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REPORT ON
THE BUILDING PROGRAM
IN ~~FOR~~ THE
SELSELEH INTEGRATED DEVELOPMENT PROJECT
ALESHTAR, LORESTAN, IRAN

BY

THE DEVELOPMENT WORKSHOP

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0.0 PREFACE

The community baths (hamaams) project was part of a comprehensive building and planning program implemented by the Development Workshop in Iran. This Project is therefore best appreciated within the context of this program which will be presented below:

This report is based on the authors architects personal notes and recollections. Detailed project records & documents were not available.

1.0 INTORDUCTION

From 1975 to 1978, the Development Workshop (DW) lived and worked in the rural region of Selseleh in Lorestan, Iran (See map). They were responsible for the Building Section of the Selseleh Integrated Development Project (SIDP). A major aim of SIDP was to demonstrate how the mobilisation of indigenous resources — human, natural, materials and technology, culture and values — could generate a process of socio-economic development within the region and meet its people's basic needs. In keeping with this objective, the building section implemented a comprehensive program for enhancing the region's capacity to meet its own settlement and shelter needs. The program's components were :

1. A Regional Plan for Selseleh which included a Town Plan for Aleshtar, the main regional settlement, and a location plan for lower order community facilities and building materials industries (primary schools, baths, brick-kilns etc.) amongst smaller settlements so as to best spread these facilities in the region.

2. Construction of essential buildings such as schools, clinics, etc., in a way that maximised the use of local resources, demonstrated improved indegenous techniques as well as trained people in these techniques.

3. Research and development on local resources and the training of local builders such that a cadre of "barefoot builders" would emerge capable of designing and constructing most buildings

required in the area.

4. Establishment of local building materials industries to both make the region self-reliant in required materials and increase income and employment generation opportunities within the district.

2.0 REGIONAL AND TOWN PLAN

The Selseleh region has a land area of approximately 400 square kilometres, with a population of some 60,000 persons inhabiting 250 scattered villages. The regional plan ~~The region was~~ divided it into 30 sub-regions, each with a designated central village. In these central villages, facilities such as schools, public baths, etc., were constructed and, where appropriate, so were rural industries such as weaving workshops, kilns, etc. A team of two or three development cadres (from a total of 90 local rural youths trained by SIDP) were also stationed in each of these villages. These cadres played a central role collaborating with SIDP and the local community to identify, implement and maintain development projects.

Aleshtar (Pop. 10,000) was the major marketing-service centre for the region. It comprised of three neighbourhoods (mohallahs) which originally had been three small villages that had expanded to ~~manage~~ merge into one large settlement. The largest of these villages had a bazaar which was the main market for the whole region. A road plan, partially implemented prior to SIDP's arrival, consisted of several wide roads and a roundabout. The roads, if fully implemented, would have cut through the original mohallahs including the bazaar. Many shops had already relocated to either side of the new roads and some houses along their anticipated routes had been demolished. The Town Plan, designed by DW proposed salvaging the indigenous town structure by rehabilitating the old mohallahs, and the origional bazaar area. The concept was one of having

a defined civic-commercial centre around which the city would expand in units of mohallahs, themselves containing lower order commercial establishments. Each mohallah has one central feeder road with a parking bay from which ~~would~~ only pedestrian and emergency vehicular access would lead further into the mohallah. (Compare previous Road Plan to DW's Town Plan, Fig's ? & ?)

Towards this end, DW diverted roads whose original routes had threatened the mohallahs and in anticipation of which residents had been required to partially or fully dismantle their houses. Paved pedestrian access ways, drainage and housing (for teachers) were then designed and constructed, ~~which~~ These demonstrated the mohallah layout concept to the residents. ~~He~~ It also assured them that the road was not coming through and they began to rehabilitate their houses and area. The layout of adjacent, ~~as yet~~ ~~un~~ built areas ~~were then begun to take~~ was started to accomodate future expansion. Resistance to the SIDP plan came from those commercial and land-owning interests who had bought land and shops to profit from the previous road plan and stood to lose from the new proposals. Thus the major problems faced by the new plan had little to do with its design concept and much to do with the antagonistic pressures from influential interests that had been dealing in the real estate market. These pressures were eventually resisted and the town plan was approved by the central authorities.

3.0 BUILDING CONSTRUCTION

From 1975 to 1977 the building design & construction activities of DW resulted in 3 hamaams, 9 schools, and health centres, 5 centres for collective promotion*, 5 housing projects and a petrol station. Below a description of the project cycle (initation design, implementation, operation and maintenance) generalisable to most of these projects will be presented. This will be followed by a case-specific description of a selection of these projects. The nature of the project cycle varied according to who the proponent initialing and funding sources were. There were basically two sources.

1. SIDP - Community Sponsored Buildings:

   SIDP had an independent construction bedget to fund those projects that it considered priorities and for which government funding would not be available. These projects were sometimes initiated by SIDP approaching a particular village community with the idea of the project or Vice-Versa. In either case, the village had to provide at least land and unskilled labour. The Niazabad and Serab Ali Hamaams represent both cases respectively.

2. Government Sponsored Buildings:

   Each year budget were allocated for construction of a number of buildings by the various central government departments and the provincial authorities. The settlement in which they were to be

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* This building is constructed in the central village serving a particular sub-region. It acts as the working & living base for the development cadre responsible for that region. It consists of 4 rooms, 1 each for agriculture, health and education activities, and one living quarter plus courtyard, bathrooms etc.

constructed was fixed by the government and they also had standard designs and technical specifications. DW could use alternative materials and technologies and alter the design so long as the stipulated room and space types and numbers, and their basic arrangements shown in the standard drawings were adhered to. Since a full budget was available no community donations in men and materials were required. The Aleshtar and Kaka Reza Schools to be described shortly were examples of such buildings. Whatever the funding sources the following steps were generally followed:

A meeting of the SIDP central committee* (consisting of representatives of the Agriculture, Health, Education and Buildings section - a DW member) and other interested parties, such as the project proposers (a cadre, village head) was held to establish the value and feasability of the project.

This was followed by meetings between SIDP representatives, usually a DW member, members of the village in which the project was to be constructed and the development cadre responsible for the village, to discuss the siting and design of the building, the level and type of community assistance in men and materials, and future operation and maintenance arrangements (See photo). Community participation was an essential pre requisite for a project to receive SIDP assistance.

* The SIDP Central Committee, chaired by the Project Head, was the main decision making + coordinating body.

In discussions with villagers and the builders DW did the detailed design of the building project. In addition to conventional architectural criteria, the buildings were designed with three further criteria in mind.

Firstly that they should demonstrate how indigenous spatial arrangements, materials and technical could be adopted for modern uses. Secondly that the implementation process should be used to train local builders as well as provide maximum income and employment for the village. Thirdly that they should be significantly cheaper per square foot than the conventional government designed buildings, so as to make them more affordable if the rural community was contributing towards it or provide longer and more facilities if the project was government funded.

