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BASIC URBANIZATION IN AFRICA - A DISCUSSION OF COSTS AND STANDARDS[1/]

by

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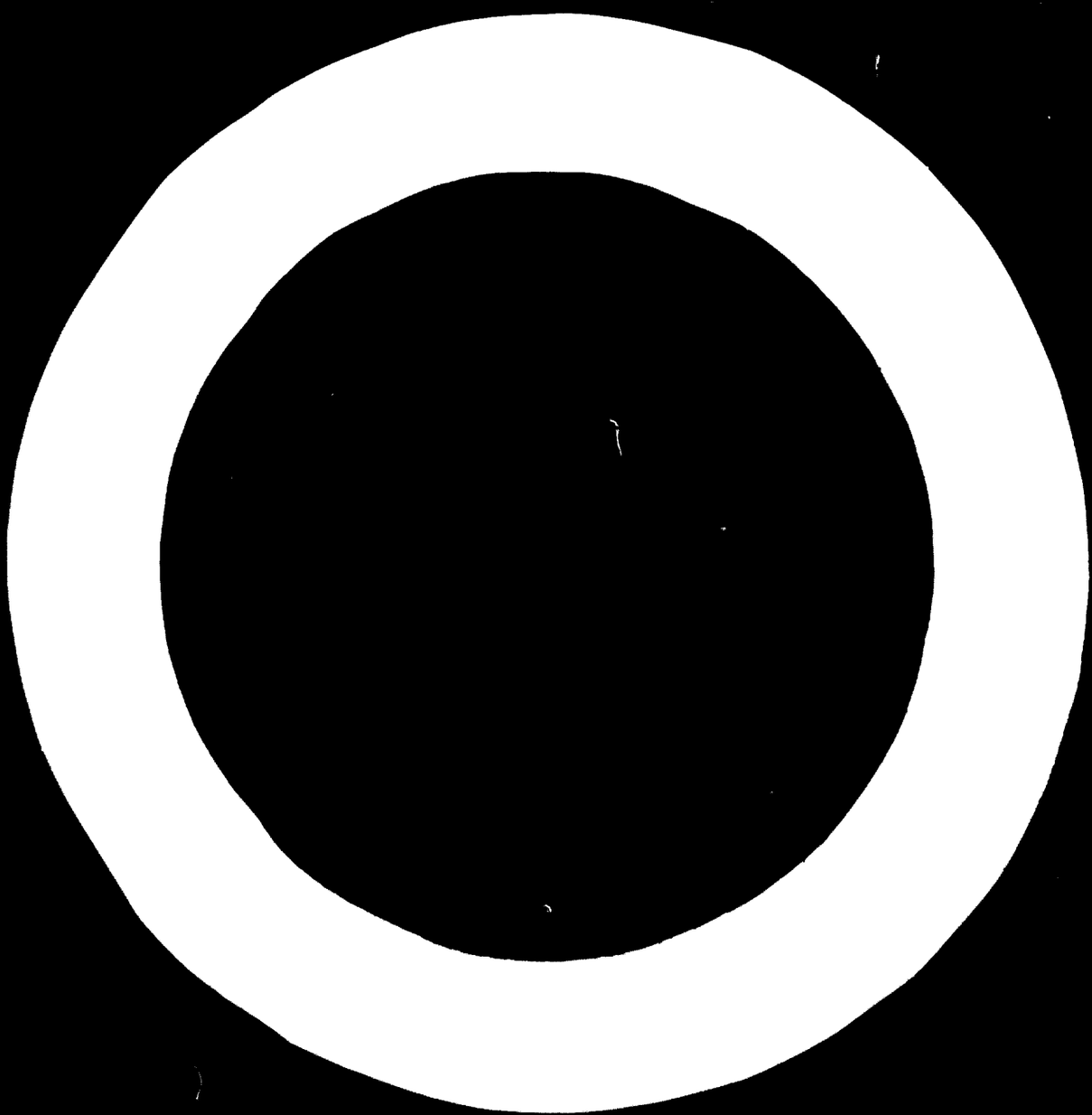

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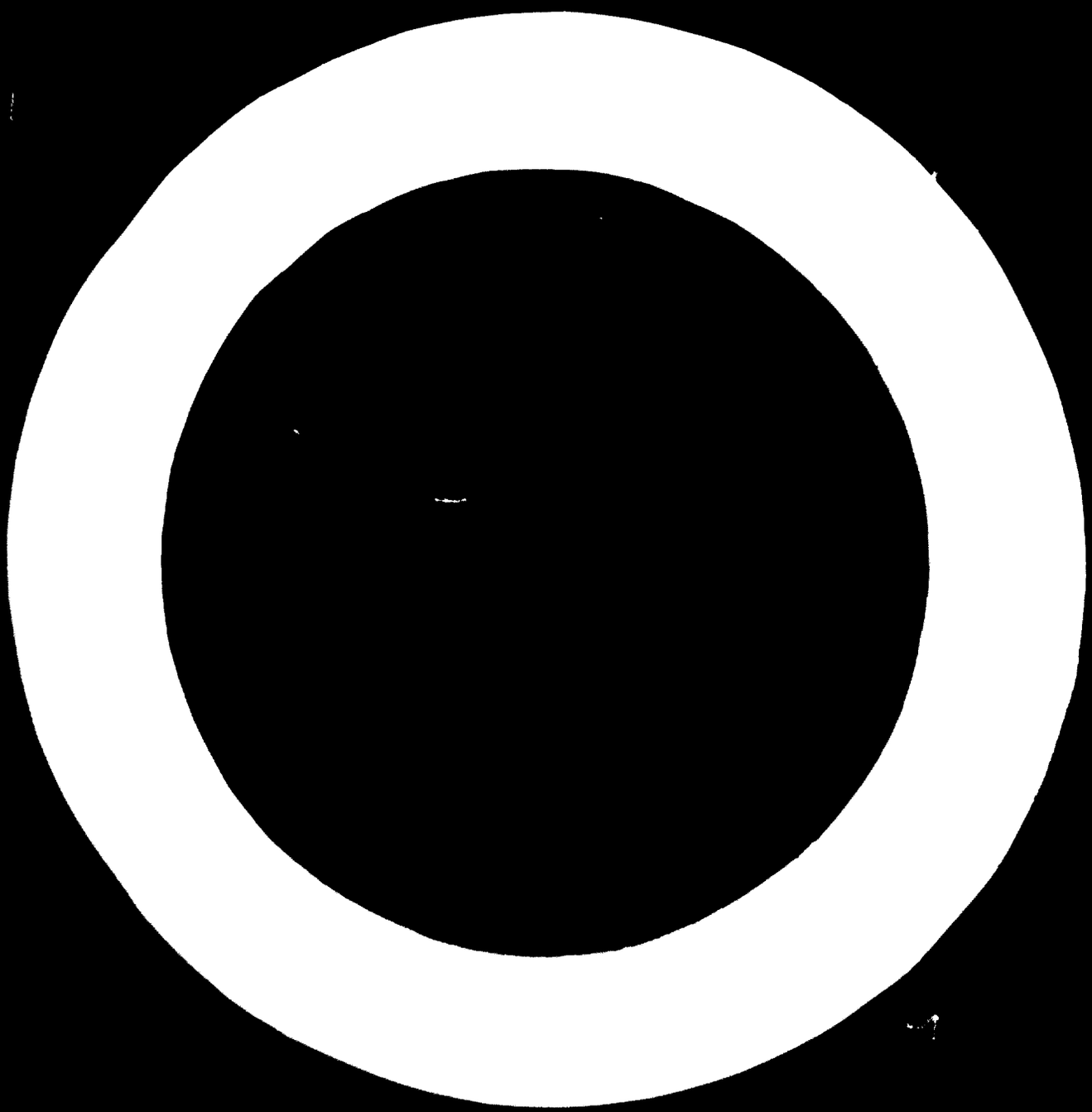

INTRODUCTION

The ever accelerating urbanization process is now posing one of the major economic and social problems in developing and developed nations alike[1)]. Against this background we have been asked by UNIDO to prepare a paper on "Traditional houses - simple improvements".

terms of reference

The suggested topic immediately raises some questions: What is a "traditional" house in Africa today? Which are the problems (within the scope of this seminar) posed by rapid urbanization? To what extent can "simple improvements" of traditional houses contribute to solving the problems? These are the main questions discussed in this paper. The scope is limited to housing for low income groups in urban areas.

scope

conclusion

Our conclusion is that the role of traditional housing in urban development is limited. The main problem is not posed by the house itself but rather by its pre-requisites: the basic utilities water supply, waste disposal, surface drainage and access lanes.

