Centre for Endogenous Development Studies

WORKING PAPER

INDIGENOUS BUILDING IN REGIONAL DEVELOPMENT

(Case Studies of work carried out in the Selseleh Integrated Development Project)

BY

THE DEVELOPMENT WORKSHOP

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John Norton

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ARCHITECTURE IN DEVELOPMENT

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Indigenous Building in Regional Development:

The common situation in Third World countries is of a few increasingly unmanageable major cities concentrating investment, services and labour to the impoverishment of the rural areas. National development plans should place an emphasis on rectifying these imbalances between town and country by the development of the rural areas, their villages and service towns, leading as far as possible to self-reliant regional groupings.

In the process of developing the necessary infrastructure for such a policy to be carried out, a considerable amount of building must be done. In most official rural development projects, the physical services and infrastructural networks are planned in centralised offices by people who have little knowledge of the socio-environmental conditions of the field area. Often the same building designs are applied to all regions. This approach results in the buildings being alien to the local environment, and almost invariably reduces their effectiveness and usability.

An effective strategy for meeting shelter needs requires a comprehensive, integrated and grass roots effort. From our experience, particularly while working for the Selseleh Integrated Development Project, we have found that action needs to be taken on several inter-related levels.

1. Research experimentation and development work on local building resources - materials, technologies and skills.
2. Training of local builders to develop a cadre capable of implementing most building projects independant of extra-regional professionals and contractors.
3. Stimulation of local building materials industries such as quality controlled mud-brick yards, and brick and lime industries, to make regions largely self-sufficient in materials.
4. Construction of essential buildings such as schools, clinics, houses and village baths in a way that demonstrates the use of indigenous technologies, and training local

builders during the construction.

5. Plan for the growth of the major settlements of the region, demonstrating how settlements can grow in continuity with its indigenous settlement pattern, as well as develop on traditional planning methods.

The one fundamental principle underlying these proposals is that the local people, such as the local builders, are often both the best sources of information and the most effective implementors. The extra-regional cadres can best act as temporary catalysts.

BUILDER'S WORKSHOP: YAZD IRAN: 1977.

Community Building:

The provision of basic services and infrastructural installations such as roads, water supply, rural clinics, public baths, schools, etc., should be an integral part of the development process. The most important aspect of this activity is not merely the creation of the physical structures, but the way they are created (i.e. the process), and the nature of the activities which these structures envelop (i.e. the function).

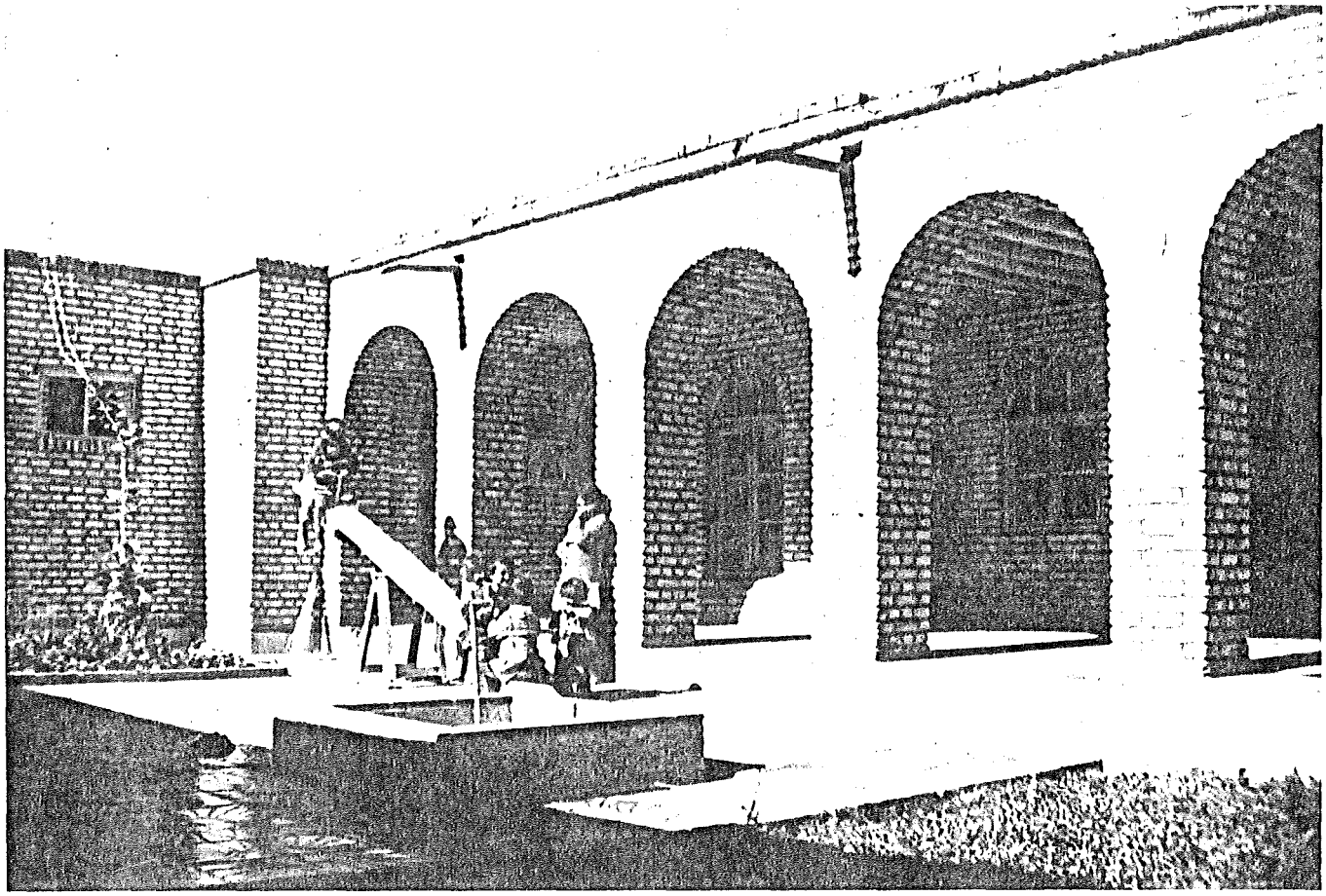
Public buildings in the rural areas are normally financed by the central government. These buildings can only be built by officially recognised, usually city based contractors and their standard designs specify the use of manufactured and often imported materials such as steel and cement. Thus the construction budget would largely go to city contractors and materials merchants. Moreover, the designs, materials and the construction techniques are alien to the social, cultural and environmental conditions of the villages and the local people are unable to continue building in the same way or repair the existing buildings. This method of provision of public facilities increases the dependance of the rural population upon the city and the central government.

On the other hand, local builders with little training and supervision are capable of meeting nearly all the building requirements of their region. Also, indigenous materials and techniques that have developed over centuries to suit the particular socio-cultural and environmental characteristics of their locality, if used, would reduce the reliance upon the city and increase the benefits of the investment for the area for which it was designated.

The implementation of all S.I.D.P. projects is regarded as an educational process and already many local builders and craftsmen have been trained in working with improved traditional or appropriate techniques. Also a good proportion of the build-

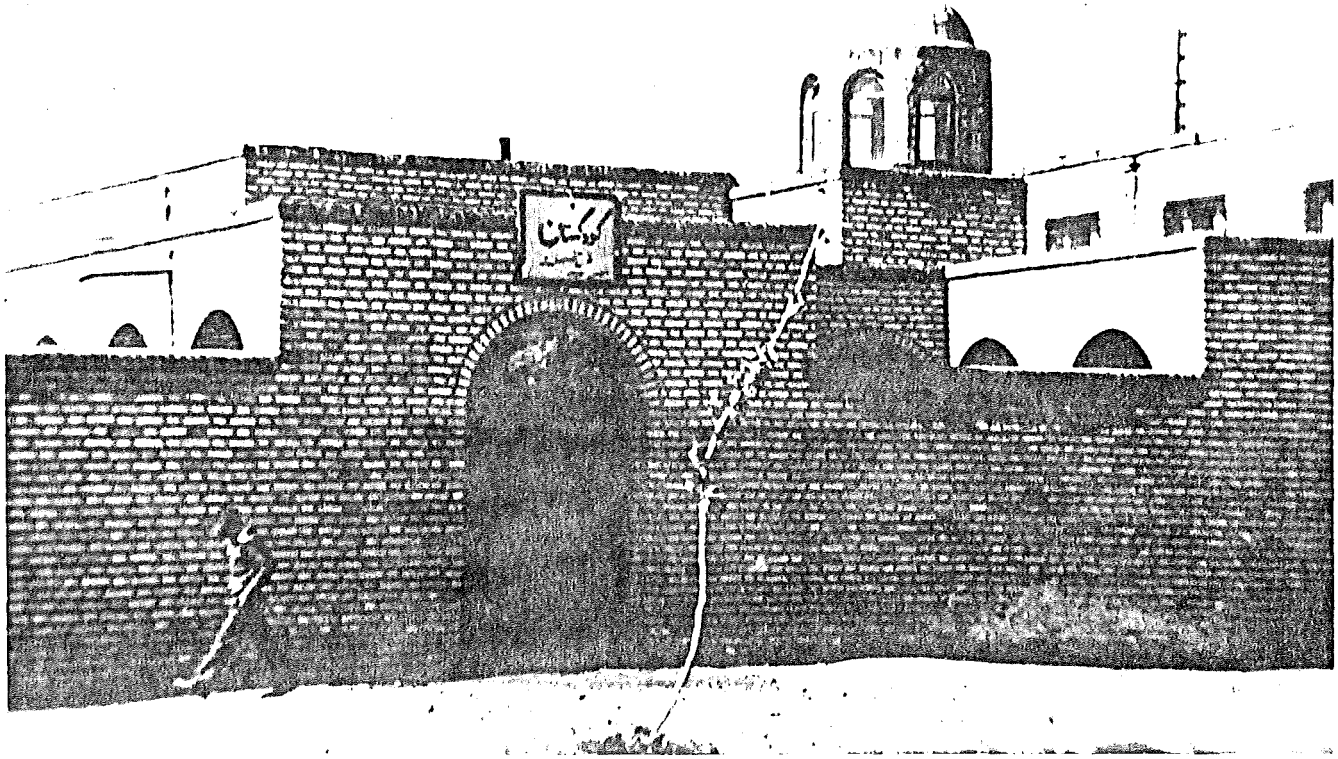
ing projects will house the activities initiated by S.I.D.P., such as public literacy classes being held in the schools and the Front Line Health workers trained by S.I.D.P. being based in rural health houses. In addition, an important task of the services section is the creation of productive and employment generating small-scale industries.

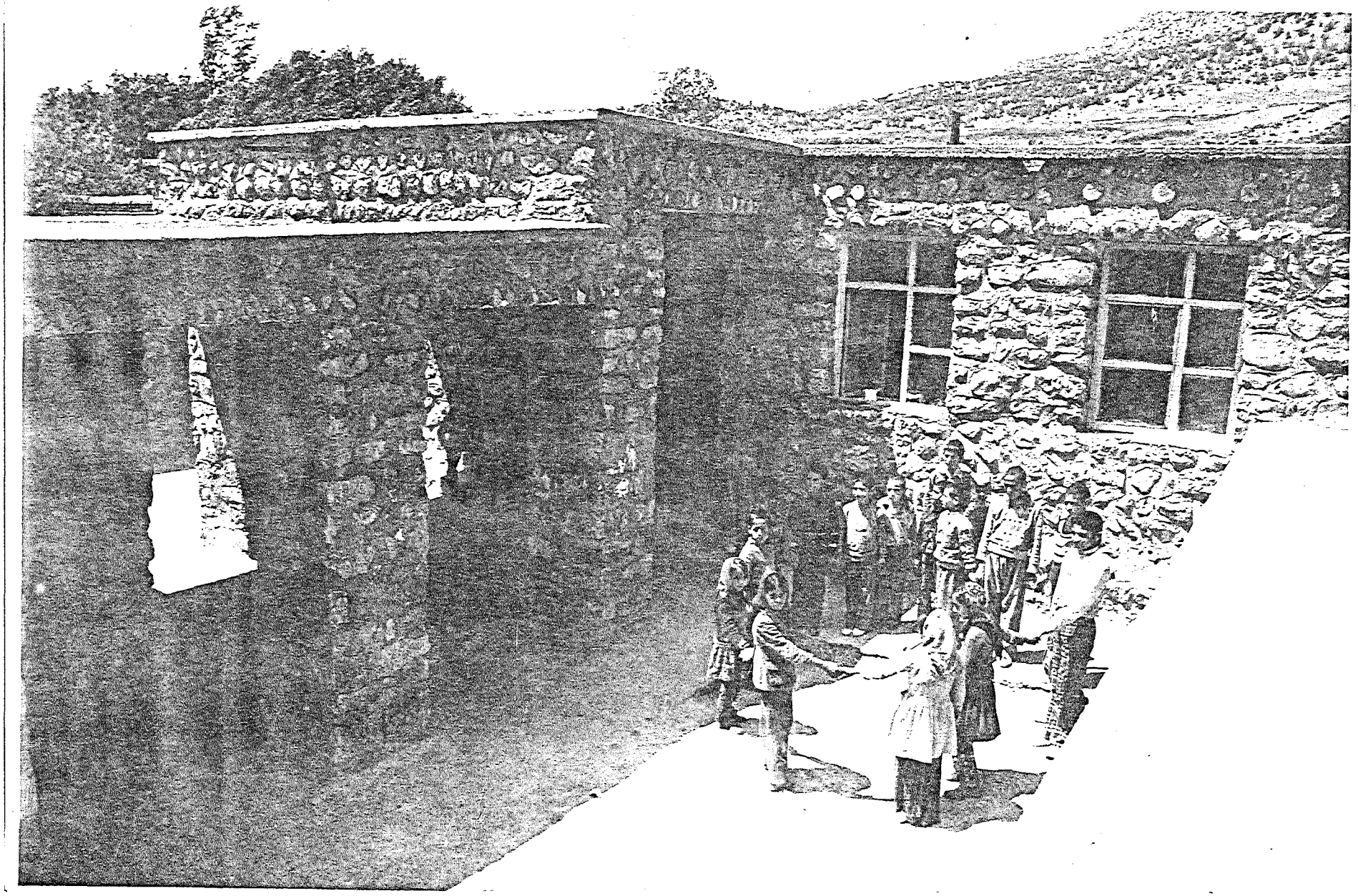
The public buildings built in Selseleh fall into two categories: projects financed directly by the central government, and those arranged by the Selseleh Development Project. The official organisations responsible for the government projects were requested to devolve their implementation responsibility to the S.I.D.P. Therefore we were able to use local builders to implement these projects. Projects were redesigned to suit the local social and climatic conditions. A systematic approach was taken in the design of community buildings so that the plan could be adapted to each village's particular needs and available resources, as well as allow for expansion with increasing population. Local materials and technologies were used and in some cases improved upon. Through the construction process local builders were trained in these techniques, and in this way it was ensured that the majority of the government budget for the projects went to the local community (the kindergarten is an example of such a programme). S.I.D.P. building projects were built in partnership with the village. The village generally requested the facility, provided the site, the unskilled labour and some of the materials while the project provided the design, the skilled labour and other materials. Designs were developed in consultation with the users. Thus the people participated in both the decision making and implementation.



Kindergarten courtyard: childrens play area.

Detail of kindergarten entrance





Village School

Built of local materials
Luristan

The Hamaam (Public Bath):

The hamaam has long played an important role in the villages and towns of Iran, as both a social and health institution. People came together to bathe, massage, shave, receive medical attention (usually provided by the village barber) and to simply chat at leisure. Men and women used the bath at separate times.

A hamaam has always been built out of stone or fired-brick, since the atmosphere inside is too damp to allow the use of sun-dried mud-brick. It was usually built into the ground, with the vault and dome roofs, chimney and entrance showing above the ground. Placing the bath underground contained the heat better and also transferred the thrust of the vault and dome roof into the surrounding ground. The village water channel was diverted and flowed by gravity down through the heating chamber (fired by brush or wood fuel) and into the baths. The smoke ran in ducts under the bath floor to heat the rooms above. The rooms became progressively hotter as one moved to the steamy bathroom. Connecting entrances were bent for insulation and privacy reasons. These hamaams had a minimum of two rooms: the first, a changing room (rakhkan) where people could sit on raised slabs in niches round the walls, facing each other. The second, the large bathroom, had similar seating slabs, a communal hot bath pool (khazeeneh) and a warm rinsing pool. The open plan arrangement with people facing each other was very important for the hamaam's social function.

