Society for the Revival of Architecture &
Planning Heritage (SRAPH)
In Cooperation with
Center For Planning & Architectural Studies
(CPAS)

جمعية إحياء التراث التخطيطي و المعماري
بالتعاون مع
مركز الدراسات التخطيطية والمعمارية

أبحـــاث

ندوة حسن فتحي العالمية لعمارة الفقراء

من ٢٠ إلى ٢٢ إبريل ١٩٩٣م

PAPERS
THE INTERNATIONAL SYMPOSIUM
OF
HASSAN FATHI
FOR ARCHITECTURE FOR THE POOR

From 20 to 22 April 1993

CPT21000.DOC H.S/H.S

14, EL SOBKY ST., M. EL-BAKRY - HELIOPOLIS - CAIRO - EGYPT.
P.O.BOX : 6 SARAY - EL-KOBBA - **P.C.** 11712
TEL: (202) 4190843 / 4190744 / 4190271 - **FAX:** (202) 2919341

١٤ شارع السبكي – خلف نادي هليوبوليس – مصر الجديدة – القاهرة
ص.ب: ٦ سراي القبة – رمز بريدي ١١٧١٢
ت : ٤١٩٠٨٤٣ / ٤١٩٠٧٤٤ / ٤١٩٠٢٧١ فاكس : ٢٩١٩٣٤١

الفهـــــــرس

ندوة حسن فتحى العالميه لعمارة الفقراء

خلال الفتره من ٢٠ الى ٢٢ أبريل ١٩٩٣ م

كلمة الأفتتاح

للدكتور عبد الباقى أبراهيم

رئيس جمعية أحياء التراث التخطيطى والمعمارى

بسم الله الرحمن الرحيم

ندوة حسن فتحى العالمية لعمارة الفقراء

كلمـــــة الافتتـــــاح

أ.د. عبد الباقى ابراهيم
رئيس الندوة

بسم الله الرحمن الرحيم

السيد الوزير/ حسب الله الكفراوى
وزير التعمير والاسكان والمجتمعات الجديدة

السيد المهندس الدكتور/عبد القادر كوشك
أمين عام منظمة العواصم والمدن الاسلامية

السيد/ بارفيس توفيقى
ممثل منظمة الأمم المتحدة للاستيطان البشرى

اخواتى الزملاء المشاركون فى هذه الندوة ...

السادة الضيوف الكرام...

انـــــه ليسعد جمعية احياء التراث التخطيطى والمعمارى ومركز الدراسات التخطيطية والمعمارية أن ترحب بكم فى هذه الندوة العالمية الأولى حول فكر حسن فتحى لعمارة الفقراء ... حول مضامينه الانسانية .. حول أنسب الأساليب للارتقاء بهذه الغالبية العظمى من السكان عملا وسكنا.

وأنتهـــز هذه الفرصة لأقدم الشكر للسيد الوزير/ حسب الله الكفراوى الذى دعم هذه الندوة وقبل وضعها تحت رعايته، كما أقدم الشكر الى كل من عاون وساهم فى انجاحها، وأخص بالذكر ادارة العلاقـات الثقافية بوزارة الخارجية المصرية، والشكر أيضا لهذه النخبة المعتازة من الخبراء والعلماء الذين قدموا من كل أرجاء العالم للمشاركة فيها ، ونهنىء مركز اوروفيل للبناء بالهند بفوزه بجائزة حسن فتحى العالمية لعمارة الفقراء عن عـام ١٩٩٢ م وهى الجائزة التى أنشأتها جمعية احياء التراث التخطيطى والمعمـارى. ونحن نحتفل اليوم بتسليمها لمندوبة هذا المركز.

واذا كـــان تعبير الفقراء لايتفق عليه البعض ويـرى فـى تعبير "من لادخل لهم" بديلا عنه ويرى البعض الآخر فى تعبير "من لامأوى لهم" بديلا آخر الا أننا نستعمل تعبير الفقراء هنا كرمز لارتباطه بكتابات حسن فتحى عن عمارة الفقراء.

لقـــد بنى حسن فتحى للأغنياء من ذوى الثقافات العالية الذين تمكنوا من الوصول اليه.. بنى لهم بيوتا ينعمون بالعيش فيها، كما بنى أيضا للفقراء الذين لم يتمكنوا من الوصول اليه الا من خلال المؤسسات العامة مثل هيئة الآثار بالنسبة لقرية القرنة وغيرها من المشروعات.

لقـــد أبدع حسن فتحى فى استعمال مفردات العمارة التراثية وتقنيتها المتوافقة مع البيئة والانسان وذلك فى الوقت الذى انغمس فيه الغرب فى تصنيع العمارة .. الى أن وجد فى دعوة حسن فتحى العودة الى الاصول الحضارية والتراثية ملاذا من الهوة المعمارية التى تعرض لها فى أوائل الستينات .. وهكذا أصبح حسن فتحى علما من أعلام العمارة فى العالم واستمر فى رسالته حتى حاز على كل التقدير والتكريم من كل الهيئات والمنظمات العالمية ذات العلاقة، وزاد من ذلك لباقته وثقافته المتشعبة واجادته للغات الحية.

لقـــد انقسم المعماريون على أنفسهم بالنسبة لحسن فتحى فمنهم من أخذ عنه حرفية التشكيل فـى البنـاء المنخفض وانتشروا يبنون للأغنياء والقادرين يبنون لهم القصور والفيلات والقرى السياحية كأنماط متناسقة مع البيئة المحلية والمتطلبات الانسانية ولكنهم لم يتمكنوا من البناء للفقراء الذى هـو أصعب كثيرا من البنـاء للأغنياء، فالبناء للفقراء يتطلب ممارسة مهنيـة خاصـة ومعايشـة علميـة معينـة قد لاتقبلها أو تتحملها النظم الحالية للممارسة المعمارية، لقد كان دور حسن فتحى فى بناء قرية القرنة مثلا حيا للتعايش المستمر مع كل طوبة .. فى كل جدار .. فى كل مبنى .. فى كل قرية من مشاريعه.

ومـــن المعماريين من لم يعترف بعمارة حسن فتحى كعمارة مـن الطين الـذى أصبـح مـادة نـادرة فـى نظرهم.. وقد نسوا أو تناسوا الجوانب الفكرية الانسانية التى طرحها فى سبيل البناء للفقـراء بمـادة الطين فـى الوقت الذى كان يبحث فيه عن غيرها من المواد والأنظمـة الانشـائية المتوافقـة، ولكن لم يجد حسن فتحى المؤسسات التى تتبنى فكره وتعاونه على تحقيق حلمه فى انشاء معهد تكنولوجيا البنـاء المتوافقة حتى يمكن من خلاله ممارسة تجاربه فى مشروعات ارشادية تخدم الفقراء.

لقـــد تصادم حسن فتحى كثيرا مع الروتين والنظم المالية الحكومية التـى تتعامل باسلوب المناقصات والمقالاوت، الأمر الذى كان يرفضه لتناقضه مع رسالته الانسانية للبناء بالجهود الذاتية والمشاركة الشعبية.

واذا كـــان فكر حسن فتحى قد ارتبط بالجانب العمرانى لاسكان الفقراء باستثمار تكنولوجيا البناء المتوافقة وهو الأمر الذى يمثل جانبا هاما من جوانب التنمية المتكاملة للمجتمعات الفقيرة فانه لابد من استكمال تنمية الجوانب الاخرى الاقتصادية والاجتماعية للفقراء بنفس المنهج الفكرى لحسن فتحى.

وجديـــر بهذه الندوة العالمية أن تبحث فى مناقشتها الاساليب التى يمكن بها نقل فكر حسن فتحى واسلوبه ومايقدمه المشاركون فى هذه الندوة من تجارب ودراسات من حيز الأوراق والبحوث الى حيز

السياسات والمناهج القومية أو الاقليمية حتى لايبقى فكر حسن فتحى حبيس الكتب والمجلات نردده بين الحين والحين كذكرى وتاريخ، وحتى لايبقى حسن فتحى ظاهرة يأخذ عنها البعض الشكل دون المضمون.

لقـــد دعى حسن فتحى الى الانتشار والاستيطان خارج الوادى الضيق فى مصر ولكن لم تنتهى هذه الدعوة بسياسة قومية تحقق هذا الهدف من خلال مؤسسات غير حكومية أو جمعيات خيرية أو قوافل للتعمير لاتسعى الى الربح ولكن تعمل على الاستيطان البشرى للغالبية من الفقراء خارج الوادى لتحقيق الاستراتيجية القومية للتعمير مستعينة بذلك بمراكز البحوث والجامعات التى توجه أنشطتها لخدمة هذا الهدف. .. فهل يمكن تجميع الفقراء كأسر منتجة فى قرى انتاجية جديدة؟ .. أو هل يمكن أن يجتمعوا فى قرى للصيد أو الزراعة؟ .. أو هل يمكن مساندة القرى السياحية بقرى انتاجية سياحية تستوعب الفقراء؟ .. ان أرض الله واسعة وقد أمرنا تعالى بتعميرها حتى يمكن تفادى هذا الزحام الرهيب المولد للأمراض الاجتماعية التى منها الارهاب؟ .. هل يمكن اعتبار تمويل اسكان الفقراء من مصارف الزكاة وتأكيد مبدأ التكافل فى الاسلام بمساهمة الغنى فى اسكان الفقير والانتقاص من بعض رفاهيات الاسكان الفاخر وتوجيهه بالرضا الى معاونة الفقير فى الحصول على مأوى؟ .. وماهو السبيل الى ذلك؟ .. هل يمكن تبنى رجال الأعمال لهذه الرسالة السامية للأخذ بيد الفقراء ومعاونتهم فى تشغيلهم واسكانهم؟ .. وهل تقبل الدولة توفير الأرض للبناء دون مقابل ليبنوا مساكنهم ومرافقهم بأنفسهم تحت رعاية جماعية واجتماعية؟ .. ان كل هذه التوجيهات تدعونا الى التفكير فى آليات جديدة لجعل عمارة الفقراء سياسة قومية تجند لها كافة الامكانيات المالية والفنية والتنظيمية.

واذا كـــان حسن فتحى قد عرفه العالم الخارجى أكثر مما عرفته الأرض التى أنجبته، فقد آن الأوان أن تقوم الدولة التى ينتمى اليها بتبنى مضامين فكره وأرائه وتحولها الى سياسات قومية تدخلها فى مناهجها التنموية والتعليمية وبرامجها البحثية وأساليبها التنفيذية من خلال هيئات غير حكومية يغطى نشاطها الجوانب التالية:

١- مصادر التمويل.	٢- تحديد جماعات الهدف.
٣ - اختيار المواقع التى توفرها الدولة.	٤- التحرك الجماعى والاجتماعى الى المناطق المختارة.
٥- المشاركة الشعبية	٦- نظم ودلائل التدريب.
٧- توفير مواد وتجهيزات البناء.	٨- تنظيم وادارة عمليات التنمية والاسكان.
٩- التنمية الاقتصادية الاجتماعية	١٠- التخطيط الحضرى والتصميم المعمارى.
١١- برمجة العمليات التنفيذية.	١٢- المتابعة والتقييم والتطوير
١٣- التوعية الشعبية والاعلام.	١٤- التسويق والعلاقات العامة.

ان هـــذه المجالات يمكن أن تكون أساسا لمناهج علوم العمران التـى توفر الكوادر الواعية والقادرة على اعمار الأرض وعمارة الفقراء من خلال المؤسسات غير الحكومية أو الجمعيات الخيرية أو قوافل التعمير فى اطار من المعايير التى تضعها الدولة لهذا النشاط الانسانى الهام وفى ذلك دعوة لانشاء مدرسة حسن فتحى الدولية لعلوم العمران تقوم على أرض الدولة التى أنجبته والتى بدأت تستشعر قدره ورسالته بعد رحيله .. هذه دعوة الى المنظمات الثقافية والعلمية والاستيطانية العالمية للمشاركة فى انشاء هذه المدرسة.

واذا كنـــا نحتفل اليوم بافتتاح ندوة حسن فتحى العالمية الأولى لعمارة الفقراء على أرض الكنانة فانه يحق لهذه النخبة الممتازة من خبراء العالم المجتمعين هنا فى القاهرة أن ينتهزوا هذه الفرصة ويتفقوا على انشاء جمعية حسن فتحى العالمية لعمارة الفقراء تعمل على الاستمرار بفكره وتحمل أعباء النشاط الخاص بجائزته العالمية والذى بدأته جمعية احياء التراث التخطيطى والمعمارى على مدى السنوات الثلاث الماضية. ولتكن هذه الجمعية تحت رعاية السيد وزير التعمير والاسكان والمجتمعات الجديدة الذى دعم هذه الندوة ووضعها تحت رعايته.

أيهـــا الزملاء الأعزاء ...

ان جمعية احياء التراث التخطيطى والمعمارى وهى تسعد بلقائكم اليوم فى هذه الندوة العالمية لترجو أن يتمخض لقائكم هذا عن توصيات عملية قابلة للتنفيذ نابعة من خبراتكم الواسعة ودراساتكم المستفيضة التى سوف تطرحونها على بساط البحث والنقاش.

ان جمعية احياء التراث التخطيطى والمعمارى لتتمنى لكم طيب المقام فى مصر الحضارة والسلام.

دعوة لتأسيس جائزة حسن فتحى لعمارة الفقراء

بـــــادرت جميعة احياء التراث التخطيطى والمعمارى الى الدعوة لتأسيس جائزة دولية لعمارة الفقراء تحمل اسم الراحل حسن فتحى. وقـــد نجحت الجمعية - بالرغم من مواردها المالية المحدودة - فى توصيل دعوتها للجائزة الى شتى أنحاء العالم. وقـــد منحت جائزة حسن فتحـى الدولية لعمارة الفقراء لعام ١٩٩٢ لمركز ايروفيل للبناء بالهند.

ثـــــم كان تنظيم الندوة العالمية الأولى عن فكر وفلسفة حسن فتحى، والتى استطاعت الجمعية أيضا بالرغم من مواردها المحدودة أن تنظمها. وقد حضر الندوة مجموعة من أبرز المعماريين على مستوى العالم، وفى مقدمتهم ضيفة الشرف المعمارية سوها سينى أبر جوجين والتى تمثل مركز ايروفيل للبناء بالهند، الحاصل على جائزة ١٩٩٢.

ولعلنـــــى أنتهز هذه الفرصة للدعوة لانشاء مؤسسة دولية قادرة على ادارة وتنظيم هذه الجائزة الدولية بالتعاون مع سكرتارية الجائزة بالقاهرة. كمـــا أنتهز هذه الفرصة لدعوة ضيوفنا الكرام، لحضور هذه الندوة، ليكونوا ضمن مؤسسيها، مع اختيار خمسة أعضاء فيما بينهم ليشكلوا اللجنة القيادية الموجهة لنشاط هذه المؤسسة الدولية. ويلى ذلك انتخاب رئيسا للجنة القيادية من ضمن أعضائها.

وتجـــــىء هذه الدعوة عن ايمان عميق بأن هذه هى الفرصة الذهبية لتقديم التقدير الواجب للراحل حسن فتحى عن طريق انشاء هذه المؤسسة الدولية تحت اسمه بجهد مجموعة المعماريين القادرين على الاستمرار فى خدمة أفكاره وفلسفته لخدمة الفقراء فى أرجاء العالم.

وبمـــــا أن جمعية احياء التراث التخطيطى والمعمارى لن تستطيع الاستمرار فى تحمل كل هذه المسئوليات بمفردها، فانني أدعو أعضاء هذه الندوة الكرام للتعليق على هذا الاقتراح.

مـــــع الشكـــــر،،،،،

أ.د. عبد الباقى ابراهيم

ندوة حسن فتحى العالميه لعمارة الفقراء

خلال الفتره من ٢٠ الى ٢٢ أبريل

بحث مقدم الى الندوه العلميه حول:

فكر حسن فتحى وأثره على العماره المعاصره

أعداد
محمد خير الدين الرفاعى
مهندس معمارى أستشارى

فكر حسن فتحي
وأثره على العمارة المعاصرة

بحث مقدم الى
الندوة العلمية العالمية حول
فكر حسن فتحي
نيسان ١٩٩٣ م . بالقاهرة

اعداد
محمد خير الدين الرفاعي
مهندس معماري استشاري

فكر حسن فتحي
وأثره على العمارة المعاصرة

قبل دراسة فكر المعماري الكبير الراحل حسن فتحي وأثره على العمارة المعاصرة لابد اولا من دراسة الجوانب المتعددة لتلك الشخصية الفذة التي انتجت هذا الفكر والتعرف على مكوناتها العلمية والفنية والانسانية .. بل وعلى مختلف جوانبها الاخرى . لأن هذا الفكر في واقع الامر انماهو حصيلة تلك المكونات جميعها .

كما لابد ايضا من دراسة الاعمال التي انجزها سواء في مجال الاسكان الريفي أو في المشاريع المختلفة الاخرى ، بل وحتى تلك الاعمال التي لم يكتب لها ان ترى النور .

لقد كان حسن فتحي يتمتع بشخصية قوية جذابة واثقة تبعث على الاحترام من خلال ايمانه الكبير وثقافته الواسعة وقدرته على التعبير والاقناع بمختلف الوسائل بالقول أو الكتابة أو الرسم ... بالكلمات أو الألوان أو الالحان ... بل وحتى بالنقد اللاذع والدعابه والتهكم .

احب الموسيقا وكان يطيب له احيانا ان يقارن بين انسجام الانغام والالحان وبين تجانس الخطوط المكونة للعمارة .. كما أحب الطبيعة ودعا لأن يكون العمل المعماري متآلفا معها وليس دخيلا عليها .

كان لشخصيته بعدها الوطني والقومي من خلال دعوته الدائمة الى عمارة أصيلة ومعاصرة تعبر عن هوية الامة وعن عمق جذورها الحضارية ... كما كان لشخصيته أيضا بعدها الانساني عندما حمل على عاتقه مشكلة الملايين من الناس في هذا العالم ... مشكلة تأمين السكن للفقراء .

كانت له فلسفته الخاصة في كل شيء حتى في مفهومه للمعاصرة في العمارة والعمران . يقول حسن فتحي في محاضرة القاها عام ١٩٧٠ في جامعة اسكس ببريطانيا :

" يمكن القول ان العمل المعماري لكي يكون مرتبطا بزمانه "
" أو معاصرا ، يجب ان يكون جزءا من النشاط الحضري القائم "
" في حياة المجتمع اليومية ... وان يكون متوافقا مع الدرجة "
" الحاضرة التي وصل اليها الانسان من المعرفة في مجالات العلوم "
" الانسانية والعلوم الطبيعية والتي لايمكن الفصل بينها في "
" التخطيط والتصميم المعماري . ويتضح اليوم من التحليل العلمي "
" لمعطيات العلوم الطبيعية والانسانية ان كثيرا من مبادىء "
" التصميم في عمارة المنزل العربي التقليدي لايزال قائما سليما "
" اليوم كما كان بالأمس ، كما أن بعض مايسمى بالحديث من "
" العمارة انما يعتبر متخلفا اذا ماحكمنا عليه بالمعايير "
" القياسية العلمية ذاتها . "

وهكذا من تفهم الجوانب المتعددة لشخصيته شيخ المعماريين العرب حسن فتحي .. ومن دراسة ماصدر عنه من فكر وقول وعمل يمكننا ان نستخلص عمق الأثر الذي خلفه على العمارة المعاصرة والذي يمكن أن نلخصه فيمايلي :

١ - الدعوة الى ان تكون العمارة المعاصرة عمارة اصيلة :

أي منبعثه من العمق التاريخي للامة ومعبرة عن هويتها وانتمائها الحضاري وفي هذا يقول :

" كما ان لكل شعب لغته التي يتحدث بها وزيه الوطني الذي "
" يرتديه ابناؤه .. كذلك فان لكل بلد فنه المعماري المتميز "
" بخطوط واشكال تعبر عن جذوره الحضارية الممتزجة بخيال الشعب "
" ومتطلبات البيئة . "

وكان يرى انه لتحقيق ذلك علينا ان نأخذ العمارة من اللحظة التي تخلينافيها عنها وان نعمل على وصل ما انقطع من سلسلة تطورها الطبيعي وذلك بتحليل عوامل التغير واستخلاص الثوابت منها ، ثم العمل على ايجاد الحلول الملائمة لما استجد من عوامل لم تكن موجودة على هدى ماتوصل اليه الانسان من علوم وتقنيات بحيث نصل بالعمارة العربية الى ماكان يمكن ان تكون عليه اليوم وليس ماهي عليه الآن . وبحيث تصبح معبرة عن هوية هذه الامة المستمدة من قيمها وجذورها الحضارية .

٢ - الدعوة لأن تكون العمارة المعاصرة عمارة انسانية :

أي ان يكون الهدف منها هو تأمين احتياجات ومتطلبات الانسان المادية والروحية وفي هذا يقول :

" ان المحك في تقييم أي مخطط هو الاجابة على سؤال هل هو "
" للانسان أم بشيء آخر ؟ "

كان يرى انه مهما تطورت المعارف والتقنيات فان المقياس الانساني يجب أن يكون الاساس الذي يستند اليه كل عمل معماري أو عمراني وانه لابد ان يكون هناك دائما توازن دقيق بين الانسان والتكوين المعماري الذي يعيش فيه ، وإلا فان ذلك سينعكس سلبا على مشاعره وبالتالي على سلوكيته ونفسيته .

ولقد جد ذلك من خلال النسب الانسانية التي كانت تختفي وراء العديد من أعماله والتي نلاحظها في تكويناته المعمارية وفي تبادل الحركة بين الحجوم والفراغات وفي انسجام وتنوع العلاقة بين الضوء والظل واللون داخل المبنى وفي محيطه .

كما كان يرى أن على المعماري ان يتفهم احتياجات من يبني لهم يتعاون معهم وينمي روح التعاون فيمابينهم .. فطالب بوجود المهندس الحافي مثل اسلوب الطبيب الحافي لكي يدرك ويحس بمشاعر الناس .

ولقد عرف حسن فتحي ان تكامل العلاقة بين العمارة والطبيعة والانسان يضفي على الحياة أبعاد جمالية وروحية لامثيل لها ويزيدها ثراء وغنى .

٣ - الدعوة الى ان تكون العمارة المعاصرة عمارة بيئية :

أي ان تكون متلائمة مع معطيات البيئة المحيطة بعواملها الطبيعية والحضرية والانسانية ولاسيما الثابت الاساسي فيها وهو المناخ . وكان يرى ان على المعماري مراعاة كل تلك العوامل في تشكيل عناصره المعمارية وتنظيمها في الفراغ لاعطاء اكبر كفاية للمبنى في توفير راحة الانسان وتأمين احتياجاته المادية والروحية دون الاستعجال في استخدام الحلول الاصطناعية المعتمدة على التقنية الحديثة .

وفي بحث له بعنوان (المنزل العربي في الوسط الحضري) المنشور في مجلة الفكر العربي عام ١٩٨٢ يقول :

" ان المهندس المعماري الذي يعمل من مبناه فرنا شمسيا ثم "
" يستعمل جهازا كبيرا للتبريد ليجعله قابلا للسكن انما يبسط "
" المشكل اكثر من اللازم ويعتبر تصميمه تحت مستوى فن العمارة . "

وكان يرى انه بالامكان ومن خلال التشكيل المعماري للمبنى التخفيف كثيرا من تأثير أشعة الشمس اللاهبة ولاسيما باستخدام القباب والقبوات وكذلك التحكم في حركة الهواء وانسيابه من الاجزاء المظللة والرطبة بالاعتماد على الملاقف التي يرع في استخدامها ، وعلى الاحواش الداخلية التي تعمل كمنظم طبيعي للحرارة اضافة لوظيفتها في تأمين الخصوصية للساكنين .

وكان يحرص دائما على ان تأتي مبانيه متلائمة مع الارض الطبيعية المحيطة بها ، وكان يجد فيها مصدرا طبيعيا لمواد البناء التي يستخدمها في أعماله .

فاستخدم الطين في قرية الجرنه الجديدة بالاقصر ، كما استخدم الطلة في بناء قرية باربز الجديدة بالواحات الخارجية ، وكذلك استخدم الحجارة في منازل عديدة بالقاهرة وغيرها .. كما استخدم ايضا وبمهارة فائقة الاخشاب في رباط الغابيانكا بجزيرة مايوركا الاسبانية ... الخ ولاغرابة في ذلك كله ، أوليس هو القائل (انظر تحت اقدامك وابن) .

٤ - الدعوة الى ان تتبنى العمارة المعاصرة قيما جمالية ترتكز على الايمان :

ذلك الذي يصقل العقل والروح ويدعو الى البساطة والتواضع والبعد عن التعقيد والزخارف والنقوش تلك البساطة التي تجلت في اعماله من خلال الاتزان والاستقرار في التشكيل المعماري وكذلك في سهولة الانتقالات وتدرجها بين كتله المختلفة .

كما كان يدعو أيضا الى قيم جمالية تعبر عن روح التسامي الى درجة التصوف في بعض الاحيان . يقول حسن فتحي عن مسجد السلطان حسن بالقاهرة :

" ان التوافق خاصة انسانية كريمة ولكن سمو الانسان هي قيمه "
" روحيه نبيلة تدعوه دائما الى النظر فوق ماديات ته وحاجاته "
" الوقتية المباشرة لقد حقق هذا المسجد لقاء الارض بالسماء "
" اكثر واوضح ماحققه أي مبنى آخر ... ان هذا المسجد هو حقا "
" موسيقا رفيعه مجسدة ."

كما كان يرى ان الاستفادة من الاشكال والمفردات المعمارية التقليدية كالمشربية والملقف والعقود ... الخ هو ايضا في واقع الامر احياء لقيم معمارية وفنية استقرت في وجدان المجتمع . وفي هذا يقول :

" على المعماري أن يعيد ثقة المجتمع بثقافته التي اندثرت "
" وذلك باستخدام الاشكال المحلية في عمارته حتى يجذب نظر "
" الحرفيين الى انتاجهم بفخر واعتزاز ومن ثم يقنع المجتمع "
" بالقيمة الثقافية لاعمالهم في البناء المعاصر ."

كما يقول ايضا :
" كما اوجدت الجماعات خطوطها النابعة من العقل الباطن ، فقد "
" اوجدت اشكالها وطرزها المعمارية المتميزة الخاصة بها "
" والحبيبة الى نفوس أهلها التي يتعرف بها عليهم وقد نبعت "
" من وجدانهم ، كما أوجدت اشكال ملابسها وفنونها الشعبية "
" ولغاتها ."

٥ - الدعوة الى اعتماد العمارة المعاصرة على البحث العلمي الجاد :

ولقد ركز اهتمامه على اجراء البحوث حول مواد البناء المحلية وطرق الانشاء التقليدية سعيا وراء تحسين اداتها والاستفادة منها .

كما اهتم ايضا بالبحوث المناخية والاجتماعية والاقتصادية ... وشارك شخصيا في العديد من لجان البحث العلمي المتخصصة ولاسيما في مجال الاسكان الريفي .

كما دعا لاستخدام التقنيات المتوافقة في البناء المعاصر التي تعتمد على استخدام مواد البناء المحلية وتطويرها مع استخدام القدرات الذاتية للمجتمعات في التشييد والبناء ، وطالب برد الاعتبار الى الحرف اليدوية لمالها من أبعاد ثقافية وانسانية . وبذلك تكون عملية البناء متوافقة مع الامكانيات الذاتية المادية والتقنية للمجتمع ، ولهذا الغرض حاول حسن فتحي ان ينشيء المعهد العالي للتكنولوجيا المتوافقة الذى قال عنه :

" ان الانسان تفاعل مع البيئة التي يعيش فيها مستعملا في ذلك "
" كل امكانياته وذلك تحقيقا للتوازن السيكولوجي بين الطبيعة "
" والانسان ... وعندما ظهرت الثورة الصناعية اختفت الحرف "
" اليدوية وفقدت العمارة انسانيتها ... وقل ارتباط الانسان "
" والطبيعة التي هي من خلق الله ، من هنا كانت الدعوة الى انشاء "
" مراكز بحثية تلتزم بالجوانب الروحية للوصول الى اعادة صيغة "
" العلاقة المتوازنة بين الانسان والبيئة . "

ومن ناحية اخرى فقد اقترح عام ١٩٦٢ انشاء معهد خاص للدراسات الريفية وكذلك معهد آخر لدراسات الفنون الشعبية .

٦ - الدعوة الى عمارة معاصرة تهتم ايضا بالفقراء من الناس :

اذ انه كان يرى ان القادرين على البناء هم قلة ويستطيعون ان يبنوا مايشاؤون ، ولكن مشكلة البشرية في زمانها القادم كله هي في عمارة الفقراء .. في اسكان غير القادرين . وفي هذا يقول :

" ان المحزن والذي يأكل القلب والروح من الداخل ، انه لم يعد "
" احد يهتم بالبناء من اجل المواطن البسيط ، وهو الفقير دائما "
" اي ان يكون الهدف النهائي هو بناء تتوافر فيه اربع صفات "
" اساسية . ان يكون رخيصا وبسيطا ومريحا وجميلا . "

وكان يرى ان الوصول الى هذا الهدف يكمن في :

- استخدام مواد البناء المتوفرة محليا والابتعاد ما أمكن عن المواد المستوردة .
- الاعتماد على تقنيات بسيطة وغير مكلفة تتواءم مع امكانيات الانسان المادية والعلمية .
- اتباع الاسلوب التعاوني في البناء وفي هذا يقول في كتابه (البناء مع الشعب) الصادر بالفرنسية عام ١٩٧٠ :

" ان رجلا واحدا لايستطيع ان يبني بيته ، ولكن عشرة رجال "
" يستطيعون أن يبنوا عشرة بيوت لو تعاونوا ... ومع الزمن "
" يبنون قريتهم . "

وفي احاديثه الاخيرة قبل وفاته قال فتحي لزواره :

" ان تحقيق عمارة البسطاء هي الأمل الذي طالما راودني وأعيش "
" به ويدفعني الى مواصلة حديثي للناس بالفكرة لعل وعسى أن "
" ينجح احدهم في تحقيق حلمي كمعماري، مصري عايش هؤلاء الناس "
" واضى جيدا وطويلا الى نغمات الحدران والاسطح في بيوت "
" بسطاء مصر . "

ولعلنا نجد في كتابه (عمارة الفقراء) الذي نشر عام ١٩٦٩ باللغة الانكليزية مايفتح الآفاق أمام الجيل الحالي من المعماريين للاهتمام بالبناء الشعبي وتأمين المأوى اللائق للملايين من الناس في كل مكان .

تلك هي الافكار والمبادىء التي نادى بها المعماري الكبير الراحل حسن فتحي وعبرّ عنها في العديد من الاعمال التي انجزها ... كما عبر عنها من خلال مؤلفاته وكتبه التي صدرت بلغات مختلفة في وقت كان فيه معظم المعماريين من حوله مبهورين مشدوهين بالتقدم العلمي والتقني الذي وصل اليه الغرب ...لدرجة انهم أداروا ظهورهم لثقافتهم ولتراثهم المعماري والعمراني الخالد .

كان رائدا في مجالات عديدة من خلال مبادىء واتجاهات فكرية ومعمارية نادى بها وظهرت بعده بعشرات السنين :

- في مسؤولية المعماري عن مواءمة المبنى لمحيطه .
- في صراحة التعبير عن وظيفة المبنى ومواد البناء المستخدمة فيه وعن تكوينه الانشائي من الداخل والخارج .
- في ضرورة الحفاظ على البيئة وحسن التعامل معها .
- في الدعوة لرد الاعتبار للحرف اليدوية والطرق التقليدية في البناء .
- في الاهتمام بالعمارة الشعبية ... واسكان الفقراء من الناس .

وتقديرا لذلك كله فقد نال حسن فتحي العديد من الجوائز التقديرية من مختلف المنظمات العربية والدولية المعنية بقضايا العمارة والعمران ، كما ان عددا من جامعات العالم ادخلت تلك المبادىء والاتجاهات في مناهجها التعليمية ... اضافة الى ان جمعيات ومراكز ابحاث قد قامت هنا وهناك على هدى تلك الافكار والمبادىء حتى ان بعضها قد حمل صراحة اسم المعماري الكبير الراحل .

ولعلنا اليوم أحوج مانكون الى دراسة تلك الاعمال والافكار والمبادىء بعمق للاستفادة منها والسعي لتطويرها وصولا الى عمارة أصيلة ومعاصرة تؤمن المبنى الاقتصادي الملائم لمختلف قطاعات الشعب ولاسيما الفقراء منهم ... وتعبرعن الهوية والشخصية الحضارية لهذه الامة .

حلب - شباط ١٩٩٣

محمد خير الدين الرفاعي
مهندس معماري استشاري

ندوة حسن فتحى العالميه لعمارة الفقراء

خلال الفتره من ٢٠ الى ٢٢ أبريل

بحث مقدم الى الندوه العلميه حول:

أستثمار طاقات المجتمع فى البناء بالجهود الذاتيه
بعض التجارب التطبيقيه من المدن العربيه

أعداد
د.محمد عبد الله الحماد
مدير عام المعهد العربى لأنماء المدن

استثمار طاقات المجتمع في البناء بالجهود الذاتية
بعض التجارب التطبيقية من المدن العربية

إعداد : د. محمد عبد الله الدماد
مدير عام المعهد العربي لإنماء المدن

بحث مقدم إلى الندوة العلمية حول :
«أثر فكر حسن فتحي في العمارة المعاصرة»
تنظيم جمعية إحياء التراث التخطيطي والمعماري
مركز الدراسات التخطيطية والمعمارية

خلال الفترة من ٢٣ ـ ٢٥ مارس ١٩٩٣م

القاهرة ـ جمهورية مصر العربية

المحتويات

مقدمة : مبدأ استثمار طاقات المجتمع بالجهود الذاتية :

منذ أوائل السبعينات من القرن الميلادي الحالي شرع البنك الدولي في تمويل مشروعات تستند إلى مناهج عملية تسهم في توفير المأوى لسكان الحضر، وقد أخذ المنهج الجديد لتوفير الوحدات السكنية بمبدأ «مساعدة النفس» أو استثمار طاقات المجتمع بالجهود الذاتية وذلك بأن تتم تعبئة الجهود الذاتية والموارد المتاحة للقاطنين ليقوموا بأنفسهم بإنشاء مساكنهم بعد أن توفر لهم الدول المواقع المناسبة والمزودة بالخدمات والمرافق، وتأتي الجهود الذاتية من خلال العمل المتدرج حيث تقوم كل أسرة بإنشاء جزء من المسكن، ثم تستكمله أو تتوسع فيه خلال مراحل زمنية تمتد إلى سنوات حسب توفر الموارد المالية لها .

وبعد النجاح الذي حققه منهج مساعدة النفس في كثير من الدول التي أشرف البنك الدولي على تنفيذ المشروعات الإسكانية بها والتي تعتمد على هذا المبدأ، ونتيجة للعجز المستمر الذي صاحب الطلب على المأوى في كثير من بلدان العالم النامي خاصة الدول العربية، وبعد أن أدرك المهتمون بأمر الإسكان في هذه الدول أن الاستثمارات الحكومية وغير الحكومية الموجهة إلى إسكان الغالبية العظمى من سكان المدن وهم محدودو الدخل ليست كافية ولا تستطيع الوفاء بالاحتياجات المتزايدة من الوحدات السكنية، وبعد أن دلت التجارب أن نسبة كبيرة قد تتراوح ما بين ٦٠٪ إلى ٨٠٪ من مجموع الوحدات السكنية التي شيدت في الخمس عشر سنة الأخيرة في بعض البلدان العربية، تعتبر إسكاناً غير رسمي، وأن ٥٪ إلى ١٠٪ فقط من مجموع الوحدات السكنية التي بنيت خلال هذه الفترة تعتبر إسكاناً رسمياً، نتيجة لكل ذلك اكتسب مبدأ الجهود الذاتية أهمية خاصة كبرنامج عملي يسهم في توفير المأوى لمحدودي الدخل في بلدان العالم الثالث. ففي منتصف السبعينات بلغ عدد المشروعات الإسكانية التي تعتمد على مبدأ الجهود الذاتية أكثر من ٧٠ مشروعاً في سبع وعشرين دولة نامية .

أما عقد الثمانينات فقد شهد برامج متعددة لإيواء محدودي الدخل في البلدان النامية بوجه عام والبلدان العربية بوجه خاص في إطار مبدأ استثمار الجهود الذاتية لمحدودي الدخل .

وقد أدى مبدأ مساعدة النفس كمنهاج لتعبئة الجهود الذاتية إلى تخفيض تكاليف إنشاء الوحدات السكنية، ذلك أن الأسر تساهم بجهود أفرادها مباشرة، أو تستطيع الحصول على العمالة المطلوبة بتكاليف أقل، وقد لعب الجهد التعاوني دوراً مهماً في إنجاح بعض مشروعات مبدأ مساعدة النفس في بعض الدول. كما أن توفير الأراضي بأسعار رمزية قد ساهم في تخفيض كلفة السكن في مشروعات الإسكان الذاتي .

ومما سبق تتضح لنا أهمية الاعتماد على مبدأ الجهود الذاتية في توفير المساكن لذوي الدخل المحدود في البلدان العربية خاصة وأن الوحدات السكنية التي أنشأتها القطاعات الحكومية لم تكن في حدود الامكانات المالية لمحدودي الدخل، بالاضافة إلى أنها لم تأخذ في الحسبان العادات والتقاليد لسكان هذه الوحدات، أي

بمعنى أن الاسكان النمطي لم يكن متمشياً مع الظروف الاقتصادية والاجتماعية والمعيشية لمعظم السكان من ذوي الدخول المنخفضة في الوطن العربي .

برامج و مشروعات مبدأ مساعدة النفس المنفذة في بعض البلدان العربية :

شهدت أقطار الوطن العربي ومدنها في الربع القرن الأخير حركة نشطة لمواجهة المشكلات الإسكانية ترجمت في تنفيذ العديد من البرامج والمشروعات، ويمكن حصر هذه البرامج والمشروعات في الآتي :

(أ) برامج ومشروعات الموقع والخدمات .

(ب) برنامج المسكن النواة .

(جـ) برامج تطوير وإعادة تخطيط المناطق العشوائية والأحياء المتدهورة .

[أ] برامج ومشروعات الموقع والخدمات .

يعتبر برنامج الموقع والخدمات من أحدث البرامج المطبقة في كثير من الدول النامية وبوجه خاص في الدول العربية مقارنة ببرامج الإسكان العام والإسكان الشعبي، وقد حظي بقبول أوسع وسط الجهات المسئولة عن الاسكان ووسط الفئات السكانية ذات الدخول المتوسطة والمنخفضة، خاصة وأن هذا البرنامج قد أتاح الفرصة للفئات المستفيدة أن تشيد مساكنها بمواردها الذاتية وطبقاً لإمكاناتها وعاداتها وتقاليدها، أما موارد الدولة فتخصص لتوفير الأرض اللازمة للبناء وتهيئتها ومدها بالخدمات الأساسية والضرورية، أي بمعنى أن برنامج الموقع والخدمات قد قنن دور وإمكانات الدولة والمستفيدين ووجهها الوجهة الصحيحة وحدد لكل جهة المهام والواجبات التي يفترض القيام بها لإنجاح هذا البرنامج وتنحصر في :

١ ـ الدور والمهام المحددة للدولة وتشمل :

- تخطيط الأراضي وتهيئتها وتوزيعها على المستفيدين إما مجاناً أو بأسعار رمزية تسترد على آجال متوسطة أو طويلة .
- القيام بإنشاء البنية التحتية والخدمات الأساسية كالطرق والمجاري والكهرباء والمياه .
- المساعدة في توفير التمويل المناسب عن طريق مؤسسات التمويل الإسكاني المتخصصة .
- دعم الجهات الرسمية التي تعمل على وضع المواصفات القياسية بحيث تصبح مواد البناء المحلية والمستوردة وعناصرها مؤمنة في السوق الاستهلاكي .
- توفير مخططات وتصاميم نموذجية تخضع للوائح ونظم التحكم في المباني .

٢ ـ دور ومهام الفرد أو الجماعات وتشمل :

- المشاركة الفعالة بالبناء وتسديد تكلفة الأرض وفق البرنامج الموضوع لها .
- الإقدام على الادخار لتوفير المبالغ لتغطية أثمان مواد البناء .
- التقيد بالشروط الموضوعة للبناء قدر الامكان حتى وإن أدى ذلك إلى إطالة الفترة الزمنية للتنفيذ .

وهكذا استطاع برنامج الموقع والخدمات أن يؤسس نوعاً من التعاون المثمر بين السلطات والسكان، مما جعله أكثر قدرة على تلبية الاحتياجات المتزايدة للمأوى في الدول النامية بصفة عامة والدول العربية بصفة خاصة، وهذا ما حدى بالأمم المتحدة والهيئات والمنظمات العالمية والاقليمية والمحلية أن تولي اهتماماً خاصاً لهذا البرنامج وعملت على تطوير الفكرة وتعميمها وحث الدول خاصة تلك التي تتميز بانخفاض في دخولها إلى تبني السياسات الإسكانية التي تركز على برامج الموقع والخدمات .

وتؤكد الاحصائيات المتوفرة في بعض المدن العربية نجاح برنامج الموقع والخدمات، فقد استطاعت المدن الرئيسية بالمملكة العربية السعودية والتي كانت تعاني ـ في الماضي ـ من نقص في المساكن، أن تحقق تقدماً كبيراً في مجال الاسكان بفضل تبني برنامج الموقع والخدمات ومنح الأراضي الصالحة للبناء مجاناً بعد تجهيزها بالخدمات والمرافق، ومنح المستفيدين من البرنامج قروضاً ميسرة للمساعدة في إقامة مساكنهم، وبذلك زاد العرض على الطلب في هذه المدن بمقدار ١٧٠ ألف وحدة سكنية في عام ١٩٨٦م .

وفي السودان حققت مصلحة الإسكان نجاحاً كبيراً في تطبيق برنامج الموقع والخدمات حيث أشارت الاحصائيات أنه من بين ٥٠ ألف وحدة سكنية توفرت للمستفيدين في العاصمة الخرطوم خلال الفترة من ١٩٦١ ـ ١٩٨٨م ساهم برنامج الموقع والخدمات بأكثر من ٩٥٪ من إجمالي الوحدات السكنية في هذه المدينة .

[ب] برنامج المسكن النواة .

فكرة المسكن النواة كانت وليدة بعض العقبات التي واجهت تنفيذ برامج الموقع والخدمات خاصة من جانب المستفيدين الذين كانوا يجدون صعوبة في القيام بعمليات البناء التي تتطلب دراية فنية خاصة كأعمال السباكة والحمامات ومراعاة المواصفات المقاومة للعوامل والمخاطر الطبيعية المحتملة كالزلازل والسيول وغيرها، ذلك أن الجهود الذاتية لا تستطيع من واقع التجارب التي مرت بها الدول القيام بهذه الأعمال الخاصة، بل إن الحاجة تستدعي التدخل المباشر من الدولة في عملية بناء هذه المرافق، بالاضافة إلى أن طرق الجهود الذاتية تستغرق أحياناً وقتاً أطول في إنجاز بعض عناصر المشروع البنائي المفترض اتمامها في وقت مبكر بسبب شحة الموارد المالية لدى محدودي الدخل .

لكل هذه الأسباب نشأت فكرة المسكن النواة وهي تعتمد أساساً على إنشاء غرفة واحدة من المسكن وتجهيز توصيلات المنافع العامة وترك حرية التوسع فيه بمرور الوقت وعند توفر الموارد لدى المستفيدين. وقد اكتسب برنامج المسكن النواة أهمية خاصة كأحد البدائل الإيجابية لحل مشكلة إسكان محدودي الدخل في الدول النامية بصفة عامة وبعض الدول العربية بصفة خاصة لأنه يتميز بما يلي :

١ ـ يعتمد المسكن النواة على مساهمة محدودي الدخل بجهودهم الذاتية لحل مشكلة الإسكان الخاصة بهم .

٢ ـ إمكانية التطور والتوسع فيه وبما يتلاءم مع المستوى الاقتصادي المتغير للسكان والحجم المتزايد للأسرة المستفيدة .

٣ ـ إمكانية استغلال الدعم الحكومي لإنشاء أكبر عدد من الوحدات السكنية وذلك يساهم في حل مشكلة القطاع الأكبر من السكان وهم محدودو الدخل .

٤ ـ توجيه الدعم لفئات السكان ذوي الحاجة الملحة للمأوى عن طريق إعانات مباشرة على شكل مواد بناء .

٥ ـ إن وجود وحدات المسكن النواة بأراضي المشاريع التي تتوفر بها المرافق العامة والخدمات تساعد على تنمية هذه المناطق .

وهناك دول رائدة في مجال الإسكان النواة ومنها المغرب والسودان والعراق ومصر والتي شهدت مدنها الكبرى تنفيذ عدد من مشاريع الإسكان النواة .

ففي مدينة الدار البيضاء اعتمدت الخطة الخمسية للدولة للفترة ١٩٧٢ ـ ١٩٧٧م تنفيذ ١٤٢ ألف وحدة سكنية في إطار برنامج المسكن النواة لمحدودي الدخل مقابل أن يتحملوا قيمة الأرض المخصصة للمسكن وقدمت الدولة تسهيلات في شكل قروض تسدد خلال ٢٥ سنة .

وفي السودان قامت مصلحة الإسكان بتنفيذ برنامج المسكن النواة على فترتين متباعدتين : الفترة الأولى كانت ما بين ١٩٧٢ و ١٩٧٦م والفترة الثانية كانت في النصف الثاني من الثمانينات .

ونظراً لشحة الموارد المخصصة للبرنامج فلم تستطع مصلحة الإسكان تنفيذ العدد الكافي من الوحدات السكنية، حيث بلغ عدد الوحدات المشيدة في الفترة الأولى حوالي ٧٥ وحدة سكنية وبلغ عدد الوحدات المنفذة في الفترة الثانية بضعة مئات من الوحدات .

[جـ] برامج تطوير وإعادة تخطيط المناطق العشوائية والأحياء المتدهورة .

اتخذت المدن العربية توجهات متباينة نحو علاج ظاهرة المستوطنات العشوائية والأحياء المتدهورة، بحيث يمكننا تقسيم تلك التوجهات إلى ثلاثة أنواع رئيسية :

فهناك أولاً النظرة إلى المستوطنات في إطار منهج الاقتصاد الحر الذي يعتبر المستوطنات نتاج ظروفها وحدها، وهي مسئولة عن تحسين أوضاعها بنفسها بينما موارد الدولة توجه نحو تنمية القطاعات الأخرى . أما التوجه الثاني فيدعو إلى اجتثاث المستوطنات العشوائية أو الحد من توسعها بإعمال سلطة القانون، حيث تعتبر قائمة على أراضي استولى عليها المقيمون بطريقة غير نظامية، ولذلك فإنها لا تحظى باعتراف المسئولين وبالتالي تحرم من أية مشاريع عامة أو خدمات أساسية أو مرافق صحية وتعليمية .. إلخ . وهناك التوجه الثالث ويرى في المستوطنات العشوائية أمراً واقعاً لابد من علاجه وذلك بتحسين الظروف المعيشية والطبيعية فيها .

وقد لاقى التوجه الأخير الذي يهدف إلى الاعتراف بأحقية المواطنين المقيمين في المستوطنات العشوائية في العيش في المجتمع الحضري الذي يقيمون فيه قبولاً واسعاً على المستوى العالمي، كما بدأت السلطات في كثير من الدول العربية تتبنى هذا التوجه منذ السبعينات من هذا القرن بعدما تبين لها أن الحلول السابقة والتي كانت تعتمد على إزالة المستوطنات العشوائية والأحياء المتدهورة لم تعد عملية، ذلك لأن تكاليف الإزالة ونقل القاطنين إلى مواقع أخرى مرتفعة جداً ناهيك عن الأضرار الاجتماعية والاقتصادية الناجمة عن عملية اجتثاث السكان من مواطنهم الأصلية .

وفي إطار تطوير وتحسين المستوطنات العشوائية اتخذت المدن العربية طرقاً وأساليب مختلفة للتحسين يمكن تحديدها في ما يلي :

(أ) إقامة مجمعات سكنية ضمن برامج الإسكان العام ومنحها لسكان المستوطنات العشوائية والأحياء المتدهورة بأجور رمزية ويطبق هذا الأسلوب في المدن التي لا تتوفر فيها المساحات الكافية وتتميز بالاكتظاظ السكاني كالقاهرة الكبرى على سبيل المثال :

(ب) إعادة تخطيط المناطق العشوائية وتوفير مواقع البناء المزودة بالخدمات ليقوم ذوو الدخول المحدودة ببناء مساكنهم في إطار مبدأ مساعدة النفس، وتأخذ بهذا الأسلوب المدن العربية ذات الدخول المحدودة كالمدن السودانية مثلاً : ففي مدينة بورتسودان حقق هذا الأسلوب نجاحاً منقطع النظير إذ أن المسئولين في قطاع الإسكان استطاعوا توطين أكثر من ٧٠ ألف أسرة خلال الفترة من ١٩٧٠ ـ ١٩٨٥م في المواقع التي تم إعادة تخطيطها وتحسينها .

وقد قامت السلطات المختصة بتخفيض معايير بناء المسكن والمرافق الأساسية والخدمات إلى أدنى حد ممكن حيث خفضت مساحة الأرض إلى ٢٠٠م^{2} واقتصر البناء على غرفة واحدة موادها من الطوب الأحمر (الطين المحروق) والخشب وغيرها من المواد المحلية قليلة التكلفة، كما اقتصرت الخدمات الأساسية على شبكة تقليدية لتصريف مياه المجاري وصنابير مياه شرب عامة تخدم ما بين ١٥٠ إلى

٢٥٠ أسرة .

(جـ) توفير المساعدات الفنية والإدارية بما في ذلك توفير القروض ومواد البناء ليقوم سكان المستوطنات العشوائية ببناء مساكنهم بجهودهم الذاتية كما هو الحال في مدينة عدن باليمن .

برامج و مشروعات الجهود الذاتية بين النجاح والإخفاق :

يرى كثير من المتخصصين في مجال الإسكان والمهتمين بإيواء فقراء المدن أن برامج الجهود الذاتية لم ترق إلى طموحات القائمين على أمر الإسكان في المدن العربية، وأنها لم تحقق النتائج المرجوة منها، وأنها لم تستطع أن تستأصل المشكلة من جذورها وذلك للأسباب التالية :

١ ـ سوء الإدارة وتعقد الإجراءات البيروقراطية وافتقاد الخبرة وضعف حماس السلطات المحلية قد قلل من احتمالات الوصول إلى النتائج المرجوة ألا وهي إيواء العدد الأكبر من المحتاجين من ذوي الدخول المتدنية .

٢ ـ محدودية موارد بعض الدول وضآلة النسبة المخصصة من الاستثمار العام لمشاريع الجهود الذاتية قد انعكس على قدرة هذه الدول على الوفاء بالتزاماتها في هذه المشاريع والتي تتمثل في تهيئة المواقع ومدها بالخدمات الأساسية والعامة .

٣ ـ كثير من مشاريع الجهود الذاتية خاصة مشاريع الموقع والخدمات قامت في مواقع بعيدة وفي أطراف المدن حيث تنعدم وسائل النقل للسكان الذين يعملون في المرافق العامة والخاصة والتي تتركز في وسط المدينة مما يزيد من معاناة هؤلاء السكان .

٤ ـ كثير من مشاريع الموقع والخدمات لم يستفد منها المعدمون من فقراء المدن في بعض البلدان العربية نظراً لارتفاع تكلفة إقامة الوحدة السكنية والتي فاقت إمكانات وقدرات هؤلاء الفقراء في وقت لم تكن هناك تسهيلات ائتمانية أو قروض ميسرة تساعدهم في البناء. وقد ساهم في ارتفاع التكلفة شروط ونظم ومعايير البناء المعمول بها في هذه البلدان والتي لم تراع إمكانات هذه الفئات .. وتشير بعض المصادر إلى أن بعض فقراء المدن والذين حازوا على قطع أراضي في مشاريع الموقع والخدمات قد اضطروا إلى بيعها إلى الفئات الأكثر اقتداراً .

٥ ـ ويرى البعض أن البناء الذاتي في عمليات إعادة الإسكان يطيل الفترة الزمنية لإنجاز الوحدات السكنية وذلك راجع في الأساس إلى ضعف موارد المستفيدين والتي من الممكن أن توظف في عمليات البناء وغالباً ما يصاحب ذلك ارتفاع في تكاليف البناء وزيادة في أسعار المواد .

٦ ـ كما يرى البعض الآخر أن الامكانات الذاتية لساكني المستوطنات العشوائية لم تستغل الاستغلال الأمثل حيث كان من الممكن عن طريق التوجيه والتدريب والاشراف والمتابعة المستمرة توظيف قدرات هؤلاء في إقامة المأوى المناسب لهم .

أما المؤيدون لفلسفة البناء بالجهود الذاتية، فعلى الرغم من قناعتهم أن هناك بعض الأمور التي هي بحاجة إلى تعديلات قد تكون جوهرية بعض الشئ كالضرائب وأسعار الأراضي والاستثمارات الموجهة للإسكان، ونظم البناء، ومواد البناء وظهور تنظيمات رسمية وشعبية قادرة على توجيه النشاطات المتصلة بالسكن الفقير، إلا أنهم يقرون بأن برامج الجهود الذاتية سوف تظل البديل الملائم، وأن تحقيق إصلاح جزئي في مجال السكن الفقير لهو أمر أفضل بكثير من الوقوف دون إنجاز شئ على الاطلاق .

ونحن من جانبنا نميل إلى تأييد هذا الجانب لاعتقادنا أن برامج الجهود الذاتية تمثل أفضل السياسات المتاحة الآن في مجال السكن الفقير. وإذا كانت هذه البرامج قد واجهت بعض الصعوبات وصاحب تنفيذها بعض السلبيات، فإن ذلك لا يعود إلى فلسفتها ومبادئها بقدر ما يعود إلى السياق البنائي الذي تعمل في إطاره. إن الكثير من الايجابيات التي أفرزتها تجارب الدول في مجال الجهود الذاتية لجديرة بالتوقف عندها. فهي بالاضافة لكونها تسمح بإنتاج أعداد هائلة من المساكن التي تواكب وتيرة الاحتياجات المتزايدة للنمو الحضري السريع، فإنها قادرة أيضاً على الحد أو الحيلولة دون توالد ظاهرة السكن غير اللائق، وهناك أمثلة كثيرة من التجارب الناجحة في الوطن العربي. ففي المغرب ساهمت سياسة مشاريع الموقع والخدمات إلى تراجع ظاهرة أحياء الصفيح وانخفضت نسبة قاطني هذه الأحياء بالمقارنة إلى مجموع السكان الحضريين من ١٢,٨٪ في عام ١٩٨٢م إلى ٥,٨٪ في عام ١٩٩١م[١] .

وفي مدينة بورتسودان بالسودان ساهمت مشاريع الموقع والخدمات في إيواء أكثر من ١٠٠ ألف أسرة كانوا يقطنون الأحياء العشوائية المتخلفة خلال الفترة من بداية السبعينات إلى أواخر الثمانينات من القرن الميلادي الحالي .

وبالاضافة إلى كل هذه الايجابيات فإن برامج الجهود الذاتية قد أفرزت نوعاً من التعاون المثمر البناء بين الدولة والمستفيدين، وأسست بذلك إطاراً لتبادل المنفعة بينهما. فعلى مستوى الدولة أدى تحمل المستفيدين كلفة بناء مساكنهم إلى الاستفادة من الاستثمارات التي كانت تصرف في مشاريع الإسكان العام في مجالات أخرى تعود بالفائدة على الدولة والمجتمع. وأما على مستوى المستفيد فإن السماح له بأن يقيم مسكنه بإمكاناته

---

(١) توفيق حجيرة : ديناميكية البناء الذاتي في عمليات إعادة الإسكان بالمغرب، ورقة مقدمة إلى المؤتمر الدولي للإسكان، القاهرة، فبراير ١٩٩٢م .

الذاتية وفي حدود طاقته، قد خفف عنه كثيراً من الكلفة العالية التي كان يتحملها في استئجار المباني، وكذلك من المعاناة التي كان يجدها في المستوطنات العشوائية بكل سلبياتها ومشكلاتها، وهذا بخلاف الخدمات التي وفرتها له الدولة في موقعه الجديد والتي كان يفتقدها في هذه المستوطنات .

وتأسيساً على كل ما تقدم فإن برامج الجهود الذاتية لإيواء المحتاجين من فقراء المدن لها من الايجابيات ما يجعلنا نقر بصلاحيته في مدننا العربية إلى أن يظهر البديل الأفضل، على الرغم من بعض السلبيات والمعوقات التي صاحبت التطبيق في العقود الماضية والتي تعتبر بمثابة التحديات التي يجب علينا مجابهتها في المستقبل. إن التركيز على استغلال إمكانات وقدرات وطاقات ساكني المستوطنات العشوائية بالطريقة المثلى، وإعادة النظر في شروط ونظم ولوائح التحكم في البناء، وتطوير الأجهزة الإدارية والفنية على مستوى أجهزة الدولة وخاصة الأجهزة المحلية، والتقليل من تكلفة البناء بالاعتماد على مواد البناء المحلية بعد تطوير صناعتها، لهي أمور على غاية الأهمية وتتطلب وقفة جادة من أجل وضعها موضع التنفيذ .

الاستفادة من التجارب الرائدة في دعم برامج الجهود الذاتية :

إن زيادة المعرفة وتطويرها لا يأتي من فراغ، ولكنه ينبني على تجارب الماضي والاستفادة من دروس هذا الماضي ويلعب التاريخ دوراً أساسياً في تغذية هذه المعرفة من خلال إبداعات الأجيال التي تتعاقب عبر هذا التاريخ .

وفي مجال المأوى والإسكان يذكر لنا التاريخ كيف استطاع الإنسان أن يبني مأواه ويطوره على مر الحقب الطويلة ولقد كانت هناك إبداعات خلدها التاريخ في مجال المأوى وضع لمساتها أفراد ومجموعات نذكر منها على سبيل المثال لا الحصر : إبداعات المهندسين حسن فتحي وجون تيرنر على المستوى الشخصي، وجهود وإبداعات برنامج الأمم المتحدة للمستوطنات البشرية «الموئل» كمنظمة دولية لها إسهامات بارزة في مجال إيواء الفقراء في الدول النامية، ودعم تقنية البناء بالجهود الذاتية .

[أ] جهود حسن فتحي في تطوير تقنية البناء بالمواد المحلية .

اكتسب المهندس حسن فتحي شهرة عالمية، بجهوده في تطوير بناء المأوى منخفض التكاليف بالاعتماد على مواد البناء المحلية واستناداً إلى الفن المعماري المحلي الذي يتميز بالبساطة. ولقد انطلق حسن فتحي من القناعة بأنه لا يوجد شخص ـ خاصة إذا كان من ذوي الدخول المتدنية ـ قادر على تشييد مسكن عادي من مواد البناء المستوردة ووفق معايير البناء التي تعتمد على الخرسانة المسلحة والخشب ولذلك عكف معظم وقته وكرس حياته كلها من أجل تثبيت أفكاره حول السكن الملائم للفقراء ويرهن للجميع أن الحلول لمشكلات السكن

بالنسبة لهؤلاء سواء في وطنه مصر أو بقية الدول النامية إنما تكمن في التجارب المحلية عبر التاريخ. فلقد عكف على دراسة مباني الطين المنتشرة في دول وادي النيل (مصر والسودان) والتي صمدت في وجه الزمن لآلاف السنين ومنها مخازن الأقصر المبنية من الطوب المصنوع من الطين منذ ٣٤٠٠ سنة. ولقد استفاد حسن فتحي من هذه التجارب في بناء قرية قرنة من الطوب الطيني. وقد وظف قدراته في إعداد التصاميم المعمارية النابعة من العمارة المصرية التقليدية، واستطاع أن يكيف هذه التصاميم حسب احتياجات ورغبات سكان القرية. وعاش حسن فتحي بين الفلاحين والبسطاء منتقلاً فيما بينهم يعلمهم كيف يستفيدون من قدراتهم الذاتية في بناء المساكن، ويشرف على عمليات البناء من قرب، وبذلك أعطى نموذجاً للتعاون المثمر بين المشرف المسئول وبين المستفيدين من محدودي الدخل في مجال توفير المأوى المناسب والملائم لقدرات الفقراء، حتى إنه برهن للجميع كيف أن الأسلوب الذي اتبعه في تصميم المسكن الملائم للفقراء قد خفض كلفة البناء إلى أقل من النصف باستخدام مواد البناء المحلية وبتوظيف قدرات المستفيدين في إقامة هذه المساكن، ولعله من المفيد هنا أن نشير إلى أن برامج ومشروعات الموقع والخدمات أحوج ما تكون لمثل هذه التجربة من أجل مواجهة التحديات التي تواجهها ومنها القدرة على توظيف قدرات المستفيدين في إقامة مساكنهم والعمل على خفض كلفة المسكن لتكون في متناول الفقراء .