DEFINITIONS AND GENERAL DISCUSSION OF TERMS

A report published by UN some years ago[2)] contains a useful discussion of the terms "development", "values", "needs", "standards", "goals", "targets", "priorities", "plans" and "programmes" (see Appendix A). The same report divides "community facilities" into three classes:

utilities

(1) Utilities: water supply, waste disposal, surface drainage, electricity supply and access lanes or streets;

general public facilities

(2) General public facilities: schools, clinics, social service, fire protection, parks and playgrounds, transport etc;

commercial facilities

(3) Commercial facilities: markets, stores, repair shops etc.

technical infrastructure

This paper is confined to community facilities of the first class: utilities - also referred to as "technical infrastructure".

basic house

basic utilities

basic urbanization

The very common but rather misleading and often misused term "low cost housing" is not used in this paper. We prefer the more specific terms "basic house", "basic utilities" and "basic urbanization". The term "basic" means satisfying minimum health requirements. A "basic house" is thus the cheapest possible dwelling satisfying minimum health requirements. Similarly "basic utilities" is the cheapest possible infrastructure satisfying minimum health requirements. "Basic urbanization" refers to a combination of basic houses and basic utilities plus, although outside the scope of this paper, general public facilities and commercial facilities.

The "minimum requirements" are likely to vary from one country to another as well as between rural and urban areas. They are influenced by

such factors as local customs, prevailing communicable diseases, climate, and population density.

In most countries houses are built, and human settlements are developed, simultaneously at different levels. Human settlements growing up within the context of local, mostly rural, established cultures are here called "traditional". This term can refer either to the dwelling unit, the utility-system or the total settlement. "Traditional" settlements can be either self-built, i.e. built by the non-specialised labour of the households themselves, or artisan-built, i.e. produced by specialized craftsmen. In Europe the rural, "traditional" building cultures gradually gave way to urban "modern" development. The "modern" building cultures are characterized amongst other things by factory produced materials and components, specialized building workers, and extensive utility systems[3]. Where "traditional" and "modern" cultures meet, as in the urban areas of Africa, Asia and Latin America, hybrid forms arise. Such buildings, utility-systems or settlements are referred to as "intermediate".

"traditional"

"modern"

"intermediate"

PRESENT SITUATION EXAMPLES

The general conclusions reached in this paper may apply to a great number of countries. The experiences upon which the analysis is based are, however, mainly from eastern Africa: Ethiopia and Tanzania. A few figures from the capitals of these two countries are given as a background to the analysis.

Addis Ababa

In 1961 Addis Ababa had 440 000 inhabitants. All except foreigners and the members of the upper classes lived in simple, and in many ways unsatisfactory, houses. About 90% of the houses had walls of mud and wattle, most had mud floor and metal roof without ceiling, many had a thatched roof. Only 1/3 of the households had access to piped water in the house, about one half had a pit-latrine while the other half had no arrangement for human waste disposal. Just over half the households had electricity[4]. Some of the main streets were paved and had street-lighting but most of the streets had neither.

Over the past ten years the annual population increase has been around 7% and the 1971 population is estimated at 867 000[5]. Over 100 000 dwellings must have been built between 1961 and 1971 but the building industry proper has only produced a few hundred houses and flats for the rich and less than a hundred "low cost" houses.

The city still has no sewage system, and most households still have to queue up for water at standpipes. Official estimates indicate that the population growth in the 70's will continue at the same rate as over the past ten years, reaching 1.6 million in 1980[5].

Dar es Salaam

The situation in Addis Ababa is not entirely unique but perhaps slightly worse than in most African cities. Dar es Salaam is probably a bit better off but there also the situation could

rapidly deteriorate. In 1948 the population of Dar es Salaam was about 70 000. In 1967 the population was 273 000 living in 35 000 dwelling units, out of which 10 000 were classified as "irregular"[6]. The standard of the dwellings is similar to that of Addis Ababa. In 1967 piped water in the dwelling was available to less than 1/3 of the households - most people had to buy their water from kiosks. Only a small section of the existing built-up area is served by a sewer system, which discharges untreated sewage into the sea near the entrance to the habour. Most households have simple pit-latrines. The 1971 population is likely to have reached 400 000, and the National Capital Master Plan suggests that by 1974 the figure will exceed 500 000, reaching 1 million by 1989. Only a small portion of the dwellings are produced by the building industry proper. The production of "low cost" houses over the past five years has been 1 000 - 1 500 units per year, most of them replacing other houses and thus not adding to the housing stock[7].

ANALYSIS

The "modern" sector of the building industry produces a very small amount of the total number of dwellings built every year in these two capitals, and the situation is the same in most of Africa. None the less people do get housed one way or the other and most dwellings are produced within the "traditional" or "intermediate" sectors.

Most pre-industrial societies have a building tradition based on self-help and mutual-aid. Dwellings are built by the householders themselves, often with the help of neighbours. The single dwelling unit or group of dwellings is self-contained and forms part of a balanced ecological system. Material for the house is available locally and can be collected without charge. No elaborate infrastructure is required. Each household or local community builds and maintains its own roads and water-wells and in a rural setting the disposal of excreta and refuse need not pose any serious problem.

During the initial stage of urbanization - while settlements are small and densities low - "traditional" houses and utility systems could also be used in urban areas. But not for long. The building material available is no longer free. What was a cheap and rational way of building within a subsistence economy may be neither cheap nor rational when material like straw, bamboo, wood, and stone has to be purchased or transported from far away[8]. With increasing densities the ecological balance is upset and some kind of communal arrangements become necessary for the basic utilities of water supply, waste disposal, surface drainage, electricity supply and access lanes.

In urban areas all over Africa a new building tradition is emerging: the "intermediate" settle-

ment. This is actually an urban adaptation of the rural building tradition. The "intermediate" house can be placed wherever one can build without purchasing land. The building materials come from the urban environment: old sacks, wooden boxes, tin cans, or whatever is available. Sometimes concrete blocks, doors, windows and roofing materials are purchased new, but for the most part waste material is used. The resulting structure has some of the characteristics of the "traditional" house: it is cheap, it is flexible and it can be put up by anyone. It is in fact a "basic house" as defined earlier. We may call this type of building "intermediate" as it contains elements of both "traditional" and "modern" cultures.

Unfortunately this new tradition does not solve the problem of basic utilities. In that respect it is as ill-adapted to an urban environment as "traditional" building cultures. In densely populated areas dwellings are no longer self-contained. The workable systems for water supply and waste disposal evolved by pre-industrial societies over the years do not work in urban areas. This is mainly due to the much higher population densities, but also to the breakdown of traditional organizational patterns.

Thus we have a situation where a large number of houses are built at costs most households can afford, but at unacceptably low public health standards. At the same time there is a limited production of houses of acceptable standards which cost far more than the great majority can afford. The situation is illustrated in the diagramme on the next page.

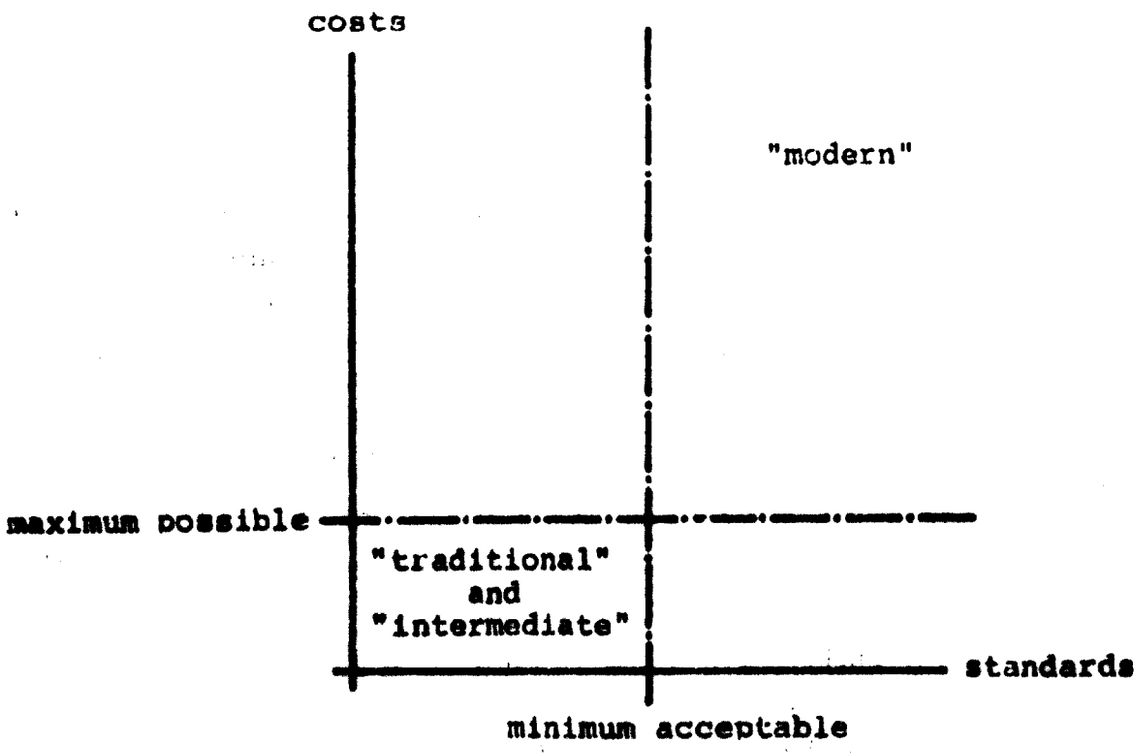

Fig 1: African urban settlements: relationship between costs, standards, and current modes of building.