In the Selseleh district there had been several hamaams functioning in the past, but for a variety of reasons most of these have fallen into disuse. The recent Government built hamaams with shower cubicles are largely not functioning because their heating system or oil deliveries have not been maintained. The Project's programme is to renovate and revitalise existing hamaams, to train local people in their maintenance and to set up a local fuel distribution system -

as well as to build new bath houses.

The process of constructing new bath houses in various villages illustrated the integrated approach taken in the construction of all the community buildings.

Design -

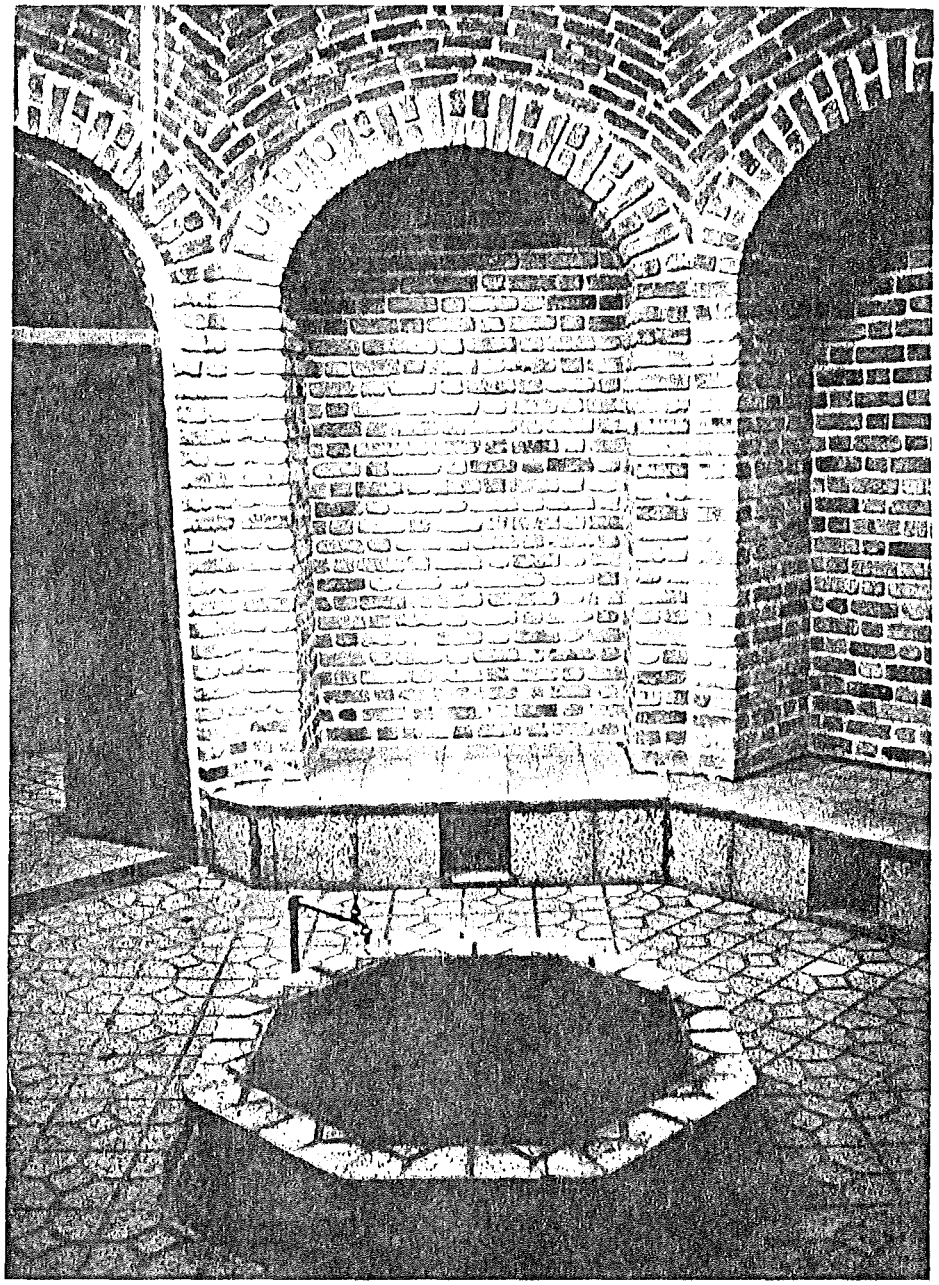
The designs were a result of careful investigation into traditional hamaams in the area and discussions with users and builders. The first hamaam- in Niazabad village - was a clear expression of this process. It has a vaulted entrance passage leading to a waiting room (utaq-e-intezar) with space enough for collecting money. This leads to a rakhkan with a domed roof supported on arched seating niches around the central footbath pool. The rakhkan opens to the main domed hot bath room.

As the traditional khazeeneh (common pool) has been banned for health reasons, new baths require showers. This change has important social implications. The communal bath is clearly a much more sociable activity, whereas showers, particularly as they were designed in government baths, are much more individual oriented. In the government baths the main bath room was reduced to a narrow corridor with a series of shower cubicles on one side. In the Niazabad bath, the shower niches are located under small vaults forming the octagon (hashtie) from which the dome springs. The showers face towards the central rubbing down and massage platform. Shower doors were lowered to allow people to communicate during all the stages of the bathing process.

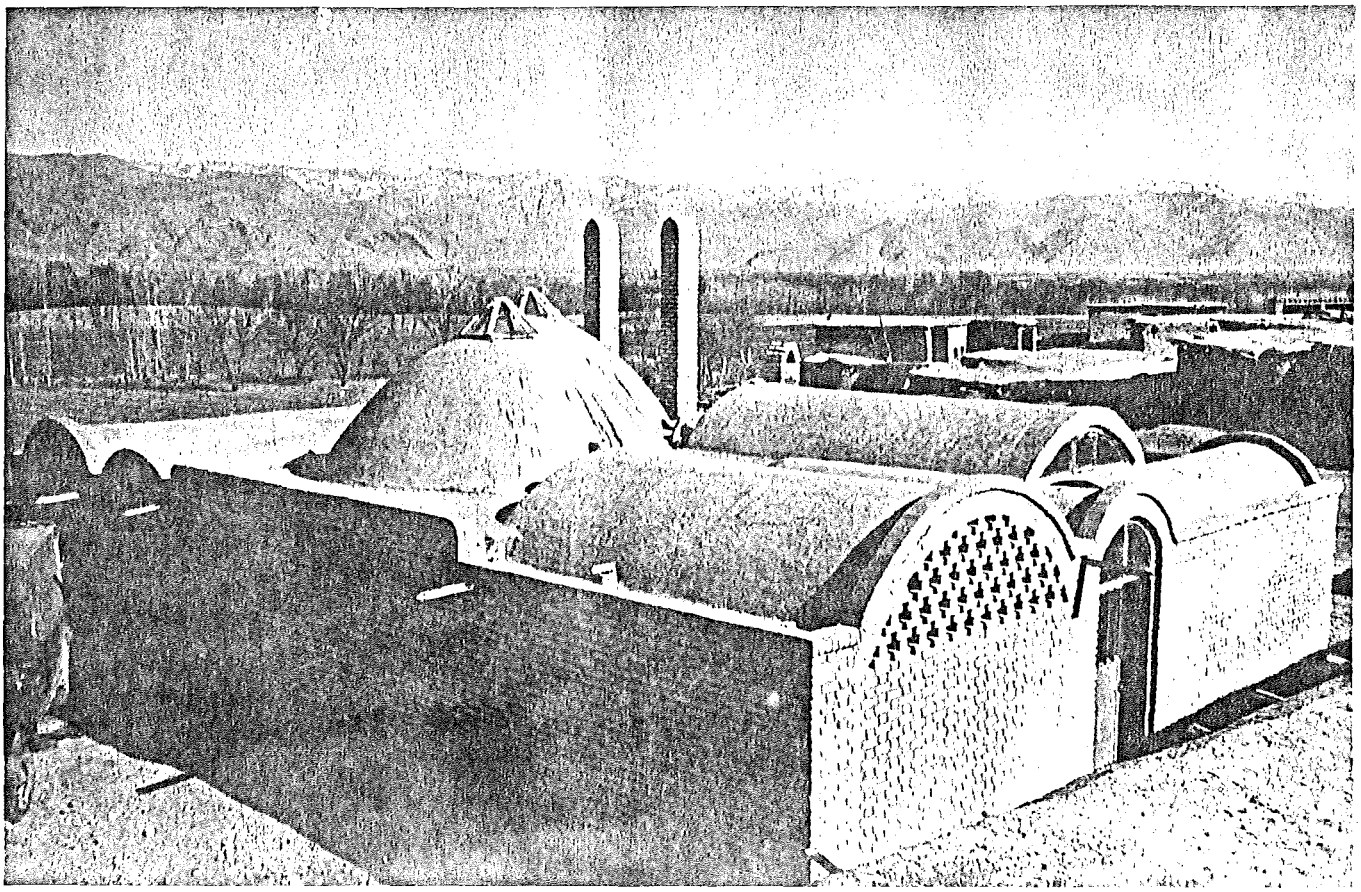
It had been observed that little children were not taken to the baths due to the excessive heat, and were washed in the open water channels. To stop this unhealthy practise a baby and clothes washing room was located to one side of the main entrance passageway. This is an innovation not found in traditional baths.

The Niazabad hamaam has six showers and is large enough to serve several villages. From the experience in designing and constructing this hamaam, and from further discussions with

Niazabad hammam;
central pool in changing room.
Spaces desined to meet
traditional social functions



Niazabad hammam :
chimneys connected to
underfloor heating ducts.



local people, it was decided to design a basic hamaam unit that could be expanded from two to four or six showers. The design itself was somewhat simplified and only vaults were used so that the villagers could consult the hamaam themselves with a minimum of external supervision.

Technology and Training -

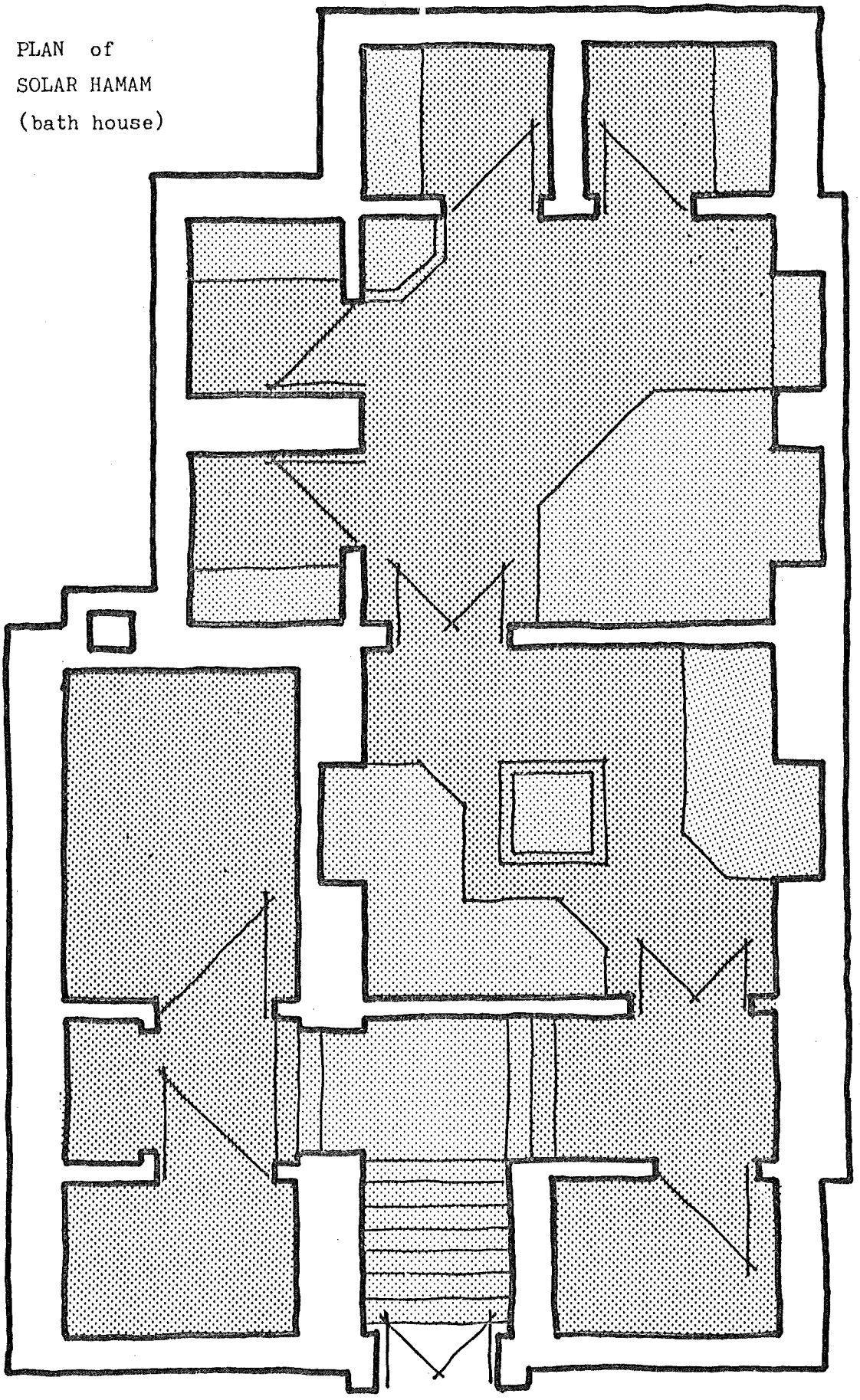
As in traditional baths, vault and dome roofing was used in the Niazabad bath. The octagonal (hashtie) dome fitted naturally with the "in the round" socialising space required for the bathing process. Vault and dome roofing also did away with the need for bringing in expensive I beams, which in any case rust easily particularly in hamaams. The construction of the hamaams was also used as a training process for local builders. Thus while the Niazabad hamaam depended on two skilled masons leading the building team, there are now several more local builders trained in the process who can construct the hamaams independently.