[٢] جون تيرنر واكتشافه المبكر لقدرات قاطني المستوطنات العشوائية في إقامة المأوى .

برهن جون تيرنر وهو أحد الخبراء المرموقين في مجال السكن الفقير والمستوطنات العشوائية بأن الفقراء يتصرفون إزاء ظروفهم السكنية بطريقة لا تخلو من إبداع وترشيد ومواءمة وذلك في دراساته عن سكان المستوطنات العشوائية في بيرو بأمريكا الجنوبية. وفي هذه الدراسات ذهب تيرنر إلى القول «بأن الأحياء العشوائية التي تعد من أكثر المناطق الحضرية تخلفاً تعد مأوى للكثير من الأسر الفقيرة في مدن العالم الثالث ومع أن هذه الأحياء تفتقر إلى الخدمات الأساسية، إلا أن سكانها غالباً ما يحرصون على تطوير مساكنهم وتدعيمها بتشييد جدران خارجية، وحجرات إضافية، وسقوف أكثر صلابة وربما طوابق أعلى . وبمرور الزمن قد يتمكن هؤلاء السكان الفقراء من تدبير بعض الخدمات الحضرية الضرورية» . ونستشف من آراء تيرنر أن الأسر الحضرية الفقيرة تتخذ مواقف رشيدة إيجابية لمواجهة ظروفهم السكنية المتدنية، ويعبرون عن ذلك بأساليب مختلفة تكشف عن مرونة بالغة في مواجهة البيئة القاسية، وأنهم أقدر على إقامة المساكن التي تناسب احتياجاتهم وقدراتهم .

وذهب تيرنر إلى أبعد من ذلك حيث أشار إلى أن قاطني المستوطنات العشوائية رغم قدرتهم على توظيف امكاناتهم في إقامة مساكنهم التي تلبي رغباتهم إلا أنهم لازالوا بحاجة إلى قدر من النصح والاشراف وخاصة ما يتعلق بمساعدتهم في إعداد تصاميم نموذجية للمساكن وتنظيم نوع من التثقيف في مجال تشييد المساكن وما إلى ذلك .

والحقيقة أن آراء تيرنر وإن كانت قد أخذت طريقها إلى التطبيق في بعض البلدان النامية، إلا أن هذه الآراء لم تطبق كما يجب، أو لم تجد طريقها إلى التطبيق خاصة في البلدان العربية الأقل نمواً .

إن سكان المستوطنات العشوائية ونحوهم من فقراء المدن والذين أكدوا من خلال ممارساتهم اليومية قدرتهم على الاعتماد على النفس في مواجهة قسوة الحياة ومشكلات المأوى بحاجة إلى تشجيع ورعاية من السلطات ذات العلاقة بالبلدان العربية لتمكينهم من بناء مساكنهم على النحو الذي يجمع بين رغباتهم وبين متطلبات البنية الحضرية بكل مقوماتها .

[٣] تجارب وجهود مركز الأمم المتحدة للمستوطنات البشرية في إيواء محدودي الدخل في الدول النامية .

إن جهود مركز الأمم المتحدة للمستوطنات البشرية ودوره في إرساء قواعد البناء بالجهود الذاتية في إطار مبدأ مساعدة النفس، ليس بحاجة إلى إعادة تذكير، ولكن ما يهمنا الآن هو دور المركز وجهوده في حث الدول على الاعتماد على مواد البناء المحلية وتطويرها لما لهذه المواد من تأثير على كلفة المأوى للفقراء، ذلك التحدي الذي أشرنا إليه أنه كان أحد العوامل الأساسية التي افتقدتها مشروعات البناء بالجهود الذاتية في السنوات السابقة .

فلقد تبنى المركز عدة برامج ناجحة في عدد من الدول النامية أسهم فيها بإمكاناته وخبرات القائمين على أمره في تطوير صناعة مواد البناء المحلية. ففي مشروع كلفته مليون دولار أمريكي في السودان، قام كل من مركز الأمم المتحدة للمستوطنات البشرية وبرنامج الأمم المتحدة للبيئة بمساعدة الحكومة على إنشاء مصنع متنقل قادر على إنتاج ٢٠ مليون قطعة من الطوب الأحمر المحروق، ويتم إنتاج قطع الطوب بكلفة ١٢ دولاراً لكل ١٠٠٠ منها، في حين تبلغ كلفة قطع الأسمنت أكثر من ثلاثة أمثال ذلك. وفي الجزائر يعمل المركز على الترويج لمشروع تعزيز مواد البناء المحلية والذي يعتمد على الحجارة والتربة والرمل والجير كمواد أساسية للبناء مع تحسين تقنيات استخدامها، ولدى المركز مشاريع مماثلة في شتى أنحاء العالم ـ خاصة في الدول النامية ـ يتم التركيز فيها على تطوير مواد التسقيف المحلية كسعف النخيل وخشب الخيزران ومواد أخرى يجري

استخدامها بشكل مأمون ضمن الأساليب المعمارية التقليدية .

لقد أدرك مركز الأمم المتحدة للمستوطنات البشرية أن تحقيق هدف توفير المأوى للفقراء مرهون بالانتفاع بمواد البناء المحلية المتاحة، وأدرك كذلك أن لوائح البناء القائمة لا تتسم بالواقعية وتحتاج لبعض التعديلات كي تصبح مناسبة للأوضاع المحلية، إذ لا ينبغي تطبيق المعايير والمقاييس الدولية القائمة لمباني الأسمنت والحجر، على تشييد مساكن الفقراء التي من المفترض أن تعتمد على مادة الطين وسعف النخيل وخشب الخيزران وغيرها .

وفي شعاره لليوم العالمي للموئل عام ١٩٩٠م تبنى مركز الأمم المتحدة للمستوطنات البشرية استراتيجية توفير المأوى للجميع عام ٢٠٠٠ استناداً إلى ما يسمى بمبدأ « النهج التمكيني » وينطوي المبدأ التمكيني ضمناً على منح السكان المعنيين الفرصة لتحسين أوضاعهم السكنية وفقاً للاحتياجات والأولويات التي حددوها لأنفسهم .. فمن شأن نهج المشاركة المجتمعية هذا أن يضمن الارتباط الفعلي والوثيق بين برامج تنمية المأوى والاحتياجات الاجتماعية والعمرانية والاقتصادية للمجتمعات المحلية ذات الدخل المنخفض وإمكاناتها المحتملة من أجل تعبئة هذه الامكانات لتنمية المأوى القابل للأدامة وذي الكلفة التي تقع ضمن مقدرة الأفراد .

ويناشد مركز الأمم المتحدة للمستوطنات البشرية (الموئل) البلدان النامية ـ التي ترغب في إحراز تقدم في مجال إيواء الفقراء ـ إعادة تقدير القيمة التي تنطوي عليها موارد البناء المحلية والأنماط المعمارية التقليدية الخاصة بها وإعادة تقييم لوائح وقوانين البناء القائمة بالنسبة للمساكن منخفضة الكلفة .

وهذه لا شك دروس وتجارب تعلمها مركز الأمم المتحدة للمستوطنات البشرية من خلال عمله الوثيق مع أصحاب المشكلة الحقيقيين وهم الفقراء في مواقعهم النائية في أطراف المدن، ومن باب أولى نحن المهتمين بحالة الفقراء في بلداننا العربية أن نتعلم من هذه الدروس والتجارب .

دور منظمة المدن العربية والمعهد العربي لإنماء المدن في دعم جهود إيواء محدودي الدخل في المدن العربية :

اهتمت منظمة المدن العربية والمعهد العربي لإنماء المدن ـ طبقاً للأهداف المنظمة لنشاطاتهما ـ ببذل الجهود لدراسة جميع مشكلات المدن العربية وإنمائها .

وانصبت جهود المنظمة (والمعهد) في التعرف على أبعاد ومشكلات المدينة العربية بالتركيز على مشكلات النمو الحضري السريع وبوجه خاص المشكلات الإسكانية مستهدفة بذلك إيجاد الحلول الملائمة مع الاهتمام بقضايا السكن الفقير والمستوطنات العشوائية وأثرها في تدهور البيئة الحضرية، وكرست كل إمكانياتها لهذا

الغرض وذلك عن طريق مؤتمراتها وندواتها ودوراتها التدريبية ودراساتها وأبحاثها الميدانية والتطبيقية .

وكان للمعهد العربي لإنماء المدن دور بارز في هذه النشاطات التي يمكن حصرها بإيجاز في المجالات التالية :

١ ـ ترجمة وتعريب بعض الدراسات العلمية والتطبيقية في مجالات النمو الحضري السريع والإسكان والمستوطنات العشوائية والتجارب العالمية في مجال برامج الجهود الذاتية لإسكان الفقراء في دول العالم النامي بصفة عامة ودول الوطن العربي على وجه الخصوص .

٢ ـ تزويد وإثراء مكتبة المعهد بالمصادر والمراجع المتخصصة في مجالات النمو الحضري والإسكان .

٣ ـ إصدار العديد من الكتب والموسوعات التي تعالج ظاهرتي النمو الحضري والإسكان وتتناول مشكلات التنمية الحضرية والإسكان والنتائج والآثار المترتبة على هذه المشكلات ومنها انتشار المستوطنات العشوائية ومن أهم هذه الاصدارات : كتاب حول (الهجرة من الريف إلى المدن في الوطن العربي ـ أسبابها ومستقبلها) وكتاب أخر حول (البيئة الصحية في المدن العربية) إلى جانب إصدار موسوعة حول (ظاهرة السكن العشوائي في بلدان العالم الثالث ـ أسبابها ، وآثارها السلبية) .

٤ ـ المشاركة في الندوات والمؤتمرات المحلية والاقليمية المرتبطة بالتنمية الحضرية والاسكان والمستوطنات البشرية ومن أهمها ما يلي :

٤ـ١ الاجتماع الاستشاري الأول للبلدان العربية الذي نظمته وزارة الأشغال العامة والاسكان بدولة الامارات العربية المتحدة بالتعاون مع مركز الأمم المتحدة للمستوطنات البشرية في مدينة دبي في ابريل ١٩٨٦م وشارك المعهد بورقة عمل تضمنت بعض المقترحات حول (المأوى والمستوطنات وتطويرها في المدن العربية) .

٤ـ٢ مؤتمر المنظمة العالمية للمدن الكبرى حول (المدن الكبرى في عام ١٩٨٧م) والذي عقد في المكسيك في مايو ١٩٨٧م وشارك المعهد فيه ببحث عن (المدن الكبرى في الوطن العربي : نشأتها، نموها، والمشكلات الناتجة من توسعها الأفقي) .

٤ـ٣ المؤتمر الدولي حول (الاسكان والتنمية المحلية وعمليات التحضر وبدائل التنمية) المنعقد في برلين في يونيو ١٩٨٧م وقد قدم المعهد بحثاً حول (الإسكان والنمو الحضري) .

٤ـ٤ ندوة حول (أحوال السكان في المستوطنات المتدهورة والعشوائية في المدن المغربية) والتي عقدت في مدينة مراكش في يونيو ١٩٨٨م وشارك المعهد ببحث عن « ظاهرة السكن العشوائي في الوطن العربي ـ مظاهره، مشكلاته، ومستقبله » .

٤ـه ندوة (الإسكان والتنمية) والتي نظمها مركز الأمم المتحدة للمستوطنات البشرية بالتعاون مع مؤسسة الإسكان الأردنية ووكالة الولايات المتحدة للإنماء الدولي في اكتوبر ١٩٨٩م وشارك المعهد ببحث عن « المدينة العربية والإسكان » بالتركيز على أبعاد المشكلة الإسكانية وأسبابها ونتائجها .

وبعد، فهذه بعض من مساهمات منظمة المدن العربية والمعهد العربي لإنماء المدن في مجال الإسكان والتنمية والمستوطنات البشرية والسكن العشوائي والإسكان منخفض الكلفة والتي يعطيها أهمية كبيرة نظراً لارتباطها الوثيق بتنمية المدن العربية وتطويرها .

وكان لمشاركات المعهد واهتمامه بجمع وتبويب الأبحاث والدراسات التي قدمت في الندوات والمؤتمرات وإصدارها في شكل كتب وتوزيعها على المدن العربية الأعضاء في منظمة المدن العربية أثره المباشر في نشر المعرفة بالنسبة لقضايا ومشكلات الإسكان بصفة عامة والسكن والعشوائي والفقير بصفة خاصة .

الخاتمة والتوصيات :

أخفقت الجهود التي بذلت طيلة العقود الماضية في توفير المأوى المناسب لمحدودي الدخل بسبب عدم مراعاة الامكانات المالية لهؤلاء عند إقامة الوحدات السكنية ضمن برامج الإسكان العام والعاجل، بالاضافة إلى أنه لم يؤخذ في الحسبان العادات والتقاليد الموروثة لدى السكان عند تصميم وإقامة هذه المساكن، أي بمعنى أن الإسكان النمطي لم يكن متمشياً مع الظروف الاقتصادية والاجتماعية والمعيشية لفئات الدخل المنخفض .

كما أن البدائل الإسكانية التي تم الاعتماد عليها في الآونة الأخيرة وهي البرامج التي تعتمد على مبدأ مساعدة النفس لم ترق إلى مستوى الطموحات التي كان مؤملاً أن تصله رغم اسهامها بفعالية في إيواء فئات الدخول المنخفضة قياساً إلى مشروعات الإسكان النمطي .

ومن الأسباب التي حالت دون إسهام برامج الجهود الذاتية في توفير المأوى لهذه الفئات المصاعب المتعلقة بحيازة الأرض، وارتفاع أسعار مواد البناء المستوردة، وعدم ملاءمة نظم ولوائح البناء مع قدرات محدودي الدخل، إلى جانب التقليل من قدرات وطاقات وإبداعات هذه الفئات في بناء المأوى المناسب لهم .

وعلى الرغم مما بذلته الحكومات والمنظمات الدولية من جهود في هذا المجال، فما زال هناك مليار من البشر معظمهم من مدن الدول النامية، يفتقرون للمأوى الملائم للسكنى الكريمة، مما يتطلب بذل الكثير من أجل تخطي هذه المصاعب والمعوقات. فالمأوى حاجة أساسية وجوهرية بالنسبة للرفاه العام سواء للفقراء أو غيرهم، وهو التعبير الأكثر وضوحاً عن قدرة البلدان على تلبية بعض من احتياجات سكانها الأكثر ضرورة ولذلك

يصبح من الضروري أن تشرع الدول في التعرف على الثغرات التي تتخلل نظم إنتاج المأوى للقطاعات العريضة من السكان ومن ثم العمل على إيجاد الحلول الملائمة لسد هذه الثغرات والمقترحات التالية تعكس مدى اهتمام المعهد العربي لإنماء المدن بمشكلة إيواء فقراء المدن في المدن العربية .

١ ـ إن تحقيق المأوى الملائم لمحدودي الدخل لن يتحقق مالم يصبح في مقدور السكان مساعدة أنفسهم في سياق سعيهم للحصول على المسكن المناسب، لذلك ينبغي على الحكومات في الدول العربية تمكين السكان من تحسين أوضاعهم المعيشية، فبسواعد فقراء المدن من قاطني مدن الأكواخ ونشاطهم ومبادراتهم ستنبثق أحياء سكنية تتسم بالبساطة والجمال وتعكس قدرات وإبداعات هذه الفئات .

٢ ـ إن الكثير من الدروس والتجارب الفردية وتجارب المنظمات الاقليمية والدولية لازالت تتسم بالواقعية والشمولية مما يجعلها صالحة للتطبيق على الصعيد العالمي ذلك أن تجميع المعارف العالمية قد يؤدي إلى تحسين نظم تجهيز المأوى للفقراء في كل بلد من البلدان إلى حد بعيد .

٣ ـ ينبغي على الحكومات تسهيل عملية تحسين الأوضاع السكنية لمحدودي الدخل من خلال التخفيف من حدة القوانين والقواعد التي قد تحد من قدرات هذه الفئات، وينبغي بشكل خاص تعديل وتنقيح نظم حيازة الأرض المعمول بها وإعادة النظر في نظم ولوائح البناء وجعلها أكثر واقعية بحيث تتناسب وإمكانات محدودي الدخل .

٤ ـ من الضروري تبسيط وتحديث الإجراءات البيروقراطية من أجل تمكين السكان من المشاركة في نشاطات الإسكان ابتداء من التخطيط وحتى إنجاز البناء مما سيمكنهم من إنتاج المساكن الاقتصادية وذلك لخيرهم وخير بلادهم .

٥ ـ ينبغي أن تتم عمليات تطوير المستوطنات العشوائية في مواقعها الأصلية طالما كانت هذه المواقع تتيح لقاطني المستوطنات التنقل إلى مواقع العمل والخدمات والتسويق بأقل كلفة ممكنة مراعاة لظروفهم وقدراتهم المحدودة .

٦ ـ ينبغي أن توجه مدخرات الدولة والمخصصة للإسكان إلى تحسين المستوطنات العشوائية وتخطيط وتهيئة المواقع ومدها بالخدمات الضرورية والأساسية وكذلك الخدمات الاجتماعية من صحة وتعليم وغيرها . ويمكن أن توظف بعض مدخرات قاطني المستوطنات لدعم هذه الخدمات في البلدان التي تعاني من شحة الموارد المخصصة للإسكان، وقد أثبتت التجارب وبوجه خاص في السودان والمغرب وتونس أن قاطني المستوطنات قد أسهموا وعن طريق المساهمات التي تجبى بوساطة ممثلي سكان المستوطنات في دعم بعض الخدمات الأساسية والاجتماعية .

٧ ـ وانطلاقاً من التجارب أعلاه يوصي البحث بإيجاد مراكز للسلطات المحلية في مواقع المستوطنات العشوائية لتعمل مع ممثلي قاطني المستوطنات على مباشرة المشاكل المتعلقة بالتخطيط وتنفيذ المشروعات المتعلقة بالخدمات وتوجيه السكان ومعاونتهم في إقامة الوحدات السكنية من خلال العمل الجماعي الهادف .

٨ ـ ينبغي على الحكومات أن تركز على تطوير مواد البناء المحلية لتحل محل المواد المستوردة ومراجعة مواصفات ومقاييس مواد البناء لكي تفرز وتسمح باستعمال المواد المحلية والتقنيات المحلية المستخدمة في صناعة مواد البناء وخاصة المستخدمة في صناعة الطوب من مادة الطين وإفساح المجال للأساليب المعمارية المحلية التي تسمح باستخدام المواد المحلية على أفضل وجه. ينبغي العودة إلى الأبنية الطينية لربط الحاضر بالماضي، فهناك أمثلة من الشموخ المعماري الأثري كالأهرامات ومخازن الأقصر في مصر والبوابات الضخمة لسور الصين العظيم، والعمارات الطينية في جنوب المغرب والمباني الطينية في شمال السودان والتي استخدمت في بنائها صناعة الطين والتي تشهد على قدرة الإنسان في الاستفادة من البنية الطبيعية المحلية والأساليب المعمارية التقليدية .

٩ ـ لقد برهنت التجارب التي خاضتها بعض الدول الافريقية أنه لا بديل للتدريب في مواقع المستوطنات العشوائية من أجل تطوير مبدأ استثمار طاقات المجتمع للبناء بالجهود الذاتية. إن قاطني المستوطنات العشوائية بحاجة إلى زيادة المعرفة في مجالات البناء وترجمة التصاميم المعمارية إلى أبنية وصيانة مساكنهم في فترات دورية وتعليمهم الصناعات الحرفية التي تستخدم في عملية البناء وكيفية الاضطلاع بالمهام الإشرافية والرقابة على أداء الجماعات التي تضطلع بمهام البناء وغيرها من الأعمال المتعلقة بتطوير المستوطنات. ويمكن أن يسهم تعزيز الصلات بين الجامعات ووكالات المأوى والمنظمات غير الحكومية والمنظمات الدولية وعلى رأسها مركز الأمم المتحدة للمستوطنات البشرية في تصميم البرامج التدريبية المناسبة لقاطني المستوطنات العشوائية .

ندوة حسن فتحى العالميه لعمارة الفقراء

خلال الفتره من ٢٠ الى ٢٢ أبريل

بحث مقدم الى الندوه العلميه حول:

نظام جديد لاستخدام الحجر الطبيعى غير المعالج فى الأنشاءات

أعداد
د.م. رنيف مهنا
د.م. رفيع مهنا
د.م. زياد مهنا

العنوان
بناء ٥٨ - شارع بن حيان
تجارة دمشق
الجمهوريه العربيه السوريه

مجموعة العمل : الدكتور المهندس رشيف مهنا — الاستاذ بكلية الهندسة المعمارية
– جامعة دمشق –

الدكتور المهندس رفيع مهنا — استاذ مساعد هندسة الانشاءات
كلية الهندسة المدنية
– جامعة دمشق –

الدكتور المهندس رشاد مهنا — المدرس بكلية الهندسة المعمارية
– جامعة دمشق –

العنوان : بناء ٥٨ – شارع بن حيان – تجارة
دمشق – الجمهورية العربية السورية

العمل المقدم : نظام جديد لاستخدام الحجر الطبيعي غير المعالج في الانشاءات

اسم العمل : منشآت الحجر الطبيعي .

وصف العمل : يعتمد العمل اساسا على استخدام الحجر الطبيعي غير المعالج المتواجد بكميات كبيرة في القطر العربي السوري خصوصا في المنطقتين الجنوبية والوسطى وفي المناطق الريفية منهما .

واتجه العمل بدراسة المجسم المناسب من وجهة النظر الانشائية والمعمارية والوظيفية بحيث يلبي كل المتطلبات .

ينفذ المجسم بواسطة قالب خشبي او معدني وفق احداثيات معينة تحددها الدراسة الانشائية . (على شكل قوس) . ويعتمد المنشأ تبعا لذلك توضع الاقواس حسب ضرورات المخطط المعماري بمسافات حوالي المتر الواحد بين كل قوسين متتاليين يثبت عليها الواح خشبية تشكل في نهاية تكاملها قبوة .

ترصف الاحجار الطبيعية على القبوة الخشبية المتشكلة وفق ما ذكر اعلاه بمداميك افقية باتجاه المحور الطولي للقبوة وتربط بين بعضها بمونة الاسمنت حتى تشكل قبوة حجرية في حالة الاكتمال .

(تفك) ترفع القبوة الخشبية بعد ثلاثة ايام لنحصل على الفراغ المطلوب .

– ان شكل العمل ومواده الطبيعية المستخدمة ينسجم تماما مع البيئة المحيطة .

حيث يمكن جمع الاحجار من الموقع نفسه او من الحقول المجاورة الامر الذي يساهم

[illegible]
دمشق ١٩٨٨

في عملية استصلاح الاراضي الزراعية التي تعاني من كثرة الاحجار فيها .ومما يعطي بعد استعمال الاحجار متكاملا مع البيئة المحيطة باستخدام المواد المتوفرة فيهـــا

- ان المادة الحجرية المستعملة تؤمن عازلية كبيرة مما يساعد على خلق جو مناخي ملائم داخل البناء مما يساهم في حفظ الطاقة ويأمن حدود مناخية ملائمة لراحة الانسان .
- والشيء الاهم في هذا المجال انه لا حاجة لاي نوع من الطاقة لتصنيع المواد اللازمة للانشاء (الاحجار) الامر الذي يوفر في استخدام الطاقة ويحقق احتمالات التلـوث بسبب لذلك الى حدودها الدنيا .
- وفي النتيجة فان هذا النظام الجديد للانشاء يعتبر مساهمة كبيرة في تأمين علاقة أوثق بين الانسان وبيئته الطبيعية المحيطة .

ويمكن ان نجمل ما ورد أعلاه بالخصائص التالية .

خصائص العمل :

- ليست هناك حاجة لأيّ نوع من حديد التسليح في هذا العمل .
- رخص ملحوظ للكلفة .
- رخص ملحوظ لرمن التنفيذ ليصل الى $\frac{9}{10}$ الرمن اللازم لمثيله من المنشآت الخرسانية
- خصائص العزل والتوفير في الطاقة اللازمة للتبريد والتدفئة .
- يحافظ على روح العمارة المحلية وتقاليدها . (المكانية منها والمحلية)
- يعطي تعبيرا متميزا للتيارات المعمارية المعاصرة امتدادا لعراقة الماضي .
- يساهم في استصلاح الاراضي الزراعية المعطاة بكميات كبيرة من الاحجار ويحسـن من امكانيات وفعالية العطاء البشري والمناطق المزروعة .
- يتكامل بقوة ويتجانس مع الطبيعة والبيئة المحيطة ويجعل وحدة معمارية بيئيـة متميزة .
- يخلق نسيجا معماريا وعمرانيا رقيقا وخصبا مغريا .
- يساهم في خفض التلوث بالحد من استخدام الطاقة .
- نظام اقتصادي ناجح يعتمد على النظام الذاتي في مجال الاستفادة من الطاقة الشمسية في مجالات التدفئة والتهوية الطبيعية المعتمدة على الخبرات المحلية .
- يؤمن مرونة معمارية .
- يمكن أن يؤمن تعرجات وتكوينات معمارية مختلفة في مجال السكن والمدارس والابنية الرسمية والسياحيـــة .

الجوائز :

- ويبو (WIPO) ميدالية ذهبية لأفضل ابتكار (اختراع) بمعرض دمشق الدولي لنظام جديد للبناء باستخدام الأحجار الطبيعية . (نظام المشربيات الحجرية).
- جائزة مالية لمركز الأمم المتحدة للمستوطنات البشرية ١٩٨٩ . (HABITAT) .
- الميدالية الفضية لمعرض العمارة ١٩٨٩ في إطار مسابقة (بينالة - صوفيا - بلغاريا) الثانية للعمارة .لنظام جديد لإنشاء مباني وأبنية باستخدام الأحجار الطبيعية غير المعالجة .
- جائزة آغا خان للعمارة .

جائـــزة
حسن فتحى العالمية
لعمارة الفقراء

عندما كرس حسن فتحى حياته لتعميق مفهوم عمارة الفقراء... ببعديها المعمارى والانسانى... وعندما أسبغ جهوده على البحث والتطبيق حتى استطاع تكوين مادة علمية تطبيقية تدرس فى المناهج المعمارية بالعديد من جامعات العالم... إنما كان يهدف إلى ارساء القواعد... ووضع اللبنة الأولى فى بناء باب واسع عسى أن يلج منه الملايين من فقراء العالم... ليسلكوا طريقهم إلى الراحة.. والأمان... وهما أدنى متطلبات العمارة فى جميع أنحاء العالم... وفى جميع العصور.

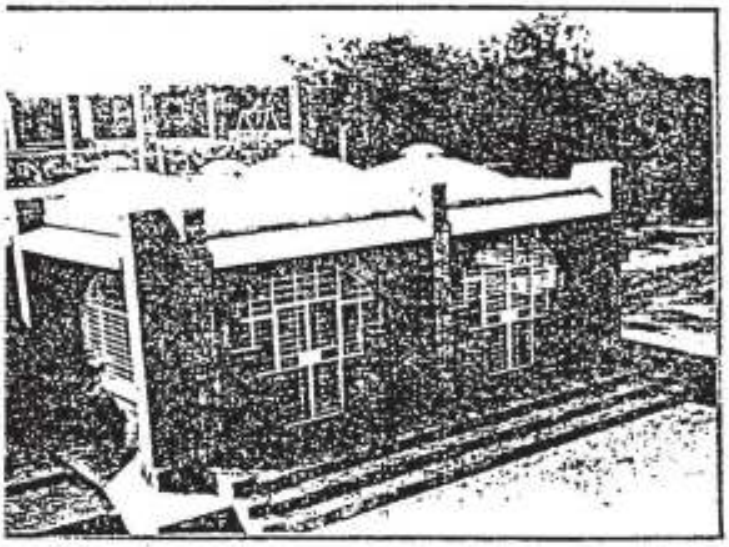
ومن هذا المضمون.. خصصت جمعية احياء التراث التخطيطى والمعمارى جائزة.. تحمل اسم المعمارى الراحل حسن فتحى... سعيا إلى تفجير الطاقات الفكرية والفنية لدى المخططين والمعماريين والحرفيين والمؤسسات العلمية والفنية والأفراد المهتمين بهذه الرسالة فى كل أرجاء العالم.. لتقديم أفضل انتاجهم لخدمة هذه الفئة المهضومة من فقراء العالم.. بيئيا وعمرانيا.. كما تهدف الجائزة إلى زيادة الوعى لدى المسئولين عن أعمال الإنشاء والتعمير والتعليم المعمارى والتخطيطى والأنشطة العملية والمهنية والأفراد والجمعيات الخيرية بهذه الدعوة.

مركز اوروفيل للاستقبال والمعلومات نموذج للعمارة المتوافقة

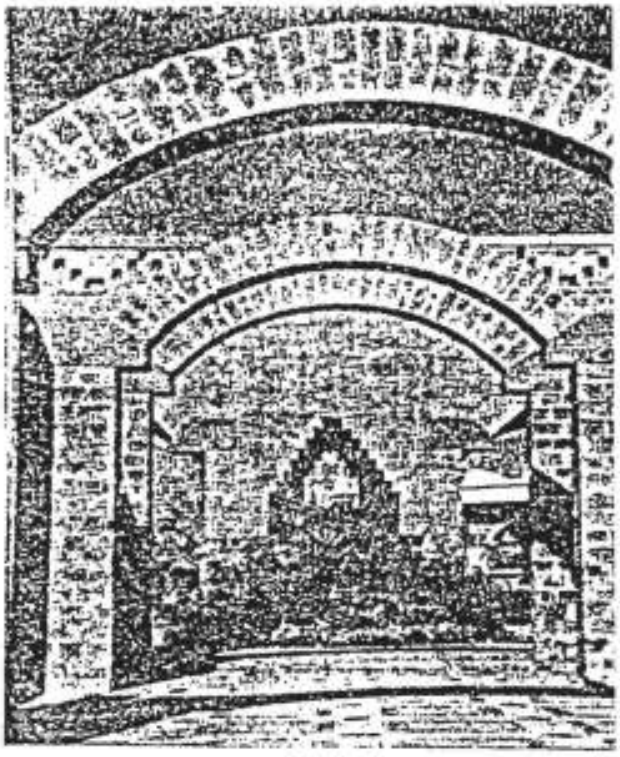
الإنسانية وبذلك تأخذ الجائزة اتجاها انسانيا خاصا يحتاج إلى الادراك بالمسئولية الاجتماعية والحضارية قبل فقراء العالم. وهذا ما كان يدعو إليه المعمارى الراحل حسن فتحى ويعمل فى سبيله إلى آخر لحظات حياته.

وعندما خصصت هذه الجائزة تقرر منحها لأحسن الأعمال أو البحوث أو المشروعات المعمارية أو التخطيطية التى تصمم بهدف الارتقاء بالبيئة العمرانية للفئات محدودة الدخل. وتقرر منح هذه الجائزة مرة كل عامين فى شهر مارس وهو الشهر الذى ولد فيه المعمارى الراحل حسن فتحى.

وقد منحت الجائزة هذا العام لمؤسسة أوروفيل للبناء بالهند عن مشروع مركز الاستقبال والمعلومات التابع لهذه المؤسسة.



منظر للمركز من أعلى يظهر القبة بالقباب



مدخل المركز

شروع الفائز بالجائزة لعام ١٩٩٢ مركز استقبال ومعلومات - الهند

المشروع يقع فى جنوب الهند وهو تابع لمؤسسة أورميل للبناء.. وهى مؤسسة للبحث والتدريب على العمارة المتوافقة.. وهى جزء من شبكة عمل دولية وقد أسست هذه المؤسسة بمساعدة المجلس البلدى للاسكان والتنمية الحضرية بالهند. وتناولت حتى الآن اتجاهين أولهما البناء بالطين والحديد فأسمنت وثانيهما انتاج عناصر الحديد والأسمنت سابقة التصنيع.

ترجع أهمية المشروع إلى اعتبارات ثلاثة: أولا أن المبنى يعد مركزا لاستقبال مئات الزائرين الذين يفدون إلى أورفيل كل يوم للاستعلام وثانيا البناء نموذجا متكاملا للعمارة المتوافقة واستخدام الطاقات المتجددة وثالثا المبنى تجربة حية لاستخدام الطوب المصنوع من التربة الطبيعية بعد تكها كما أنه كان مجالا لتدريب القرويين الذين قاموا بالبناء.

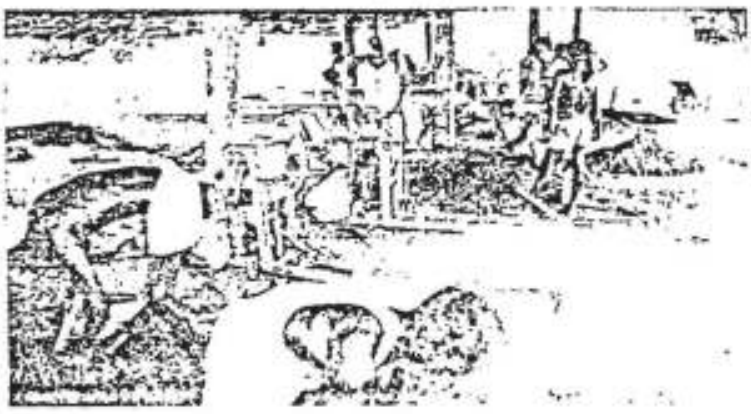
يتكون المشروع من مدخل تحفه الأشجار يؤدى إلى ساحة مغلقة للعرض مكتب للاستعلامات ومحل لبيع المصنوعات اليدوية وعلى الجانب الآخر مطعم حق به المطبخ وخدماته وبينهما مدرج مفتوح كمنطقة بؤرية للمبنى ككل. هذا د أعد المكان لإستقبال نوعيات مختلفة من الناس.

العوامل الموجهة للتصميم:

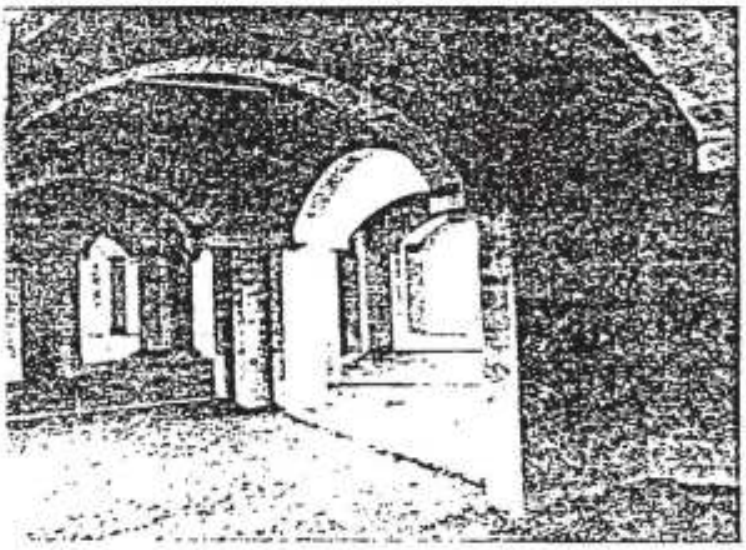
عند تصميم المشروع كانت هناك دراسة لمجموعة العوامل والمؤثرات حيطة والتى جاءت كما يلى

المناخ:

تصنيع البلوكات



منظر من فناء المدرج المفتوح



استخدام العقود فى الفتحات

المناخ فى هذه المنطقة حار ورطب ويحتاج الامر إلى تهوية طبيعية وفى أكثر الأوقات حرارة يختفى النسيم تماما.. ومن ثم فقد استخدمت التهوية بواسطة طاقة الشمس الكامنة حيث تستخدم مدخنة المنزل لاعطاء حرارة علوية تتسبب فى دفع الهواء والرياح إلى الغرفة بأسفل المدخنة

العمالة:

معظم سكان هذه المنطقة من القرويين الذين يجهلون أساليب البناء الحديثة. ومن ثم كان لابد من استخدام أبسط الطرق فى البناء.

المواد المتاحة:

طريقة بناء العقود

طريقة رص البلوكات قبل استخدامها

ينتشر استخدام الطوب المحروق إلا أن كفاءته تتضاءل أمام البلوكات المصنوعة من التربة المدكوكة.

كفاءة الموقع:

باعتبار المبنى غير متصل بشبكة الكهرباء التابعة لمقاطعة Tamil Nadu التى تتبعها المؤسسة فكان لابد من نظام خاص للتهوية والإضاءة.

اقتصاديات الموقع:

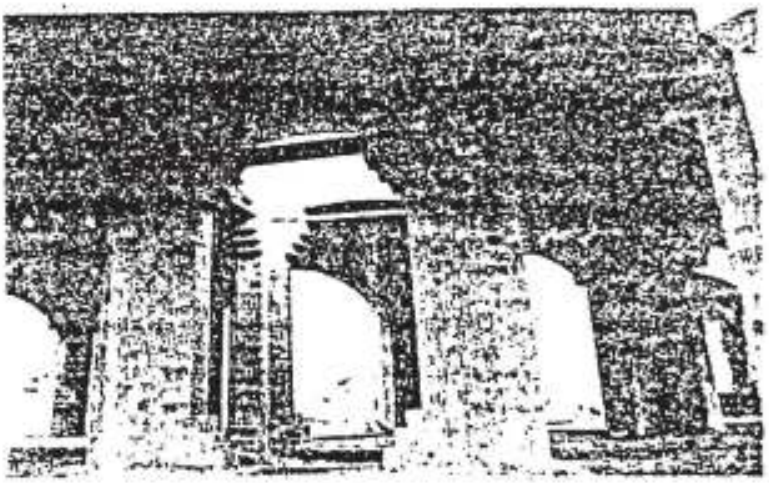
لتخفيض تكلفة المتر المربع كان لابد من استخدام طرق منخفضة التكاليف فى البناء.. ومن أجل ذلك وتبسيطا للانشاء تقرر أن يأخذ التصميم الإنشائي شكل مربعات ٤م × ٤م تحملها أعمدة وكانت الفتحات على هيئة عقود على كوربل. ولما كانت الهند تفتقر إلى الأشجار ومن ثم ترتفع تكلفة الأخشاب علاوة على غزو النمل الأبيض لها فقد تجنب استخدامها فى البناء واستخدمت البلوكات المصنوعة من التربة لبناء الأعمدة والعقود وغطيت بعض الأجزاء بقباب والبعض الآخر غطى ببلاطات من الأسمنت الحديدى سابقة التصنيع. وفى النهاية كانت المساحة الكلية المبنية ٢٠٠ م٢

طريقة الانشاء:

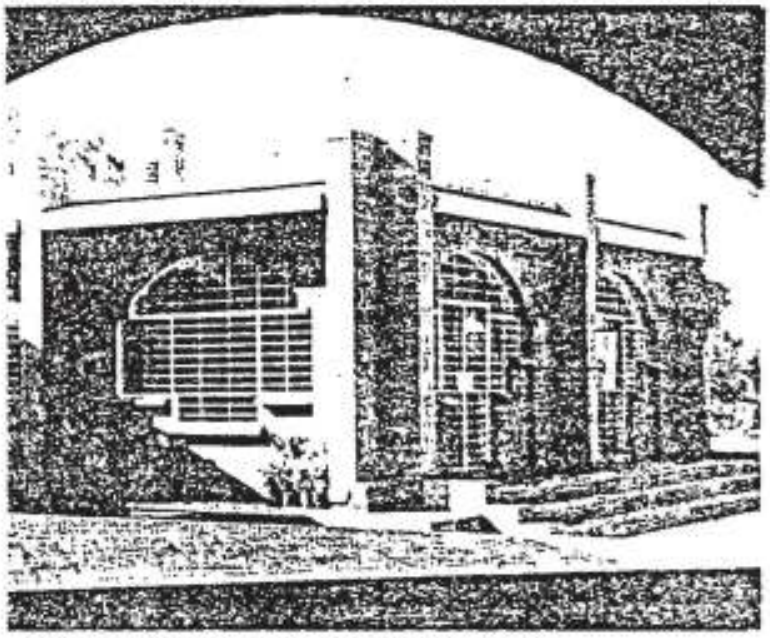
- الأساسات

تم الحفر بعمق ٧٥ - ١٢٠سم تحت سطح الأرض للوصول إلى طبقة الطفل والحصى لوضع قواعد الأعمدة وهى من مادة الجرانيت الذى يستخرج من مكان ليس ببعيد عن حقل العمل. ويتم ذلك فى سرعة وسهولة لاتحتاج إلى عمالة مدربة ولا تكلف عملية الحفر الكثير.

وفى بعض الأجزاء استخدمت أساسات عبارة عن مخلوط من الأسمنت



القباب من الداخل



استخدام القضبان الحديدية فى فتحات الأبواب والنوافذ

والحصى والتربة المستخرجة من أحد الفنادق وذلك بعد دمك هذا الخليط

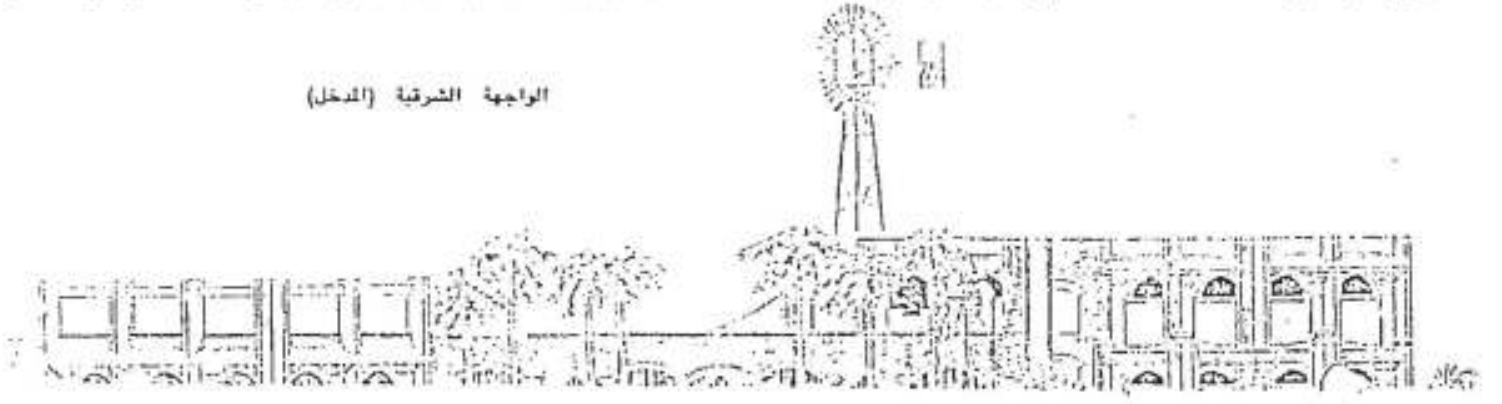
وتسوية سطح قواعد الأعمدة وضعت طبقة أسمنتية ثم طبقة بيتومين وكبروسين ثم طبقة بيتومين ساخن ويعتبر هذا حماية كافية ضد النمل الأبيض

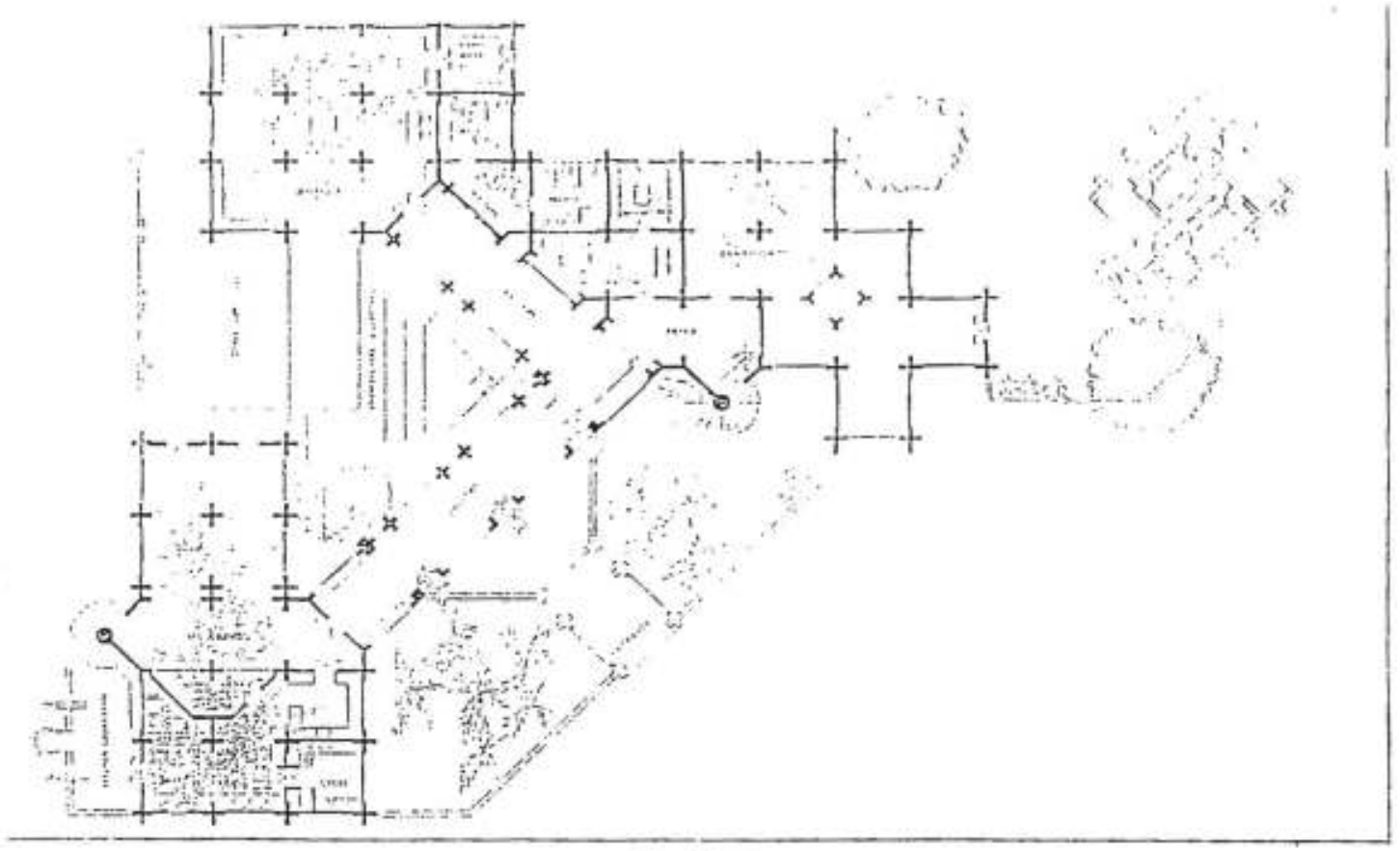
ولما كانت الأعمدة تتأثر بقوى الدفع من العقود والقباب فتبدأ فى الانزلاق فقد عولج ذلك بعمل ثقوب فى قواعد الأعمدة وتثبيتها بواسطة قضبان حديدية.

- الإنشاء بالطين

يتطلب الإنشاء بالطين معلومات وخبرة عن التربة كحد السيولة والانكماش

الواجهة الشرقية (المدخل)





مسقط أفقى للمشروع

ومعامل اللدونة. كما يستلزم الأمر المراقبة الدائمة والملاحظة أثناء الانشاء.

- تصنيع الطوب

تم تصنيع نوعين من البلوكات من خليط من الاسمنت والرمل الحصوية والتربة الرملية بنسب مختلفة لاستخدامات البناء المختلفة (أعمدة - حوائط) وتجرى على هذه الخلطات عدة اختبارات بالموقع من انتظام المقادير ونجانس الخلط.. والرطوبة.

في البداية يكون الخلط على الجاف... وعندما يتم التجانس في اللون يضاف الماء ثم يخلط ثانية... ولما كانت الخلطات صغيرة فإن الأمر لا يحتاج إلا إلى نصف ساعة بعدها يبدأ الاسمنت في الشك. بعد تشكيل الطوب توضع في رصات منخفضة بارتفاع ٧ بلوكات وتغطى برقائق بلاستيكية لحفظ الرطوبة خلال يومين بعد ذلك تحرك إلى أماكن الرص حيث تعالج مرتين في اليوم لمدة ٣ أسابيع بعدها تكون جاهزة للاستخدام

تم تنظيم هذا المصنع البدائي للطوب بحيث تقل مسافة النقل في جميع المراحل. كما أن المحجر الذي تستخرج منه أحجار الأساسات ليس ببعيد فهو على بعد ١٠ م فقط من المبنى. وأقيم مصنع الطوب تحت مظلة من ورق شجر جوز الهند وهو قريب إلى حد ما من المبنى ومن المحجر.

وجدير بالذكر أن عملية تصنيع بلوك واحد من هذه البلوكات يستغرق ٨ دقائق وبذلك كان تصنيع ٥٠٠ بلوك يستغرق ٦ ساعات.

الأدوات والتجهيزات

استخدمت عربات اليد للتحميل. والمناخل المعدنية ذات الفتحات المخ واستخدمت قوالب لتشكيل بلوكات العقود ودوارة (فرجار) للقباب وسك بدرى لقوالب.

- طريقة البناء

جميع مداميك الاعمدة والحوائط وغيرها رسمت من قبل ومن ثم تلافد مشاكل أثناء العمل بالموقع

- التكلفة

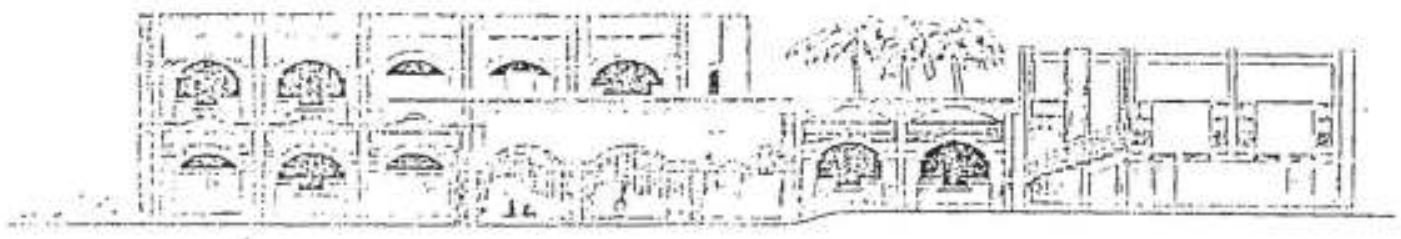
بالمقارنة بالطوب المحروق وجد ان تكلفة البلوكات أكثر ارتفاعا الا تتميز بانخفاض نسبة الهالك أثناء التصنيع أى انه في مجمل الامر نجد البلوكات المصنعة من التربة المخلوطة بالاسمنت كانت أكثر اقتصادا.

جدير بالذكر أن بعض أجزاء المشروع مثل الخدمات والممرات عم ببلاطات الأسمنت الحديدى سابقة التصنيع.

وفى النهاية يمكننا أن نشير إلى أن القرى المحلية بالهند عند استخد للطين فى بناء حوائط المنازل لم تتمكن من الارتفاع أكثر من متر ، واستخدمت أوراق اشجار جوز الهند والنخيل لتغطية الاسقف. وهذا ال من البناء غير جيد الإضاءة والتهوية ولذلك فإنه عندما صمم مركز اور للاستقبال والمعلومات كانت محاولة استخدام وتدريب البنائين على ا المتوافق مع الاحتياجات بأقل التكاليف وذلك باستخدام الطين أيضا

ونأمل أن يكون هذا المشروع أول طريق البداية لغيره من المشروعات

واجهة جنوبية غربية



- الدكتور المهندس رشيد منها – معماري –
  استاذ التصميم المعماري ونظرياته وعلم الاجتماع العمراني .
  كلية الهندسة المعمارية – جامعة دمشق –
- الدكتور المهندس رفيع منها – انشائي –
  استاذ مساعد الهندسة الانشائية وحساب الانشاءات .
  كلية الهندسة المدنية – جامعة دمشق
- الدكتور المهندس زياد منها – معماري –
  مدرس التصميم المعماري .
  كلية الهندسة المعمارية – جامعة دمشق .

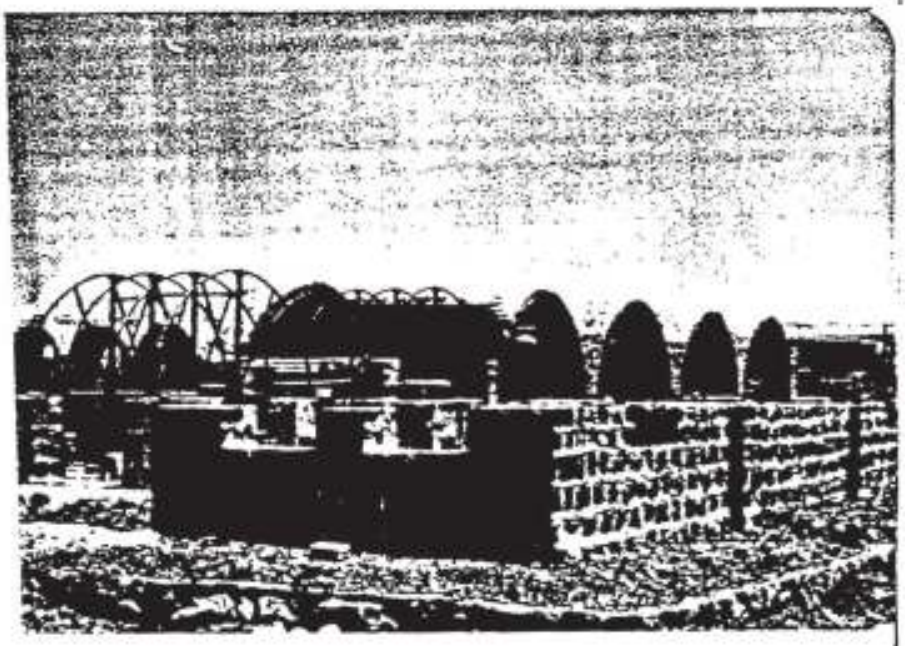
الموضوع :

نظام قشريات الحجر الطبيعي .

باستخدام الحجر السارلتي الطبيعي غير المعالج وغير المتذب والمتوفر سطحيا وبكثرة في مناطق مختلفة في سوريا .

الخواص :

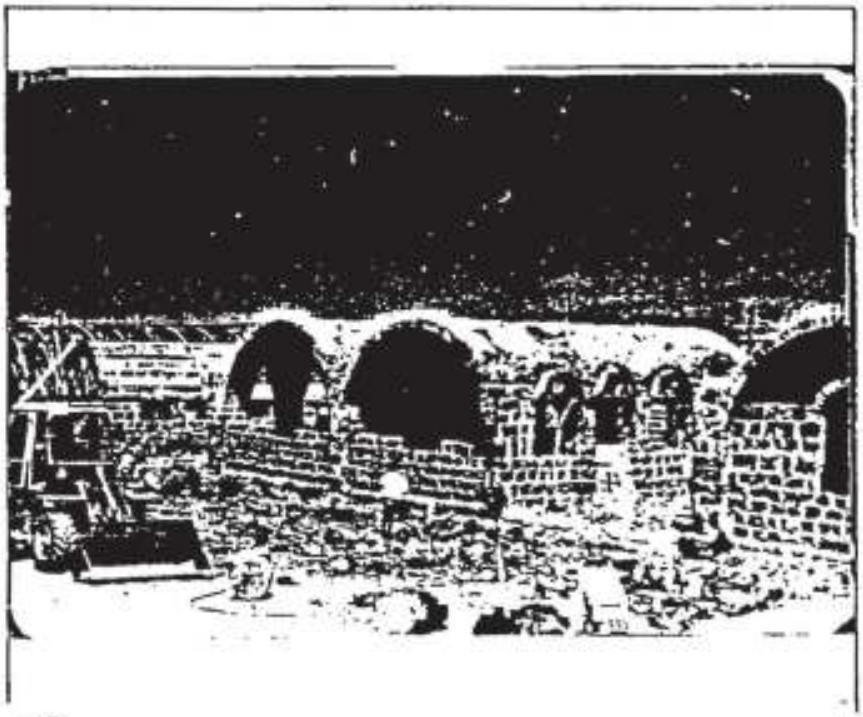
- نظام يستغني عن حديد التسليح .
- يحقق الكلفة في القيمة والزمن بالمقارنة مع مثيله من الحرسانة المسلحة .
- يؤمن الاقتصاد في الطاقة نظرا لعازلية المادة المستعملة
- يؤكد الشخصية المعمارية المحلية والاقليمية في اطار استمرار الماضي في الحاضر .
- يعطي تعبيرا متميزا للعمارة التراثية
- يسمح بتكوين معماري سهل يناسب لتصميم المساكن والابنية الريفية ،المدارس ،المنشآت الباحية والادارية والخدمية التابعة لها .



- الدكتور المهندس رشيف مهنا — معماري. — استاذ التصميم المعماري ونظرياته وعام الاحكام العمراني .
كلية الهندسة المعمارية — جامعة دمشق —

- الدكتور المهندس رفيع مهنا — انشائي — استاذ مساعد الهندسة الانشائية وحساب الانشاءات .
كلية الهندسة المدنية — جامعة دمشق

- الدكتور المهندس زياد مهنا — معماري — مدرس التصميم المعماري .
كلية الهندسة المعمارية — جامعة دمشق .



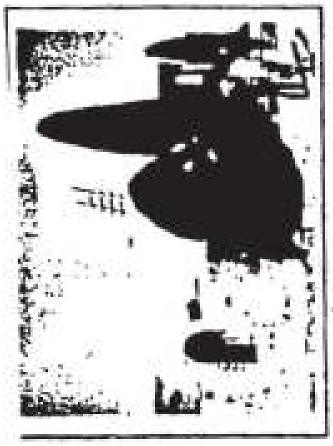
الموضوع :

نظام تشربات الحجر الطبيعي .

-استخدام الحجر السارلتي الطبيعي عبر المعالج وعبر المشذب والمتوفر سطحيا وبكثرة في مناطق مختلفة في سوريا .

الخواص :

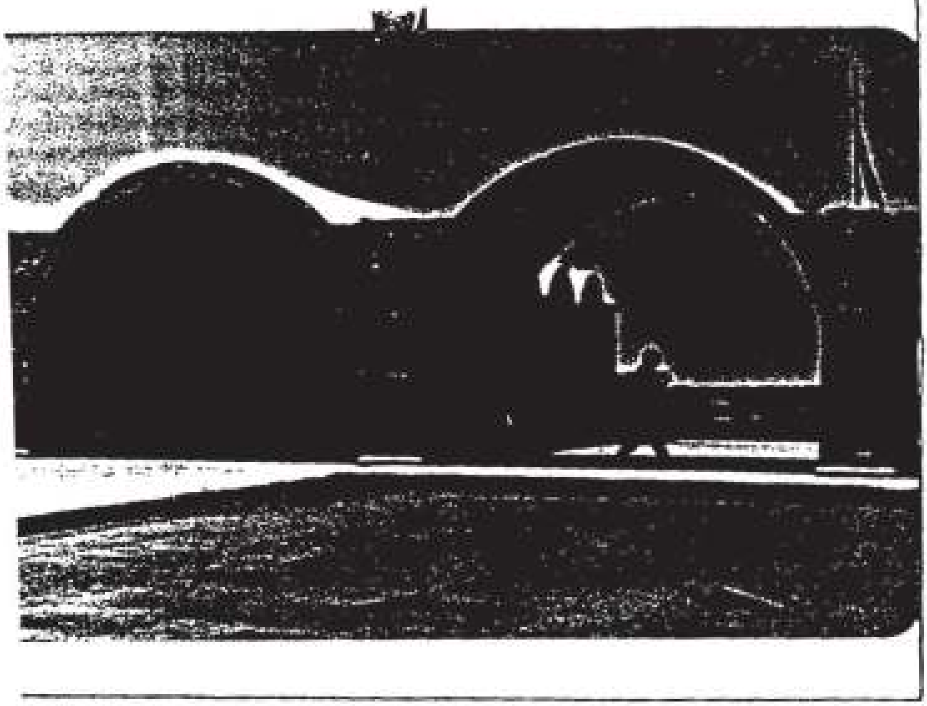
- نظام يستغني عن حديد التسليح .
- يحقق الكلفة في القسمة والرمم بالمعارنة مع مثيله من الخرسانة المسلحة .
- يؤمن الاقتصاد في الطاقة نظرا لعازلية المادة المستعملة
- يؤكد الشخصية المعمارية المحلية والاقليمية في اطار استمرار الماضي في الحاضر .
- يعطي تعبيرا متميزا للعمارة التراثية
- يسمح بتكوين معماري سهل يستجيب لتصميم المساكن والابنية الريفية ،المدارس ،المنشآت السياحية والادارية والخدمية التابعة لها .



- الدكتور المهندس رشيد مهنا – معماري – أستاذ التصميم المعماري ونظرياته وعلم الاجتماع العمراني . كلية الهندسة المعمارية – جامعة دمشق –

- الدكتور المهندس رفيع مهنا – انشائي – أستاذ مساعد "الهندسة الانشائية وحساب الانشاءات . كلية الهندسة المدنية – جامعة دمشق

- الدكتور المهندس رشاد مهنا – معماري – مدرس التصميم المعماري . كلية الهندسة المعمارية – جامعة دمشق .