For the purposes of the analysis the cost-variable can be broken down as follows:

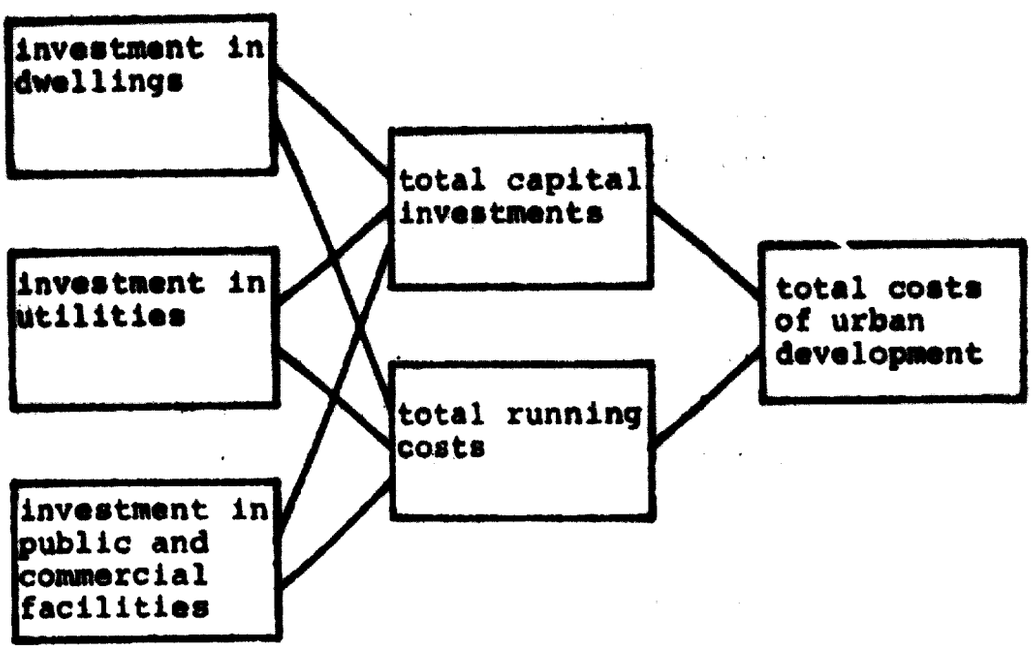

Fig 2: Break-down of total costs of urban development

The scope of this paper is limited to capital investments in dwellings and utilities.

The standard-variable can likewise be broken down into a number of constituent parts but in this paper, dealing with basic houses and basic utilities we shall limit the discussion to standards related to basic requirements of health: safe water supply, facilities for personal hygiene, and some means of waste disposal (excreta as well as refuse) that guarantee freedom from pollution.

The problem as illustrated in fig. 1 is that urban development within the cost limits set by available resources does not satisfy basic requirements of health, and conversely, "modern" development of acceptable standards is much too expensive. There are basically four ways of attacking this problem:

1) increase the resources e.g. by increasing the GNP or by allocating more money to the housing sector of the economy;

2) lower the standards e.g. by setting emergency standards or by temporarily letting two or more households occupy one dwelling;

3) lower the costs of "modern" development;

4) increase the standards of "traditional" and "intermediate" development.

A substantial improvement of the urban housing situation is not likely without action at all these levels. The message of this paper, however, is that concentration on approach No. 4 in the first instance is likely to be the most rewarding. That is to say, we should concentrate on the possibilities of increasing the standards

("simple improvements") of "traditional" and "intermediate" urban development.

So far research and development in the field of housing has been directed mainly towards the "superstructure", i.e. the building itself, its lay-out, materials and construction. Very little work has been done on the "infrastructure", i.e. the utility systems. For the dwelling unit present practices in Africa offer us a wide selection from the entirely self-built, "traditional" buildings, through the "intermediate" houses made up of waste material, to "modern" partially or completely prefabricated units. In addition there are numerous combinations of these three ways of building.

There is no corresponding choice of materials, components and technical solutions for the utility system. Here we are limited to either archaic "traditional" systems: wells and pit-latrines - or to "modern" systems: piped water supply, and sewage collection networks and treatment plants.

The "traditional" systems do not work at urban densities, and the "modern" systems cost far too much in relation to the limited resources available to urban authorities in Africa.

A recent study of Swedish municipalities showed that investments in utilities are around US $600 per person[9]. In British New Towns the average investment is of the same order , US $500 per person. But Tanzania can spend no more than US $8 per urban inhabitant (1969) per year for urban infrastructure according to the current 5-year development plan! [10]

One way of lowering the per capita investment in utilities is to increase population densities.

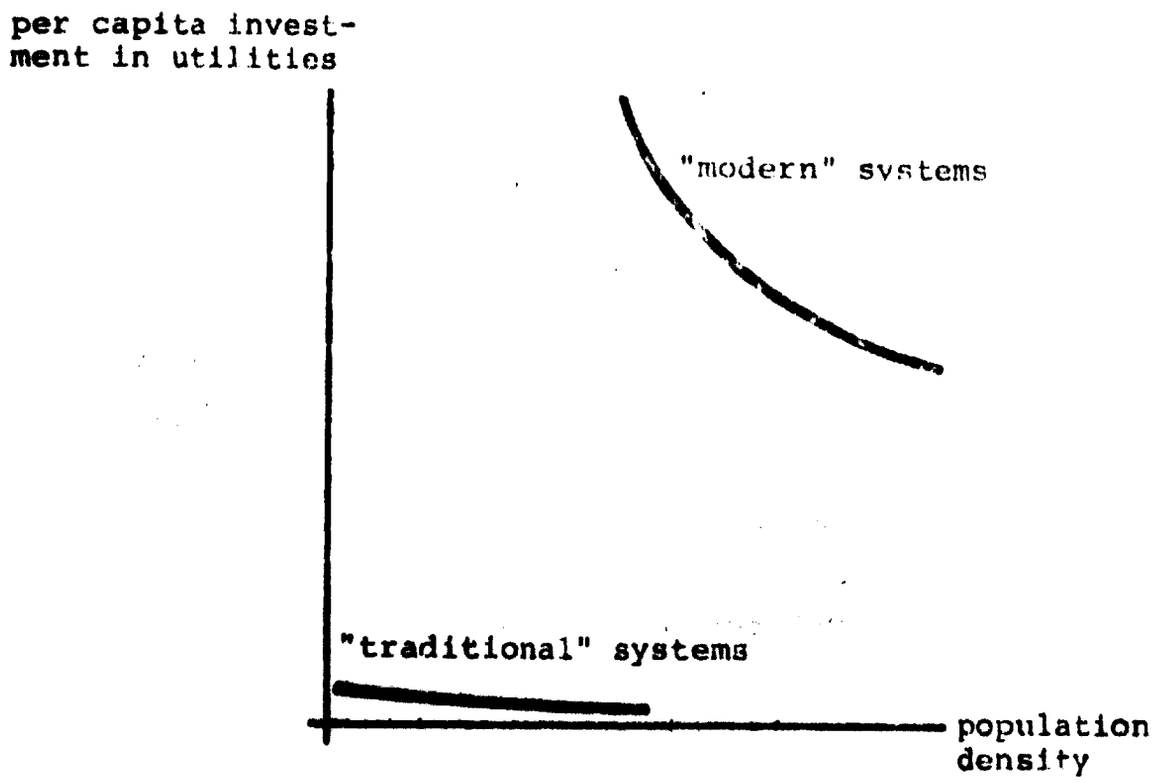

Fig. 3: Relation between per capita investment and population density for "traditional" and "modern" utility systems.

This has been done in Hong Kong where extremely high densities, 20 000 persons per hectare or even more, have kept per capita investments in utilities relatively low in spite of the use of "modern" utility systems.

As an example we can take systems for the disposal of human waste. The most simple one would be to dispose the excreta directly in the fields. This may be an acceptable method in sparsely populated areas under certain climatic conditions. Another simple method is the pit-latrine. If properly built and maintained and under favourable soil and climatic conditions the pit-latrine can be used at low urban densities, say up to 10 households per hectare, if combined with a piped water supply. When densities begin to increase, more costly systems like aqua-privies and septic-tanks have to be installed. As densities increase further, and multistorey housing is introduced, it may be necessary to

build a collection network with some kind of primary treatment plant, followed, at still higher densities, by secondary and tertiary treatment. Extremely high densities may eventually require a recycling system of the kind used in spacecraft.

None of these systems is compatible with the way African cities are developing today. Densities are too high for the "traditional" pit-latrine[11], an aqua-privy or a septic-tank may cost as much as a "traditional" or "intermediate" house. Collection networks in their present form are much too costly for any African city to afford for anything but a small part of the urban area.

For urban utilities we lack an equivalent to the "intermediate" house. In order to reverse the current trend towards steadily deteriorating urban conditions we have to develop "intermediate" utility systems, "basic utilities", to fill the gap between "traditional" and "modern" systems, see figure 4.