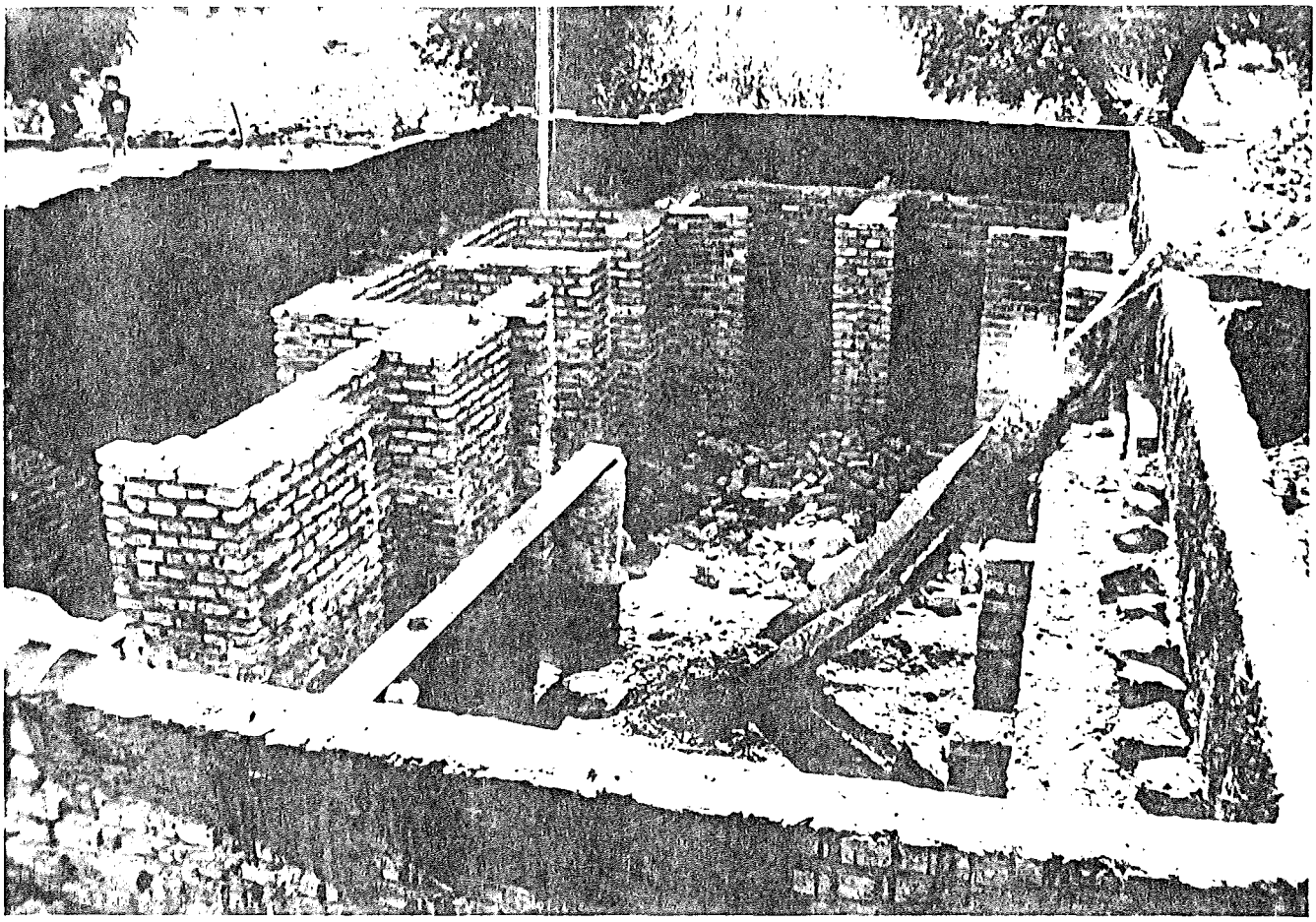
Solar Hamaam System -

The fuel costs for conventional water heating systems for the average village are high, even in a country such as Iran. Deliveries of fuel are at best uncertain, and maintenance and repair of boiler systems are too complicated for the local skills available. Fires often occur as a result of poor supervision. Several hamaams in Selseleh were lying idle as a result of one or a combination of these reasons. Furthermore, the conventional fuel sources are finite and alternatives must be developed to take their place in the future.

With these points in mind, we have designed hamaams so that they could be run on solar energy. Although the solar water heating system is not maintenance free, it does offer a simpler and more autonomous method of providing hot water than the conventional fuel fired systems. Experiments are being carried out on a variety of solar systems, prior to installing them on the hamaams. Meanwhile, small fuel fired boiler systems are operating the hamaams, which in future could act as back-ups to the main solar systems, during short periods when there may be insufficient sun.

PLAN of
SOLAR HAMAM
(bath house)

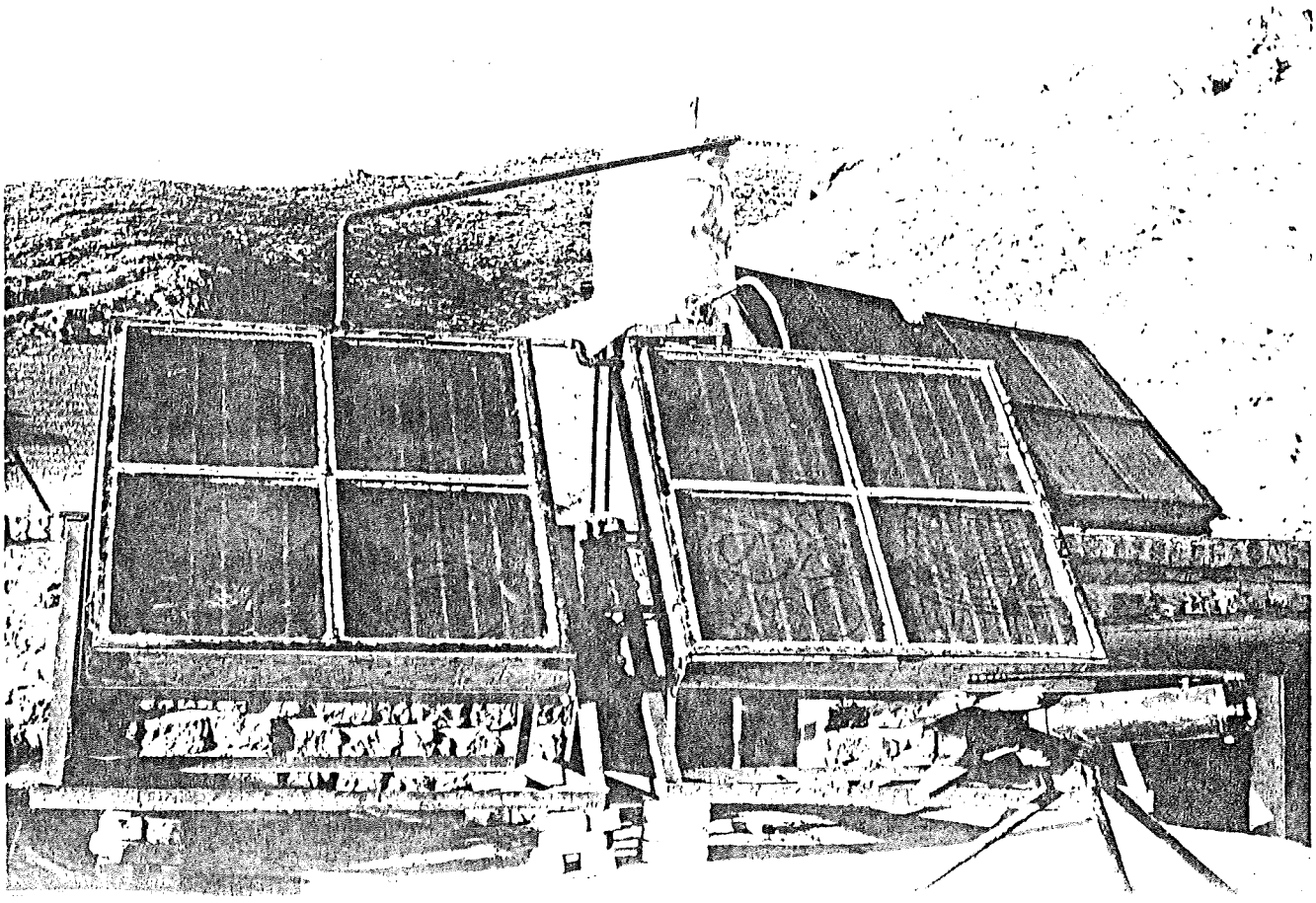




Solar hammam being constructed

below ground level.

Solar collectors produced in village workshop in Loristan being tested for use in solar hammam.



Village Participation -

As was the case for all community buildings the process was initiated by the villagers requesting the facility and showing willingness to contribute land and unskilled workers. In Niazabad the headman had donated a plot of land. However, construction work had stopped in the early stages because the villagers felt that the headman would use the bath as his personal property. It was not until the land was officially claimed as public property that construction continued.

The village divided itself into six sections based on extended family groupings - each grouping responsible for providing an equal number of workers. This is the system used during harvesting and other times when the village has to organise for a collective effort. There were two further crisis situations: one was when the Niazabad villagers said that because the surrounding villages were not contributing they should not be allowed to use the hamaam. After some debate, the Niazabadis agreed that the advantage of having the hamaam in their village warranted their additional effort. The second time was when, with winter approaching, some bread-winners planned to leave for their customary jobs in Tehran. Initially they refused to pay for someone to take their place. Once again after much debate and with the fear of village ostracism and forfeiting the right to use the hamaams, these villagers agreed to contribute.

Such incidents were typical of the problems that arose in participatory projects. But the educational benefits for all concerned in learning to organise co-operative action and effectively implement such action far outweighed the problems. Thus there was a significant improvement in voluntary organisation with each successive hamaam to the point that the most recent hamaam needed a minimum of external supervision and the work was largely carried out by the local villagers and their Front Line Worker.

The final proof of effectiveness of using improved indigenous methods of design and technology and participatory action in implementation of projects is reflected in the costs. The Nia-

zabad hamaam cost less than 50% the cost of a government six shower hamaam, although it had the extra feature of the baby wash room, a slightly more time consuming training process, and the inevitable extra cost of being the first of its kind. The hamaams built consequently cost a further one third cheaper partly because of the improved design, the use of vaults alone and better organisation of voluntary workers as a result of prior experiences.

Intermediate Urban Centres:

It is essential that small urban settlements spread across the country are encouraged so that people can live, work and obtain their required services within their own regions. In this way each region can develop using its own population to its fullest potential and not lose this active work force to a few large cities. Such settlements can play a key role in achieving a healthy balance in the development between regions and between the rural and urban areas. Recent government studies suggest that the largest number of urban settlements to develop in the next 25 years will be in the 5000-50,000 population bracket.* It is very important that some guidelines are developed on how these settlements should grow. Alashtar is in many ways typical of such newly emerging urban settlements. From the experience of its rapid transformation from village to town and in the developing of a town plan for Alashtar some guidelines are suggested here.

1. As far as possible the growth of existing settlements should be encouraged rather than the building of new towns. The number of soulless or even abandoned new towns indicate that it is extremely difficult to create a living community where nothing existed before.

2. Intermediate urban settlements should provide only those facilities that cannot be further decentralised in the villages around it. People should come to the settlements to obtain their required services during a short stay and return to their villages. This requires efficient public transport within the region.

3. The potentials of the existing settlement pattern and housing types should be fully extended in guiding the

* Plan and Budget Organisation. Centre for National Spatial Planning. Urban Development Vol.3. Second Stage Final Report. May 1977.

growth of the settlement and in new housing.

4. Existing social and commercial nodes should be encouraged and improved, as should existing neighbourhoods. These nodes and neighbourhoods are often physical expressions of rich, long nurtured social linkages between people that cannot be easily re-created in newly constructed areas. Thus as far as possible it is better to rehabilitate than to demolish and build anew.

More specific issues are discussed in the following description of Alashtar's growth and the proposals for it.

Alashtar Town -

Alashtar, the administrative centre of the Selseleh Division (Baksh), is located 50 km. north of Khoramabad, the provincial capital of Luristan.

Within the Selselh region, Alashtar acts as the market, administrative and service centre for the 60,000 population of the area, who are engaged mainly in agro-pastoral activities. In addition, there are a number of nomadic tribes who pass through the region on their twice yearly migration, who could use the services offered within the town. Alashtar is already a rapidly growing town, facing the problems of transition from a rural to an urban settlement, and it contains the main medical dispensary and secondary education facilities in the region. In the last five years its population has nearly doubled to 7,000, reflected in a sharp increase in house building activity.

The three original villages within the present town area of Alashtar are examples of compact indigenous settlements. Qaleh Mozafari, the largest of the three villages, was built around a communal square onto which the castle of the tribal chief fronted. In recent years the Alashtar settlement began to lose cohesion. A number of public buildings were situated at a considerable distance from the village and began a linear

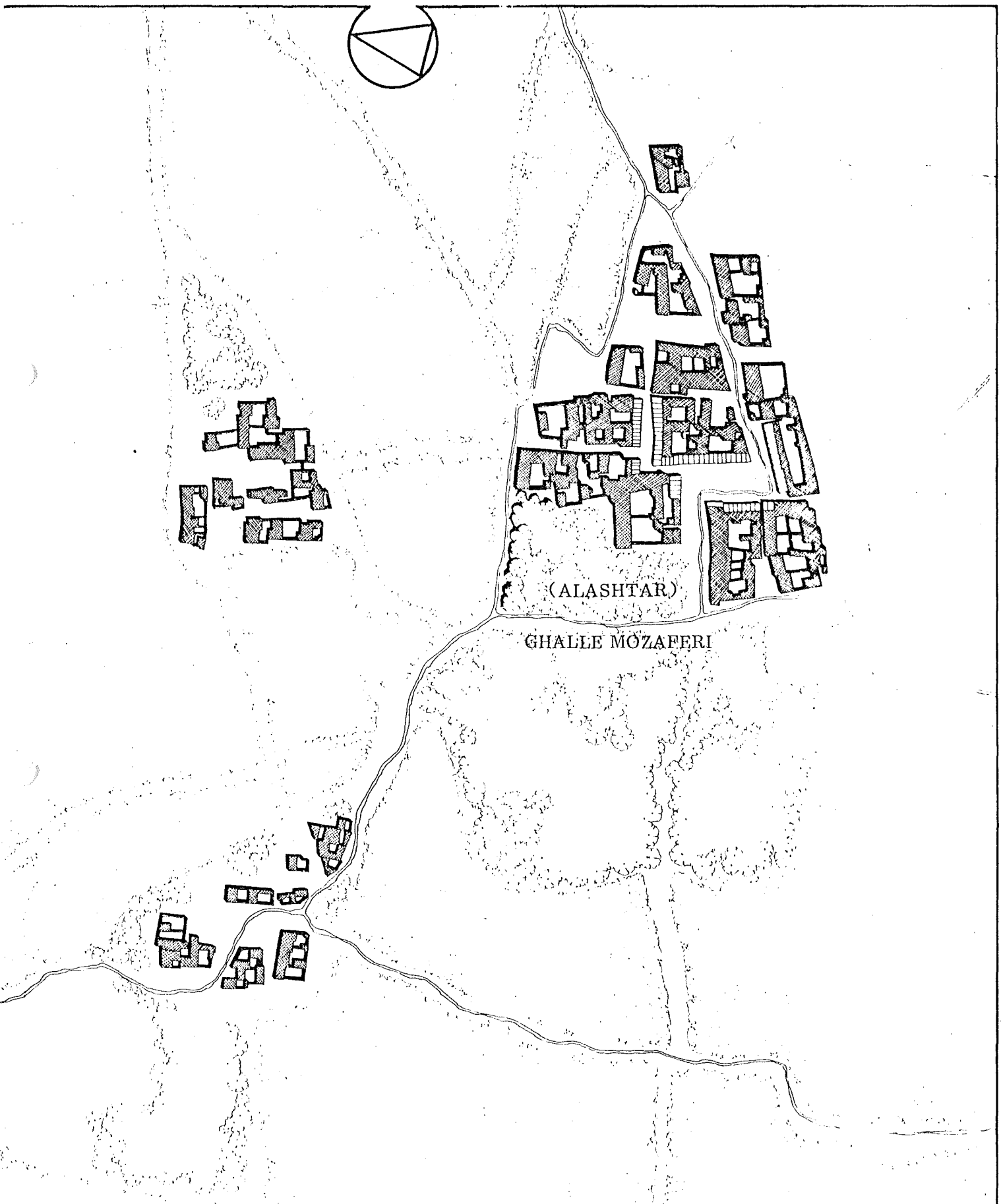


Fig. 2.2

INDIGENOUS PATTERN

Alashtar was the largest of a number of villages in the neighbourhood. It reflects the local pattern of compact concentric development around a common space. The fort of the local tribal chief was the centre of the village.

expansion. An official road plan which was partially implemented increased this linear movement and endangered the integrity of all three indigenous settlements by proposing wide roads cutting through the centre of these communities. Furthermore, the local population had been building along the proposed roads of this plan, and the unbuilt areas in between the ribbons of housing turned into rubbish pits and stagnant pools, a major threat to health. The tendency of the town to sprawl rendered it unsuitable to pedestrian circulation and the present use of animals for transportation, as well as engulfing large areas of fertile agricultural land without utilising the full potential of this area for urban development.