الموضوع :

نظام قبويات الحجر الطبيعي .

باستخدام الحجر البازلتي الطبيعي غير المعالج وغير المشذب والمتوفر سطحيا وبكثرة في مناطق مختلفة في سوريا .

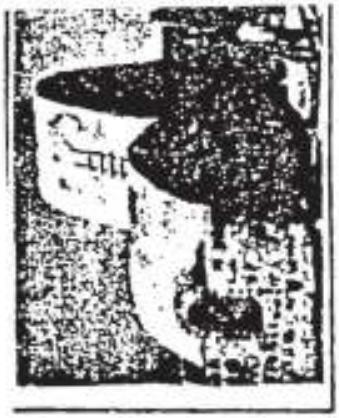
خواص :

- نظام مستغني عن حديد التسليح .
- يخفض الكلفة في القيمة والزمن بالمقارنة مع مثيله من الخرسانة المسلحة .
- يؤمن الاقتصاد في الطاقة نظرا لعازلية المادة المستعملة
- يؤكد الشخصية المعمارية المحلية والاقليمية في اطار استمرار الماضي في الحاضر .
- يعطي تعبيرا متميزا للعمارة الريفية
- يسمح بتكوين معماري سهل ينجح لتصميم المساكن والابنية الريفية ، المدارس ، المنشآت السياحية والادارية والخدمية التابعة لها .

الدكتور المهندس رفيق مهنا
- معماري -
استاذ التصميم المعماري ونظرياته وعلم الاجتماع العمراني .
كلية الهندسة المعمارية - جامعة دمشق -

الدكتور المهندس رفيع مهنا
- انشائي -
استاذ مساعد الهندسة الانشائية وحساب الانشاءات .
كلية الهندسة المدنية - جامعة دمشق

الدكتور المهندس زياد مهنا
- معماري -
مدرس التصميم المعماري .
كلية الهندسة المعمارية - جامعة دمشق .



وضع :

ام تقنيات الحجر الطبيعي .

ستخدام الحجر البازلتي الطبيعي
ر المعالج وغير المشذب والمتوفر
لحيا وبكثرة في مناطق مختلفة
، سوريا .

لسواس :

نظام يستغني عن حديد التسليح .

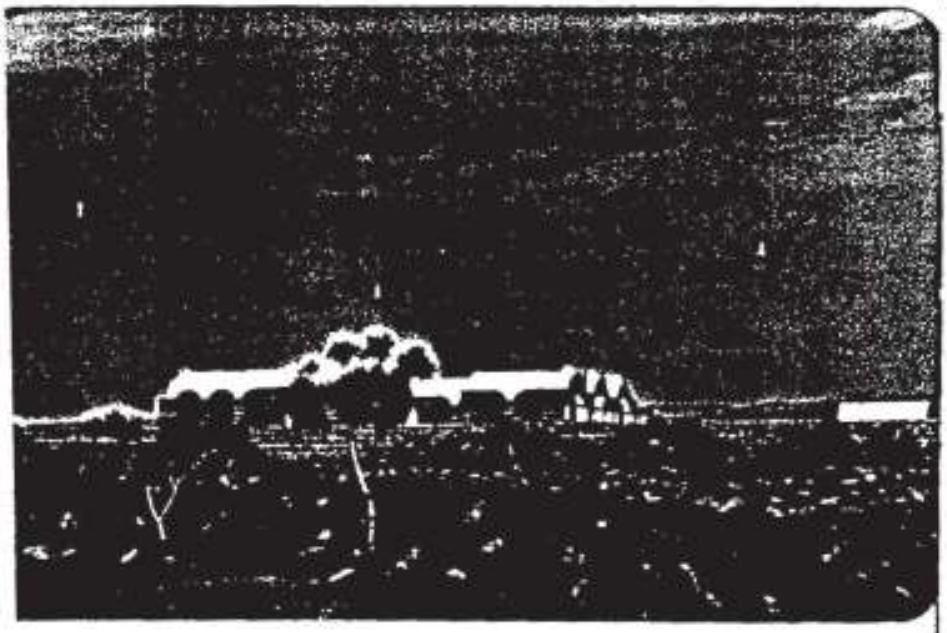
يخفض التكلفة في القيمة والزمن
بالمقارنة مع مثيله من
الانشائية المسلحة .

يؤمن الاقتصاد في الطاقة نظرا
لعازلية المادة المستعملة

يؤكد الشخصية المعمارية المحلية
والاقليمية في اطار استمرار
الماضي في الحاضر .

يعطي تعبيرا مثيرا للعمارة
التراثية

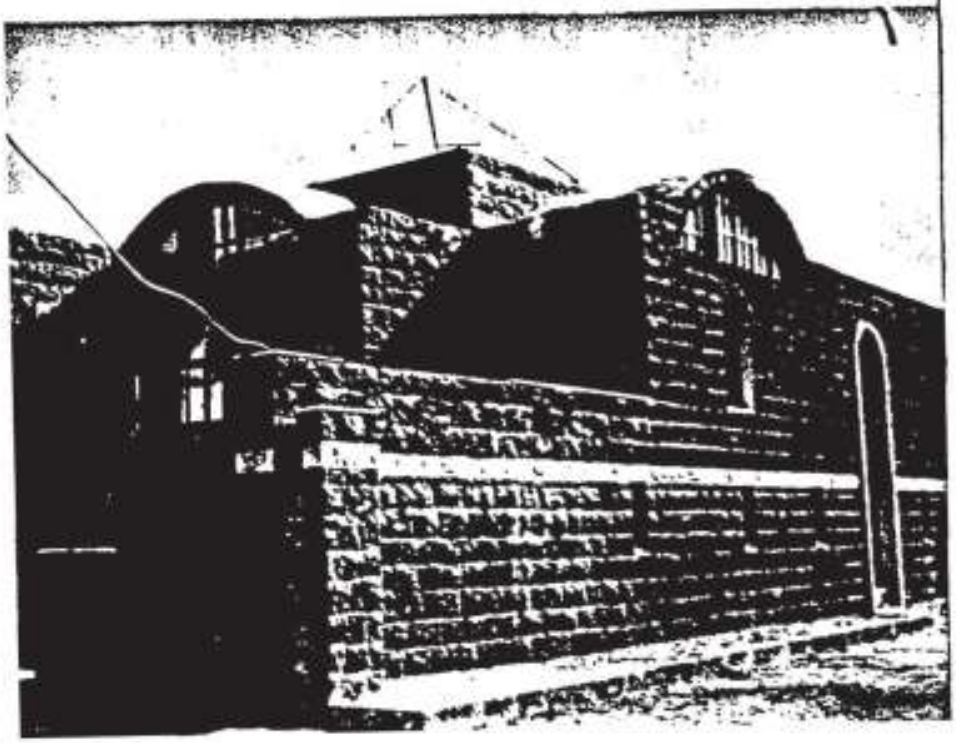
يسمح بتشكيل معماري سهل
يستجيب لتصميم المساكن والابنية
الرسمية والمدارس والمنشآت
الصحية والادارية
والخدمية التابعة لها .



- الدكتور المهندس رشيف مهنا - معماري -
استاذ التصميم المعماري ونظرياته وعلم الاجتماع العمراني .
كلية الهندسة المعمارية - جامعة دمشق -

- الدكتور المهندس رفيع مهنا - انشائي -
استاذ مساعد الهندسة الانشائية وحساب الانشاءات .
كلية الهندسة المدنية - جامعة دمشق

- الدكتور المهندس رياد مهنا - معماري -
مدرس التصميم المعماري .
كلية الهندسة المعمارية - جامعة دمشق .



الموضوع :

نظام قشريات الحجر الطبيعي .

باستخدام الحجر السازلتي الطبيعي غير المعالج وغير المشذب والمتوفر سطحيا وبكثرة في مناطق مختلفة في سوريا .

الخواص :

- نظام يستغني عن حديد التسليح .
- يخفض الكلفة في القيمة والزمن بالمقارنة مع مثيله من الخرسانة المسلحة .
- يؤمن الاقتصاد في الطاقة نظرا لعازلية المادة المستعملة
- يؤكد الشخصية المعمارية المحلية والاقليمية في اطار استمرار الماضي في الحاضر .
- يعطي تعبيرا متميزا للعمارة التراثية
- يسمح بتكوين معماري سهل يتجيب لتصميم المساكن والابنية الرسمية ،المدارس ،المنشآت السياحية والادارية والخدمية التابعة لها .

- الدكتور المهندس رفيق مهنا
- معماري -

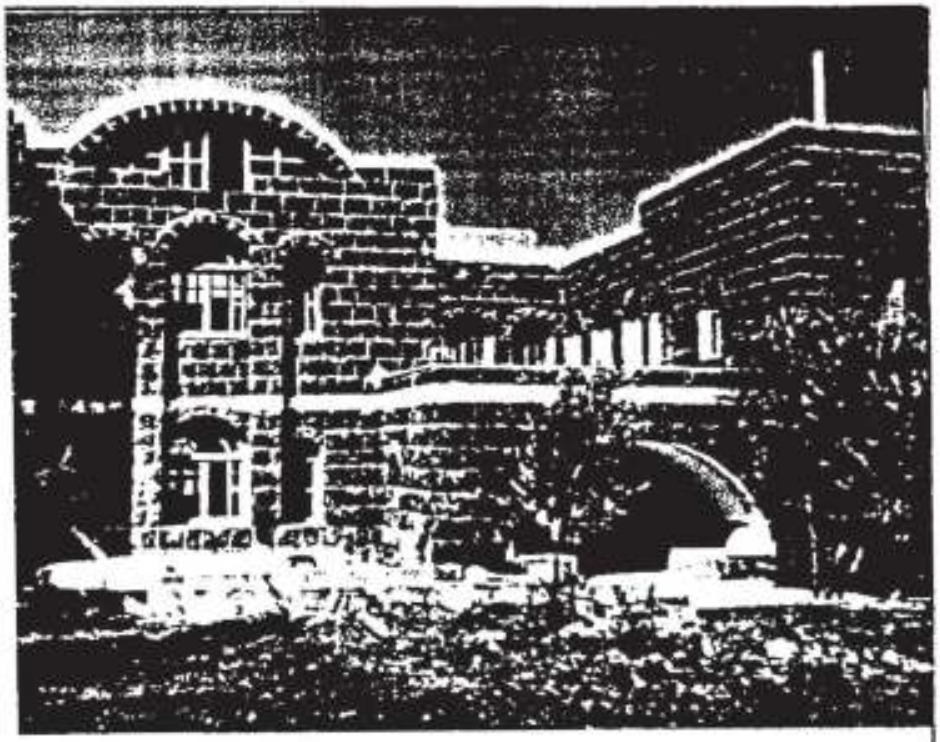
استاذ التصميم المعماري ونظرياته وعلم الاجتماع العمراني .
كلية الهندسة المعمارية - جامعة دمشق -

- الدكتور المهندس رفيع مهنا
- انشائي -

استاذ مساعد الهندسة الانشائية وحساب الانشاءات .
كلية الهندسة المدنية - جامعة دمشق

- الدكتور المهندس زياد مهنا
- معماري -

مدرس التصميم المعماري .
كلية الهندسة المعمارية - جامعة دمشق .



المشروع :

نظام تشريبات الحجر الطبيعي .

باستخدام الحجر البازلتي الطبيعي غير المعالج وغير المشذب والمتوفر سطحيا وبكثرة في مناطق مختلفة في سوريا .

الخواص :

- نظام يستغني عن حديد التسليح .
- يخفض الكلفة في القيمة والزمن بالمقارنة مع مثيله من الخرسانة المسلحة .
- يؤمن الاقتصاد في الطاقة نظرا لعازلية المادة المستعملة
- يؤكد الشخصية المعمارية المحلية والاقليمية في اطار استمرار الماضي في الحاضر .
- يحقق تعبيرا مميزا للعمارة التراثية
- يسمح بتشريبن معماري سهل يستجيب لتصميم المساكن والابنية الرسمية والمدارس والمنشآت السياحية والادارية والخدمية التابعة لها .

- الدكتور المهندس رشيف مهنا - معماري - استاذ التصميم المعماري ونظرياته وعلم الاجتماع العمراني . كلية الهندسة المعمارية - جامعة دمشق -
- الدكتور المهندس رفيع مهنا - انشائي - استاذ مساعد الهندسة الانشائية وحساب الانشاءات . كلية الهندسة المدنية - جامعة دمشق
- الدكتور المهندس رياد مهنا - معماري - مدرس التصميم المعماري . كلية الهندسة المعمارية - جامعة دمشق .

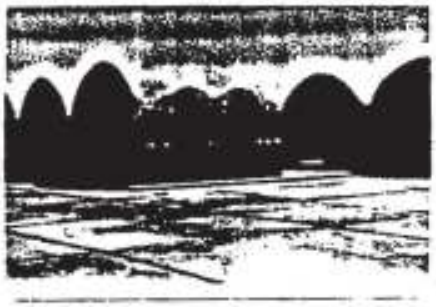
لموضوع :

نظام قشريات الحجر الطبيعي .

باستخدام الحجر السارلتي الطبيعي غير المعالج وغير المشذب والمتوفر سطحيا وبكثرة في مناطق مختلفة في سوريا .

الخواص :

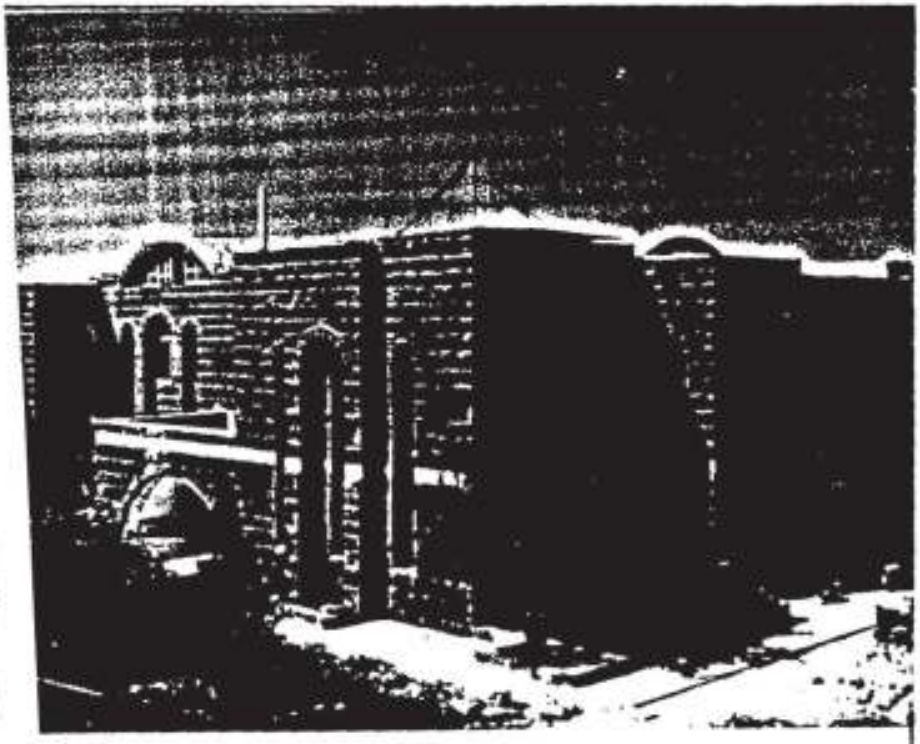
- نظام يستغني عن حديد التسليح .
- يخفض الكلفة في القيمة والزمن بالمقارنة مع مثيله من الخرسانة المسلحة .
- يؤمن الاقتصاد في الطاقة نظرا لعازلية المادة المستعملة
- يؤكد الشخصية المعمارية المحلية والاقليمية في اطار استمرار الماضي في الحاضر .
- يعطي تعبيرا متميزا للعمارة التراثية
- يسمح بتكوين معماري سهل يستجيب لتصميم المساكن والابنية الريفية ،المدارس ،المنشآت السياحية والادارية والخدمية التابعة لها .








ـ الدكتور المهندس رشيف مهنا ـ معماري ـ	استاذ التصميم المعماري ونظرياته وعلم الاجتماع العمراني . كلية الهندسة المعمارية ـ جامعة دمشق ـ
ـ الدكتور المهندس رفيع مهنا ـ انشائي ـ	استاذ مساعد الهندسة الانشائية وحساب الانشاءات . كلية الهندسة المدنية ـ جامعة دمشق
ـ الدكتور المهندس زياد مهنا ـ معماري ـ	مدرس التصميم المعماري . كلية الهندسة المعمارية ـ جامعة دمشق .



الموضوع :

نظام مشربيات الحجر الطبيعي .

ـ استخدام الحجر السارلتي الطبيعي غير المعالج وغير المذنب والمثقوب سطحيا وبكثرة في مناطق مختلفة في سوريا .

الحواص :

- نظام يستغني عن حديد التسليح .
- يخفض الكلفة في القسمة والرمم بالمعارسة مع مثيله من الحجارة المسلحة .
- يؤمن الاقتصاد في الطاقة نظرا لعازلية المادة المستعملة
- يؤكد الشخصية المعمارية المحلية والاقليمية في اطار استمرار الماضي في الحاضر .
- يعطي تعبيرا متميزا للعمارة التراثية
- يسمح بتكوين معماري سهل يتجه لتصميم المساكن والابنية الريفية ، المدارس ، المنشآت الباحية والادارية ، الخدمية التابعة لها .

تطوير مدينة " غدامس "

فى محاولة لإيجاد الطابع المفقود والبحث عن العمارة الريفية.

د. عبد الجواد بن سويس استاذ بكلية الفاتح -ليبيا

مقدمة:

بدأت فى خلال فترة الخمسينيات والستينيات عدة محاولات للبحث عن طابع يعبر عن المحلية والقيم الخاصة بالعمارة، والبحث عن الواقعية والتراث المحلى الأصيل ومن هذا المنطلق وضع حسن فتحى قواعد وأرسى مبادئ عامة.اتجهت محاولات حسن فتحى للبحث عن نظرية خاصة للعمارة من خلال تأثير النواحى المناخية والمواد البيئية المحلية والتى يمكن إيجادها من نفس الموقع وما الى ذلك وقد سار حسن فتحى على هذا الفكر والذى يعود ظهوره إلى فترة الأربعينيات . هذه المفاهيم تقود إلى حقيقة أخرى بأنه فى خلال العشرين سنة الأخيرة اتجهت العمارة إلى التعبيرية و المقصود بها "الفن الرفيع " وتبعد فى نفس الوقت عن الواقعية.وقدتاثرت ليبيا مثلها مثل باقى بلدان العالم الثالث بنمو تجمعاتها العمرانية الريفية. وظهر ذلك خلال تخطيط المناطق الزراعية والريفية ، إلى ان أصبحت مناطقا عمرانية أو مستوطنات حديثة. وتحولت التجمعات العمرانية الريفية الزراعية إلى تجمعات عمرانية صناعية إلا أن معظم مبانى التجمعات الجديدة لم تكن على مستوى التصميم المحلى المطلوب. وقد فشلت هذه التجمعات فى الوصول لاستيفاء احتياجات الإنسان الريفى وفى نفس الوقت لم تفى باحتياجات المجتمع المتحضر.وبالرغم من أن الهدف هو ايجاد بيئة عمرانية يعتمد فيها المجتمع على نفسه فقد تم البناء العمرانى بما لا يتواءم مع البيئة المحلية والمتطلبات المختلفة للانسان العادى لذا نعرض فى هذا البحث إلى وضع بعض الاعتبارات التي يمكن أن تكون الحل لتطوير التجمعات الريفية ونورد مدينة " غدامس " كمثال لذلك.

مدينة غدامس القديمة

تُعرف مدينة" غدامس "بانها تجمع عمرانى تقليدى و هي تعتبر أحسن مناطق ليبيا الزراعية وتبلغ مساحتها ٧٥ هكتارا وتتكون من ٨٠٠ وحدة سكنية ومسجد وعدة محلات تجارية وساحات عامة وتعتبر أكبر مركز تجارى فى صحراء ليبيا كماتبدو كواحة خضراء فى هذه الصحراء التى يصل فيها المدى الحرارى إلى ٤٠م.ويمكن اعتبار غدامس أحد الأمثلة التى تعبر عن أقصى ملاءمة معيشية، وبالرغم من أنها محاطة بالصحراء من كل جانب إلا أن هذه الواحة بخصائصها الطبيعية استطاعت أن تصل إلى الاكتفاء الذاتى ، فهي تمثل بيئة عمرانية مثالية تتغلب على الظروف المناخية ومطبق بها تكنولوجيا العصر الملائمة.

الخصائص العمرانية:

تتواءم مدينة غدامس القديمة من الناحية العمرانية مع الظروف المناخية والتكنولوجية ونجد أن لها خصائصا مميزة فى الطابع المعمارى مستمدة من العمارة المحلية المتوارثة ، و يعكس الطابع المعمارى الحياة الاجتماعية والتفاعل المباشر مع المكان ويعطى للبيئة المعمارية ولاء حضاريا.

وتظهر عدة اعتبارات فى المدينة القديمة سواء بالنسبة للمسكن أو التجمع العمرانى نفسه وأهمها أن المساكن فى مدينة غدامس تبدو ملاصقة بعضها لبعض. وقد صممت الوحدات السكنية والمبانى العامة والشوارع ملائمة للظروف المناخية ويظهر ذلك فى الطابع المعمارى والألوان المستخدمة وغير ذلك. ويفصل بين المساكن ممرات مشاه مظللة نتيجة تقارب المساكن. كما أن تفاوت الارتفاعات يعطى الظلال عمقاً أكبر.ومن ناحية أخرى يمكننا أن نتبين الروح التقليدية المتلائمة والتى تعمل على تكامل الوحدات السكنية مع المبانى العامة والشوارع والساحات المفتوحة مع بعضها وقد اهتم البناؤن بعناصر المسكن وادماج الوحدات وتوحيد تصميم الوحدات الداخلية مثل الخارجية وجعلها بمقياس ضخم بحيث يمكن القول بأن المسكن هو مدينة بينما نجد أن المدينة نفسها عبارة عن مسكن كبير.

الشوارع وممرات المشاه

تعتبر ممرات المشاه فى المدينة القديمة عنصرا حيويا ، وتعبر وظيفتها عن متطلبات المجتمع فنجد أن فراغ الشارع ذو الطلاء الأبيض على الحوائط الطينية والمحاور الطولية ومواصفاته الخاصة من حيث الأشكال المختلفة للفراغات والعقود والأضواء المتساقطة المتسلطة على الأبواب المصنوعة من أخشاب جذوع النخيل فإن ذلك يعطى الشارع الاحساس بأنه ليس فراغا بل هو جزء مصمت يمنح شعورا بالحماية والتغلب على الظروف المناخية الصحراوية التى تواجهها المنطقة.وهنا نتذكر قول " لوى كانز " أن الشارع عبارة عن غرفة تعتبر فيها المبانى كحوائط والسماء سقفها وهنا نجد المثل في ممرات المشاه فى غدامس حيث يمكن اعتبار الوحدات السكنية هي السماء التى تغطى الشوارع.كما أن الممرات المغطاه تعبّر عن الخصوصية فيستخدمها الرجال أثناء النهار فى العمل والتنقل بينما نجد أن النساء يتحركن فوقها من داخل الوحدات السكنية ويستخدمن المعابر للتنقل فوق تلك الممرات لتعطيهم الخصوصية وحرية الحركة الداخلية..

الفراغات المفتوحة:

إن أهم الخصائص الهندسية لهذه الفراغات المفتوحة هي أن معظمها مربعة الشكل تقريبا مما يعطى احساسا بالانغلاق وتعتمد خصائص كل فراغ على استخداماته وبالتالى يتحدد مقياسه وبعتبير أخر فان الإحساس بالانغلاق جاء نتيجة الحوائط المحيطة والارتفاعات المختلفة للمبانى ، هذا بالإضافة إلى أن هذه الفراغات تعتبر بوابات لممرات المشاه وتضفى فى نفس الوقت عنصر المفاجاة ، وفى بعض الأحيان تستخدم هذه الفراغات لإقامة المناسبات الاجتماعية مثل الأفراح.

الوحدات السكنية

يعتمد تصميم الوحدات السكنية فى المدينة القديمة على الحاجة الوظيفية ومواد البناء والظروف المناخية. وتبدو الوحدات السكنية وكانها بمقياس واحد وبنفس التقسيم الداخلى وقد فرشت بأثاث مصنوع يدويا.(فى الغالب تصنعه المرأة) لتعطى الفراغات بعدا فنيا ومعانى قيمة للمساكن. وتم تقسيم الحجرات المختلفة طبقاً لاستخداماتها هذا و تختلف ارتفاعات الاسقف الداخلية فمثلا ترتفع فى صالة المعيشة الرئيسية لتعطى الاحساس بالاتساع .

ملاءمة المسكن للظروف المناخية

تعتبر غدامس من المناطق ذات الحلول التصميمية الملائمة للظروف المناخية فعند الدخول إلى المسكن يشعر الانسان بدخول فراغ يشبه الكهوف إلى حدما، فالمداخل مظلمة تضاء عن طريق الشموع بما يكفى لمرور المشاه، فالفراغ الداخلى بالوحدة السكنية لا يعكس المناخ الخارجى. ويشعر الفرد فى الفراغ الداخلى بالاندماج والارتياح النفسى وبخصوصية المكان ، وهنا لا يصبح مناخ الصحراء واضحا فالحوائط سميكة بحيث تعزل الفراغ الداخلى عن الخارجى وكذلك عن طريق احتفاظ هذه الحوائط بالحرارة وتخزينها أثناء النهار ثم اشعاعها مرة أخرى أثناء الليل ، وتعكس الارتفاعات المختلفة للمبانى ظلالا فوق أسطح المبانى الأخرى كما أن اندماج الوحدات مع بعضها يقلل من مساحات الحوائط الخارجية المعرضة للعوامل المناخية الخارجية. ويغنى اللون الاحمر المستخدم فى الديكور الداخلى وانعكاسات المرايا الوادى والسجاد اليدوى عن اللون الذهبى للصحراء واللون الاخضر للمشروعات واللون الازرق للسماء. وبذلك فانه يمكن الاحساس بالمناخ البارد وتجنب أشعة الشمس فى الفراغ الداخلى للوحدات السكنية.

الطابع المميز

تعتمد النظرية المعمارية للبناء على العلاقة بين المبانى ومستخدميها والتى تأخذ فى الاعتبارات والمضمون الخاص بالمعانى الحضارية.

على سبيل المثال فإن مفردات العمارة مثل السلالم والنوافذ و نهايات المباني والأسقف الجمالونية وغيرها لاتستخدم لاغراضها فقط بل أنها تعبر عن رموز أخرى.

ويتجاوز الاحتياج إلى الوصول إلى التعبيرية لتحقيق الوظيفية كما وتتوافق التعبيرية مع الفكر المرتبط بالعقائد والتى من خلالها يمكن للإنسان إدراك القيمة الحضارية الخاصة بالمجتمع .

ويمكن لمس هذا المعنى والذى يتجلى بوضوح فى عمارة "غدامس" على سبيل المثال فالرقم ثلاثة يعبر عن ثلاثة أشياء تؤثر على سكان مدينة غدامس هى الخبرة والمؤثرات الخارجية والتاريخ . فنجد أن تصميم نماذج النوافذ الحائطية والتى تأخذ شكل المستطيل يعلوها ثلاثة مثلثات حادة مدهونة باللون الاحمر نرى أنها منتشرة بصفة عامة فى كل البلدة ويمكن رؤيتها فى الحوائط الداخلية للمسكن وفى نفس الوقت من خارج المبنى نفسه بنفس الشكل.

كذلك فإن الأسطح العلوية للمساكن منفصلة بحوائط متغيرة الارتفاع و يتم بناء ثلاثة

درجات من السلالم وتعطي بذلك الوحدة التصميمية للتنسيق العام للمدينة حتى المسكن نفسه يتألف من ثلاثة طوابق يحتوى الدور الأرضى على المدخل الرئيسى والمخزن الثانى يحتوى على فراغ المعيشة الرئيسية وحجرات النوم ويحتوى الدور الأخير على سطح وفراغ مفتوح يمكن لاستخدامه للنوم ليلا.

الإضاءة

بالرغم من أن الإضاءة الداخلية قليلة فإن الفراغ الداخلى لا يبدو مظلما .
ولتقليل شدة الإضاءة بالداخل فإنه يمكن التحكم في نسبة دخول الضوء إلى مساحة المسطح.و ذلك عن طريق التحكم اليدوى بغلق هذه الفتحة أو فتحها. كذلك فإن المرايات المعلقة على الحوائط الداخلية تساعد على توزيع الاضاءة من خلال غرفة المعيشة بصورة منتظمة .وقد اهتم البناء بالعلاقة بين البناء المعمارى والضوء وأهمية الاضاءة الداخلية ليصل بذلك إلى فراغ تصميم مستنير وفى نفس الوقت مريح للرؤية.

الحلول البيئية المناسبة للبناء

كانت أمام اهل غدامس مشكلة توفير المسكن المصمم على مواجهة الجو الحار باقل مواد يمكن الحصول عليها من نفس المكان.
وقد بنيت المساكن من جذوع النخل استخدمت ممرات من الأحجار والجبس والطين.

طريقة البناء:

عبارة عن أساسات حجرية طولية مغطاه بالطين والمونة وتعلو متر واحد عن سطح الأرض تحمل الحوائط الحاملة. ويختلف سمك الحائط المصنوع من الطوب اللبن من حائط خارجى الى داخلى وتصنع السلالم من قوالب الحجر الجيرى الخفيف ومغطاه بالجبس ويغطى السطح بجذوع أشجار النخيل على بعد حوالى ٥٠ -٥٦سم عن بعضها ويغطى بالطين المدهون بالجبس ليعكس أشعة وبهذا يصبح أحد عوامل عزل الحرارة عن المبنى.
وتعتبر غدامس مثال جيد لتعاون الناس فى إيجاد التوافق الكامل والانسجام فى تصميم وبناء مساكنهم فيشارك السكان نفسهم فى بناء المساكن الاقتصادية .
ومن هنا جاء البحث عن بناء بيئة يطور فيها الإنسان قيمة المجتمع ويحافظ على الخصوصية.

القاء الضوء على تطوير مدينة غدامس الحديثة:

تتألف مدينة غدامس الجديدة من ٦١٦ وحدة سكنية صممها مجموعة من المعماريين من بولندا Andrzei & Mika Ratshura فى بداية الثمانينات كمساكن حديثة. قامت فكرة الحلول التصميمية على تطوير مدينة غدامس ، وفى رؤية تحليلية لكاتب المقال: وجدت عدة سلبيات فى هذا الحل على المستويين العمرانى والفسيولوجى.
ونجد أن محاولة تطبيق العمارة الحديثة والمساه " الوظيفية " والتى تعبرعن محازاة الثورة الصناعية والتي نجد فيها فقط التركيز على البناء والوظيفية فنجد أن تلك الوحدات التصميمية تبعد عن العمارة التقليدية المحلية أو المعالجة المناخية فى حين تم

الإبقاء فقط على السلالم الركنية ، وجاءت فكرة تجنب أشعة الشمس فى محاولة للحصول على جو ملائم بتصميم وحدات ذات فتحات صغيرة مثل المستخدمة فى مساكن المدينة القديمة. ومن وجه الغرابة أن نجد المشروع يبدو وكأنه وحدات سكنية مستقلة وليست مندمجة مع بعضها كل منها له خمسة جوانب معرضة للشمس ومبنيه بحوائط غير سميكة وبالتالى يساهم ذلك فى زيادة الحرارة وحياة داخلية غير مريحة

النظرية والمنهج للبناء فى المناطق الريفية.

نفترض أن المتطلبات الرئيسية للعمارة التي تفي بالغرض لا بد ان تستمد من الخصائص المحلية و من المعلومات العامة عن سكان القرية الخاصة باحتياجاتهم الاجتماعية والمعيشية.. ويصبح السبيل إلي إقامة العمران هو توافق مفهوم المتطلبات الخاصة بالمجتمع مع تكامل الأبعاد المختلفة للبرنامج التصميمى والمؤثرات الحضارية الطبيعية على هذا المجتمع. والخطوات التصميمية التي تتجه فى الغالب إلى البحث عن عمارة من خلال تطوير التجمعات العمرانية فى الريف لا بد أن تقوم على التوافق بين الخصائص الطبيعية للبيئة والاحتياجات الوظيفية للمجتمع..

شروط البناء

تمثل ليبيا ثلاثة مناطق مناخية مختلفة هى مناخ الساحلية والمناطق الجبلية والمناطق الصحراوية وكل منها له خصائصه المناخية من حيث درجات الحرارة والأمطار وسرعة الرياح وكذلك تختلف عادات الناس ولهجاتهم.

وللبحث عن عملية للوحدات الريفية ولمواجهة المتطلبات والاحتياجات المستجدة للحياة العصرية.

مرحلية التطوير

ان الغرض من هذه الدراسة هو تطوير المناطق الريفية على أن تكون بصورة مرحلية .

فالانتقال من تجمعات ريفية إلى تجمعات حضرية جديدة قد يحدث نوع من اختلال التوازن والهدف هنا هو الوصول إلى مبانى عمرانية تحقق متطلبات الناس فى نفس الوقت تواكب التطوير المستمر في النواحي التكنولوجية .

إن الحل الأمثل هو اختيار البرنامج بالاشتراك بين الاستشاريين ومستخدمى المسكن .

ونورد هنا كمثال التجمع السكنى الذى قام بتصميمه لوكوربوزييه بالقرب من Bordenux عام١٩٢٥

ويتضح بها التناقض بين المتطلبات المعيشية والفكر الخاص بالمعمارى لوكوربوزييه وقد تم تعديل وتغيير التصميم عن طريق المستخدمين.

فيما يتعلق بالمحليات فإن التعبير المعمارى يجب ان يتعلق بالمحافظة على استمرارية المنهج التقليدى للتصميم والمحافظة على التراث فعلى المصمم أن يبدأ من حيث ينتهى الآخرون بحيث يضيف أفكارا جديدة يكونها من الفكر الخاص بكل بيئية عمرانية.

الفكر المعمارى والتصميم

إن القيم المعمارية والجمالية والرمزية والرغبةفي الوصول إلى الوحدة و التناسق

ليس من خلال التركيب المعمارى ولكن باالاندماج مع المكان نفسه تلك كانت الأهداف التصميمية للمشروعين اللذين قام بتصميمهما قسم العمارة التابع لكليةالفاتح فى ليبيا حيث كان التركيز على المتطلبات الوظيفية وتوجيه المبانى والمعالجة المناخية والتهوية الطبيعية و التداخل بين الفراغات الخاصة والعامة.
وصممت الحوائط الخارجية كحوائط مجوفة ويتم وضع فراغ المطابخ فى الجهة الامامية لتشكل مساحات مظللة من جهة الواجهة الامامية وتشكل سطح بلكونى علوى وملاءمة الأعداد المختلفة للعائلات صممت المساكن بنماذج مختلفة في عدد الحجرات بحيث يكون التصميم على نموذج يعتمد على وحدة متكررة يمكن الإضافة إليها فى حالةالرغبة في زيادة اتساع المسكن وتركب مع بعضها حول ممرات مشاه تغطيها فى نفس الوقت.
وبهذا يطبق هذا الفكر التعبير عن البيئة المحلية فى صورة تنسيقية افضل.
وبهذا نكون قد وصلنا إلى التعبير عن الصفات الاجتماعية والمناخية للطابع التقليدى المحلى وتطويرها فى صورة فكر حديث ولتجنب الفراغات بين المساكن والتى حدثت فى المشروع البولندى فان الوحدات المتقاربة تشكل ممرات متلاحمة تعكس وظيفة خاصة وضحت فى استعمالاتها فى المجتمع العام. وتشكل مجموعات المساكن فراغات يتفرع منها محاور الشوارع المختلفة الممرات الداخلية كلها مظللة كذلك الفراغات العامة وتستخدم ممرات المشاه للخدمات الكهربائية بينما نجد أن الشوارع الخارجية المفتوحة بها المجارى العامة.
وقد اخذت اللمسات الفنية لتصميم الوحدات من غدامس القديمة فى انتقاء الالوان والاشكال والنظام العام وفى ممرات المشاه بين المبانى ويظهر التكوين العام للتجمعات العمرانية المقترحة ذو شكل حديث أما فى حقيقة الأمر فإنه إعادة للنظريات الخاصة القديمة التى إعيدت للنور مرة أخرى.

النتائج والتوصيات

تعبر مدينة غدامس القديمة عن فكر وتعبير خاص لشخصية المكان وهو يهدف إلى ضرورة تفاعل الإنسان مع المكان والبيئة.ويصبح الهدف من التصميم من خلال التطوير الحضرى للتجمعات الريفية خاصة فى غدامس هو تكوين تجمع يضعه الإنسان نفسه يحقق صفات وخصائص مجتمعه وإن هدف العمارة من خلال تطوير الأماكن الريفية لا يمكنه حل المشكلة بالاهتمام بالنواحى الوظيفية فقط بل بالاتجاه للبحث عن التخطيط الملائم – والطابع الخاص الملبى لاحتياجات الانسان

نحو استراتيجية تصاميم البيئة لإعمار المستوطنات الصغيرة بأفغانستان.

د. عبد المحسن فرحات
أستاذ العمارة بجامعة الملك عبد العزيز – جدة

مقدمة

بعد أن توصلت أفغانستان إلى حل لمشكلتها السياسية ، كان من المتوقع أن تتزاحم فلول الأفغان الفارين من البلاد أثناء سنوات الحرب للعودة إلى بلادهم التى اختلفت صورتها وتبدلت معالمها بعد أن تعرضت للدمار والتهدم ، ومن ثم فكان لا بد من التوجه إلى محاولة إصلاح ما تهدم وإعادة إعمار المناطق المختلفة ، وبث الحياة فيها من جديد.
وكنتيجة لقلة الموارد المالية بالبلاد اتجهت السلطات الحكومية إلى الاعتماد على المساعدات الأجنبية لتغطية احتياجات التعمير وبهذه الصورة فإن أعمال الإصلاح والتعمير إذا تمت دون تخطيط دورى ومتابعة فإنها ستتعرض لكثير من الإخفاقات وتؤثر سلبا على البيئة الطبيعية والاجتماعية والاقتصادية والثقافية. ومن ذلك الاختيار السئ لمواقع البناء والتسخير الزائد للموارد الطبيعية فى مدينة تعرض أساسها الزراعى للأضرار الجسيمة. كما أنه من غير الملائم استخدام النماذج البنائية المصنعة فى الخارج والتى لا تتناسب مع المناخ المحلى والبيئة الاجتماعية المحلية وعادات البلاد ، مع اعتبار ضياع التارخ الثقافى للبناء ، هذا إلى جانب الحاجة إلى مزيد من الطاقة لأعمال الإنشاء والتنفيذ. وأخيرا وليس أخرا الاعتياد على استغلال المساعدات الأجنبية والانتفاع الأقل للموارد المحلية والشخصية.
ونقدم هنا محاولة لمواجهة هذه المشكلات بطريقة تكنولوجية مرنة ذات نهاية مفتوحة يمكن تغييرها تبعا لتغير ظروف كل منطقة. وذلك فى صورة دليل مقترح للتخطيط والتصميم والشكل الإنشائى للتجمعات الجديدة وبخاصة فى الأجزاء الريفية البسيطة.

أولا عناصر استراتيجية التصميم البيئ حصرها وأهدافها

باعتبار أن تخطيط وتصميم قالب ثابت لأسلوب التعمير يعد نظرية خاطئة وذلك للاختلافات البيئية الطبيعية عبر أقاليم أفغانستان كما أنه يعد تنفيذيا غير إيجابى لأنه عند وضع التخطيط والتصميم يجب الرجوع إلى المواقع المحددة التى أعدت للبناء ؛ من ثم فإنه تم اعداد دلائل إرشادية للتصميم والتخطيط يمكن التحرك خلالها والتغيير والتبديل تبعا للظروف البيئية وذلك مع إبراز طرق التعمير التى تعتمد على الأساليب التقليدية.
اختير إقليم الجبال الجنوبية والسفوح للتناول فى هذه الدراسة مع التركيز على المساحات المحيطة بمدينة كاندهار (Kandhar) وقد اختيرت هذه المنطقة باعتبار تعرضها للتدمير الشديد كما أنها تستخدم المواد الطبيعية من الأرض كمادة أساسية فى أغراض

الإنشاء بالإضافة إلى اقترابها كثيرا من المعسكرات التى أقامها الفارين من البلاد.
قبل مناقشة عناصر التصميم البيئ فانه من الأهمية بمكان استخراج أهدافها وامكاناتها والتى استنتجت من السياسة المقترحة (والتى لن نتعرض لها هنا) ويمكن تناولها كالآتى:

١- الاقتراب من التوجيهات الإسلامية:

يتضمن ذلك الابتعاد عن الإيذاء بقدر الإمكان وهذا فيما يتعلق بالبيئة الفيزيقية مثل تجنب التلوث واستنفاذ موارد الطبيعة (قطع الأشجار) وفيما يتعلق بالبيئة الاجتماعية مثل توليد مزيد من التنافس على الأرض وإحداث نوع من التضخم للمشكلات. هذا بالإضافة إلى بعض التوجيهات الإسلامية فى التصميم مثل تأمين خصوصية العائلات سواء فى الإسكان الفردى أو الجماعى. هذا مع تجنب الإسراف فى استخدام المواد كما وكيفا.

٢- الاعتماد على الذات والإدارة المحلية الذاتية فى نشاط التعمير:

الاعتماد على الذات عنصر هام فى السياسة عموما. وبالنسبة للتصميم البيئ فهو يعنى الانتفاع إلى أبعد مدى بالموارد والأيدى العاملة والمواد المحلية فى أعمال التعمير.
تبعا لذلك فإن سياسة التعمير تؤسس عمليا على الطرق والتقنية المحلية فى استخدام المواد المحلية وذلك يفضى إلى الكفاية الاقتصادية والتكيف مع الظروف البيئية والاجتماعية واستغلال الإمكانات البشرية. والاعتماد على الذات فى الإصلاح والتعمير يسير بمحازاة إتباع أسلوب الإدارة المحلية (وليس السلطة المركزية) حيث تقوم هذه الإدارة بصنع القرارات الهامة فى إدارة البيئة الفيزيقية. وبالنسبة للسلطة المركزية فهى تقوم بتشكيل التكوين الداخلى الأساسى والمد بالمساعدات المالية والقروض والمساعدات التقنية. وتجدر الإشارة إلى اشتراك العائلات فى بناء منازلهم كسمة أساسية للعمل.
وحيث أن القرارات الفردية قد تؤدى إلى النزاع وتنعكس على المجموعة بشكل سلبى مباشر أو غير مباشر فانه من الأهمية بمكان التحكم فى الرغبات الشخصية لتحقيق المصلحة العامة. وقد أثبت التاريخ والبراهين المعاصرة أنه من الأفضل اجتماعيا وبيئيا اتباع نظام المشاركة.

٣- التعمير بالاعتماد على الطرق التقليدية فى الإنشاء:

إن اتباع الطرق التقليدية فى الإنشاء لا يمكن تطبيقه حرفيا إلا فى بمراعاة عدة عوامل:
- استخدام الموارد الطبيعية كالأخشاب فى البناء يتطلب تناسب فى معدل قطع الأشجار مع معدل النمو حيث أن الغابات الطبيعية بالبلاد تم تدميرها إثر الحروب.
- الاحتياجات الصحية تتطلب توفير التصريف الصحى وتوصيلات المياه الصالحة للشرب والتشطيبات الداخلية للأرضيات والحوائط والأسقف.
- التقدم فى العلوم والتكنولوجيا كان من أثره إجراء التحسينات فى طرق الإنشاء التقليدية فعلى سبيل المثال إضافة بعض الأسمنت لتثبيت بلوكات الطوب المصنوعة من التربة الطبيعية واستخدام الآلات اليدوية والهيدروليكية لإنتاج بلوكات التربه

الطبيعية وكذلك اتباع طرق الإنشاء المقاوم للزلازل فى الأجزاء المعرضة له.
- التقدم التكنولوجى ساعد على الانتفاع بموارد الطاقة المتجددة وإعادة استخدام الفاقد منها.
- تحسين الأساس الصناعى للمدينة ككل يعطى درجة من التقدم التكنولوجى فى أعمال التعمير.

٤-التكيف البيئ والتقنية المناسبة وتوزيع السلطات:

هناك عوامل أخرى تساعد على التحسين فى طرق الإنشاء التقليدية يجب التحكم فيها لتحقيق بعض الأهداف ذات العلاقات المتبادلة: .
-التغيير والتحسين لا يجب أن يخاطر بالتكيف مع البيئة الطبيعية والاجتماعية التى تعطى صفة خاصة للعمارة التقليدية.
- التكيف مع البيئة يتضمن استخدام الموارد الطبيعية واستخدام موارد الطاقة المتجددة.
والتكيف مع البيئة الاجتماعية يتضمن توفير لوازم المعيشة الوظيفية والفراغية اليومية والحفاظ على الشخصية الثقافية من خلال استخدام التكوينات التقليدية والحرف والفنون المحلية.
- لضمان توفر الامكانات الاقتصادية والاستغلال الأمثل للموارد الشخصية يجب الابتعاد عن الأساليب التكنولوجية باهظة الثمن واللجوء إلى التقنية المناسبة.
- وبهدف ضمان أقصى انتشار لنشاط التعمير يجب اتباع النظم اللامركزية.

٥- زيادة الانتاج:

يمكن لمشروعات التعمير بالإضافة لتوفيرها المساكن والخدمات يمكن أن تحقق زيادة فى الإنتاج وتساهم فى التنمية الاجتماعية والاقتصادية.

ثانيـــــا الدليل الإرشادى للتخطيط

التكوين الأساسى المقترح لمستوطنة أفغانية:

هذا التكوين يمكن تطبيقه على المستوطنات القائمة أو الجديدة بدرجات متفاوته من الاكتمال. وفى الحالتين فإن الهدف هو عرض المكونات الأساسية المقترحة وشكلها وعلاقاتها المتبادلة فى التكوين الكلى. والتكوين الأساسى المقترح لمستوطنه يستنتج من ظروفها البيئية ولما كانت البيئة الطبيعية فى كاندهار (Kandhar) (المنطقة المختاره) عموما جافة ومن ثم فقد استوجب ذلك استغلال كمية الأمطار القليلة التى تسقط وبأقصى مدى.

الموقع: الخطوة الأولى هى اختيار موقع المستوطنه الجديدة والتى يجب أن تكون بعيدة عن الوديان لاحتمال تكون ممرات تصريف المطر بها. يجب عمل تدرجات على طول الوادى لزيادة المحاصيل المعتمدة على مياه الأمطار وذلك من خلال تكوين برك المياه والمستودعات وعموما عند اختيار موقع المستوطنه الجديدة أو نمو المستوطنات القائمة يجب تجنب الأراضى الزراعية القائمة أو تلك التى يمكن استصلاحها.

شبكات الصرف: تراعى جودة أنظمة الصرف والمد بالمياه بحيث تحقق التكامل بين المقياس الصغير والمقياس الأكبر وذلك يكون بالتكامل بين ما يحيط بالمستوطنة مع الإقليم الكلى بهدف ضمان الاستغلال الجيد لموارد المياه والتوزيع العادل لها.

الطرق : وعند التخطيط لشبكة الطرق الداخلية يجب إبعادها عن الأراضى الزراعية.

معالجة المخلفات :هذا وتعد عملية معالجة المخلفات عملية هامة فى البناء الداخلى للقرية. حيث أن المعالجة اللاهوائية هى أفضل الطرق للتخلص من المخلفات فبالاضافة إلى منافعها الصحية فإن معالجة المخلفات العائلية والزراعية تنتج بعض الموارد البيئية والطاقة. حيث تنتج بعض المواد التى يمكن استغلالها كأسمدة للأراضى الزراعية أو لاستصلاح الأراضى الجديدة.كما ينتج عن عملية المعالجة اللاهوائية للمخلفات غاز الميثان الذى يمكنه تغطية احتياجات الوقود لكل المستوطنه. يمكن مد هذا الغاز للمنازل عبر أنابيب مباشرة أو حفظه على هيئة سائل فى أسطوانات لتوزيعه على المنازل.
وتؤثر انظمة التحكم فى الفيضانات والصرف والتحكم فى مياه الأمطار والمعالجة اللاهوائية للمخلفات تأثيرا مباشراً أو غير مباشر على شبكات مياه الشرب والكهرباء وخطوط التليفونات ولذلك فانه يمكنها المساهمة فى تنمية المستوطنات

الزراعة: بالنسبة للزراعة تقسم الأرض المحيطة بالمستوطنة إلى ثلاث مناطق أساسية تختلف فيها الاستعمالات. أولى هذه المناطق هى المراعى والتى يجب أن تكون بعيدة عن المستوطنة وفى مناطق عامة يلى ذلك مناطق الزراعة التقليدية فى الحقول المفتوحة والتى يتوقع أن تبقى فى قاع الوادى مع احتمالات تحسين نظم الرى.
المنطقة الثالثة والحديثة يمكن إقامتها فى كل أجزاء أفغانستان نتيجة للموقع والمناخ القارى ، وهى البيوت الزجاجية (الصوب) حيث أن درجات الحرارة القصوى فى كاندهار تتفاوت على طول العام بين ١٥,٤ فى ديسمبر و ٤٠,٢ فى يونيو .هذه البيوت الزجاجية يمكنها خلال الشهور الباردة الاستمرار فى إنتاج الحبوب التى تنمو فى الجو الدافئ فى الحقول المفتوحة بالإضافة لذلك فإن هذه البيوت الزجاجية يتضاعف فيها انتاج الأرض بالمقارنة بالحقول المفتوحة. ويمكن للصوبات الزجاجية أن تكون بمقياس كبير لتحل جزئيا محل الحقول المفتوحة أو تكون بمقياس صغير وتلتصق بالمنازل. وتوضع هذه البيوت الزجاجية عموما على الطرق الرئيسية وترتبط بالمدن الكبيرة. ويمكن اعتبارها فى الخطوات الأولى للصناعات الريفية التى تتضمن أيضا تعليب وتجفيف الطعام. هذه الصناعات الريفية بمساعدة التجارة والفنون والحرف مثل صناعة السجاد يمكنها تقوية الأساس الاقتصادى بالقرية. وعليه يمكن للنزوح الريفى إلى المدينة أن يتوقف تبعا للتنمية الاقتصادية.

الطاقة: وفى المراحل الأخيرة للتنمية يمكن للطاقة أن تنتج بمولدات تعمل بحركة الرياح وتوضع هذه المولدات فى الأماكن المرتفعة من المستوطنة.

الاختلاف والتميز بين المستوطنات القائمة والحديثة:

تقدر النسبة المئوية للمساحات الريفية التى تعرضت للتدمير تقدر بحوالى ٥٠٪ ومن ثم فإنه يجب تخصيص نسبة معقولة من مشروعات التعمير للمستوطنات القائمة. حيث من المتوقع عودة غالبية المهاجرين إلى هذه المستوطنات. ومن ناحية اخرى فان عودة المهاجرين إلى مستوطناتهم مع الزيادة السكانية التى حدثت خلال سنوات الحرب سيؤدى إلى نوع من التضخم والتكدس السكانى بالمستوطنات وبكثير من الأقاليم ولذلك كان يجب بناء مستوطنات جديدة تستوعب هذه الزيادات.

بالنسبة للمستوطنات القائمة هناك بعض الأولويات أثناء عمليات التعمير يجب مراعاتها وهى:

- بعد اصلاح التكوين الداخلى لكل الأجزاء المحيطة بالمستوطنة متضمنة المناجم والقنوات والطرق التى تربط بين القرى وغيرها فإن التكوين الداخلى للقرية نفسها يجب إصلاحه ثم يحسن للحصول على التكوين الأساسى المقترح للتجمع السكنى.
- المنازل القائمة التى تركت خالية دون صيانة تتطلب بعض الجهود لتتهيأ للايواء المناسب ويتضمن ذلك أعمال البياض الخارجى للحماية من مياه الأمطار وتثبيت الأبواب والنوافذ والاتصال بنظم الصرف.
- المنازل المهدمة جزئيا يجب إصلاحها ثم يلى ذلك ادخال التحسينات عليها.
- المنازل التى دمرت تماما يجب إعادة بنائها كاملة.
- تبنى منازل جديدة كامتداد للقرية لتقليل الكثافة فى الأجزاء المكدسة بالسكان..

النظام العام للانتاج وبناء المنازل

يتم اختبار النظام، أولا اختبار العمليات الفيزيفية متضمنة إنتاج المواد المطلوبة للبناء وتصنيعها إلى عناصر بنائية وعمليات نقل المواد والعناصر ثم البناء بالموقع.

بعد ذلك يتم تحديد الوقت المطلوب والتكلفة والعمالة والطاقة والتاثير على البيئة والتلاؤم معها والتناسب الثقافى والاجتماعى متضمنا الإدارة الذاتية.

هنا يجب المقارنة بين نظامين أولهما هو تكوين البلوكات ثم اتباع الطرق التقليدية فى الإنشاء مع التحسينات اللازمة أما النظام الثانى فهو استخدام العناصر سابقة التجهيز.وبعد إجراء المقارنة وجد أن الاتجاه الأول أكثر ملاءمة وذلك لعدة أسباب:

الوقت:

بالنسبة للزمن فبالرغم من سرعة التركيب فى النظام الثانى فإنه بالنظر إلى جميع مراحل التجهيز فإن الزمن فى النظام الأول أقل وذلك يرجع إلى المراحل التى يحتاجها تجهيز العناصر سابقة الصنع بالإضافة إلى أن النظام الثانى يستخدم المقياس الكبير فى البناء مما يستلزم بناء عدد كبير من المنازل ثم يتم التسكين بعد الانتهاء أما فى النظام الأول فإن التسكين يتم بسرعة بمرحلة ابتدائية صغيرة يتم تنميتها بعد ذلك.

التكلفة:

يعد النظام الثانى أكثر تكلفة نتيجة لصعوبة تقنين الأبعاد والأنواع (خاصة فى الأقاليم

المتباينة فى أفغانستان) بالإضافة إلى تكاليف النقل. وحقيقة فإن البناء بالاعتماد على مواد الأرض يعد أقل فى التكلفة من البناء بالمواد المصنعة .

العائد:

بالنسبة للنظام الأول فإنه يكون تقسيم الربح بين المقاولين المحليين والأيدى العاملة الماهرة وغير الماهرة والذين يمكنهم جميعهم العمل باستخدام تقنيتهم التقليدية والموارد المحلية.
بينما فى النظام الثانى فان العائد يكون خارج المدينة لاستخدام العناصر سابقة التجهيز.

الطاقة:

فى النظام الأول يكون الاعتماد على الإمكانيات الشخصية باستثناء الحاجة إلى بعض الطاقة لتصنيع الأسمنت وبعض الإضافات الأخرى أما فى النظام الثانى فهو معتمد كلية على الطاقة.

التاثير على البيئة:

بالنسبة للتاثير على البيئة والتناسب معها فإن النظام الأول ضعيف التأثير عليها باستثناء فى مراحل صناعة الطوب . فهو يناسب طبيعة البيئة بالنسبة للمناخ وخاصة خاصية الاحتفاظ الحرارى الناتجة من الحوائط والأسقف السميكة.
النظام الثانى ذو تاثير سلبى على الطبيعة حيث يسبب التلوث أثناء صناعة الحديد والأسمنت وخلال عمليات النقل. كما أنه يفتقر إلى التلاؤم مع المناخ حيث أن مكوناته خفيفة الوزن ومن ثم تصعب عملية الاحتفاظ بالحرارة. وعند استخدام العزل الحرارى فإنه يكون التوصل إلى حل جزئى للمشكلة باعتبار زيادة التكاليف وزيادة التلوث.

التاثيرالثقافي والاجتماعي :

النظام الأول يمكن استخدامه بالنسبة لعدد كبير من المواطنين كما أنه يتيح اتباع أسلوب الإدارة المحلية سواء فى المقياس الفردى أو الجماعى فى التجمع.
النظام الثانى المتجه إلى سبق التصنيع واستخدام الآلات يمكنه تقديم حلول على هيئة قوالب تنفيذية لا يمكنها سد الاحتياجات المحلية خاصة لوجود الاختلافات البيئية بين المواقع المختلفة بالأقاليم كما أنه تفتقر إلى إمكانية الادارة المحلية.
ثالثـــا الدليل الارشادى للتصميم والتكوين

الدليل الإرشادى الاساسى للتصميم:

تحتوى الوحدة السكنية على غرف مختلفة الاستعمالات من حمام ومطبخ ومخزن وهما يكونان بالخلف بالقرب من حظيرة الدواجن والأرانب وقد روعى توفير التهوية الطبيعية. كما روعى مرونة الاستعمالات فى الغرف . وتخصص لعائلة واحدة إلا أن البناء قابل للامتداد. ويمكن استخدام الفناء الداخلى كملعب للأطفال أو فى بعض الحالات يستخدم كمكان لصناعة السجاد وغيرها من الصناعات الريفية.
المساحة الخلفية للمنزل تستغل كمكان للغسيل والتجفيف وتستخدم فى تربية الدواجن

التركيب الشكلى للتكوينات التقليدية واحتمالات التحسين:

إن العقد والقبة والقبو هى التكوينات السائدة فى إقليم كاندهار ويمكن ايجاز العوامل المساعدة على تنمية هذه الاتجاهات كالآتى:-

- قلة الاخشاب المتاحة لإنشاء الأسقف المستوية حيث أن شجر الحور (Poplar Tree) المستخدم فى النظام العام للتسقيف فى أفغانستان لا ينمو فى كاندهار.
- البعد عن اضطرابات الزلازل.
- الإنتاج المحلى للطوب المحروق بالإضافة للطوب المجفف بأشعة الشمس.
- المناخ الحار الجاف حيث أن المساحة المغطاة بالقبو تكون باردة صيفا كما أن الحوائط السميكة التقليدية تساعد على الاحتفاظ بالحرارة وتقلل فرق درجات الحرارة بين الليل والنهار.
- القبو والقبة لا يزلان يتيحان إضافة دور أخر عند الحاجة.

الشكل التقليدى للقبة والقبو:

في بعض المباني نجد أن سمك الحوائط الداخلية والخارجية كبيرة يصل إلى ٧٢ سم وبالداخل توجد كوة بالحائط بسمك ٢٤سم تعمل على تقليل سمك الحائط إلى ٤٨سم .
وفى بعض الأحيان تكون هناك كوة فى كلا الجهتين من الحائط الداخلى وذلك يقلل سمك الحائط إلى حوالى ٢٤سم فى بعض الأماكن.يستخدم الطوب المحروق لإنشاء القبو ولتغطية أسطح الحوائط الخارجية بينما الحوائط الداخلية وبقية أجزاء الحوائط الخارجية فتصنع من الطوب المجفف فى الشمس. وهناك عوامل أخرى غير قوة الضغط المؤثرة على الطوب تتحكم فى سمك الحائط مثل الرغبة فى إيجاد كتلة حرارية داخلية.، وعمل تثبيت جيد للقبة أو القبو ومقاومة تأثير مياه الأمطار. والأفضلية هنا لاستخدام الطوب المزود بالأسمنت بدلا من الطوب المحروق أو الطوب المجفف فى الشمس لتغطية أسطح الحوائط الخارجية وذلك لعدة اسباب منها:

١- ان قوة الضغط للطوب المزود بالأسمنت كمادة تثبيت تفوق تلك القوة فى الطوب المجفف بالشمس وهى تعتمد على كمية الأسمنت المضافة وعلى نوع التربة والضغط المستخدم لإنتاج الطوب.

٢- وباعتبارات القوة فإن توفير المواد يصل إلى ١٠- ٤٠٪ فى حالة استخدام الطوب المزود بالأسمنت حيث يقل سمك الحوائط كما يقل الوقت والعمالة.

٣- كما أشير سابقا فإن الطوب المحروق يستخدم فى الخارج لتغطية أسطح الحوائط ومن الممكن تغطيته للحوائط المصنوعة من الطوب المجفف فى الشمس حماية لها من الأمطار. ولكن استخدام الطوب المزود بالأسمنت فى إنشاء الحوائط الخارجية يقلل الاحتياج إلى طبقة خارجية من الطوب المحروق. حيث أنه يمكنه مواجهة الامطار دون حاجة إلى بياض.