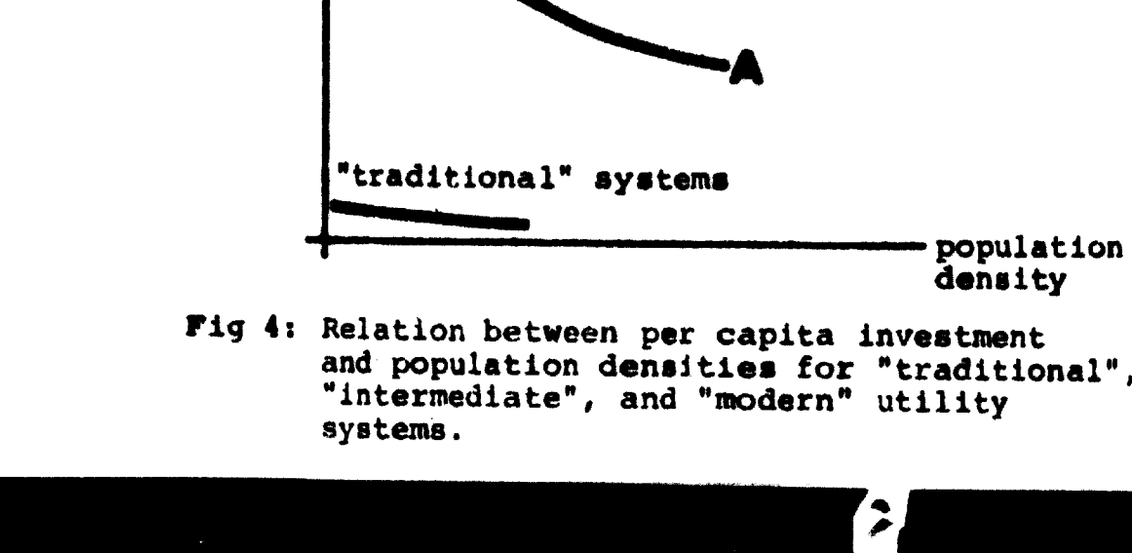

Fig 4: Relation between per capita investment and population densities for "traditional", "intermediate", and "modern" utility systems.

With "intermediate" systems the total investment requirement is kept well below the level for "modern" systems, while the investment per capita is further lowered by intensive use of the land, i.e.: at the highest densities the utility systems will allow (point A in diagramme 4). Little has been done to develop such systems. Nor will they be developed unless the need is recognized and the requirements specified. Let us return to the example of systems for the disposal of human waste: what are the requirements for an "intermediate" waste disposal system for urban development in Africa?

First, the system must be balanced, meaning that it should not, like the water-born sewage system, solve one problem by creating another. Second, it must satisfy local public health requirements. Third, it must have low investment and maintenance costs. Fourth, it should have a low water consumption. Besides all this it should fit into existing built-up areas and preferably be capable of extension in small increments.

Research and development on utility systems should be given a higher priority at this stage than the more conventional fields of study within the construction industry.

Could such a system be developed out of current "modern" utility systems used in industrialised countries? Certain simplifications and cost reductions are possible. Sanitary wares can be made locally out of concrete or asbestos cement, and stabilization ponds can substitute sewage treatment plants. It is less likely that the collection networks can be simplified. The underground pipe systems for water-born carriage are built to minimal standards even in the industrialized countries. Any further simplifications would create health dangers and necessitate extensive

maintenance[11].

The opposite approach of developing an "intermediate" system by improving the traditional one is more likely to lead to a successful result in this particular case. The requirements listed above point towards some kind of individual disposal system. A modified pit-latrine system called "multrum" has been used in Sweden for a number of years and appears to promise success under tropical conditions as well (see Appendix B).

CONCLUSIONS

Three questions were raised in the introduction to this paper: What is a "traditional" house in Africa today? Which are the problems (within the scope of this seminar) posed by rapid urbanization? and - To what extent can "simple improvements" of traditional houses contribute to solving the problems?

The answer to the first question was that there are two basic types of traditional houses: The rural "traditional" and the urban "new-traditional", here called "intermediate". The analysis in this paper indicates that the main problems of urban development are not so much related to the houses as to the question of how to provide the houses with basic utilities. The importance of population density for the minimisation of per capita investment has been illustrated. There is also a close relationship between house type, density, utility systems, and costs. An intricate problem is to find the combination of basic house, basic utilities, and densities which gives us the lowest total cost of urban development. Very little attention has so far been paid to these relationships, though they are obviously critical.

The third question must be related to this problem. "Traditional" houses cannot be improved upon because they are throughout perfectly adapted to their own environment. Outside this environment they cannot be built but are replaced by "intermediate" houses[12].

"Intermediate" houses can often be improved by simple means. Important innovations would be lay-outs and structures permitting higher densities, staged construction and gradual improvements. An example of such a house is given in Appendix C.

There is no single, simple solution to the problems discussed in this paper. No new design, method of production, or combination of materials can alone solve the housing problems in Africa's urban areas. The house itself is only part of the problem. More urgent and more difficult to solve are problems related to basic utilities: an adequate supply of drinkable water and a satisfactory waste disposal system.

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3. In Europe part of the "modern" building culture is sometimes referred to as "traditional" to distinguish its building process from the one used in producing "industrial" or prefabricated buildings.

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8. "The semblet used for thatching the roof of the Gurage house is acquired fairly easily in the area around Woliso-Welkite, 50 km south-west of Addis Ababa. When a model of this type of house was built in the compound of the Ethio-Swedish Institute at Addis Ababa, the expenses of bringing semblet from this area to Addis Ababa were so great that had the hut been roofed with iron sheets, it would have cost only half as much."

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9. LINDSTRÖM, H.
Bostadsbyggandets kommunalekonomiska konsekvenser
in ATT BO, No 1, 1972
Stockholm 1972.

10. TANZANIA
Second five-year development plan
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11. GRAVA, S.
Urban Planning aspects of water pollution control
(Columbia University Press) New York 1969.

12. "This example seems to suggest that traditional house-types do not always lend themselves to partial or intermediate improvement. Indeed, innovation may only make them unworkable. For example, the smoke from open fires (especially the one fuelled by cow dung) is believed to provide the thatch with increased protection from rotting. If open fires are to be abolished (and well they might since small children often fall into them), it must be remembered that the thatching may rot more quickly."

"Efforts from outside to improve local traditional techniques are, on the whole, destined to fail. It is important to understand that when traditional practices break down, it is usually because craftsmanship is dying out and/or suitable materials are becoming scarce. It has already been suggested that the upgrading of inferior materials by such means as chemical treatment of grasses is unlikely to be economic."

Ref. 8, pages 120 and 122.

APPENDIX A

Extract from

METHODS FOR ESTABLISHING TARGETS AND STANDARDS FOR HOUSING AND ENVIRONMENTAL DEVELOPMENT

United Nations 1968

II. DEFINITION AND GENERAL DISCUSSION OF TERMS

Development is not an end in itself, but rather a means toward an end, a process resulting in changes in the lives of people. Though these changes may be harmful to some during the process, it is assumed in this paper that development can be so directed as to achieve broadly defined goals such as "greater human welfare", the "wider distribution of wealth", and the "fuller development of individual potentialities". These goals themselves are conditioned, in any society, by the values, individual and social, which it considers most important, and these in turn vary with religious belief, philosophical systems of thought, historical development and the like. The society's goals may be formulated consciously or unconsciously, may be stated implicitly or explicitly in ideal or practical terms and may be translated into many more or less specific objectives, long-, intermediate- or short-range targets, policies, plans and programmes.

In development planning, there has been a tendency to use many of these terms — goals, objectives, targets, plans, programmes — rather loosely, in fact almost interchangeably. There has also been some confusion between the idea of standards and that of goals or objectives. Though there are many different definitions [13] of these terms, they are defined below, at least for the purposes of this report, in order to clarify the ensuing discussion of their interrelationships in the methods of setting goals, targets and standards for housing and related facilities.

A. Development [14]

As used in this report, development is defined as the process of mobilizing and organizing a country's or region's resources — natural, human, industrial, institutional and so on — for purposes usually involving the creation of an increasingly higher level of material wealth, social well-being and individual self-fulfilment. Implicit is the continually broadening base of those sharing in the fruits of the process. Development involves mobilization of internal and external capital resources to create industries which will provide more employment and produce more and cheaper goods and to provide the necessary infrastructure, such as roads, transport, housing and public utilities. It also involves raising consumable incomes, improving the level of living — nutrition, education, health and housing — of the people, and creating the necessary organizations and institutions for the effective functioning of the more complex society it creates.

Basic to the idea of development as used here is the concept of change consciously directed to achieve predetermined goals. In this, it differs from the idea of development as a natural process which "just happens" as various individuals or groups more or less spontaneously decide that they can profit by utilizing a better tool or machine or organizing a process or service more effectively. Such individual decisions and activities exist and will continue to do so in any development process. In this report, however, it will be assumed that they operate within a framework of policy decisions — by government and also by private investors and entrepreneurs — which have been consciously designed to attain certain social objectives.

Within the broader concept of development is physical development, and within that, housing and urban development. Physical development, as defined here, will mean the process of building the actual tangible facilities — factories, refineries, mines, roads, railroads, utility systems, drainage and flood control installations, homes, schools, hospitals, market and shopping facilities etc. — through which the development process, both economic and social, can operate. It involves the translation of the objectives of the development process into time and place through a planning process which determines where new industries shall be located, how raw materials can be transported to them and their products distributed to market, where the employees shall live, how they will get to work, where schools and other institutions shall be situated, in what order these and the many other needed facilities shall be built, and how all this can be done within the resources available as efficiently and economically as possible.