The proposed plan has two broad aims. Firstly it aims to use and extend the potentials embodied in the indigenous settlement pattern to provide continuity along with growth. Secondly it aims to rectify the damage done to the existing settlement in recent years. A unifying sociocommercial nucleus to the town is suggested at the site of the original bazaar to revitalise it. The proposed town centre is composed of a bazaar, hotel, workshops, the old fort and town square. Gathered concentrically around this nucleus are the residential neighbourhoods (mahallehs). The mahallehs are linked with this centre and with each other and yet are distinct units with their own facilities, preserving the partial autonomy of a village and keeping a scale that residents can identify with. The mahallehs average four hectares with approximatley 500 persons per mahalleh. Apart from three existing wide avenues that cut the town, the rest of the roads have been laid out so that they provide car access without destroying the mahalleh identity nor dominating over pedestrian needs. Major roads ring each pair of mahallehs. A smaller service road runs between two mahallehs leading to common parking, at which point vehicles give way to pedestrians. The pedestrian lanes however allow emergency vehicle access. A series of existing green spaces with the largest located centrally run diagonally across the town. These have been desig-

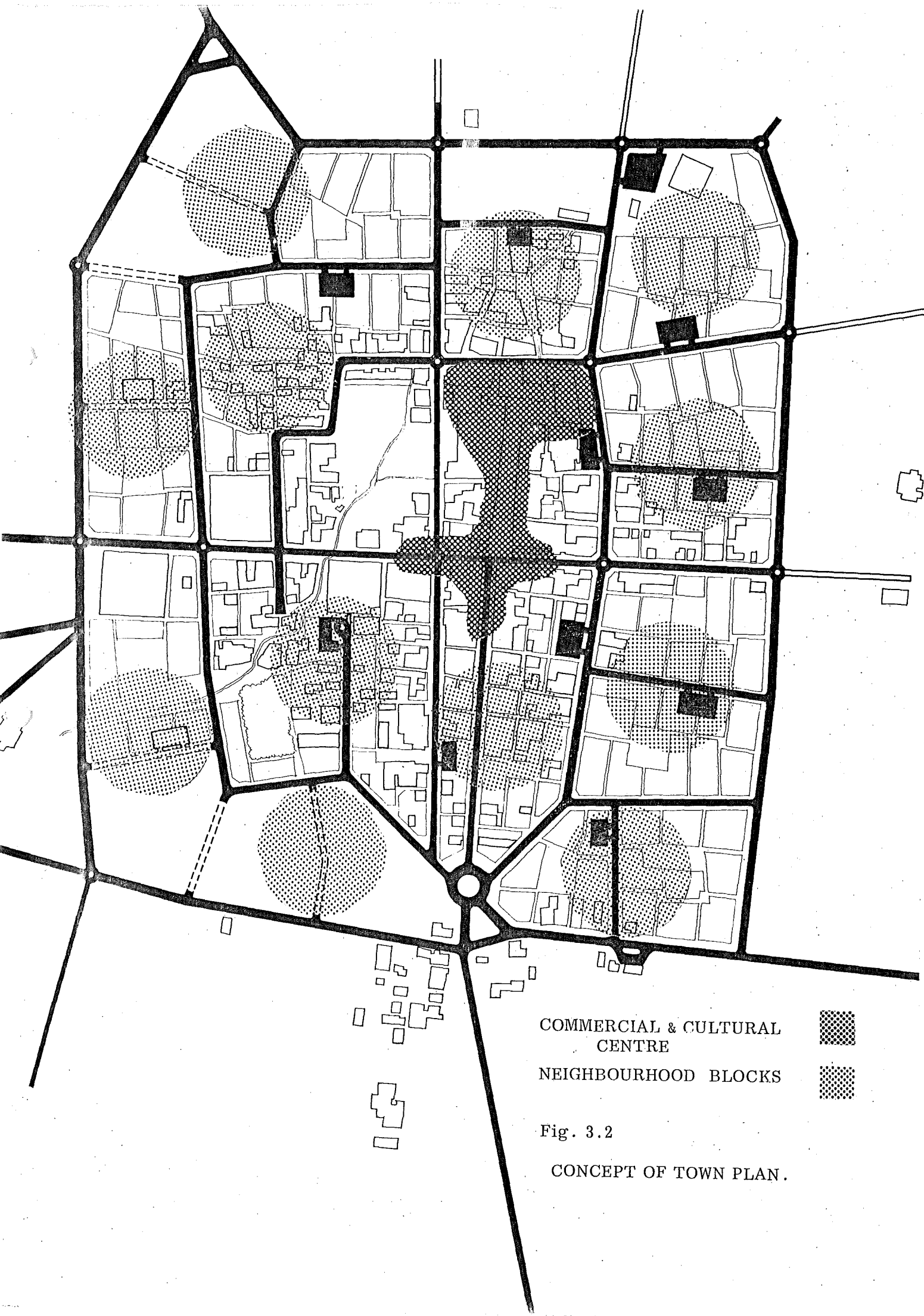


Fig. 3.2

CONCEPT OF TOWN PLAN.

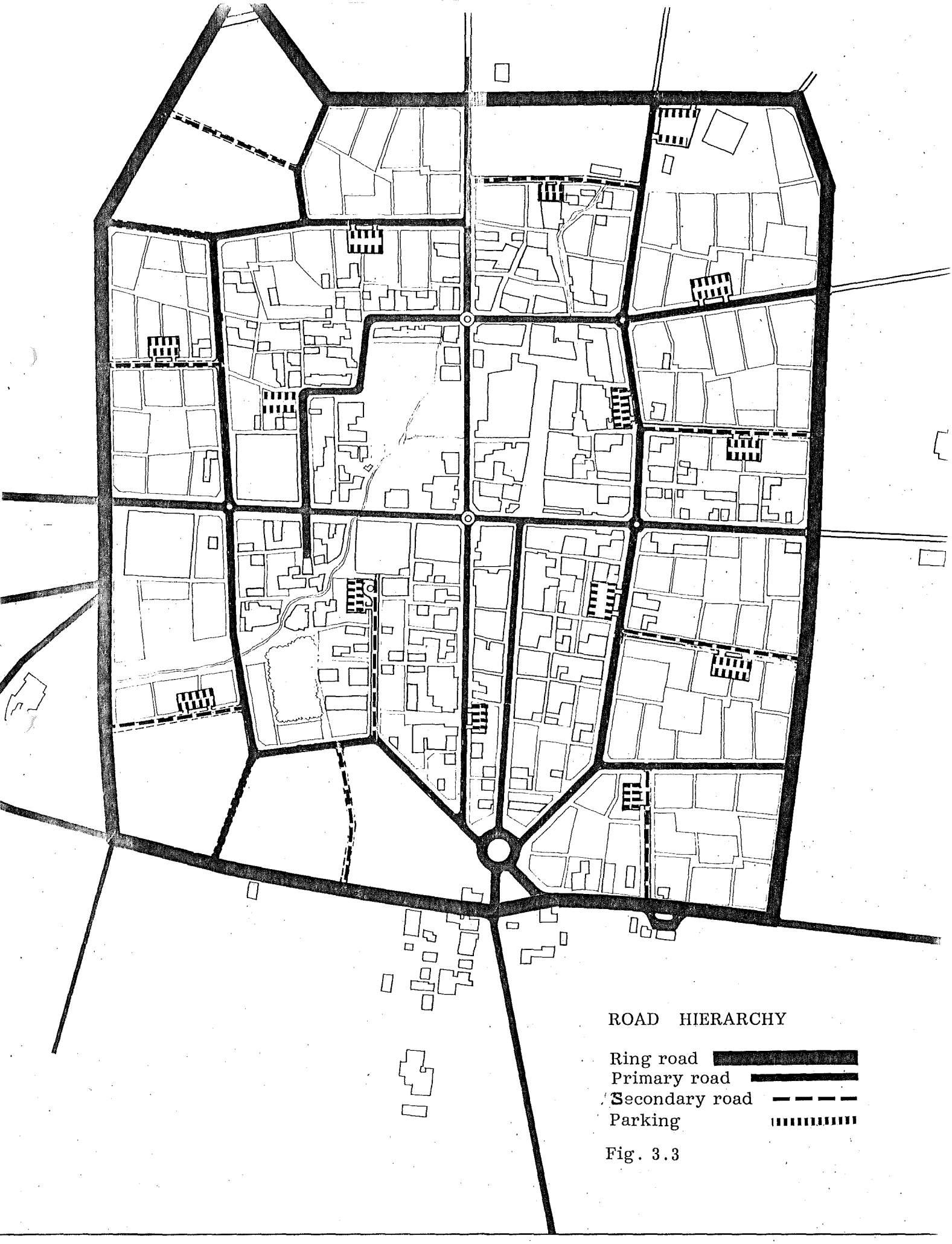
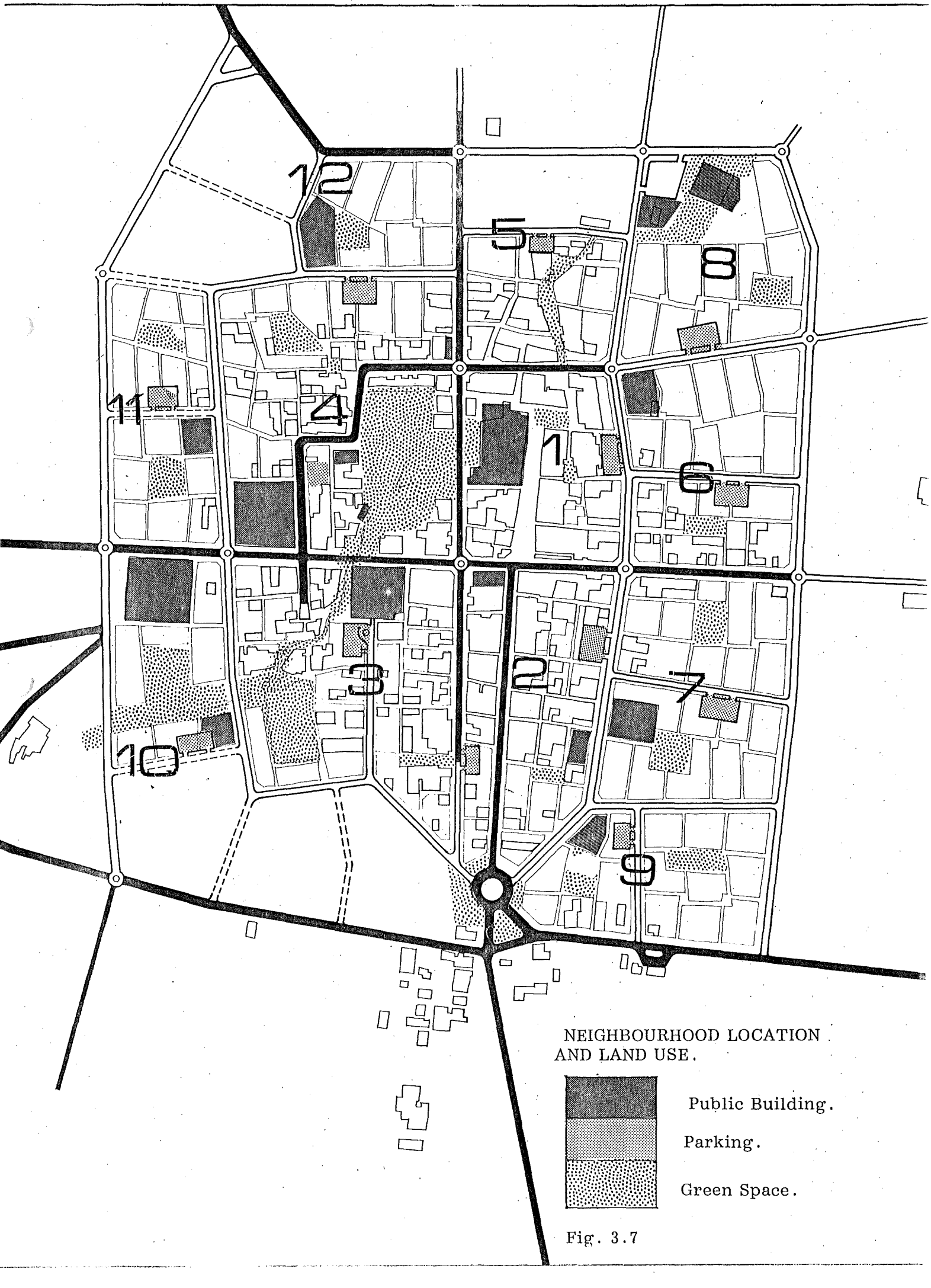

ROAD HIERARCHY
Ring road
Primary road
Secondary road
Parking

Fig. 3.3



NEIGHBOURHOOD LOCATION AND LAND USE.

Public Building.

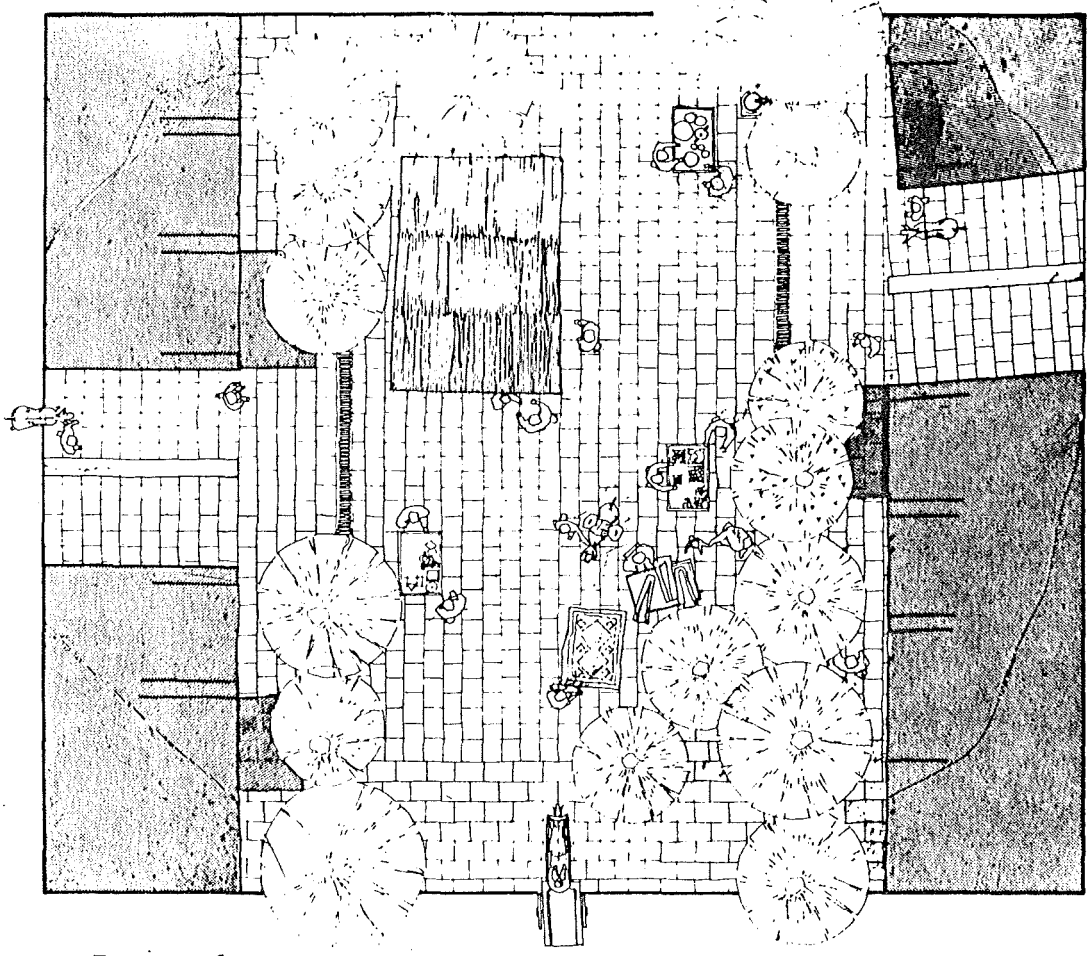
Parking.

Green Space.

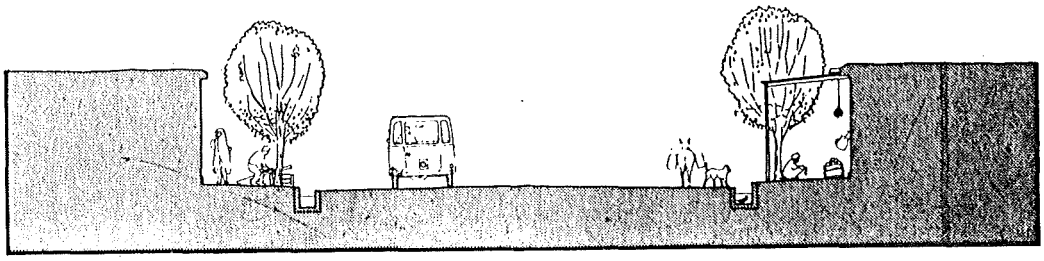
Fig. 3.7

PEDESTRIANISED COMMERCIAL CENTRE

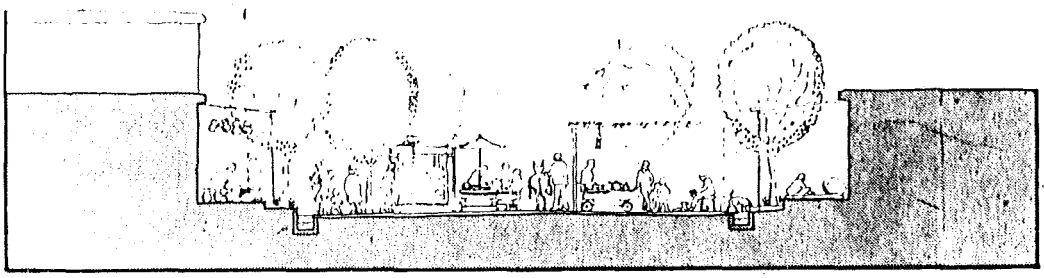
Fig. 3.17



Proposed



Existing



Proposed

nated as parks and form a pedestrian route through Alashtar. Outlying mahallehs will not be released for building before the inner ones are efficiently built up, thus providing orderly and phased growth.