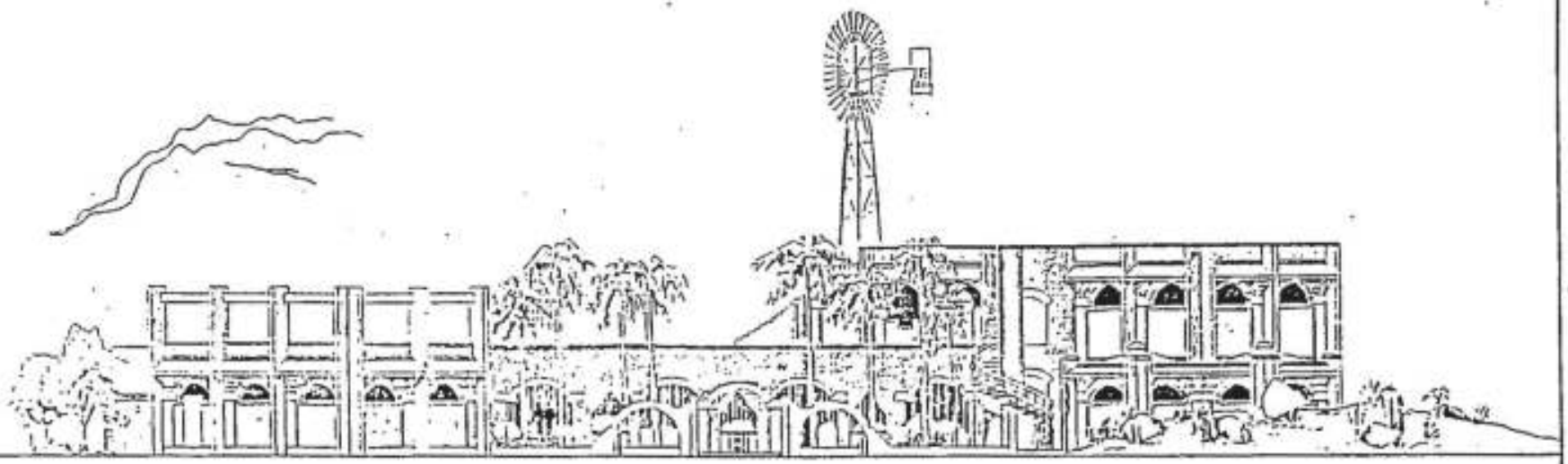
٤-وكنتيجة لاستبعاد الطوب المحروق تمنح المميزات الاقتصادية والاجتماعية التالية:

- توفير الطاقة حيث لاحاجة للوقود لحرق الطوب.
- تقليل تكلفة الإنتاج حيث لاحاجة لبناء القمائن وتقليل الفاقد من المواد أثناء الحرق -
تقليل التلوث الناتج عن عمليات الاحتراق.

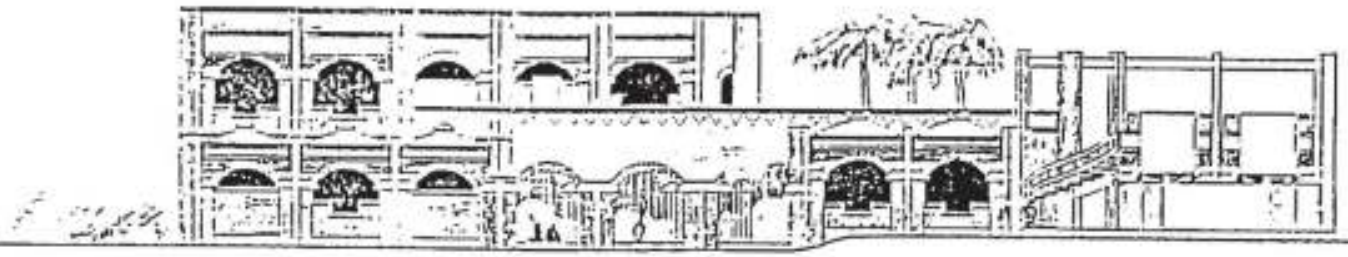
الخلاصة:

يؤكد البحث على الاعتماد على الذات فى بناء المستوطنات الصغيرة بأفغانستان وذلك بمقاييس مختلفة (على مستوى البلاد ... على مستوى الاقليم ... على مستوى القرية...) فهو الاستراتيجية الوحيدة التى يمكنها تلبية الاحتياجات بافغانستان حيث أن المساندات الدولية لن تستمر إلى الابد. ويختلف الاعتماد على الذات عن الاكتفاء الذاتي حيث أنه المقصود به التحكم فى درجة الاعتماد على العالم الخارجى.ويتم ذلك بتنمية الموارد المحلية المادية والشخصية فيكون الانتفاع بكل عناصر الطبيعة المؤثرة فى الإعمار بشكل مباشر أو غير مباشر ثم حماية الأراضى الزراعية والتلاؤم فى البناء والتخطيط مع المناخ والخدمات المتاحة. ويجب استخدام التقنية المناسبة وزيادة الفنون والحرف. وتختلف الموارد المحلية من إقليم لاخر تبعا للبيئة الاجتماعية والعمارة التقليدية وتقنية البناء.

وفى النهاية فإنه طبقا لتجارب الآخرين فإنه تظهر أهمية المشاركة ليس فقط فى عملية البناء ولكن أيضا فى صناعة القرار وعلى المقاييس المختلفة.



EAST ELEVATION (ENTRANCE)



SOUTH-WEST ELEVATION

AEROVILLE INFORMATION RECEPTION CENTRE

ELEVATIONS

THE INTERNATIONAL SYMPOSIUM OF HASSAN FATHY FOR ARCHITECTURE OF THE POOR

From 20th to 22nd April 1993
Cairo, Egypt

TITLE

HASSAN FATHY A LIVING SPIRIT

BY

Mrs. Nawal Mahmoud Hassan
President, Association for the Urban Development
of Islamic Cairo and Former Director,
Institute for Appropriate Technology

ADDRESS

36 Shareh Al Muiz El Din Allah
Al Ghouria
Cairo

SOCIETY FOR THE REVIVAL OF ARCHITECTURAL AND PLANNING HERITAGE.

THE INTERNATIONAL AWARD OF HASSAN FATHY FOR ARCHITECTURE FOR THE POOR.

HASSAN FATHY: A Living Spirit

by Nawal Mahmoud Hassan
President, Association for the Urban Development of Islamic Cairo and
Former Director, Institute for Appropriate Technology

(Reprinted from Pioneers, 1990 and
The International Builder, Hassan Fathy Institute for Constructor Workers, Jan. 1992).

HASSAN FATHY: A Living spirit
by Nawal Mahmoud Hassan

Hassan Fathy had elected to live in a 17th century Arab house at the foot of the Citadel -- to which countless people would trek to see him, from every walk of life -- architects, students, princes, philosophers, film-makers, musicians, journalists, admirers and friends from every conceivable nation and background. He was an architect, artist, philosopher and prince holding court, all rolled in one. Like a true Arab prince, his house was always open -- there was always a cup of tea and room for an extra person around the crowded fireplace or at the tea-table and always room for the widows and burdened mothers from the hara who knocked on his door. It was always an exhilirating experience to listen to his creative mind jump from one topic to another, drawing on his knowledge of the literature, music and art of many cultures. Through all this emerged a feeling of his sensibility for beauty, his humanity and concern for others and the courage to express his convictions and fight for a better Egypt.

Tea would be followed by a tour of this splendid house during which he explained the architectural features of the Arab house: the bent entrance for privacy, the court-yard creating an inner oriented suburbia and acting as a temperature regulator, the takhtabush seating area, the magnificent mushrabeyas, which served to diffuse light and allow for a maximum of air to enter the rooms, the maq'ad or, loggia facing the north breeze, and the finely decorated main qa'a or reception hall with its iwans, (recessed alcoves), and lantern latticed or shukhshekha to allow for hot air to rise and escape. (The malqaf or windcatch facing the north breeze had disappeared from the roof but could be seen in his drawings of the 14th century palace of Katkhoda). We would climb to the roof at sunset in time to see the magnificent minarets of Sultan Hassan and Rifaii mosques silhouetted against a red blaze while the Mohamed Ali mosque overlooked us from the Citadel. This was followed by a descent to an enclosed terrace flanked by a huge candelabra cactus in a pot on one side and a Turkish basin with a florid acanthus on a miraya or carved marble panel on the other, where Hassan Bey supervised the evening meal for his cats. In me he found a willing student, I listened, took notes, helped him with his manuscripts and looked at everything with new eyes. Through him, I met his true friends "close in nature to the way", like the sufi Hamid Said, the artist and philosopher who lives in a palm grove in Marg in a beautiful adobe house designed Hassan bey in 1942. Despite a full time job first at AUC, then at Fulbright, finally at the Center for Egyptian Civilization Studies, I managed to go in the afternoons as often as possible over a thirty year period to help out with the numerous manuscripts and memos he worked on for conferences, workshops and articles on human issues for the newspapers. In this he had the support of many good friends. When Dr. Magdi Wahba was appointed Undersec-

retary in the Ministry of Culture he proposed publishing Hassan Bey's manuscript on Gourna in book form. (It has since been translated into at least 5 languages, though. It finally came out under the title I helped choose, perhaps under the influence of my school days, as Gourna, A Tale of Two Villages. This was later republished in America as Architecture for the Poor in keeping with America's more technocratic orientation. However, Hassan Fathy always gave the poor peasant as much consideration and respect as he did the scholars (Schwaller de Lubicz, for example, who wrote the Temple in Man), or nobility (Princess Faiza and her sister had dinner in his adobe house in Luxor, new Gourna, and for them he organized a folk play at the theatre he had built for the peasants). "When I build a house for a peasant, I build it for myself, the peasant. When I build a house for a prince, I build it for myself, the prince". "An artist should never reduce the quality of his design... he has to meet with the best in himself". Indeed the house of every poor peasant which he designed according to their specifications was as beautiful as his own in Gourna.

Hassan Fathy's concern with the plight of the peasant stems from his first encounter with a village farm near Talkha as a young man. "It was a terrible experience. I had no idea until then of the horrible squallor and ugliness... I saw a collection of mud, low, dark, and dirty huts, with no windows, no latrines, no clear water, were the cattle live practically in the same room with the people... everything in this wretched farm was subordinated to economics-the crops came right up to the threshold of the huts-there was no shade, for the shade of trees would inhibit the growth of cotton; nothing had been done out of consideration for the human beings who spent their lives there".

His dream to restore dignity to the peasant, not only to provide him with decent housing and basic needs, but to attend to his psychological, cultural and spiritual well-being as a human being was made possible when the Director of the Antiquities Department, Abbé Drioton, asked him to design a village in the West Bank of Luxor to which the Gournis, living among the tombs of the Nobles, could be moved. Hassan Fathy made sure that the new Gourna village would include a theatre for the entertainment of the villagers (and to enact educational programs on the dangers of "bilharzia", the demon, 40 years before out TV media started a campaign on the same subject); it had schools and a covered market so that villagers would not have to sit for long hours in the sun, a craft center to teach children traditional skills, a hammam or public bath so that people would not wash in the infected canals and even an artificial lake so that children could safely swim in summer when temperatures shot up to 40°. During the whole period of construction he lived with them as one of them including the cholera epidemic period of 1947 when he personally disinfected the wells and transferred water pumps to Old Gourna so that

not a single case of cholera appeared in Old or New Gourna. He grieved when Government officials scoffed at his idea of the artificial lake on the ground that it utilized cultivated land on which cash crops could be produced ... still the poor peasant was considered an economic animal.

Hassan Fathy was inspired by a saying of the wise philosopher, Lao Tze, and quoted it several times in his writings:

"The greatest goodness, water-like
Does good to everything and goes
Unmurmuring to places men despise;
But so is close in nature to the way..."

His choice for the appropriate building material was unfired, mud-brick: toub laban or adobe. If the houses of the peasants were hovels that was not the fault of the mud, from which was created that noble creature, man, and which was used as the preferred building material for the houses of the Egyptian princes since the earliest dynasties. Hassan Fathy selected for the first illustration for his book on Gourna, Queen Hatshepsut making a brick--a relevé from a bar-relief. While temples in Ancient Egypt praising the divinity were made of stone to last for millenia, their houses were built of mud-brick for their comfort -- good insulators against cold in winter, and exuding coolness in the heat of summer. All his life, Hassan Fathy was to champion the properties of mudbrick. Once when a group of our party was touring Upper Egypt by Nile cruiser, including Queen Dina and Princess Fawzia and her husband, he took us on a special tour of the Ramesseum, a vaulted granary dating from dynasty XIX, 1300 B.C. He stooped to pick up a fallen brick which bore the royal cartouche. "Look", he exclaimed, "and they say that mud-brick is not durable".

Having discovered the qualities of mud brick, his early attempts to roof the houses of his client, the peasant, with wooden beams proved too costly for his client, the fellah. He found the solution when he first visited Nubia in 1941.

"It was like a new world for me, a whole village of spacious, lovely, clean, and harmonizing houses each more beautiful than the next... I realised that I was looking at the living survivor of traditional Egyptian architecture, at a way of building that was a natural growth in the landscape, as much a part of it as the dom-palm before the Fall... before money, industry, greed and snobbery had severed architecture from its true roots in nature".

Here was the solution to housing the rural poor of Egypt - where in 1946 at least 20% of the peasant houses were roofless due to the high cost of wood. With renewed enthusiasm Hassan Fathy made relevés of Nubian houses and studied all the ancient monuments that were the original prototypes for the Nubian houses -- the Ramesseum of Luxor, with its magnificent vault span, the Monastery of St Simeon and the Fatimid tombs in Aswan, (which inspired

the design of the mausoleum of the Aga Khan), the Coptic chapels of Bagawat in Kharga oasis, the arch in the Ptolemaic staircase in Tuna el Gabel, and the ancient Egyptian dome of Seneb in the cemetery of Giza (invented long before the Byzantine dome). For Hassan Fathy tradition had, "a creative role to play, for it is only by tradition, by respecting building on the work of earlier generations, that each new generation may make some positive progress..."

Hassan Fathy went beyond tradition to create a distinctive style, both aesthetically pleasing and functionally practical.

Hassan Fathy's approach was to build with the people. He mourned the passing of the traditional cooperative systems of building due to socio-economic changes and the imposition of central planning emanating from government agencies in Cairo, and sought to reintroduce it to revitalize village self-sufficiency. "One man cannot build a house", he would say, "but 10 men can build 10 houses". Then he would recount his visit to Ganah in Kharga Oasis where the moving sand-dunes had covered three quarters of the village and the villagers had been forced to rebuild their houses further away. Only one man refused to leave his house full of memories which already partially submerged under the sand. When Hassan Fathy asked what would happen to him when the sands covered his house... they said "don't worry, we have built a house for him with us". To counteract the introduction of the money economy which had replaced the cooperative system in the villages, he always developed training programs in the building crafts for the villagers. "In the Gourna pilot project, one master-mason could train 36 trainees to master all the building operations needed in the construction of this village in three months".

Hassan Fathy felt that new technologies often led to ignoring man's social, cultural and physical environment and lead to the imposition of an architectural form alien to man's biophysical nature.

This was Hassan Fathy's belief -- human effort should lead to man's spiritualization. His friends gathered around the tea table would be fascinated by his story about the three masons, "compagnons" members of a guild of the Middle Ages, who were cutting stone and were asked by a passerby what they were doing. The first man answered "I am earning my living", the second said: "I am dressing stone", while the third man exclaimed "I am building a cathedral". How can man feel that he is spiritualizing himself at work when he is reduced to unskilled labor of straightening some rods, nailing boards and mixing concrete. We are not building cathedrals nowadays but we can still spiritualize ourselves in the way we live and the way we work. When you build with stone this happens... you remove the superfluous and keep the essential so you are spiritualizing yourself in the process. This does not mean that he was an exclusivist or that concrete should not be used. It was certainly not

suitable for a rural house or a desert dwelling. "A question we must ask ourselves", Hassan Fathy, would say, "is how we can achieve modernity without neglecting the architectural heritage of our people. We should ask ourselves what is interchangeable and not interchangeable in a culture.

When Hassan Fathy built his house in Sidi Kreir to serve as a model for a tourist unit for the north-western coast, he chose to situate it at the foot of the sand-dunes, rather that directly on the sea. Here he marvelled at the respect of the bedouin for nature (ecology), who planted the eternal fig, olive and palm tree and whose attractive dwellings blended with the landscape. This was in 1971 before the heyday of "tourist village mania" where developers dislodged bedouins, flattened the sand dunes, planted myriads of electricity poles instead of palm, bulldozed bedouin houses and replaced them with five story buildings.. while the white "agami" sands disappeared forever under black asphalt roads granite steps leading to super-markets and Cairene-style cultivated gardens. Most of Sidi Kreir was to disappear behind a fives square kilometer red brick wall five meters high. The land was "expropriated" from 35,000 bedouin families living from their fig cultivation. As in Nubia, another example of "development" and we must ask for whom? Hassan Fathy was too disheartened to set foot again on the northern coast one wonders how long will tourists continue to be attracted to this urban sprawl when the high walls block all view of the sea from here to Al Alamein.

More than anything, Hassan Fathy earned my respect and that of others for his integrity, and the way he fought for principles and good causes. It often meant confrontation with his colleagues and with august institutions. When an architect built the New Winter Palace, a soaring building dwarfing the Temple of Luxor, Hassan Fathy sent a cable of congratulations saying they should now remove the temple which is not to scale!

When architects built low-income housing with out balconies, he wrote an article in the newspaper to remind them that the poor buy their onions and garlic in season and store them on the balconies where they also keep chickens in coops, the only cheap source of meat.

On the Committee for the Preservation of Fatimid Cairo, he and his colleagues insisted that the plans for new buildings should be blend with the architecture of historic monuments but this was not the case, as pressure groups urged the Governor to suspend the committee.

Foremost he fought the contracting system which with its "octapusal" tentacles of "commissions" on expensive industrial materials drives up the prices of low-income housing.

It is hard to say which was the most emotionally trying for Hassan Fathy, grappling with the bureaucracy that hindered his projects which he called "Iblis" or his concern for what was happening to the Nubians, as many of us were.

To Hassan Fathy, Nubia was like a "bride" who had been sacrificed three times to the Nile in its recent history. The first time when the Aswan Dam was built in 1902, and the second time in 1934 when there was a second elevation of the Dam and the third time when the High Dam was constructed. Within one year the Nubians rebuilt houses each one more beautiful than the other with no architects, no contractors, no lorries at all, only what they had under their feet, mud and stone, and with cooperative self-help. When the High Dam was constructed in 1965 the Nubian area was flooded for the third time and this time non-Nubian architects designed the new settlements as rows of matchboxes so that Nubians had to count the doorways to find out which one was theirs, and with ceilings so low they even suffered heat strokes inside the houses... "this kind of architecture or cultural revolution is dehumanizing because it is not sensitive to nature" he wrote.

He was not only concerned about this cultural genocide of what was once one of Egypt's most beautiful areas, but also what had happened to this gentle people. When his suffragui, Osman, told him that after the mass transfer of 50,000 people to the Kom-Ombo reclaimed desert area, they were going to the cemetery twice a day to bury the children and old men who had died from dehydration, Hassan Fathy then tried to attract the attention of the muffled media and wrote to the Minister of Health to demand statistics on the mortality rate.

I think that this aspect of Hassan Fathy's personality is terribly important for young people to appreciate. It is very much what love for one's country is about: devotion, truth and integnity.

Hassan Fathy had friends from every nation, age and background who gave him the moral and intellectual support he needed to survive in the face of the obstacles which likes a tidal wave in a Greek tragedy often impeded or demolished his work. He leaves with all of us a feeling of gratitude to have encountered such a great human being, intellectually inspiring, whose faith in God was uplifting.

This feeling of good will, which serves as a linkage between all who knew him, extends deep into the countryside and deserts. It is a pleasure to see grown men who recall with pride how at a toddlers age they went with their fathers on a mission to help built "cathedrals", when they were treated not as paid labourers but as human beings worthy of respect, dignity and friendship.

Hassan Fathy left a legacy: his search for truth in all things. If I have not spoken about his architectural work which has received international acclaim - and over 12 prestigious awards such as the first Gold Medal awarded by the International Union of Architects, the Adlai Stevenson Institute fellowship which published Architecture for the Poor, and the Chairman's Award the Aga Khan Award for Architecture and the International Union of Bricklayers and Allied crafts_men's_The Louis Sullivan

Award it is because his buildings are there for everyone to see in situ and in beautifully illustrated books. If I have not dwelt more on his personality it is because he himself identified wholly with his ideals. These I tried to present to the best of my ability. You are welcome to visit me at the Center for Egyptian Civilization Studies, situated in Fatimid Cairo, to read and learn more about Hassan Fathy.

---

* The address is: 36 Shareh Al Muiz li Din Allah Al Ghouria - Phone. H. 3408807, 924095.

Selected Bibliography in English

* Hassan Fathy, Gouna: A Tale of Two Villages, Ministry of Culture, Cairo, 1968.
* Hassan Fathy, Architecture for the Poor: An Experiment in Rural Egypt. The University of Chicago Press 1973.
* Hassan Fathy, Construire avec le Peuple: Histoire d'un Village d'Egypte, Gourna 2 vol. Ed. Sindbad, Paris 1977-78.
* Hassan Fathy, The Qa'a of the Cairene Arab House. Its Development and some new usages for its Design concepts, Colloque International sur L'histoire du Caire 1969 Ministry of Culture 1972.
* Hassan Fathy, The Arab House in the Urban Setting: Past, Present and Future. Longman, London 1972.
* Hassan Fathy, National Energy and Vernacular Architecture: Principles and Examples with Reference to Hot Arid Climates. The UN University and the University of Chicago Press, 1985.
* Hassan Fathy, Comprehensive Design for Rural Living. American Association for the Advancement of Science.
* Personal Notes N. Hassan.
* Reference Books:
Richards J.M., Serageldine J. Rastorfer Dane, Hassan Fathy. Mimar Books, Concept media 1985.
James Steele, Hassan Fathy. Academy Editions, St. Martin Press 1988.

THE INTERNATIONAL SYMPOSIUM OF
HASSAN FATHI
FOR ARCHITECTURE OF THE POOR

From 20th to 22nd April 1993,
Cairo, Egypt

TITLE

THE INTELLECT OF HASSAN FATHI AND ITS INFLUENCE ON MODERN ARCHITECTURE

BY

Eng. Mohamed Khair Eddine Al-Rifa'i
Consultant Architect

THE INTELLECT OF HASSAN FATHI

AND ITS INFLUENCE ON MODERN ARCHITECTURE

A Paper Presented to the

INTERNATIONAL SCIENTIFIC SYMPOSIUM ON

HASSAN FATHI'S PHILOSOPHY

Cairo, April 1993

Prepared by :

MOHAMED KHAIR EDDINE AL-RIFA'I

Consultant Architect

The Intellect of Hassan Fathi
And Its Influence on Modern Architecture

Before we start studying the thinking of the late great architect Hassan Fathi and its influence on modern architecture, we have to study first the varied sides of his unique personality which produced this thinking and to get acquainted with its scientific, technical and human constituents as well as the other unknown sides, because that thinking is in fact the outcome of all those constituents.

We should also study the works which he executed, whether in the field of rural housing or the other different projects, even to study those plans which were not destined to come to light.

Mr. Hassan Fathi had the gift of a strong, attractive and confident personality that drove the others to respect him and which appeared in his deep fa vast culture and ability to express himself and convince people using diffe means of saying, writing or drawing, by words, colours or tunes, even by hi sharp criticism, joking and sarcasm.

He liked music and liked to compare sometimes between the harmony of tunes and melodies on the one side and homogeneity of the lines composing archit ture on the other. He also loved nature and demanded that any architectural work should be in concord with it and not an intruder.

His personality had its local and international dimensions which he acquire due to his constant calling to an original and modern architecture that may express the identity of the nation and the depth of its roots in civilizati His personality had also its own human dimensions that best appeared when h held on his shoulders the issue of millions of people in this world; that i the problem of securing houses for the poors.

He had also his own philosophy in everything, even in his concept on modernism in architecture and civilization. Hassan Fathi said once in a paper he delivered in 1970 at Essex University, U.K.:

" It can be said that in order to have an architectural work that is of relation to its time, that is contemporary, it should constitue a part

.../...

of the urban activity of the day-to-day social life... and it must be conformable with the present level of knowledge which man has reached in human and physical sciences that can not be separated when an architectural piece is being planned and designed. It is obvious today, taki the scientific analysis of data furnished by the physical and human sci ces, that many principles of designing the traditional Arabic house are still intact and valid today, the same as were yesterday. Furthermore, a part of the so-called new architecture could be considered as backward if it is judged by the same scientific criteria and standards."

Thus, by understanding the numerous sides of Hassan Fathi's personality, th forerunner of the Arab architects, and by studying what was issued of his thoughts, sayings and works, we can deduce how deep his influence was on mo architecture, this influence which can be summarized as follows:

1. <u>His calling for the modern architecture to be original</u>

That is to say, an architecture originating from the historical depths o the nation and expressing its identity and its belonging to civilization In this respect, he says:

" As every people have their own language which they speak and their national dress which they wear, the same is as true regarding every country's architectural art which is usually characterized by its own lines and forms that express its roots in civilization mixed wi the imagination of its people and the requirements of its environme

He used to see that in order to achieve this goal we have to re-capture the architectural art from the point we left and try to reconnect the pieces that were cut from its chain of natural development, all by analyzing the factors of change and deducing the constant elements, then by working out convenient solutions for the new factors that were not exist in the past on the light of sciences and technologies achieved by man, s that to bring the Arabic architecture to the point where it should be to not where it is in fact, that is to become expressive of the real identi of this nation, the identity which is derived from its values and cultur roots.

2. <u>His calling for the modern architecture to be humane</u>

That is to say, an architecture whose goal should be to satisfy the material and spiritual needs and requirements of man. In this respect, he say

" The test that should be adopted for the evaluation of any plan is to answer this question: Is it for man or something else ?"

He had the belief that no matter how much man's knowledge and technology are developed, still the human standard should be the foundation on which every architectural or civil work is to be based and that there should always be a delicate balance between man and the architectural framework in which he lives, otherwise, it will be reflected badly on his feelings and consequently on his behaviour and psyche.

He has materialized this belief by the human proportions that were hidden behind many of his works, a matter which can be recognized in his architectural formations, in the movement exchanged between masses and spaces and in the harmony and diversity of relations between light, shade and colour inside and outside the building and in its periphery.

He also believed that an architect should understand the needs of those men for whom he is building, cooperate with them and try to develop the spirit of cooperation among them. That is why he called for creating the bare-foot architect, on the example of the bare-foot, whose aim is to comprehend and sense the feelings of others.

Hassan Fathi realized also that the integration of the relationship between architecture, nature and man adds aesthetical and spiritual dimensions to life and make it richer and wealthier.

3. <u>His calling for the modern architecture to be environmental</u>

That is to say, an architecture which is in conformity with the surround environment, with its natural, urban and human factors, especially with t one basic factor, that is the climate. He believed that an architect sho take into consideration all the said factors when formulating his archit tural elements and should organise them in space in such a way so as to yield the greatest possible capacity of the structure in securing rest fo man and ensuring the satisfaction of his material and spiritual needs wit out rushing to use those artificial solutions that depend on modern technology.

In one of his papers titled " The Arabic House in Urban Milieu ", publis

.../...

in 1982 in Al-Fikr Al-Araby magazine, he says:

" The architect who convert his building to a solar oven then uses a big airconditioner to make it suitable for living is only simplifying the problem too much , and his design can only be considered as under the level of architectural art."

He had the opinion that it was possible , through architectural formati of the building, to mitigate to a great extent the influence of burning solar rays, especially by using domes and vaults and by controlling the movement of air and its flowing from the shady and wet parts by way of reverting to vents, which he excelled in using, and to the internal cou yards which act as natural regulators of heat in addition to their task of providing privacy for the dwellers.

He was constantly concerned that his buildings should keep conformable the surrounding natural land, which he saw in it the natural source for the construction materials he used in his works.

He used argil in building the village of Al-Garna Al-Gadida in Al-Oksor clay in building the village of New Paris in the Outside Oases and masor in many building in Cairo and other cities. He used timber as well, wit great skill, in the Rabat of Gabianca in the Spanish Mallorca Island e Nothing strange in all these. Is not he the man who said " look under y feet and build ".

4. <u>His calling for the modern architecture to adopt aesthetic values based on faith</u>

That faith which refines the mind and soul and call for simplicity, mod ty and keeping away from complexity, ornamentations and engravings. Tha same simplicity which was evident in all his works through the equilibr and stability that he kept in his architectural structure as well as in the easy and gradual movements amongst his different masses.

He also called for the adoption of aesthetic values which can express t spirit of sublime, to the level of sufism in few cases. Look at his com- ments on the structure of Sultan Hassan's Mosque in Cairo:

.../...

" Modisty is a precious human characteristic but sublimity of man is a noble spiritual value that invites him always to look beyond his direct temporal needs. This mosque has achieved the meeting betwee earth and heaven more than, and clearer than, any other building h done. This mosque is really a materialized fine piece of music ".

He also had seen that to utilize the forms and elements of the traditio architecture, such as the oriel (moucharabys), vents and arcs etc., i in fact a matter of reviving the architectural and artistic values whic had long settled in the consciousness of society. He says in this conte

" An architect has to restore the confidence of his society in its obsolete culture by way of using the local form in his buildings so that to attract the sight of the craftsmen and let them look at their produced pieces in pride and self-esteem. He has then to convince his community of the cultural values of those craftsmen'e works as regards modern construction."

He also says:

" Just as the old communities created their own calligraphies that s from their sub-conscious, they also created their own distinct arc tectural styles and forms which are so dear to their native popul because by them they are recognized and they stem from their consc ness. In the same manner, these communities had created their own styles of dressing, popular arts and languages."

5. <u>His calling for the modern architecture to depend on serious scientific research</u>

He concentrated his attention on the importance of making researches on the local construction materials and the traditional ways of constructi all as part of his endeavour to improve their performance and utility.

He also cared a lot about making meteorological, social and economical researches. He himself had participated in the membership of many speci lized scientific research committies, particularly those relating to ru housing.

He also called for using the comformable techniques in modern buildings

.../...

which rely on the use of local construction materials and their develo-ping together with the utilization of self capacities of the communitie in the field of construction and building. He demanded the rehabilitati of handicrafts because of their cultural and human dimensions. By this we will ensure the conformity of the building operation with the materi and technical self-capacities of society. For this purpose, the late Ha Fathi tried to establish the High Institute for the Comformable Technol about which he said:

> " Man has always interacted with the environment he lives in by us all the capabilities available to him in order to achieve the ps chological balance between him and nature...But when the industr revolution came into existence, the handicrafts disappeared , an thus architecture had losed its human face... In the same way, t connection between man and nature, which is one of the creations God, diminished steadily. That is why it came to mind to establis research centres which should commit themselves to the spiritual aspects with the aim of re-adopting the old formula of balanced relationship between man and his environment."

On the other hand, he proposed in 1962 to establish an institute for ru studies and an another one for the studies of popular arts.

6. <u>His calling for a modern architecture that cares for the poors too</u>

As he was of the opinion that those men capable of building their house are few and they can build whatever they want. But the problem of human in its coming time lies in the buildings of the poors.. in housing the incapables. He says, in this respect:

> " What is so saddening and devouring the heart and the spirit from inside is that nobody cares anymore for building for the simple citizen, who is always poor. The ultimate aim should be then in reaching a building that fulfills four basic features; that is, to be cheap, simple, comfortable and beautiful. "

He perceived that this aim is only attainable by:

- Utilization of those construction materials that are available locally and by keeping as far as possible from the imported materials.

.../...

- Relying on simple and non-costy techniques conguent to the material a scientific capacities of man.
- Adopting the cooperative course in building. In connection with this, says in his book titled " Building With The People ", which was issue in French in 1970:

" One sole man can not build his own house, but ten men can build t houses if they cooperate... With time, they can build their own village. "

And in one of his last talks with his visitors, just before his death he said:

" The hope that kept recurring to me, that I live for and drives me to continue talking to people conveying it to them in the expecta tion that someone might be successful in achieving my dream as an Egyptian architect who lived with these simple folks and listened carefully and lengthily to the tunes of walls and roofs of the houses of these humble people of Egypt, that hope is to achieve The House of The Simple Souls."

Perhaps by reading his book " The Building of The Poors, which was publ shed in English in 1969, one can find what may open new horizons for th present generation of architects, horizens that may lead them to care f the popular building and to try to secure the proper shelter for milli of people everywhere in the world.

Those were the ideas and principles which were cherished and called for by the late great architect Hassan Fathi, which he expressed openly and execu in many of his works as well as in his writing and books that were issued different languages at the time when the majority of architects around him were fascinated and dazzled by the scientific and technological progress o the West.. to the degree that they turned their backs to their culture and their eternal architectural and civil heritage.

He was a pioneer in many fields. They are best personified in the princip intellectual and architectural trends which he either announced and called during his life or appeared decades after his death. They can be summarize

.../...

- The responsibility of the architect to seek conformity between building and environment.
- The necessity of expressing clearly the function of the building, and the construction material that are going to be used and the structural set-up from the interior and exterior views.
- The necessity of preserving the environment and good handling of it.
- The call to rehabilitate the handicrafts and the traditional ways of construction.
- The care for the popular building ... and housing of the poors.

In appreciation to all that was mentioned above, Hassan Fathi was rewarded many prizes from various Arab and international organizations that are concerned with questions of architecture and civilization. Several universities in the world have chosen to include those principles and trends in their curricula, in addition to the many associations and research centres which have been erected here and there on the light of those thoughts and principles, some of which even hold openly the name of the late great architect.

Perhaps we are today in our utmost need to study his works, thoughts and principles in depth, seeking to benefit from them and endeavouring to develo them so as to reach an original and modern architecture which can provide an economical and convenient building for the different sectors of people, espe cially the poorer ones... and which can express clearly the identity and the civilized personality of this nation.

Aleppo, February 1993

Mohamed Khair Eddine Al-Rifa'i
Consultant Architect

THE INTERNATIONAL SYMPOSIUM
OF HASSAN FATHI FOR
ARCHITECTURE OF THE POOR

From 20th to 22nd April 1993,
Cairo , Egypt

TITLE

SHELTER, SELF HELP MOBILIZATION: WITH SPECIAL REFERENCE TO SOME ARAB CITIES' EXPERIENCES

BY
DR. M. A. AL-HAMMAD
DIRECTOR GENERAL

ADDRESS

ARAB URBAN DEVELOPMENT INSTITUTE
RIYADH - 11452
SAUDI ARABIA

CONTENTS

SHELTER, SELF-HELP MOBILIZATION : WITH SPECIAL REFERENCE TO SOME ARAB CITIES' EXPERIENCES

BY

DR. M.A. AL-HAMMAD

Introduction:

Since the seventies, The World Bank launched funding projects to provide shelter for urban populations around the world. The Bank's ne approach rests on the principle of self-help. Communities are expected to mobilize their own resources, financial as well as manpower. Beneficiaries will build their own shelters once the governments offer sites that are provided with services and utilities. Each household will mobilize its resources to construct its shelter by stages as financial resources become available to it.

Initially the self-help approach proved successful in many countries which received funding from the World Bank. The previous experience whereby the governments were mainly responsible for providing housing, specially for the poor, proved to be an utter failure. Governments alone cannot meet the demand for housing. This is specially expressed in the growing gap between supply and demand of housing stocks. More saliently, the failure is expressed in the squatte growth in the Arab cities. In the last 15 years, 60% to 80% of the housing units built were un-official. For all these reasons, shelter self-help mobilization gained an added significance as an appropriate program to resolve low-income housing shortage in the Third World countries. In the mid-seventies, there were over 70 self-help housing projects being carried out in 27 developing countries, including some Arab countries. In the eighties the shelter self-help surge continued.

The shelter self-help approach assisted in decreasing construction costs of low-income housing. Members of the household contributed their labour in the construction process. Outside labour was paid a lower wage rate, or otherwise contributed free labour in cooperative spirit. Added to this saving, land was given at nominal costs.

Shelter self-help mobilization, as an approach to provide low-income housing for the poor, proved its worth in some Arab cities. Housing units built by the government sectors were usually beyond the financial means of the poor. Planning-wise, they were alien to the traditions and customs of native household's lives. In short, the standardized housing was in discord with socio-economic and living conditions of most Arab urban poor groups.

Self-Help Programmes Implemented in the Arab Cities:

The Arab countries witnessed a surge of activities in the housing sector in the last two decades with the intent to counter the housing deficit. These activities were translated into projects which can be categorized in three main programmes:

A. SITE AND SERVICES PROGRAMME.
B. NUCLEUS SHELTERS PROGRAMME.
C. UP-GRADING SQUATTER SETTLEMENT AND PLANS.

A. Site and Service Program:

The site and service program has been widely implemented in the developing countries, including the Arab cities. Compared with government and private sector housing, the site and service program proved successful in the delivery of affordable housing to the poor, an middle-income groups. The people benefitting from the program contribute their savings and manpower, while the governments develo the sides and install utilities and services. This partnership requires that the people and governments play certain roles and assume define responsible towards the program.

(1) Government's Role:

- Plan the land plots and distribute them to beneficiaries either free of charge, or at nominal prices to be paid according to medium or long-term installments.

- Develop the infrastructure such as roads, and services like water, power and sewerage.

- Assist in securing appropriate loans through specialized credit institutions

- Support local industries in supplying appropriate building materials to the local markets.

- Develop models of shelter architectural design.

(2) Beneficiaries' Roles:

- Participation in the construction activities.

- Repaying of land costs according to schedule.

- Mobilization of own savings to meet the cost of construction activities and materials.

- Adherence to the specifications / conditions set for regulating the construction process, even if it would entail delay in the completion of program.

The site and service program forged a fruitful partnership between the government and the people. It was inherently capable of responding to the increasing needs for shelter in the developing countries, including the Arab countries. The initial success of the program encouraged U.N. agencies to push forward the program with the intent of spreading it out throughout the world. The concept was also improved specially in relation to decreasing the cost involved.

Statistics available from the Arab cities bear witness to the success of site and service program. The major Saudi cities, which previously experienced housing shortage, have achieved remarkable results with the site and service program. Sites were developed and plots were given free to beneficiaries, with the Real Estate Fund provided easy-term locans for private housing. By 1986, the total supply of housing the Saudi cities exceeded demand by 170 housing units. In Sudan The Housing Authority accomplished great success with the site and service program. Statistics show that 95% of the 50,000 housing units produced between 1961-1988 was accounted for by the site and service program.

B. Nucleus Shelter Programme:

The concept of nucleus shelter emerged as a result of some problems involved in implementing site and service programs. Often the beneficiaries were not able to complete building their shelters because of lacking certain knowledge of building aspects, such as the laying of plumbing facilities. Some beneficiaries did not have encough financial resource to complete their shelter. Other encountered various problems. The nucleus shelter concept calls for building one single room and the introduction of utility services. Beneficiaries can expand this meagre shelter over time when they have saved more resources. The concept gained populalrity among low-income in the Third World countries, specially in some Arab countries. It has several advantages.

1. The beneficiaries themselves build their own shelter using their labour or and their financial resources.

2. Such type of shelter can be expanded and improved with rising standard of livings and income earned by the beneficiaries.

3. Government support resources can be used efficiently to enable production of large number of housing units, thereby increasing in large measure housing stock afforded by low-income groups.

4. Government can contribute to the program by granting in kind support such as building materials to the low-income beneficiaries.

5. The fact that nucleus shelters are built on sites where services and infrastructure are already in existence give an impetus for further development of such areas.

Among the Arab countries, Morocco, Sudan, Iraq, and Egypt were leaders in adopting the nucleus shelter program in their cities. In Casablanca, the 5-year Development Plan, 1972-77, implemented 142,000 housing units in the context of nucleus shelter program. Lo income beneficiaries had to pay the cost of plots, but received 25-ye term loans to build their shelters. In Sudan, however, the nucleus shelter program encountered some difficulties. Two programs were adopted. The first covered, 1972-76, and the second the Mid-eighties Because of resource scarcity, the Housing Authority was able to accomplish few hundred units in both programes.

C. Upgrading Squatter Settlements and Slums:

The Arab cities took different approaches in resolving squatter settlement and slum areas. Three approaches are identified. The firs approach consideres the squatter settlement a natural result of the free market process. And in a way the free market inter-play of supp and demand can eventually lead to the improvement of such settlements or their displacement by better residential areas. The second approach calls for the forceful up-rooting of squatter settlements or their containment by the mandate of law. Squatters occupy the land un-lawfully, and therefore the settlement cannot be eligible for public and municipal services. The third approach considers the squatter settlement as a fact of urban physical form, ar must therefore be improved and served.

INDEX

9- **PROF. DR. ENG. GERNOT MINKE**

DESIGN AND CONSTRUCTION OF ENERGY AND COST SAVING VAULT AND DOME STRUCTURES

10- **MR. JOHN NORTON**

ADAPTING A TIME HONOURED ROOFING TECHNIQUE TO MEET THE CONTEMPORARY NEEDS AND NEW LOCAL CONDITIONS: THE CASE OF THE "WOODLESS " ROOFING PROGRAMME IN NIGER AND MALI

11- **DR. RAIF MUHANNA, DR. RAFI MUHANNA & DR. ZIAD MUHANNA**

NEW SYSTEM FOR BUILDING BY LOCAL STONE "NATURAL STONE SHELLS SYSTEM"

12- **ARCH. SHERIF AL-GOHARY**

APPROACH DESIGN AND CONSTRUCTION USING APPROPRIATE BUILDING TECHNOLOGY THROUGH A GOVERNMENTAL ORGANIZATION.

13- **DR. OMAR EL-HAKIM**

NEW APPROPRIATE TECHNOLOGY AS A MEANS TO CAPTING SOURCES OF NATURAL ENERGY IN ARCHITECTURE.

14- **ARCH. OMAR KHATTAB**

REBIRTH OF SIWAN VILLAGE

15- **DR. ABDULRAHMAN MAHKAMOV**

HOUSING AND ITS PROBLEMS

THE INTERNATIONAL SYMPOSIUM OF HASSAN FATHI FOR ARCHITECTURE OF THE POOR

From 20th to 22nd April 1993,
Cairo, Egypt

TITLE

OPENING ADDRESS

BY

Prof. Dr. Abdelbaki Ibrahim
Chairman of SRAPH

Hassan Fathy has always been known as the master builder of ea architecture, besides being an artist and a philosopher. The work of Hass Fathy was always distinguished by his clever use of the traditional r structures, the dome and the vault. Moreover the architecture of Hassan Fat holds his human and moral obligation towards the poor. His ideals could satisfied by all local materials provided in the place, as well as local buildi traditions. The main point of his thesis is how to organize the poor population participate in the building process especially in new development areas whe there is no population.

The personality of Hassan Fathy left its imprint on all architectural circl and publications all over the world. He has been widely recognized a honoured that he became a worldwide figure. Nevertheless, most of those w celebrated Hassan Fathy did not work for the continuity of his mission a. ideals. It is immature to confine Hassan Fathy to mud architecture, especially places like Egypt where mud became a precious material after the constructi of the High Dam. It is also immature to consider Hassan Fathy as a poet architecture or a philosopher when he could not cope with the berocracy ar routine of public authorities or when he lacks the flexibility of dealing with then Indeed the ideals of Hassan Fathy could not be implemented within the rig routine of public authrorities. This does not mean that they are not applicab except in the way he built his Gorna village in upper Egypt, which was his fi practical experience for his theory in housing the poor. However, the people I wanted to house were not poor and they rejected the idea of living in Ne Gorna.

The idea of Hassan Fathy should remain as the base for more resear and studies in order to build upon them and not to remain confined to th architecture vocabulary of form. Hassan Fathy tried to escape from the limitations and called for the establishment of the Institute of Appropria Building Technology as an advanced step towards the search of new buildi systems and building material appropriate to the place and the community. Th experiment of New Gorna was based on the training of youngsters from the loc vicinity and not the participation of the target community. The organization community participation in developing new sites is another scope f management and social research. The establishement of building centers assist the new inhabitants in constructing their houses is a way to avc employing contractors. These items and others could be included in what cou be called "Appropriate Planning System" in order to support the proposal Hassan Fathy to establish The Institute of Appropriate Building Technolog Another important issue still remains which envolves the provision of jc opportunities in the new settlements, and also how to relief the congested area from their excess of population. The transfer of the poor from their old inform communities to the new settlements is another issue which envolves political a well as economic and social problems. Then remains the question of who

going to take care of housing the poor?, the non-governmental organizations the social socities or the public authorities?. The management mechanism the operation should be well designed. The problem is more administrative th being technical or architectural.

There are many experiments which have been carried out all over t world trying to solve the problem of housing the poor, but the magnitude these activities is not relevant to the magnitude of the problem when more th 50% of the population in the developing countries come under the marginal li of poverty. There should be clear diffrentiation between housing the poor a housing the low-income groups. The problem of housing the poor is not solv yet.

It is good to follow the ideas Hassan Fathy accomplished in any of h single projects here or there. But the problem remains how to apply these ide in housing as a policy on a larger scale-regional or national. The buisness cl supports the business men but the poor have no club to take care of them. Th is the dilemma of the poor countries. The questions now is: Who is going to tal care of housing the poor?... The public authorities ... from their previou experience, proved to be unable to deal with the problems of housing the poo This is because of their application of the usual contracting system beside th lack of efficient management and organization.

Non-governmental organizations (NGOs) could be the answer. But s remains the question of how these NGOs will be established, finance organized, and managed. The problem now is not the conviction of the ideas Hassan Fathy; It is rather how to implement them. It seems that most of th attempts to implement the ideas of Hassan Fathy were very limited, and in mo personal initiations than institutional policy. The structure of the NGO shou include the following components:

1- Sources of finance.
2- Definitions of target groups.
3- Selections of land location.
4- Social mobilization and transformation to new sites.
5- Community participation.
6- Training and required manuals.
7- Provision of building materials, structure components, and labour (Building Centers).
8- Management of development operation.
9- Social and Economic development.
10- Urban planning and building design.
11- Implementation programming in a continuous process.
12- Follow-up, evaluation and adjustment of programmes.
13- Public relation and marketing.

The ideas and philosophies of Hassan Fathy have been overlooked architecture education in his homeland and other Arab countries. With t approval of Hassan Fathy, I introduced him to the Arab speaking countri through a book that covers his life, work, ideas and experimentations, ir critical form. Hassan Fathy called for the reform of architectural education Egypt in order to cover local indigenous architecture, architectural heritage, a appropriate building technology. Yet he did not write any document on th subject. There was a moral gap between Hassan Fathy and the architectu departments in the Egyptian universities except for the Faculty of Fine Arts Cairo, where he was teaching. Although he was graduated from Ca University, he did not have any acadamic relationship with the professors architecture of his age in the same university who have had different orientatio in their work and theories based on western education. Hassan Fathy could r extend his role in the education media as he was described as the mud archite who pays no respect to modern architecture. This is why Hassan Fathy was w known outside his homeland more than inside, and was more honoured foreign institutions and international organizations. The problem to b examined here is how to include Hassan Fathy in the architecture curriculum local universities, if possible, to apply his ideas by NGOs for housing the po together with up-grading their social and economic standards. recommendation for establishing Hassan Fathy's school of Architecture in Egy or elsewhere could be announced as a result of this symposium. The curriculu of this school will include the history of local indigenous architecture, appropria building technology (materials and structures), passive energy in architectur community participation in the building process, social and economic aspects the building process, management of the development operation, conservatio up-grading, and applied research and projects. There remain the main questic of who will take the initiation in establishing Hassan Fathy School Architecture?, will it be part of an existing university if its council agrees? cou it possibly be a private institute? who is expected to apply as students research workers if it starts as a research center for its region? What are th previleges to be gained by the students who apply for this school? A w designed study may lead us to the appropriate approach and program satisfyi this idea.

There remains one point : what can we as participants do to contin celebrating the ideas and philosophies of Hassan Fathy? Can we establish th Assosiation of Hassan Fathy for Architecture for the Poor to be a monitori body to all acitvities in this field? perhaps with the help of other organizatio like HABITAT Nairobi, IHS - Holland, or others. Can we consider th symposium as a start point for more activities in this field? It is a humanitari mission rather than a technical or academic issue. With this there is Invitation for the establishment of Hassan Fathy International Award F Architecture For the Poor.

Thank You.

CALL FOR THE ESTABLISHMENT OF HASSAN FATHY INTERNATIONAL AWARD FOR ARCHITECTURE FOR THE POOR

The Society for the Revival of Architecture and Planning Herita (SRAPH) took the initiation to call for establishing an International Award f Architecture for the Poor holding the name of the late Hassan Fathy. W SRAPH limited financial resources it succeeded to extend the invitation for t 1992 Award all over the world, which was granted to Auroville Building Center India.

SRAPH in despite of its limited resources was also able to organize th first symposium on the architectural ideals and philosophies of Hassan Fath The symposium is attended by a group of distinguished guest architects fro several countries in the world including the guest of honour Mrs. Suhasini who representing "Auroville Building Center" in India, the 1992 award winner.

I take this opportunity to call for establishing an international boc capable of handling the administration of this award in cooperation with i secretariat in Cairo. I also take this opportunity to invite our distinguishe guests who are attending this symposium, to be the founders of this internationa body and choose five from among themselves to act as the steering committe guiding the activities of this international body. The chairman of the steerir committee will be selected from the members of the committee . I beleive th this is a golden chance to pay tribute to the late Hassan Fathy by establishir this international award which holds his name and is promoted by a international group of architects who are willing to continue serving his ideal and philosophiies for the sake of the poor all over the world.

I call upon the members of this symposium to comment on this propos as SRAPH will not be able to carry out all these responsibilities on its own.

Thank You,

Prof. Dr. Abdelbaki Ibrahim

The last approach to the squatter settlement problem is now widely acknowledged through out the world. Urban authorities in the Arab cities began since the seventies to accept the squatter settlement, and sought to improve instead of removing them by force. In fact, the removal of squatter settlement is more expernsive than attempting to up-grade them. The socio-economic costs of displacement has greater ramifications.

Improvements of squatter settlements in the Arab cities took different methods.

(A) Building of residential compounds as part of the public housing programs to which squatter settlers are moved. They are asked to pay nominal rents. This method is adopted in over-populated areas, where land is limited.

(B) Re-planning of squatter settlements, by providing sites for the people to build their own shelters. Some public and municipal services are also introduced. This approach is used in scarce-resource cities such as in Sudan. Port Sudan was particularly successful in this approach. More than 70 thousand households were settled between 1970-1985 in squatter settlements that had been replanned and upgraded. The competent authorities lowered standards of building codes to the safe minimum so that dwellers can erect their homes, which usually consist of one room built of red brick and other local materials. A traditional sewerage system was laid, while water is supplied by communal public faucet, each serving 150 to 250 households.

(C) Providing technical and administrative services by making loans available to purchase building materials. Dwellers are asked to build their own shelters, as the case in Aden, Yemen.

Success and Failures of Shelter Self-Help Mobilizati Programs:

Many housing specialists and those involved in providing shelters tc low-income group consider the self-help mobilization falls short of realizing its full potentials. In the Arab cities, the programs cannot said to be remarkably successful, the reasons being:

(1) Mis-management, red-tapes, lack of experience, and enthusiasm the official level. These factors could have hampered programs from realizing the greatest potential of self-help programs.

(2) Scarcity of resources in some countries. This fact many have caused the setback of some self-help programs. The governments could not come with enough finance to prepare the sites and provide basic structure of simple infrastructure services.

(3) More of the projects, specially site and services types, were located on the fringe of cities, and therefore inaccessible by public transport. If dwellers work in the city, their shuttling back and forth is a daily ordeal,

(4) In some site and service projects, the poor people could not gain from them. Construction costs far exceed their financial ability. Anr without soft loans or subsidies, they could not build their shelters. Construction costs may have been relatively high because of the requirements to conform to certain building codes. For instance, poor people who could not build their shelters had to sell their plots to other able people.

(5) Some say that self-help shelter programs involve considerable delay in the delivery of housing. This is of course, attributed to inadequate resources that the beneficiaries have at their disposal. By the time the dwelling is completed the cost of building materials would have increased many times.

(6) Others think that the potentialities of self-help dwellors have not been fully tapped. With training and follow-up programs, the homeless could have mobilized to build their own shelters.

The shelter self-help proponents, while acknowledging some difficulties, and theneed to introduce fundamental changes as regards land prices and taxes, still believe that the programs are the only workable alternative to provide housing to the poor people. These programs may not in some instance, wholly successful, but some achievement is better than totoal failure.

The shelter self-help mobilization is probably one of the best policies to provide the poor people with housing, inspite of the difficulties of implementing the programs. Successful programs are not scarce to recall. In Morocco, the site and service programs helped to partly displace the squatter settlements. The ratio of these settlements has decreased continually from 12.8% in 1982 to 5.8% in 1991. In Port Sudan, Sudan, the same programs could house over 100 thousand households who once lived in squatter settlements from the early seventies to late eighties. The self-help programs had other positive aspects. The poor people were given the opportunity to participate in the making of urban life. Using their own resources, even if only little, they relied on themselves with government supports. The government could devote greater resources to certain areas of higher priorities. In short, the shelter self-help mobilization programs have proven their worth in the Arab cities, and still can be used to achieve better results in terms of housing production at a low cost. Some changes may have to be introduced to overcome certain hurdles - such as lowering the building code standards for low-income group.

Lessons from Pioneering Experiences for the Shelter Self-Help Programs:

Knowledge can be accumulated and enhanced by experiences. And pioneers have foresight to innovate solutions to problems. The delivery of housing for low-income group has ben a concern to a number of visionaries and institutions. Two visionaries are worthy of

mention for their foresight: The Late Hassan Fathi of Egypt, and John Turner, they had advocated certain propositions, that came to be experimented by such institutions as U.N. Center for Human Settlements (U.N. HABITAT). This agency became the proponent of shelter self-hellp mobilization worldwide.

[1] Hassan Fathi's Contribution to Self-Help Construction Techniques:

Hassan Fathi earned a worldwide recognition for the proposition calling for the building of low-income housing using local materials. Originally an architect, he designed a low cost shelter which low-income with their own labour and financial resources can build. His precept was based on the fact that mud structures built throughout centuries in Egypt and Sudan were strong enough to stand for many years. He studied buildings such as warehouses in luxor, that were built of mud-clay 3400 years ago. He experimented on clay buildings, and eventually built a model village called Karna. He was not only interested in building materials, also in architectural design. Working with farmers, and experimenting himself, he came to the final conclusion that mud clay and local wood and products are best suited to the Egyptian environment. Aside from this fact, utilization of certain mud building techniques, construction cost is low, and can be afforded by low-income or poor people. Not only this, but beneficiaries can contribute their labour, and skilful builders are locally available. Hassan Fathi's precept and techniques can be used for producing shelte for the urban poor, within the context of shelter self help programs. However, certain producers and organizations will have to be introduced. For instance, the urban building code will have to be waived away or amended.

[2] John Turner's Early Discoveries of Squatters' Potential Capabilities to Build their own Shelters:

In his studies on squatter settlements in Peru, South America, John Turner discovered that squatterers exhibit innovation in their organization and efforts for erecting their shelters, and improving them. His observations were that, despite the poverty of squatter settlements and their lack of any service, the dewellers sought every means to expand and improve their shelters. Over the years, they may themselves introduce some services, however primitive, to their settlement. Furthermore, the dwellers seem to show rational investment behaviour, and have built shelters that serve their household needs. However, the dwellers still need some technical consultancy and support. with Turner's conclusions, the shelter self-help mobilizationn program gained concrete rationale.

[3] U.N. Center for Human Settlement's Contributions to Low-Income Shelter :

The U.N. Center for Human Settlements sponsored many shelter self-help programs in the developing countries. This contribution came in different forms: financial, and technical. In Sudan, the U.N. Center contributed and UNEPP contributed one million dollars towards the establishment of a mobile factory capable of producing 20 million red bricks. Each 1000 bricks were produced at a cost of U.S. Dolllars 12.00, while cement blocks cost three times as much. In Algeria, the U.N. Center is promoting the use of local building materials such as stones, clay etc., for low-cost housing purposes. The U.N. Center stress that low-income shelter programs can use local building materials to save in the construction costs.

U.N. Center for Human Settlement long recognized that providing shelter to poor people require the exploitation of local building materials. With the modification of building codes, local building materials can be used to build low cost shelters within the financial abilities of low-income groups.

To generate international support, the U.N. declared 1990 as the year shelter. U.N. HABITAT drew a long-range strategy that will help provide shelter for all by the year 2000. In short, the U.N. Center for Human Settlements emphasizes the use of local building materials an the mobilization of self-help strategy to resolve housing shortage the poor people experience around the world, particularly in large cities of the developing countries.

Roles of ATO/AUDI in Support of Low-Income Housing Efforts in the Arab Countries:

The Arab Towns Organization (ATO) and its techno-scientific organ th Arab Araban Development Institute (AUDI) showed great interest in th poor housing situations in the Arab cities. This interest took the form of studies designed to identify the housing problems within the context of rapid urban development which most Arab cities experience Precisely, squatter settlements, slums and shortage of housing affordable by the poor were the prime target of AUDI/ATO involvemen in urban housing. AUDI's contributions come within its mandate, namely, to provide studies on the issues. In particularly AUDI:

1. has translated some important documents and studies related to housing the poor people in urban areas of the Arab & developing countries;

2. has continued to acquire references, books, and studies to enhance its library capaabilities to provide researchers with materials on housing, and shelter for the poor in particular;

3. has issued several publications which treated housing problems as a by-product of rapid urbanization in the Arab countries on such issue. Squatter Housing Phenomenon in the Third World, deals with the subject of housing the poor. Other publications such as Rural-Urban Migration in the Arab countries, deals with the housing problem in its wider context.

4. has co-sponsored or participated actively in many conferences, symposia, and seminars dealing with the subject of squatter settlements, slums, and housing the poor.

ATO/AUDI continue to give housing problems in the Arab cities a priority in study efforts, publications and events.

Conclusion and Recommendations:

Traditional public housing policies have been proven a failure in the delivery of housing affordable by low-income group. First the government's resources are not enough to produce the quantity demanded by increasing number of low-income popullation. Second, the low-income people often cannot buy these housing units or pay their rents. Thirdly, the design of public housing in some countries are not suitable to living conditions and customs of low-income people, who are often former peasants or nomads.

The shelter self-help mobilization programs was original by innovated to resolve several problems all related to housing the poor. As discussed earlier the self-help shelter movements adopted certain project forms, namely site and service, nucleus shelter and up-grading of squatter settlements.

The shelter self-help movements achieved some success in some countries, and failures in the other. There were many obstacles which either hampered the realization of greater success, or frustrated the projects. Land ownership was a common problem, where projects required the beneficiaries to acquire their own land before they could

qualify to benefit from the project. Increasing costs of building materials was another severe problem. Beneficiaries could not only produce out of their own savings the monies needed to purchase the building materials. Thirdly, the building codes which originally were developed for high-standard urban houses could have been a cause for the high total cost of building materials. Certain regulations of the building code were mostly a luxury thing to poor people which they could not afford. Fourthly, the beneficiaries were not active participants in the most of these projects. Yet the shelter self-help materialization programs can be given better trials, with modifications based on past experience.

In short, AUDI would like to present some concluding recommendation

(1) The concept of shelter self-help mobilization is still a valid approach to resolving shortage of housing to low-income and poor people. However, the beneficaries should play a great role in these programs.

(2) Past experience from different nations and situations can be used to modify these programs, giving appropriate consideration to cultural diversities.

(3) The main obstacles that frustrated past programs should be resolved. They are mainly: land ownership and building codes for low income housing.

(4) The organizational set up and program operations should be simplified, with red tapes eliminated, and beneficiaries have greater access to project management and resources.

(5) Squatter settlements should be up-graded in their original locations. Public transport to work places should be provided.

(6) Introduction of public and municipal services to the squatter settlement, as part of the improvement program, can be supported by dwellers, however their meagre contributions may be. Beneficiaries, as experience in Sudan and Morocco, and Tunis has shown, can become regular tax and charge payers.

(7) Local administration units should be introduced to the squatter settlements, so that the dwellers can eventually participate in the planning and operations of their settlements.

(8) Local building materials should be given a greater interest as a resource that can be exploited for low-income shelter building. With being of low price, construction cost of shelters using local building materials can be very low, and within financial reach of poor people. Local building materials are durable as ancient monuments show in Egypt, China, and elsewhere. Earth, local wood and plant parts are excellent materials.

(9) Experience has shown that training is an important component of shelter self-help programs. Beneficiaries should be given training opportunities to learn how to build their shelter, and lay down the plumbing system. Once they learn they can use their own labour to maintain their shelters or expand it. Collective labour can also be mobilized for public works projects at the squatter settlements.

BIBLIOGRAPHY

[أ] المراجع العربية .

١ ـ أبحاث ندوة ظاهرة السكن العشوائي وأحياء الصفيح في الوطن العربي، الرباط، المملكة المغربية، ابريل ١٩٨٥م .

٢ ـ أبحاث ندوة السكن العشوائي وأحياء الصفيح، مراكش المملكة المغربية .

٣ ـ د. عادل مصطفى أحمد : المستوطنات الشعبية في الخرطوم الكبرى، ورقة مقدمة للمؤتمر الثامن لمنظمة المدن العربية، الرياض، ١٩٨٦م .

٤ ـ المجلس الاقتصادي والاجتماعي، حالة المستوطنات البشرية في جمهورية مصر، الأمم المتحدة ١٩٨٧ .