After construction, SIDP - community sponsored buildings were handed over to the village community for operation and maintenance and government funded buildings were handed over to the government agency involved (for example schools were handed over to the education department). In practice the development cadre often continued to oversee its operation and maintenance if the project was in a village.

What follows is a more detailed description of the above for a selection of DW projects.

3.1 COMMUNITY BATHS (HAMAAMS)

The hamaam as a social and health promoting institution has long played an importance role in Iranian settlements. People come together in the hamaam to bathe, massage, shave, and discuss at leisure. Thus the hamaam promotes both personal hygiene as well as social intercourse among villagers.

The design of traditional hamaams encouraged this social function by providing in-the-round internal spaces - seating and washing arrangements (see Figs.). However the government had prohibited the use of traditional hamaams because the communal bathing pool was deemed unhygienic. The baths constructed by government to replace the traditional ones had a "shower cubicles off a corridor" design which inhibited the socialising function (See Fig. sketch of govt hamaam?). They also prescribed steel and concrete which both raised their cost, so only a few could be constructed, as well as stimulated very little local income and employment since the materials and even some skills to implement construction had to be purchased from outside the region.

The hamaams designed by OW were adaptions of the traditional hamaam. The shower cubicles, required by law, were integrated with the traditional "in-the-round" seating and bathing arrangements. The rooms consisted of a series of chambers with bent connections which led from reception room through changing room to bathroom. Such indirect connections

increased both privacy and thermal insulation between rooms. The shower cubicles had low doors which permitted eye contact and conversation between bathers (See Figs. drawings & photos of hamaam)

The construction method was fired brick, vault and dome roofing with lime mortar. Vault and dome technology was indigenous to the region (although not widespread as were flat timber roofs) and local builders could be rapidly trained in that technology. Brick and lime industries could be started locally since Selseleh had extensive clay and lime-stone deposits. Neither timber nor mud-brick could be used because of the highly humid conditions within the hamaams . Two examples of these hamaams are presented below:

3.1.1 Niazabad Hamaam (Figs.)

This hamaam was initiated by SIDP since it was the first of its kind to be constructed and somewhat experimental. It attempted to demonstrate the feasability of using the indigenous designs and technologies for contemporary buildings to local villagers, and thus stimulate them to initiate subsequent similar hamaams.

Niazabad village (population 300) is centrally located in the Selseleh basin and is one of the sub-regional centres. Its facilities such as the hamaam were to service several villages or approximately 2000 persons.

Consequently a six shower hamaam was designed. The design follows the

traditional bathing procedure (See Fig.). Bathers first enter a reception room where they pay and wait their turn if the bathing room is full. This reception leads into a changing room where bathers change into a waist cloth, wash their feet and enter the main bathing room. Here a central raised ~~and~~ slab is provided for bathers to rub-down and massage between showers. DW designed a seperate baby-bathroom, which doubled as a cloths-utensils Washing area, since it was noted that mothers preferred the often dirty open water channells ~~then~~ to the steamy baths for their infants.

Following traditional practice, the main bathroom has heating flues running under its floors from the boiler room to the chimneys to keep the bath warm and steamy. The boilers are oil-fired. The bath was constructed next to a small experimental bio-gas unit which if expanded could replace oil as the energy source for the bath. Oil even in Iran is expensive for a rural economy and deliveries are uncertain. Repairs may also ~~be~~ often require the skills of a town mechanic.

Two Yazdi masons, hired by the building section worked with two local builders, one from Niazabad, to construct the Hamaam. The Yazdis' instructions were to train the local builders during construction.

The village donated both the land and the unskilled labour. The traditional system of cooperative effort, such as that used in harvesting, was followed to provide workers. Under that system, the village was divided into six sections, each ~~section~~ consisting of a group of households with extended family links. Each section was responsible for providing a

certain number of workers at prescribed times throughout the construction.

The Niazabad Hamaam as a "first of its kind" achieved its dual purpose of testing and demonstrating some basic notions as well as being instructive about how to better replicate them in future hamaam construction. (This latter point to be discussed in connection with the Serab Said Ali Hamaam).

The notion that the indigenous but waning vault and dome technology alongwith the internal spatial arrangements could continue to be successfully applied was demonstrated not only to DW's satisfaction but much more important to the villagers satisfaction as well. In subsequent projects it took no persuasion for villagers to prefer the Niazabad prototype to the standard concrete and steel 'corridor' hamaams which had been the only alternative they had been presented with. The hamaam was completed at half the cost of equivalent government constructed hamaams even though the reception and baby wash room were not provided in the latter types. The costs included the estimated value of voluntary labour. These savings accrued despite the inevitable construction delays caused by community participation and the training of builders during construction.

3.1.2 The Serab-Said Ali Hamaam

Serab Said Ali village (Population 400) is located ~~to~~ in the South and at the foot of the hills surrounding the Selseleh basin. The villagers through their development cadre requested SIDP assistance to construct the hamaam for which they offered to donate the required land and labour. This was agreed since the village was in an area of the region where no other hamaams existed.

The Niazabad Hamaam ~~had~~ proved instructive in suggesting certain simple but important modifications for future hamaam construction which were applied in Serab Said Ali.

Firstly, in discussion with villagers and builders in the region a set of 2, 4, and 6 shower prototype hamaams had been designed. These were simpler in plan and easier for builders to layout and construct with less supervision, could respond to variations in village size and budget, and be incrementally expanded. The Said Ali hamaam had two showers (?) which was for the village alone. (See Fig.). Similarly the option allowed for the reception and baby bath rooms to become optional items to be added ~~if desired~~ at a later stage.

Secondly, only vaults were used because they were somewhat simpler to construct than domes. Thirdly, unlike the Niazabad Hamaam, which as a demonstration unit had to make a maximum visual impact, the second

generation hamaams such a Serab Said Ali could be partially sunk underground as is traditional to improve thermal insulation and further simplify construction. These modifications all further decreased cost while preserving the basic internal spatial arrangements achieved in Niazabad (See Figs.).

Two infrastructural modifications were, firstly, placing more emphasis on insuring an adequate and reliable water supply for the hamaam and secondly, considering solar energy rather than bio-gas as an alternative for water heating.

In Niazabad, DW had been content to accept the villagers' assurance that the existing village well could provide adequate water; this well later proved an unreliable source. Henceforth, construction of an improved water supply system was made mandatory, pre-requisite for the villages requesting assistance with construction of a hamaam. The promise of a hamaam became an incentive to mobilize villagers to first improve their water-supply. The need for such an incentive have had something to do with the fact that the men - The villagers valued and availed of the social functions of the hamaam but placed less importance on water supply per se and may not have been willing to work for the latter alone. Since it was usually the women who performed the laborious task of fetching water from streams and wells.