The Bazaar -

In traditional Middle-eastern cities, the bazaar was one of the few most important urban elements. Its role being both more comprehensive and more fundamental than just a market, the bazaar formed the heart of the city's economy - trade and production as well as containing a substantial proportion of the public facilities and socio-cultural centres. The labour-intensive economy of the bazaar made it a major source of employment for the city. Shops lay on both sides of the bazaar's central linear axis which was one of the town's major routes, normally beginning near the town entrance and terminating in the main square. Caravanserais containing warehouses and accomodation for the tradesmen were situated behind the shops and off the main axis. Mosques, hamaams, teahouses and workshops were all integrated into the bazaar complex. As a covered space with limited vehicular access, the bazaar could be used all year round regardless of climatic extremes and unhindered by heavy vehicular traffic. Today the bazaar in many Middle-east cities is still a vital element.

Alashtar, on a modest scale, had such a bazaar. But, as has happened in so many cities in Iran, an imposed system of wide roads has begun the disintegration of this bazaar. Most of the roads are lined with garage-like shops, many unused and speculative. No clear focus for commercial activity has emerged to replace the bazaar. The streets that do have shopping and production are highly unsatisfactory: the shops are too small, pavements are filled with makeshift extensions that are only usable in the summer and shoppers mingle dangerously with vehicular traffic, exposed also to the summer heat and

winter snows.

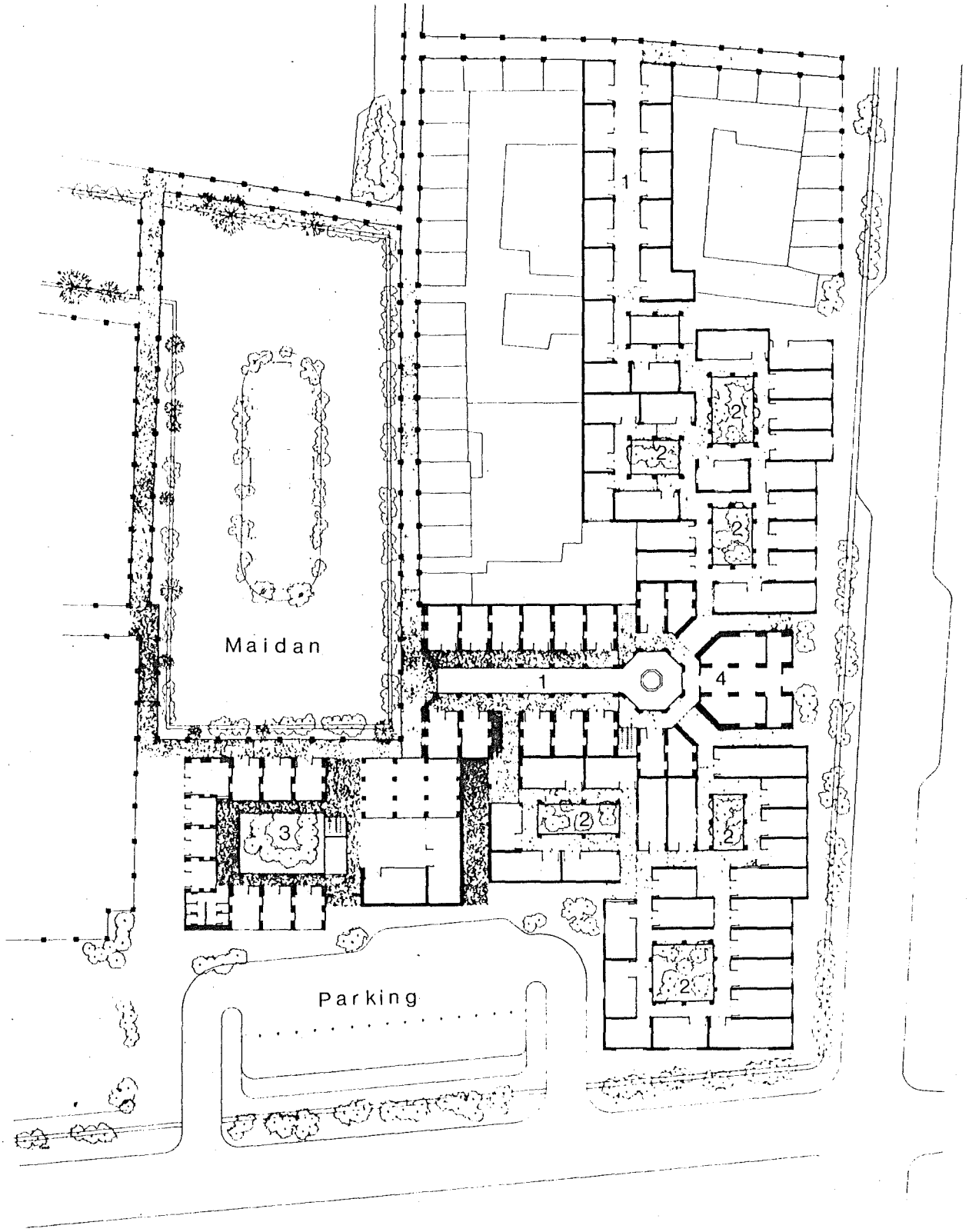
The proposed bazaar area attempts to retain the qualities of a traditional bazaar while modifying it to suit present day needs. Part of the existing shopping street has been pedestrianised with only delivery vehicles allowed during fixed times. Covered arcades are proposed in front of existing shops to deal with shop over-spill. The pedestrian precinct leads to the old town square (maidan), the old fort, the proposed bazaar and mehmanserai. The old fort could be used as a cultural centre for the town. The commercial and productive activities of the bazaar itself are integrated in a covered and pedestrianised complex that is well served by roads along its boundaries. From parking bays adjacent to the bazaar, goods can be taken between trucks and shops by small trolleys. The bazaar consists of a central pedestrian spine with selling outlets on either side. This extends to a second floor with more shops, offices, workshops, and a gallery overlooking the lower level. The spine branches left and right to a series of production courtyards - where quilt-making, weaving, metal-goods manufacture, etc. can take place.
As the bazaar also serves the surrounding villages and the migrating nomadic population, the mehmanserai can be used for short stays by visitors and tradespeople. The combined production and selling spaces and the mehmanserai perform the function of the traditional caravanserai.
While not replacing small shops located in mahallehs, the bazaar area will nevertheless focus commercial activity which at present is spread haphazardly through the town. The bazaar will also encourage the trade and market town role of Alashtar, thus encouraging the region's socioeconomic development.

The Mahalleh -
The mahalleh formed the basic residential unit in many middle-eastern cities. Each mahalleh often belonged to a particular

COMMERCIAL - CULTURAL CENTRE.
Location Plan. Fig. 3.16

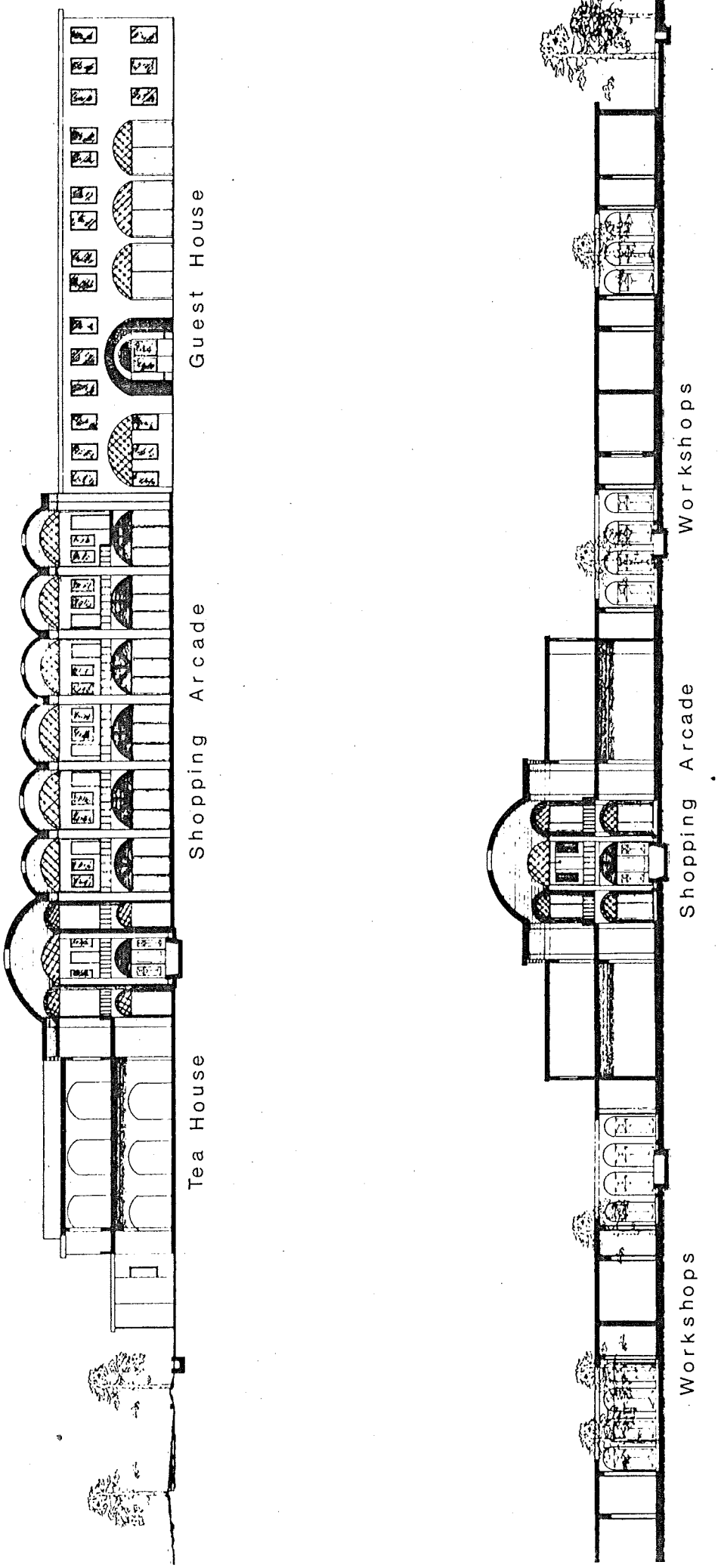
ALASHTAR BAZAAR

Fig. 3.18



1 Shopping Arcade
2 Workshops
3 Guest House
4 Tea House

Fig. 3.19 ALASHTAR BAZZAAR.



ethnic or occupational group. Even when this was not the case, the inward looking form of the mahalleh, its clear definition as a separate unit, the presence of communal facilities such as local open spaces and shops, and the avoidance of busy roads that would invite through circulation of people who were not actually visiting the mahalleh, all helped foster the community nature of the unit. Each mahalleh has houses laid out in clusters and contains community facilities such as schools and shops. Small existing green spaces within the mahallehs have been designated neighbourhood parks.

In Alashtar, the inspiration has been both the traditional city mahalleh as well as the village settlement. Thus in addition to creating new neighbourhoods, three of the mahallehs have developed from the existing villages which are now within the town limits. The previous town plan envisaged wide roads cutting through each of these villages and adjacent orchards, thus destroying the indigenous settlement pattern. The proposed plan capitalises on the villages' existing community structure by making each village the core of a mahalleh. However, in one of the villages houses had already been partially demolished to make way for the road through the village. Although considerable damage had been done it was not irreversable. Having diverted the road to go around the village, an infrastructure of lanes and small public squares within the village was then laid out. The most difficult task was to convince people that the road would not go through and that they could start rebuilding their homes according to the new layout. To instill confidence, S.I.D.P. built three houses directly in the line of the previously proposed road. These houses were integrated into the built fabric by combining with existing houses to form a cluster around a public space. The houses used the local timber roof technology and the indigenous courtyard design to demonstrate how local methods could be used to meet contemporary urban needs. As a result the local people are now rebuilding and restructuring their community in this mahalleh.

