several hundred or thousands of units it becomes an important amount. This is pointed out here because it is typical of other decisions regarding material selections that will be weighted economically even though there is some element of risk to the structural perfection of the units. This does not mean that the building will be in danger of collapse. It does mean that some imperfections will be found in some of the units. These will mostly be of the type that can be repaired by the owner or ignored by everybody. To give perspective to

this calculated risk it should be pointed out that massive inputs of money, materials and attention to design will not absolutely guarantee structural perfection. The cracks in the massive reinforced concrete columns at the HUD Building in D.C. are a demonstration of this point.

Where it is necessary and if it is necessary to build in areas of deep black cotton soils a different foundation will be necessary. We are informed by the local German and Italian road builders that the moisture content of the black cotton is stable (in most areas) at a depth of one meter. This means that good bearing can be found at this depth that is not subject to seasonal volume change. Therefore heaving and lateral movement of the black cotton will only have to be contested in the top three feet of the soil. I recommend in these cases 8" bored and poured pilasters (reinforced) to a depth of 4-5 feet at the perimeter walls, spaced not more than 3 meters apart and connected by an 8" x 12" reinforced concrete grade beam. Structural details to be included in the final drawings. This I believe to be the cheapest practical solution to foundations in these expansive soils (other than avoiding the areas of deep black cotton entirely).

Walls: the local mud and wattle walls have exerted on different people either a romantic attraction because of their exotic charm or an economic attraction because of their supposed low cost. Neither the exotic nor the economic preconception is a certainty. The one certainty is that mud and wattle is a lousy building material: it rots, it erodes, it is subject to termite infestation. That it is cheap is arguable because of

obvious reasons. It is also arguable that it is not cheap in wasted manpower in the gathering of wattles for the original building and the regathering of wattles for replacement and maintenance. Further - it cannot be definitely established that enough wattles can be harvested in a reasonable radius of the project to construct much more than the pilot project of 400 units. This uncertainty of supply is by itself reason enough to reject this material. Moreover, there is the fact that the material is subject to at least three forms of deterioration: the mud erodes, the wood rots and termites eat it.

Other vegetable fibers for wall coverings have been investigated. One idea was to build the walls of galvanized chain link fence. Cheap, fast, durable and secure. The fencing could then be covered with some local grass or other fiber in a thatch style to be a protection against wind and rain and to give privacy. I think the idea has merit, but it has been impossible up to this writing to find a local fiber that is both durable and in sufficient supply. There is the problem of insect and rodent habitation of the thatch. In any case without a good supply of good material the idea is worthless.

The motive for presenting this idea which, until now, has no practical solution is partly to present to the reader a view of the broadness of the approach that has been used in these investigations. There will inevitably be some criticism of the materials chosen and it must be clear that this investigation and materials selection has been done with

some imagination and an open mind. My occasional references to "lousy" materials does not reflect parochialism or prejudice. It represents an accurate description of some of the materials investigated.

So much for two wall systems. Others have been investigated (animal hides and woven grass mats). These last two are not practical for several reasons.

There is a brick kiln at the project with a production rate of 60,000 bricks per week. Enough for a house a day or more. These are low density charcoal-fired clay bricks. Not high quality but almost exactly the same as bricks now used in Latin America and known as "Ladrillos Comum". They have several advantages: they are durable, A.I.D. has past experience with them, they are not subject to termites or erosion, they do not harbor rodents or insects, they are locally made and they are cheap. If the above description had been the criteria for the wall material (which, as a matter of fact, it was - after some verbal distallation) and a search had begun for such a material the answer would have been -- bricks.

The answer might have been high density stabilized soil blocks. The popular name for these is cinva-ram blocks. It could be either brick or block made from local material. There is a disadvantage in both of them of an element of foreign exchange. Brick to be practical beyond the pilot project will require oil-fired kilns. Stabilized blocks will require from three to eight percent portland cement. Either one as a

building material is excellent for the uses here. Economic or social implications could weight the final decision either way. The choice does not effect design, cost or rate of implementation. They could be used interchangeably and could be changed in mid-stream as building techniques are the same.

Since construction of the first prototype unit using the charcoal-fired bricks, it is obvious that to be as desirable as possible the bricks should be of uniform dimensions. The ones being produced at Kurtunwaare are not. Because of this it is difficult to lay up the walls with level courses true to line and plane. This results in lost time, out-of-plumb corners and the excessive use of mortar (and imported cement) to make up dimensional differences. This problem could be partically cured by making new molds for the brick plant to use and forcing the brick plant to' use no other molds (to enforce this the existing molds should be destroyed). With the cinva-ram blocks there will be no dimensional differences. Also with cinva-ram only three blocks are used per square foot of wall surface vis a vis eight bricks per sq. ft. Speed of erection and economy of mortar would be improved using cinva-ram.

Roof structure to roofing: these two items must be considered together because the weight and character of the roofing will dictate the design of the structure that supports it.

The local roofing material for the rural farmer is thatch. This material has been mentioned before briefly in respect to the wall covering.

We have talked to some village leaders both from the settled farming villages and from the nomad village to gain some knowledge of local thatch. The chief advantages are a factor of insulation, the materials are at hand and the materials are free. Actually quite a formidable combination and not to be ignored.

On the negative side: they leak even when new, they leak more with age, some fibers attract rats as food and all of them are nesting places for insects.

However, the alternatives (imported or manufactured roofing) are expensive. So are some other suggested materials and systems such as brick dome, woven reed mats (nomad style) or a variation of spanish tiles. All are impractical because of considerations of weight, supply, effectiveness or expense.

During the research and testing effort on one prototype house that was built before the end of 1978 I experimented with a roof system that is practical: a dimension lumber gable-end structure with no member larger than a 2 x 4, purlins over the rafters made from wattle spaced about 22 cm on center, 30 lb impregnated asphaltic felt (tar paper) over the wattles in imbricated layers alternating with thatch to give the necessary waterproofing and thatch over the tar paper to protect it from deterioration from ultra violet, drying, wind, heavy rain and to give a traditional appearance and some insulation from the sun by shading the tar paper.

There are advantages to this: low amount of imported materials (the dimension lumber roof structure would be necessary in almost any type of simple roof system), local wattles and thatch which are traditional and cost only unskilled labor to gather and the tar paper which is imported but should be less than U.S.$50.00 per house.

The disadvantages of the system are elusive and one of the reasons for experimenting on one prototype house. Wattles for purlins are used under thatch in the traditional Somali "mundul" or round country house. They are really more rafter than purlin in the mundul. Therefore this aspect is traditional. They are relatively weak but will support a minimum live load of workers during construction. The development of construction techniques for the application of this roof was the main thrust of this experimental roof on the first prototype. If it can be erected with a high percentage of structural integrity the roof should last for 6-10 years.

This is not a good roof by U.S. standards. It will be a better roof than the traditional thatch which is what they live with now. It is probably the least expensive that can be devised even with a 6-10 year dependability and finally, when people are trained for it, the repair and maintenance should not be beyond even the meager financial resources of the nomads.

Floors: These can be done in stabilized and compacted soil or compacted sand fill with brick over (state-side patio style) to take the abrasion

of foot traffic. The bricks would be laid directly on the sand with no mortar setting bed and the joints filled with a sand and cement mix sifted on the surface and brushed in the joints and slightly wetted to form a mortar joint. This last would be the better floor. It takes minimal skills and is durable and cheap.

Compound walls: The compound fencing on the prototype model was done in wattle. Even though this is a traditional material it is being criticized as being too flimsy and not durable. Cinva-ram block walls could be used at a reasonable cost because the walls are only four feet high and the two sidewalls are common walls with the neighbor. Total blocks per house is about 800.

Summation of Prototype Experience

The prototype house finished at the Kurtunwaare Settlement in early December 1978 has proven some assumptions and forced thoughtful reconsiderations of others.

There is no reason at this time to change the assumptions regarding the two types of foundations (the cheaper cyclopean footing was used on the prototype in spite of the fact the house was built on black cotton soil during a wet season. This will give us a chance to observe this foundation during a three-month dry season just beginning).

The brick floor over sand fill has worked out better than planned because it was possible to use broken bricks for the floor thus disposing of debris and utilizing it in construction at the same time.

The brick walls of irregular dimensional bricks were a problem, as described earlier, and reinforces the tentative plan to use cinva-ram blocks in lieu of bricks, except in the floor. The walls were built only 6'2" high to minimize materials and improve the stability of the walls. An 8" reinforced tie beam ove rthe wall gives a minimum head-room of 6'10". There are no ceiling joists and so the true head-room is to the bottom of the truss collar-ties that are about 8 feet above the finish floor. There was no negative comment from any source about the height of the walls and so this dimension should be incorporated into the final plans.

The roof tresses were made in a simple jig and after the first one was made the Somali workmen produced the rest with no supervision and no lost time.

Construction of the roof was held up for about three days because it was difficult to find wattle for purlins that were of uniform dimension (more or less) and reasonably straight. Enquiries among the local wattle experts for a solution brought to light the previously unknown fact that the center spine of the coconut palm frond could be used. This did not seem, at first, such a good idea. On investigation, it was found to be a nearly perfect solution. The spines are straight, easily obtained and surprisingly tough (they support the weight of workmen putting up tar paper and thatch). The original plan was to space the wattle/purlins about 4 inches apart. In practice it was found practical to space them 9 inches apart. A savings in time and material without detriment to the roof system. The local wattle experts claim the frond spines are good

for fifty years. Probably an exaggeration. Some roofs were seen that are at least 10 years old and with spines in good condition.

The experimental roof of wattle purlins with thatch and tar paper has come out as good as hoped for and better than expected. In actual production it will be better than the prototype because of improved skills of the workmen and the use of 30 lb felt in lieu of the 15 lb. felt used on the prototype (the only weight available at time of prototype construction).

The floor plan of the house and its exterior esthetics are more than acceptable (see photos attached). During construction the place was so overrun by "shoppers" and sidewalk superintendents it was at times difficult to work. In the month it took to build the prototype there were very few negative observations. The few that seem to have a valid basis will be incorporated into the second prototype.