٥ ـ مجلة المدينة العربية ـ عدد خاص للسنة الدولية لإيواء من لا مأوى لهم، رقم ٢٨، نوفمبر ١٩٨٧م .

٦ ـ مركز الأمم المتحدة للمستوطنات البشرية : المأوى والتحضر، اليوم العالمي للموئل، اكتوبر ١٩٩٠م .

ـ مركز الأمم المتحدة للمستوطنات البشرية : المأوى للجميع ـ الاستراتيجية العالمية للمأوى حتى عام ٢٠٠٠، نيروبي، كينيا، ١٩٩٠م .

ـ توفيق حجيرة : ديناميكية البناء الذاتي في عمليات إعادة الإسكان بالمغرب، ورقة مقدمة إلى المؤتمر الدولي للإسكان، القاهرة، فبراير ١٩٩٢م .

[ب] المراجع الأجنبية .

1. Altmann, Jorn: Self-help housing in urban squatter settlements.- HABITAT INTERNATIONAL, 6(4), 1982. pp.417-424.
2. Behnfeld, Hartwing and Heide Traeder., eds: Urban planning in Arab countries.- Seminar Report.- West Berlin: DSE, 1981.
3. Dakhil, Fahd L., Oktay Ural and Moneer F. Tewfik: Housing problems in Developing countries - Proceedings of IAHS International Conference, Dhahran, 1978. Vol. 1. Dhahran: University of Petroleum & Minerals, 1978.
4. Dwyer, D.J. : People and Housing in third world cities - Perspectives on the problem of spontaneous settlements.- London: Longman, 1981.
5. Fathy, Hassan: Architecture for the poor, Chicago: The University of Chicago Press, 1973.
6. Hardoy, Jorge E. nd David Satterthwaite. Shelter need and response - Housing, land and settlement policies in seventeen third world nations.- New York: Wiley, 1981.
7. Hardoy, Jorge E. and David Satterthwaite: Shelter, infrastructure and services in the third world cities. HABITAT INTERNATIONAL, 10(3), 1986. pp. 245-284.

8. Laquian, Aprodicio A: Basic housing - policies for urban sites, services and shelter in developing countries.- Ottawa, Canada: International Development Research Centre, 1983.
9. Mientjes, Peter and Jan Van der Zinden: Approaches to low-income housing in the third world, some comments.- INTERNATIONAL JOURNAL OF URBAN AND REGIONAL RESERCH, 9(3), 1985.
10. United Nations Centre for Human Settlements (HABITAT): Survey of slums and squatter settlements.- Dublin: Tycooly International Publishing, 1982.
11. United Nations Centre for Human Settlements (HABITAT): Community participation in the execution of squatter settlement upgrading projects. Nairobi: UNCHS, 1985.

THE INTERNATIONAL SCIENTIFIC SYMPOSIUM
OF HASSAN FATHY
FOR ARCHITECTURE FOR THE POOR

From 20th to 22nd April 1993,
Cairo , Egypt

TITLE

TOWARDS AN ENVIRONMENTAL DESIGN STRATEGY FOR THE RECONSTRUCTION OF SMALL SETTLEMENTS IN AFGHANISTAN

BY
Dr. Abdelmohsen Farahat

ADDRESS

Associate Professor,
SED, Faculty of Engineering
King Abdulaziz University
P.O.Box 9027, Jeddah - 21413
Saudi Arabia

TOWARDS AN ENVIRONMENTAL DESIGN STRATEGY FOR THE RECONSTRUCTION OF SMALL SETTLEMENTS IN AFGHANISTAN

by

Dr. Abdelmohsen M. Farahat

Associate Prof. SED, Faculty of Engg. KAAU,
P.O.Box 9027,Jeddah-21413, Saudi Arabia.

INTRODUCTION

When the Afghani problem is resolved, huge masses of refugees are expected to return in a rush. These refugees with their countrymen, would immediately then try to reconstruct damaged houses and buildings through whatever means they have at hand. Due to scarcity of financial resources, concerned governmental authorities would - most probably - depend on foreign aids to do its part in answering urgently needed reconstruction activities. If such reconstruction activities are done in a rush without prior planning, a lot of damage would be expected. The damage would have considereable negative effects on the natural, the built, the socio-economic and cultural environments. Examples for such damages include improper site selection and overexploitation of natural resources in a country whose agricultural base has been severely damaged and where deforestation have already exceeded renewable and reclamation limits; maximization of the use of standardized prefabricated models (possibly imported from outside) that may not respond adequately to the needs of the local climate and local social pattern and behavior, in addition to the possible loss of the built cultural heritage and waste of energy both in terms of construction and performance of buildings; and last but not least the possibility of perpetuating the dependence on foreign debts and the underutilization of local human resources.

This paper presents an attempt to overcome the above mentioned problems. The main objective is not to present a complete answer but rather an open-ended methodology which is flexible and adjustable according to feed-back from application. Series of guidelines are proposed for planning, design and structural aspects of the proposed new communities, mainly in rural areas. These aspects are discussed under the following headings:

- The Nature of the Environmental Design Elements of the Strategy, their Constraints and Objectives.
- Planning Guidelines.
- Design and Structural Guidelines.
- Conclusion.

1. THE NATURE OF THE ENVIRONMENTAL DESIGN ELEMENTS OF THE STRATEGY, THEIR CONSTRAINTS AND OBJECTIVES

No attempt is made in this paper to plan or design standard "prototypes" for reconstruction. This would be theoretically wrong due to the many environmental and social variations in Afghanistan, and it would also be practically wrong since this study has been carried out outside Afghanistan and with no reference to the specific sites where reconstruction is planned. What is intended here is to give planning and design guidelines rather than specific plans and designs. On the other hand, these guidelines are, hopefully, specific enough to illustrate a noticeable improvement upon traditional methods and to benefit from contemporary practices.

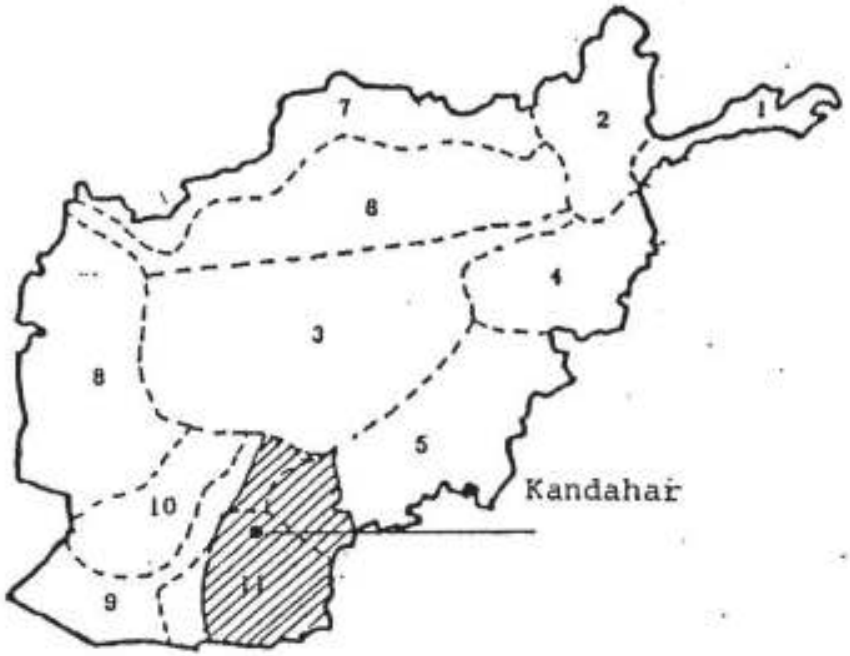
The planning and design guidelines proposed here do not cover all geographic regions of Afghanistan. They are concentrated on regions where mud bricks or generally earth-based materials of construction are common. For clarity, the region of "southern Mountains and Foothills" especially the area surrounding the city of Kandahar (Fig.1) can be considered a target region for the recommended planning and design guidelines. It was chosen for the following reasons:

- It is one of the areas estimated to have severe destruction.
- The area uses earth - based materials for construction purposes traditionally
- The area is relatively near to refugee camps in Peshawar, compared to other areas having the above two characteristics.

In case of dealing with other regions in the planning and design guidelines, a reference will be made accordingly. Before discussing the environmental design elements of the strategy, it is important to set out their objectives, which are basically derived from a proposed policy (which is not included in this paper) and then translated into environmental design terms. These objectives are mentioned in the following:

1.1 Relatedness to Islamic Shariah Directives

This includes avoidance of harm as much as possible to both the physical environment (e.g. pollution or depletion of natural resources) and the social environment (e.g. generating more competition for land and inflation). In addition, some of the Islamic Shariah Directives that have direct relevance to environmental design include securing privacy of the family in the design of both a single residence and a group of residences. They also include avoidance of waste in the use of materials quantitatively and qualitatively. Beside such direct directives of Shariah,



GEOGRAPHIC ZONES OF AFGHANISTAN

1. WAKHAN CORRIDOR & PAMIR KNOT
2. BADAKHSHAN
3. CENTRAL MOUNTAINS
4. EASTERN MOUNTAINS
5. SOUTHERN MOUNTAINS & FOOTHILLS
6. NORTHERN MOUNTAINS & FOOTHILLS
7. TURKESTAN PLAINS
8. HERAT-FARAH LOWLANDS
9. HILLMAND VALLEY-SISTAN BASIN
10. WESTERN STONY DESERT
11. SOUTHWESTERN SANDY DESERT VALLEY

Fig. 1: The Target Region for the Recommended Planning and Design Guidelines.

there are innumerous indirect implications that lead to the common good. The realization of these implications consciously and sensitively, after fulfilling the direct directives, leads to what can be called Islamic environmental design. All coming objectives relate to such indirect implications.

1.2 Self-Reliance and Local Self-Management in Reconstruction Activities

Self-reliance is an important element of the policy in general. Here, in environmental design terms, it means maximum utilization of local resources, human and material, in the reconstruction activities. Accordingly, these reconstruction activities should be based as much as practical on traditional methods and techniques of using local natural materials in the indigenous architecture of the concerned region. This would result in economic efficiency, adaptation to both social and environmental conditions, and employment of human resources. Traditional ways of siting and planning settlements should also be taken into consideration.

Self-reliance in reconstruction activities goes along with the twin objective of local self-management, where the local community - not the central government -makes all the important decisions in terms of management of their physical environment. The central government should provide the basic infrastructure, financial assistance, loans, and technical assistance. On the other hand, each family makes its own decisions about the construction of its house and its phasing, in addition to the possibility of participation in its construction [1]. Since individual decisions may conflict and would reflect on the whole community directly or indirectly, it is important to control individual desires within the overall interest of the community. It has been proven through historical and contemporary evidences in Islamic societies that it is far better, socially and environmentally, not to have such controls through rigid building codes and land-use regulations, but rather through a shared value system (Islamic Shariah) enacted by the representatives of the local community in conjunction with governmental officials [2], [3].

1.3 Improvement Upon Traditional Construction Methods

The employment of traditional construction methods mentioned in the preceding objective should not be practiced literally, since there are newly introduced factors that justify or even demand modifications and improvements. These factors are discussed in the following:

- Sustainable use of natural resources necessitates a strong restraint on cutting forests for the use of timber in construction. This restraint could be practiced partially or gradually according to sound

forest management criteria -- i.e. rate of cutting should be a percentage of the rate of growth taking into consideration the destruction of forests that had already occurred and the need for reforestation. This restraint is especially needed, given the massive reconstruction needs in a minimum of time to house refugees.

- Hygienic requirements necessitate modifications and improvements in traditional construction methods in order to secure hygenic waste disposal, possible potable water supply and a reasonable internal finish of floors, walls and roof in order to minimize domestic insects.

- Improvement in science and technology can facilitate the improvement of traditional construction methods in structural terms (e.g. use of small traces of cement to stabilize earth blocks), in terms of speeding up the construction operations (e.g. use of manual machines -- including hydraulic ones -- in the production of earth blocks), and in terms of more efficient structural methods that improve earth-quake resistibility in seismic areas.

- Improvements in science and technology can facilitate further utilization of renewable energy resources and recycling of wastes.

- Improvement of the industrial base of the whole country enables a degree of technological advance in reconstruction activities.

1.4 Environmental Adaptation, Appropriate Technology and Decentralization

The above mentioned new factors leading to modification and improvement of traditional construction methods should be controlled in order to satisfy the following interrelated objectives:

- Modifications and improvements should not jeopardize the adaptation to the natural environment and the adaptation to the social environment that are so characteristic of traditional architecture and settlements.

- Adaptation to the natural environment includes sustainable use of natural resources, climatically responsive designs and use of renewable energy resources. Adaptation to the social environment includes spatial and functional accommodation of daily and seasonal pattern of life, social customs and retaining cultural identity through a degree of continuity of traditional forms and related arts and crafts.

- They should also be within the realm of appropriate technology (low to intermediate technology) and not

reach what can be considered high technology, in order to guarantee economic efficiency and maximum employment of human resources.

- As a consequence to the previous objective, the overall system of reconstruction should be basically decentralized in order to guarantee maximum spread of the reconstruction activities and their accompanied economic returns to both builders (small contractors, laborers) and residents.

1.5 Maximization of Productivity

Reconstruction activities, apart from producing needed residences and facilities, can also contribute to increasing productivity within the living environment, instead of being completely a consumptive environment. Thus, reconstruction activities would contribute to social and economic development of the areas concerned during and after construction activities. However, such productive activities should be compatible to the nature of the living environment. Examples here include relatively inexpensive greenhouses that can be attached to residences giving them warmth during cold months and vegetables, out of season and at higher yields per area than open field agriculture.

2 PLANNING GUIDELINES

2.1 Proposed Basic Structure of a Community

The proposed structure can be applied to existing or new settlements in various degrees of completeness. In both cases, the attempt is to show the proposed basic components and aspects and their interrelatedness into an overall structure. It is also important to show that while these components realize the objectives of the environmental design strategy mentioned earlier, they are also the result of various levels and types of planning, including policy planning environmental or landscape planning, site selection, site planning and possibly site design. The proposed basic structure of a community is shown in (Fig.2) and is explained in the following:

- Like much of Afghanistan, the natural environmental context of Kandahar is generally dry. Accordingly, the small amount of rainfall that occurs should be captured as much as possible, through rainwater harvesting techniques. The first step here is in the site selection of new settlements, sites should be away from valleys where major drainage paths occur. Grading should be done along the valley to maximize rainwater harvesting through detention basins, retention basins, cisterns and terraced agricultural fields [4].

- Also in site selection for new settlements, or growth of existing settlements, existing agricultural lands or

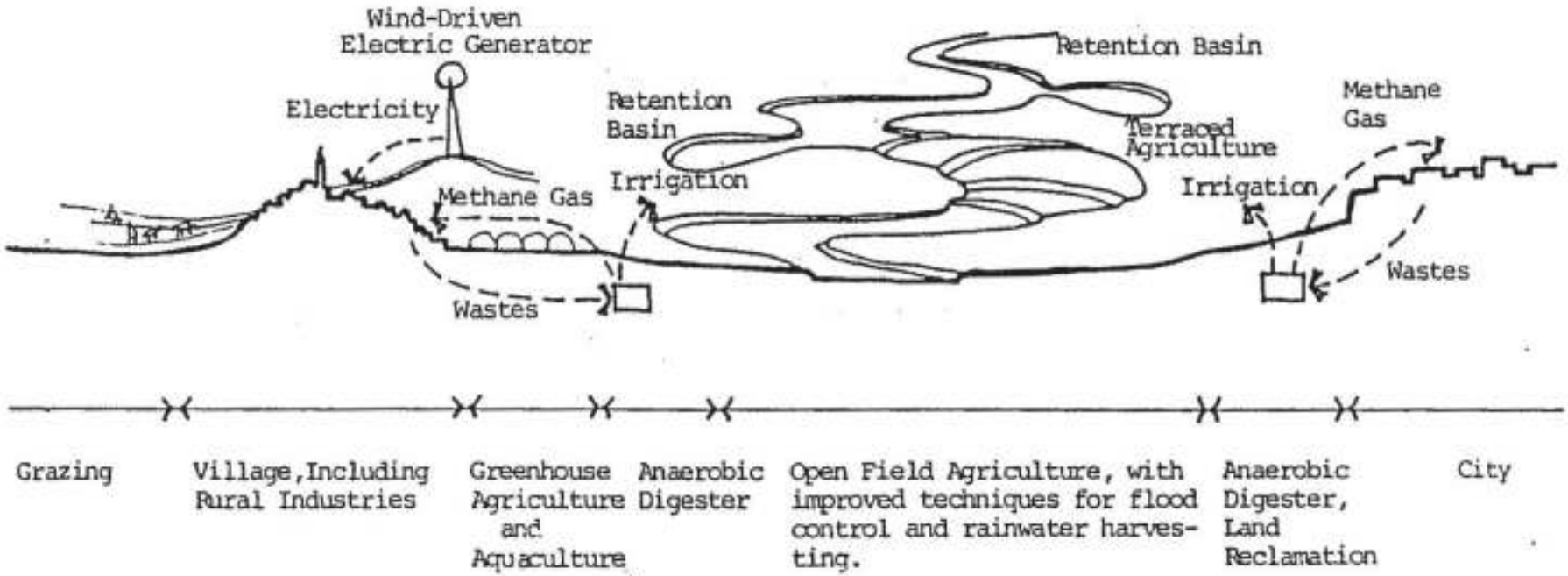
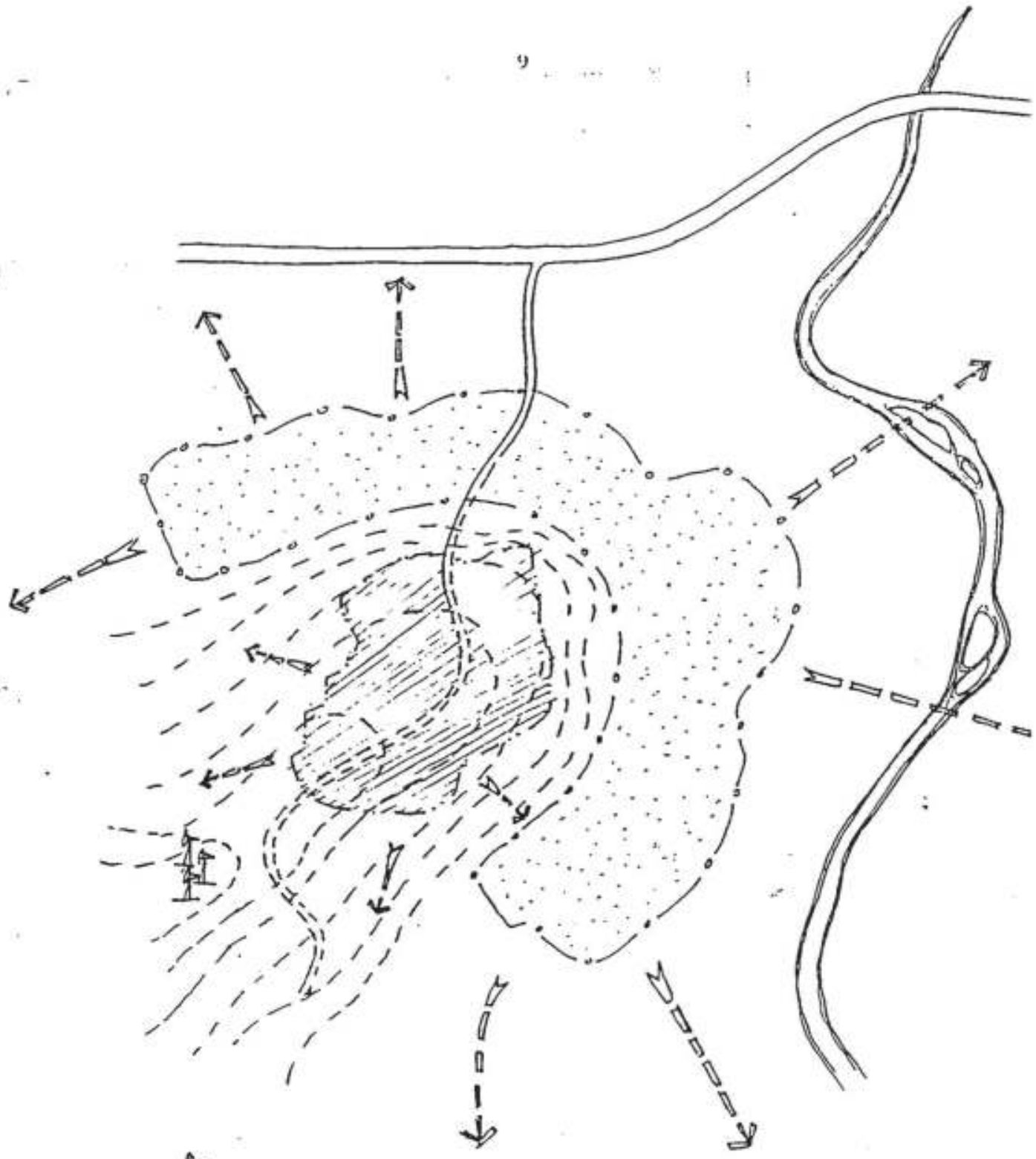


Fig. 2: The Proposed Basic Structure of a Community.

lands with good potentials for reclamation should be avoided (Fig.3). The historic traditional practice of locating settlements - and even cemeteries - on barren hillsides in order to conserve the soil of the valley floor should be adhered to [5].

- Improving the treatment of the drainage system should be done in a way that integrates grading work at the scale of the immediate surroundings of the settlement to the larger scale of the region, in order to guarantee best use of the water resources and also their fair distribution. In addition and in relation to the larger scale, appropriate treatment of the inter-settlement road network should be practiced in a way that does not disturb the drainage pattern but rather supports it. This road network should also have minimum impact on agricultural land, in the initial stages of the construction of a settlement as well as in later stages of growth. Moreover, this intersettlement road network should be done with the objective of encouraging interdependence between settlements and accordingly regional stability and self-reliance through the development of smaller and cheaper roads between small settlements.

- In addition to roads, waste treatment is of utmost importance to the village infrastructure. The Anaerobic Digester is highly recommended here. In addition to its hygenic benefits, by treatment of all domestic and agricultural wastes, it provides important environmental resources and energy resources. Environmental resources include the Supernatant which provides fertilizers disolved in irrigation water and solid digested slurry which provides fertilizers. These environmental resources can be used in the irrigation and organic fertilization of existing agricultural lands or in the reclamation of new lands for agriculture. The form of energy produced by the Anaerobic digester is the Methane gas which can cover all domestic fuel needs of the settlement. Methane gas can be provided to houses through direct pipes, or it can be stored in liquid form in cylinders, to be distributed to houses. Thus, water can be conserved and recycled, the need for importation of expensive chemical fertilizers is minimized, horizontal expansion of agricultural lands is made possible, and domestic fuel needs are met locally and very cheaply. It should be noted here that the traditional practice of collection of urban wastes from cities like Herat and Kandahar by near farmers to be used as fertilizers in the surrounding farmlands should be revived through the use of large scale Anaerobic Digesters [6]. In this way the countryside can benefit from the cities recycled water and fertilizers, while the cities can use the produced Methane gas as domestic fuel and possibly for industrial purposes.



Potential WECS location

Potential and/or existing village

Potential and/or existing farmland

Potential direction of growth

River or other water sources

Fig. 3: Factors for the Selection of a Village Site

- It should be noted here that the two items of improving the treatment of the drainage system through flood control and rain water harvesting and improving waste treatment through the use of the Anaerobic Digester should receive a clear priority over other items such as drinking water network, electricity and telephone lines. This priority order is justified by the fact that the first two items would help in the early stages of survival and initial development of the settlements in terms of hygiene, environmental adaptation, land reclamation, and productivity. These two items also help the needed orientation towards self-reliance through decentralization and use of intermediate technology. Other items are only justified after advanced development stages have been reached. If introduced earlier, they could contribute to environmental degradation, more consumption, and dependence on centralized and high technology systems which means more dependence on imports rather than self-reliance. It would also mean exhausting the budget on less number of settlements due to cost increase.

- The land surrounding the settlement should be zoned into three basic categories, having a hierarchy of intensity of use. The lowest of them is the category of grazing lands which should be farthest from the settlement and only on public lands of marginal soil productivity (i.e. not capable of supporting agricultural crop production) that are mostly away from valleys and on higher plains. Following that is the category of traditional agriculture in open fields, which is expected to remain mostly the same in valley bottoms, with possible improvements in the irrigation system. The third and new category is that of greenhouse agriculture. This category has considerable potentials in almost all of Afghanistan due to its continental location and accordingly continental climate. In Kandahar, yearly variations in mean maximum temperature can reach 25°C. between 15.4°C in December and 40.3°C in June [7]. Accordingly, greenhouse agriculture can extend productivity in the cold winter months with crops that only grow in warm seasons in open field agriculture. In addition, greenhouse agriculture can double the productivity of land upto 7 to 10 folds compared to open field [8]. With such superior productivity, the prevailing problems of dense population exceeding land carrying capacity and fragmented land holdings can be overcome, at least partially. Greenhouses can be of relatively large scale replacing some of the open fields, or they can be of small scale and even attached to houses. the second type will be dealt with in the third section of this paper dealing with design guidelines. Large scale commercial greenhouses better be located, if possible, near to main roads linking to large towns and cities where markets are:

- The above mentioned greenhouses represent a form of intensive investment that can be amongst the first steps for rural industries including canning and drying of food, and agriculture. These rural industries in association with traditional arts and crafts such as carpet weaving, textiles and carpentry can strengthen the economic base of the village and contribute to its self-reliance. Thus, rural migration to cities could be stopped for the benefit of both, in addition to national economic stability.

- At later stages of development, electricity can be introduced though wind-driven electric generators, to be located at highest elevations near the settlement.

2.2 Differences between Existing and New Settlements

The average ratio of destruction in rural areas in Afghanistan is estimated at 50% [9]. This requires devotion of a considerable ratio of reconstruction activities to existing settlements where the majority of immigrants are expected to return [10]. On the other hand, if all immigrants returned to their original settlements, with the population increase during war years, the carrying capacity of several regions and of most areas surrounding existing settlements would be exceeded. Accordingly, resettlement policy should attract (not force) immigrants from such problematic areas and regions to those with economic development potentials where new settlements can be established.

In the case of existing settlements, the following is recommended in an order of priority:

- After repairing the infrastructure of the whole countryside surrounding the settlement, including clearing mines, repairing canals, dams and roads connecting villages, ... etc., the infrastructure of the village itself should be repaired and then improved to achieve "the proposed basic structure of a community" discussed in the previous item (2.1).

- Existing houses that have been left empty without maintenance would need minimum effort to qualify for decent shelter. Such effort of rehabilitation may include plastering for rain water resistance, fixing of windows and doors, and connection to the sewage disposal system (the Anaerobic Digester).

- Existing houses that are partly damaged would need repair or reconstruction of damaged parts. Then, other improvements can follow. Guidelines illustrated in the third part of this paper should be followed whenever relevant.

- Houses within the settlement that have been completely destroyed would require complete reconstruction, following the guidelines illustrated in the third part of this paper. They should be built within their original property lines.

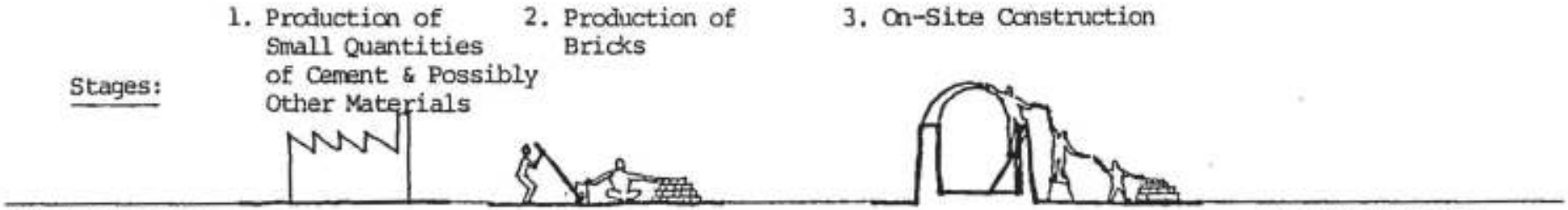
- Construction of new houses as an extension of the village should receive the last priority, if done at all, and only in case of adequate carrying capacity of the surrounding area. The reason is to encourage resettlement in other areas and regions of economic development potentials.

2.3 The Overall System of Production and Construction of Houses

The specific guidelines for design, structure and construction of houses is to be discussed in the third section of this paper. Here, the overall system of production and construction of houses is discussed, with emphasis put on the resulting implications of the chosen system. Firstly, the overall system is examined in terms of its physical processes, including the production of needed materials for construction, their manifacture into building components, transportation of materials and compoents, and construction on-site. Secondly, the implications of the system are examined in terms of needed time and cost, profit makers, needed work force and energy, effect on the natural environment and response to it, and finally response to cultural and social aspects including self-management. Accordingly, one can decide more objectively on the choice of a system, rather than being mislead by one stage of a given system. The objective choice is based on conscious knowledge of the direct and indirect implications, including societal and human ones, instead of stopping at the physical end-product [11].

Although one of the objectives mentioned earlier in this paper (item 1.4) is related to appropriate technology and decentralization, it was found necessary to compare two systems. The first one is the chosen system of stabilized earth blocks, following and improving upon traditional construction methods and techniques (Fig.4). The second one is the system of precast and prefabricated building components (Fig.5) which seems to be attractive to some decision makers due to it's speed of construction. By comparing the matrices accompanying both figures, the first system of earth blocks appears clearly to be more favorable, due to the following reasons:

- In terms of time, although the on-site construction time is shorter in the second system than in the first, the overall labor time per house is shorter in the first than in the second. This is due to more stages needed for preparing construction materials and components in addition to considerable transportation time in the



Implications :				Overall Effects :
Time	Short	Moderate to Long	Moderate, Incremental, Convenient	Overall Labor Time per House is Small. Waiting Time per House is Small & Convenient.
Cost	Low	Low	Low	Overall Cost per House is Low
Profit-Makers	Outside Local Communities & Possibly Outsie the Country	Mostly Inside Local Community		Profit - Makers are Mostly Inside Local Community.
Work-Force	Energy Intensive	Labor - Intensive		Work - Force is mostly Labor-Intensive
Effect on Natural Env.& Response to it	Both - ve.	Minimal Effect & +ve. Response		Overall Effect on Natural Env. is minimal & Response to it is +ve.
Response to Cultural & Social Aspects (Self.Management)	-ve	+ve		Overall Response to Cultural & Social Aspects (Self-Management) are +ve.

Fig. 4 : The Overall System of Production and Construction of Houses Using Stabilized Earth-Blocks.

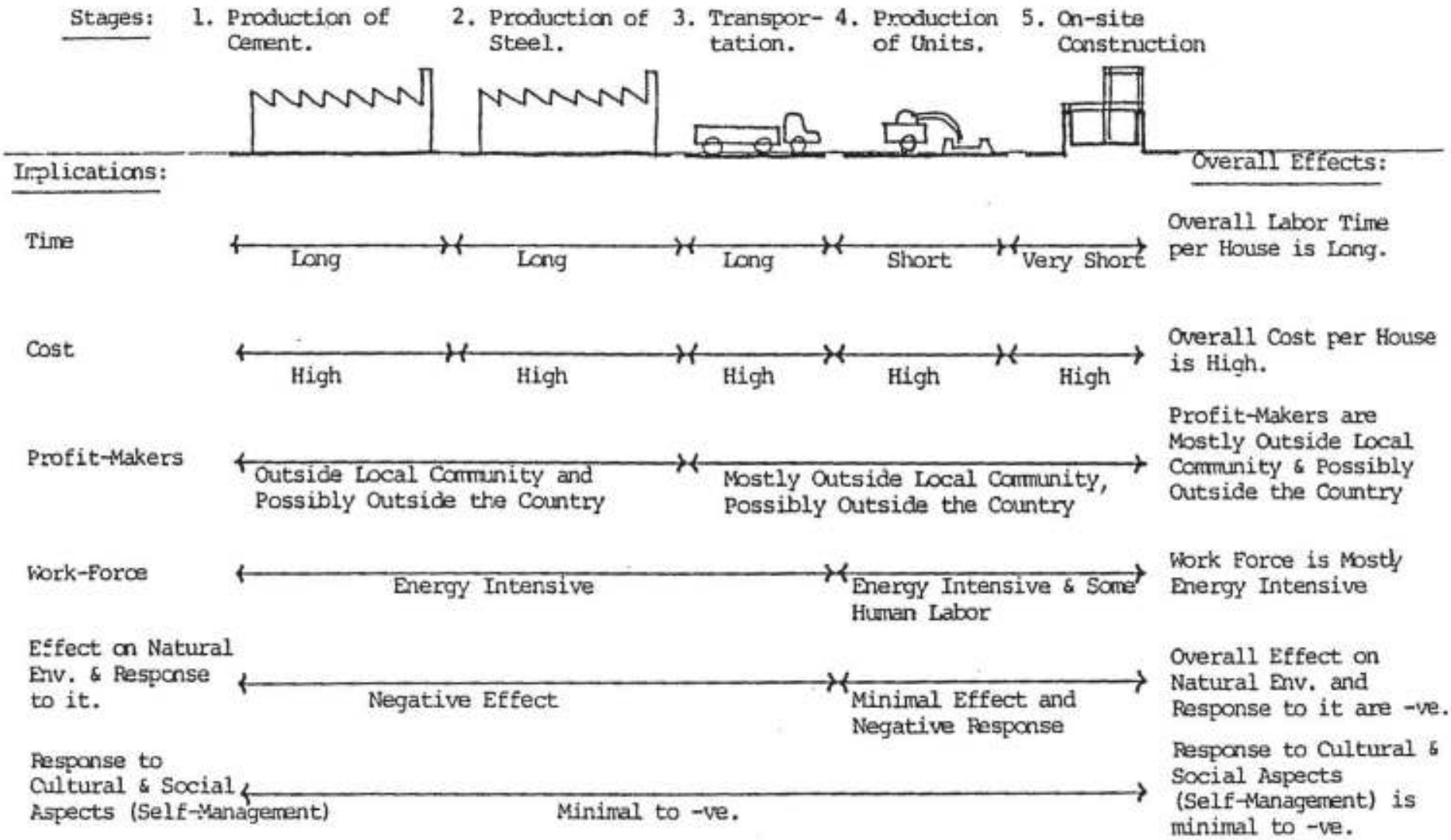


Fig. 5 : The Overall System of Production and Construction of Houses Using Precast and Prefabricated Building Components.

second system. Moreover, the waiting time (for a family to settle) per house is longer in the second system, because houses are constructed at a massive scale. So, families have to wait until a huge number of houses is finished, while in the first system houses are constructed concurrently in smaller packages (and smaller initial house size) allowing families to settle incrementally and continuously [12]. The other time factor affecting negatively the second system is the prerequisite of having a smooth and even flow of distribution all over the system, which proved to be impossible in the American Context [13], let alone the difficult circumstances of Afghanistan in terms of roads and isolated small settlements in various environmental conditions.

- In terms of cost, the second system of precast and prefabricated building components is significantly higher, due to difficulty of applying dimensional and qualitative standardization (especially in the varied regions of Afghanistan), cost of added transportation, and the fact that traditional earth-based building materials are significantly cheaper than the cost of industrialized materials especially reinforcement steel and cement [14]. Moreover, due to the centralized nature of the second system, it would have more intermediaries which would add to the cost [15].

- In terms of profit-makers, in the first system of stabilized earth blocks they would be outside the local community only in manufacturing the minute quantities of cement and other possible additives, and also possibly in the initial stages of reconstruction where manual machines for making bricks could be imported before they could soon be manufactured, since they belong to the range of appropriate technology. In all other stages of construction, which form the majority of work, the profit - makers can be widely distributed between local small contractors, skilled laborers and unskilled ones (possibly the peasants themselves) who can all work efficiently using mostly their traditional techniques and materials. On the other hand, in the second system, profit-makers are mostly outside the local community and very possibly outside the whole country [16].

- The first system is mostly labor intensive, with the minor exception of the energy intensive manufacturing of cement or other possible additives. Accordingly, maximum utilization of local human resources can occur. On the other hand, the second system of precast and prefabricated components is mostly energy intensive.

- In terms of effect on the natural environment and response to it, the first system of stabilized earth blocks has little impact in general, except again the

minor stage of cement manufacturing. It's response to the natural environment in terms of climate is excellent due to the thermal mass provided by the thick walls and roofs made of earth-based materials. The second system, on the other hand, has negative impacts on the natural environment, due to pollution generated in the manufacturing of steel and cement and their transportation. It's response to climate is generally poor, since the system favours light weight components lacking thermal mass. If thermal insulation is used, it can solve the problem partially with considerable higher cost and again more pollution [17].

- In terms of response to cultural and social aspects, the first system - being decentralized and inviting to maximum users participation - would allow adequate response (especially in terms of self-management) both individually and collectively at the scale of the local community. The second system of precast and prefabricated components, on the other hand - being centralized and mostly mechanized - would produce rather standardized solutions that can not always fit local needs, especially those of the varried individuals. Self-management at the local community scale and the scale of the individual is almost nonexistent [18].

3 DESIGN AND STRUCTURAL GUIDELINES

3.1 Basic Design Guidelines

Figure 6 shows the proposed elements and activities linked to a house, to achieve ecologically and culturally based productivity. The sequence of construction is shown in Figure 7 which indicates briefly the gradual transition from a temporary shelter (a tent) to a completed house, as the family needs grow and also as their means and affordability grow.

Figure 7 also shows the completed plan of a dwelling unit (enlarged) with rooms serving different functions. Other than hygienic reasons, the washroom is required at the earliest possible time to facilitate for the Muslims ablution and other cleaning rituals. Kitchen and Storeroom are located near the backyard due to the relationship to the Laundry area, the Greenhouse and the chicken/rabbit yard. The location should also consider natural ventilation. The functions of rooms are flexible as in accordance to individual family needs. As the family expands and as requirements alter through time, a second level could be introduced if necessary.

The internal court could be used as either playground for the children or to some families as workshop for pottery and/or carpentry. The backyard not only serves as laundry and drying area which is located outside of the kitchen, but also has the potentials of rearing chickens, rabbits and

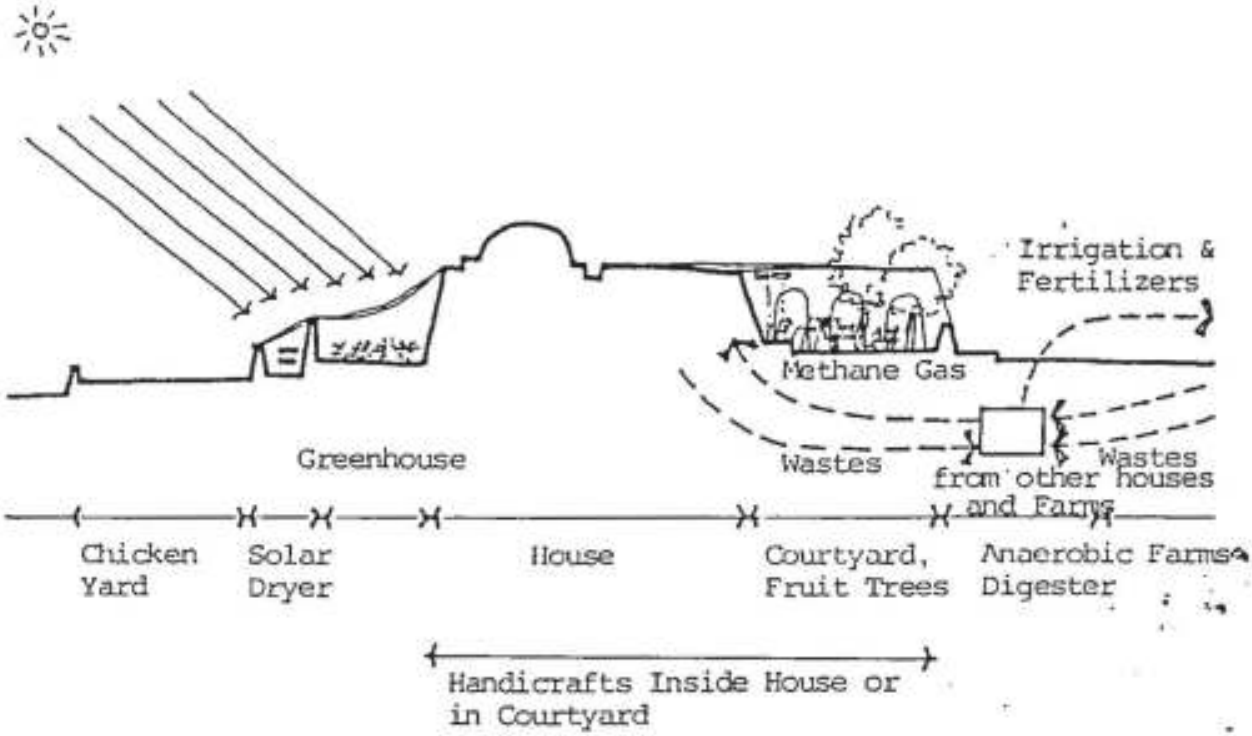


Fig. 6 : Proposed Elements and Activities Linked to a House, To Achieve Ecologically and Culturally Based Productivity.

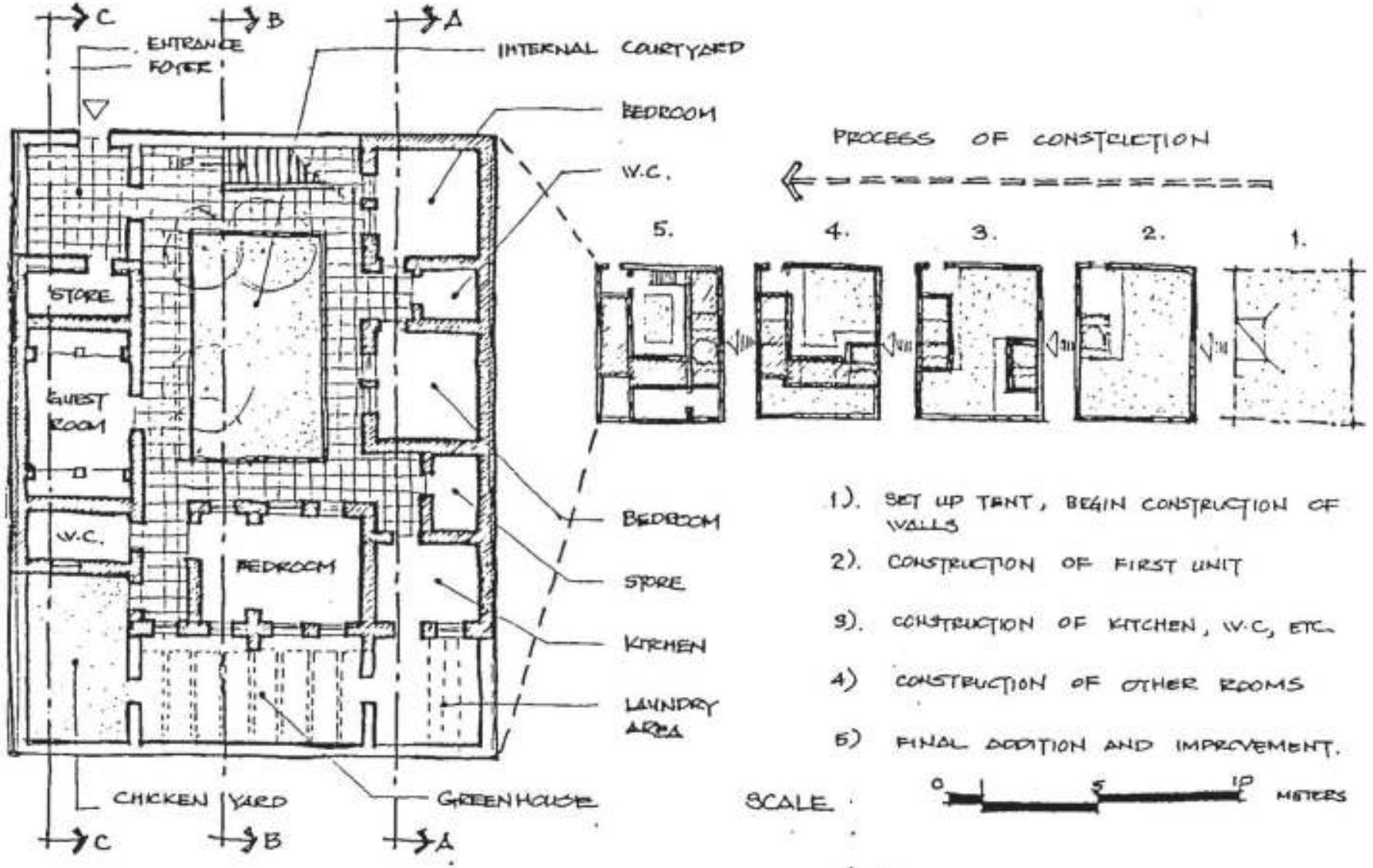


Fig. 7 : Basic Unit and Process of Construction.

installing a greenhouse for off-season vegetable produce as well as heating the house during the cold seasons.

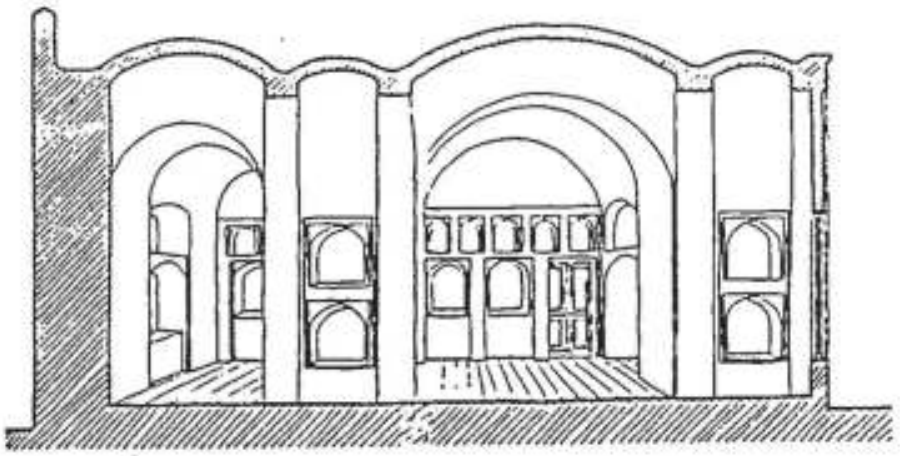
3.2 Structural Aspects of Traditional Forms and Possible Improvements

The arch, vault and dome construction is the prevailing building forms in Kandahar region. The factors responsible for the development of this art by Kandahari craftsmen may be summarised as follows [19]:

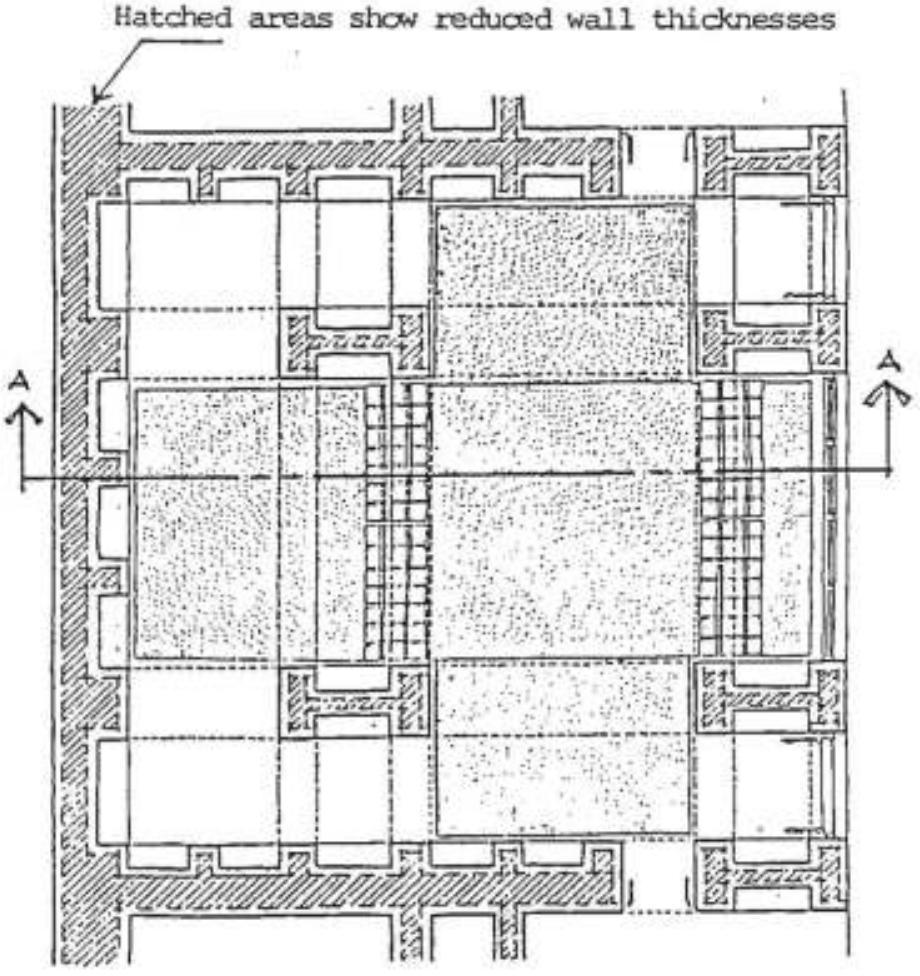
- Scarcity of nearby wood for construction of flat roofs, where the poplar tree used as a common system of roofing in Afghanistan does not thrive in Kandahar area.
- Freedom from earthquake distrubance.
- Local production of high grade burnt earth bricks, in addition to regular sun-dried earth bricks.
- Extremely dry and hot climate, where vaulted areas are cooler in the summer and thick external walls provide high thermal mass which reduces extreme fluctuations between day and night temperatures.
- Shallow vaults and domes still allow for the addition of a second floor if needed.

The main features of this traditional dome and vault construction form are discussed in the following, highlighting areas where improvements over traditional methods may be introduced in terms of both material and structure.

It can be noticed from Fig. (8) that both external and internal wall thicknesses are large. The full thickness of an external wall is about 72 cm where one niche of about 24 cm is introduced on the inside thus reducing the wall thickness to about 48 cm. Internal walls are sometimes provided with niches on both sides of the wall thus reducing the wall thickness to about 24 cm at some areas. It has been reported [19] that burnt earth bricks are used for the construction of vaults and exterior wall surfaces which implies that the internal walls and the rest of external walls are made of sun-dried earth bricks. This may explain the large thickness of these bearing walls made mostly of sun-dried earth bricks. Although there are factors other than compressive strength of the bricks which decide the thickness of walls such as having a high thermal mass, providing enough supports for vaults and domes or providing resistance to frequent rainfalls, it is believed that some savings in material may be achieved by reducing the wall thickness. This is an area where improvements over traditional methods may be introduced. In this regard, the use of cement - stabilized earth blocks as a replacement of both sun-dried and burnt bricks (on the exterior wall surfaces) results in the following advantages:



Sectional (A-A) prospective showing vaulting and niches



Plan showing niches, walls and vaults

Fig. 8 : Structural and spatial details of the adopted building form [6.19]

1. From strength point of view, the compressive strength of cement - stabilized earth blocks far exceeds the strength of sun-dried earth bricks. The actual compressive strength of cement - stabilized earth blocks depends on the amount of cement added, the type of soil and the compaction pressure used to produce the block. Based on strength considerations, great savings of material in the range of 10 to 40% could be achieved, if thick internal and external walls traditionally made of sun-dried earth bricks are replaced by thinner walls built of cement - stabilized earth blocks. Furthermore, time of construction and labour requirements would be reduced too. Reduced wall thicknesses are indicated on the plan shown in Fig. (8) by the hatched areas.

2. As mentioned before, burnt bricks are used for exterior wall surfaces only, probably as a protection for the rest of the wall made of sun-dried earth bricks against rainfall. The use of cement - stabilized earth blocks in the construction of external walls, would eliminate the need for providing an exterior layer of burnt bricks, since it has been reported that cement - stabilized blocks are durable enough and can withstand rainfall without the need for any rendering [20]. This is particularly true for Kandahar area which has mainly dry climate. As a result of eliminating the use of burnt earth bricks, the following economical and environmental advantages may be achieved:

   - saving energy since no fuel is needed to burn the blocks.
   - reducing production costs where kilns do not have to be built and where losses in terms of under or over burnt bricks are eliminated.
   - reducing pollution resulting from the burning of fuel and bricks thus keeping the rural areas clean.

4. CONCLUSIONS

- If there is one conclusion to be made of this paper research, it should be the strong emphasis on self-reliance in the reconstruction of small settlements in Afghanistan. Self-reliance should be percieved at various scales (e.g. the whole country, the region, and the village) with more attention given especially to smaller local scales.

- Without self-reliance, the expediency of dependence on international assistance would be perpetuated, in spite of the obvious fact that such assistance cannot be guaranted forever and may not come innocently without a price and attached strings. Self-reliance seems to be the only strategy capable of satisfying the needs of

millions of Afghanis for shelter in a holistic environment. It is also the way to percieve and utilize such reconstruction activities, not just as "products" that can be imported, but as a "process" for building and developing the socio-economic structure of the country.

- Self-reliance should be differentiated from self-sufficiency which is not recommended here for being an unrealistic absolute and an unjustified extreme. A controlled degree of interdependence with the outside world is always needed.

- Self-reliance can be achieved through the development of local resources -- both material and human. the development of material local resources includes the utilization of or response to all elements of the natural environment that affect reconstruction activities directly and indirectly -- e.g. utilization of earth-based building materials; protection of agricultural and other productive lands; and adaptability of building design and settlement layout to climate, terrain and natural drainage. The development of human resources includes the use of appropriate technology for maximum participation of users in building activities; the enlightened utilization and enhancement of local arts and crafts including traditional building techniques; and ethnic integration through reconstruction activities.

- By definition, these local resources have to be dealt with on a regional and sub-regional basis, since they differ from one locality to another in terms of the natural environment, the social environment, traditional architecture, building techniques and settlement patterns.

- Lessons from other places of the world showed the importance of users participation not only in construction activities, but also in decision making at various scales in cooperative arrangement that still return the satisfaction of differing individual needs.

- Any policy for reconstruction in Afghanistan cannot succeed unless it stems clearly from Islamic Shariah especially in terms of defining priorities for action -- Which locality gets funds for reconstruction first? and which aspect of the built environment gets repaired first? The first question relates mainly to fairness (that can be linked directly to the degree of destruction). The second question relates basically to functionality and efficiency.. e.g. clearing of mine fields then repairing irrigation canals, then building roads and then houses.

REFERENCES AND NOTES

* This paper is extracted from a research project report intitled " Towards an Environmental Design Strategy for the Reconstruction of Small Settlements in Afghanistan", sponsord by King Abdulaziz University. Co-investigators in this project are: Dr. Hamdy H. Abdel-Rahman (structural aspects) and Mr. Mubarak S.Tung (design aspects). The Principal Investigator of this project is Dr. Abdelmohsen M. Farahat, the author of this paper. The author of this paper is responsible for all opinions expressed in it.

1. Turner, J., Housing by People, (New York: Pantheon Books, 1977), pp. 110-111.

2. Hakim, B.S., Arabic Islamic Cities, Building and Planning Principles,(London: KPI Limited, 1986), pp.19-22.

3. Akbar, J., Crisis in the Built Environment, the Case of the Muslim City, (Singapore: Concept Media, 1988), pp. 13-14.

4. National Academy of Sciences, More Water for Arid Lands: Promising Technologies and Research Opportunities, (Washington, D.C., 1974), pp. 13-19 & 26-29.

5. Hallet, S. & Samizay, R.,Traditional Architecture of Afghanistan, (New York & London: Garland STPM Press, 1980), p. 195.

6. Ibid, p. 195.

7. Dupree, L., Afghanistan, (New Jersey: Princeton University Press, 1980), p. 17.

8. Hodges, C., "Desert Food Factories", Technology Reviews, MIT, Vol. 77, No.3, (Jan. 1975), pp.33-39.

9. Sherrer, O., "Afghan Refugee Housing", Mimar, Architecture in Development, (No.34, March, 1990), p. 43.

10. Ibid, p. 43.

11. Alexander, C., with Davis, H.; Martinez, J. and Corner, D., The Production of Houses, (New York: Oxford University Press, 1985), pp. 33-36.

12. Farahat, A. & Cebeci, N., "A Housing Project: Intentions, Realities and Alternatives", International Journal for Housing Science and its' Applications,(vol.6,No.3,1982) pp. 209-227.

THE INTERNATIONAL SYMPOSIUM OF
HASSAN FATHY
FOR ARCHITECTURE OF THE POOR

FROM 20th to 22nd April 1993,
Cairo, Egypt

TITLE

INVESTING SOCIETY'S ENERGY IN SELF HELP BUILDING: THE PARAMETERS FOR PARTICIPATION.

BY
Dr. Nicholas Wilkinson

ADDRESS

University of Newcastle
Tyne, U.K.

INVESTING SOCIETY'S ENERGY IN SELF HELP BUILDING:

The Parameters for Participation.

Nicholas Wilkinson and Dr. Hala Kardash

INTRODUCTION..

Participation per se is only possible when rules are prescribed which allow players to move in unrestricted yet parametric ways. Games such as football or chess, to name but two, allow their sides to move around in a framework of rules which determine characteristic moves, building goals or eliminating pieces which at the end of a prescribed period of time, determine winners and losers.

Trams or Buses.

The aftermath of games leads to an analysis of strategies and the prospect of the next match in an attempt to play a better game whose quality depends on the skill and competence of the players. The fact is that each player can weigh up the opposition, assess,analyse and act leading to numerous outcomes in a great number of sequences which are to a large extent under the control and power of the player. Car driving works with similar parameters which brings to mind the limerick by William Frankena on Ethics:

"It grieves me to think that I am,
Predestined to move,
In a circumscribe groove,
In fact not a bus but a tram !"

Responsibility.

The pleasure of participation must not be undervalued. With choices available in terms of position, dimension and time players or drivers can exercise their own decision making powers and are significantly responsible for their actions.

It is very difficult, especially with a referee and five thousand spectators, to pass the blame for mistakes onto a third party. You are judged according to your actions and the consequences, good or bad are for your own shame or pleasure.

THE LINK WITH HOUSING.

It is quite a simple affair if the attitude is taken that each side, that is the beneficiaries on the one hand and the Government on the other, has a role to play and each has limitations in terms of available choices, strategies and resources.

The point of view taken is quite a simple one. Each side is responsible for certain actions. However when we come to a specific project the players are often so utterly at odds with eachother in agreeing the rules of the game in the first place. The results are at their worst a roughly organised pile of timber, mud, brick and stones. At their best, when the parameters for participation are established by the residents,

touching not only on housing but education, employment, health,sanitation,environment and local management. the results are places of hope, are poor yet are socially, economically and culturally dynamic.

SIDES WHICH NEVER PARTICIPATE.

The Government.

We are more used to the familiar role of government, in the low income housing sector, scoring a goal a minute with the opposition immobilised with policy makers taking the project not only as their own creation but more importantly where every move and decision has been "paperised" and prepackaged to be acted on by different parties down the line, including the inhabitant, whose role to build a house is pre- described "....take three steps forward, turn 90 degrees right, take ten steps....." etc.

The User.

Conversely the inhabitants may take the whole affair into their own hands building and planning outside the rules and regulations, inventing the game as they go along.

This is a kind of live theatre where disputes arise because of an intrusion of daylight, privacy, noise, smell, disposal of

waste and safety. Sometimes, by chance, equilibriums and balances are achieved, where a set of parameters are taken and respected but generally no common plan exists for the whole development and no particular framework exists for individual reference to assist and develop self-help energies in the building of a house.

QUASI-PARTICIPATION.