The scope of this report is limited to that portion of the physical development process which deals with the provision of housing [15] and the public services or facilities related to it, such as streets, water supply, waste disposal, electricity and gas, schools, hospitals and clinics and shopping facilities. For convenience, these will be defined as the residential environment — that portion of the urban or rural infrastructure which serves the people as consumers rather than as producers, where they live rather than where they work. It will be assumed that the development of housing requires the parallel development of this environment, and that housing programmes cannot realistically be

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[13] A useful discussion, though with different definitions of these terms, will be found in part I, section A.III, "Housing programmes: their purposes and general characteristics and the factors determining their scope", of the report on the Seminar on Housing Surveys and Programmes with Particular Respect to Problems in the Developing Countries, held at Zagreb, Yugoslavia, in October 1961 (United Nations publication, Sales No.: 62.II.E/Mim.8).

[14] See also *Metropolitan planning and development*, report of meeting of experts in Stockholm, Sweden, September 1961 (ST/TAO/SER.C/64).

[15] Housing is sometimes also considered as one of the economic "sectors" of development, or as part of the construction sector. In this report, however, emphasis is on its role in the urban development process rather than on housing construction as an industry.

formulated or carried out except in co-ordination with programmes for development of the residential environment as a whole. Both, in turn, are closely related to over-all urban development, including metropolitan and regional programmes for location of industry, and population settlement patterns, which are in turn closely linked with national over-all development programmes. The development of housing and the residential environment are thus conceived of as an integral part of the development process, not as its by-product or result.

B. Values

Implicit in the definition of the goals of development is the assumption that a society shares certain basic values that transcend other considerations tending to divide it. Where groups within a society hold such widely different values that they are virtually irreconcilable, the resulting social and political conflicts may well make the formulation of development goals impossible, and the process of development may bog down in civil, religious, or class warfare. As used herein, values are defined as fundamental beliefs as to the nature and purpose of human life, the relationships of human beings to one another, and the essential social conditions which make life meaningful. Though these values may differ from country to country and, even from time to time, it will be assumed that the desire for a better life for oneself and one's children and for recognition of one's dignity and worth as a human being are basic to all people everywhere, and that it is a fundamental objective of development to fulfil this desire.

The values of a society are deeply involved in the formulation of its developmental goals. Conceivably, it is possible to construct a development plan that would provide everyone with a stated minimum number of calories of nutrition a day, a specified number of square feet of housing space, employment in an occupation and a location as required to maximize the production of specified goods and maintenance of hygienic conditions contributing to the individual's highest productive efficiency as a worker. If a society's goals were confined to these levels, the result would be little better than well-managed slavery. It is not until the human and social values of a society are reflected in its goals that the development process can achieve its greatest goal.

C. Needs

Determination of goals implies recognition of the necessity to move toward something, to change direction, to fulfil some recognized deficiency. If a society felt that everything was perfect, that no needs existed that its economy and social structure did not already meet, it would hardly be concerned with formulating goals as an element in planning its future development. Needs, then, may be defined as measurements of the gap between what is and what is felt to be desirable. They may be expressed in terms of what the individual feels represents the gap as far as he personally is concerned, or of what society feels is required to bridge the gap between a level of fulfilment acceptable as a minimum standard and the actual conditions of life of its people.

Needs, as so defined here, differ from requirements as measured in terms of economic demand. Analyses of the market for housing in a developing country usually indicate the proportion of the population able to afford housing at a predetermined price or rent, with those below the income level that exercises such "effective demand" presumed to be out of the market. If, however, a country's values are such that it feels concern for those who are not yet able to exercise economic demand, it would include in its compilation of needs the quantities or qualities of housing required to bridge the gap between existing conditions and what it considers an acceptable minimum for all.

It is obvious that needs, standards and goals are closely interrelated. For example, a developing country may be aware that its levels of nutrition are inadequate, that many children are receiving insufficient and unbalanced diets for health and normal growth, that there is a *need* for improving the country's food supply both quantitatively and qualitatively if its people are to be healthy and productive and enjoy the benefits of development. Medical and agricultural research may develop the *standards* of nutrition which, in terms of the country's climate, soil, culture and food habits, represent the minimum level of nutrition seemingly required by its adults, children and pregnant or nursing mothers for healthy, productive life. It is then possible to include in the country's *goals*, the improvement of levels of nutrition in a certain period of time by adopting specified measures to meet the proposed standards. In housing and related development, the needs in most developing countries are multiform: in addition to actual housing as such, related facilities and services are wanting, such as water supplies, waste disposal, public utilities and educational and recreational facilities. But general recognition of need is of little help in formulating development goals until some standard is established to measure by. Once the gap between existing conditions and what should be considered acceptable (see definition of "standards" below) has been determined and expressed in measurable quantities, goals can be formulated that are meaningful in developmental terms. Thus, a goal qualitatively expressed as "to provide a decent home in a healthful living environment for every family" can be expressed as "to meet the needs", in concrete terms more readily translatable into investment allocations, materials and labour supply requirements, urban land patterns and the like.

D. Standards

Standards, then, may be defined as measures of levels of acceptability, at a given time and place and in a given set of cultural, technological and economic conditions. The determination of needs depends on measurement of the gap between "what is" (the level) and "what should be" (the standard). In housing and residential development, standards vary widely

from country to country, by regions, in urban and rural areas, by stages of development and urbanization. They vary with climate, culture and time. There can be " minimum ", " maximum " or " average " standards. Attempts have been made to develop a single standard, for example, of the amount of floor space needed in a dwelling for a family of a certain size or composition, based on universal biological or psychological considerations applying to all human beings everywhere on earth. It is not felt, however, that this approach would be practicable for the purposes of this report, and no attempt will be made here to define such a universal standard. Rather, the standard will itself be considered as dependent on the conditions actually existing in a country: the proportion of families homeless or living in conditions of the greatest overcrowding or dilapidation; the resources available in the form of building materials, labour, land and investment; the competing claims of other needs such as nutrition, health, education and industry; the rate of growth of population, productivity, and savings; the stage of technology, particularly in the building industry; the level of wages and incomes in relation to building and land costs; and related factors. If in any country the standard is set too high, the goal related to it will be unattainable; if too low, the goal will be too limited to serve as a vital element in the development process. Standards are thus relative rather than objective or absolute, dynamic rather than fixed. A standard acceptable today in the light of the interplay of the factors mentioned above may have to be increased, or reduced, as conditions change. This, in turn, may require revision of the related goals. In setting the level of today's standard, anticipation of the direction of future development is a relevant factor, particularly if the latter seems reasonably predictable on the basis of past performance. Thus, in a rapidly developing country, where resources are expected to increase quite sharply but where the current level of housing space is low, the minimum standard for new housing might be set quite a bit higher than the present level, in order to avoid building quantities of housing which might be considered substandard within a few years. Where no such increase is hoped for, the standard might have to be far more modest, assuming that to bring existing conditions and future requirements up to it is the goal.

E. Goals

As used in this paper, goals are defined not so much as broad national or social objectives on an ideal or philosophical level, but rather as fairly specific objectives formulated, with due regard for resources available or reasonably likely to become available within a specified period of time, to indicate the direction of desired development and the results to be achieved. It is assumed in this discussion that they are consistent with the basic values of a society, and that if achieved they will fulfil the needs recognized by that society as measured by the minimum standards acceptable to it.

Goals may be long-range, intermediate-range or short-range. They may be expressed in economic, social, or physical terms, qualitatively or quantitatively.[16] Frequently they may be found to be incompatible with one another and then have to be reconciled, ranged in order of dominance, modified or even abandoned. Like the standards themselves, goals are subject to change as time goes on and as conditions, needs and even values change. The important thing is that, once set and accepted and until changed, they become the frame of reference for the setting of targets, the formulation of development policies and programmes, the determination of priorities, and the planning and implementation of development.

It is at this point that criticisms have been made of many housing and urban development activities in the past and even currently. Because there was no clear formulation of goals and no reconciliation or ordering of mutually incompatible objectives, many decisions had to be made on an *ad hoc* basis, and many projects were undertaken and carried out which, in the end, did not add up to any measurable contribution in terms either of the needs of the people or of the country's development process as a whole. " Pilot projects " that are unrepeatable because they depend on costly imported materials, slum clearance that merely drives already homeless squatters into another squatter area, multistorey projects standing empty because the people won't accept them or can't afford to live in them, expensive impressive avenues on which no traffic moves because they are located in the wrong places, factories built where workers can't get to them and therefore must build new makeshift slums to live in, highways built twenty years too soon — all over the developing world the lack of clear goals for housing and urban development has resulted in waste and frustration. If development is to be reflected in a better life for people rather than merely in statistics of an increased GNP or so many units of added physical output, goals are required to guide the development process.

F. Targets

Targets may be defined as qualified or limited goals or specific stages in the achievement of longer-range goals. For the purposes of this report, they will be defined as specific levels of achievement of longer-range goals set for the year 1970, the end of the United Nations Development Decade. They are usually expressed in quantitative terms, but not necessarily so.