In Serab Said Ali the spring was a Kilometer uphill from the village.

The water-supply improvement consisted of constructing a hygienic, protective (from animals) enclosure around the spring source and extending a pipeline to a reservoir in the village. From this reservoir, water could be drawn for communal taps and a separate channel from the spring enclosure flowed to irrigate the village fields and water the animals.

Serab Said Ali and other second generation hamaams were designed to accept solar collectors because unlike bio-gas which required village level cooperation in manure collection and plant operation, the institutional requirements for operating the collection - one person to ensure water circulation through the collectors - were much simpler. These collectors were to be installed after experimentation was concluded on another more easily monitored building (Serab-e-Amir house to be described later).

The Serab-Said Ali Hamaam - as all hamaams subsequent to Niazabad, were constructed by Selseleh builders who by then had been trained through the building construction and the builders training workshop (to be described later). The Yazdi masons now needed only to supervise the construction.

Finally unlike Niazabad in which villagers assurances of setting up an operation and maintenance group was accepted at face-value and proved less than adequate, SIDP was more careful to insure such a group or individual was available. In Serab Said Ali's case this person was the development cadre living in the village.

3.2.1 SCHOOLS: Aleshtar Kindergarten

The government had budgetted for a Kindergarten to be constructed in Aleshtar. The standard government design consisted of a set of rooms on either side of a narrow corridor. DW kept the room types, numbers and sizes as required and changed the design. The design consisted of open and semi-covered play courts of varying sizes, and classrooms which were dividable and with smaller more intimate niches for small groups of children together in. A light-ventilation catcher (Kolah-Farangie), traditional in Iran, was centrally located so as to be connected to three rooms as both a functional and playful element.

DW was also not bound to use the conventional technology of steel lintels, and roofs of steel girders and brick jack arches. For lintels, the indigenous hemispherical brick arch was used. Since there were many to be constructed, the school provided an excellent training experience in this technology for the ~~Aleshtar~~ selseleh builders. The specified 5 & 7 metre wide classrooms posed a challenge since the local timber roof could not span over 4 metres. The provincial engineers with overall responsibility for government funded buildings refused ~~to accept~~ small classrooms, ~~informing us with some triumph~~ and had stated that such limitations in the indigenous technology prompted them to adopt steel and concrete solutions. A discussion with our builders was more useful and led to a simple solution. A brick arch spanning the 7 metre width was constructed across the centre of the room on which rested the timber beams spanning from each end wall. (See Figs).

The rest of the roof was then of a traditional type with planks on the beams over which layers of mud and bituminised hessian (for waterproofing) were laid (See photo/drawing of traditional and improved roofing).

In keeping with the policy to use building construction as a vehicle for R & D on indigenous technologies, DW designed a timber truss roof for the second class room. However, because the timber had been inadequately cured it began to sag after a time. In its place, another brick arch was constructed. This experience prompted DW to include timber treatment measures in the builders' training.

The building was sited along a proposed road and bordering the area that had been designated in the town plan. The site reinforces both these elements of the Town Plan. (See Town Plan).

3.2.2. Kaka Reza Primary School

The government had allocated funds for a primary school in this village (population 250) which was to be shared by a number of surrounding villages. The government standard design consisted of two rooms opening on to a shallow covered porch. It used fired brick walls in concrete mortar and the conventional roof of shallow brick jack arches spanning on steel girders at 1 metre distances.

On visiting the village and in discussions with the villagers & school teachers, DW designed a school with walls of stone and cement-lime-sand

mortar with a low ratio of cement, and roofs of timber beams, planks, mud and bituminised hessian. ~~Except for~~ The cement and bituminized hessian were all readily available local materials and their use closely followed the indigenous housing technology. The savings on materials' costs allowed the budget to finance a school with 4 classrooms, 1 teachers' office, 1 toilet and 2 playyards. The extra space and design allowed for living quarters for the teacher (from the provincial capital) who had explained his regular absences ~~on~~ a lack of adequate living arrangements. This alternative also meant that almost the entire building budget would be spent within the community, generating local income and employment multipliers whereas in the government design, to unskilled labour, the entire budget would be 'leaked' to materials's merchants' in the provincial capital. The SIDP sponsored local brick kilns had not yet come on stream. The alternative designs with these implications were presented to the villagers, with the caution that the timber and mud roof would require more of the usual regular snow-shovelling and compacting during winters than the government specified brick, steel and cement roof. The villagers chose the alternative design and this was constructed.

As a footnote one can add that of the several villages faced with this choice in the first year a few still chose the government design but in the second year all villages chose the alternative design. By that time the advantages Kaka-Reza enjoyed in getting a much larger facility, a resident teacher and the impact of the construction budget in the local economy ~~became manifest~~.

3.3.1 Housing: Caretaker's Hous: A low-cost technology prototype

The owner of a small plot of land had donated a part of it for SIDP to construct a petrol station (there was none in the region). His condition was that a SIDP employ him as the caretaker and construct a house for him on the remainder of the plot.

The prospective owner suggested the spatial design but was open to any technology. DW constructed a bitumin stablised mud-brick house with vaulted roofs. A frame of timber ring beams tied to posts imbedded in the wall corners increased the building's earthquake resistance. Mud-brick walls with vaulted roof has been considered and particularly cheap technology since an entire housing unit uses only mud and straw, two freely available materials. It has been rejected for its poor weather and earthquake resistance. Experiments during the builders' workshop (to be described later) had shown that a small 2-5% of bitumin could significantly increase the moisture resistance of mud-brick. Timber tie frames were a traditional method of resisting mild earth tremors.

The house has withstood several winters in lorestan which experiences severe rain and snow. No tremors have tested its tie frame system but in a subsequent survey of earthquake damaged structures, in another region of Iran (Bandar Abbass), DW found that those older buildings, which had used the tie frame, had fared much better than others.

Thus the building demonstates that apparently serious defects in an otherwise recognisably appropriate and economical indeginous technology can be overcome by quite minor modifications: one introducing a noval technique and the other reviving a traditional one.

The construction also offered the apportunity to test in a preliminary fashion some notions on how to rationalise mud-brick making and perhaps even encourage a small industry producing bitumin stabilised earth-blicks, (in some parts of Pakistan, mud-brick production is a rural industry). The roofs alongwith those of the second generation hamaams were constructed by Selseleh builders who only recently had been taught the technology in previous building construction and the builders workshop.

3.3.2 GUEST-MEETING HOUSE AT SERAB-E-AMIR

This building was constructed to house the frequent visitors to the project which included high government officials and interested professionals. It was also a meeting house for project personnel and between them and the visitors. Since the purpose of the visits often were to discuss the feasibility of spreading the SIDP model across Iran the site on the hill slopes, was chosen to give a good view of most of the region. It was a short distance away from the bustle of the project office in the town ~~in which~~ Where it was very difficult to have uninterrupted discussions.