The first prototype was extremely valuable for technical reasons and at least as valuable from a public relations aspect. One other valuable lesson was that the training program will be a critical component of the pilot project. We used carpenters and masons on the prototype that were the best the village had to offer. Their incompetence was only surpassed by their cooperation and eagerness to learn.

Individual Sewerage Disposal

Practically all of the usual methods of sewerage disposal have been considered for this project. And nearly all of them discarded. The usual and obvious methods, such as water-borne sewerage in collection systems, have been discarded because of the costs of piping. These same systems should include a treatment system that is also costly even if it were to be simplified to lagoons or IMHOEF Tanks. Other considerations of these systems are the high per capita use of water, which in dry seasons can be in short supply, and because of the flatness of the terrain the almost certain need of lift stations. Collection systems, lift stations and treatment plants require expensive maintenance and a fairly high degree of technical skills for their continual and efficient operation. In short, these usual systems require technology, money and water -- all of which are in short supply. The next degree of sewerage disposal is a retreat to septic tanks with leaching lines or seepage pits. The septic tanks with seepage pits are not practical because of the lack of percolation in most areas of the project. Septic tanks with leaching lines are not practical because of the high density of construction and the fact that the disposal of effluent would depend almost entirely on evaporation. The small plot would not contain a large enough leaching net and during the rainy seasons (about five months of the year) would not work at all.

The next retreat, in the direction of the primitive, would be to cesspools or pit privies. Again impractical because of high density and low percolation. These would also need periodic pumping and with 18,000 souls

contributing every day to the solid waste collection of the community the pumped waste would be a mountain. And where would the mountain be built? And at what expense in vehicles and man-hours?

The above nearly exhausts the possibilities of sewerage disposal within the confines of practical operation, minimal health hazards and economics.

There is one other possibility that seems nearly ideal for the ambient of the project. This is the use of aerobic digesters. This uses a fiber glass tank beneath a toilet stool with a direct duct from stool to tank. There is no water used (except for minimal amounts to clean the duct occasionally) and therefore no siphon or water trap. The system is stack vented to the outside air to assist the aerobic digestion of the solid waste.

A simplified cross section of the digester would show the fiberglass tank built in steps. The fresh waste falls to the first step and aerobic digestion begins deterioration of the waste letting it fall to step two and step three and finally to a sump in the bottom of the tank -- a waterfall in slow motion. The process takes time and the waste is digested by the action of air and the glacially slow stirring in its progress from step to step to the bottom of the tank. The ash that is in the bottom of the tank after digestion resembles moist top-soil and is odorless and non-toxic. It can be used directly as fertilizer and is extracted about every eight months through a clean-out door at the rear of the tank.

There is a commercially available system developed in Sweden known as Ficus-Multrum and uses the same principal of aerobic digestion. However the system is patented, expensive and incorporates a western style commode in lieu of the oriental or French squat type, which is the preferred type in Somalia.

The tanks can easily be shop fabricated using molds and the hand lay-up method of fiberglass fabrication. The tank would be partially submerged at the back corner of each compound and surrounded by a masonry wall about 7' high without a roof (the rural Soamlis do not normally roof the pit privys).

The advantages of the system are: it uses no water, the waste is minimal and non-toxic, the waste can be disposed of easily on gardens or crops in a farm community, there is no expensive maintenance or technology involved, it is as cheap as a septic tank system and not much more expensive than an adequate pit privy (an impossibility at the project).

This writer sees no other solution with the same advantages, even at higher costs.

Surface Drainage and Storm Run-off

The site chosen for the pilot project is very flat, as is the entire settlement area, and elevations on the site vary less than 1.5 meters. The entire satellite village when completed will cover 50.2 hectares or approximately 120 acres. The longest diagonal distance across the village

(1,200 housing units) is about 1,000 meters. Therefore the land is nearly flat with a difference in elevation of 1.5 meters in 1,000 meters. This makes storm water drainage very difficult in any soil except sand and with the nearly impervious black cotton soil on the site the problem is increased.

The surrounding land will be used for farming and the surface drainage plan proposes to divert about 40 percent of the surface drainage to farm areas to the west and south of the village. The other 60 percent of storm water will be drained to a lagoon that is located a little to the east of the village center.

The lagoon has a surface area of about four acres and the area to be drained is 60 percent of 120 acres or 72 acres. April is the month with the heaviest rainfall of approximately 4 inches or 24 acre feet. This can safely be reduced in this first month of heavy rain by about 15 percent for evaporation and initial saturation of the dry soil. Therefore 85 percent of 24 acre feet will be 19.2 acre feet that must be provided as a minimum of lagoon capacity for this heaviest month of rain. This then will necessitate an average depth of 5 feet (5 ft. depth x 4 acres of surface = 20 acre ft.) below the inverts of the run-off swales to accomodate this much water, Because there will probably be some percolation in the lagoon, because the test holes have shown strata of sand and clayey sand, a 50 percent over-capacity would be sufficient for water control. This would mean an average depth of 7.5 feet. If in a worst possible condition the rainfall was to be higher than average the water could rise

two feet above the swale inverts and still not flood the building sites. The overflow would infringe on the recreational area but in so doing would increase the lagoon surface area by at least 50 percent (six acres) and thus accommodate an extra 9 acre feet of water or nearly 50 percent of the 19.2 acre feet originally figured before the average depth was increased to 7.5 feet to accept 50 percent more water than is usual in April, the wettest month. In short the lagoon, including the overflow, would accept approximately 39 acre feet while the usual April rainfall is approximately 19 acre feet giving a 100 percent safety factor.

A further precaution, if it seems necessary would be to install a 2 meter deep sump at the deepest part of the lagoon and back-fill the sump with gravel. Before back-filling appropriately sized well points would be installed in the sump and connected to a 4 inch amnifold and pipe leading to a concrete platform with a pump house. If desired a diesel pump could then be installed by the SDA for controlling the lagoon depth and for pumping to the irrigated land system immediately to the east of the village or to the dry farms to the south or west. This may be an important consideration for the agricultural component of the community, but this writer does not advise this as a flood control measure because the sizing of the lagoon should be adequate to protect the housing units.

TRAINING PROGRAM FOR CRAFTSMEN

The training program, at least in the first stages, should be pragmatic and simplified. It should be pragmatic to supply skilled labor as quickly as possible to the pilot project and simplified to the extent that the structures are simplified, i.e., there will be no need for tinsmiths or electricians.

The goal of the training program should be the essence of the program and needs to be stated early and remembered constantly through the inevitable improvements and changes that are inherent in a program with so many unknown variables. Some examples of unknown variables are the attitude of the people being trained, the incentives (or lack of incentives) in the program, the dexterity and spatial concepts of the trainees, the level of intelligence and education of the trainees and the teaching skills of the instructors.

The goal of the training program, beyond developing the cadre of skilled workers necessary for the project, should be to train skilled workers well enough so that they, individually, can show and articulate their trade to an apprentice. This not only supplies the craftsmen for immediate use but has the old well-known system known as "each one teach one". This replicates craftsmen without the continuing expense of a training program, or at least it diminishes the necessary size of a continuing training program.

The simplification of the training is a reflection of the simple-as-possible construction. Foundations will be designed in two distinct types. This is really a simplification although it does not sound like one and the explanation will be covered elsewhere. Foundation dimensions, walls and wall dimensions will all be repetitive. The roof structure will be simple and designed for a light roof load. In fact the very simplicity of the structures is contrary to a truly good comprehensive training program: repetition in this as in other endeavors is like having long experience in a steady job. One does not have, in this case, 20 year's experience but one year's experience twenty times. In any case, the basics can be taught of carpentry and brick laying and roofing, etc. This coupled with practice will make good if parochial craftsmen and will give them a foundation for future experience.

A parallel program should be done for foremen and superintendents. This will require a higher type of recruit because the teaching must encompass more esoteric aspects of the art: lay-out (the pythagorean concept of 3-4-5. The 5 unit being the hypotanuse of the triangle for arriving at right angles for building or lot corners). This can be easily taught to epople who know no math but can count. This does not mean that people with some schooling would not be valuable, it does mean that articulate bi-lingual teachers must be found.

Beyond the purely technical, the foremen should be taught some tact and skills in the supervision of people. The truly effective supervisor is a leader not a pusher.

The structure of the training school will be basically on-the-job training. We are fortunate that this can be done because the project is the perfect classroom. A nucleus of craftsmen must be found (the SDA says there are a few in the Settlement) to demonstrate the skills to the teachers (bi-lingual Somali-English) who can then structure the course and articulate the lectures. Practice for the students can be on buildings under construction under firect supervision of the craftsmen or teacher. As soon as the student gets the hang of it he can solo and the process can be repeated with a new recruit. The very beginning of the school should use at least one carpenter/generalist and one mason as instructors until the original local craftsmen are brought up to good construction practice standards. After that the school can expand with local talent.

The training program should be started when the original grading and grubbing is begun. This is because soon after the start of grading there will be sites available for individual units and these first units will be the "classrooms" for the apprentice workmen.

It is appropriate here to describe some aspects of the beginnings of this remote project. A good construction rate considering the weather, bad roads, intermittent deliveries, etc., would be 10 units per week. This would mean 400 units in 40 weeks. This is not possible because work cannot begin at this desired rate and one of the main reasons is the lack of skilled workmen. To do 10 units a week will require a basic skilled

crew of about 120 people, 60 brick layers, 30 carpenters, 6 layout crews (3 men each), 12 steel workers and 12 foremen. This will require labor support of about 200 workers more and does not include a dozen or more equipment operators and probably a dozen mechanics with helpers. The training program does not contemplate the training of truck and heavy equipment mechanics although these people will be critical; if they cannot be hired they hay have to be trained. This last requires a curriculum and physical plant considerably different from that used for the building trades. If such a program is considered necessary, and if local mechanics are not available, it will be necessary, it may be prudent to get factory reps on short-term contract along with the equipment to teach the fundamentals of parts replacement if not a complete mechanical machine shop course. There is a large and well-equipped machine shop at Kurtunwaare supplied by the Germans for farm machinery maintenance. This shop could easily (with good personnel) maintain the construction equipment. Every effort should be made to come to some contractual agreement in this area, with whatever entity of local government has jurisdiction over this shop, for maintenance of the construction equipment. A request has been made to the SDA for the use of these facilities.