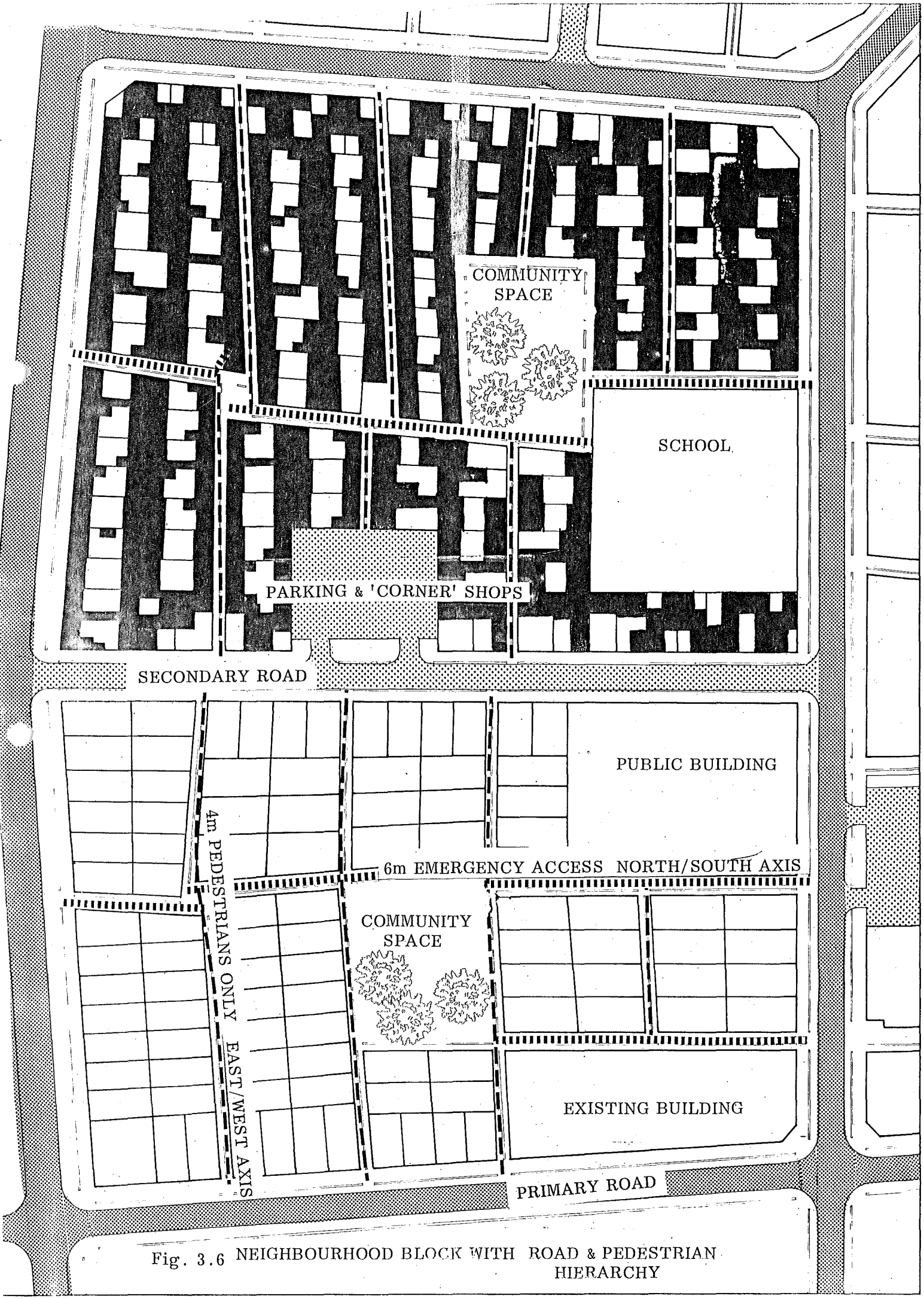
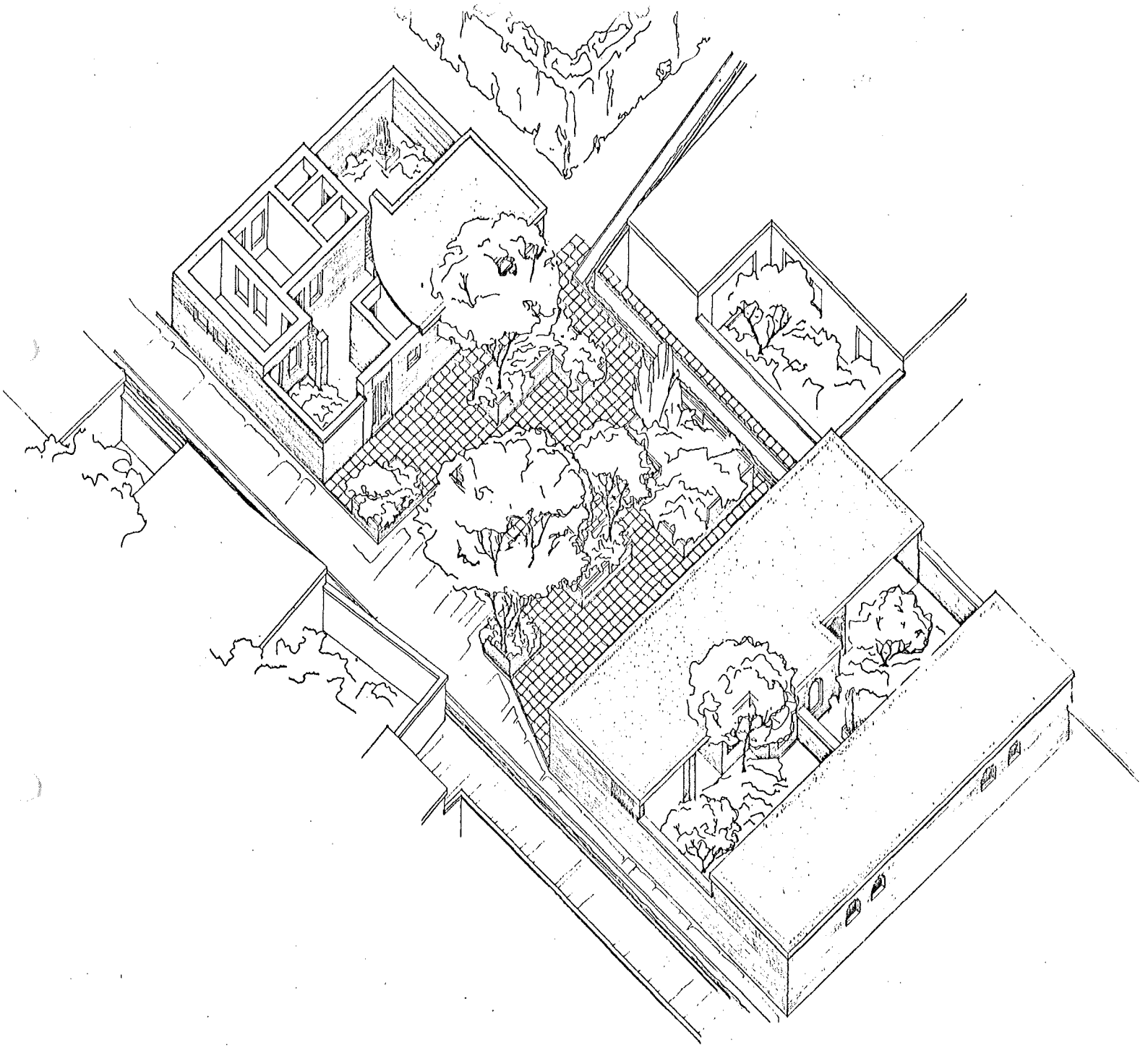
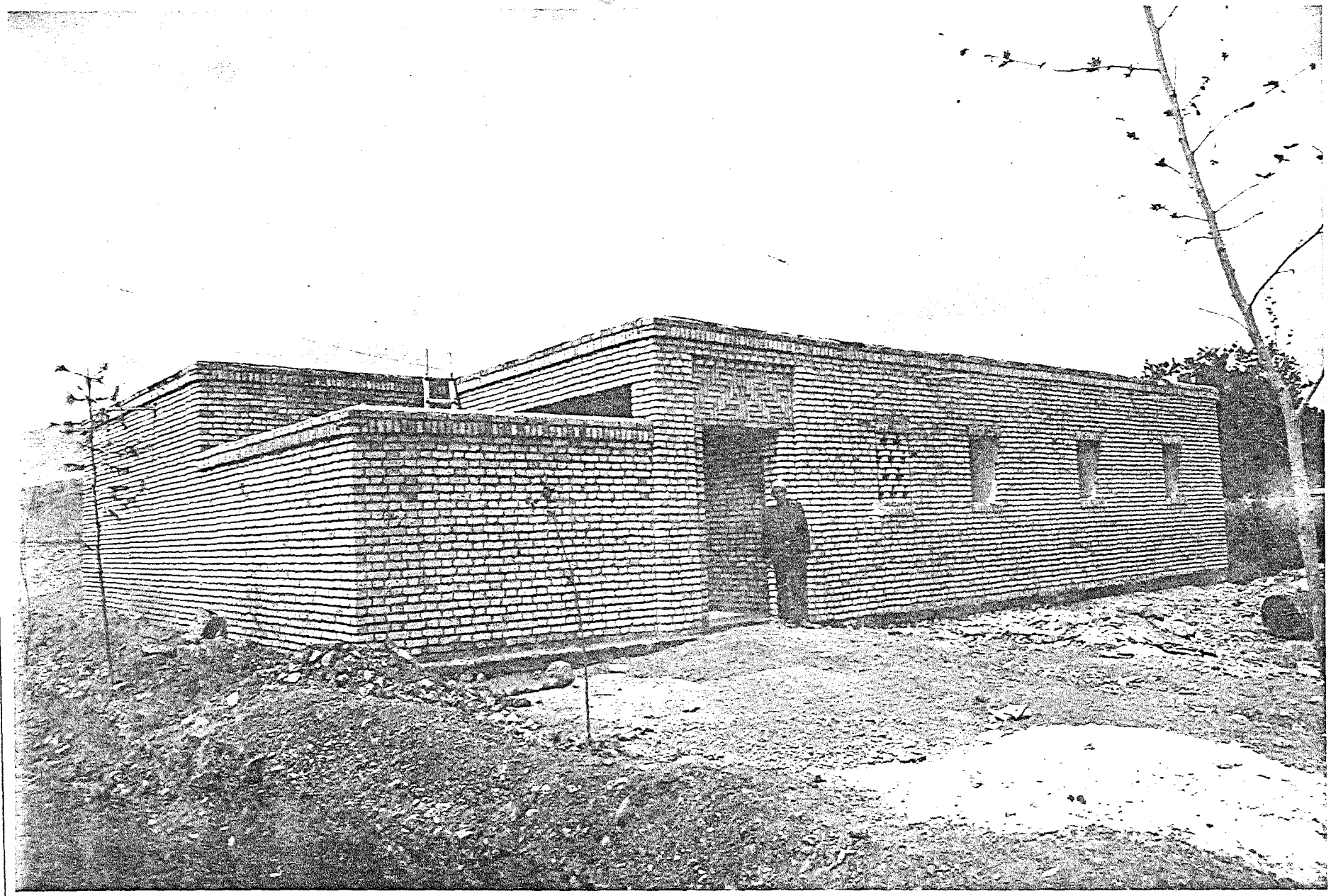


Fig. 3.6 NEIGHBOURHOOD BLOCK WITH ROAD & PEDESTRIAN HIERARCHY



NEIGHBOURHOOD SQUARE AND NEW HOUSE DESIGNS BASED ON THE INDIGENOUS

Fig. 3.12



Low Cost Housing for Teachers

Alashtar, Luristan

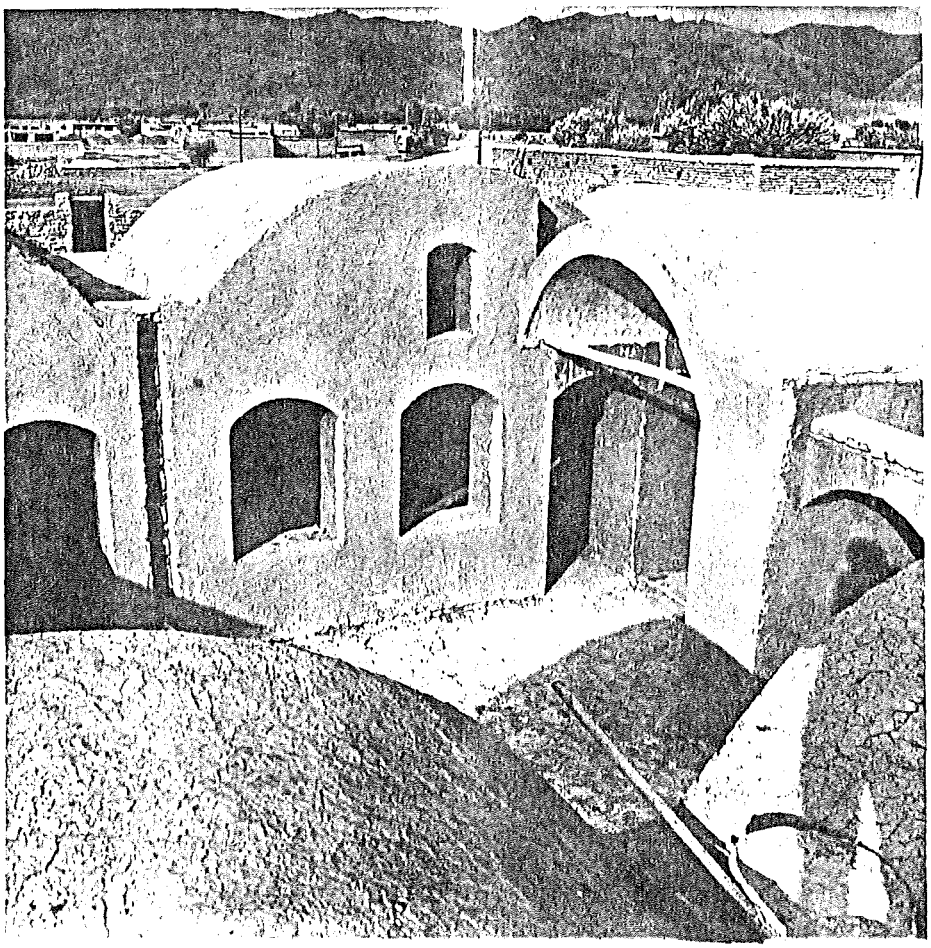
Housing:

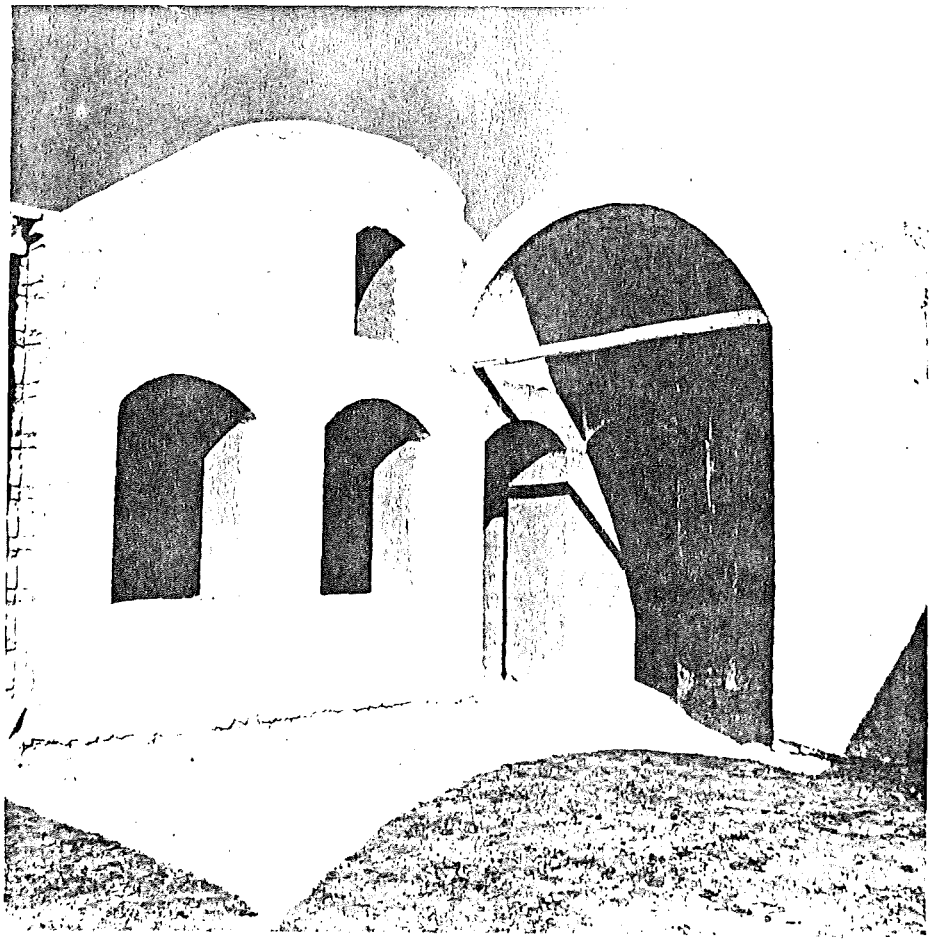
Regional development that decentralises population centres and therefore also housing demand, coupled with the development of indigenous human and natural resources would go a long way to alleviate housing problems in Third World Countries.

Land prices for housing would be significantly lower when demand is spread in many small settlements rather than highly concentrated in a few cities. Local builders could be trained in greater numbers and more quickly to build houses using improved local methods than if they were to be trained for complicated, imported, highly technical methods of construction. Maximising the use of local technologies and resources would result in low cost houses whose construction process would also be free of delays in delivery that dependence on importing materials often cause.

Cheaper land, the greater availability of builders, building materials and use of local construction methods will mean that more people can directly meet their own housing needs. Government will be free to concentrate its limited personnel and funds in the tasks that are beyond the individual's ability. These are:

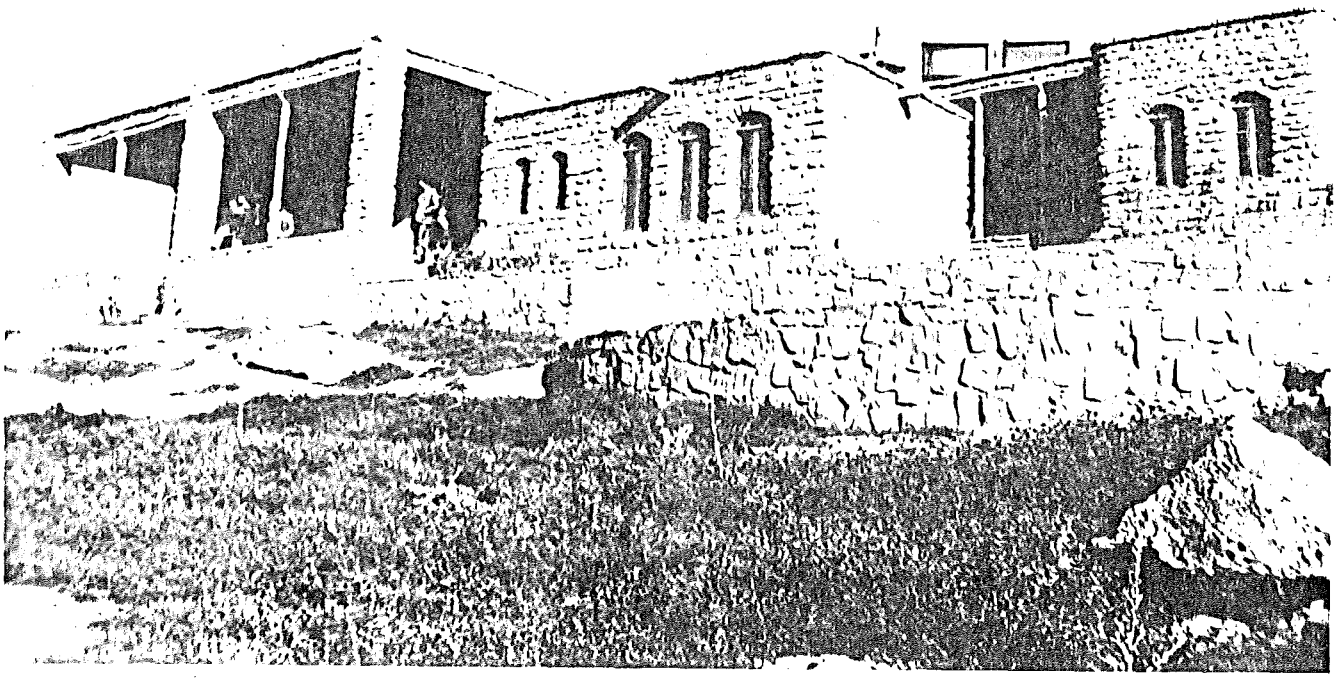
1) A legal, administrative and financial structure that guarantees and facilitiates the individual's easy accessibility to cheap land, building skills and materials. For example, loans to small-scale building materials industries, builders' co-operatives, etc.
2) Site infrastructure, such as levelling, roads, water supply and waste disposal.
3) Construction of housing units for those who cannot be involved in organising their own house building such as factory workers in a new settlement.