The building had to be able to act on the one extreme as a comfortable, 2 bedroom house and on the other extreme sleep 20 or more people in dormitory fashion. The rooms also had to be able to house separate groups relatively independent of each other. Above all, the building had to demonstrate to often skeptical officials that indigenous designs and technologies could produce as high a quality of building, as their supposedly modern, and costlier counterparts.

A village hamlet layout was chosen because there too, a single extended family may share the whole space or have clearly defined spaces for each section of the family. This layout consists of 2 rooms with deep verandahs set at right angles to each other in a cluster around enclosed and semi-open courtyards. This layout allows independent entrances to

each room, with each couple of rooms having their own courtyard and verandah spaces designed as outdoor meeting areas for seperate groups.

The L-shaped living-dining area could be partitioned so that half could be used for sleeping. The remainder dining-sitting half could also double as a slide-film presentation room, with the raised dining half allowed unobstructed view behind which the kitchen-hatch window served as the project booth. The rooms progressively step up following the slope of the hill-side.

Walls are of locally quarried cut stone set in lime-sand-cement mortar, with the traditional timber and mud-roof with bituminized hessian. The interior plaster is a fine mud-straw-chalk/gypsum? mix with chalk/gypsum? borders around openings and wall edges. This finish was common in wealthier traditional houses.

The quality of workmanship was a testimony to the success of 2 years of training through construction and the builders' training workshop that had preceded this building.

An experimental set of solar collectors to heat water in one of the bathrooms was constructed in the Aleshtar workshops and set up on the roof. After testing them larger units would be designed for the hamaams and other buildings.

The house, although cheaper than an equivalent one in the conventional

'modern' technology, was the only building that unabashedly did not attempt to be low-cost and for low-income people. Its function was to demonstrate that local resources were not necessarily synonymous with second best, for low-incomes. Its message was that even when a building budget was generous and high quality required (as in some public ~~function~~ buildings and houses for the wealthy) local resources could result in that required quality. And simultaneously it would preserve the advantages over the conventional 'modern' and imported technologies by still being cheaper and stimulating local incomes and employment. These advantages were in addition to the more subjective and intangible ones of aesthetic and cultural appropriateness.

A small but significant episode during this buildings' construction perhaps best illustrates what DW was trying to do in Selseleh. The Selseleh builders had been told to construct all but the largest arch in the building. This arch was to be left for the Yazdi masons to execute. A day before the Yazdis were to construct the arch a DW member went to the site and was presented with that arch almost flawlessly executed by two of the local builders, looking nervous yet proud and happy. A technology had been mastered but far more significant, a pride in their own indigenous skills had been rekindled amongst atleast some of the people in Selseleh.

4.0 R & D AND BUILDERS' TRAINING

Research and Development work on indigenous techniques and the training of builders were an integral part of the building progress.

Some R & D was undertaken by DW members independent of building construction and the builders. For example an initial reconnaissance survey of the region discovered indigenous (albeit crude) uses of vault construction and ~~justified~~ prompted bringing in 2 Yazdi masons to help develop the techniques. Experiments on local soil quality and mud stabilisation. methods were also initially undertaken within the confines of DW's living quarters. However for the most part R & D was undertaken in collaboration with the builders and experimentation applied with them in the buildings they were constructing. This approach was both necessary and preferable. Neither time nor separate funds were available to devote solely to R & D. It was also preferable so as to expose the builders to the importance of innorating with their indigenous traditions rather than passively accepting imported techniques to supercede these traditions. Such an approach was also in keeping with the experimental nature of the whole project ~~given~~ within which unsuccessful but relatively inexpensive and instructive experiences such as the Kindergarten timber truss, were acceptable.

Selseleh, a semi-nomadic area had a weak building tradition. The two Yazdi masons (Yazd being an area of various advanced yet traditional

building techniques) were hired primarily to help improve local techniques and train builders and secondarily to build buildings. From the first building, the Niazabad Hamaam, the pattern of simultaneously building and training was set. Two main builders (at first the Yazdis, later the Selseleh builders they trained) each worked with two apprentices, taking timeout as they constructed to also instruct. The result of each project had to be both a building and two to four apprentices who, if not yet builders, had come much closer to becoming one. The result of each project had also to be yet another improvement on an indigenous technique or atleast some valuable lesson consciously cultivated and learnt regarding improving that technique.

In this manner, over three building seasons, a group of approximately 15 relatively accomplished builders emerged several of whom had at best been construction workers (one had been a cook). A number of improved indigenous techniques had been developed. The most prominent was the rejuvenation of vault and dome technology. Others included ~~range~~-wide-span arch construction, more economic weather-resistant and structural timber roofing (Fig.) a variety of stabilised mud-brick and mud-plaster types (using bitumen, lime, chalk varying conventional mixes etc.) and earth quake resistant timber tie roof and wall methods.

In addition to the ongoing R & D and training described above, two intensive workshops were held for the builders, the first organized by

DW and the second organized by the builders for themselves after DW had left SIDP. The first workshop is described below. It illustrates the underlying principles and methodology applied in R & D and training throughout the 3 yeares, albeit have telescoped into a two month period.

4.1 The Builders Workshop

Between February and March 1977, a two months workshop for the Selseleh builders was conducted in the city of Yazd, in central Iran. They city was chosen because in possesses many fine examples of high qaulity traditional buildings which were useful for the Selseleh builders to see, to counterbalance the image of their own relatively undeveloped construction and the inappropriate "modern" alternatives emanating from Tehran. The participants in the workshop were the authors, the two Yadi master masons and the builder-trainees from Selseleh. The workshop had been preceded by a year of on-th-job training of the builders in such projects as the hamaam. Construction method R & D and training pursued in the preceding year were further developed during the workshop in a more intensive and systematic manner than had been possible during on-the-job training.

The workshop had three aims: to improve indigenous building methods, to train the builders in practical and organisation skills and to develop an educational methodology that the builders could use amongst themselves. They would thereby be equipped to meet most rural shelter needs

without depending on imported building materials, city contractors, architects and engineers.

The educational methodology consisted of pooling the knowledge of the builders through their participation in discussions, followed by practice and experimentation for example, a class on building methods, design and drawing principles was introduced by asking each builder to draw his house and discuss its advantages and disadvantages. From these discussions, the design problems of typical village housing were identified, and drawing skills were developed. The problems and alternative solutions to each aspect of building construction, from foundations, to walls and roofs, were discussed in turn. Each potential solution was tested in a practice yard set aside for that purpose. Similarly, experiments were carried out to improve local materials such as timber and mudbrick to help earth walls withstand weathering were developed. Resource persons were also brought to the workshop: a local stonemason conducted a two-week session on stone technology, and a well informed Yazd resident gave an illustrated talk on the historical buildings in the area. In the evenings, literacy classes were conducted for the largely illiterate village builders. By directly relating the literacy programme to the builders' work (e.g., reading building plans and keeping their own records), a keen interest in becoming literate was developed.