With these described restraints on time at the start-up of the project it will be necessary to design the training program to grow with the project in the beginning. It will be a hoist-by-the-bootstraps operation in the beginning: the few skilled workers available to teach. Then graduates to the field where house starts can slowly be exhilerated, then start

another class on some units segregated from the production line as "classrooms" then the graduates to the field again, etc, etc.

To get 60 good masons it may be necessary to train two or three times that many. The best ones can be used on the project, the mediocre ones can gain practice in the field and improve their skills. Some of the worst may be articulate enough to be used as teachers thus freeing the original journeymen for work on the project. This holds true for all of the trades. Moreover, it will be necessary to have a reservoir of masons, carpenters, etc., available if the project goes beyond the pilot project stage.

A training organization that can produce a steady flow of good skilled workers is more desirable than a crash program that may produce 130 skilled people in a month and then collapse. The latter probably is not possible in any case. The continuation of the program would not go into infinity but there are several good reasons to keep it viable for an extended time: to retrain or extend the training of promising people, to maintain a reservoir of skilled people to be ready for expansion of the site or for starting other sites and to have a sufficient number of skilled people so that an elite is not manufactured that could disrupt the project progress because of ambition or pique.

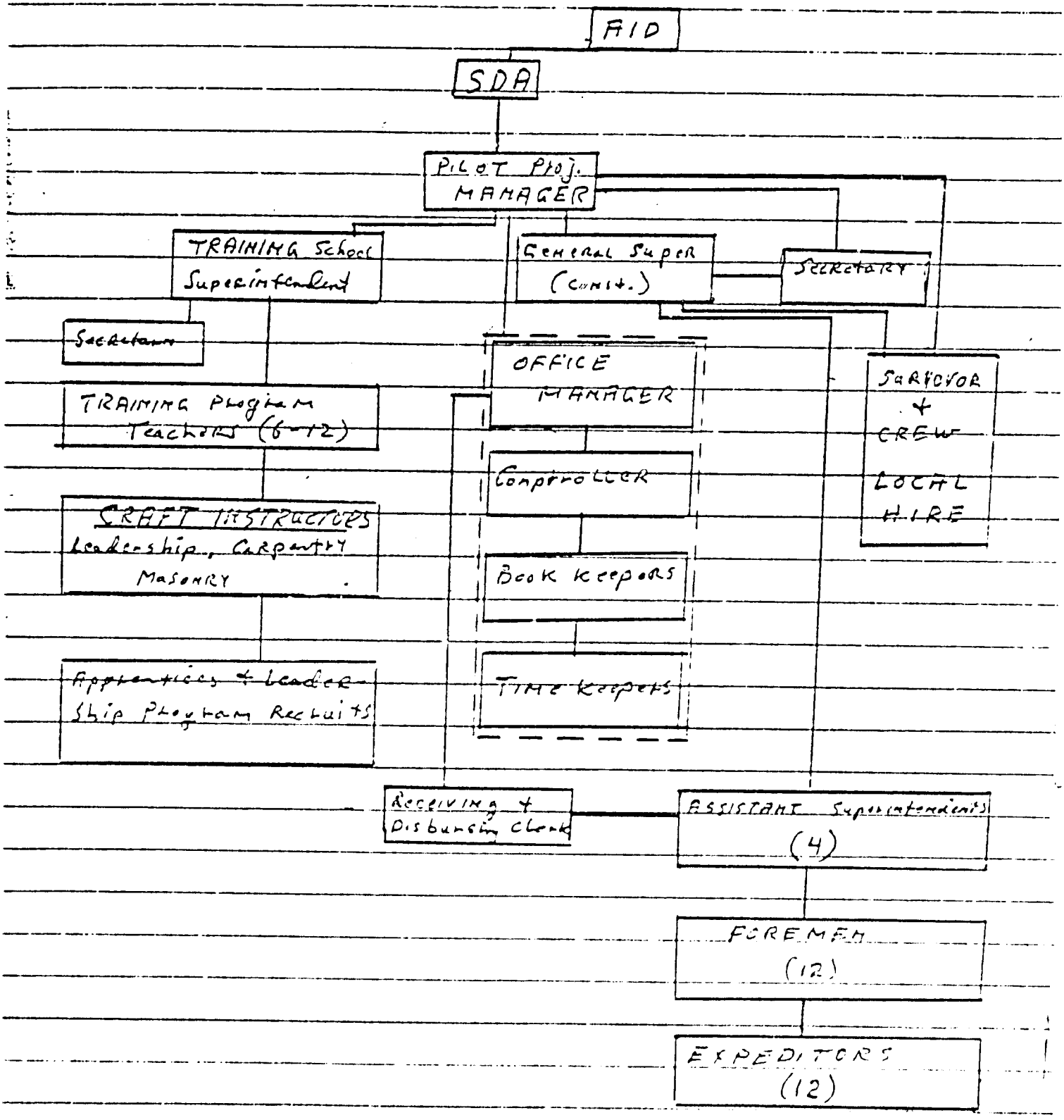
The actual size and composition of the training school, considering the realities of the pilot project could be the following:

SKILL	PER CLASS OF THREE WEEKS DAYS NEEDED TO TRAIN	NUMBER REQUIRED	TEACHERS REQURIED
Lay-Out	10	6	1
Stoneworkers	5	20	1
Masons	15	10	2
Roof Carpenters	15	10	2
Form Carpenters	15	10	2
Steel Workers	10	10	1
Roofers	?	20	2
Maximum 15 days per class (3 weeks)		86	11

These classes will not produce 76 skilled workmen, probably one-third will prove to be slow learners or not dextrous. After the beginning it may be seen that some teachers can be valuable in more than one subject thus reducing the number of teachers. It may even be relevent to have one set of classes for three weeks teaching only 3 or 4 trades and then reconvene for the second three weeks teaching 3 or 4 other trades. This is because it will not be possible to assimilate skilled workers into the project as fast as they may be produced. The lack of skilled workers is not the only impediment to fast production in the beginning of a project that must be mobilized from scratch 40 miles or more from the simplest supplies. this staggered approach also reduces the need for teachers to 5 or 6 giving them a more reasonable tenure and thus making them more available.

Annex B-24

PILOT PROJECT T.O.



The above are the marameters of the training program. Adjustments will be made on a empiracle basis. The real size and shape after a shakedown of possibilities and realities may not be very different than the program described here.

TECHNICAL ASSISTANCE PERSONNEL

JOB DESCRIPTIONS

Pilot Project Manager

This person will have responsibility for the entire project. He will delegate authority to the General Superintendent, the office manager and the school superintendent, but the final authority (within the policy guidelines of SDA) and responsibility for every phase of the project will be his.

This person will need experience in housing projects (not commercial construction) construction and development and should be a builder. An architect or engineer with a good track record in housing projects would be acceptable but a builder is desirable. The architectural and engineering aspects of the project will have been done before beginning of construction and therefore the builders expertise in scheduling and financial control is what is critical. An administrator or accountant is definitely not the background for this position.

Office Manager

Appropriate experience in office management and an ability to adapt to primitive living conditions with some background in accounting are the guidelines for this position. Office management, accounting and an appreciation of a gritty ambient do not seem to be compatible personality traits. However, to avoid expensive personnel turn-over all three of the above qualifications should be present in this employee.

Comptroller

Competent auditing experience and ditto the ability to adapt to the Kurtunwaare realities.

General Superintendent

Much the same qualifications as the project manager with emphasis on construction background and less necessary ability to be diplomatic and an administrator. The scheduling, quality control and ultimately the overall success of the day-by-day construction operation are the direct responsibilities of this individual and probably at least as critical to project success as the project manager position.

Assistant Superintendents (4)

Basically the same qualifications as the General Superintendent. Ideally any one of the four assistant supers could take the General Superintendent's position in case of illness or other problems.

Training School Superintendent

Should be an educator by profession with background in both teaching and administration. Although this is a relatively short-term assignment, adaptability is important in this position also.

Craft Instructors (2)

Short-term assignment of about three months to train carpenters and masons to such a high degree of competence that the best of the trainees can replace these craft instructors for the continuation of the training program.

These instructors must be thorough craftsmen in their field but need not be teachers. An understanding of their own craft, how their own expertise relates to other building crafts and tolerance and patience in the instruction of students with no previous mechanical background would be minimal but adequate requirements.

PROJECT COST

The project costs will break down into eight categories and each category will have sub-categories. Costs will be itemized differently in this project than in a classical state-side or private sector project. The differences in some cases are obvious: no land cost, no profit, self-help or subsidized labor. Other differences are not so obvious: the expenses that are critical to the logistics of remote projects anywhere, the dearth and necessity of heavy equipment and the costs of contracted expatriate management. This is also an auxilliary cost that is crucial and at tne same time unique, and that is the cost of the training program.

The basic costs of any product are labor, materials, capital investment, taxes, overhead and profit. This exercise will only deal with the first three of these as applicable taxes will be integral with material costs and there will be no entrepreneurial profits. Overhead will be an increment of other costs.

Labor

Will be supplied by the Government of Somalia (GOS) by paying the village laborers and craftsmen token wages ranging from two somali shillings a day to ten shillings a day. This is a cost to the GOS but not a charge against A.I.D. funding. An estimated cost for this labor would be interesting and one will be given here -- but with reservations.