Participation relegated only to the realm of user questionaires or of executing building work according to perscribed plans and materials is a cynical political ritual where the odds are stacked heavily in favour of the promoter and where the outcome is fixed in advance of the play. (Fig.1)

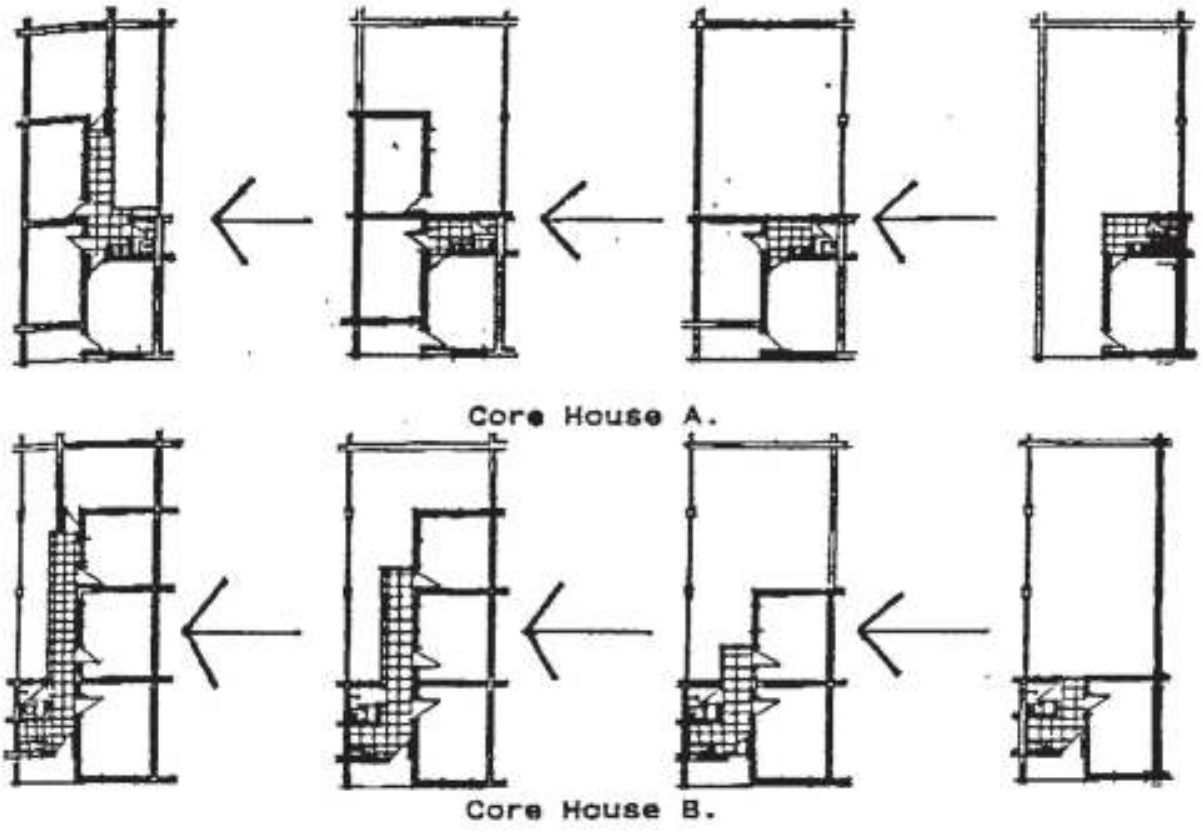


Figure 1. Quasi-Participation: Different Core Housing Types.

The free-for-all self build, both high rise and low rise,whilst often seen as the true example of participation must also be relegated to the ranks of quasi-participation. This form of building and environmental ad-hocism form has been extensively research, analysed and documented in the doctoral work on Transformations and Self-Help by Kardash (1). There are subsumed rules which allow some freedom of movement and which uphold a certain public and private standards but the frameworks are so weakly implied that strength of structure, character and performance in the resultant built forms and environmental quality leave much to be desired. (Figs 2 and 3.)

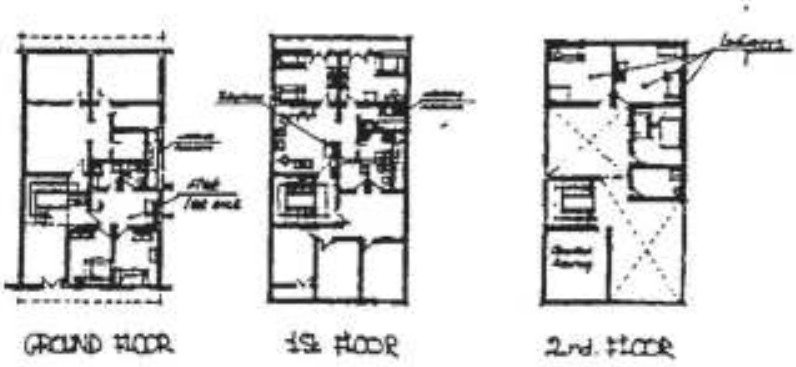


Fig 2. Quasi-participation. Low rise core housing.

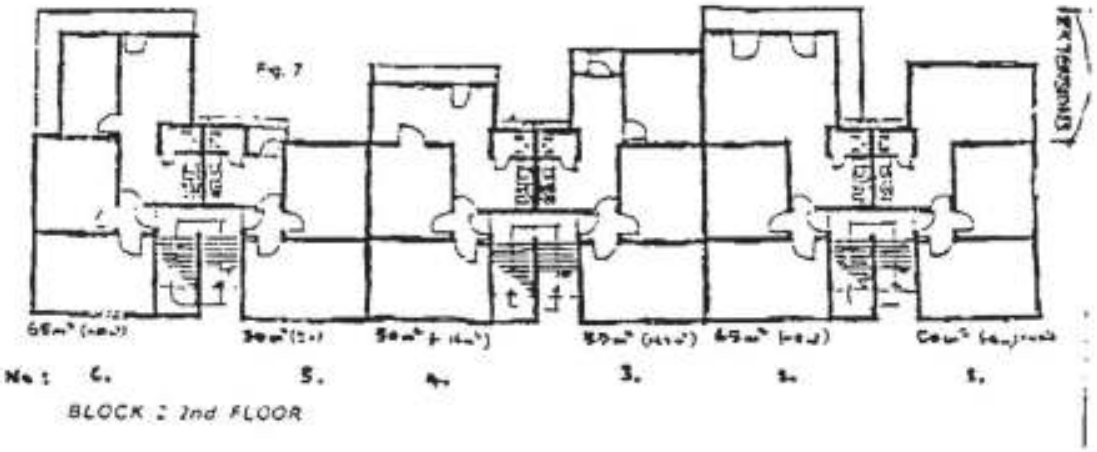


Fig 3. Quasi-participation. High - Rise.

PARAMETERS FOR PARTICIPATION.

Investing society's energy in Self-Help Building.

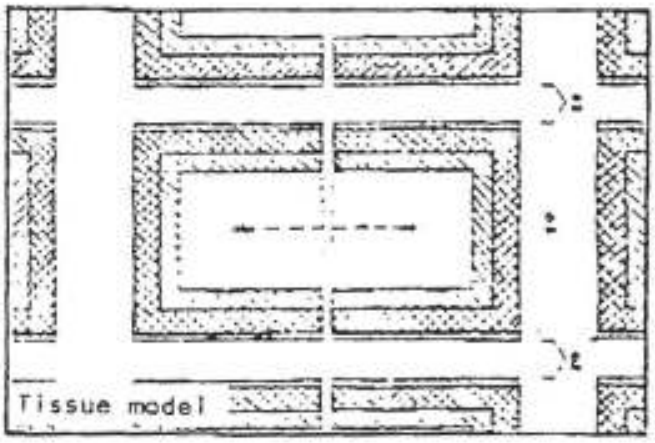
Real participation in housing must allow a degree of ad hocism which falls outside of the rules but should not cause enough violation to qualify as being illegal or punishable by demolition or fine. Being sent off the field does happen but is an agreement to maintain continuity and standards of performance.

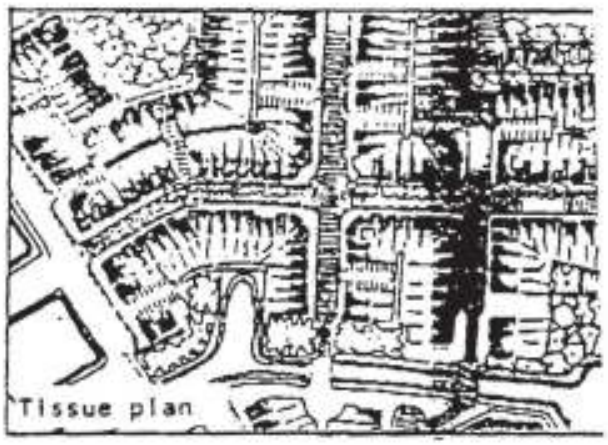
Into the equation of participating sides and rules and regulations, training is required. In the first place an understanding of requirements is necessary in order to draw up the rules. When these are known training can begin.

In our case of the Governemnt versus the Users in Self-Help building, the avoidance of poor quality can be achieved by the of understanding of the requirements of each side and the training of the players to meet those same requirements.

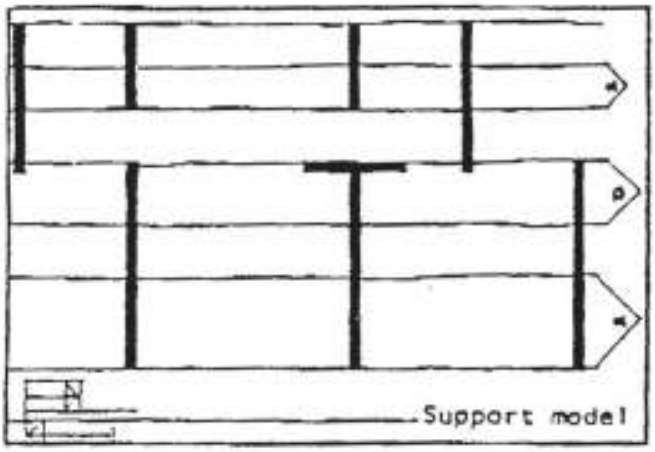
Each side needs to practise and develop their skills. A common denominator must surely be the language of the game. Without this not much hope of success can be expected. Language means communication and for communication the definition of elements which we are talking about, needs to be specified.(Fig 4.)

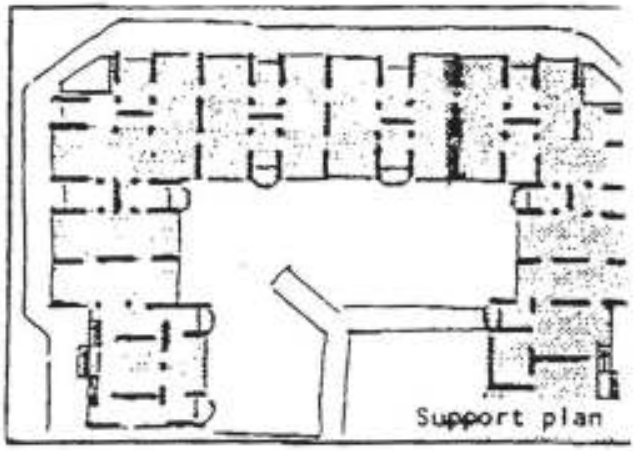
Tissue Level



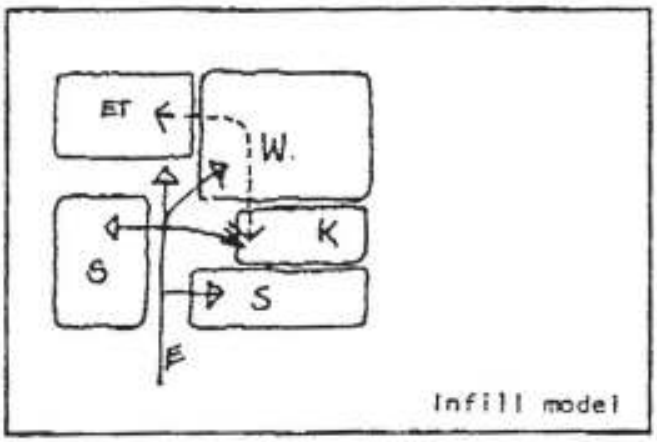


Support Level





The infill level



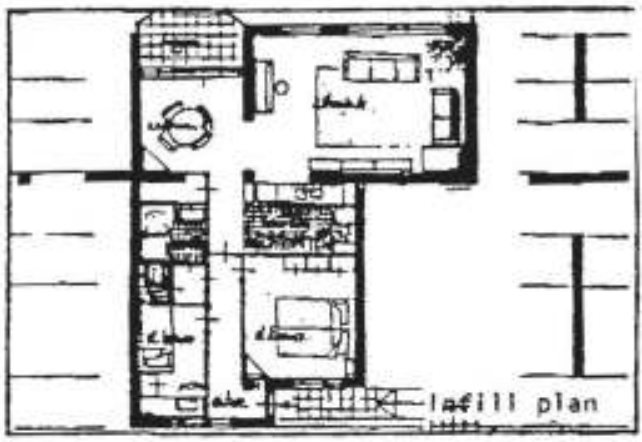


Fig 4. Parameters for Participation:Levels of Decision Making

Fig 4. Parameters for Participation:Levels of Decision Making

The Figure 4 example is only a general one and needs to be adapted to culture, context and climate. The built environment is complex affair. In its cultural context and various social and economic stratifications environments cannot be made in an orderly and human way without an explicit description of the parameters which address the ways in which particular social and economic group work and live.

Finally, the sides must respect eachother and if one side is weaker, then the weaknesses must be aknowledged and allowances made. A game, after all, is to be enjoyed but unlike a game our domestic lives are a continuity of efforts redressing themselves, upgrading, improving and learning how better to communicate and act within the rules and at the same time aspire to higher ideals and more articulate results.

References:

Frankena W. 1954 Ethics Prentice Hall, USA

Kardash H. 1993. The Transformation of Public Housing Provision in Egypt and The Role of Self Help. Doctoral Thesis, University of Newcastle on Tyne.UK

THE INTERNATIONAL SYMPOSIUM OF HASSAN FATHY FOR ARCHITECTURE OF THE POOR

From 20th to 22nd April 1993,
Cairo, Egypt

TITLE

TOWARDS THE REGISTRATION OF MATARIYA: A PROJECT PROPOSAL

BY
Prof. Dr. Anthony D.C. Hyland

ADDRESS
Centre for Architectural Research & Development Overseas,
University of Newcastle
Tyne, England

TOWARDS THE REGENERATION OF MATARIYA: A PROJECT PROPOSAL

Anthony D.C. Hyland

Status: Deputy Director,
Address: Centre for Architectural Research & Development Overseas,
University of Newcastle upon Tyne, England.

Abstract

In an ancient country like Egypt, the national heritage is a major generator of economic development through the activities of the tourist industry. Some parts of the country, some sectors of society benefit from those activities, others do not. But the national heritage is not a static good, it is continually growing, as new aspects are added or revealed.

Matariya, a rapidly growing municipality in the northern part of Cairo, occupies the site of the ancient city of Heliopolis, and contains, in the village of Al Zahraa, a religious shrine, venerated by Christian and Muslim alike, with a popular appeal that transcends religious boundaries.

The shrine of the Virgin's tree, reputedly (the successor of) the sycamore tree under which the Holy Family rested on their arrival in Egypt, was once and could become again a powerful focus of devotion. The author believes it has the potential of becoming a source of regeneration of the neighbourhood, leading to the physical rehabilitation, upgrading and transformation of the whole area, and proposes a project to that end.

'The past is another country'[1], but a country of which we are all citizens. It may not be a country many of us visit very frequently, or to which we profess any allegiance, but like our native country, and the country in which we live now, it is an inalienable part of each one of us. For those of us who live in an old country, this is particularly true, and our past may heavily constrain us; but though we may well be shaped by our country's history, we re-write that history for each successive generation,[2]. There are many old countries, but few have such a weighty, such a burdensome heritage as Egypt. In no other country in the world is the national heritage - historical, architectural, archaeological - so substantial as in Egypt. Many countries have a long and proud history, which is reflected in the heritage that their citizens are heirs to, but in few countries has that heritage become the driving force of the national economy. In Greece and Italy it is becoming so; in Britain it may become so,[3] in Egypt, it has already become so.

Acknowledging the power and influence of the heritage industry, I am cautious about harnessing that power in countries like Egypt and my own: furthermore, I am doubtful about the benefits of many manifestations of the heritage industry for the common people. The heritage industry has become virtually synonymous with the tourist industry: the former term identifies the product - the heritage; the latter term identifies the consumer - the tourist. In countries where the average citizen can afford to be a tourist, there may be no conflict of interest between the needs of citizens and the demands of tourists; but in countries where the average citizen cannot afford to be a tourist, there probably will be major conflicts of interest. The history of the attempts to resettle the inhabitants of Old Gourna provides evidence of such conflict, as Hassan Fathy himself acknowledged,[4].

It is with considerable trepidation, therefore, that I propose intervening in this country's development, by tapping into her power source, the national heritage, to energize and activate development for the benefit of the common people. But I welcome the opportunity presented by this Symposium, to test the validity of my proposals in the forum of my colleagues and fellow participants, against the social, economic and political realities of present day Egypt.

You may ask in what additional ways can the Egyptian national heritage possibly be harnessed in the interest of national development: surely our historic monuments and sites have been exploited enough in the interests of tourism? The last drop of meaning and association and aesthetic appreciation has been squeezed out of every hieroglyph and hypostyle hall, every mausoleum and 'mashrabiya'. Surely, the problem is rather, how to prevent the feet and hands and breath and sweat of countless tourists wearing our monuments and sites away?

This is a real problem, a problem we face in Europe, in Britain, too. To spread the load more widely, to channel the flow of tourists more extensively

throughout the country, by revealing hitherto unsuspected treasures and creating new tourist trails and destinations, is one way not only of reducing the rate of wear and tear on our major monuments, but of bringing the economic benefits of tourism to less prosperous parts of the country. This has been done most effectively in Britain through exploiting the comparatively new discipline of industrial archaeology and promoting the country's industrial heritage, in a wide variety of ways. Reviving and re-activating abandoned steam locomotives and water-mills, converting empty factories and power-stations into visitor experiences, creating living museums on green field sites by assembling and re-constructing there derelict buildings and obsolete industrial installations; nowhere more effectively than at Beamish, not far from Newcastle, where the Beamish Open Air Museum of North Eastern Life, designated European Museum of the Year in 1989, now draws hundreds and thousands of visitors and generates hundreds of jobs and millions of pounds of revenue annually,[5].

Another layer of Britain's national heritage that is being increasingly revealed and promoted is the religious: through the excavation and exploitation of sites associated with the introduction of Christianity to Britain, and with the holy men and women who first brought the gospel to the British people. This has resulted in not so much the revival of the cult of saints, as the revival of the spirit of pilgrimage and the recognition of 'holy places'. In the North East of England, again, this development is most evident, in places like the Holy Island of Lindisfarne and Durham Cathedral, both associated with the 'apostle' of the North, St. Cuthbert, and both promoted, for their Christian associations, by the Northumbria Tourist Board.

The industrial and the religious aspects of the national heritage, as significant and as valuable in Egypt as in Britain, await and deserve more effective presentation and interpretation in Egypt, I believe, than they now receive. Receiving the presentation and the interpretation they deserve, those aspects of the national heritage can and will regenerate and replenish the national economy - through the expansion of tourism into new areas - and enrich national life. Throughout the country, there must be many hundreds of sites that reveal, or conceal, one or other aspect of the national heritage: as an outsider, it would be presumptuous and foolish of me to attempt to estimate their quantity or quality. I know of just one such site, and that not far from here - at Matariya.

I first heard about the site of the Virgin's Tree at Matariya, thirty years ago, during my first visit to Egypt. During that visit, in 1962, I was overwhelmed by the awesomeness of the Pharaonic monuments, amazed by the magnificence of the Islamic architecture of the mediaeval period, and touched, moved by the humbler Coptic relics of the Christian period. As a young still immature architect, I was not prepared for the excellence of the architecture of Islam; as a young Western Christian, I had not expected the survival of the ancient Coptic churches in Old Cairo, around Fortress Babylon. While there, I learnt about the Virgin's Tree at Matariya, and I later visited the place.

The site was unkempt, rather forlorn: the ancient settlement, picturesque once, perhaps, with an honourable identity of its own, had been swallowed up, it appeared to me, in the peri-urban sprawl of modern Cairo. I perceived little, if anything, of the 'genius loci', the spirit of the place: and what I could learn about the site of the Virgin's Tree was rather perfunctory,[6]. Legend had it that this was the site of the sycamore tree under which the Holy Family - Mary and Joseph and the infant Jesus - rested, when they first arrived in Egypt, fleeing persecution in Judaea. To visit the site was a moving experience for me, for the Flight into Egypt is one of the powerful themes of the Christmas Story, and a popular subject of Christian iconography,[7]. And yet, there was little if anything to distinguish the place from anywhere else in peri-urban Cairo, apart from the fact that it was quite close to what little remains of the ancient city of Heliopolis. A recently published guide to the antiquities of Egypt states:

> 'Practically nothing remains of this once great city, the 'On' of the Bible, dedicated to the sun god Rē and to Atum, the primeval creator. A suburb, 'Pithom' or Estate of Atum, was built for Pharaoh by the Children of Israel (Exodus 1:11) but only the solitary obelisk of Senwosret I is left standing today in the northern Cairo suburb of Mattariya: the location is inconvenient, and few visitors will seek it out.'[8]

Matariya, already swallowed up by modern Cairo when I first visited the place, continues to grow. From Galia El Kadi, I subsequently learnt about the dynamics of growth and settlement that explained its phenomenal expansion,[9]. Created a separate municipal district in 1947, its population expanded between 1960 and 1976 from 161,000 to 535,000 inhabitants. At its heart, was the ancient settlement, now known as El Zahraa, whose notable inhabitants and leading families had acquired much of the agricultural land in the area and actively promoted its sub-division for building, thus participating in the spontaneous urbanisation of Cairo. But underlying all this activity, I sought for evidence of an inherent quality, a 'genius loci' that could transform the urban built environment. I needed to dig beneath the surface of twentieth century Maturiya, to reveal that evidence.

You may ask, what concern is that of mine? Is it not insufferably presumptuous for an outsider, and an Englishman at that, to propose some 'hidden agenda' for the development of one municipal district of Cairo? What are my credentials? What <u>are</u> my credentials? - let me lay them on the line.

Recognising that Egypt shares with Israel/Palestine the distinction of having hosted many of the formative events that have shaped the history of the world's three great monotheistic religions, as described in the pages of the Old and New Testaments of the Holy Bible and of the Holy Koran, I believe that Egypt shares with Israel/Palestine the responsibility for re-creating an environment in which those three great religions, and their adherents, may meet together and live together, in mutual peace and concord, and that therein lies their true destiny. To re-create such an environment may seem a tough task, an impossible

assignment, in the present-day world. All our political actions, all our personal actions, work towards or against the re-creation of such an environment. Politicians took a step in the right direction, I believe, in signing the Camp David agreement; architects and planners can take a step in the right direction, too, by collaborating in projects that seek to create such an environment.

One such project is the one I am proposing for Matariya.

Matariya, at present a rapidly growing municipal district in the governorate of Cairo, on the northern peri-urban fringe of the city, populated predominantly by the poor, low-income workers in the city's industrial and service sectors, and rural immigrants, and starved of resources with which to provide the urban infrastructure and the educational, health and community facilities that the municipality needs, contains, in the village of El Zahraa that is the heart of this sprawling urban area, a religious shrine, venerated by Christian and Muslim alike, and with a popular appeal that transcends religious boundaries.

The shrine of the Virgin's tree, reputedly (the successor of) the sycamore tree under which the Holy Family rested on arrival at Heliopolis after their flight into Egypt, was once and could become again a powerful focus of devotion. I believe it has the potential of becoming a source of regeneration for the whole area, leading to the physical rehabilitation, upgrading and transformation of the neighbourhood that surrounds the shrine, through the mobilization of resources not normally available for urban improvement in Egypt.

The site has religious associations far older than those with Mary and Jesus: both the Holy Bible and the Holy Koran associate Moses and Joseph with On, the Pharaohic city of Heliopolis. These levels of association strengthen the case for the project.

I began preparing the proposal for the project by making an initial brief literature search and sounding out Egyptian and Arab colleagues. Enquiries about the meaning of the name Al-Matariya revealed little more than that the Arabic form of the name conveyed the sense of a wet or muddy place; and of the name El Zahraa, an association with the prophet Mohammed's daughter.

The brief literature scan, revealed some interesting facts about the place. According to Stanford's Handbook for Egypt and the Sudan, an invaluable guide for colonial travellers:

> The gardens of the small village of Matariya were formerly renowned for the balsam they produced. The balsam-plants are said to have been brought from Judæa to this spot by Cleopatra; who trusting to the influence of Antony, removed them, in spite of the opposition of Herod, they having been hitherto confined to Judaea. Josephus tells us that the lands where the balsam-tree grew belonged to Cleopatra, and that "Herod farmed of her what she possessed of Arabia, and those revenues that came to her from the region about Jericho, bearing the

> balsam, the most precious of drugs, which grows there alone." This is the Balm of Gilead mentioned in the Bible. The plants were in later times taken from Matarîya to Arabia and grown near Mecca, whence the balsam is now brought to Egypt and Europe, under the name of Balsam of Mecca; and the gardens of Heliopolis no longer produce this valuable plant. But a still more profitable shrub - cotton -is said to have been first cultivated, at the beginning of the century, on the ground near the obelisk; an experiment which has succeeded far beyond the most sanguine expectations.(9)

The author goes on to describe the Virgin's Tree:

> The **"Virgin's Tree."** Just after leaving the village of Matarîya, at a little distance from the road on the rt., is the garden in which is shown the sycamore-tree beneath whose shade the Holy Family are said to have reposed after the flight into Egypt. The present tree, which fell in 1906, is known to have been planted in 1672, the former one having died in 1665. It was a splendid old tree, and still shewed signs of life as late as the summer of 1906, when it fell. It was terribly mauled alike by the devout and the profane, who respectively have forgotten their piety and their scepticism in the egotistical eagerness to carry away and to leave a record of their visit. The present proprietor, a Copt, fearing lest their united efforts should result in the total disappearance and destruction of the tree, has put a fence round it, which, while it prevents the ruthless tearing off of twigs and branches, affords those who are anxious to commemorate their visit a smooth and even surface on which, with the help of a knife obligingly kept in readiness by the gardener, they may make their mark. A short distance beyond the Virgin's Tree is an ostrich farm, which is well worth a visit. It produces a considerable amount of feathers annually.(10)

More information was provided by Stanley Lane-Poole in his Cairo - Sketches of its history, monuments and social life, published in 1892, referring to the Pharaonic associations of the site:

> Near Cairo, forming the southern point of the triangle which included the land of Goshen, stands a solitary obelisk of red granite, the oldest but one in Egypt - the only sign remaining that there was once a "City of the Sun." In the plain of Matarîya, before this lonely stone, the Turks fought the battle that won Egypt from the Memlûks in 1517, and Kléber gained his famous victory in 1800 over the very site of Heliopolis, or On, the oldest seat of learning in the world. There stood the famous temple of On of which Potipherah, the father of Joseph's wife, was priest; here Pianchi, the Ethiopian priest-king, eight centuries B.C., washed at the "Fountain of the Sun," and made offerings of white bulls, milk, perfume, incense, and all kinds of sweet-scented woods, and entering the temple "saw his father Ra [the sun-god] in the sanctuary." Heliopolis was the university of the most ancient civilisation in the world, the forerunner of all the schools of Europe. Here, in all

probability, Moses was instructed by the priests of Ra in "all the wisdom of the Egyptians"; here, too, Herodotus cross-questioned the same priesthood with varying success; here Plato came to study, and Eudoxus the mathematician to learn astronomy; and here Strabo was shown the houses where the famous Greeks had lived. Of this seat of learning and focus of religion nothing but the obelisk remains. "The images of Beth-Shemesh" (the "House of the Sun") have indeed been "broken," and "the houses of the Egyptians' gods" have been "burned with fire."

Beside the Obelisk is an ancient sycamore, riv:n with age and hacked with numberless names, beneath which trad:.ion hath it that the Holy Family rested in their flight into Egypt, and which is hence known as the "Virgin's Tree." Near by is a spring of fresh water - a rare sight in this brackish land - which, it is said became sweet because the Bambino was bathed there. From the spots where the drops fell from his swaddling clothes, after they, too, had been washed in this sacred spring, sprang up balsam-trees, which, it was believed, flourished nowhere else. There is no evidence for these fancies, and, of course, the sycamore is but a descendant of the supposed original, as it was not planted till after 1672. But the circumstances that a temple was built by the Hebrew Onias for the worship of his countrymen near here, and that Jewish gardeners were brought here for the culture of the balsam-trees, give the tale a certain fitness. "The tradition is no more than a legend, yet there is no place in Egypt to which the visit of the Holy Family would be more fit, than to the almost deserted seat of learning, when it was already the parent of the great university under whose widespreading shadow grew and flourished those Hebrew and Christian schools which had so mighty an influence in the annals of the early Church. Thus Heliopolis then represented that which was passing away, not without hope of that which was to come. The least monumental of all the sites of Egypt, without temple or tomb, nor any record but the obelisk, is yet eloquent of greater things than the solemn pyramids of Memphis or the storied temples of Thebes. What these tell is rather of Egypt's history than the world's; the idea that Heliopolis suggests is the true progress of the whole human race. For here was the oldest link in the chain of the schools of learning. The conqueror has demolished the temple; the city, with the houses of the wise men, has fallen into hopeless ruin, downtrodden by the thoughtless peasant, as he drives his plough across the site. Yet the name and the fame of the City of the Sun charms the stranger as of old while, standing beside the obelisk, he looks back through the long and stately avenue of the ages that are past and measures the gain in knowledge that patient scholars have won. He sees that phoenix-like power of renewing her youth, which gives all wisdom the deathlessness which is at once a type and a presage of immortality."

Much earlier than these colonial Britons, fifteenth century Italian visitors to Egypt recorded their impressions, quoted here in an 19th century French translation:

> 'Près du Caire, à environ dix milles, sur la route direct pour Sainte-Catherine, nous vîmes beaucoup de choses remarquables, et d'abord une fontaine d'eau très belle, à l'eau limpide et bonne. Elle est partagée par un mur au milieu, de sorte qu'il y a deux sources d'eau, l'une à côté de l'autre. Le sultan a fait élever sur cette fontaine une construction belle et grande comme on les fait là-bas. Là se trouve le jardin du sultan, très grand et très beau, plein de dattiers et d'excellents fruits. Dans ce jardin se trouve l'endroit où est produit le baume, lequel ne croît nulle part ailleurs. Il y a là plusieurs employés et fonctionnaires du sultan pour garder le jardin et l'entretenir. Ces fonctionnaires inscrivent les récoltes de baume. Le sultan en fait grand cas et prend ses mesures pour qu'on ne lui en vole pas. On dit que c'est Notre Seigneur qui, de ses pieds, fit jaillir cette source à la demande de sa Mère, quand ils eurent fui la Syrie et furent parvenus en Égypte en traversant le désert sans eau: Notre Dame eut soif et, ne trouvant pas d'eau, elle demanda à boire à son Fils; alors Jésus frappa la terre du pied. Dans cette source Notre Dame lava les linges de son Fils, et elle les tendit à sécher sur les arbustes du jardin, lesquels ont depuis produit le baume . . . " [12]

The references to the cultivation of balsam, or balm, prompted me to consult a Biblical Concordance. The phrase 'balm in Gilead' is one of those resonant phrases, familiar, evoking a sense of healing power, but not self-explanatory. I was surprised to discover only two citations in the Concordance I consulted,[13], both with Egyptian associations. The first cites Genesis 37 : 25, in the account of Joseph's abduction by his brothers:

> 'Then they sat down to eat: and looking up they saw a caravan of Ishmaelites coming from Gilead, with their camels bearing gum, balm and myrrh, on their way to carry it down to Egypt.'

The second cites Jeremiah 8 : 22 in which the prophet Jeremiah, prophesying the fall of Jerusalem and the Kingdom of Judah to the Babylonian King Nebuchadnezzar, and the flight of the Jews into Egypt, asks:

> 'Is there no balm in Gilead? Is there no physician there? Why then has the health of the daughter of my people not been restored?'

The association of Matariya with the cultivation of balsam, and the healing powers associated with it, is an important one.

The earliest literary reference to the site that I have come across so far is in the writings of Abû Sâlih, an Armenian who lived in Egypt during the late 12th and

early 13th century. Translated into English as 'The Churches and Monasteries of Egypt and some neighbouring Countries', his manuscript describes the country and its Christian buildings at the time of the Kurdish invasion under Saladin. Although his account is rather garbled and difficult to follow, it is clear that he knew Matariya well:

> 'The church of the Pure Lady Mary, called Al-Martûtî, is surmounted by a cupola. in ancient days, this was a place of worship of the Israelites when they were in bondage in Egypt; and when our Lord Jesus Christ came down into Egypt from Syria, with his mother in the flesh, our Lady the Pure Virgin, and the righteous old man Joseph the carpenter, they sat in this place where there is now a picture of the Lady before the holy altar. The church was founded by the Copts under the name of the Lady, and was called Al-Martûtî, which is the Greek word Matîr-tâ, and means 'Mother of God the Word',[14].

Is this the origin of the name Al-Matariya? Rather than being named after a muddy place, which present-day Egyptians might suppose, is not this ancient settlement now swallowed up in the outer suburbs of Cairo, named after the Mother of Jesus? And does not the local name Al-Zahraa, daughter of the Prophet, confirm the religious association?

Abû Salih continues his description of the church:

> When this church grew old it fell into decay, and was restored by the Shaikh Abû 'l-Yaman Wazîr, a native of Sanhûr, and metwalli of the Divan of the Delta, and by Abû 'l-Mansûr, his son, in the caliphate of Al-Âmir, and in the vizierate of Al-Afdal Shâhanshâh. In its upper story Abû 'l-Yaman built a beautiful *manzarah* called As-Salûkîyah, and the priests assembled there, and he conversed gaily with them; this was in the lunar year 478 (A.D. 1086), in the patriarchate of Cyril, and the episcopate of Daniel. He also caused a complete set of vessels of goldsmiths' work to be made for this church, for the liturgy and the incense and all the needs of the church. In the upper story of the church he built several dependences and offices. A small garden was attached to the church, and was entered from the interior of the building; and the door gave proof of its existence. So the government laid its hands upon this garden, and it was taken away from the church.[15]

The small Coptic church that adjoins the site of the Virgin's Tree today is clearly not the church described by Abû Salih, but it may stand on the site of the earlier one. Abû Salih goes on to describe other Christian churches and monasteries in the locality, which do not concern us here, and of which presumably all track is now lost.

From the little I have read so far, it is clear that there is sufficient documentary evidence to confirm the historic and religious importance of the site. Its

conservation and rehabilitation, therefore, can be justified as an enhancement of the national heritage. I see no reason why it should not attract pilgrims and tourists from all over the world, and by so doing, stimulate the social and economic regeneration of the whole area. To that end, I am proposing this project.

The proposed project envisages a three phased study: firstly, a historical, socio-economic, physical and environmental study of the shrine and the surrounding neighbourhood, and an examination of its function and status within the municipality of Matarîya; secondly, in collaboration with the local community, the identification of local needs and aspirations, and of local and national resources with which to meet them, and the drawing up of a programme of work for planning and implementing a pilot project in the area surrounding the shrine; and thirdly, the mobilization of resources, locally, nationally and internationally, for the implementation of the pilot project, the monitoring of the process of implementation and the evaluation of the project upon completion with a view to assisting the community and the local authorities to extend the rehabilitation and transformation programme throughout the neighbourhood and beyond. The target date for the completion of the pilot project and the inauguration of the larger programme would be the year 2000, the perceived bimillenary of the birth of Jesus.

Bricks and concrete and piped water do not regenerate and transform a community, but the human resources of its members, and the power, the enthusiasm and the skills that they can mobilize. These are the materials that this project seeks to identify and to mobilize, to bring the project to fruition. It is, I believe, one that Hassan Fathy himself would have supported.

References:

1. Quotation from a novel by L.P. Hartley.
2. Wright, Patrick, On Living in an Old Country: the National Past in Contemporary Britain, London, 1985.
3. Hewison, Robert, The Heritage Industry, London 1987.
4. Fathy, Hassan, Architecture for the Poor, Chicago, 1969.
5. Wright and Hewison, op.cit.
6. Habib, Raouf, Mataria and the Virgin Tree, Cairo, n.d.
7. Representations of the Flight into Egypt are far too many to list or even number. One of the most attractive, and among the earliest known examples in the West, is the fresco by the Italian painter Giotto (1267-1337) in the Arena Chapel in Padua.
8. Murname, W.J., The Penguin Guide to Ancient Egypt, London, 1985, (p.106).
9. El Kadi, Galila, L'Urbanisation Spontanée au Caire, Tours, 1987.
10. Hall, H.R., ed. Handbook for Egypt and the Sudan, 11th edition, London, 1907, (pp.147,148).
11. Lane-Poole, Stanley, Cairo: Sketches of its History, Monuments and Social Life, London, 1892, (pp. 212-214).
12. Dopp, F. 'Le Caire vu par les voyageurs occidentaux du moyen âge', Bulletin de la Société Royale Geographique d'Egypte, tome 21, 1951 (p.149).
13. Holy Bible: Revised Standard Version with Concordance, New York, 1952.
14. Evetts, B.T., transl. The Churches and Monasteries of Egypt and some neighbouring countries attributed to Abû Salih the Armenian, Oxford, 1895, (p.137).
15. ibid. (pp.137,138).

THE INTERNATIONAL SYMPOSIUM
OF HASSAN FATHI FOR
ARCHITECTURE OF THE POOR

From 20th to 22nd April 1993,
Cairo , Egypt

TITLE

THE DEVELPMENT OF THE CITY OF GHADAMES; BETWEEN THE LOST IDENTITY AND THE SEARCH FOR MEANINGFUL AND PRODUCTIVE RURAL ARCHITECTURE

BY

DR. ABDUL-JAWAD H. BEN SWESSI

ADDRESS

ASSISTANT PROFESSOR
UNIVERSITY OF EL-FATEH,
TIPOLI, LIBYA

THE DEVELOPMENT OF THE CITY OF GHADAMES; BETWEEN THE LOST IDENTITY AND THE SEARCH FOR MEANINGFUL AND PRODUCTIVE RURAL ARCHITECTURE

Dr.Abdul-Jawad H. Ben Swessi
Assistant Professor
Department of Architecture
University of Al-Fateh
Tripoli Libya

1993

ABSTRACT

The aim of this research has two objectives: first, to explore the uniqueness of architectural character of the old town of Ghadames, and second, to build a theoretical guidelines based on identifying key variables that establish the fundamental constraint of architecture's identity in the development of the city of Ghadames. The ultimate purpose of the key variables is the satisfaction of ethetical as well as physical function.That is, to achieve built environment in which architecture is considered as a recongnizable and harmonious totality and determined by a set of certain characteristic domains. The proposed theoretical framework will be supported by clear, detailed design in the form of thesis projects.

The methodology used in this research is inductive investigation and comperative analysis with measurment drawings as supplementary tools.

INTRODUCTION

Many attempts in art and architecture during the 1950's and the 1960's were occured as opposition to the modern trends of architecture and specifically the International Style-that were based mainly on the personal and emotional imagination of the elites and aimed a break with tradition and searched for other values; machine, speed and psychological awareness of space. The search for the absolute led by avant-garde movement has arrived at "abstract" art which in turn reduced experience to expression.

In this regard,Hassan Fathy represented a significant role. Fathy's subjective attitude toward architecture is the search for an architectural production determined by climate,local material,sense of place,etc. This signifies that Hassan Fathy line of thought which dated back to the 1940s "underlines how far this thinking was in advance of his time."(1)

This understanding leads to the fact that during the last two decades, the attitude of rapid change and abstract expressionism's which is being an artificial seperation from life and its institutionalization as "high art" has affected the rural areas. For instance, Libya like many other developing countries of the third world had experienced a major transformations in the areas of rural settlements development. This has been obtained through planning and promotion of agricultural and rural areas. Planning was introduced whereby physical plans were prepered at national, regional, subregional and settlments level.

As a consequence to these efforts which sought rapid change from rural and agricultural economy to an urban and industrial one, much of the buildings and structures of the new settlements are

Fig.1 The old town of Ghadames

not all in accordance with appropriate design principles. They failed to achieve satisfaction of human needs of the rural people and in turn did not respect the socio-cultural tradition of the inhabitants.(2) Instead of creating a "physical environment readily identifiable by a society as its own,"(3) they constructed buildings that have become irrelevant to the specifity of the local environment and the various human needs. That is, the sense of individuality to building and places, with regard to space and character has been lost. (4) In this sense, it is irrelevant to assume certain universal principles to be applied to the solution of shelter in rural areas and specifically in the the city of Ghadames.

THE OLD TOWN OF GHADAMES

Ghadames represents a unique traditional human settlement and considered as one of the best Libyan cultural heritage. The 75 hectares of the old town was fortified by a wall and consisted of about 800 dwelling units, mosques, markets and public spaces(Fig.1). Its main purpose was the trans sahara trade. Being a small oasis in the Libyan Sahara, surrounded by a sandy and rocky desert between the great oriental Erg and the arid plateau of Al-Hamada, with mean annual temprature of up to 40° C between night and day, Ghadames did infact represent a significant example of how to obtain maximum living comfort. It

is a horizontally extended cluster in which it is difficult to distinguish the individual houses, and thus, it represented a dense town within the vast desert-the infinite expanse of the surrounding country.Every where the desert is present, and therefore, the only element which is strong enough to oppose the desert is the Oasis itself.Clearly enough, the aim was to create a built environment that is cool and filled with symbolic and rich meaning and was determined by available technology.

ARCHITECTURAL CHARACTER

The old town of Ghadames came into existence in a creative harmony of purpose and meaning,architecture and art, climate and technology. It had preserved its own character through a broad area of agreement among its architectural vocabulary. This has been encountered by an active and continuing tradition. The work of architecture within this domain emerged from certain basic principles that determined a unique character. Through this and over the centuries, people revealed their conventions, inspirations and consequently individuality.That is, Ghadames' significant architecture representing a clear expression of an attitude that is held by the society, seeking integration with the context of place and gave to the built environment a cultural belonging.

In building the old town, consideration had benn given to both; the individual and the community. The different districts within the town of Ghadames are experienced as being close to each other. Dwellings, public buildings and streets were designed and erected to cope with the essential ingredients; climatic effect, architectural details, art, color,.etc., that determined the architectural character. They are well protected volumes, linked one to another by shaded walk ways.The typical rectangular geometries and flat roofs of the the town, with different in hights create deep shadows and enlivened by repetitions and variations of simple themes, makes it a memorable place (Fig.2).

In other words,there exists a harmonious traditionalism which integrated dwellings, public buildings, streets, open spaces,etc. This concordant integration is a consequence to the builders who operated within the context of an architecture which is in sympathy with the whole town. The implicit collaborative congruence effort of the people of Ghadames, created a concordant and harmonious totality yielding a highly visible architectural character.

The builders aimed to unify the implicit pattern as well as the explicit patterns in order to form an interested large scale project--the town. In this sense we may say that the house is considered as small town while the town is considered as a big house.

Fig.2 The roof of the old town

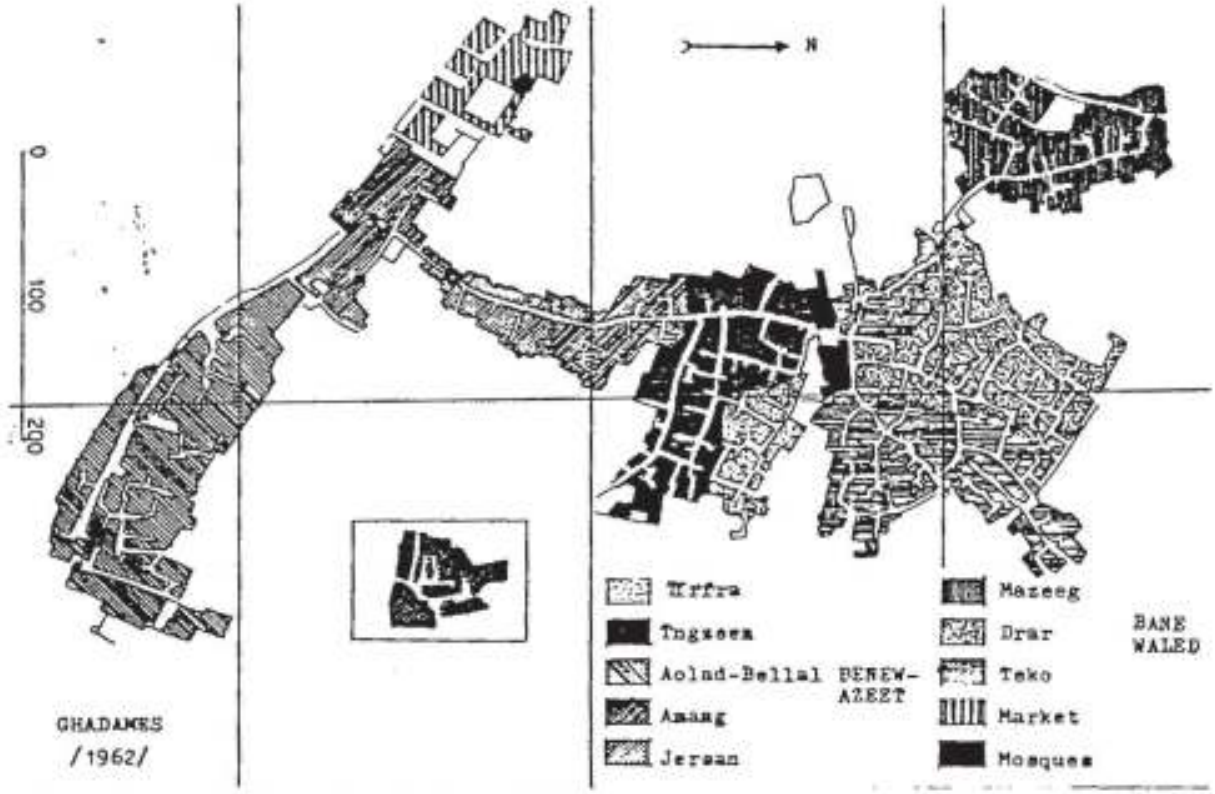


Fig.3 The seven distructs of the old town

climate, that is, the only local motif used is the stepped finials at the corners (Fig.25).

To give protection from sun and acquire a suitable human comfort, the method used in old Ghadames is that the town has become cluster in composition with few and small size openings and almost one exposed side of the house. Strangely enough, the 616's project has shown that the housing units were grouped independently (Figs. 24-27). Each housing unit has five sides exposed to the sun with the use of thin walls. This caused increase in heat gain and created discomfort living condition inside. No wonder that the A.C. units were indispensable features in this case.

A THEORETICAL GUIDELINES TOWARD BUILDING IN THE RURAL AREAS

The hypothesis is that in order for architecture to become a meaningful and productive fabric, it should derive its existing from the specific local character and common knowledge of the people. The aim of architecture achieved by a concept of identity requires an understanding and integration of the many dimensions of the program and the forces which are derivative from natural-cultural attitude. In other words, it is believed that in the process of appropriate design, the work of architecture within the development of rural settlments should be considered as a harmonious synthesis that seeks to complement and be integrated with a particular natural-cultural attitude of a miliew.

BUILDING LAWS

Regulations concerning the development of new settlements in different areas, has nothing to do with the country in large. Libya characterized mainly with three different climatic zones; the coastal zone, the mountains zone and the desert zone. Each zone is characterized by its rainfall,temperature,wind speed, customs, behavior and even accent.Accordingly, in order to achieve human and practical standards for rural dwelling and meet the newer and more diverse needs of modern life, reworking of prevailing legislation of housing in Libya is required. It must be reviewed and evaluated. The housing laws which are adopted all over Libya, ought to be worked out in order to achieve and establish an appropriate and recommended design principles that satisfy human needs.

DEVELOPHENT IN STAGES

The assumption of this study is that the development of rural areas ought to be in stages, rather than one big project. The sudden shift from rural settlements to modern urban areas cause lack of credibility.One plan can not acquire ideal solution to rural development. The aim is for more realistic and physical buildings with concern of people's

The use of such devices create a pleasing human scale. Each of these structures influences the aesthetic of urban space in a particular way. For instance, the scale of the stepped section in Aei Al-Faras is in harmony with the place. It is used as seating terraces for the spectators in wedding ceremonies and social activities. It was considered as a back stage to the whole urban space (Figs.13,14).

TILAWAN SCHOOL

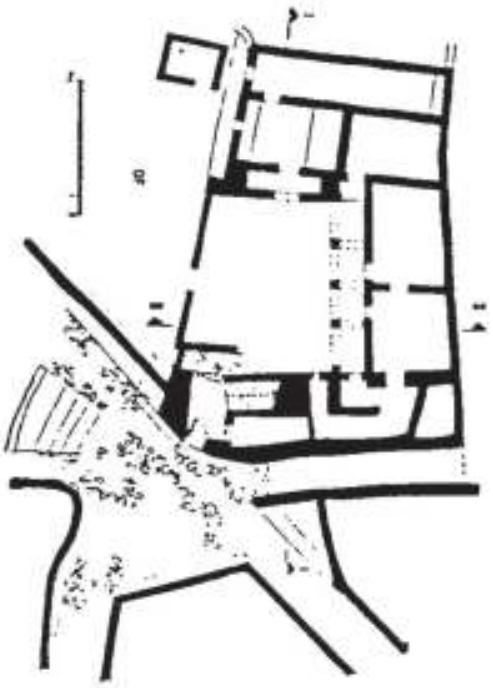


Fig.10 Tailawan plaza

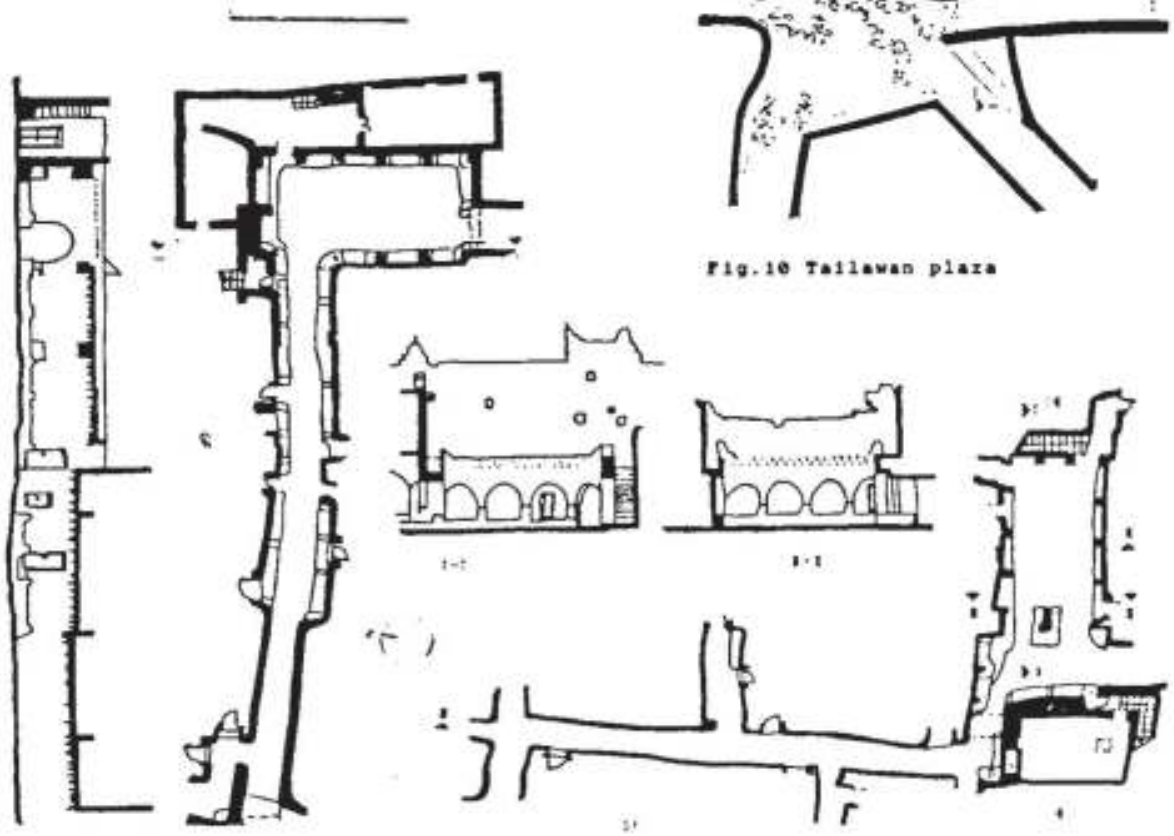


Fig 12. Andkalif moeque and squarre

Fig.11 Algazar square

THE DWELLING UNITS OF GHADAMES

The dwellings of the old town were derived from a careful assessment of function, material, climate and symbolic dimension. They are all alike with slight differences in size and composition (Figs.15-18). They are fully decorated by significant patterns of local handicraft (usually done by women) that gave the house a sensitive touch and richness of meaning(Fig.19-20). The different rooms were arranged in a patteren appropriate to their different functions and available technology with a unity of expression. Each element in plan, such as, room, stair, landing, alcove, to name few, has its own living entity and distinctive purpose and constitute a sharing harmony in determining a specific and meaningful place.There exist a variation in ceiling heights and a change in levels created a feeling of spaciousness in the common living room(Figs.15-18).

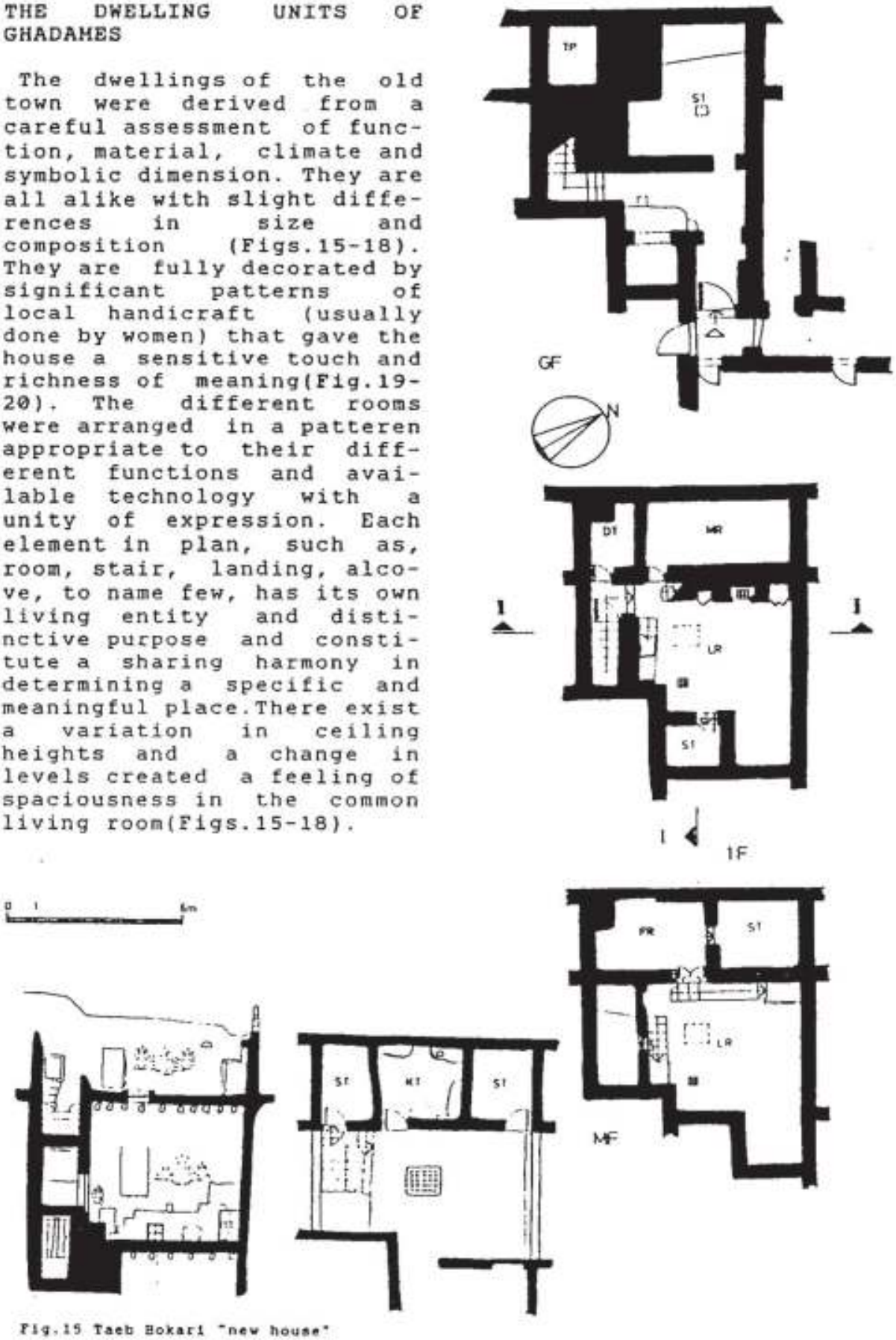


Fig.15 Taeb Bokari "new house"

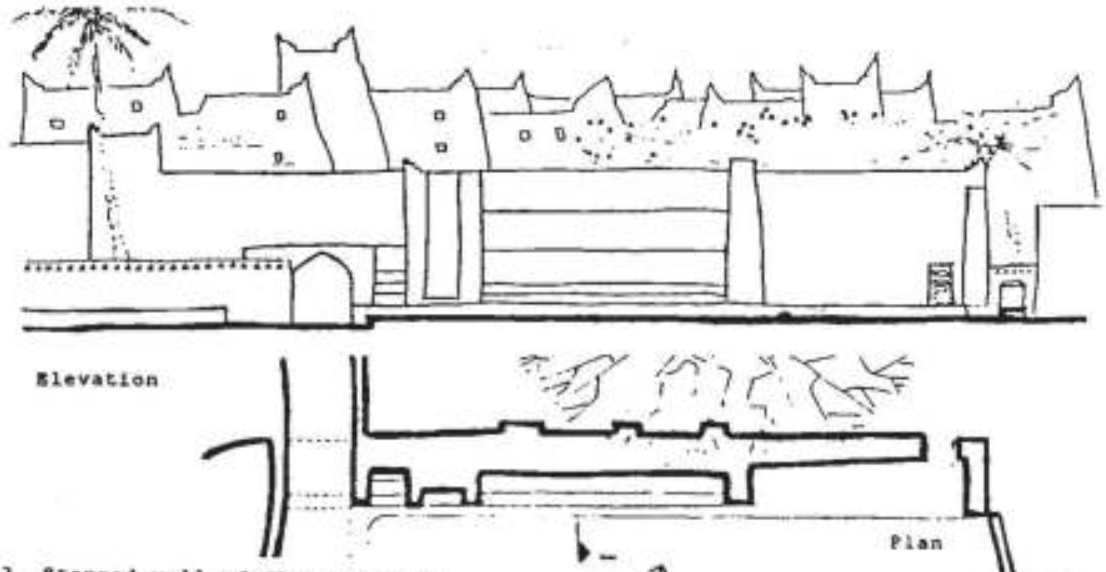


Fig 13. Stepped wall of Ghassuf plaza

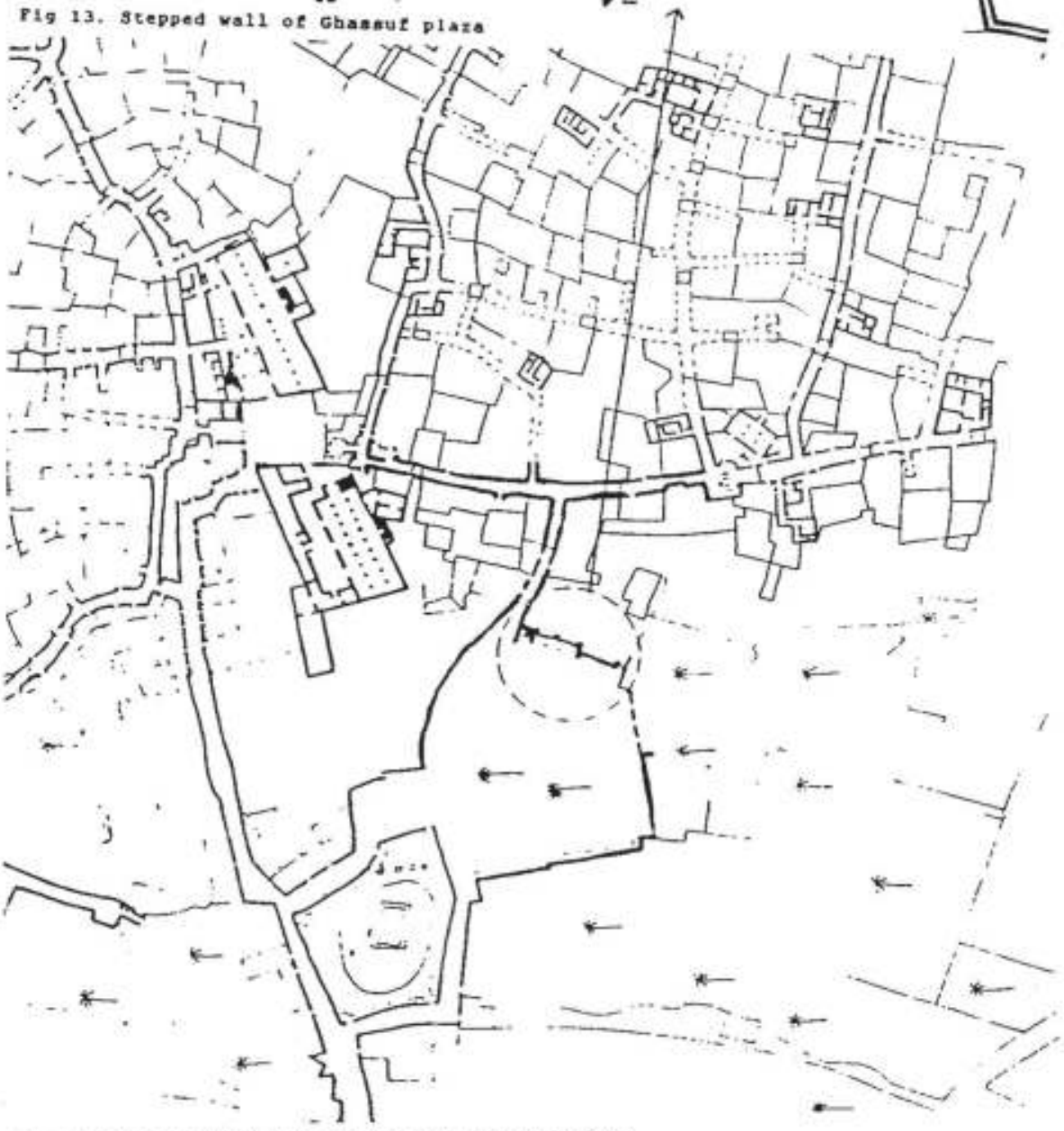


Fig.14 Site plan of Ain Alfaras and Ghassuf plaza

townscape(Fig.8).This differentiation in the use, by men and women to the covered streets and the open roof above, constitute a unique and distinctive character which is derivative from the social custom and order of the people.