Most important perhaps was the educational methodology the workshop

developed, which even barely literate builders could use to improve their skills and develop their indigenous methods. It proved successful during the workshop, but the results were even more clearly demonstrated in the following building season: several additional builders could now assume independent responsiblity for projects. The builders also took on new apprentices, training them using the same procedures from which they had benefitted the year before. A year after the authors left the proejct, the builders independently organised another workshop to train a new generation of builders. This evidence that a methodology for development had been internalised by the village builders was of great significance, far more than any specific knowledge or one-off innovations in building techniques. Such internalisation was imperative if innovation were to become an ongoing and grassroots phenomenon.

5.0 BUILDING MATERIALS' INDUSTRIES

In 1975, any building that attempted to be a significant improvement on the traditional, used techniques and consequently materials that came from outside the region. This was partially because improved technologies using local materials or materials that could be locally produced were not developed and applied. But conversely, to introduce such technologies successfully and insure their survival, the industries providing the materials demanded by these technologies had also to be developed. Consequently this latter task was seen as an essential complement to the others described in previous sections.

An initial survey of materials' resources in the region revealed a materials' base for at least four promising industries. These were stone quarrying, brick, lime and timber. With stone for foundations, fired brick or stablised mud-brick or stone in lime or mud-mortar for walls and timber or arch, vault and dome roofing, there was no reason why buildings of adequate standard using almost completely local materials could not be produced. (sand and aggregate were available along the several river and stream beds). Small amounts of some items such as cement, bitumen and hessian, would have had to be continued to be brought ~~imported). purchased~~ from outside the region.

The task to develop the four major materials' industries remained. Stone quarrying was begun in two locations in Selseleh and sufficient

stone produced for all of SIDP's building activities. Timber, although already plentiful was increasing steadily in price, indicating increasing demand outspacing planting. SIDP undertook an extensive reforestation program along roads, water-courses etc. In parallel, DW began to institute proper curing, drying and storage procedures for timber at least in SIDP construction. However none of these efforts amounted to setting up self-sustaining ~~commercial~~ industries.

SIDP came closest in this regard with the Brick and Lime Industries. Brick and lime kilns had not been operating in the region for at least half a century. On the basis of soil surveys carried out by DW and a kiln craftsmen from a neighbouring region, and studies of kilns in those regions, a brick and lime kiln was set up in Kamar-Siah village in 1976. After operating for approximately a year the kiln had to stop production because of a dispute with the village headman. SIDP was attempting to pass kiln ownership onto a cooperative of the village landless while the headman hoped to himself gain ownership of the kiln.

In 1977 a second kiln was begun in Serab Sheikh Ali village. This time SIDP insured that both the land and the water rights were of public origin and control (In Kamar Siah the headman cut off the water- supply which he contolled). From the outset in many discussions with villagers, procedures were also established through which the kiln would be devolved as a cooperative to village members. DW left SIDP before this kiln was completed, but its construction continued since other SIDP members who

remained in the region had taken an active role in its development and continued to do so..

An important indication of SIDP's success in brick and lime industries was the subsequent proliferation of such kilns by private entrepreuners in the region.

After almost half a century ~~(the date the last commercial kiln ceased operating)~~ a building materials' industry was once again considered a commercially viable venture in the Selseleh region.

6.0 PROJECT SIGNIFICANCE

The Building Program ~~(designed and implemented by DW within SIDP)~~ is perhaps the most explicit and comprehensive formulation of indigenous architecture's role in development ~~and how the potentials of this role can be realised.~~ that has been put into practice. The underlying principle ~~was~~ is that the indigenous architecture or the resources embodied in such architecture ~~could~~ can meet, most if not all, the settlement and shelter needs of a developing culture and economy. What ~~was~~ is required ~~was~~ is a determined effort to improve those resources and creatively combine them so that the resulting architecture ~~was~~ is not a repeat of tradition but an extension of it. DW in ~~over~~ three years of living and working in Selseleh had the, perhaps, unique opportunity to develop this principle (itself formulated in a preliminary fashion from their previous experiences) both conceptually and in practice.

The vehicle for realising the developmental role of indigenous architecture was a program whose components -- a regional and town plan, building construction, research and development and training, materials' industries -- represented the major linkages that architecture has with development.

To effectively exploit these linkages, the components ~~had to be~~ were implemented in a complementary fashion and ~~had to use~~ used the range of channels through which architecture could contribute to development.

These contributions were not only in design and technology but also in the cultural and economic spheres. An example of the complementarities was the implementation of building construction so as to systematically train builders which, in turn, made more construction work possible. Examples of exploiting all channels were building construction which attempted to:simultaneously enhance community participation and extend indigenous designs (e.g., the community baths and Serab-e-Amir Guest House); improve or creatively combine indigenous technologies (e.g., the bituminised, earthquake resistant mud-brick house and the kindergarten arch and timber beam roof); instill a cultural self-confidence amongst the people (e.g., the arch builders of Serab-e-Amir); be more economical than the conventional 'modern' alternatives while also stimulating incomes and employment in the local rural economy (e.g., the Kaka-Reza school), and train builders in technical skills and literacy (as in the Builders' Workshop).

However, the above approach also had certain pitfalls. A confidence in the local communities' judgement could sometimes be misplaced as in the case of accepting the Niazabadis' assurance of water availability for the hamaam without checking to insure that it was so. Similarly, overlooking the treatment of the truss timber in the enthusiasm to develop yet another improved indigenous technology. Such occasional pitfalls were, nevertheless, well worth the net result.

A more substantial ~~problem was the question of an~~ issue was that of insuring an enduring institutional

structure. By definition, such an experimental, innovative project cannot survive unless an appropriate institutional is established to nurture, help develop and expand it. The conventional existing institutions, ~~again by definition,~~ may often be inappropriate, even antagonistic, or institutions may simply not exist since we are talking of a relatively remote rural area. Such a structure had been designed by SIDP in the form of the development cadres who were trained to assume responsibilities and keep the project functioning once SIDP personnel moved on to other areas. Similarly, the building program trained the team of local builders to be able to continue their work in conjunction with these cadres. The cadres were to provide the organisational structure and the builders, the design and technology to operate and maintain existing buildings and construct new ones. An indication of SIDPs and DW's success towards achieving this institutional arrangement was that, in less than three years, the builders and the cadres could work together in executing projects with minimum (if any) supervision from their respective mentors. The Iranian revolution, however, caused the project to be put in abeyance. This institutional structure ceased to exist. With the operation and maintenance structure designed for these projects thus removed, these ~~must~~ may have suffered both in function and physically (DW members have not been in Iran since 1980).