It is estimated that the work force to produce (after a start-up period) 10 houses per seven-day work week will require about 300 people for 15 to 16 months. At an average wage of 4 shillings per day the total labor cost of the project will be almost So. sh. 600,000 or U.S.$100,000. This is U.S.$250.00 per house and is cheap labor by any standards. This is not the whole cost because the World Food Program is furnishing food for the settlers budgeted at 7 shillings per day per person. If the family of a worker is supported by the WFP while he works on the project and he had 4 dependents then his daily wage is 35 shillings plus 4 shillings or 39 shillings or 9.25 times the 4 shilling wage figured above. Maternity care, per capita cost of well water etc., is a cost of supporting the worker on the social program of the Settlement and is not figured here. But if family support is added to wages as a labor cost then the cost per house is $250 x 9.25 or approximately $2,300. This is a project labor cost of something under $1,000,000.00.

This is not such cheap labor. It is basically an exercise in philosophy or accounting as to which figure you want to use.

I should digress here to say that the project should run seven days a week because of scheduling and the psychological advantages of not having a run-down day, a lost day and a start-up day which is the case with a six-day week. One day is lost and at least two hours of the last day and two hours of the start-up day. This effectively slows production by at least 15 percent and adds at least that amount of time to the project duration. This is avoided by each individual working six days but

on staggered schedules o that the project never stops. Another advantage is that fewer day are lost to bad weather. Rain does not always come on Sunday and fai weather oft-times does. What cannot be done on a rainy Thursday can b caught up on a sunny Sunday -- if Sunday is not an automatic day off.

Materials

Will be both locally b ght and imported. The breakdowns of these cannot be definite at this ti because the final design is not complete. Preliminary cost estimate of material for a house similar to the prototype house already built at he project show that material cost can be held to U.S.$1,500.00 per u t with shipping of imported items at about 10 percent of total cost. U .$1,650 per unit or U.S.$660,000.

Services

Fee or contract servic would include local hire surveyor, well drilling, materials testing and her possible consultant services. One four-inch well to about 80 meter deep with dual pumps will supply 400 families. The estimated cost of is installation plus the storage tank, water supply net and demand hyd nts at intervals will be about U.S.$50,000.

A surveyor and crew wi be necessary for about 90 days and intermittently thereafter, estimat cost U.S.$15,000 . Material testing and consultants - allow U.S.$20, 0. Training program consultants, allow U.S. $70,000.

Heavy Equipment, Tools, Vehicles

See attached list - U.S.$631,000.

Earth Moving and Hauling

Earth moving on this project is more conspicuous by its critical tolerances than by quantity. The tools for this are figured in the heavy equipment and the labor will be done by GOS contributed labor. Therefore the cost that is applicable to A.I.D. funding will be fuel and maintenance. Total fuel consumption for earth moving and hauling will average 100 galbns per day at 10 shillings per gallon or U.S.$170 per day for a project cost of U.S.$80,000, and maintenance at 10 percent of equipment cost at $50,000. Some equipment rental will be necessary at the beginning of the project. Allow $20,000. Therefore total earth moving and hauling cost to contract will be U.S.$150,000.

Training Program

Cost against funding will be low because the actual construction site will be the classroom and eliminate the need for capital investment. The GOS through the SDA has agreed to supply bi-lingual teachers and the craft instructors will be recruited from outside the village but paid by SDA. The only cost against A.I.D. funding will be an expatriate superintendent of the school and training program and should be employed for about eight months and two craftsmen for three months. After that time the curriculum will be established and the teachers will be

efficient enough to function under a Somali professional educator. The cost of the superintendent and two craftsmen will be included in the cost of consultants. Allow $70,000.

Expatriate Management Contract

The Table of Organization for this contract will include nine people for various periods of time and at different estimated wage scales. The wage scales and percs for this contract must be realistic to attract professional people to a remote project with practically none of the social amenities or recreational possibilities that are taken for granted in the U.S. and indeed in many L.D.C.s.

The list of positions and realistic remuneration is as follows:

POSITION	YEARLY COST	TIME ON CONTRACT	POSITION COST
Project Manager	60,000	16 MOnths	80,000
General Superintendent	60,000	12 Months	60,000
Assistant Superintendents (4)	120,000	8 Months	120,000
Office Manager	50,000	3 MOnths	34,000
Comptroller	50,000	6 Months	35,000
TOTAL DIRECTOLABOR COST			319,000
Transportation and Travel (allow)			24,000
Miscellaneous and Contingencies			100,000
Consultancies			50,000
Evaluation			27,000
Contractor's profit at 20 percent			80,000
TOTAL ESTIMATED COST			600,000

Infrastructure

This item includes potable water system, storm drainage, roads and walk ways, and sewerage disposal. All of these items are included in construction costs, earth moving or wells and water net.

Clean-Up

This item refers to final reports, evaluation of project success vis-a-vis project goals, local or state-side legal and/or legislative termination of the project, disposal of unused equipment or materials and final closing and auditing of the books. Allow $40,000.

Total Project Recapitulation Cost

Materials (imported and local)	U.S.$660,000
Services	155,000
Heavy Equipment, Tools, Vehicles	530,000
Earth Moving and Hauling	150,000
Training Program (in Management Contract)	
Expatriate Managing Contract	500,000
Infrastructure (included in other items)	
Clean-Up	40,000
TOTAL	U.S.$1,945,000

This figure does not include the GOS input for labor nor does it include the cost of school buildings, mosques or clinics, nor inflation and contingencies. At this writing the inclusion of these items and allocation of costs has not been determined.

At the end of the pilot project there will be a recoverable value in the heavy equipment and tools. There is no way to know at this writing what the procedure or policy will be in this respect and therefore the local value cannot be applied here as a credit against project cost. With proper maintenance this equipment would last through the construction of the other 800 units of the first village and could be used for this if the decision is made to build beyond the pilot project. These replicable units will be cheaper than the pilot project units because of the absence of a heavy investment in heavy equipment, the end of the expatriate expense of the training program and no need for expatriate management.

Typical Housing Unit Cost

Building 3.3 meters x 9.5 meters plus kitchen 2 x 4 meters.

Area = 31.35 + 8 meters = 39.35 M^2 = 423 sq. ft.

Perimeter = 37.6 Meters = 124 L. ft.

Partitions = 9 Meters x 3 Meters

Gable ends = 5 M^2

ITEM	TIME (MAN HOURS)	MATERIAL	COST U.S.$
Layout	4	Batter boards	2
Excavation-mechanical auger	3	Gas and depreciation	30
Excavation-grade pams	8		
Steel rebar-grade beam and pilasters	14	960 L' #3 = 300 lb	105
Form grade bein	24	Reuseable lumber	30

ITEM	TIME (MAN HOURS)	MATERIAL	COST U.S.$
Pour pilasters and beam	48	5.5 cubic yards	275
Strip and repair form	16		SDA
Cimva-ram blocks-manufacture	240	3000 pec. 6" x 12" x 4"	SDA
Cimva-ram blocks-laid	160	as above (500 cu. ft.)	100
Mortar for blocks	40	54 cu. ft. x 15 bags cement	100
Duro-wall ties at all corners	3	56 corner ties/unit	40
Tie beam steel (2 #3 rebars)	6	208 L' = 70 lbs	25
Tie beam concrete	3	1 cubic yard	50
#10 wire ties to rafters	2	30 pcs = 200 L'	1
2 x 4 x 7' rafters	16	30 pcs = 210 L'	75
1 x 4 x 5' collar ties	3	15 pcs = 75 L'	15
2 x 4 ridge poles	3	13.5 M = 44 L'	16
Wattles (gathering)	36	2,600 L'	
Wattles (in place)	30	2,600 L' x fasteners	15
Asphaltic felt	20	100 m^2	30
Thatch to site	8		
Thatch in place	96	1 M^2 = 9 So. sh.	35
Brick floor 40 M^2	16	1,400 common brick	SDA
Sand fill under floor	32	10 M^2	SDA
Brick floor grout	10	5 M^3 sand, 4 bags cement	15
Kitchen brick work and grate	16	Grate + 2 bags cement	10
One entry door	10	Lumber and hardware	15
Ficus Multrum privy	100	Allow for fiberglass, etc.	350
Perimeter wattle fence	100		SDA

37

#884

ITEM	TIME (MAN HOURS)	MATERIALS	COST U.S.$
Crushed coral walks	40	2 M^3	35
Plantings	10	Allow	10
TOTAL	1,117 hours		$1,350
Vehicles, Hauling, Maintenance, earth moving, and fuel	80	Depreciation and fuel	450
Local supervision	80		
U.S. Supervision contract using staff of 9 people with transport, housing and average time on site of 12 months each plus overhead to contractor		Allow	1,000
TOTAL	1,277 hours		$2,800

Minimum Transport for Each Unit Under Construction

Note: If one unit is started each day this will be actual transportation per day. If one and one-half units are started per day multiply all transport by 1.5, etc.

10 yards coral rock	1 load
5 yards crushed rock	1/2 load
20 yards sandy clay (to block plant)	2 loads
3,000 blocks (plant to site)	3 loads
60 bags cement (3,000 kilos)	1 load
Rebar - 400 lbs	Fraction
Lumber - 1.5 cubic yards	Fraction
Hardware - assorted items	Fraction

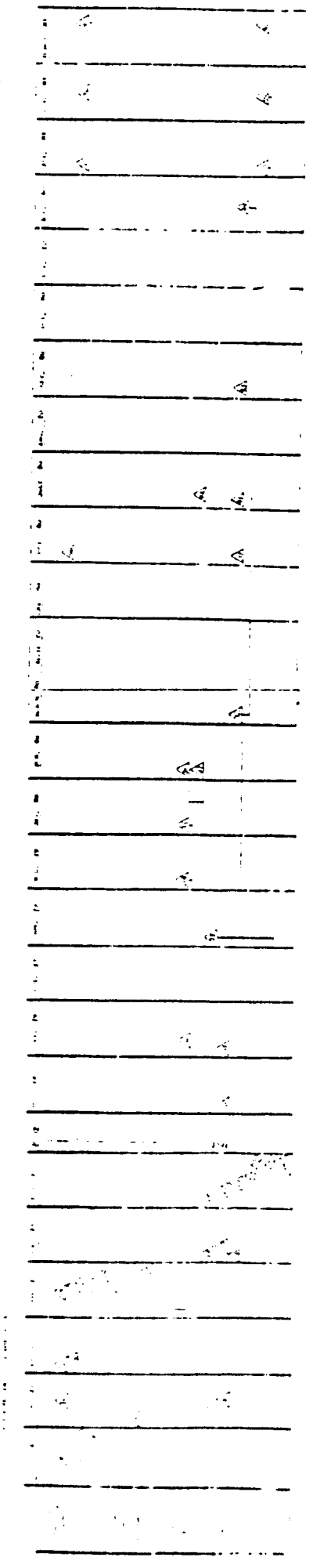
Thatch	Fraction
Clean-up	1 load
TOTAL	10 LOADS
Plus cement, lumber, rebar, hardware from Dock to Project (long haul)	2 loads
TOTAL (per day, per unit)	12 loads

This analysis means 18 loads per day for a project doing 10 units per seven-day week. This analysis does not include grading and earth moving. Estimated daily fuel consumption for above - 120 gallons. Add 30 gallons per day for grading and earth moving. At height of project total project fuel/day = 150 gallons. Estimated average daily fuel consumption per day over entire project time span = 100 gallons per day.