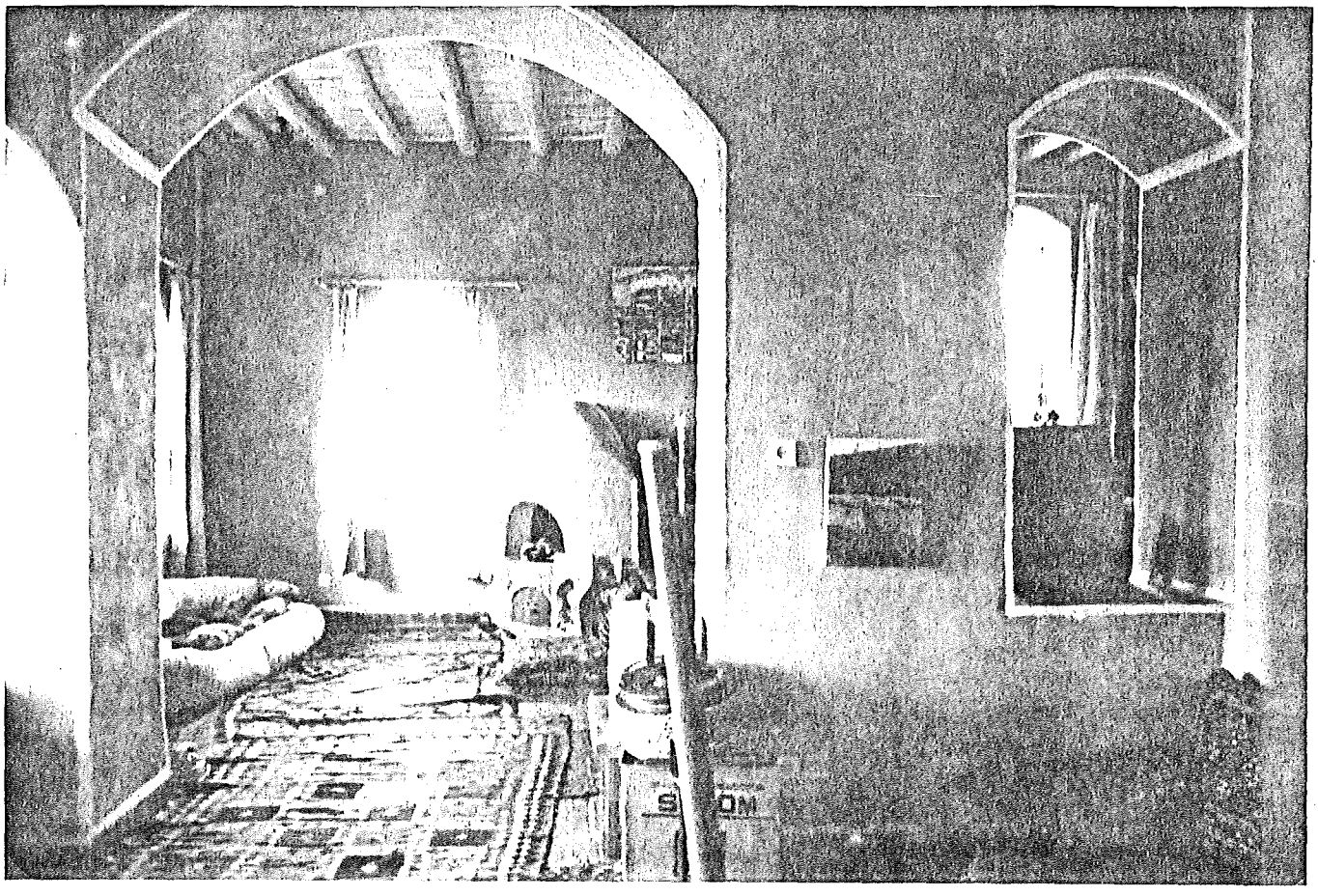




Prototype Low Cost House Unit

Under Construction
Built with stabilised Mud Brick





Project Meeting House

Design based on local village model
Built of stone with timber and mud roof.

The Courtyard House -

The most predominant feature of the indigenous middle-eastern settlement is the courtyard house form. This pattern of clustered inward looking units reflects not only the family's requirements for privacy, but also the settlement's response to a frequently harsh external environment. Unlike the outward looking European house, designed for a temperate climate and the western family unit, the middle-eastern house turns its back on the extreme climate and focuses upon a peaceful private courtyard with its naturally moderated micro-climate.

The rooms are built around a walled courtyard and open onto it. This courtyard helps protect the rooms from the occasional dust storms and the severely cold winter winds. In the warm summer days it acts as a well to trap cool night-time air and retain it throughout most of the day.

Thick walls isolate the interiors from the extremes of heat and cold. The thermal properties of the masonry walls store daytime heat from the sun and radiate into the room interiors at night. The predominant south orientation of buildings means that the lower winter sun can penetrate and warm the interior of the house. Avans also facing south provide warm protected outdoor activity spaces in the cold winter months, and shaded spaces in the summer.

The indigenous process of construction for low-income families consists of first building a wall around the plot, and then gradually adding rooms around as the need arises with the increase in family members, and as money becomes available. In some cases, the house will grow up to two stories above the courtyard.

With increasing urbanisation in the Third World, unfortunately, many countries are importing high-rise solutions in an attempt to meet the demand for high density housing. High-rise becomes a major feature in many Third World Countries just at a time

when the West is beginning to realise the damaging social effects of living in such buildings, the high energy requirements and the costs to keep them even minimally comfortable.

Meanwhile, the indigenous courtyard house cluster is ignored though it is able to achieve high densities equivalent to maximum standards set in many European cities, while still providing private open space for each family and direct contact with the community at street level.

Contemporary housing should grow out of an understanding of not only the indigenous courtyard model but also the structure of the neighbourhood and its pattern of closed and open spaces.

Vault and Dome Technology -

Vault and dome roofing is an indigenous technology with particular potential for low-cost housing in many regions of the Third World. The vault and dome system evolved centuries ago in countries like Iran where the arid climate and growing population made roof spanning materials like timber and reeds scarce. Today, in a world where industrialised and often imported materials such as steel and concrete become more and more expensive, and also suffer periodic shortages, there exists a potential for developing indigenous vault and dome technologies to meet today's low-cost housing needs.

Local builders in much of Iran are familiar with vault and dome construction which is one of the most advanced indigenous building technologies. Apprentice builders can master the basic techniques after only short training periods.

Indigenous environmental technologies of natural cooling and heating have long been employed to provide comfortable environments in the traditional house. Today modern building depends upon energy consuming mechanical systems to make them humanly habitable. Features of the indigenous house such as wind catchers, evaporative coolers, and the use of masonry's

heat capacity in external walls can all be developed in contemporary shelter to create comfortable environments.

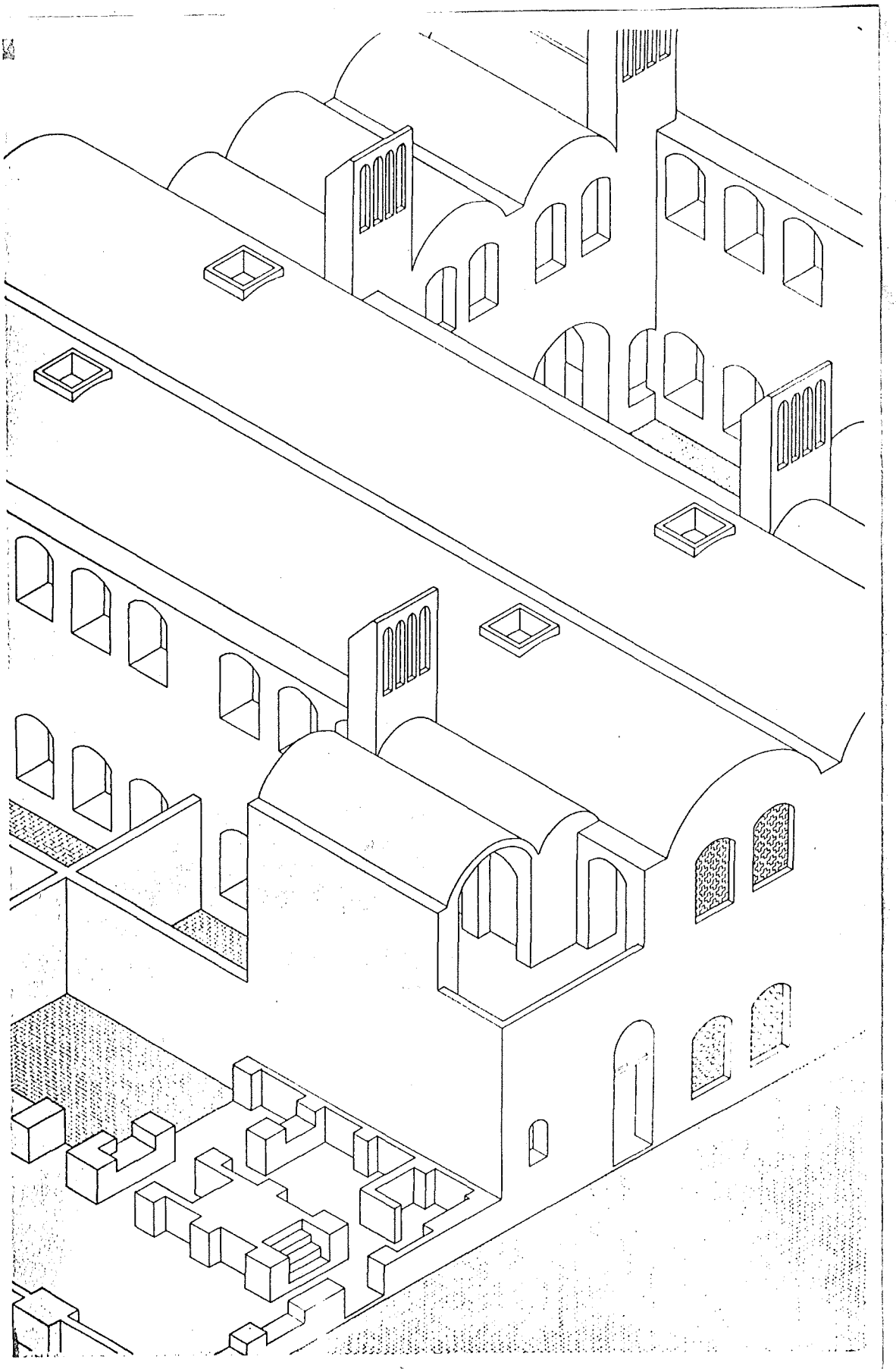
By using indigenous materials, economies can be made in both cost and energy terms. For example, stabilised mud-bricks, made of site soils with the addition of small amounts of either bitumen, lime or cement, can be produced for 1/3 to 1/4 the cost of conventional fired bricks. Even more are the energy savings in the production of the materials and construction using indigenous methods. A three bedroom 100m^2 house built of brick and steel will consume over 50,000 kilowatt hours of energy in its production and construction. A similar house built from local mud-brick will consume only about 6,000 kilowatt hours of energy during production and construction.

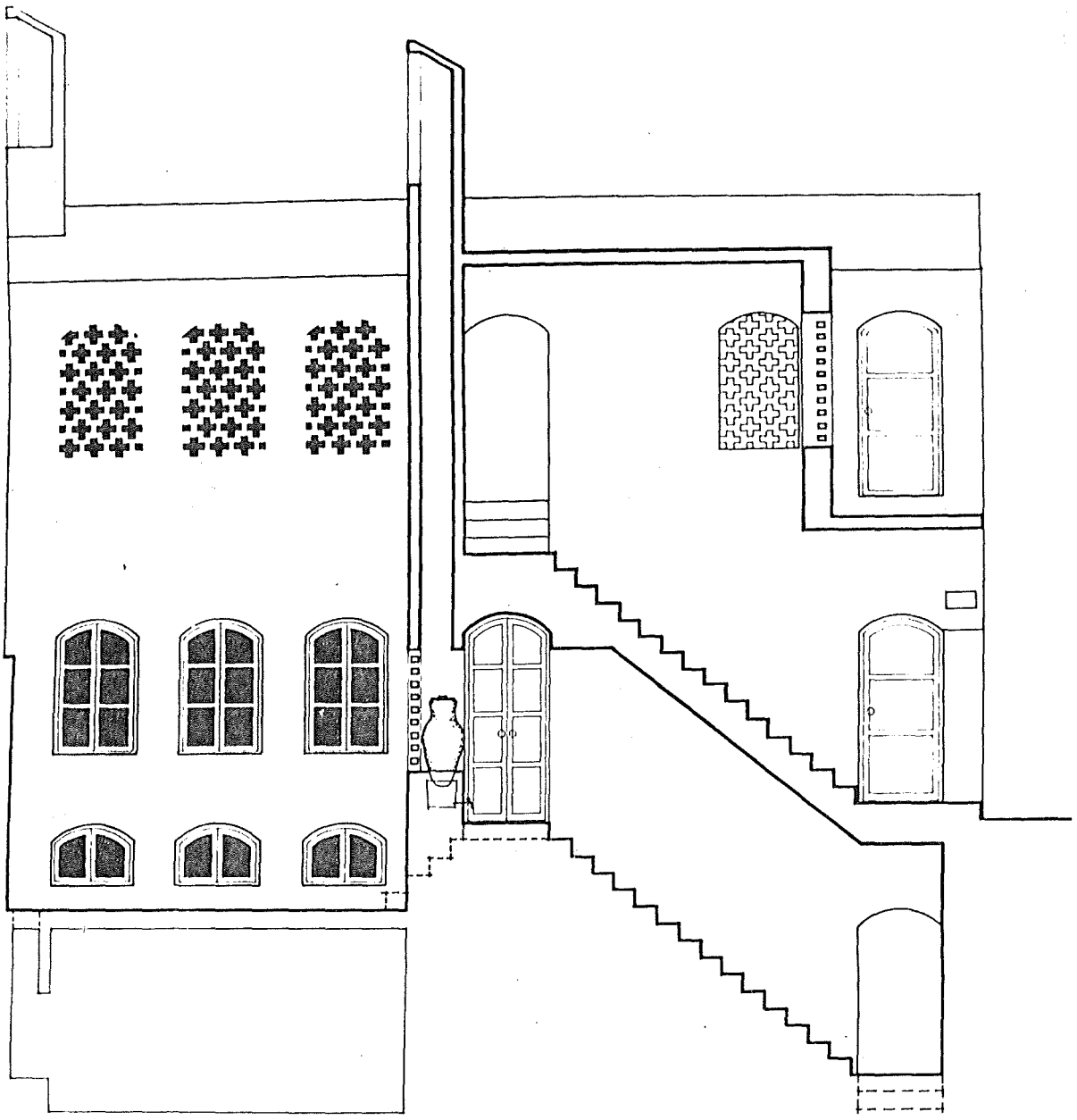
Housing Scheme -

The housing scheme illustrated here follows the approach taken in this paper. Prototype units have been built and tested.