In sum, one can say that the achievements of the Building Program and the building projects within it are two-fold. Firstly, given the conventional architectural criteria of design and technology, they

successfully illustrate how the indigenous inspiration can result in aesthetically pleasing, technically competent buildings appropriate to their cultural context and their modern function. Secondly, and some may argue, more significantly, the projects ~~are a testimony to~~ demonstrate how the process of architectural creation rooted in the indigenous tradition can stimulate a range of benefits--enhancing cultural self-confidence, developing skills, creating jobs and income in the local economy, encouraging collective effort, community participation and self-reliance -- achievements that, if intangible and not easily manifest through the conventional architectural lens, remains critical for appreciating the role of architecture in development.

ANNEX 1
ORGANISATIONS INVOLVED IN SIDP:
Selseleh Integrated Development Project, Centre for Endogenous Studies and Development Workshop

The Selseleh Integrated Development Project (SIDP) was set up in 1974 to demonstrate a more self-reliant, basic needs oriented approach to development than was current in Iran at that time. It was initiated by Dr. Majid Rahnema, a former Minister of Education, who remained an active supporter and mentor of the project until the revolution. The Project Directors were Dr. Farvar (up to 1975) and Mr. Bafikr (1975 onwards). The project consisted of four sections: Agriculture and Animal Husbandry, Health, Education and Building, which were the fields in which projects were implemented. The staff was approximately 15 professionals - agriculturists, economists, sociologists, planners and architects (including Development Workshop members) - and an administrative support of about 25 people. Ninety rural youths from the region were trained in the four fields mentioned, to assume primary responsibility for developing the region. The project was funded through the Prime Minister's Office.

The SIDP was put in abeyance by the Iranian revolution.

Centre for Endogenous Studies (CEDS)

The CEDS was established in 1974 as a research and development organisation aimed at the improvement of indigenous (endogenous) methods. It worked closely with the SIDP, and Selseleh was its primary field area but it remained an independent organisation, undertaking R & D in other areas for other organisations as well (particularly in the later years). The bio-gas unit in the Niazabad bath is an example of CEDS' collaboration with SIDP.

CEDS was also funded through the Prime Minister's Office. Its Director since 1977 has been Dr. Keshavarz. The CEDS still maintains an office in Tehran, Iran.

The Development Workshop (DW)

The DW was established in 1973 in London, England by four architects - Farokh Afshar, Allan Cain, Mohd. R. Daraie and John Norton - to work on the improvement and promotion of indigenous building and planning methods in the Third World. On the strength of DW's work in Egypt, Oman and Iran, the group was invited by CEDS in 1975 to develop the building program of SIDP. Although DW worked in Selseleh and was in-charge of the SIDP's Building Section, it remained affiliated with the CEDS. The DW left Selseleh in September, 1977 to undertake a new project on indigenous building methods in the Caspian region, in affiliation with CEDS and the Institute for Rural and Peasant Studies.

Since leaving Iran, DW members have undertaken projects in Niger, Angola, the Comoros, Indonesia and Pakistan. The DW is based in Toronto, Canada.

ANNEX 2
DEVELOPMENT WORKSHOP PROJECTS WITHIN
THE SELSELEH INTEGRATED DEVELOPMENT PROJECT:
MAY 1975 to SEPTEMBER 1977[1]

1. 1975 (May onwards)

1.1 Survey of Selseleh region's indigenous building resources; labour, materials and technologies, industries, settlement and shelter types.

1.2 Reconnaissance of Yazd's[2] indigenous building resources to assess possibilities for technology transfer. Return to Selseleh with Yazdi masons.

1.3 Design and construction of:

	No. of Units
(a) Hamaam: Niazabad[3]	1 (medium-cost)[5]
(b) Centre for Collective Promotion[4]	1 (low-cost)[6]

1.4 Soil Surveys for Identifying brick kiln location

2. 1 6

2.1 Aleshtar Town Plan

2.1.1 Survey, research, formulation and physical design of plan. Preparation of plan document for approval by central government town planning committee.

2.1.2 Survey of Aleshtar land values and report recommending land pricing and sale policy.

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[1] These are projects in which DW played a primary role.

[2] The Yazd region has a strong indigenous building tradition while Selseleh being nomadic has a particularly weak tradition.

[3] This list is based on recollection and a few records at hand outside Iran. Hence, only some of the village project sites whose names can be recalled are mentioned.

[4] A centre consists of 4 rooms: 1 each for the agriculture, health and education section' activities and 1 living quarters for development cadre plus bathroom and courtyard.

[5] Medium cost=Rials 10,000 per m^2.

[6] Low-cost=Rials 5,000 per m^2.

2.1.3 Modification of previous road plan:diverting roads and rehabilitating partially demolished mohallahs.

2.2 Design and construction of:	No. of Units	
2.2.1 Primary Schools: Kaka-Reza plus one	2	(low-cost)
2.2.2 Health centres	2	"
2.2.3 Centres for Collective Promotion	2	"
2.2.4 Technical and Vocational School:Aleshtar	1	(medium-cost)
2.2.5 Kindergarten: Aleshtar	1	"
2.2.6 Housing for Teachers: Aleshtar	3	"
2.2.7 Petrol Pump Station: Aleshtar	1	(low-cost)

2.3 Construction of brick and lime kiln; Kamar Siah

3. 1977 (up to September)

3.1 Aleshtar Town Plan

3.1.1 Design and construction of some roads and squares

3.1.2 Layout of new mohallahs

3.2 Design and construction of:	No. of Units	
3.2.1 Hamaams: Serab Said Ali and Dareh Tang	2	(low-cost)
3.2.2 Schools: Firouzabad plus two	3	"
3.2.3 Centres for Collective Promotion: Peresk plus one	2	"
3.2.4 Low-cost housing technology prototype unit	1	"
3.2.5 Guest/Meeting House: Serab-e-Amir	1	(medium-cost)

3.3 Builders' Workshop: a two month intensive workshop for training Selesel Selseleh builders and research and development on indigenous building techniques.

ANNEX 3

SIDP PERSONNEL'S ROLE IN THE BUILDING PROGRAM

1. Development Workshop Members: Farokh Afshar,

   Allan Cain Mohammad Reza Daraie and John Norton.
   Collectively responsible for building section.

   Activities: Designed & implemented or supervised implementation of all projects (See list in Annex)2).

2. Ustad Mashallah and Ustad Husain.

   Yazdi master-masons. Main builders for some projects, main collaborators with DW member particularly in construction supervision, R & D and training of builders.

3. Several Builders.

   Rowand, Kapkali, Jaffar, Ali Jan, hisbrother? Ustad Kola, Cook? Hussein? others?

   good, young builder. → older builder, worked on roads → Door Ali. → get name

   cockeyed.

4. Danish:

   Responsible for labour and materials supply & logistics for all SIDP projects including Building Section.