ITEM	NUMBER	UNIT COST	TOTAL COST
Heavy truck - 10 wheel	4	30,000	$ 120,000
Flatbed truck - 2 1/2 ton	3	12,000	36,000
Pick-up truck - 4-wheel drive	3	8,000	24,000
Pick-up truck - 2-wheel drive	5	6,000	30,000
Trailer - 6 Ton	4	5,000	20,000
Low-bed trailer - 12 Ton	1	12,000	12,000
Bulldozer, D-7	1	70,000	70,000
Tractor with back hoe	1	18,000	18,000
Ttactor	2	14,000	28,000
Auger-ditcher with tractor	1	12,000	12,000
Motorcycles	2	1,500	3,000
Pug mill 6 cu. ft.	2	3,000	6,000
Cement mixer, 1 sack	2	3,000	6,000
Cement mixer, 1/2 sack	4	1,200	5,000
Diesel generator 15 kva	1	5,000	5,000
Small generator, 5 kva	3	2,500	7,500
Shallow well pumps	3	500	1,500
Radial arm saw 12"	1	1,000	1,000
Dump level	3	300	1,000
Fence - 2,000 L' x 6'	-	--	5,000
Barbed wire - 8,000 L'	-	500	500
Wheel barrows	60	50	3,000
Picks, shovels, small tools	-	--	2,000
Carpenter and mason's tools	-	--	10,000
Mechanics tools	-	--	10,000
Spare parts	-	--	40,000
House trailers	5	15,000	75,000
Shipping	-	--	80,000
TOTAL			$ 631,500

Number	Item	Month	Fund Requirement	Fund Source	Responsible Office
1	Project Paper Review	Jan	N/A	MOB	Mission AFR/DR
2	Prepare heavy equipment and material specs and quantities	Jan	Contract	PDS	Contract
3	Prepare scope of work for TA contract	Jan	Contract	PDS	USAID
4	Prepare scope of work for Training Proj. Super.	Jan	Contract	PDS	USAID
5	Prepare final plans for infrastructure	Feb	Contract	PDS	Contractor
6	Begin construction of prototypes	Feb	15,000	PDS	Contractor
7	Start Cinva-ram factory	Feb	5,000	PDS	Contractor
8	CBD for TA	Feb	N/A	N/A	AFR/DR
9	Authorization of funds	March	N/A	N/A	AFR/DR
10	Select TA/Admin. Contractor	March	N/A	N/A	SDA/USAID
11	Training Program begins	April	10,000	PDS	AFR/DR
12	Obligation of Funds	April	N/A	N/A	USAID
13	Sign Contract for TA/Admin.	April	168,500	FY 79	SDA/USAID
14	Contractor notice to proceed	April	N/A	N/A	SDA
15	Sign order for materials	April	200,000	FY 79	SDA
16	Sign order for tools and equipment and staff housing	April	631,500	FY 79	SDA
17	Tentative housing unit selection from prototypes	April	N/A	N/A	SDA/USAID
18	Project Manager to site	May	(50,000)		
19	Begin site survey for drainage, roads and infrastructure	May		Title I	SDA/Cont.
20	Begin mobilization, layout of shops and yards	May	15,000	Title I	Contractor
21	Begin site grading and miscellaneous local costs	June	100,000	Title I	Contractor/SDA
22	Balance TA/Admin arrive	June	118,500	FY 79	Contractor
23	Order and stockpile local materials	June	50,000	Title I	Contractor/SDA
	(Hauling)		25,000	Title I	Contractor/SDA
24	Set up Admin/Accounting system	June	N/A	N/A	Contractor
25	Begin wells and water distribution system	June	50,000	Title I	Contractor/SDA
26	Begin construction prog.	June	100,000	GSDR	Contractor/SDA
27	Organize equipment maintenance	June	N/A	N/A	Contractor
28	Receive equipment, tools, houses	July	N/A	N/A	Contractor

Number	Item	Month	Fund Requirement	Fund Source	Responsible Office
29	Receive materials	July	N/A	N/A	Contractor
30	Start fabrication aerobic digester privies	Aug	N/A	N/A	Contractor
31	Approval final house unit design	Sept	N/A	N/A	SDA/USAID
32	Begin integration leadership school grads as expeditors	Sept	N/A	N/A	Contractor
32(a)	FY 80 funds obligation	Oct			
	TA Amendment		401,500	FY 80	AID/W
	Materials order		402,000	FY 80	AID/W
	Miscellaneous		40,000	FY 80	AID/W
33	Accelerate construction program to 6 units per week	Nov	100,000	GSDR	SDA/Contractor
34	Begin integration Somalis into supervisory positions	Dec	N/A	N/A	Contractor
35	Begin replacement U.S. personnel	1980 Jan	N/A	N/A	Contractor/SDA
36	Begin upgrading expeditors to foremen	Feb	N/A	N/A	Contractor/SDA
37	Begin upgrading foremen to asst. superintendents	Feb	N/A	N/A	Contractor/SDA
38	Accelerate construction program to 10 per week	March	N/A	N/A	Contractor
39	Replace U.S. Office Manager	June	N/A	N/A	Contractor/SDA
40	Project evaluation	June	30,000	FY 80	USAID
41	Begin termination of infrastructure	July	N/A	N/A	Contractor
42	Integrate Somali project manager	July	N/A	N/A	Contractor/SDA
43	U.S. project manager reports	Sept	N/A	N/A	SDA
44	Finish 400 units	Dec	N/A	N/A	SDA
45	Transfer tools and equipment to SDA	1981 Jan	N/A	N/A	SDA
46	Legal and accounting project termination	Mar	N/A	N/A	SDA/USAID



SOCIAL ANALYSIS

INTRODUCTION

This analysis is organized into four sections. The first contains several observations pertaining to Somali involvement in agriculture and sedentary farming. The second section focuses briefly on the Kurtunwaare Settlement. The third is a general analysis of the social issues related to the proposed housing/planning project, and the final section identifies and discusses specific social issues which cannot be or have yet to be entirely resolved in the project design.

A detailed discussion of the rural poor of Somalia is found in the 1978 Somalia CDSS. Essentially, the paper lumps the entire population of Somalia into the category labelled "the poorest of the poor" based on a number of criteria. These include an estimated per capita income of $80; a Physical Quality of Life Index of 19 (out of 100), and an estimate that 85 percent of Somalia's 3.2 million people gain their living through subsistence agriculture or pastoral pursuits. Somalia is included on the UN register as one of the 29 least-developed countries. It is also, to its advantage, one of the minority of African nations whose people share a common language, religion, culture, and history. Additionally, it is a country with a pastoralist tradition whose people are typically characterized as resourceful, proud, pragmatic, and democratic. (See, e.g., Lewis, 1961).

I. SEDENTARY AGRICULTURE IN SOMALIA

A. Traditional Values

Although the Somali are thought first and foremost as postoralists, their adaptiveness and pragmatism has long been exemplified in involvement with agriculture and crop production. A close look at the historical record shows Somali people farming in settlements, particularly in the southern part of the country between and near the banks of the Juba and Shebelli Rivers since 1000 A.D. Throughout this peirod to the present, however, sedentary agriculture has held a special position in the lifeways and values of the bulk of the Somali. As it is important to the success of present sedentary agriculture efforts to understand this position, it shall be briefly discussed below.

Perhaps the most crucial characteristic of sedentary farming to the traditional Somali is its lack of prestige. While members of traditional specialist occupational groups (e.g., leatherworking, metal working) may have been held in lower esteem than "diggers of the soil", dirt-farmers were clearly inferior people to the pastoral Somali. Much actual farming in the inter-riverine area in precolonial times, in fact, was carried out by slaves of likely negroid origin, who are believed to be the indigenous people of the south. Others who farmed along the river banks and between the rivers were serfs (boon) or clients of people belonging to Somali Clans. However, even the two

Somali Clans most prominently associated with sedentary agriculture in south Somalia (Digil and Rahanwin) were considered less pure and of lower station than their more northern noble (gob) brethern. Of the two distinct Somali groupings (Samaale and Saab), they were the Saab, the less pure, lower status group known for allowing assimilation of non-Somali (e.g., local farmers) into their lineages as well as for undertaking degrading agricultural activities.

Among the northern Samaale groups, then, the typical pattern was involvement in farming (either on a semi-nomadic or sedentary basis) only when necessary due to extreme environmental conditions or under exceptionally favorable conditions, i.e., when others could be found to do the actual farm labor required/ or high monetary returns. The first shifting pattern has been documented among the Northern Somali for generations. The second pattern was evidenced in the late 1900's when slavery was abolished. At this time, numbers of the Hawiya Somali, losing their slave labor, reverted to pastoralism. Among the Southern Somali, use of non-Somali or inferior Somali castes was preferred for farm labor, but where absent, the Somalis themselves became farmers. The distaste for farmwork, was matched by a distaste for other manual work including house building. For example, the Rahanwin Somali who adopted the conical huts (mundul) of the indigenous riverbank population typically had local serfs do the construction.