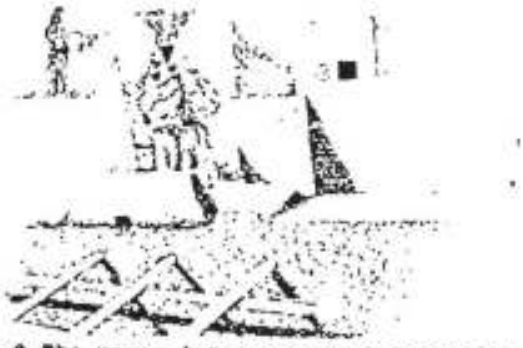


Fig.8 The upper interconnected footpaths

URBAN SPACE

The homogeneous structure of the old town consisted of seven districts; Hazigh, Tanghazine, Toskou, Jarasan, Drar, Tfrfra and Aulad Bellel. They all share common architectural vocabularly except for Aulad Bellel which is slightly different in architectural elements. In each district, there is a central street, one major mosque and common public open space which considered as connecting elements to the homogeneous network of the covered streets. The streets were intersected with urban space in many ways; centrally, oblique and offcenter (Figs.9-12).

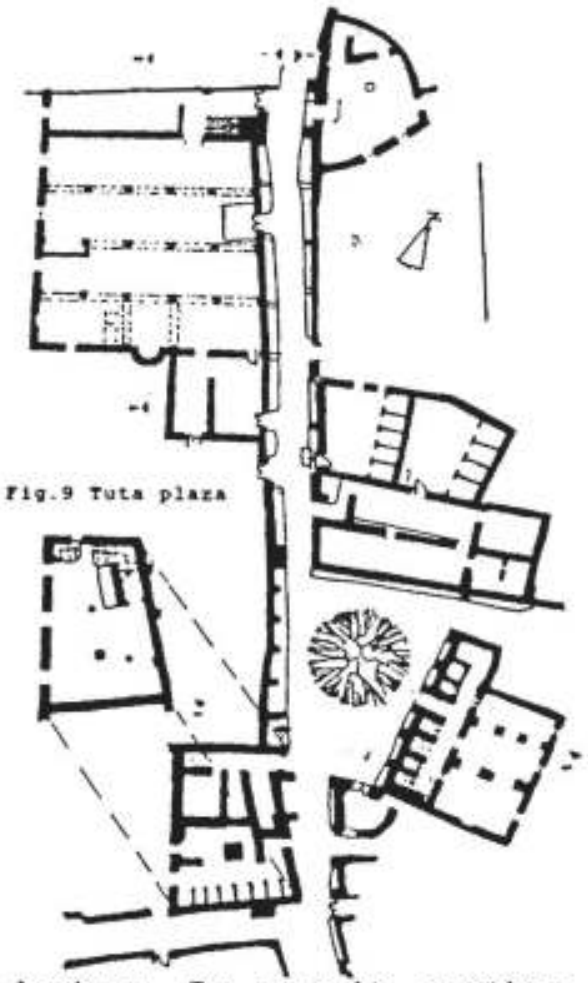


Fig.9 Tuta plaza

The geometrical characteristics of these open urban spaces are mostly square ground plan and were determined by their scale that gives a sense of enclousure appropriate to their function--the collective activities that were held inside them. The varying urban spaces represent diversity rather than uniformity of expression.The morphological aspects of each individual urban space corresponds to its purpose, where aesthetic is obtained by the manipulation of scale, and this was achieved by the interplay of architectural elements and devices. To put it another way, the sense of enclosure within the urban spaces is preserved by; the surrounded walls, buildings of varying heights, spatial hierarchy and architectural devices that emphasize gateways within the urban space. Thus, all share a mutual intention of creating a unified and meaningful whole.

levels; the ground level contains the main entrance and storage,the second level contains the main living room and bedrooms, and the upper level contains the kitchen and an open air sleeping area(Figs.15-17).

LIGHT IS THE THEME

Although the sources of light are few, the interior does not appear dark. Here, light is not associated with views. The square openning in the roof allowed daylight to enter the "Tmanaht"--the common space for collective events(Fig.23). In order to reduce the brightness of the sky, the proportion of the skylight to the size of the roof itself,gives a suitable control to the excessively bright outdoor and required light indoor. The manifestation of required light is achieved by the manipulation of the proportion, and thus, skylight was placed where light was needed most. Moreover,the mirrorss on the walls help distribute the light properly within the living area.

To put it another way, the mirrors involve spreding the light over a large area of "Tmanaht" in which common activities take place, and thus, quality seeing condition is needed. By this expedient, the light delivered by the mirrors to the task will come from a large source of low brightness and the percentage of direct light from the roof will be relatively small. We can say that the builders were aware of the relationship between architecture and light, the importance of visualising and illuminating the interior, so to achieve surprising and dilightful space.

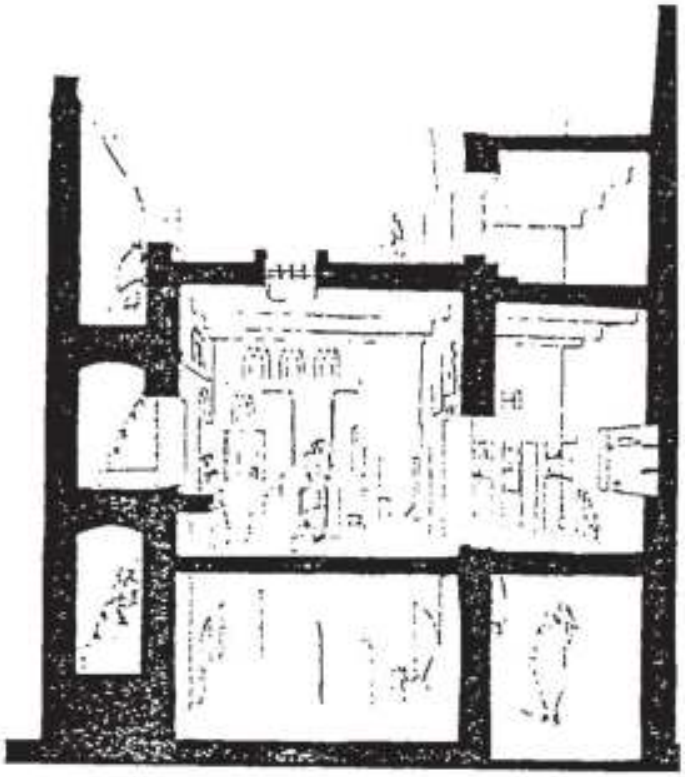


Fig.23
SECTIONAL PERSPECTIVE
IN HIBA HOUSE

APPROPRIATE TECHNOLOGY

The Ghadamesians were faced with providing shelter against a hot and arid climate with very few material resources at their disposal. The dwellings were constructed from local materials and the spanning of rooms was determined by the effeciency of the materials-the palm trunk as beams (Fig.23). Stone,gypsum, mud, palm trunk, chopped straw are the basic available indigineous materials, that were involved in construction of the whole town.

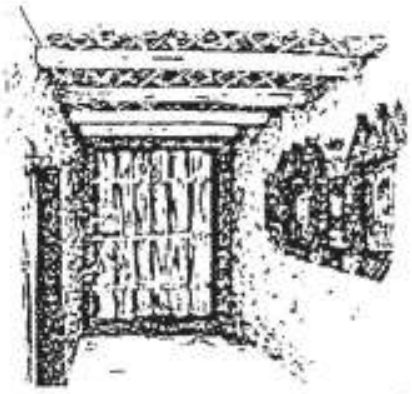


Fig.21 Main entrance from GF

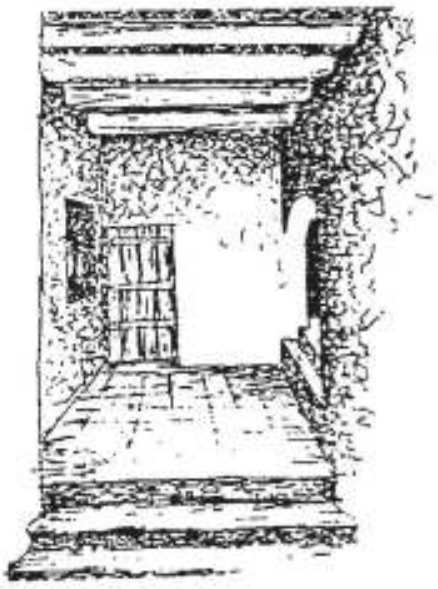


Fig.22 Upper entrance FF

SIGNIFICATION

In the making of architecture, there exist a coherent relationship between buldings and people--a "referential form," that extends to embrace cultural meanings. For instance, architectural elements and details such as; stairs, gables, metope, windows, to name few, are not only used as functional elements, but also adopted to transmit a symbolic attitudes. The need for signification transcends the fulfillment of function. Rather, signification deals with the notion of attachment that express rootedness--a sense of belonging and gathering--the building of an image, through which man can attach certain cultural beliefs.

Accordingly, the act of signification lies in the architecture's semantic analysis that seeks meaning and consequently significance. "Reference to widespread cultural phenomenon is seen as one of creating a more meaningful architectural expression..it involves boundaries of taste, not time."(7)

This sense of signification is clearly seen in the architecture of Ghadames. For instance, "three in number," seems to acquire a common belief which is deeply rooted in the experience, emotion and history of the people of Ghadames. The manifestation of this fact is clearly seen all over Ghadames. The use of pattern which is rectangular in shape and engraved in the wall and topped by three sharp angles colored with red, has been used all over the town. One can sees it on the wall as decorative indispensable elemnts within the interiors as well as the exteriors (Figs.19-21).

The upper roofs of the houses are seperated by walls varying in hights (1.5-2.0m) which are characterized by three stepped finials at their corners (Figs.2,8,10). This gives the townscape a unique external appearance. Also, the jars which are located in the doorway, are three in number, two are big and one is small. Even the house itself is consisted of three

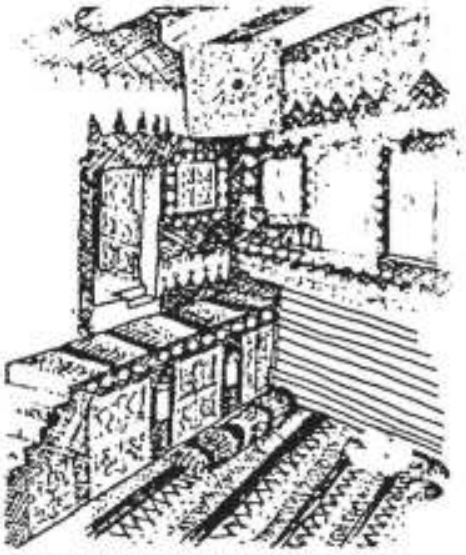


Fig.19 Interior view showing the man's room

Fig.20 The Kobba

CLIMATIC COMFORT

Recalling Christian Norberg Schulz's description of the concept of Genius-Loci, Ghadames represent the second variable of the making of man-made places-"Complementation," that is, man searches to complement the given situation by adding what is "lacking." Here the complementation is achieved through contrast rather than harmony. Upon entering the house one feels a kind of cavelike space(Fig.21,22). The dark iterior doorway is illuminated by candles--enough lighting for passing through. The dwelling unit exemplified that the interior spaces is not the visualization of the exterior hot climate environment, but rather it is an expression of the "mood of actions which take places inside."(6) In the interior space man seeks to withdraw into psychologically and socially meaningful place. Inside the dwelling-the private domain, one encounter a human and rich character. Here, the desert is no longer the dominant force; the massive walls have close it out. The lag is well obtained. The thickness of the exterior walls helped absorb heat during day and radiate it inward at night when it is needed. Moreover, the different in heights of massive walls and rooms, created shaded areas on the upper roof and consequently buildings are one shade the other(Fig.2). The cluster composition of the town, minimized the exposed exterior walls, and thus, heat gain is almost prevented from penetrating to the interiors. The red decorated patterns of the interior walls, the reflected mirrors, the handicrafted portraits and carpets, etc., substitute the golden color of the desert, the green color of vegetation and the blue of the sky and water. So, an atmosphere of cool and shelter against the sun is thus created.

Fig 28. Pessac housing
(before and after)

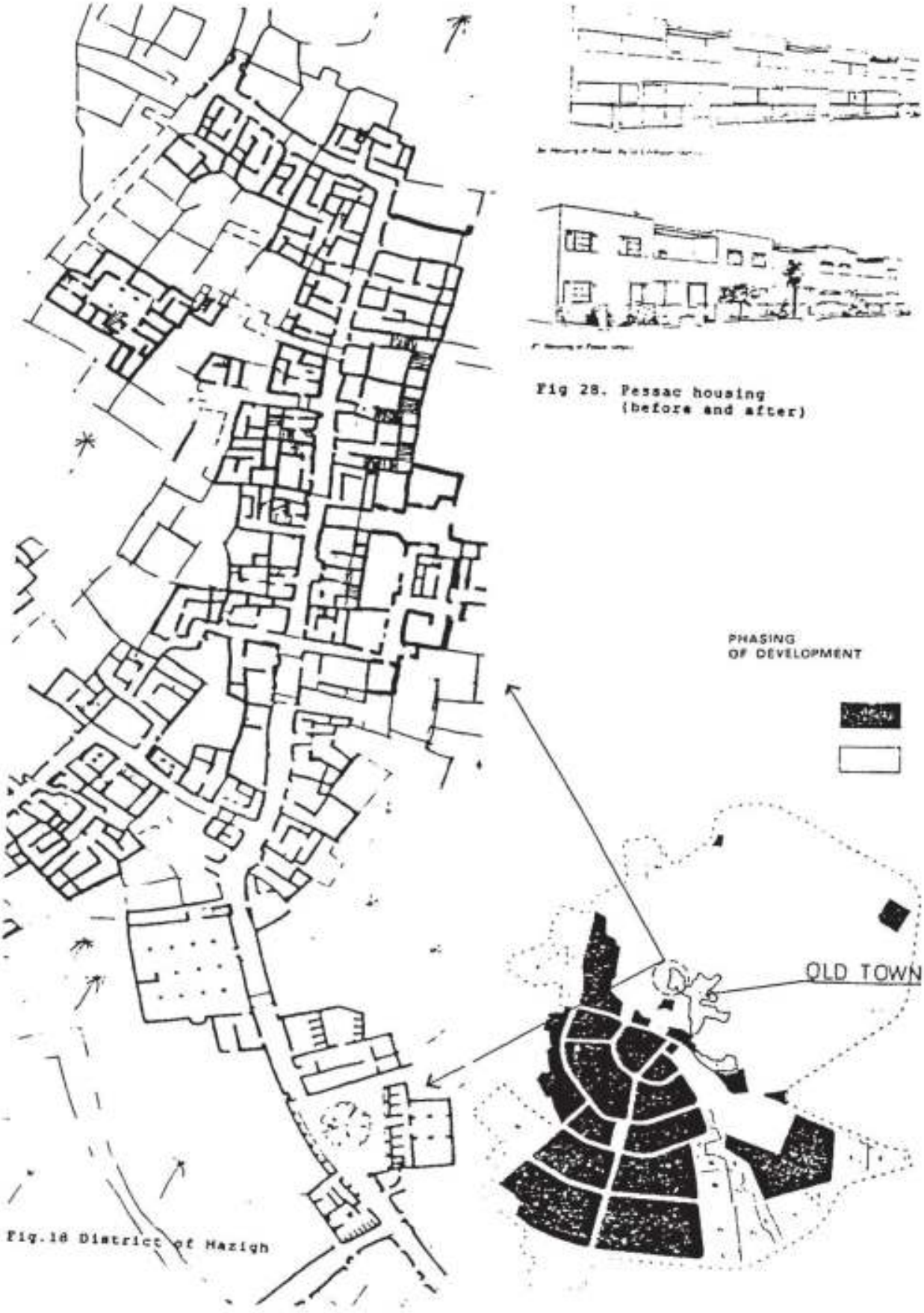


Fig.18 District of Hazigh

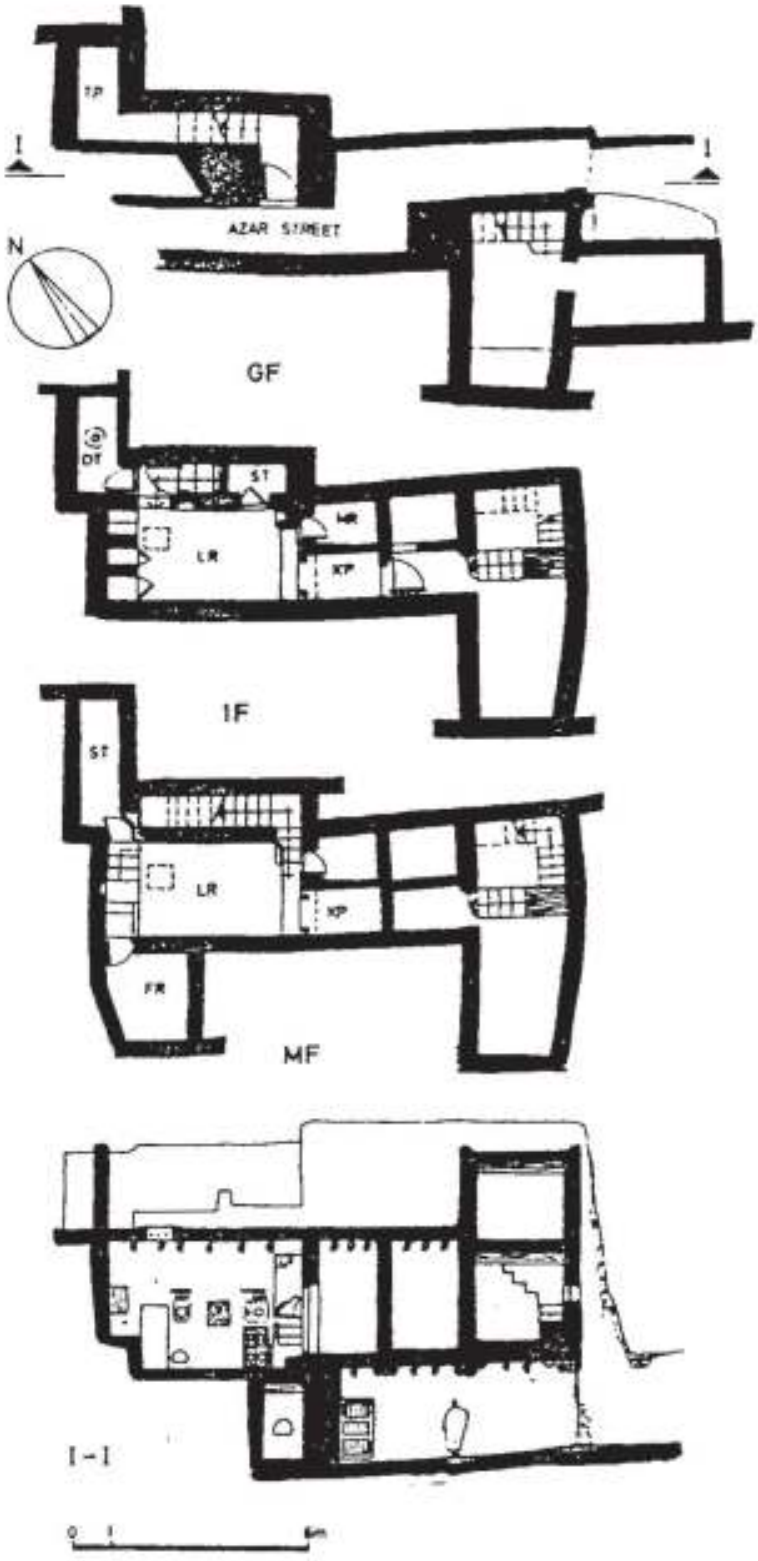


Fig.16 Braibish house

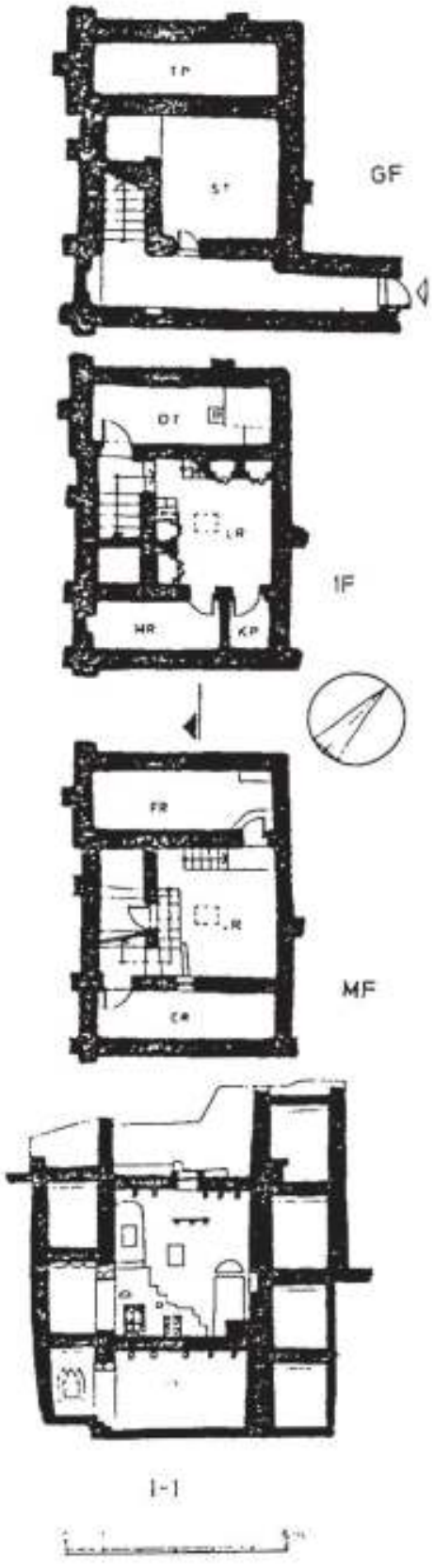


Fig.17 Saleh Haman house

attitudes and appropriate techniques. It would be illogical to favour one giant project which might turn out to be not productive, as the case in the 616's project which was built by the Ministry of Housing.

A diverse selection of programs after participations of and consultations with the users, assure productivity.It is important that we learn from the dilemma of Pessac Housings (Fig.28), near Bordeaux, designed by Le Corbusier in 1925. It showed the contrast between the individualized process and uniqueness of intention of Le Corbusier and that of the inhabitants. The work was modified and altered by the users, who found it irrelevant,"because they don't (it doesn't) have the conventional signs of domesticity, protection and identity."(11) Accordingly, local concern and creativity is an essential component in preserving the continuity of tradition. Viollet-Le-Duc has written:

"The life of man is not longer enough to allow any architect to absorb the totality of a task which is both intellectual and material. An architect can only form a part of a whole; he begins what others will finish, or finishes what others have begun,but he can not work in isolation."(12)

ARCHITECTURE AND DESIGN THESIS OROJECTS

Since always architectura values in the production o architeture of meaning,woul reside in the convincin synthesis of the practical the aesthetic and the symbo lic and in the creation of unity in harmony not onl within the architectura composition but also wit the setting as well. In thi regard, the aim behind th design of the following tw thesis projects done at th Department of Architecture, University of Al-Fateh, Tripoli, is that careful thought was given t function,image, orientation, shading, climate and natural cross-ventilation as well as to gradations between public and private spaces. The exterior walls are designed as cavity walls, with kitchens projecting forward, to form shaded areas on front elevation to free the cluster and forming generous roof-terraces above which could be used as fire escape. The attempt was to create three-dimensional like community where shadow is its utmost goal.

In order to accomodate the different number of persons of families, the houses are designed in the form of different housing sizes; two bedrooms, three bedrooms and four bedrooms. The houses formed by combination of one, two or three grid units of identical size, grouped together around central pedestrian covered street.This gives a clear hierarchy of improving local environmental quality, employing the

identity of the place in a more delightful case. Thus, the aim was to express in abstraction the underlying social and climatic features of the local tradition and rephrase them in a new context. This is considered as the main contribution toward the achievement of productive architectural design.

In order to avoid the gaping spaces between buildings that had been done at the 616's project,and create something closer to the tight-knit and dense street patterns of traditional Ghadames, hierarchy of streets with distinctive function has been presented in the making of layout. The grouping of houses formed urban spaces with different access streets. Vehicular trafic was seperated from pedestrians. Shaded alleyways and public spaces with shifted axes where strongly dominated the composition of the neighborhood. The pedestrian street is used for the electrical services, while the exterior open street suited the sewage services.

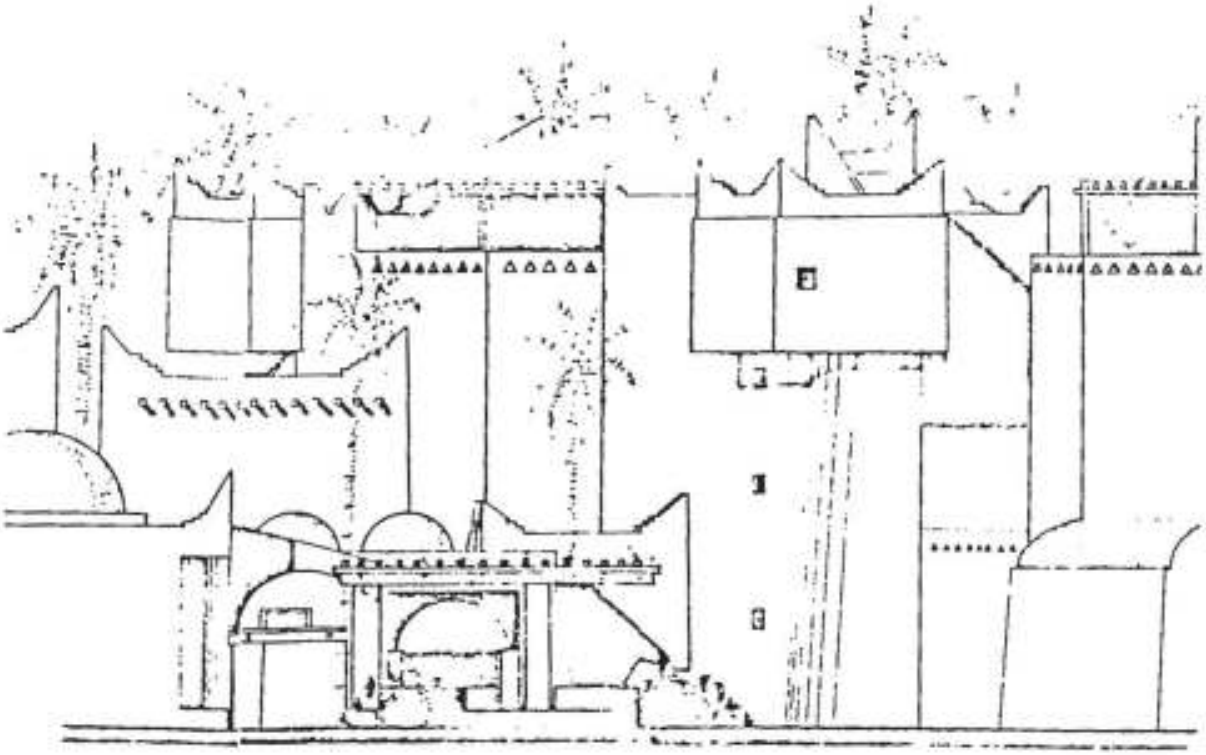
The contextual sensitivity of the scheme extended from Ghadames' color, shape and the overall arrangement which restated traditional urban alleyways and pedestrian links within the buildings. The pattern and arrangement of the traditional dwellings reappear in a new form and the inner images which underly the old spatial conceptions are brought to light again (Figs.29-30).

CONCLUSION

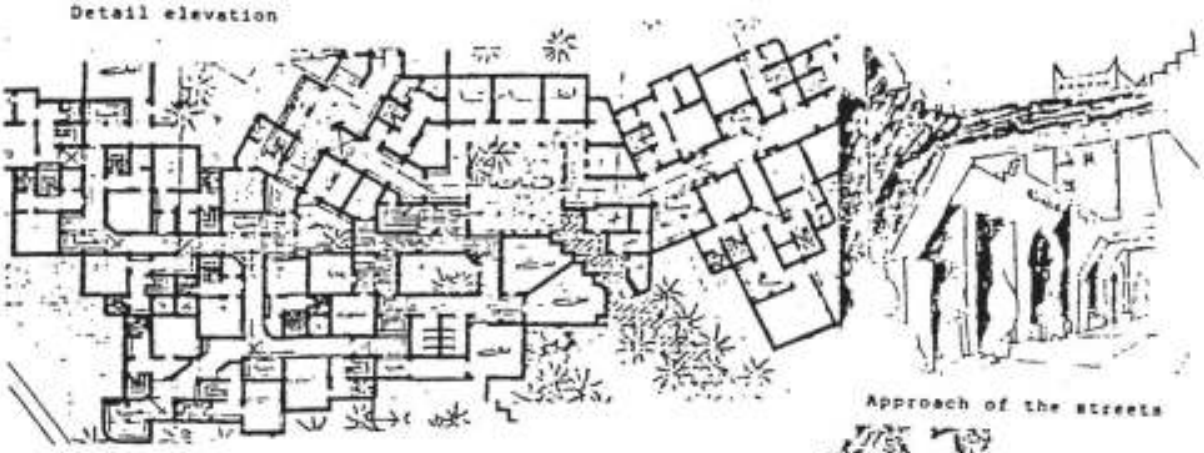
The old town of Ghadames represented a homogeneous and meaningful expression of architecture's principles in determing the identity of place.It sought to establish a unified whole with the aim of integrating man with the place and environment, where integration meant the revealation of the qualitative aspects of a given miliew, that is,human identification revealed the way in which Ghadames is somehow characteristically unique in itself.

The purpose of design within the the urban development of rural settlment and specifically in Ghadames, is to synthesize man-made place toward the achievement of an accordant totality that could determine the unique character of the town--"a living tradition which makes change meaningfully."(13) Alfred North Whitehead has written:"The art of progress is to to preserve order amid change, and change amid order."(14)

The role of the architect within the rural development does not merely reside in proplem solving, nor mere "packaging" determined by function; rather, it resides in the search for well conceived planning and design, to provide convincing, identifiable, and persuasive answers to the question of meaningful human existence.

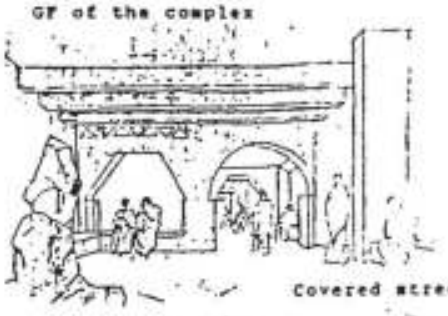


Detail elevation

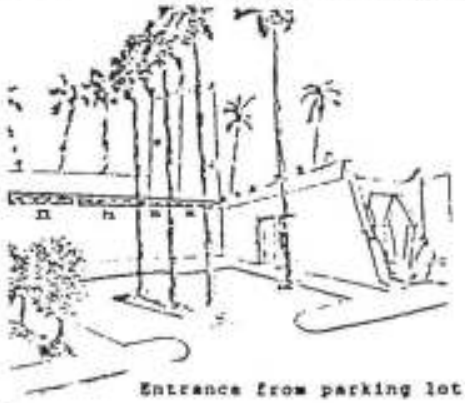


GF of the complex

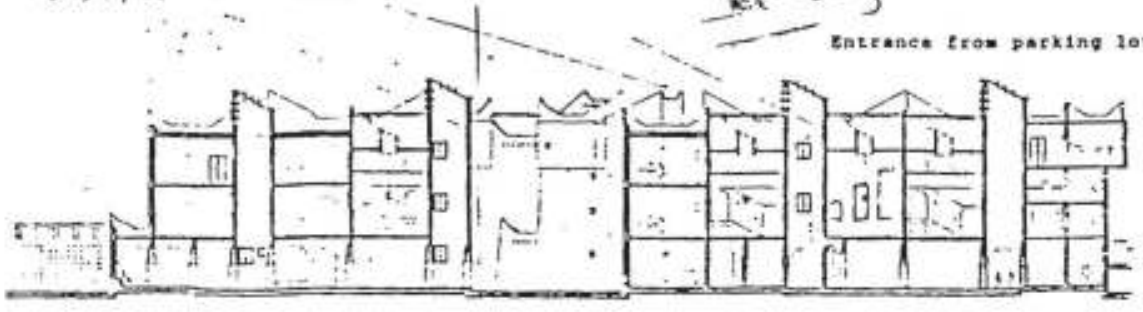
Approach of the streets



Covered street



Entrance from parking lot



Section

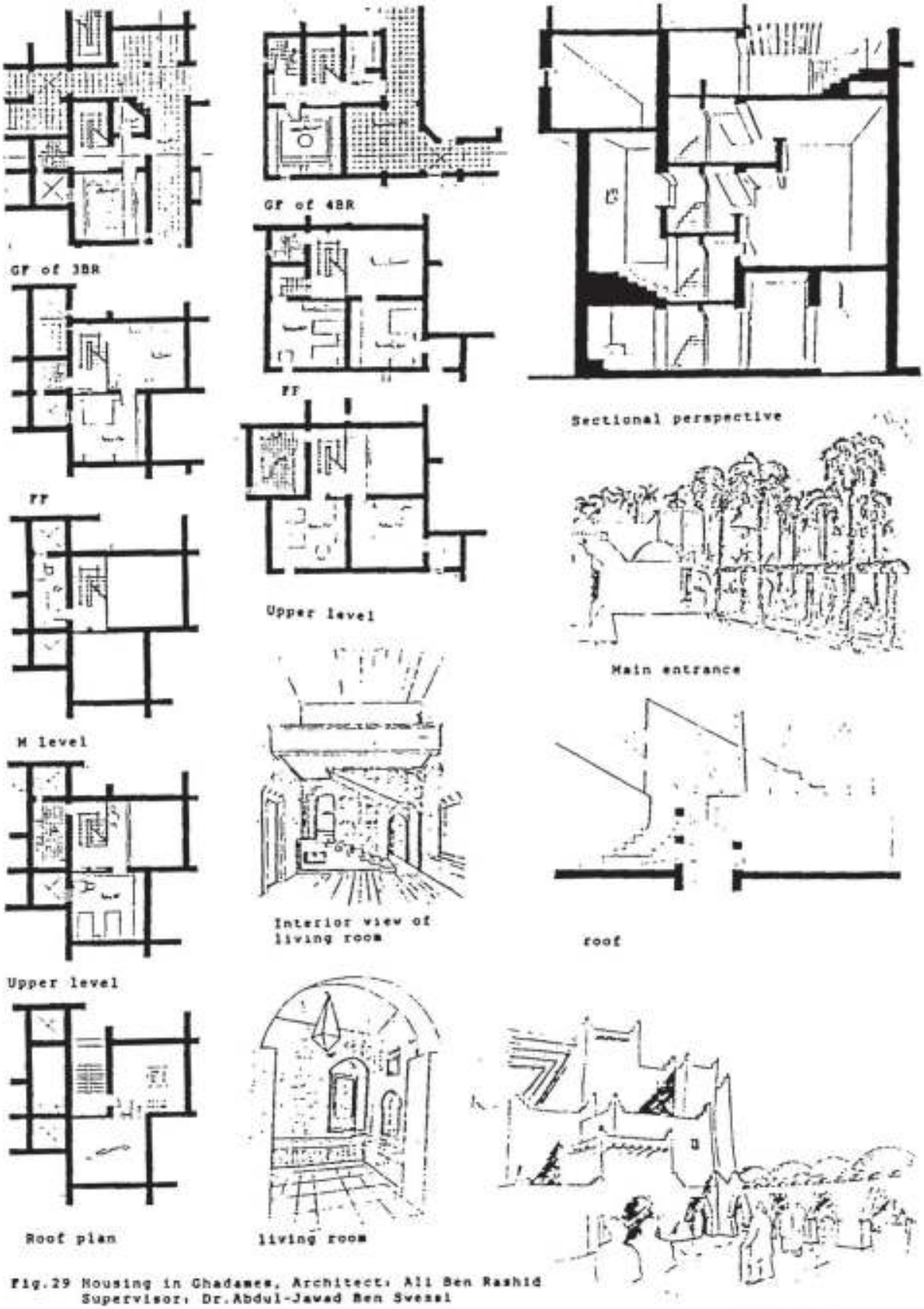
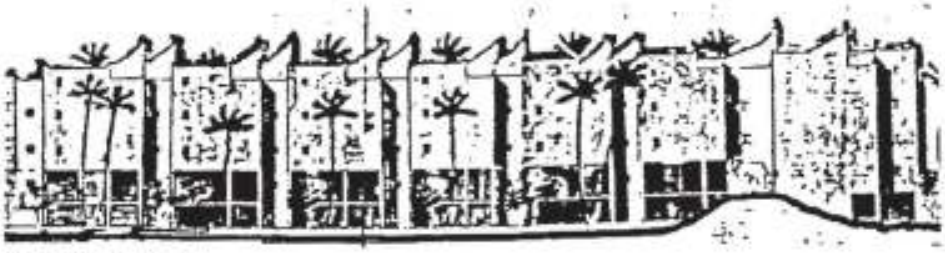
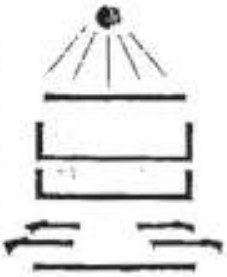


Fig.29 Housing in Ghadames, Architect: Ali Ben Rashid
Supervisor: Dr.Abdul-Jawad Ben Swesi



Detail elevation



Section through the housing unit

General perspective of the complex

Entrance to the covered street from urban space

Ground plan of the housing units

Site plan

Fig.30 Housing in Ghadames, Architect: Salah El Muzughi
Supervisor: Dr.Abdul-Jawad Ben Swessi

COMPARISON OF THE OLD TOWN OF GHADAMES
WITH THE
616's HOUSING PROJECT AND THESIS PROJECT

	OLD TOWN OF GHADAMES	THE 616'S PROJECT	THESIS PROJECTS
ENVIRONMENT	.It is intended to create cool built-environment within the hostile climate. Close environment.	.An open built environment	.Close built environment
CHARACTER	.Dwellings extende vertically .Massive walls .Shaded roof .Covered Street .Clustor in composition .Tiny windows .Sky light .Light is not associated with view .Plan is a hierarchy of rooms .White washed wall .Rich interior space	.Houses extended horizontally .Thin walls .Exposed roof .Open street .Independent housing units .Large windows .Light from all sides .Views in four sides .Groups of rooms .Gray walls .Abstract space	.Houses extended vertically .Cavity walls .Shaded roof .Covered street .Cluster in composition .Tiny windows .Skylight .Light in not associated with view .Articulated rooms .White painted walls .Imagenery space
SIGNIFICATION	.Indeginous form .Tradition and convention .Applied ornament .Contexual aesthetic .Continuous tradition	.Abstract form .Few historical references .No ornament .Modern aesthetic .Idealist	.Symbolic form "image" .Use of historical referenc .Applied ornament .Contexual aesthetic .Pluralist
TECHNOLOGY	.Local technology .Local material .Black well .Spanning is limited by palm trunk as beam	.Conventional technology .Conventional materials .Modern W.C.'s .R.C. beams	.Conventional technology .Conventional materials .Modern W.C.'s .R.C. beams

FOOTNOTES

1. Richards, J.M., "In The International Context," in Hassan Fathy, op.cit., p.13

2. Eric Fromm divided human needs to five categories; relatedness, transcendence rootedness, sense of identity and the need for frame of orientation and devotion. See Eric Fromm, The Sane Society, N.Y: Holt Reinehart and Winston, 1955, pp.27-66.

3. holod, R., "Introduction," to Architecture as Symbol and Self-Identity, The Aga Kahn Award for Architecture, Philadelphia: Smith-Edward-Dunlop Co., 1980.

4. Norberg-Schulz, C., GENIUS-LOCI, op.cit.

5. Tyng, A., Beginning, Louis I. Kahn's Philosophy of Architecture, A WileyIntescience Publication, N.Y, 1984, p.82.

6. Norberg-Schulz, C., The Concept of Dwelling, op. cit., p.89.

7. Editorial, "Beyond The Modern Movement," The Harvard Architectural Review Vol., 1, Spring 1980.

8. Ahmed, S., op.cit., p.57.

9. Woodward, A., "Urban Symbolism," in EKISTICS, Vol.49 No.295, July/August 1982, p.287.

10. Drexler, A, Transformations in modern Architecture, The Museum of Modern Art, N.Y., 1979, p.3.

11. See Hershberger, R, A Study of meaning and Architecture, Ph.D Thesis, Univ. of Pennsylvani, Phila., 1969.

12. Viollet-Le-Duc, in preface to his Dictionnaire, quoted in Changing Ideals in Modern architecture, by Peter Collins, McGill Univ Press, Montreal, 1965, p.162

13. Norberg-Schulz, C., Genius-Loci, op.cit., p.183.

14. Whitehead, A.N, Process and Reality, p.515, quoted in Genius-Loci, Ibid., p.183.

SELECTED BIBLIOGRAPHY

Aalund, Fleming, Ghadames, The Pearl of the Desert, Architectural Conservation Planning in Libyan Arab Jamahiriya, U.N., Habitat, 1987

Ahmed, Salem, City of Ghadames, Doctorate Thesis, University of Krakow, Poland 1985.

Alexander, Christopher, The Production of Houses, N.Y, 1985.

Attir, Mustafa, "Libya's pattern of Urbanization," EKISTICS, 50, No.300, May/ June 1983, pp.183-194.

Ben Swessi, Abdul-Jawad, A Study of the Concept of Identity: Towards an Architecture as a Harmonious Identifiable Fabric, Ph.D Thesis, University of Pennsylvania, Philadelphia, 1987.

Curtis, William JR, Modern Architecture since 1900,

Prentice-Hall,Inc,N.J.,1983, pp.357-366.

Elfortea, Suleiman, "The Courtyard House versus Progress and Development in Libya:A Case for Compromise" Open House International, Vol.14, No.2, 1989,pp.13-17.

Elkabir, Yassin, "The Study of Urbanization in the Arab World:A theoretical perspective," EKISTICS, Vol.50, No. 300, May/June 1983.

Fathy, Hassan, Architecture for the poor, An Experiment in Rural Egypt, The University of Chicago Press, Chicago and London, 1973.

Fathy, Hassan,Natural Energy and Vernacular Architecture, Principles and Examples with reference to Hot-Arid Climates, ed. Walter Shearer and Abd-el-Rahman Sultan, The University of Chicago Press, 1986.

Ghadames Master Plan 2000, S.P.L.A.J., Secretariat of the People's Committee for Utilities, Report No.TF-81, Polservice Office, Warsaw.

Golany, Gideon, ed., Housing in Arid Lands Design and Planning, The Architecture Press, London and N.Y, 1980.

Krier, Rob, Urban Space, Rizzoli, N.Y, 1979.

Mahmood-Misrati, Ahmed, "Land conservation to urban use:its impact and character in Libya," EKISTICS, Vol.50, No.300, May/June 1983, pp. 183-194.

Mirza, Riyaz and Abuganah, Omar, "The Old City of Ghadames-Lessons and Proposal," paper presented to the IAHS,International Congress on Housing, 21-25 September Birmingham, 1992.

Norberg-Schulz, Christian, GENIUS-LOCI,Towards a Phenomenolgy of Architecture, Rizzoli, N.Y., 1980.

Norberg-Schulz, Christian, "Genius Loci," Lotus 13, pp. 57-65.

Norberg-Schulz, Christian, The Concept of Dwelling, the way to Figurative architecture, Rizzoli, N.Y, 1985.

Richards,J., Serageldin, I., Rastorfer, D., Hassan Fathy, Concept Media, 1985.

THE INTERNATIONAL SYMPOSIUM
OF HASSAN FATHI FOR
ARCHITECTURE OF THE POOR

From 20th to 22nd April 1993,
Cairo , Egypt

TITLE

DESIGN AND CONSTRUCTION OF ENERGY AND COST SAVING VAULT AND DOME STRUCTURES

BY
PROF. DR. ENG. GERNOT MINKE
DIRECTOR OF BUILDING RESEARCH INSTITUTE

ADDRESS

UNIVERSITY OF KASSEL,
MENZEISTRASSE13,D-3500 KASSEL
GERMANY

Gernot Minke

Prof. Dr.-Ing., Director of Building Research Institute
University of Kassel, Menzelstraße 13, D-3500 Kassel, Germany

Design and construction of energy and cost saving vault and dome structures

Introduction

Vault and dome structures are foumd in traditional architecture all over the world, especially in hot and dry but also in moderate climates. People who live in domes like the Musgum in Kameroun, the inhabitants of Siestan in Afghanistan, of Tabris, Kashan and Seojane in Persia (Iran), and those who live in Trulli in Apulia, Italy, appreciate the climatic comfort and the easy construction technology of these structures. The Nubian Vault and the Nubian Dome technology got a renaissance through the building and publication activities of Hassan Fathy.

At the Building Research Institute (BRI), University of Kassel, the different traditional technologies, which allow the construction of vaults and domes without shuttering (formwork) were examined, their design potential studied and their advantages against common flat roofs analized. The Nubian Vault technique was refined and a new dome design and construction technology was developed.

Advantages of vault and dome structures

A vault or dome covered space show several advantages in comparison with a common rectangular room covered by a flat roof:

- For a constant volume the height of a dome or vault covered room is higher. This gives more thermal comfort, by more effective cross ventilation (high windows in end walls of vaults) respectively better ventilation by the increased stack effect (skylight openings in domes).
- Vaulted and domed roofs allow easy installation of skylights, which provide not only 4 to 5 times more light per area than low windows in vertical walls, but also provide equal distribution of light: As less window area is needed, heating and cooling loads are reduced.
- The shape of vaults and domes can be optimized so that no bending moments and no tensile ring forces will occur. This leads to cost savings as no reinforced cement concrete or steel structure for stabilization is necessary.
- As the special construction techniques need no shuttering and no skilled labour, construction time and costs are saved.

Refined Nubian vault technique

Based on tests of the Building Research Institute the amount of mortar and the construction time can be reduced by using tapered bricks of 20 cm width and 18 respectively 20 cm length giving the same area as the traditional mud bricks but less volume of mortar joints. On the other hand the vault thickness of 20 cm with spans between 3 and 4 m was found to be sufficient. By installing a system of guide strings which are self-correcting by counterweights a greater accuracy (and therefore stability) and a saving of construction time could be achieved.

New dome construction technology

The traditional Nubian dome technique with which a spherical surface can be achieved has the disadvantage that in the lower part of the dome tensile ring forces will occur. That means larger domes tend to collapse (as happened with several built examples), if not reinforced by reinforced cement concrete ring beams, by steel ring strips or by heavy buttresses.

At the Building Research Institute a new technique was developed utilizing a rotational guide, allowing the bricks or soil blocks to be placed with great accuracy according to the "optimal" form, calculated by a computer programme, which guarantees that no tensile forces occur within the surface: all dead loads are transferred under compression into the foundation (fig. 3).

Office building in New Delhi, India

The 115 sq.m. vault and dome structure of the Indian Institute of Technology, New Delhi, provides office and laboratory space for a research group of the Centre of Energy Studies (fig. 1 to 4). The building was built in 1990 within a research and development project financed by GTZ (German Agency for Technical Operation, Eschborn) with the support of INT/KFA (Research Centre Julich), Germany; Indian Institute of Technology (I.I.T.), New Delhi and the Building Research Institute (BRI), University of Kassel, Germany. (Design: Gernot Minke, collaborator: R.Muthukumar, Energy concept: N.K. Bansal).

Fig. 1.2: Office building of the Centre of Energy Studies, Indian Institute of Technology, New Delhi

The three vaults were built from adobes (unburned soil bricks) utilizing the local soil from excavating the foundation in the refined Nubian Vault Technique described before. The three domes were constructed in the described new developed dome technology using a guide, which rotates around a vertical axis at the centre of the dome and enables the soil blocks to be placed with great accuracy (fig. 3). The stabilized soil blocks were produced by a manually operated block press (fig. 4).

The material used was the soil excavated for the foundation. As the binding force was too poor (due to the poor clay content of 3 per cent) 6 per cent of cement and 20 per cent of coarse sand was added. Later tests found out that the compressive dry strength was 2.8 N/sq. mm (28 kg/sq.cm) and the wet strength was 0.8 N/sq.mm. As the safety factor for dry strength was 42 and for wet strength was 12, cement content could have been reduced to 4 per cent.

The section of the domes is similar to a catenary and an elliptic curve. Only the large dome with a clear span of 5.4 metres needs a small ring beam, as it is placed over octogonal vertical walls, which serve for projection and exhibition surfaces. Within the small domes all loads are transferred under compression into the foundation avoiding cement concrete.

A significant feature of the building is the use of the corbelling bricks which span the door and window openings, so reinforced cement concrete lintels as used in conventional buildings could be avoided.

In order to protect the building against rain a cow-dung mud plaster was used, optimized in prior tests by the BRI. The mixture was one part silty soil, one part cow-dung, one part coarse sand. It is important that after mixing the cowdung with water it had to stand for one day in order to allow fermentation. The dry plaster was painted (flooded) with a hydrophobizing agent and withstood the monsoon without any damage.

Since the average temperature in New Delhi is about 25°C, which is within the comfort range, the thermal storage effect of the earth is used for the climatization of the building. It was tested that the temperature at a depth of 3.5 metres is nearly equivalent to the average air temperature and remains almost constant throughout the year, whereas the ambient air temperature in New Delhi usually varies from about 45°C to 0°C. The ambient air is blown by two fans through stoneware pipes, which

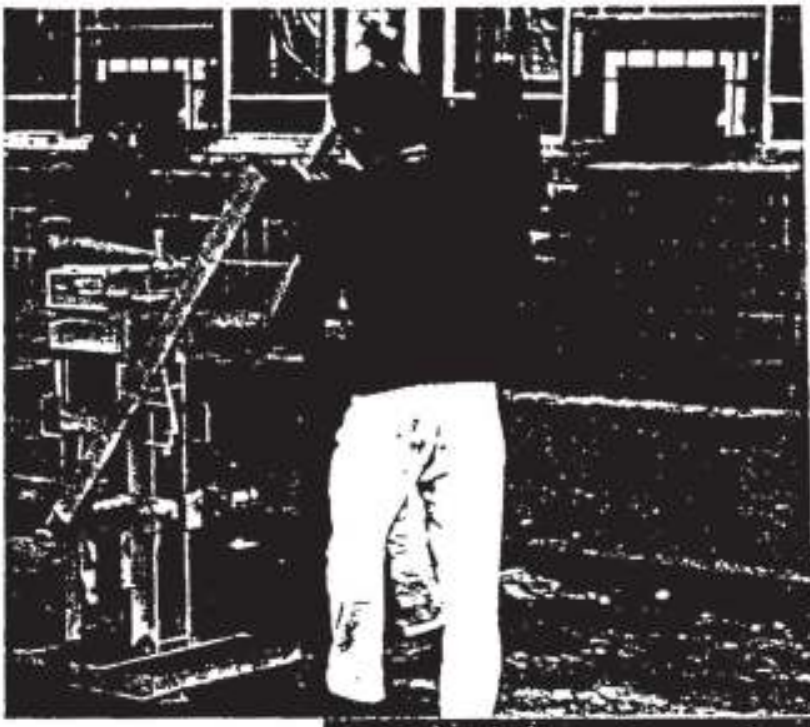


Fig. 4: Production of stabilized soil blocks by a manually operated block press

Fig. 3: Construction of a dome with a rotational slip form

have a diameter of 150 mm and a total length of 80 m laid 3.2 m blow ground. When the air enters the rooms its temperature is nearly 25°C which can be used for cooling in the hot season and for heating in the cold season. The air outlets in the rooms are placed at floor level, the exhaust of air is given by window openings on one side of the rooms and on the sky lights respectively, where the hot air exhaust is fortified by the stack effect.

It was calculated that the energy for the production and transportation of all building materials and elements of this building was 149,400 kilowatts whereas a conventional building of the same size with a flat concrete roof would have used 190,900 kilowatts. This means that the vault and dome structure results in a saving of about 400 kilowatts per sq.m. The calculated necessary heating for 90 days and the cooling for 210 days in a conventional house of same size needs 33,385 kilowatts of electrical energy; whereas the two 2,500 watt ventilators for the air-tunnel system only need 22,160 kilowatts. As the two ventilators did not work effectively, better designed ventilators can run with less than half the amount of energy. That means that at least two-thirds of the energy for heating and cooling can be saved.

A conventional building with simple installations would have cost 270,000 rupees: the vault and dome building only costs 210,000 rupees: a saving of 22 per cent. As a prototype structure always costs more, the probable saving with multiple applications would be 30 to 33 per cent.
The cost saving due to design and technology and the energy saving yield in a pay-back period of total construction costs of six to nine years (depending on the price per kilowatt of electrical energy).

Experimental Dome, University of Kassel

The 6 m high dome with a free span of 7 m, which was built at the site of the Building Research Institute (BRI) of the University of Kassel, Germany, in 1992, was erected within a training course for masons (see fig. 5.6; design: Gernot Minke). It is used as a seminar room during the courses on "building with earth" held at the BRI.

The thickness of the dome is only 20 cm. Due to the optimized shape, developed by a computer programme, only compressive forces occur under dead load. The unbaked

Fig. 5,6: Experimental dome, University of Kassel, Germany

earth bricks show a tapered form and were produced in a brick factory by an extrusion process.

Earth covered house

In Kassel, Germany, an 230 sq.m. private home and office building was built in 1992, in which all main rooms are covered by domes (Architect: Gernot Minke), see Fig. 7. The free span of all domes is 5,45 m. The dome covering the central hall has a height of 5 m and starts at a plinth which is 1.75 m high, the other domes are 4 m high and start at a level of 0,75 m. The domes are constructed by unburned earth bricks with a rotational slip form in the same manner as described in the other projects. No ring beams or tensile elements were necessary as all forces are transferred directly into the foundation.

From layer to layer the bricks are increasingly less inclined, than in a normal dome, where the bricks are pependicular to the curvature. This method makes it possible that also the last layers on the top can be placed without slipping down. Furthermore it gives a positive acoustic and esthetic effect.

As the section shows, the valleys were two domes match, are partially filled with earth so that the form of the grass roof, which covers the domes, provides natural drainage for the rain. Below the grassroof a layer of a 2 mm thick polyolefine film which is hot air welded from 1 m wide strips forms the rootproof and waterproof layer under which thermal insulation is situated. All domes have a sky light as well as one vertical window.

In the same project two other types of dome were built: Fig. 8 and 9 show the construction of a dome over a six-sided steel structure. The dome is built without any shuttering or formwork in a manner similar to the traditional dome construction technique of Afghanistan. Starting from opposite ends the mud brick arches were constructed at an inclination of about 45°. The centre part was closed by arches, which hit the other arches under 90°. These type of domes cover the bathroom and the main part of the "wintergarden", a light space with a facade, totally covered by glass, facing the garden, acting as solar collector and greenhouse at the same time.

Three smaller domes with square plan were constructed on a sand bed acting as formwork in order to form the shape of shallow funacular shells.

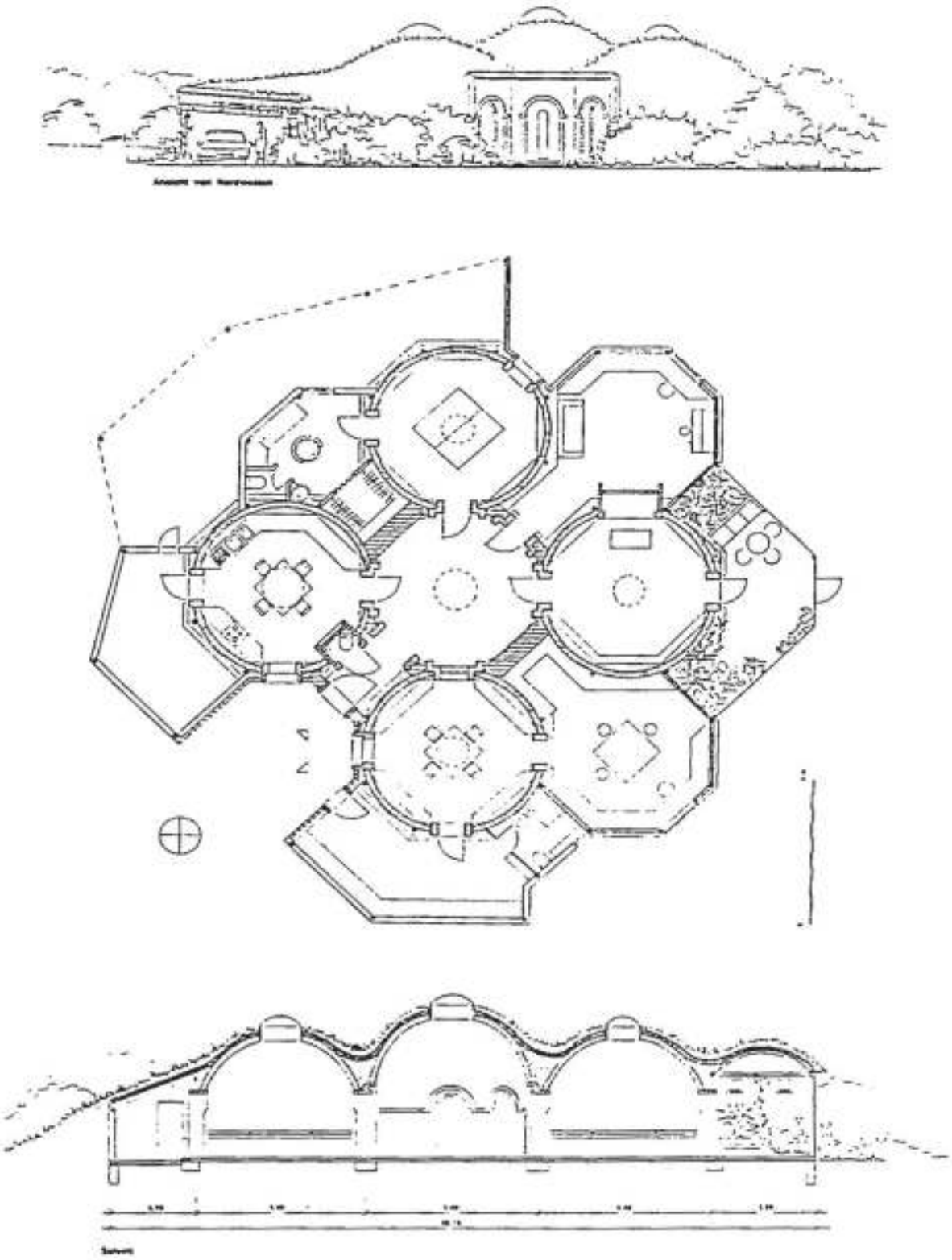


Fig. 7: Plan, section and elevations of a earth bermed mud dome house covered by a green grass roof

Fig. 8,9: Construction of a mud brick dome without shuttering

THE INTERNATIONAL SYMPOSIUM OF
HASSAN FATHY
FOR ARCHITECTURE OF THE POOR

From 20th to 22nd April 1993,
Cairo, Egypt

TITLE

ADAPTING A TIME HONOURED ROOFING TECHNIQUE TO MEET THE CONTEMPORARY NEEDS AND NEW LOCAL CONDITIONS: THE CASE OF THE "WOODLESS" ROOFING PROGRAMME IN NIGER AND MALI

BY
Director John Norton
Associate Peter Tunley

ADDRESS

Development Workshop
B.P. 13, 82110 Lauzerte,
France

NEW SYSTEM FOR BUILDING IN LOCAL STONE

" NATURAL STONE SHELLS SYSTEM "

In a region well knownly its basalt stone widely available on surface in fields , our thinking went to use this kind of stone in building, avoiding using R.C.(reiforcing steel in expensive material, imported and relatively rare though difficultly available)

Stone was the dominating material used in the region through ages and thus formed through its caracteristics , forms,way of building, a special personality to the architecture of the region even different through ages.