5. Ali Akbar:

   Responsible for all water supply and metal work aspects of SIDP including those of building section.

Annex

6. Hassanwand:

Foremen assisting in labour and materials supply & logistics.

Although DW members ~~were the major architects (in the specific and gereralised meaning of the word)~~ and the personnel mentioned above played the major role, other SIDP members contributed in varying extents to some of the projects mentioned.

Firstly the central committee members whose function it was to whet and discuss all proposed projects often assisted DW through exchanges of views in improving the conceptual physical and operational designs of the projects. SIDP members would also assist and sometimes play leading roles in the village discussion and community participation stages of some of the projects. Similarly Development cadres responsible for the areas in which projects were undertaken played a central role in liasoning with the local community and in logistics of men and mateials for the projects..

An initial identification of central villages and their hinterlands was undertaken by consultants prior to DW's arrival in Selseleh. This was integrated into the regional plan mentioned. A committee member served as Aleshtar mayor for a term and played an energetic role in aspects of the Town Plan and its implementation. Although Danish as the logistics man was most active in the materials' industries, Other SIDP members

often had key roles to play. Thus in the case of timber industries, tree planting was organized and implemented by the agricultural section. Other SIDP members were also active in developing the brick and lime kilns particularly the one in Serab Sheikh Ali by which time DW was running down its operations in Selseleh. During this later time the non technical SIDP personnel began also to directly initiate building projects with the builders who by then could execute them on DW's prototypes without requiring ~~DW's~~ their design and construction supervision.

However, in the design of the Town Plan, ~~(1)~~ the building projects mentioned in this report and the R & D and training, ~~other SIDP members had no significant role to play and~~ DW and the building section were the main architects in both the general and specific sense of the word.

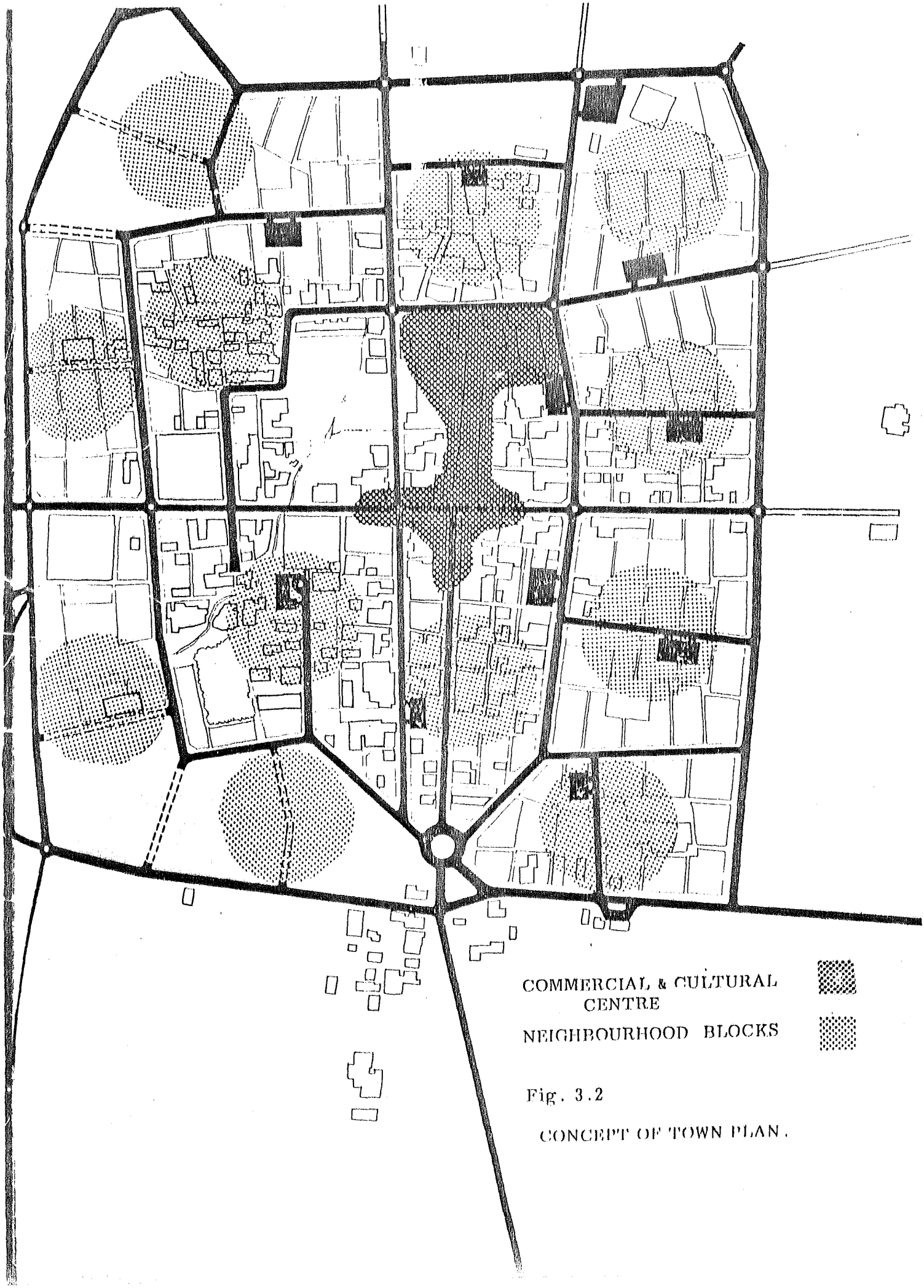
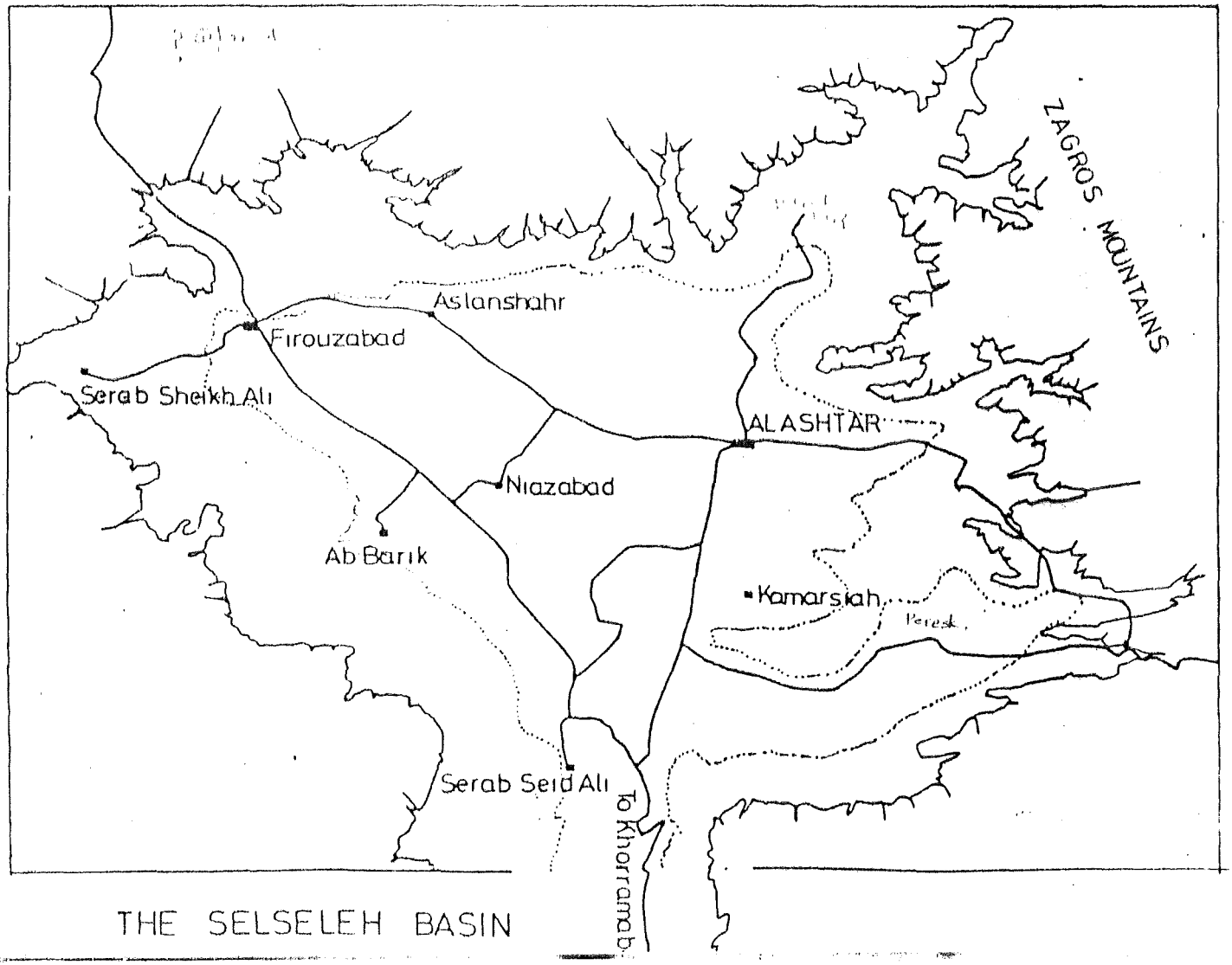