B. Farmers in the South

The social structure of the Somali and mixed indigenous sedentary groups in Southern Somalia have several characteristics which distinguish them from the Northern pastoral Somalis. Consideration of these characteristics, too, are important in an attempt to promote sedentary agriculture and establish viable agricultural settlements for the refugees from the drought of 1974-75 as well as for more traditional farming peoples. An understanding of the manner in which the Southern society has developed can be instructive particularly given a serious lack of information concerning contemporary trends over the present decade.

Clearly in part due to the requirements of sedentary agriculture, the Southern Somali settlements can be characterized as having the following: "the formation of large, stable, politico-legal groups ...., the associated development of a hierarchical, though far from strongly centralized authority system; and the widespread adoption of foreign clients in group formation" (Lewis, 1969:59). An additional characteristic whose existence should be carefully considered by those involved in the present settlements is the desire for land ownership among the farmers. This need can be seen, for example, as early as the 1920's, when Italian colonialists had difficulties recruiting local labor for their plantations along the rivers in the South. "The potential labor market (at that time) was composed

largely of the sedentary peoples who had formerly been slaves or clients of the dominant Somali. These people, however, preferred work on their own lands to salaried labor, whereas the pastoralists, more interested in cash, were uninterested in agriculture". (Area Handbook 1977:25).

C. Current Extent of Farming

According to recent estimates, approximately 20 percent of Somali's population is involved in sedentary agriculture. Another 20 percent is involved in semi-nomadic agriculture (herding and some farming), and 40 percent are thought to be fully nomadic pastoralists. The remaining fraction are estimated to be involved in the urban sector and/or in activities related to the agriculture sector.

II. THE SETTLEMENT

The background to the present situation in Kurtunwaare is briefly reviewed in Lewis (1978)., which accompanies this report. Several points in his paper merit mention and/or amplification here. First, there is a highly organized, somewhat rigid hierarchical system of leaders and sub-leaders in the settlement, which operates to maintain a stream of information for administrative decision-making and provides for a system of control down to the family level. The system includes a women's organization with representatives in each Beel. Second, the pastoralists in the settlement are typically a pragmatic people who are far less likely to be susceptable to "culture molding" (e.g., into settled farmers) than they are likely to respond to incentives and disincentives in their immediate environment. Third, women and children are very much in evidence in the settlement, and are likely to remain so.

The recent data collected by the settlement leadership provides a clear indication of the extent of the organization of the administrative system. It also reinforces the view that men are seeking work elsewhere, as their representation in the camp is apparently declining. The trend towards fewer men in the camp, which is another point made by Lewis which is closely related to those made above, Table One presents the population profile of the settlement as of 9-8-78. It could be predicted that in a changing environment, the men in the age group from 30-45 would be those most likely to find the new life unacceptable. However, it does appear that men below the age of 30 and particularly below 25 are staying in the village and adapting to the new environment despite the present difficult living conditions.

KURTUNWAARE SETTLEMENT POPULATION (9-8-78)

	AGE														
	0 - 5		6 - 14		15 - 30		31 - 45		46 - 60		61+		Total		
BELL	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female	Total
K01AAD	101	99	360	22[illegible]	191	198	102	182	54	33			808	742	1550
K02AAD	93	90	363	190	176	176	68	148	43	69	46		747	679	1426
K03AAD	100	88	293	218	189	154	77	222	45	38			704	720	1424
K04AAD	88	66	269	217	126	168	37	107	18	35			538	593	1131
K05AAD	74	77	294	234	144	189	51	167	33	36	28	16	624	719	1343
K06AAD	95	95	296	286	167	210	83	176	13	15	8	5	661	887	1548
K07AAD	114	113	164	284	183	210	101	216	64	26	4		730	799	1529
K08AAD	118	105	311	227	185	167	74	149	31	45	5	15	721	708	1429
K09AAD	179	175	217	213	154	233	99	162	58	15	17	26	724	960	1684
K10AAD	95	114	266	256	195	233	56	130	27	32	2	5	641	770	1411
K11AAD	119	122	310	247	136	150	54	203	47	33	4	2	679	757	1436
K12AAD	84	117	251	179	174	142	46	103	30	78	12	32	597	650	1247
K13AAD	72	53	192	136	101	138	43	72	15	15	2	2	425	416	841
TOTAL	1329	1314	3686	2866	2121	2568	890	2037	478	506	86	109	8590	9400	17990

An inspection of the Table will show that while there are nearly as many males as females in the settlement overall, the percentage of men of ages 31 - 45 is considerably less; about two-thirds of this age group are women. In addition, the trend over time confirms this view, as men leave the settlement to return to a nomadic existence in the north, look for positions in the towns, in the country or outside the country (e.g., the Arabian Gulf). The reduction of men however, has apparently not significantly reduced the birth rate, which is currently an estimated 2.3 percent. There are in fact several factors promoting a rapid increase in the infant population, including reduction in infant mortality on the settlement due to births in maternity, the maternal child care program, and the feeding program. Additionally, women who have children under age two are released from the settlement works hence for those who can afford it, an infant frees them from the seven day-a-week farm work typically carried out by women.

A final general point to be made about the settlement is the intense interest in education expressed by children of both sexes. As of the end of the 1977-78 school year, some 8,218 students were enrolled in the first four years of primary school (year 5 will be introduced this next school year). There were close to 200 teachers and staff running the three existing schools, with more scheduled for the next year. For the students, and their parents, a school

education is seen, as elsewhere, as a ticket to a salaried job in the future. The typical response to questions asking about career plans after school was "a job in the government". According to expressed settlement plans, of course, a salaried government job is not what is projected for the Kurtunwaare school leavers. It is they, on the contrary, who are targeted as the future builders, machine operators, farm laborers, and craftsmen of the settlement.

III. THE PROJECT IN SOCIAL PERSPECTIVE

A. Beneficiaries

The prime beneficiaries of the project will be the variety of people (mainly resettled northern nomads) living in one of the existing 13 Beel units which will be selected for relocation to the first 400 housing units. The Beel will be selected by the settlement administration from among those Beels currently residing in the core area of the main village. Relocation of the Beel to a satellite village will free up needed space for development of the core urban area.

Other beneficiaries of the project will be the skilled workers who will be hired by the Settlement Development Agency at competitive wages to work on the building and training program. Those trained in building construction will be direct beneficiaries as well. Assuming a useful, replicable, appropriate house type and master plan is developed under the project, the entire settlement population should be eventual beneficiaries of the project.

Outside the perimeter of the settlement, a number of local residents living in the indigenous villages will also continue to benefit from settlement activities such as building and construction, as they will have an expanded market for sale of household commodities such as

kerosene, lamps, simple furniture, etc. Particularly in the indigenous village close to the present settlement core (called Nasib or "Lucky" village due to its opportune location for trade) trade opportunities denied residents of the settlement should expand during the implementation of the housing scheme.

Those not benefiting from the housing scheme and the reorganization dictated by the project master plan will be the sedentary farmers living in the several nearby villages (comprising approximately 60 families each) who must move off the settlement land. The members of these villages (who have lived at their present location for less than a decade - in two villages) have been given the option to join the settlement or move elsewhere. At least one village has elected to move elsewhere. Reasons given for the choice included the fact that livestock cannot be kept in the settlement, the present farm wages (starting from 2 shillings daily) are too low, and that their potential laborer team-mates - the nomads - are not efficient workers.

Role of Women and Children

The striking improvements in house type, compound arrangement, water availability, sanitary facilities, and easier access to rainfed and irrigated fields, to firewood in the nearby bush and kitchen garden plots on the compound should clearly outweigh the inconveniences. The move to the improved housing should bring significant savings in time and labor to the women, who as the prime laborers in the fields, as well as mothers, wives, cooks, etc., in the family, have the heaviest workload of any member of the family.

For the families who move 2 km away from the core village to the improved housing in the satellite village, there will be some inconveniences. These include longer commuting distances initially for youth to the intermediate school in the core village, as well as to the other services available only at the main settlement. Women, too, will have to travel further for access to shops, major medical services, and for socialization with friends not resettled in the satellite area. These inconveniences should be felt most strongly in the early phase of construction and settlement, when there will only be a small population in the satellite village and few social and other services.

Socio-Cultural Feasibility - General

One of the most difficult challenges the project team faces is developing an improved house, compound and neighborhood arrangement and master plan which is socio-culturally feasible. There are a whole range of problems and issues associated with socio-cultural feasibility - some of which have been referred to in the introductory section, and in Lewis's analysis; those and others will be addressed in greater detail here. Before discussing specific issues, however, the means by which the project has dealt with and proposes to deal with outstanding issues will be outlined.

At the outset, it should be emphasized that the project team recognizes the socio-cultural complexities associated with a number of the project activities, as well as with a number of activities which fall

under the scope of the overall settlement program. Falling under the general rubric of the program, for example, are questions related to the socio-cultural feasibility of persuading nomads to become farmers, of providing primary education for their sons and daughters with the expectation that many will remain in the settlement to work in agricultural and related jobs, of restricting individual entreprenerial activities within the settlements, of the timing of the planned shift from state ownership of the land and produce taken from it to collective and ultimately private ownership, etc. Obviously, these are questions which have been, and are being addressed by the Settlement Development Agency and related institutions, and as such, lie largely outside the domain of the project. It is certain, given government commitment and the lack of employment alternatives elsewhere, that there will always be sufficient laborers for the Settlement.

What is important to appreciate, in this wider context, is the government's immense commitment in resources and personnel to the relocation of a successful, self-sustaining socio-culturally feasible settlement/farming program; its proven track record to date particularly in relation to the relatively rational, humanitarian manner it has dealt with the difficulties caused by the drought; the strongly pragmatic orientation of the Somali people themselves; and the unavoidable reality that in Somalia today, there are relatively few viable, productive alternatives to settlement agriculture open to the government and to a significant proportion of rural poor Somali families.