The houses could be built by individuals, a co-operative, or by the government. The prototype units used bitumen stabilised, sun-dried mud-brick to provide a cheap yet moisture resistant wall. Only vaults were used to simplify construction as domes require comparatively more work. A basement provides not only a cool extra room but could also provide most of the earth for the bricks. Two long vaults cover four units and the rooms are designed so that the vaults counteract their thrusts against each other, minimising wall thicknesses. Wall materials are minimised and useful interior space increased by providing frequent arched wall niches that can be used as cupboards or sitting enclosures. The clustered layout yields densities of approximately 400 persons per hectare. The compact design results in a minimum of external wall exposed to the sun and weathering in general. The clustering around courtyards provides

cool external spaces. Furthermore, the clustering of several houses around a public space from which cars are excluded provides a safe open space that is yet private to that particular cluster. Such groupings of several houses as distinct units could make the organisation of construction simpler. Each group of houses could be the direct responsibility of a small co-operative of owner-builders as a sub-division of the overall construction organisation. After occupation, the groupings could continue to act as maintenance and administrative units. Each dwelling can be subdivided into two flats in response to changing family or ownership patterns.





Education and Building:

The local builders in villages and small towns are traditionally responsible for most of the construction, both public and private. These builders are both a valuable source of experience on indigenous building methods and also an appropriate channel for the introduction of improved indigenous building techniques. The educational process was a three way exchange between ourselves, the master masons and the local builders. Each learned from the other. The buildings were educational tools, through which improved indigenous techniques were developed and used and local builders trained. Thus on a builder's on-site suggestion, the kindergarten used a novel combination of a central arch supporting timber beams which doubled the minimum timber roof span. During the construction several builders were trained in arch technology. From an atmosphere of discussion, experimentation and learning throughout all the building activities, a group of promising and enthusiastic local builders was formed who were highly motivated to learn and take a pride in the result.

Builders' Workshop -

A high point in this learning process was in the winter of 1977 when a two month workshop was held by the building section of S.I.D.P. It was held in Yazd as Selseleh experienced snow during that period. The workshop further developed the aims and methods in a more intensive and organised manner than had been possible through building construction. There were two aims: to improve indigenous building methods through the pooled knowledge and participation of the village builders; and to train the builders in practical and organisational skills so that they were equipped to meet most rural shelter needs without dependence on city contractors, professional architects and engineers and imported building materials.

Builders Training Workshop ;
Learning through disscussion.
Group disscussion on acheiving optimum mortar mixes.

Builders Training Workshop;
Learning through practice.
Builders practicing small vault construction.

The workshop methodology was: learning through discussion, through practise and through experimentation.

For example, discussion on building methods, design, and drawing principles was introduced by asking each participant to draw their own house and discuss its advantages and disadvantages. From these discussions village housing and detailed building problems were identified and drawing skills developed. Each aspect of building construction, from different types of soils and foundations to walls and roofs were discussed in turn. On each subject the participants contributed their experiences and optimum solutions were agreed upon. Each building solution was tried out in practise in a yard set aside for such testing. At the same time, experiments were carried out on local materials like timber, stone and mud-brick. Soils were tested using simple sedimentation techniques that could be mastered by any local builder. Stabilisers for mud-brick and renders for improving earth walls against rain and wind weathering were developed for local soil types. The most widely applicable vault and dome types were selected and the builders learned how to construct them. Techniques using local resources to improve traditional buildings' resistance to earthquakes also formed an important part of the training. A local stone mason was brought in to conduct a two week session in stone technology. An extremely well informed Yazdi resident gave the builders an illustrated talk on the historical buildings of that area. In the evening, literacy classes were conducted for the largely illiterate village builders. The workshop demonstrated the importance of basic literacy to the builders by relating it to their work. By gearing a literacy programme directly to the problems of reading plans and keeping their own building records, builders developed a keen interest in becoming literate.

Finally, the aim of the workshop was to develop an educational methodology that barely literate builders could use to educate

themselves and improve their indigenous methods. This methodology, based on problem identification and problem solving by sharing knowledge through the processes of discussion, practise and experimentation, proved successful within the workshop. The results of the workshop was clearly demonstrated in the following building season. We now had several builders who could assume independent responsibility for projects. The builders took on new apprentices and within their own building activity injected the same spirit of learning that had first enthused them.

Conclusion:

The work presented here should be regarded as part of an inter-related process of learning, experimentation and practise. Thus the strategy for indigenous building in regional development evolved from the experience of living and working with the people of Selseleh, understanding their potentials, their problems and the difficulties of integrating the work of extra-regional "official" organisations to meet the needs of the local people. The conception of the builders' training workshop was due to a strongly felt need for competent local builders capable of implementing most of the region's building projects and thus freeing the region from external catalysts such as ourselves, city-based contractors and materials merchants. The techniques used in designing and creating the buildings described in the text originated from learning the methods used by the local people through discussion and experimentation with the builders in Selseleh. The completed buildings must be seen not merely as structures but in relationship to the experience generated during their construction process and to the functions they envelop through the activities of Frontline health, education and agricultural workers (mardomyars) trained by the Selseleh Integrated Development Project. The completion ofeach building not only resulted in one more useful facility for the village but also resulted in a few more trained builders, some further improvement in local techniques, a maximum of the building capital invested into the local community, greater knowledge on how to organise co-operative effort and increased confidence by the local people in implementing a project in a self-reliant way. Furthermore, since builders and building workers were a major recipient of the benefits of the above policy and these workers are often landless peasants, it was a means of improving the lot of the poorest section of society.

Inevitably, there are administrative sociocultural and economic problems that retard progress and often frustrate the implementors of such projects. Yet we feel that these difficulties are more than compensated by the rich reward of seeing [illegible] building workshop, the original participants requested and carried out a follow-up workshop with an additional 16 new trainees. Thus, the strategy has carried on into the practical work that follows, and is passing on the education process towards increased self-reliance and more appropriate buildings.

Architecture in Development

CATALOGUE ILLUSTRATIONS

A.1 Workshop - Group	Photo
Introduction	
1.1 Nomad Tent	Photo
1.2 Luri Village Housing	Photo
1.3 Community Building. Dome in Amir Kalh	Photo drawing.
Kindergarten	
2.1 Kindergarten Section	Drawing
2.2 Isometric Roof	Drawing
2.3 Close-up view of front of Kindergarten	Photo
2.4 Arch and Cole Farangie Building	Photo
2.5 Children in Courtyard	Photo
2.6 Interior of Classroom	Photo
2.7 Looking up Cole Farangie	Photo
Schools	
2.8 Children in Kaka Reza School Courtyard	Photo
Health House	
2.9 Animated Isometric	Drawing
Hamaams	
3.1 Old Hamaam, plan and section	Drawing
Niazabad	
3.2 Plan	Drawing
3.3 Section	Drawing
3.4 Exterior, View of Roof, Winter	Photo
3.5 Action Shot Building Dome	Photo

3.6 Waiting Room	Photo
3.7 Changing Room	Photo
Solar Hamaam	
3.8 Three Plans of 2,4,6 Shower Baths	Drawing
3.9 Isometric Services	Drawing
3.10 Isometric Complete Building	Photo Reprod.
3.11 Interior Waiting Room	Photo
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3.13 Solar Collectors	Photo
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Master Plan	
4.1 Aerial View	Photo
4.2 Town Plan	Drawing (2 sheets)
Bazaarche	
4.3 Plan	Drawing
4.4 Sections	Drawing
4.5 Isometric	Photo Reprod.
4.6 Model	Photo
4.7 Close-up of Model	Photo
Mahalleh	
4.8 Old Settlement	Drawing
4.9 Effect of Road	Drawing
4.10 Revitalised Settlement	Drawing
4.11 Teachers' Housing Square	Drawing

5.21 General View	Photo
5.22 Corridor with Seating	Photo
Workshop	
6.1 Workshop Drawing	Drawing
6.2 Group Discussion	Photo
6.3 Classroom	Photo
6.4 Builders' Drawings	Drawing
6.5 Worksheet	Drawing
6.6 Experiment	Photo
6.7 Vault Practise	Photo
6.8 General Overview	Photo

Farroukh Afshar, Allan Cain, Mohammad-Reza Daraie, John Norton

Introduction:

This exhibition represents the work of the authors, the building team and staff of the Selseleh Integrated Development Project with the local people in the Selseleh Region of Luristan, Iran. Work was carried out over a period of two and a half years, from the spring of 1975 until the autumn of 1977. It demonstrates an attempt to develop upon indigenous building methods in order to find a way of meeting contemporary shelter needs in a way more appropriate than conventional capital-intensive methods. The process of human centred endogenous development is the prime motive, more important than the product of the built form.

Selseleh Integrated Development Project has been set up as an experimental project to investigate and put into operation alternative rural development policies. The concept of "endogenous" or internalised development which the project is dedicated to, calls for the improvement of the living conditions within the regions through active participation of the community and by the use of local resources. For this reason, only the minimum necessary decisions and activities of the project are preconceived, leaving room for decisions to be made in the field through ongoing research and discussion with the indigenous population. Without the involvement of the communities concerned, development work will become both authoritarian and ineffective.

The integrated approach to rural development taken by the S.I.D.P. has manifested itself in activities in the fields of education, health, agriculture and physical services. The main basis of

the same time being trained in those fields. This will enable them to carry on the development work themselves without having to rely on external aid.

The Selseleh Region, a high basin ringed by the Zagros mountains, is the field area for the first phase of the development project. It consists of a land area approximately 400 km^2. Most of the population are settled in the plains which also contain most of the fertile land in the region. The plains settlements are therefore predominantly agricultural, while the economy of the settlements in the three major valleys in the north and east of the plains is based on animal husbandry. However, as the majority do not own sufficient land or sheep or any other means of production, there exists in the region a large labour force that seasonally migrates to major cities in search of jobs.

The villages are scattered and vary in population from settlements formed of one extended family, to major villages of about 1,000 people. The town of Alashtar is the administrative centre of the region. It houses almost 7,000 people and acts as a market town. Alashtar had the only clinic and secondary school in the region.

> "The Selseleh Integrated Development Project started with an idea to try out an alternative type of development: a development based on man-centred priorities, self-reliance and democratic participation.
>
> "The Alashtar plain, the heart of the Selseleh district, comprises some 300 villages, and a population of some 60,000 - most of them poor, illiterate and in bad health.
>
> "We started our learning experience by living amongst the people. Their problems were numerous, and so were their real needs. The answers were not in ready-made solutions. They were to be found in an open process of endogenous development - that is a development deriving its vital resources from within.

"We took it as one first principle that no decision concerning development could be justified, if it were indifferent to man, as the main agent of his liberation. The man we became committed to was like a tree which had been deprived of all the vital elements of its growth.

"But the satisfaction of fundamental human needs poses very delicate problems. When people are overwhelmed by pressing needs, it is difficult for them to perceive their long-term interests and to establish priorities accordingly. We knew however, that their participation was essential in defining the needs, and in the decision making processes. And this participation had to be achieved through a real dialogue.

"It became clear to us that in establishing our plan of action, priorities should always be set in favour of the pressing needs of the least privileged - of the great silent majority which constitutes the roots of the development tree."

- His Excellency Dr. Majid Rahnema
  Director of Selseleh Integrated Development Project

Centre For Endogenous Development Studies

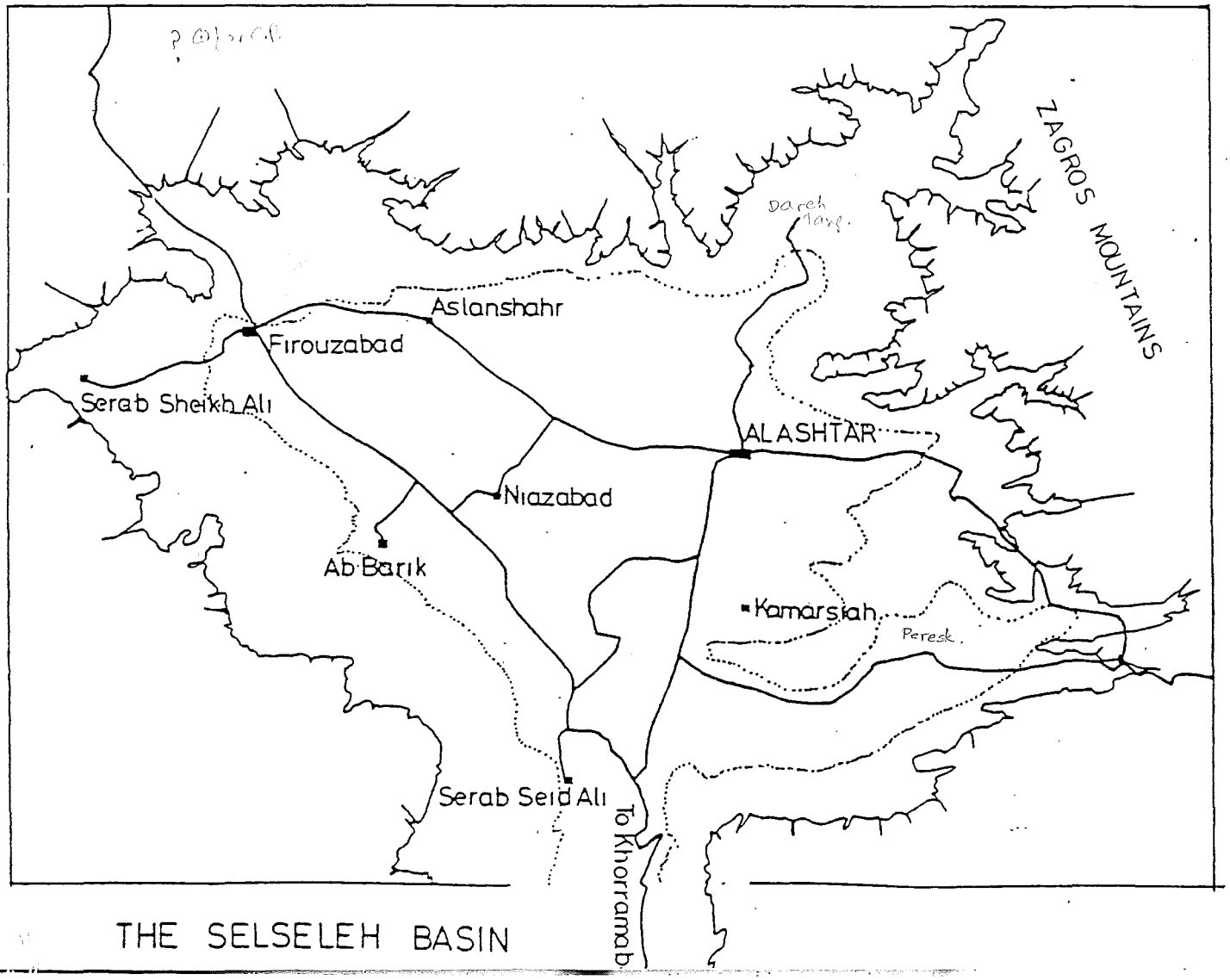
Centre for Endogenous Development Studies was formed due to a vital need for research in the fields of programming implementation methods and the evaluation of aims and models of endogenous development programmes, especially in relation to the Selseleh Integrated Development Project. The assessment of regional demands, their problems and potentials and the coordination of development programmes with regional characteristics are some of the aims of C.E.D.S. The Centre carries out researches related to Endogenous Development for both Iranian and international institutions.

Development Workshop

Farroukh Afshar, Allan Cain, Mohammad-Reza Daraie, John Norton

The Development Workshop is made up of architects and researchers from several countries. They work collectively on the research and development of indigenous planning and building. They have been involved in projects in Third World Countries such as Egypt, Oman, India, Turkey, and Iran. The authors have been working as architects and planners for the Selseleh Integrated Development Project in Luristan, Iran and are presently working with the Centre for Endogenous Development Studies on the development of indigenous building in various regions of Iran.

Fig B1 LOCATION OF SELSELEH & DETAIL



THE SELSELEH BASIN