Fig. 3.2

CONCEPT OF TOWN PLAN.

Fig B1 LOCATION OF SELSELEH & DETAIL



THE SELSELEH BASIN

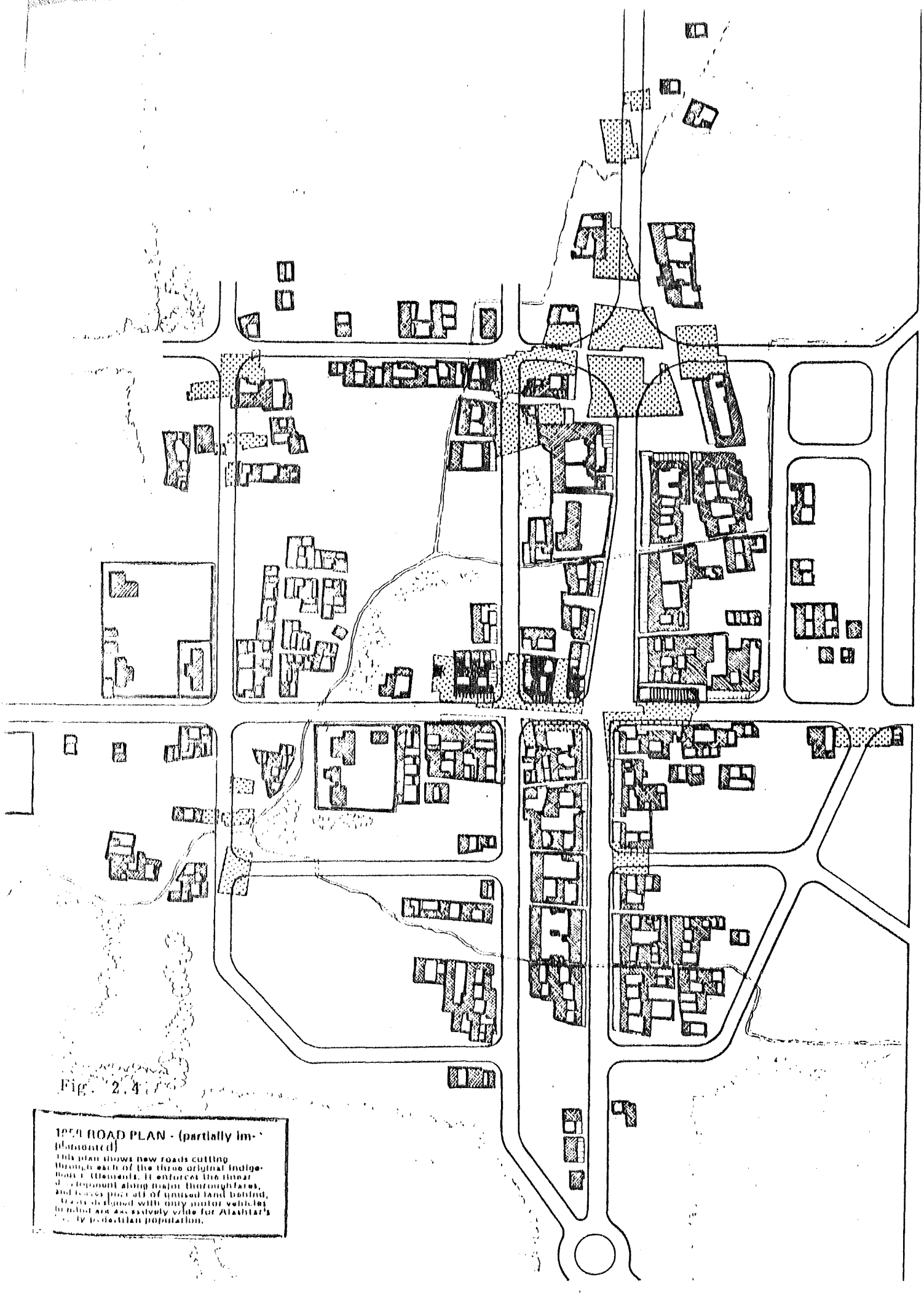


Fig. 2.4

1959 ROAD PLAN - (partially implemented)

This plan shows new roads cutting through each of the three original Indigenous elements. It enforces the linear development along major thoroughfares, and leaves pockets of unused land behind. Roads designed with only motor vehicles in mind are exclusively wide for Alashtar's heavy pedestrian population.