What is also important to appreciate is the relative newness of the proposed set of activities both within the context of the settlement of nomads, and to a certain extent within the context of the government. The project, while essentially a research and development activity, does have as an outcome the establishment of a training and construction program, construction of 400 locally appropriate, easily replicable houses, and the development of a settlement master plan. To accomplish these, A.I.D. technicians and counterparts must work in a domain of Somali life for which there is relatively little prior on-the-ground experience. The settlements are new, the occupants are new and from a different environmental and occupational background. To be effective, project staff must rely extensively on experience gained on site. This requires time, patience, and a certain amount of trial and error in an environment both in the settlement and in the government (including SDA), which is obviously looking forward to concrete results at the earliest possible time.

Just as it is important to utilize a research and development "successive approximation" approach, described in the Technical Analysis, to the fullest, so also is it important to make certain the SDA staff and other persons responsible for selecting and/or approving the emergency house prototypes and final designs remain committed to the usefulness of the preimplementation findings and of the step-by-step nature of the implementation period itself.

Although initially wary, SDA leadership's commitment to a gradual process approach has steadily increased through interaction with the A.I.D. design team and by reviewing results to date. In the final analysis the only reasonable means to maximize socio-cultural feasibility - and the potential for replication and spread -

will be through an ongoing process of monitoring and feedback of the families' adjustment to their home neighborhood and village center. By phasing constructing, occupancy and evaluation during pre-implimentation and implementation of the project- that is from prototype units to a unit of ten houses to a unit of 50 —relevant knowledge will be gained quickly and maximum socio-cultural feasibility will progressively be achieved.

D. The Spread Effect

Like socio-cultural feasibility, the spread effect depends to a great extent on the degree to which the ongoing research and development element of the project 1) identifies appropriate, locally available and/or cheap resources and skills to ensure widespread replicability, 2) develops a suitable construction and training program which provides sufficient incentives and guidance to lead to self-sufficiency, 3) generates the necessary information which will not only satisfy the demands of socio-cultural, technical, and economic feasibility, but will also maximize the likelihood that the most appropriate models will be selected , among the alternatives developed, by the government committee which is charged with this crucial responsibility.

The potential certainly exists for this project to have a significant spread effect since the technologies are minimal and the knowledge imparted great. The extent of this spread effect is impossible to predict at this time.

IV. OUTSTANDING ISSUES

The specific issues to be addressed in the pre-implementation phase described in the Technical Analysis section of the paper primarily relate to improvements and refinements in the prototype house and compound arrangement which has been developed to date. Those issues include precise placement of kitchen in relation to house, type of ventilation as a tradeoff to insect (mainly mosquito) control, placement and number of doors and presence or absence of interior separating walls, and optimum orientation of house units in relation to wind flow and sunlight.

. While the likely resolution of each of these alternatives has been identified, only time, monitoring, and where feasible additional investigation in other settlements over the seasonal periods can satisfactorily provide the data necessary to reach a high degree of confidence in the settlement environment. It should also be re-emphasized that only through a process of successive approximation and actual experience can the best mix of alternatives be determined. It is for this reason that there has been no arbitrary limit placed on the testing process, but, rather as detailed in the Technical Analysis, each step in the project development, pre-implementation and implementation phase (e.g., 50 house unit, then 350 house construction) is seen as an opportunity for evaluation of socio-cultural and other "fit".

Another set of issues which will not be able to be resolved fully until actual occupancy in the neighborhood context is the speed and efficiency

with which families will learn to utilize and/or maintain the housing unit, the toilet/privy, the immediate grounds within the compound and around it (e.g., protection of trees, garden plot), and the water standpipe. While some information concerning family behavior should be generated during the pre-implementation prototype testing phase of the project, only time and experience within the neighborhood context will reveal persistent problems.

One important factor in ensuring maintenance of the house and compound by the occupants, of course, is the development of a healthy, comfortable environment which occupants will want to maintain. This is especially important as occupants will not initially own their house. The process for establishing this environment was begun at the Settlement through interviews and group meetings with individual occupants, Beel leaders, and representatives of the local women's association. It will continue in the form of consultations, testing and evaluation throughout the project.

Another important factor in ensuring maintenance and informed utilization of the privy, water standpipe, etc., is the inclusion of the four health workers, sanitarians, etc. within the Health program. These workers will receive training in a range of topics useful in promoting a smooth transition to the new community (e.g., environmental sanitation, hygiene, family welfare). They will work closely with the existing administrative structure, government technicians (health, agriculture, etc.), women's groups and the person selected from each group of 10 families (Kubin) responsible for health matters, to educate the families in new techniques such as privy use and maintenance, water use, etc. They will also serve the

function of community ombudsmen - communicating regularly with the administration, the project staff, as well as the house occupants. In this way potential problems regarding house and drainage system maintenance, proper waste disposal, intra-neighborhood disputes, etc., can be identified and resolved at an early stage.

A final issue which can only be resolved in the course of project pre-implementation and implementation is the degree to which house construction and other related activities will be carried out on a labor intensive basis by individuals in the settlement. At this point, according to the population profile included above and other data, there is apparently more than ample unskilled labor to meet the agricultural and related requirements of the settlement. Although a slight decline in the total population of the settlement, and the adult male population is possible in the future, the decline will not be likely to significantly change the existing relative surplus of labor.

Obviously a certain percentage of the surplus labor could, and will be, utilized in the building project. For example, considerable unskilled labor -- men, women and children -- will be utilized to locate and transport local materials (e.g., wattle, dirt, bricks) to the housing sites. Men will be needed for the relatively demanding task of operating the Cinva-ram; men, women or children will be needed to drive the donkey carts. The extent to which labor can be utilized, and for what tasks, however, has not been completely established. At the outset, the number, type, and sex composition of the laborers for the construction work will

be scaled down, to ensure proper supervision. Over time, however, it is likely that the need for and usefulness of increased numbers of unskilled laborers for a range of project-related activities should be demonstrated, and that consequently, the SDA will release additional settlement workers for the project. In this project component, as in the components discussed above, additional experience on the site should greatly increase the likelihood that the overall project approach will be replicable on a large scale, at least in the existing agricultural settlements administered by the SDA.

BIBLIOGRAPHY FOR SOCIAL ANALYSIS OF KURTUNWAARE SETTLEMENT PROJECT

Kaplan, Irving, et al. 1977. Area Handbook for Somalia. Washington, D.C.: Foreign Area Studies, American Univeristy.

Lewis, I. M. 1961. A Pastoral Democracy. London: Oxford University Press.

_____. 1969. "From Nomadism to Cultivation" in M. Douglas and P. Kabery (eds.) Man in Africa. London: Tavistock Publications.

_____. 1978. Kurtunwaare Settlement Programme. Social Soundness. (Unpublished).

KURTUNWARRE SETTLEMENT PROGRAMME

SOCIAL SOUNDNESS

There is no inherent quality preventing nomads in general and Somali nomads in particular from adopting cultivation. The bulk of the present Inter-Riverine population between the Shebelli and Juba rivers is actually of nomadic origin. Over a period of centuries northern nomads have moved south into this region, adopting in the process cultivation conbined with various degrees of pastoralism. The forces underlying this gradual change of economy, life-style and to some extent culture, are not fully known but probably include acute ecological pressures in the north. More recently, over the past one hundred years, Somali nomads in the north-west of the S.D.R. have turned to cultivation combined with livestock herding. Here the immediate model, providing the so-called 'demonstration effect' is that of the neighboring Somali and Oromo-speaking peoples (known as 'Qoti') of the Harar-Jiggiga area. In contrast to the dry-farming regions of southern Somalia where a hand-hoe is traditionally employed to till the soil, here cultivation is by ox-drawn plough. More recently, in an innovation apparently prompted by an outbreak of rinderpest, people have taken to also using burden camels for this purpose. On larger holdings, tractors are now also employed for this purpose.

These developments, the first gradual and long-drawn-out, the second more recent and less protracted indicate the nomad's potential to adapt to new circumstances and new pressures by adopting cultivation. It is a mistake, however, to assume that such changes are necessary or irreversible. And the involvement of ex-nomads in cultivation at the settlement centre of Kurtunwarre (and elsewhere in the SDR) needs to be set in context.

During the severe drought of 1974/75, starving nomads who had lost most of their livestock were transported (mainly by air) into this area from their traditional grazing lands in the Nugal region of northern Somalia. In these circumstances they quite readily accepted a disciplined regime in which, in return for their labor, they were provided by the Government of the S.D.R. with shelter, rations, medical care, schooling and other benefits. This was clearly an extremely humane and efficient relief program.

Once settled at Kurtunwarre, a rational, if somewhat artificial, social organization was established by the project's directors. The aim was the laudable one of minimising, indeed destroying, traditional clan loyalties and replacing these by a strong sense of undifferentiated patriotism. On this basis the total population (officially 23,000 in 1978) was divided into 13 divisions called BEEL, each led by a spokesman with the traditional title of BEELDAAMIYE. Each BEEL consisted of 400 families (HOYS) and was in turn divided into two units of 200 families called BULSHO under the leadership of a [illegible]. The latter in turn consisted of two units (each 100 families strong) called BIRIGTA, led by a [illegible]. These divided into two further sub-divisions (each 50 families strong), called UDUD, headed by leaders called [illegible]. The smallest unit in this organization was finally the [illegible], led by a person styled [illegible] and consisting of 10 families.

Each unit is in principle run by a committee with delegates running up the scale to the final management committee comprising 13 representatives of the 13 BEEL, the local police chief, education and health

officers, economist (registrar), public work's official and development officer. This committee is headed by the local chairman (an official of the Ministry of Local Government and Rural Development), the local SDR government party secretary and the farm manager (a Ministry of Agriculture official).