G. Priorities

Frequently, in formulating goals or targets, it is necessary to order them in terms of time or relative importance in order to be able to achieve them. One may be prerequisite to another, or one may be of little or no value without another. Priorities, then, as used in this paper, will mean a set of goals or targets ranged in some form of sequential order referring to time or other relative rank.

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[16] It is also possible to define " goals " as qualitative objectives and " targets " as quantitative ones, but because of the need to translate general housing goals into quantitative terms in this paper, no such distinction was made.

H. Plans

The planning process involves continuous interaction between the formulation and choice of goals and targets, the setting of priorities, and the results of development action. It includes the reconciliation and modification of goals, the revision of standards in terms of available resources and periodic revision of the plans themselves in the light of changing conditions, modified goals or standards and the results of actions carried out in accordance with the plan. In the course of such planning, the relationships between the various elements in the development process are analysed, and "models" expressing these relationships and the effects of the application of additional resources may be constructed in abstract form.

Neither the analysis nor the model is a plan. They are components of the planning process of which the plan is the product. Fundamentally, the process involves making choices as to what in the society needs to be changed and in what order, to achieve stated goals. These are value decisions and must be made by each society according to its own goals.

In this report, plans will be defined as detailed, specific statements, in words or graphic form, of how a set of development goals or targets will have been translated by a given date into a set of physical changes in a country, region or urban area. In this sense, a plan is a concrete realization at a point in time of social, economic and physical goals. Plans need not be conceived of as rigid strait-jackets for action, which cannot be modified over time if conditions change and revision is required. Modifications can and should be made when it can be shown that they will lead to earlier or more efficient achievement of goals and targets, or when the latter themselves are changed. The plan should not, however, be changed without considering the effect: the cumulative effect of many small, unrelated changes or exceptions, of many modifications made for the sake of expediency, can nullify the plan's effectiveness for achieving the goals desired. It is perhaps the very fact that unless goals are clearly stated it may be impossible to keep the plan from being modified out of existence that justifies the need for goal formulation.

I. Programmes

A programme is defined, then, as the step-by-step listing of the specific things that need to be done to carry out a plan, identified as to time, place, and means. The order of the various items in a programme may be changed from time to time and items added or subtracted in conformity with changes in the plan as these are formally made and noted. Unless adequate institutions exist for the administration and implementation of a programme it cannot be carried out; the goals and standards upon which a plan or programme is based must consider the organs available or that can realistically be developed to bring it to fruition.

APPENDIX B

THE MULTRUM SYSTEM FOR BIOLOGICAL DECOMPOSITION OF FAECAL MATTER AND HOUSEHOLD REFUSE

by

Uno Winblad

Multrum is a device for aerobic biological decomposition of faecal matter and household refuse.

The decomposition takes place in a closed container provided with an inlet for air and an outlet (chimney) for the gaseous byproducts. The openings for inserting the wastes and for removing the residual deposits should be kept closed. The decomposition is done by certain microorganisms present in the wastes at the time of insertion. Cultures of bacteria or chemicals need not and should not be added.

The large part of the acting organisms come from the faeces. Most of them are mesophilic which means that they work best at a temperature of +35°C within the interval 25°C to 45°C. At temperatures above +45°C all organisms except the thermophile are killed.

Multrums in temperate climates are based on the action of mesophilic organisms. In the tropics it should be possible to run the process at higher temperatures using thermophilic organisms. The optium temperature for such a process is +57°C. The multrum needs a continual supply of air to function properly. The process is aerobic, that is, carbon dioxide and saturated water vapour substitute the oxygen of the air. These gaseous byproducts must be evacuated from the multrum.

The multrum-type on page 2 of this Appendix has not yet been tried out. The only multrums existing so far have been built in temperate climates. The capacity of the multrum depends on the relation between input of wastes and the speed of the destruction process. Both depend on local factors and no generally valid figure can be given. In Stockholm the volume of wastes per person and day is many times higher than in e.g. Dar es Salaam, at the same time the destruction process proceeds slower due to lower air temperatures. A multrum in Sweden, therefore, has a volume of 3-5 cubic meters. But in the tropics, where the amount of household wastes are not as formidable as in Scandinavia and where the process may be ten times faster (thermophile microbes rather than mesophile) a much smaller container would do.

Large scale application of the multrum in tropical areas has to be preceded by a thorough survey of local conditions and a series of experiments, tests and pilot projects.

Research and development along these lines is under way, partly with the support of the Scandinavian Institute of African Studies.

The programme is part of a larger project for developing simplified systems for urban infrastructures in Africa.

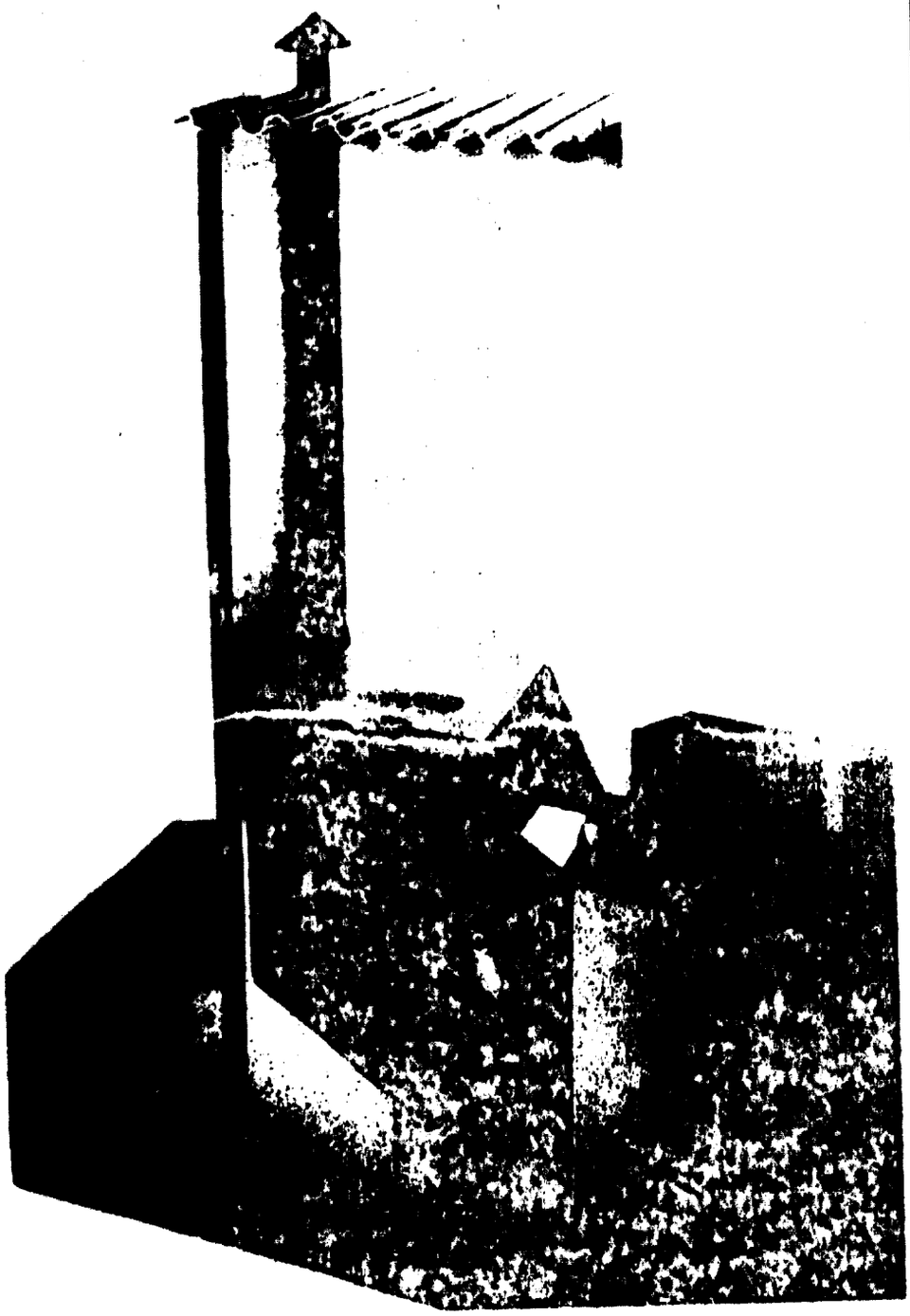


Fig. B1: Multrum - section through model.

ETEGE MESK PILOT PROJECT
ADDIS ABABA 1963

built by
The Ethio-Swedish Institute of Building Technology

architect
Uno Winblad

Extract from the Report:

THE HOUSE

The house type developed for the Etege Mesk project is a so-called "core-house". The scheme has been based on the assumption that the cores can be mass produced and that each family, while living in the core, will expand the house as time and funds allow.

The design and the construction of the house is illustrated on the following pages. A linear plan has been used to make the house easily extendible. The kitchen-latrine unit has been placed close to the street to make water and drainage pipes as short as possible.

The core of the house - the first room and the kitchen-latrine unit - is the only part of the house that is seen from the street. This means that a residential area with many extendible houses will not look unfinished although the houses may be in different stages of completion.