The emphasis in management and decision-making throughout is on grass roots concensus and consultation. It is fairly clear, however, that effective direction comes from the top (rather than vice versa) and that the enterprise is at present run essentially as a state farm employing a large labor force. Workers receive food, clothing, social services and a monetary payment related to their skills and performance. Physically, in terms of land under cultivation and farming activity, Kurtunwarre can hardly fail to impress the visitor, all the more so when its original character as a relief settlement is recalled. The marked predominance of children and women is also striking. This in part reflects a tendency on the part of adult men to drift back into nomadism in their home areas as grazing conditions improve there. Other men have also left to find lucrative employment abroad in the Gulf States and neighbouring countries. The pattern of manpower seepage seems to take the following form. Men save part of their rations and money to send to relatives in their home areas, requesting them to invest in livestock on their behalf. When they feel they have accumulated the makings of a herd and conditions in their traditional grazing grounds are reported to be favorable they slip away from the settlement, leaving a wife and children behind. Educational opportunities for children are highly valued by the nomads. Some part of the

'settled' nomad's commitment to Kurtunwarre appears to depend upon its provision of schooling for his children. Nomadic attitudes are flexible and opportunistic and whether or not this indirect attachment via wife and children dwindles further will depend in part on climatic conditions and herding fortunes in the Nugal pastures.

Other factors which encourage a return to the traditional nomadic economy are the nomad's independence and freedom and his distaste for authority and regementation. The high value placed on a fresh milk diet with meat at regular intervals has a similar influence.

It is thus probably unrealistic to envisage the present members (and ex-members) of Kurtunwarre as former nomads who can be trained to become settled farmers. This is not simply a matter of cultural molding or remolding (as most development models and theories naturally assume). It is much more a matter of incentives and disincentives.

Even if, however, much of its original population were to drift away, Kurtunwarre could, under appropriate conditions and management, still provide a home for a considerable work force and make a valuable contribution to the state's economy. Its present managers appear to envisage that in future years cultivation will be increasingly mechanized, requiring less labor intensive methods of agriculture. A run-down of the present labor force might also be offset by recruiting new members from those cultivators from the Hargar-Jijiga area and Hale who are currently flooding into Somali refugee camps from Ethiopia. Ethiopian prisoners might also provide another potential work force accustomed to sedentary agriculture.

If there are th uncertainties about the future population of the settlement there ar also a variety of alternatives to be considered. This suggests a cau ous approach in providing housing and emphasizes the undesirability of in lging in costly types of buildings. At present, the population is mainl housed in thatched round dwellings (MUNDILLE) of the type common in the ter-riverine area of southern Somalia but only occa- sionly encountered the north of the c untry. An up-graded version of this house style co d be developed similar to that used so successfully in the S.D.R. gover ent WAMO hotel at Kismayo. Another possibility would be to build rectang ar mud-and-wattle arishes of the kind generally found in northern Somali astal settlements. A stronger and slightly more ex- pensive structure w ld be the BARAKO. This style, common in Mogadiscio, has a metre high st e wall topped with wooden supports and an iron roof. It would, presumabl; be possible to experiment with replacing the stone by a brick wall, us g bricks produced in the local kiln at Kurtunwarre.

These are all m est low-cost dwellings which are part of the tradi- tional local cultur They are light and so would not entail the subsi- dence problems asso ated with buildings of heavier structure on the local clay foundations. y could easily be provided with improved facilities, i.e., water and lav ories. In this respect, note might be taken of the slum clearance prog t so successfully implemented in Hargeisa when Colonel Bille Duffle was r lonal governor there in 1953. All these structures could be made almos exclusively by using local labor.

In suggesting t se non-exotic house designs it is assumed, of course, that each family wo l be allotted a separate house and compound, allowing room for some extan in and reconstruction according to changes in domestic

membership and organization. It is also assumed that any savings in building costs would be employed to finance the provision of what elsewhere could be regarded as 'essential services'.

I. M. Lewis
Professor of Anthropology
23-3-1978

Annex 10

AGRICULTURE DESCRIPTION

KURTUNWAARE PROJECT

Agricultural Development Assessment:

While 18,000 hectares of agricultural lands have been assigned to the Kurtunwaare Project by the G.S.D.R. only 6000 hectares will be incorporated for crops over the next three years. Three thousand hectares will be developed for irrigated agriculture using Arab League Funds and three thousand hectares are to be developed for rainfed agriculture utilizing World Bank Funds. Presently only 800 hectares of the irrigated portion have been cultivated and none of the rainfed area. The SDA is supervising the project and technical assistance is being supplied by the Egyptians.

The long range project plans appear to be well thought out and experienced Somalian technicians are directing the program. Presently the seed bed preparation is completely mechanized, but subsequent cultural practices such as weeding, harvesting, etc are carried out by hand using labor from Kurtunwaare.

The farmland at this time is being cultivated collectively but it is planned that soon the irrigated portion will be divided into 300 hectare plots for100 families. Each family will receive 3 hectares which they will tend individually and reap benefits accordingly. Tha rainfed area will be divided into 600 hectares blocks with each family receiving 6 hectares. The scheme incorporates collective supervision, technical assistance, provision for agricultural inputs and marketing but still allows for individual incentives. Seems like the best of both Worlds.

Selected crops being planted on irrigated areas include a wide variety of vegetables, fruits, cotton, rice, maize and sesame. Rainfed areas will be planted to surghum and pulses. This gives the project a great opportunity for diversification.

Conceptually the project has great potential. The only possible deterrent would be mismanagement.

Annex 11

KURTUNWAARE HOUSING PROJECT

HEALTH ASSESSMENT AND TITLE I PROPOSAL

Kurtunwaare is a nomadic settlement villages with a population of 18-20,000 and about 80% of the population are women and children. There is a limited amount of low grade housing that are overcrowded, and living conditions are very unsatisfactory. The villages are heavily infested with flies, mosquitoes and rats. Environmental sanitation is non existent.

The most common diseases are malaria, schistosomiasis, Respiratory infections, Gastro-enterities, Infant diarrhoea, malnutrition, measles etc. These health problems in Kurtunwaare are due to preventable diseases, for the most part, and require an approach that stresses preventive measures such as personal hygiene, sanitation, nutrition, vector control and health education. There is a definite need for health services for the villages, many cases that are now being treated at the hospitals, could be handled by a health center and health posts that will provide first aid and simple medical treatment.

The existing hospital with a capacity of 140 beds is in a poor condition. The building is delapidated, about half of it is out of service because of broken walls and windows. The facility is poorly equipped and way below minimum standards. There are seven dispensaries in very poor condition; there is no running water or toilet facilities. The villages are in poor sanitary conditions.

The hospital and dispensaries have their drug supply from ASPIMA (the national drugs supply agency).

The staffing pattern of the health facilities are as follows:

1 General practitioner (MD)

2 Medical assistants

1 Laboratory technician (Malaria, tech.)

80 Community health workers (CHW's) and Traditional Birth Attendants (TBAS)

RECOMMENDATIONS:

1. Provide adequate water supply system for the villages and sanitary facilities. This will be a part of the housing project.
2. It highly recommended that a health center be constructed and fully equipped to provide services for the population of the villages that is mostly women and children, It will provide MCH/Nutrition services and health education activities in personal hygiene, nutrition and environmental sanitation.
3. Construct four health posts that will serve as first aid station and provide referrals for health center. The health posts will be staffed with CHW's and TBA's who will be retrained to upgrade their skills in providing primary health care services for the Satellite Villages.
4. MOH should provide the health center with two public health nurse-wifes and a sanitarian who will be responsible for supervision

technical quidance and management of the CHW's and TBAs at the health post.

5. The Medical Officer in charge of the Resettlement Development Agency's camps will coordinate, supervise and provide logistical support for the physician in charge of the Resettlement camps. These physicians will supervise and provide technical guidance to the Public Nurses and sanitarian at the Health center level.
6. Inse vice training for the existing staff will be conducted on a regular basis by the MOH.
7. USAID/Somalia has developed a Primary Health Care Program using Title I Funds for construction, Ministry of health providing the personnel and UNICEF providing the drugs and equipment for the health center and posts.

BUDGET FOR PROPOSED KURTUNWAARE

PRIMARY HEALTH CARE SERVICES

(Shillings)

ITEM	GSDR	UNICEF	TITLE 1	TOTAL
PERSONNEL				
Public Health Nurse-Midwife Salary for two years	30,000	--	--	30,000
Sanitarian, Salary for two years	15,000	--	--	15,000
Equipment, Drugs and Supplies for Health Center for two years	--	6,000	--	6,000
Four Health Posts for two years	--	8,000	--	8,000
Construction of Health Center Using local materials and funds	--	--	186,000	186,000
Construction of four Health Posts for each village	--	--	372,000	372,000
TOTAL	45,000	14,000	558,000	617,000

GOVERNMENT BUDGET FOR
SETTLEMENT DEVELOPMENT AGENCY

SETTLEMENT PROGRAM BUDGETS

1977 Actual

REVENUE

Foreign Grant	67,530,780
Sale of Products	8,128,500
Government Con't	91,964,540
	167,623,820

EXPENSES

Recurrent costs	114,272,691
Capital Investment	7,070,000
Project Support	45,681,129
	167,623,820

Sources of Food AID - (1977)

European Economic Community -	30,651,258
Canada	9,060,211
WFP	10,151,913
Italy	306,540
Holland	2,679,248
Germany	2,070,315
	54,919,485

1978 ESTIMATED

REVENUE

Foreign AID	135,000,000
Sale of Products	6,000,000
Government Contribution	26,054,093
	167,054,093

EXPENSES

Recurrent costs	126,743,004
CAPITAL Investment	7,100,000
Project support	33,490,089
	167,054,093

TOTALS of GSDR Expenditures
1977 - 78

Ordinary Budget	133,564,004

PROJECTS

Irrigated Farming	16,198,684
Rainfed Farming	14,701,405
Animals and Poultry	2,590,000
	33,490,089

TOTAL GSDR Expenditures 167,054,093

Other Donor Projects Supporting

Kurtumwaare

1. Federal Republic of Germany
   Grant
   25 trucks
   35 tractors
   2 mobile workshops

   Loan
   5 million DM general support

2. UNESCO
   Clothes
   books

3. European Economic Community and World Food Program
   Food Aid

4. IDA
   8,000,000 UA loan - Agricultural Development

5. ARAB Fund
   6,400,000 Kuwait Dinars - Agricultural Development