The foundation consists of a reinforced concrete footing at a depth of 40-60 cm. Walls and partitions of 10 cm concrete blocks are placed directly on the footing. The floors are different in each of the four demonstration houses: traditional mud floor, concrete, pumice concrete and pressed bricks have been used. The roof is made of corrugated galvanized ironsheets on zigba purlins and the ceiling is made of straw-mats and "abujidad".

The kitchen has a stove for cooking and for baking injera. Opposite the stove there is a wooden bench and a water tap. The stove is a development of the Indian "Hyderabad stove". It can be built for less than Eth. $15 (US $6).

The lavatory is equipped with a so-called Turkish latrine, a water tap and a shower. The latrine is flushed with waste water from the kitchen or with water collected in a bucket from the tap. The shower is set up above the latrine so that the latrine will be cleaned every time the shower is used.

BUILDING COSTS

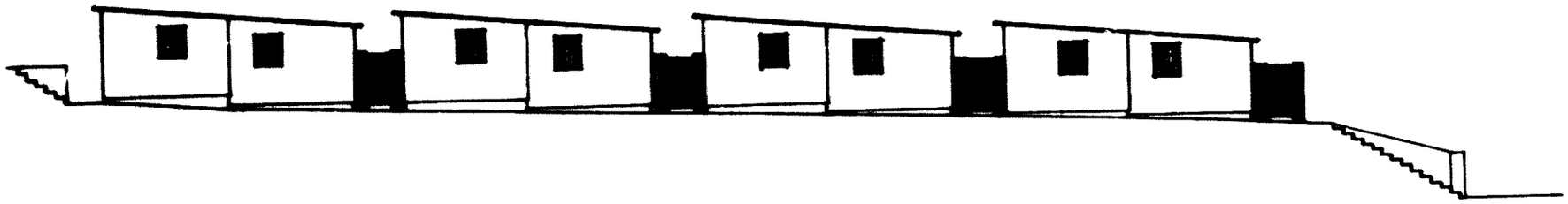
The four demonstration houses have been constructed by the Building Department of the Building Centre. Part of the job has been carried out by first-year students.

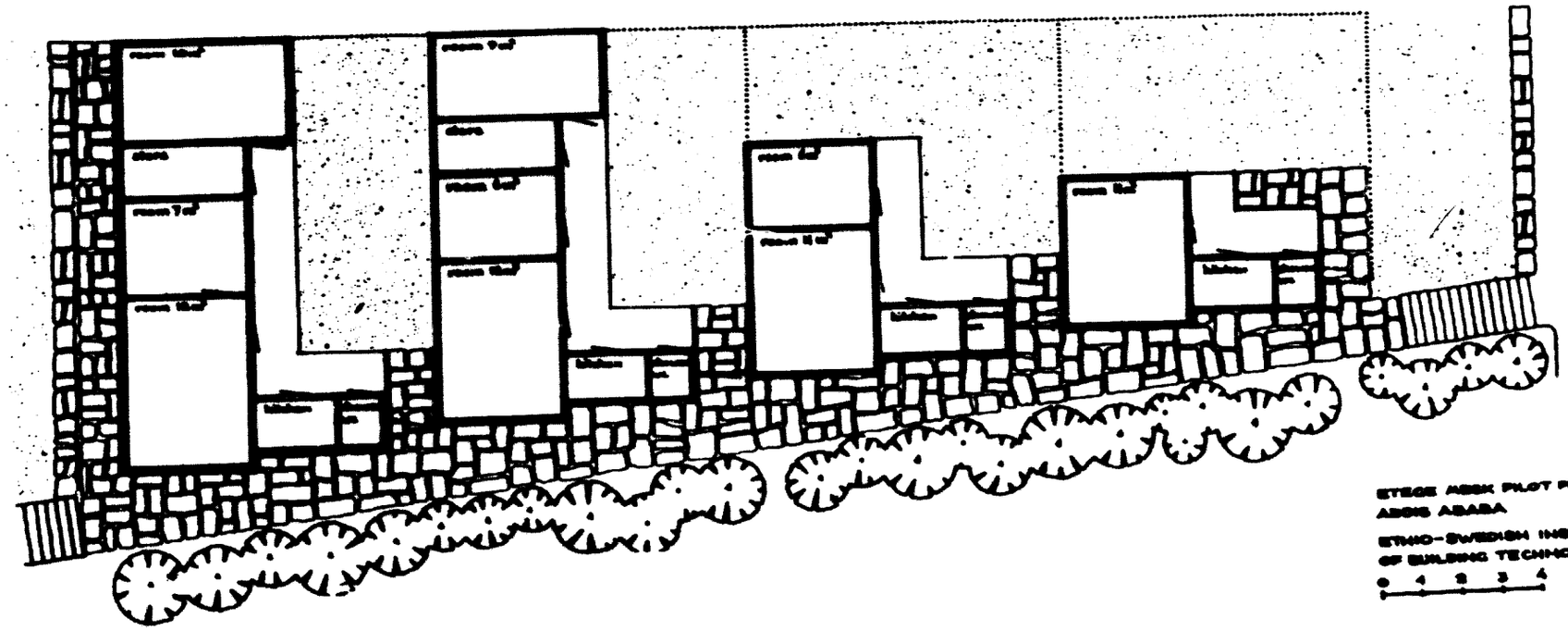
The figures below are based on contractors' prices. "Total cost" means all costs for the building itself, the site and the installations within the house (including transportation and overheads). Excluded are price of land and cost of infrastructure.

House No I, total cost Eth. $1 300 (US $520)
" " II, " " " 1 700 (US $680)
" " III, " " " 2 400 (US $960)

The building costs could be considerably lowered if the core of the house was mass produced and the extensions built by the owner and his family.

elevation
plan





ETEGE ASEK PILOT PROJECT
ADDIS ABABA

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OF BUILDING TECHNOLOGY

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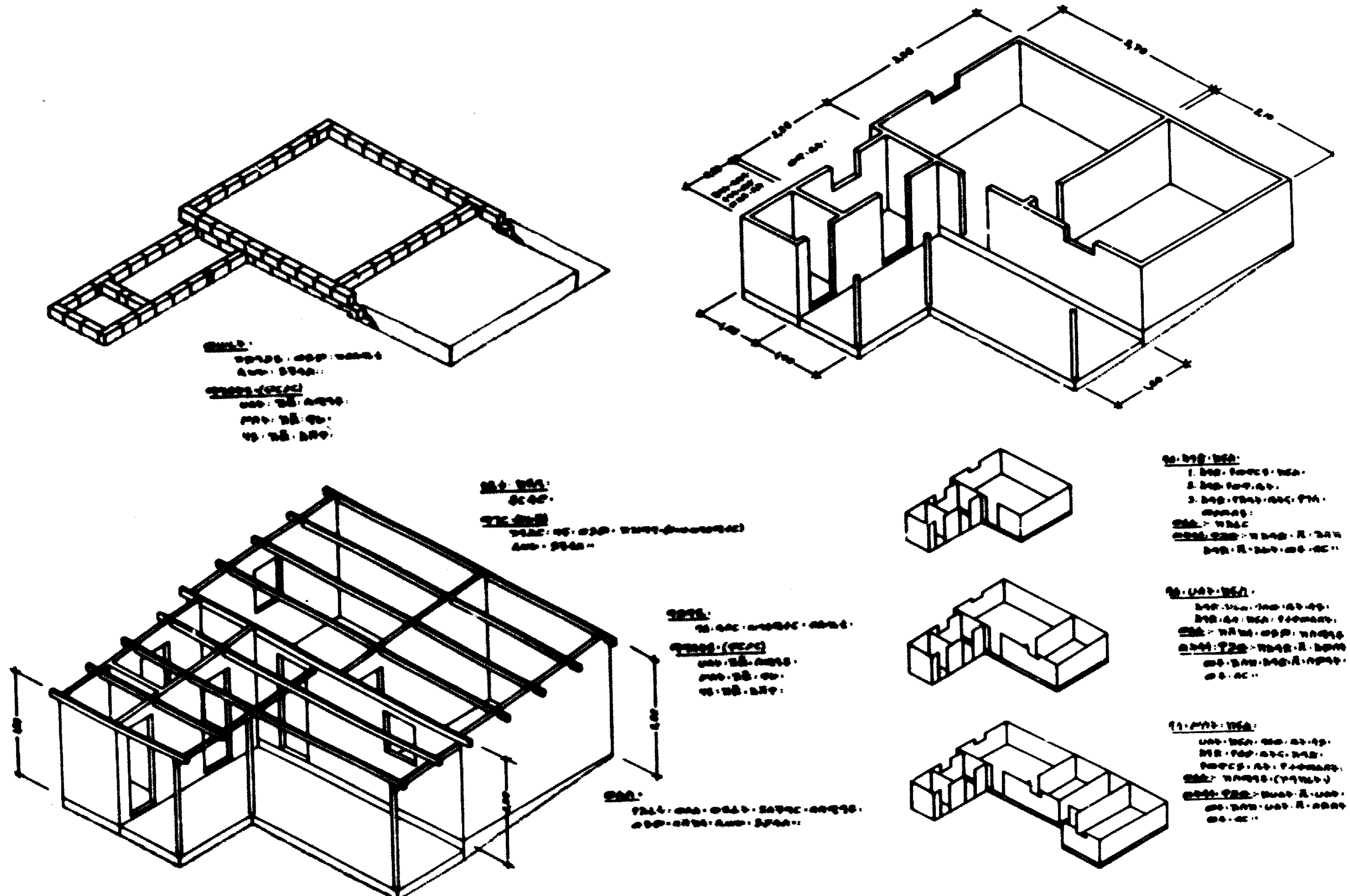

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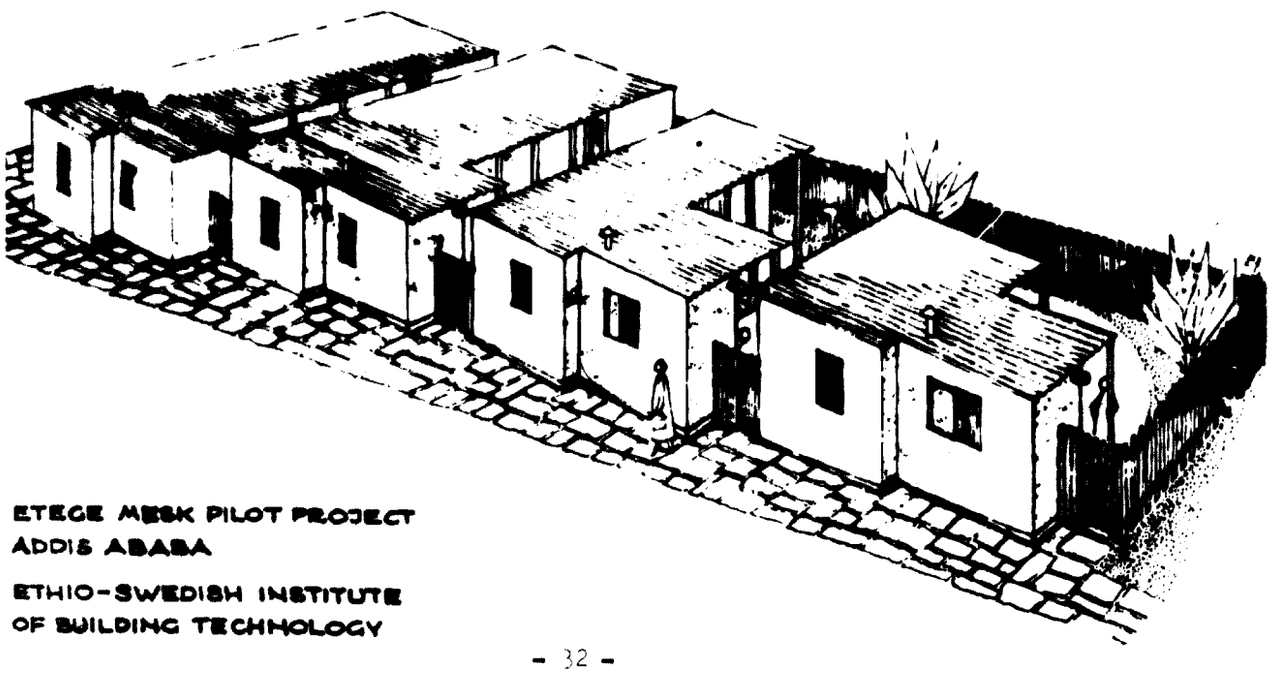

ETEGE MESK PILOT PROJECT
ADDIS ABABA

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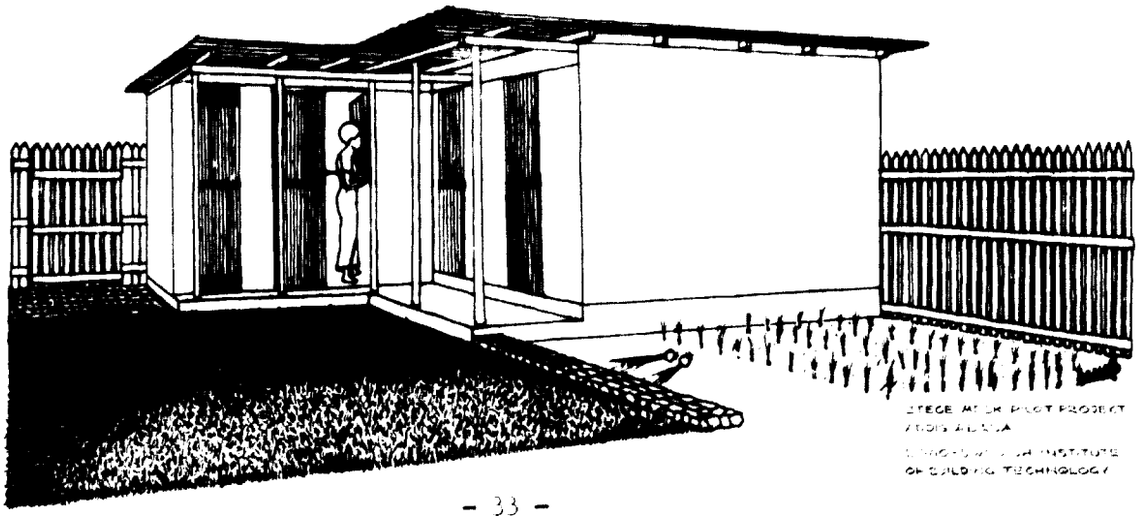

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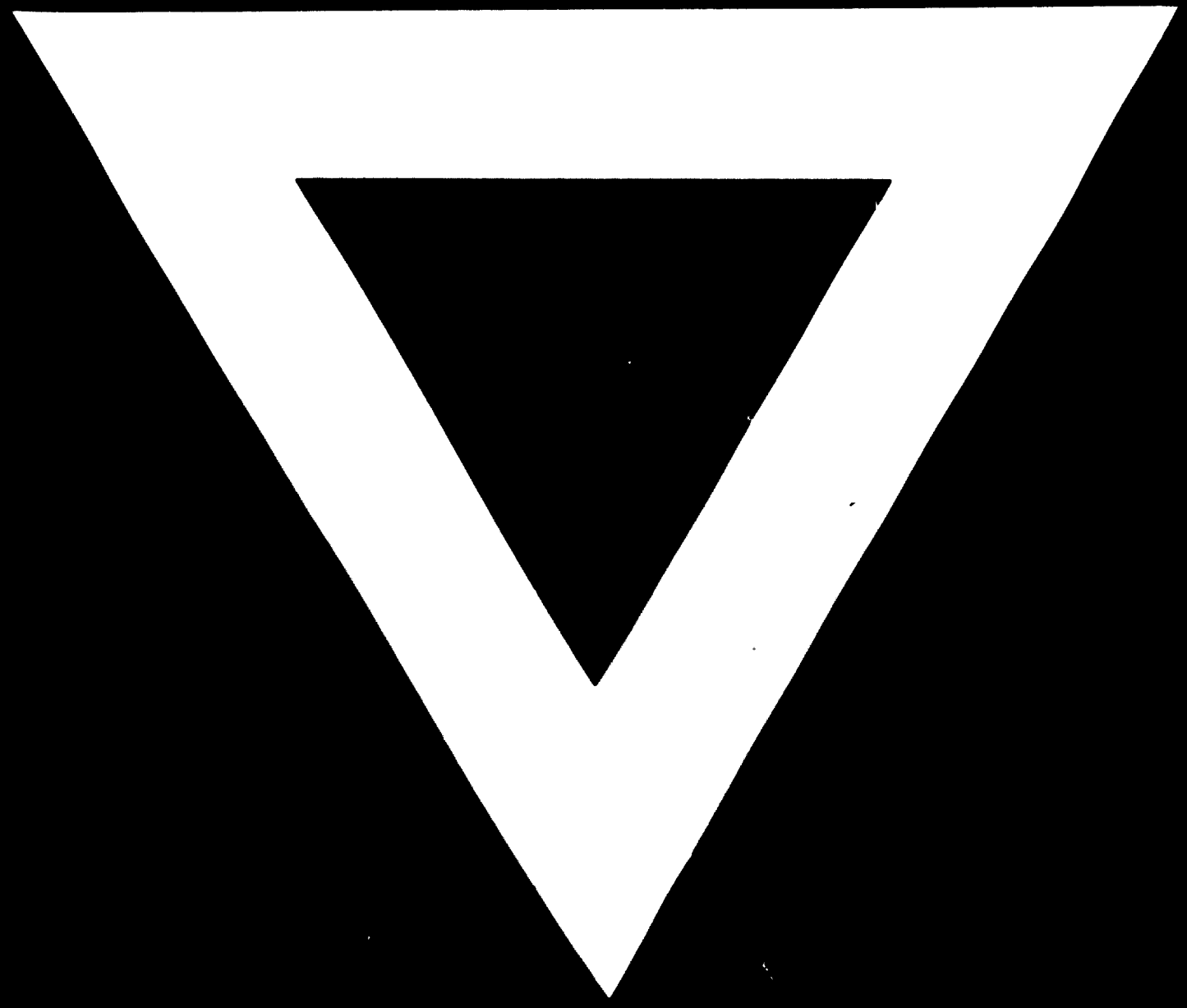

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