The more characteristic personality in the architecture of the region was formed through two structural systems in stone :

- Firstly by using the vault system especialy in " BOSSRA " in public buildings .
- Secondly the arch. system with horisontal covering of stone pieces. Several arches are distributed according to space needs ,upon which stone short pieces"Beams" are layed in a form of balance "MIZANE" an other longer piece is layed to complete the horizontal cover between two arches "longer stone beams(2-2.5 m) " called "RABBAD" supported by the other "MISANE" on the next arche or on the end wall the final balance stone is balanced by counter blance load the extreme end of the balance .

Similar system was used by ancient egyptians by using cantilever stones layed on walls on which layed long stone beams suported by an other cantilever coming out from another wall or column in the other side of the first wall .

This system is simpler and more primitive rhan the system used in mentioned region , the last one was more flexible and more effective w gave more space size .

" Our new system " was a step forward in the evolution of building sys using the same material through more understing to material properties caracteristics and its structural behaviour .

Following this logic and similar way of thinking we tried to use tural basalt stone wildly and superfecialy existed in fields of "HORAN south of SYRIA , as it existed in nature , just gathered , and perhaps slightly dressed .

This stone , as any other kind of hard stone resists highly compe ssion .

Thus employing this stone in a form putting permenenly under compression " was the idea " .

The choice of this form was carefuly chosen by computer , putting stone into a suitable arciform curve optimising the use of stone caracteristics under compression with minimum quantity of the used stone , arriving thus to a suitable minimum thinckners of vaulted form equivalent to 17 cm the max . sufficient thickners of such vault was about 20 cm according to span .

Changing the ancient system from linear system to surface working syste "shell " this called natural stone shells .

Putting the way of thinking , by stone construction , a step forwa in a very comprehensive way .

This way of thinking opened a wide horison for a widly available material in our country covering our fields , needing no quarring and making a heavy burden of using these fields properly for agriculture through history .

This material thus existing , does not need any way of facing or dresing or even quarrying , " just gather and build .
Its resources are enormous , its life is long , as history tells us .

This experiment may open door to use all simillar kind of stones , residues of quarries , surplus pieces of stone remaiders of stone cutting and quarries .

Colored and ornomental forms of stones may be used thus giving final finishing and saving the aesthetic point of view resulting form natural caracteristic of these stone .
The aesthetic issues of this experiment are resulted through the caracteristics of the material beading normaly to the resulted architectural personaltly of the region .
Emphasising this personalitly in continuity with the past through distinguished contemporal originality .

Climaticaly speaking and through the good insulating caracteristics of the material wich may reduce the need of heating and cooling of buildings to its minimum.

Enviromently speaking the expriment comes as an intergration for the nature , its a continuity to its givings , that it resulted from its materials , keeping its caracter without importing any spoiling and strange material to the site .Thus the unity of site and surroundings is highly kept .

No polution is resulted improvement of nature capacity through field reform for agricultural needs is also highly and widely possible .

It is a new approach , with the help of computer thechnology and employing the arch and vault forms traditional to SYRIA , a sophisticated building system specifically responsive to the local basalt . which resulted in enormous possibilities for the future through the combination of

traditional ideas with the modern thechnology .

To assure the continuity of the rich culture heritage of SYRIA on architectural level , thus emphasising the distinguished architectural personality of the region and giving very original solutions in the contemporary architectural context in SYRIA .

This approach presents a new way of embracing and connecting traditional forms with moderne sophisticated design techniques which result in a very easy way to follow in the art of buildings .

The system is mainly suitable for tow rise buildings for rural constructions in any region where stone is available , its potential is enormous .

* A part : of the cituation of the master jury of AGA KHAN award for architecture 1992 :

The cultural meaining of this project is based an a deep understandi of rural reality by the architects .

- Its challengs contemporary habits and construction trends . the use of vaulted space has created a challenging and original alternative .
- The architects chose to use local material and local typology : basalt stone and vault construction .
- The technique was readly adapted by unskilled local labour and resulted in building that could be completed at a cost saving of one third wh compared to prevailing construction methods .
- The resulted structures are proved memorable back drops for the educati of young syrian boys and girls .

* James steele wrote under the titel :

"CONTINUITY , RELEVANT AND CHANGE "

"For the fifth cycle of AGA KHAN award for architecture "

In " Architecture for a changing world " .

"The stone building system is not only a tribute to the skill of the MUHANNA Brothers but an echoing vindications of H. FATHY'S belive in the principaler they present as well ."

- Prof. Dr. Raif MUHANNA architect
- Prof. Dr. Rafi MUHANNA C. ENG .
- Dr. eng. Ziad MUHANNA architect

GROUP : Prof. Raif Muhanna Ph. D.Arch.
Prof. Rafi Muhanna Ph. D.Civil Eng.
Ziad Muhanna Ph. D. Arch.

ADDRESS : Tijara - Hawasly No. 58
Damascus - Syria

WORK PRESENTED :

A new system for using undressed natural stone in constructions.

NAME OF SYSTEM

NATURAL STONE SHELLS

DESCRIPTION:

The work is primarily based on using undressed stones that exist i grand quantities in Syria, especially in rural areas.

It is achieved by studying the appropriate curve from a structural functional and architectural point of view, so that it meets all needs. Th curve is implemented on a firmly fixed wooden or metalic arch on whic wooden sheets are set up one next to the other to form the complete arc (Vault). A mixture of stones and cement mortar is used in construction b arranging horizontal coars of stones until the shape is completed. Thre days later the wooden frame is dismanteled (removed) and the desired spac is achieved.

The form of this work and the used construction meterial fit completely the surrounding environment. Stones could be collected from the site itself or from adjacent lands, a thing that contributes to reforming agricultural lands and integreates with the environment (no quarry is needed).

The stone material provides high isolation quality so that it helps creating an appropriate climatical atmosphere and contributes to preserving energy to reach the standard climatical limits necessary for convenience of the human being.

The most important thing that should be mentioned here is that no kind of energy is used in manufacturing the construction material (stones) used, which again saves energy and keeps pollution down to its lowest limit.

As a result this new system of construction achieves a great contribution to a better relation between mankind and his natural environment. All above can be resumed to the following characteristics:

CHARACTERISTICS:

- No reinforcement steel is needed.
- Cost constructior is considrably reduced.
- Time of construction is reduced to 1/10 of normal construction .
- Isolating qualities, save in heating & cooling energy.
- Preserves local architecture and regional architectural tradition.
- Gives special significance to architectural heritage.
- Helps to reform fields covered by many kinds of stones, and gives more possibilities to improve planted environment and agricultural productions so made.
- Constructions so made integrated successfully with nature and environments and gives environmental architectural unity.
- Creates lovely local rural & urban tissues.
- Helps to reduce pollution by limiting emergy use.
- Successful economic system, depending on passive solar systems for heating & natural ventilation principles deriving from local experience.
- Extends architectural flexibilities.
- Shapes & provides possibilities of composition for houses, schools, motels, ... etc.

AWARDS RECEIVED:

- Winner of the WIPO Golden medal for the best invention in Damascus International Exhibition 1988 the new system of construction by using natural undressed stone shells.
- Winner of the special prize of International Habitat Center of the United Nations, 1989.
- Winner of the Interach 1989 medal to a new system for the construction of houses and buildings by using natural undressed stone shells.

THE INTERNATIONAL SYMPOSIUM OF
HASSAN FATHI
FOR ARCHITECTURE OF THE POOR

From 20th to 22nd April 1993,
Cairo, Egypt

TITLE

A NEW APPROACH FOR DESIGN AND CONSTRUCTION USING APPROPRIATE BUILDING TECHNOLOGY THROUGH A GOVERNMENTAL ORGANIZATION

BY
- Eng. Sherif Abdel Monem Algohary
Demonstrator of Architectural Engineering
Atomic Energy Authority
101, Kasr Elainy St.,
Cairo

- Eng. Karim Youssef Oaf
Architect
143, Tahrir St.,
Cairo

Title : A NEW APPROACH FOR DESIGN AND CONSTRUCTION USING APPROPRIATE BUILDING TECHNOLOGY THROUGH A GOVERNMENTAL ORGANIZATION

BY : - SHERIF ABDEL MONEM ALGOHARY

DEMONSTRATOR OF ARCHITECTURAL ENGINEERING ,

ATOMIC ENERGY AUTHORITY

101 , KASR ELAINY ST. , CAIRO

- KARIM YOUSSEF OAF

ARCHITECT

143 , TAHRIR ST. , CAIRO

A New Approach For Design And Construction Using Appropriate Building Technology Through A Governmental Organization

Abstract

A desert agriculture laboratory building (D.A.L) of 1500 sq.m covered area was built in Atomic Energy Authority (AEA) site at Inshas by newly approach for governmental organization to use appropriate building technology in its buildings (Fig.1).
This paper attempts briefly to present appropriate building technology which are used in design and construction of this building .
Comparative analysis of vaults construction with different techniques and different type of masons from upper Egypt and from Delta are also included.

Fig .1 View of DAL building

Description of the building

The laboratory building for desert agriculture application of Atomic Energy Authority at Inshas was constructed in 1992 (Fig.2).
The 1200 sq.m building , which has a covered area 1500 sq.m , provides laboratory spaces , offices , library and accommodation rooms for agriculture department as well as a multi -purpose hall for meetings and seminars.
The building is characterized by compact layout in form , the mass of the building is one story height . The building is closed from outside and introverted to an interior courtyards protecting it from outside condition .
The general form of the building consists of domes and vaults constructions.

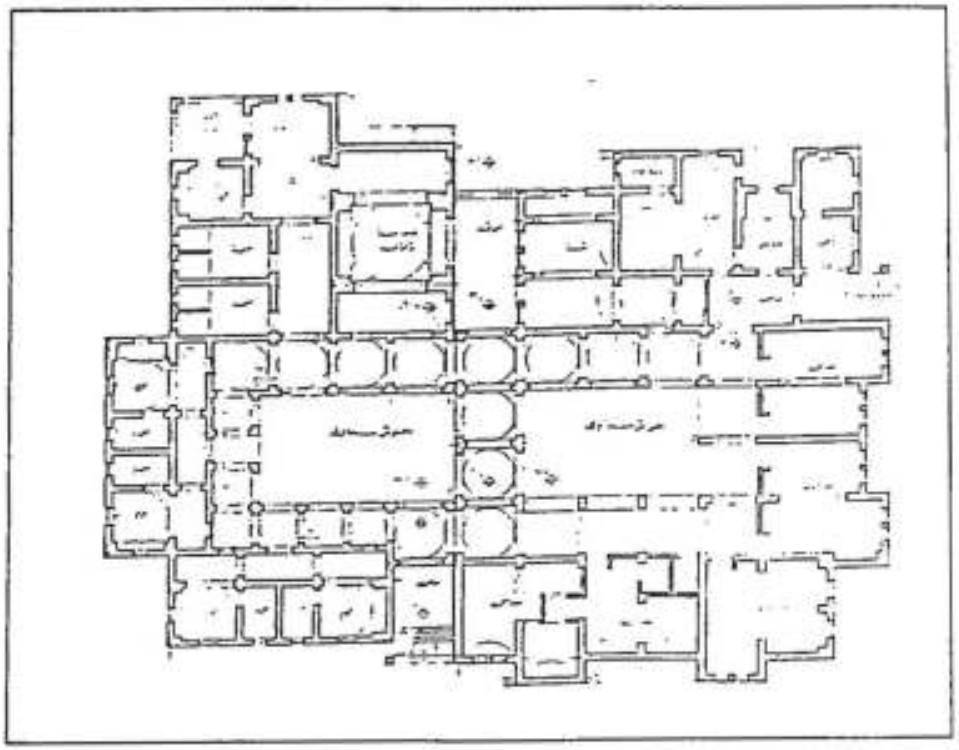


Fig .2 Plan of DAL building

1) The bearing walls and arches with 50 cm thickness (Fig.3) were built from white lime stone which has different advantages :

- Natural local material for construction and finishing .
- Good insulation material and heat reservoir .
- Cheap and simple type of construction .

2) Using domes and vaults construction for roofs (Fig.4) which shows several advantages such as:

- Structurally optimized .
- Thermally comfortable.
- It has a culture continuity and a natural aesthetic proportions .

Fig .3 View of bearing walls and arches

Fig .4 View of domes and vaults construction

3) Different technique of vaults construction are used ,traditional Nubian vaults and centering vaults.

a) Traditional Nubian vault

Traditional Nubian technique for construction of vaults is used since thousands of years in upper Egypt (Fig.5) .
In this kind of buildings Nubian vaults are used without using wooden shutters or centering and the masons are mainly from upper Egypt , which is the native land of this vault .
The main material used in this vault is mud , for making bricks and mortar , and the shape of this vault is a parabola .

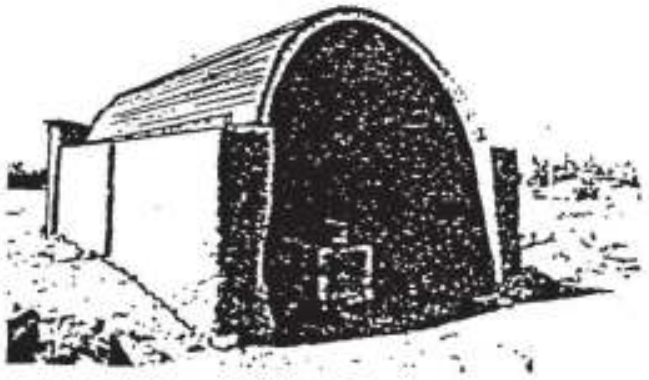


Fig .5 Traditional Nubian vault

Sequence of construction

A parabolic arch is drawn on the back wall of the room , then the beginning course of brick is put lightly inclined at the beginning of the drawn curve , and inclination increases with the courses until the whole curve is drawn with bricks , and then the courses goes on (Fig.6).
- The thickness of this vault is mainly 12-15 cm, the span of room usually does not exceed 3.5 m .
- Two masons with three assistants can build about 9 sq.m per day , and 1 sq.m of this vault takes about 110 bricks.

Here , the whole subject is an integrated chain , the materials .Technique , and the human being .If we change one of these items this integrated chain will break and different aspects will appear . If we will build in a new place , we have to bring these skilled masons from Nubia , or we might train new masons which needs time and effort . Also if we used burnt bricks with cement mortar instead of mud bricks . the quantity of bricks may not increase much but we will notice the big difference in the daily production rate of the masons , and the quantity of cement in the mortar will be more than its usual standard for the ordinary walls. With this point of view , we have to look for other solutions to build the vault .taking into our consideration that the solution have to be more economic , fast ,and appropriate .

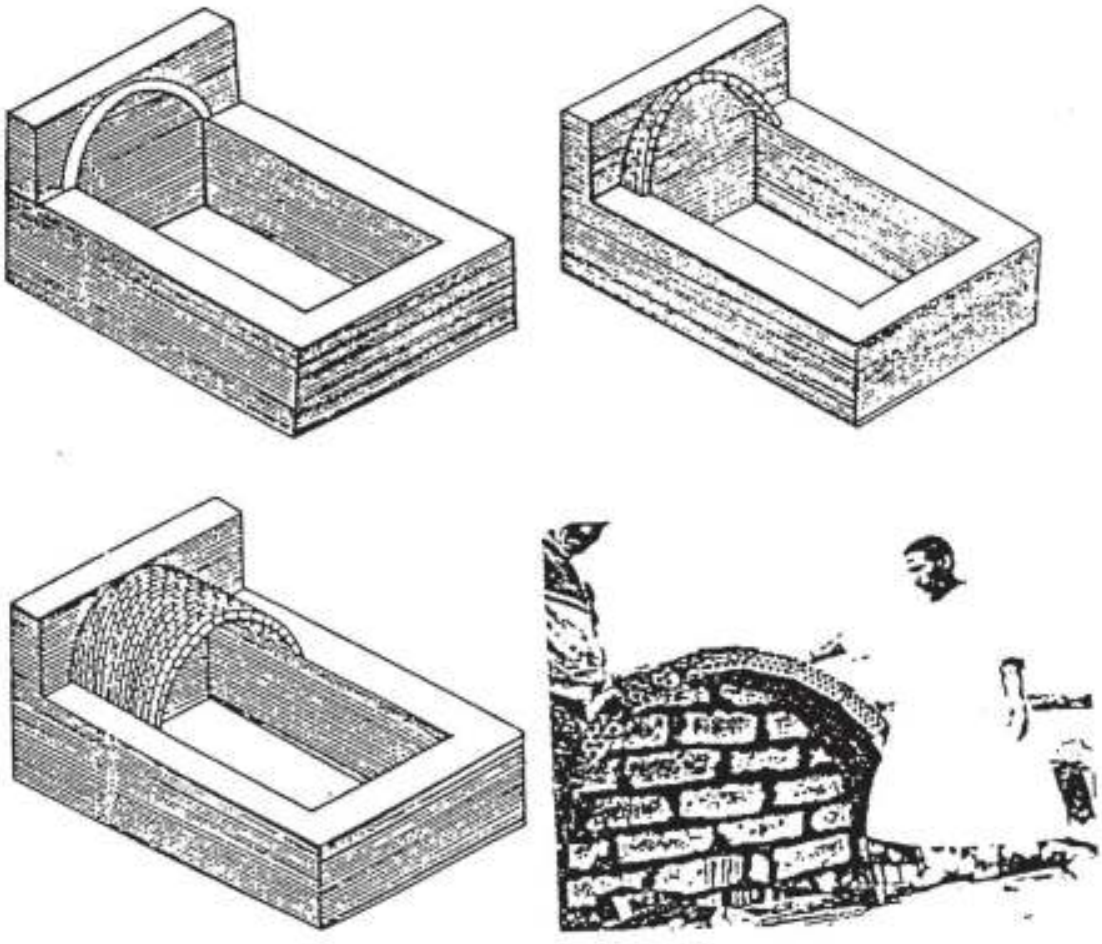


Fig .6 Sequence of construction of Nubian vault

b) Centering vault

In this project , ordinary masons built centering vaults of thickness 25 cm on wooden framework

Sequence of construction

The wooden framework is put at the top of the vertical walls , then the masons start to put the bricks on the framework as shown in (Figs.7,8).
- Burnt bricks with standard dimensions 25 X 12.5 X 12.5 cm , and cement mortar , were used in construction this type of vault of thickness 25 cm for room of width 3.0 m .
- Four ordinary masons with six assistants can build 30 sq.m per day , and we notice that any number of masons can work together in the same vault at the same time .
- The whole vault must be finished in one day , also the wooden framework should not be removed before three days from the time of finishing the vault .

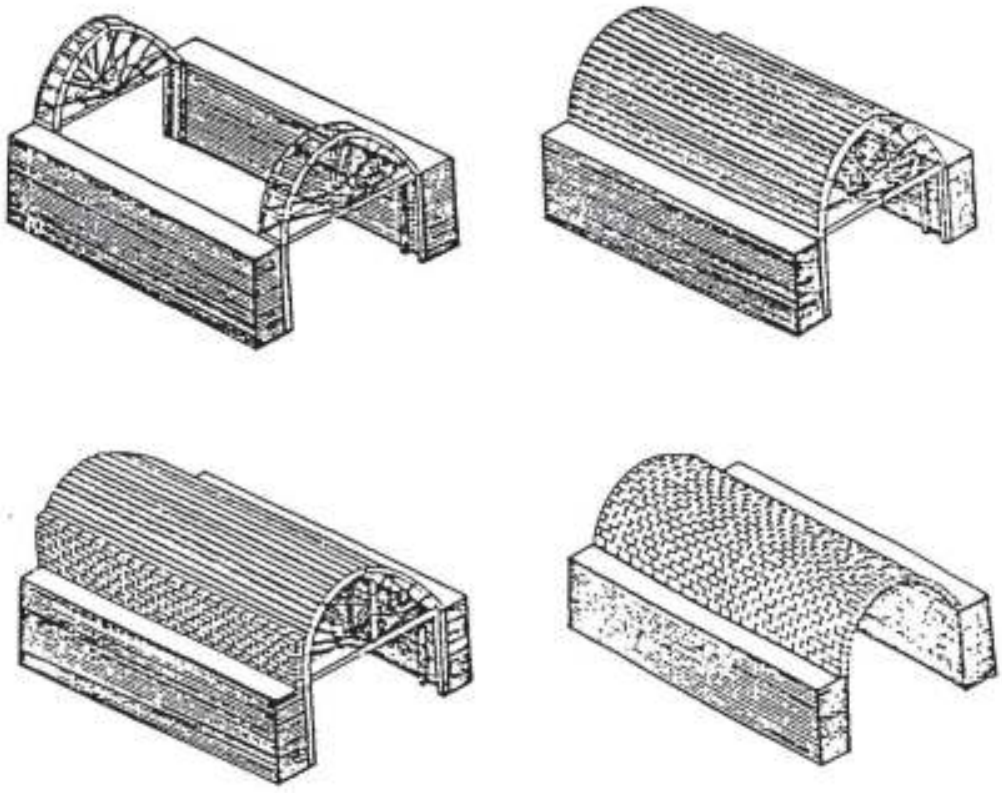


Fig .7 Sequence of construction of Centering vault

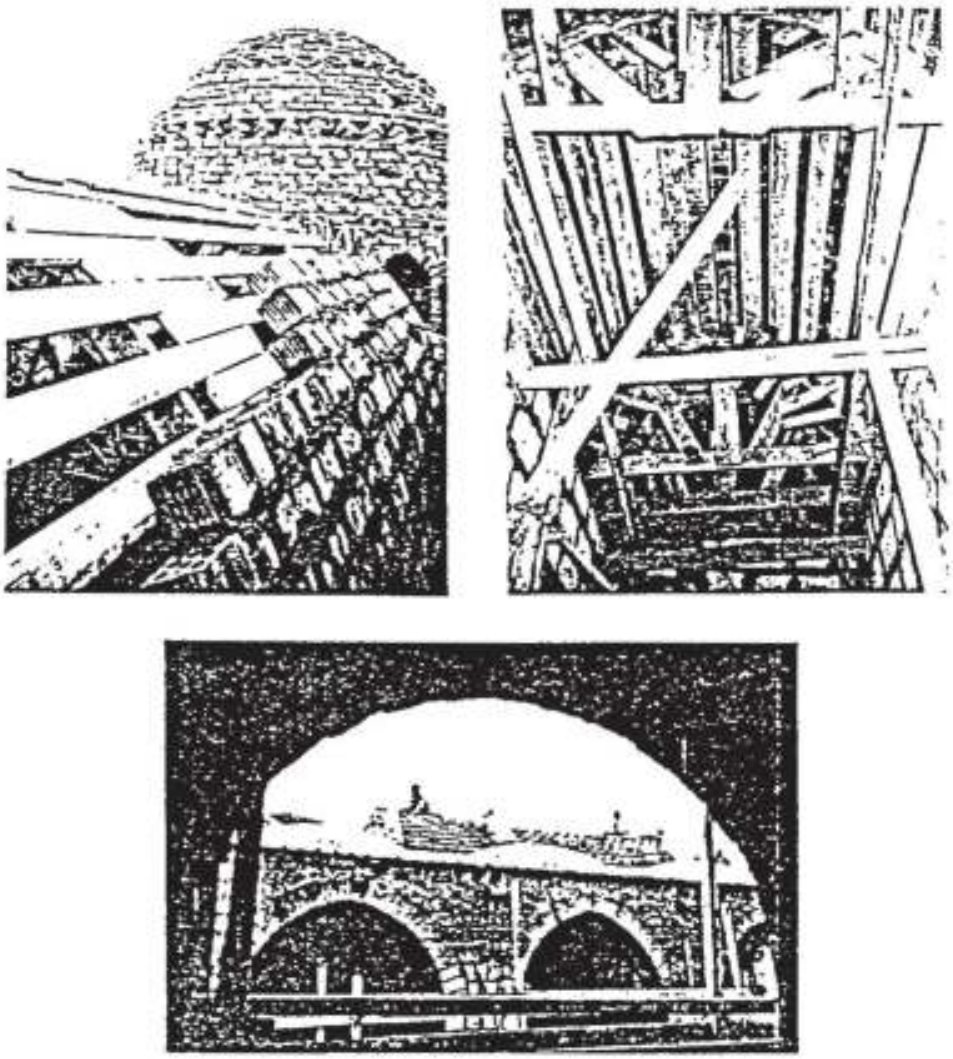


Fig .6 Different views of Centering vault

Out Look

1) Natural lime stone was used as a construction local material .
2) Vaults and domes structures are favorable for dezert areas , not only for housing and private homes but also for laboratories , schools , hospitals and office-buildings .
3) Different types of masons were involved in construction of vaults and domes :
   a) Skilled masons from upper Egypt had constructed their types of vaults and domes .
   b) Skilled masons from Delta shared in construction and they were trained to construct upper Egypt style of vaults and domes , and after a while they built it perfectly .
   c) Ordinary masons were trained in construction of vaults and domes and the result is satisfactory .
4) Burnt bricks with 25 cm thickness were used in the construction with different techniques of vaults construction (Nubian and Centering) , (Fig.9) .

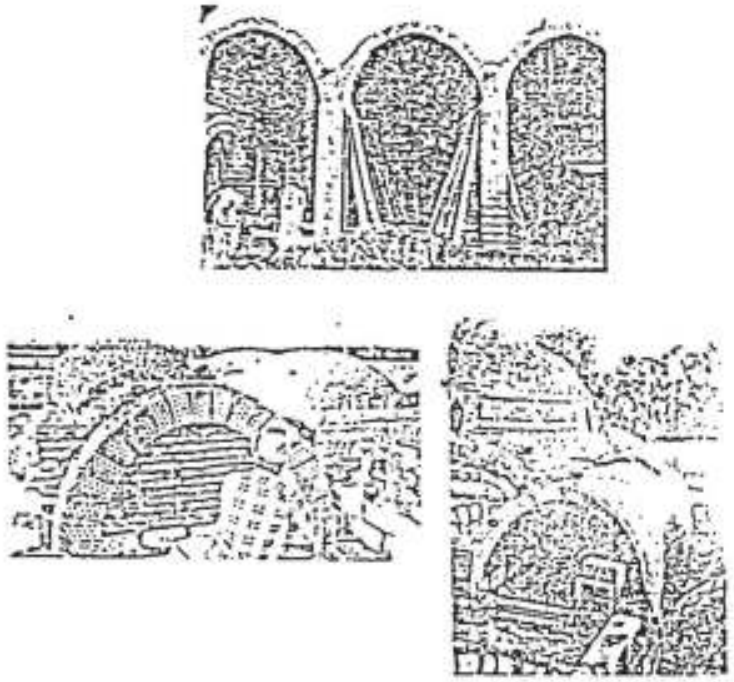


Fig .9 Different types of vaults

In general , the comparison between these two types will give to each one some advantages , and the criteria of the project will define which type is optimum to be used . In this project we found that the centering vault is more economical than the Nubian vault and table 1 will show an out look comparison between these two types .

Table 1 Comparative Analysis Between Nubian And Centering vaults

	Nubian	Centering
Masons	skilled and rare	ordinary
Cost	double the ordinary	ordinary cost
Place	Nubia living and transportation cost	local (any where) no living cost
Technique	without centering no other skills are needed	with centering carpenter must be involved
extra material	---	need wood for centering
No. of masons	not more than two for one vault	any no. of masons can share in the same vault
Thickness	12-15 cm	>25 cm
Shape	Egyptian parabola	any kind of arch
Daily output	9 sq.m /day (for 2 masons)	15 sq.m /day (for 2 masons)
Amount of cement	80 Kg / sq.m	35 Kg / sq.m
sequence of construction	can be done in stages	must be done in one stage in one day
Training	needs training	does not need training

Acknowledgement

The paper is presented with the permission of prof.F.Hammad , chairman of Atomic Energy Authority , Cairo ,and the authors would like to thank him for his help , continual encouragement , and support during various stages of this project .

Title : A NEW APPROACH FOR DESIGN AND CONSTRUCTION USING APPROPRIATE BUILDING TECHNOLOGY THROUGH A GOVERNMENTAL ORGANIZATION

BY : - SHERIF ABDEL MONEM ALGOHARY
DEMONSTRATOR OF ARCHITECTURAL ENGINEERING ,
ATOMIC ENERGY AUTHORITY
101 , KASR ELAINY ST. , CAIRO

- KARIM YOUSSEF OAF
ARCHITECT
143 , TAHRIR ST. , CAIRO

A New Approach For Design And Construction Using Appropriate Building Technology Through A Governmental Organization

Abstract

A desert agriculture laboratory building (D.A.L) of 1500 sq.m covered area was built in Atomic Energy Authority (AEA) site at Inshas by newly approach for governmental organization to use appropriate building technology in its buildings (Fig.1).
This paper attempts briefly to present appropriate building technology which are used in design and construction of this building .
Comparative analysis of vaults construction with different techniques and different type of masons from upper Egypt and from Delta are also included.

Fig .1 View of DAL building

Description of the building

The laboratory building for desert agriculture application of Atomic Energy Authority at Inshas was constructed in 1992 (Fig.2).
The 1200 sq.m building , which has a covered area 1500 sq.m , provides laboratory spaces , offices , library and accommodation rooms for agriculture department as well as a multi -purpose hall for meetings and seminars.
The building is characterized by compact layout in form , the mass of the building is one story height . The building is closed from outside and introverted to an interior courtyards protecting it from outside condition . The general form of the building consists of domes and vaults constructions.

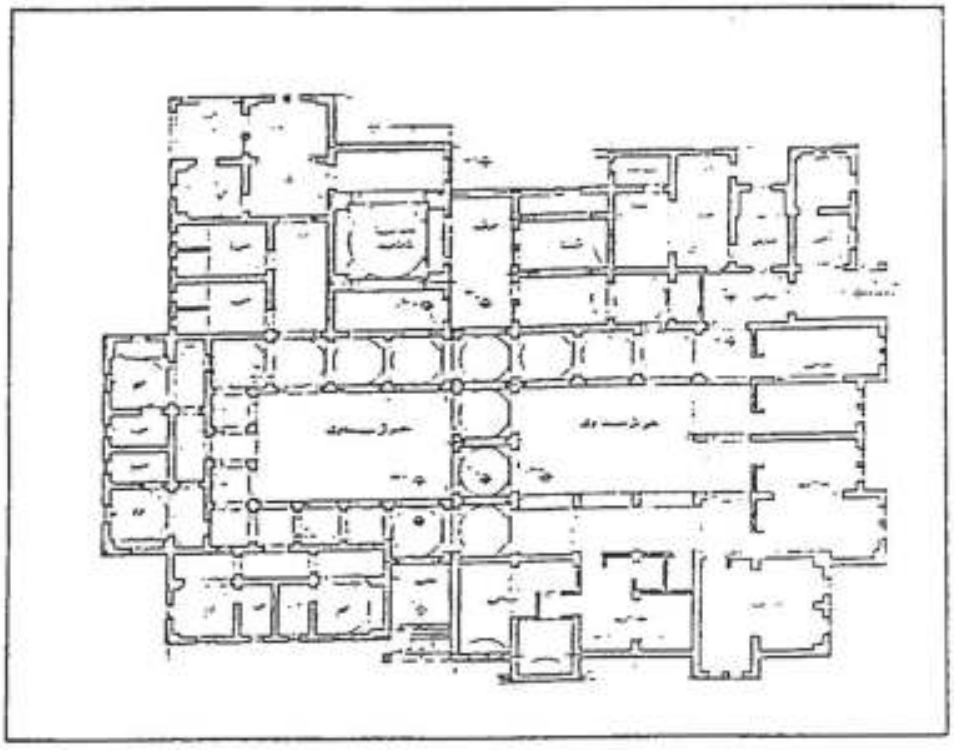


Fig .2 Plan of DAL building

1) The bearing walls and arches with 50 cm thickness (Fig.3) were built from white lime stone which has different advantages :

- Natural local material for construction and finishing .
- Good insulation material and heat reservoir .
- Cheap and simple type of construction .

2) Using domes and vaults construction for roofs (Fig.4) which shows several advantages such as:

- Structurally optimized .
- Thermally comfortable.
- It has a culture continuity and a natural aesthetic proportions .

Fig .3 View of bearing walls and arches

Fig .4 View of domes and vaults construction

3) Different technique of vaults construction are used ,traditional Nubian vaults and centering vaults.

a) Traditional Nubian vault

Traditional Nubian technique for construction of vaults is used since thousands of years in upper Egypt (Fig.5) .
In this kind of buildings Nubian vaults are used without using wooden shutters or centering and the masons are mainly from upper Egypt , which is the native land of this vault .
The main material used in this vault is mud , for making bricks and mortar , and the shape of this vault is a parabola .

Fig .5 Traditional Nubian vault

Sequence of construction

A parabolic arch is drawn on the back wall of the room , then the beginning course of brick is put lightly inclined at the beginning of the drawn curve , and inclination increases with the courses until the whole curve is drawn with bricks , and then the courses goes on (Fig.6).
- The thickness of this vault is mainly 12-15 cm, the span of room usually does not exceed 3.5 m .
- Two masons with three assistants can build about 9 sq.m per day , and 1 sq.m of this vault takes about 110 bricks.

Here , the whole subject is an integrated chain , the materials ,Technique , and the human being .If we change one of these items this integrated chain will break and different aspects will appear . If we will build in a new place , we have to bring these skilled masons from Nubia , or we might train new masons which needs time and effort . Also if we used burnt bricks with cement mortar instead of mud bricks , the quantity of bricks may not increase much but we will notice the big difference in the daily production rate of the masons , and the quantity of cement in the mortar will be more than its usual standard for the ordinary walls. With this point of view , we have to look for other solutions to build the vault ,taking into our consideration that the solution have to be more economic , fast ,and appropriate .

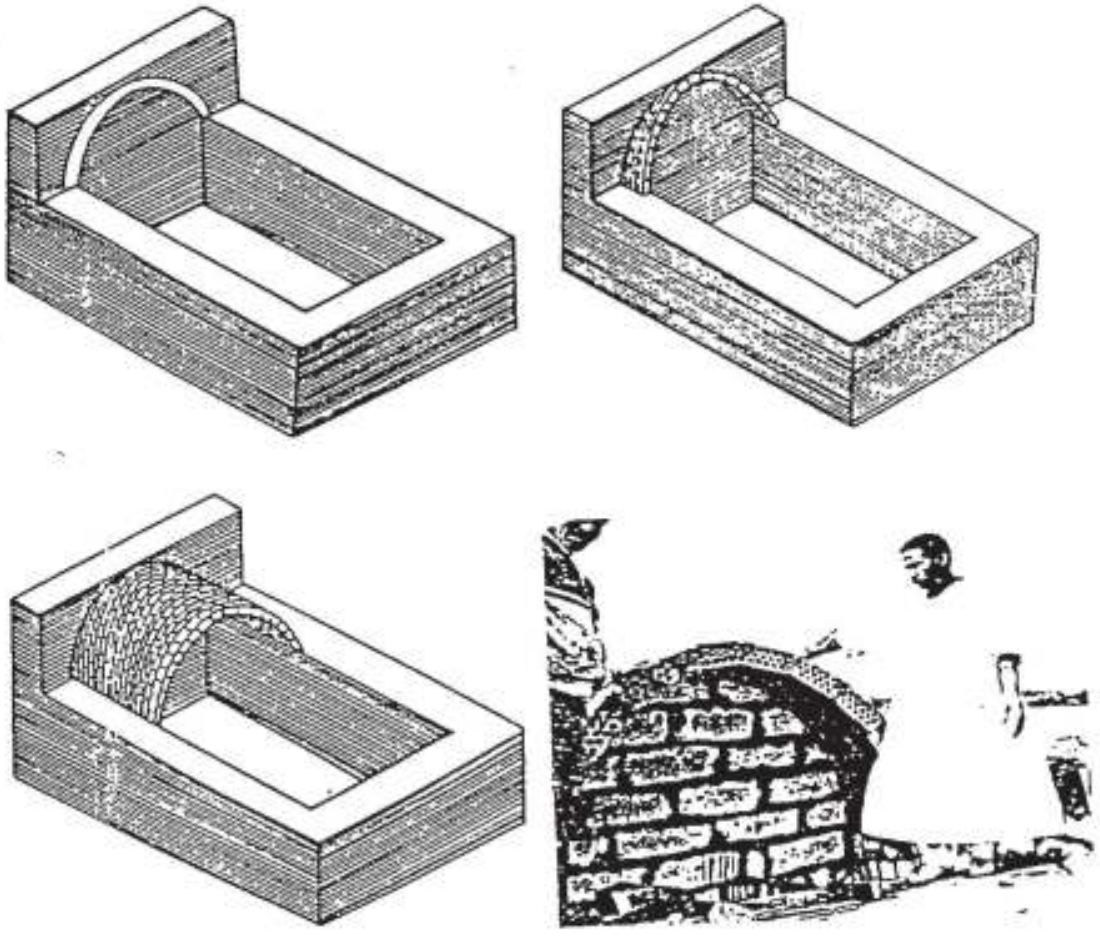


Fig .6 Sequence of construction of Nubian vault

b) Centering vault

In this project , ordinary masons built centering vaults of thickness 25 cm on wooden framework

Sequence of construction

The wooden framework is put at the top of the vertical walls , then the masons start to put the bricks on the framework as shown in (Figs.7,8).

- Burnt bricks with standard dimensions 25 X 12.5 X 12.5 cm , and cement mortar , were used in construction this type of vault of thickness 25 cm for room of width 3.0 m .
- Four ordinary masons with six assistants can build 30 sq.m per day , and we notice that any number of masons can work together in the same vault at the same time .
- The whole vault must be finished in one day , also the wooden framework should not be removed before three days from the time of finishing the vault .

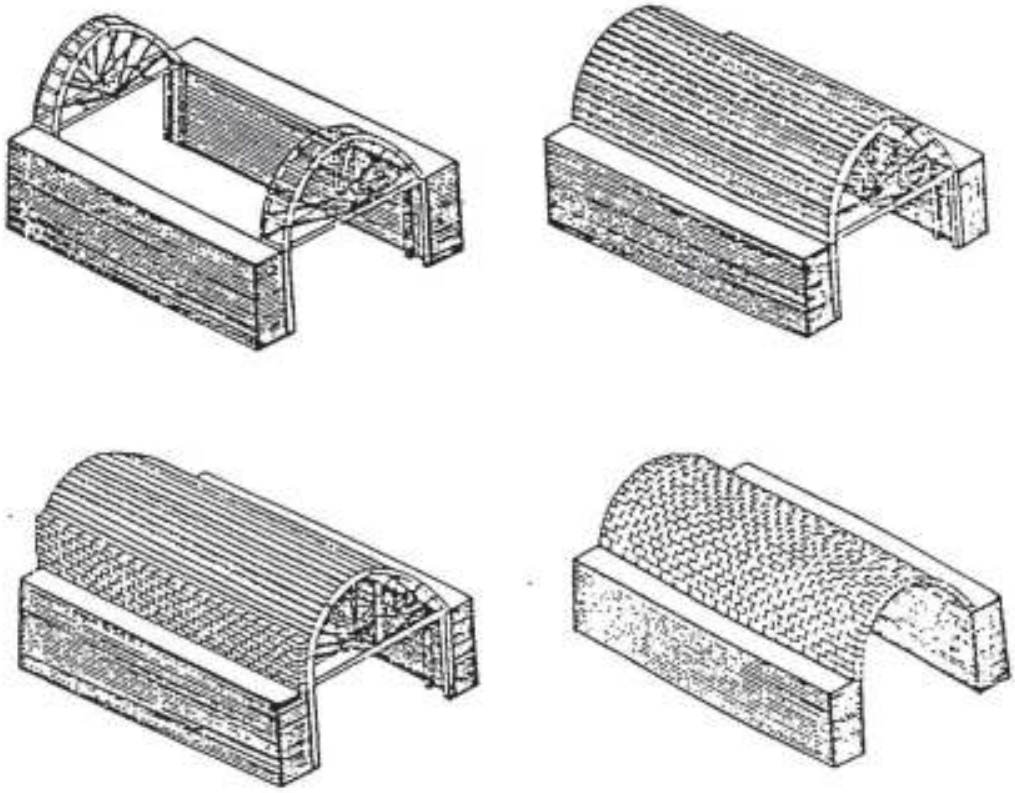


Fig .7 Sequence of construction of Centering vault

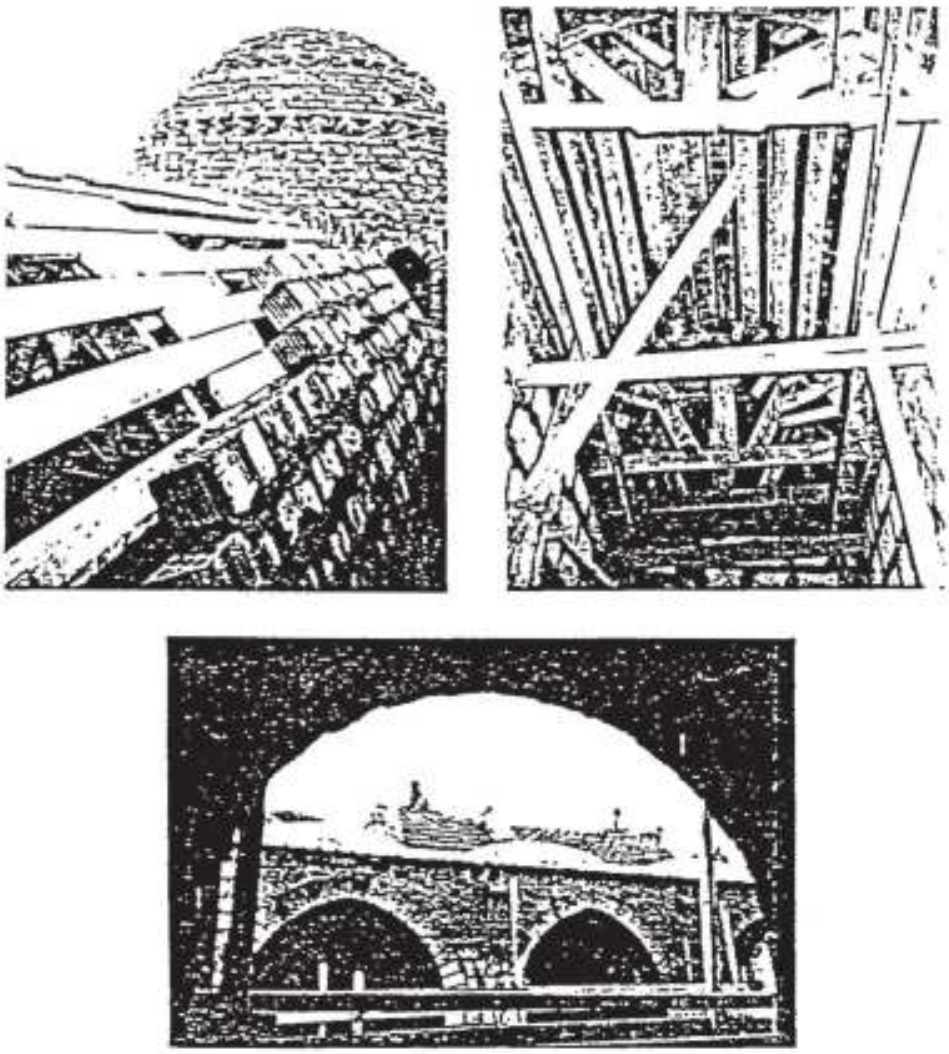


Fig .8 Different views of Centering vault

Out Look

1) Natural lime stone was used as a construction local material .
2) Vaults and domes structures are favorable for desert areas , not only for housing and private homes but also for laboratories , schools , hospitals and office-buildings .
3) Different types of masons were involved in construction of vaults and domes :
a) Skilled masons from upper Egypt had constructed their types of vaults and domes .
b) Skilled masons from Delta shared in construction and they were trained to construct upper Egypt style of vaults and domes , and after a while they built it perfectly .
c) Ordinary masons were trained in construction of vaults and domes and the result is satisfactory .
4) Burnt bricks with 25 cm thickness were used in the construction with different techniques of vaults construction (Nubian and Centering) , (Fig.9) .

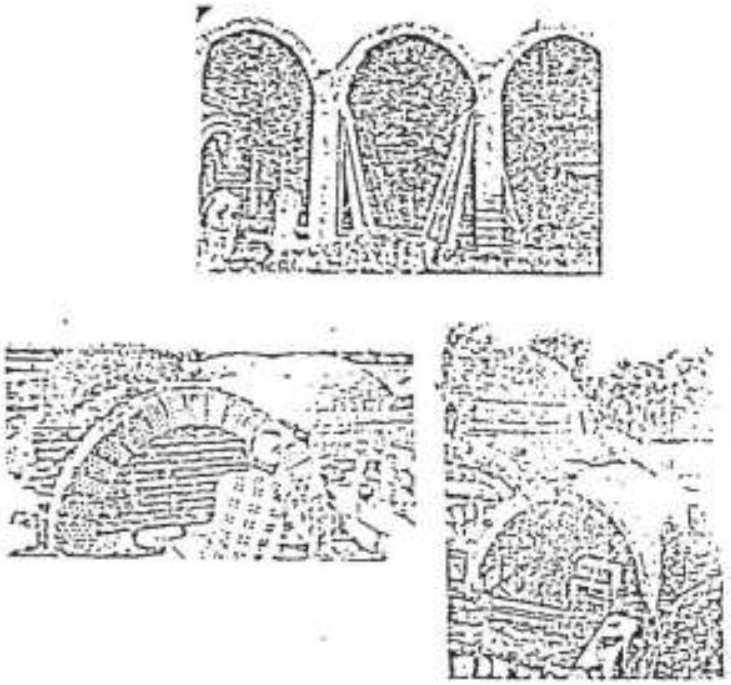


Fig .9 Different types of vaults

In general , the comparison between these two types will give to each one some advantages , and the criteria of the project will define which type is optimum to be used . In this project we found that the centering vault is more economical than the Nubian vault and table 1 will show an out look comparison between these two types .

Table 1 Comparative Analysis Between Nubian And Centering vaults

	Nubian	Centering
Masons	skilled and rare	ordinary
Cost	double the ordinary	ordinary cost
Place	Nubia living and transportation cost	local (any where) no living cost
Technique	without centering no other skills are needed	with centering carpenter must be involved
extra material	---	need wood for centering
No. of masons	not more than two for one vault	any no. of masons can share in the same vault
Thickness	12-15 cm	>25 cm
Shape	Egyptian parabola	any kind of arch
Daily output	8 sq.m /day (for 2 masons)	15 sq.m /day (for 2 masons)
Amount of cement	80 Kg / sq.m	35 Kg / sq.m
sequence of construction	can be done in stages	must be done in one stage in one day
Training	needs training	does not need training

Acknowledgement

The paper is presented with the permission of prof.F.Hammad , chairman of Atomic Energy Authority , Cairo .and the authors would like to thank him for his help , continual encouragement , and support during various stages of this project .

5. The OLE Object property sheet will pop up. You will want to group your data on the company so drag and drop the Company Name column to the Group By column.

6. The data you will display will be the company name and the sum of the purchase order for the company. Drag and drop the Company Name column to the Target Data column. If the column shows any functions with it, double-click on the column and replace the expression with the column name in the Expression painter.

7. Drag and drop the Purchase Order Amount column to the Target Data column. The painter will automatically place the sum function around this column. The property sheet should look like the one in Figure 9-23.

8. To define the titles and labels for the graph, double-click on the graph to activate the OLE object.

9. Click the right mouse button somewhere in the area outside of the graph to access the graph properties. Select the Insert Titles option and then check the Chart Title and Category (X) Axis title.

10. Click on the title areas the graph just created and change the title of the graph to "Purchase Order by Company" and the X Axis title to "Company". The graph should look like the one shown in Figure 9-24.

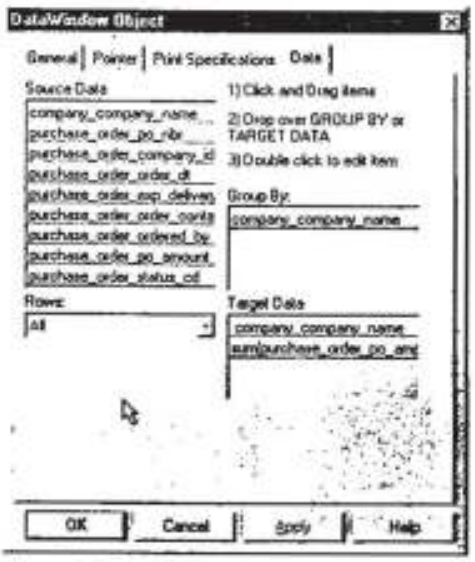


Figure 9-23 OLE Object Data property sheet

THE INTERNATIONAL SYMPOSIUM OF HASSAN FATHI FOR ARCHITECTURE OF THE POOR

From 20th to 22nd April 1993,
Cairo, Eygpt

TITLE

NEW SYSTEM FOR BUILDING IN LOCAL STONE NATURAL STONE SHELLS SYSTEM

BY

Prof. Raif Muhanna Ph. D. Arch.
Prof. Rafi Muhanna Ph. D. Civil Eng.
Dr. Ziad Muhanna Ph. D. Arch.

ADDRESS

Tijara - Hawasly no. 58
Damascus - Syria

Adapting a time honoured roofing technique to meet the contemporary needs and new local conditions: the case of the "woodless" roofing programme in Niger and Mali

John Norton, Director, Development Workshop

in collaboration with

Peter Tunley, Associate, Development Workshop

Development Workshop

B.P. 13, 82110 Lauzerte, France
Fax: 63 95 82 42. Phone: 63 95 82 34

This paper presents a case study of the introduction of "woodless" roofs (ie. Nubian vaults and domes) to Niger and Mali. It considers the important role that adaptation and evolution of architectural forms and structural details have played in making these techniques - previously unknown in the area - widely popular amongst the local rural builders of the Sahel. Indeed they are now locally perceived and used today as a genuinely viable solution to the increasing difficulty of finding affordable materials for roofing. In this respect the spirit of the "woodless" construction programme in the Sahel, originating in 1980 and with ongoing activities programmed up to 1998, is directly in keeping with Hassan Fathy's philosophy, which the author was privileged to learn at first hand through working with him in Egypt and Oman in the early 1970's.[1]

A problem of resources - survival and supply

Vault and dome roofing techniques were introduced by Development Workshop into Niger in 1980 at the request of a small NGO, ISAID. The request came in response to the recognition of two growing problems in the region: (1) the consumption of wood, branches and grasses in building is a major factor in the depletion of natural resources and contributory factor in 'desertification'; and (2)

that the inhabitants of the Sahel face increasing difficulties as these organic materials habitually used for building either disappear or become prohibitively expensive.

Throughout the Sahel, species of timber that have traditionally been used for the main structure of flat earth and timber roofs, such as the doum palm, are now difficult to find or afford. In some cases where supplies were available close by twenty years ago, people now have to travel many tens of kilometres to find similar and only marginally suitable wood[2]. Over-consumption has led to the almost total disappearance of certain species in some areas. For the population this has meant turning instead to alternative species, often less durable or less well adapted to their needs. A vicious circle is created, as the quality of wood deteriorates, the rate at which it has to be replaced increases. Builders north of Mopti, Mali, complain that the only wood they can now get and afford has to be replaced after one or two years, and in many cases the tree trunks are so short that room width has to be reduced to two and a half or three metres wide. They are not alone - a similar problem has occurred for women in building their traditional round shelters in northern Niger, where the cereal stems, grasses and tree roots that have mainly been used are now very difficult to obtain, and where the potential through training to use the accessible alternative local material of traditional earth blocks - typically a male skill - has been received with enthusiasm. These difficulties (of finding wood and organic materials for building) extend from the simplest shelter right through to the construction of government facilities, but it is primarily to the poorest amongst the private sector that the "woodless" construction effort has been addressed.

A choice of suitable roofing techniques

In 1980, vaults and domes using unstabilized and uncompressed earth bricks seemed an obvious potential solution to the apparent problem in Niger. Nevertheless it was necessary to choose techniques which could be easily transferred into the local building 'vocabulary' of Sahelian villages. Development Workshop, with many years of experience of building with a wide range of Iranian vault and dome techniques and having worked with Hassan Fathy in 1972 and 1973 and built with the Nubian vault and dome techniques in Egypt, selected the latter primarily because of the greater simplicity and safety with which the Nubian techniques can be learnt by unskilled masons. During the first training programme in autumn 1980, techniques of vault and dome construction were shown to local builders in the area of Chikal, Filingué, in Niger. Both the preliminary demonstration structures and the small literacy centre that was built at the time closely adhered in style and technique to basic rules of Nubian vault and dome construction, much as had been used in New Gourna and other projects in Egypt in the preceding years.

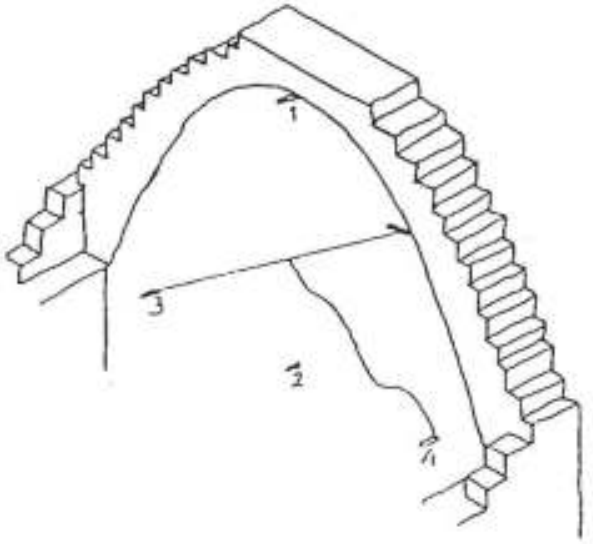
Technical adaptation

However, in Niger from the outset it became clear that if the techniques were to be learnt efficiently and safely, and if they were to suit the climate and soils of the different parts of the Sahel, modifications would be needed both in how the techniques were taught, in the form of the structures themselves, and in the way they were built. As well, one needed to take into account that here there were new masons learning in a matter of weeks to build with techniques which in traditional use in Egypt (and Iran) have been passed slowly down through generations of builders and apprentices. In this, far more rapid, process of training builders who would then be working on their own in their villages, the 'woodless construction programme' has recognised that builders will rarely have the benefit of a skilled master builder or technician to guide them, that mistakes will be made, and that the structures and techniques must take this into account. These considerations began an ongoing process of adaptation and improvement based on a collaboration between the Development Workshop team and the local builders involved in training programmes, a collaboration which has resulted in solutions genuinely adapted to local conditions.

In training, for example, it was soon apparent that building Nubian (catenary) vaults was unnecessarily complicated by the absence of a guide to help ensure the correct horizontal alignment of bricks, and that popular dissemination of the vault would be limited unless the builders could have a sure and accurate method for drawing out vaults of different spans and of different height to span ratios. To make building straight vaults easier, horizontal strings were stretched

Double ended vault being built in Niger. Horizontal courses fill in the light gap between two approaching vaults. The masons work with guiding horizontal strings to ensure good vault alignment.

from one end of the vault to the other between two supporting end walls; this in turn lead to the building of vaults from both ends of a room and the practice of filling in the final gap where the two opposing vaults meet with horizontal courses, both easy and rapid to lay. This process of "infilling" has in turn eliminated the need to straighten up the slope of the vaults as they are built out from the end wall, a process which was extremely difficult for many builders.



Nubian vaults can be drawn accurately with three pieces of string or wire. Each mason is taught the simple method that allows him to work out the lengths of string and position of pegs.

The programme has also developed a simple method of using strings to accurately draw the profile of vaults onto the end wall. The result of developing these aids to learning has been that whilst in the early years in Niger many builders were reluctant to use vaults and favoured domes, this is no longer the case, and most masons feel as happy with either technique.

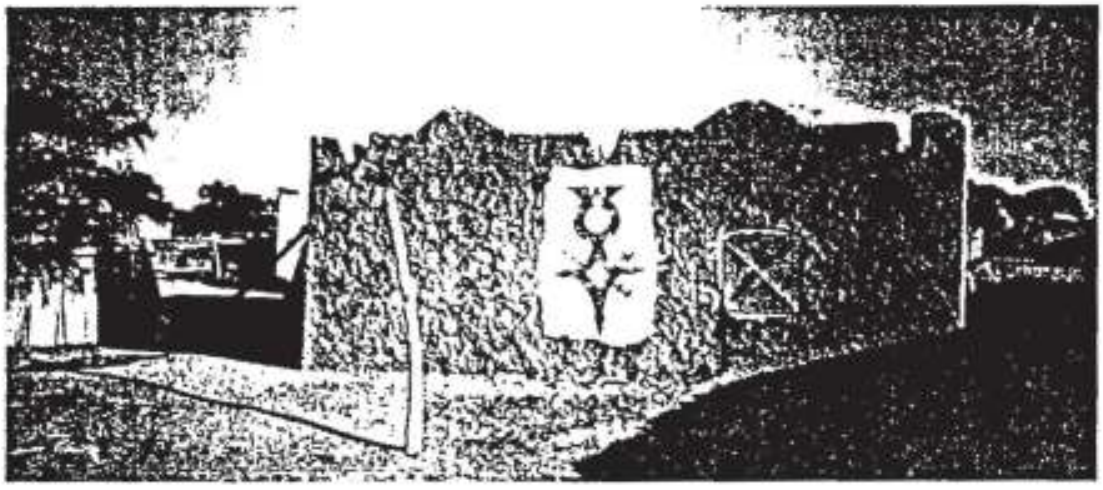
Modifications have also been introduced in order to accommodate local building practices thus allowing the "new" techniques a better chance of being disseminated. For example, from the outset training stressed the importance of good bonding in the brickwork of walls to ensure that the structure could support the forces exerted by the roof. To this end the programme for many years promoted the use of a modular earth block measuring approximately 40 x 18 x 15 centimetres (allowing good masonry with headers and stretchers). But this wall building brick does not match the popular brick sizes of the Sahel, more commonly non-modular and measuring about 36 x 22 x 11 centimetres, which on a 36 centimetre wall are always laid as headers. Recognizing that in reality more people would build with this non-modular brick, the programme has worked with builders to ensure that they can achieve acceptable and safe brick bonding patterns. The result is that on small buildings masons are building better with a locally familiar "bonding" pattern and brick than they would do with the technically "better" modular brick.

Rainfall is, perhaps surprisingly, also a major consideration in the Sahel. Although the area is extremely arid, rainstorms when they do come are invariably violent, and unless care has been taken, earth structures can be seriously eroded in a short period. The angular junctions between a dome and wall parapet, and

the steep "valleys" between vaults which are possible in the arid climate of Egypt cause problems in the Sahel for water run-off. Thus the profile of roofs and the infilling between domes and vaults has needed to be treated with more rounded forms that avoid sudden changes of slope or sharp changes in roof thickness, the latter also provoking differences in thermal expansion. Experience gained over the past twelve years - watching how rain performs on earth vault and dome roofs - has helped local builders see how best to "sculpt" the roof shape to ensure quick but smooth evacuation or rain water towards wide water spouts which throw rain water well clear of the building. Treatment of rainwater has been an important example of the fact that one cannot simply transfer a design or technology from one country to another; potential solutions must be adapted to the local context, and in many cases the process of adaptation will require considerable time.

Cultural integration

These and many other minor technical innovations are gradually helping to develop a system of using vault and dome roofing well adapted to the physical conditions of the Sahel. But the Sahel is also a region with many distinct cultures, social patterns and specific styles of architecture and decoration. This has meant that the woodless construction programme has needed to demonstrate a wide variety of buildings, ranging from single domed round shelter, through combinations of round and rectangular rooms, to large structures capable of accommodating offices and exhibition halls. These in themselves have produced a range of interesting spatial and roof combinations, many the result of builders working to see how vaults and domes can be used to resolve their own housing needs and those of their clients. But perhaps the most important aspect of the adaptation of the woodless construction techniques has been in the way the



A spontaneous two domed house in Iferouane, northern Niger. Most masons have their own distinctive style.

Highly decorated two-domed house in Youvarou, central Mali. Only from the inside can one tell how the house has been built. Pride in their work is one way of ensuring that masons maintain a high standard of workmanship.

builders of each different region have absorbed the vault and dome system into their own building "vocabulary", and have then applied to it their own forms of elevation treatment and decoration. In many cases one can no longer distinguish between traditional and the new "woodless" construction buildings. What one can clearly distinguish, on the other hand, is the styles of individual masons and particularly those who have become masters in their own area, already training a first generation of their own apprentices. These styles range from the highly decorated buildings of Youvarou in the Niger Delta in Mali, to the simple buildings of master mason Mouloul north of Agadez, where the hall-mark is a fine attention to the detailing of openings and finishes. The potential to achieve personal expression in the process of "woodless" construction has encouraged pride in building amongst the masons, and has been an important factor in helping the "woodless" construction techniques achieve wide popularity in the villages of Niger, and more recently in Mali.

In effect, the real reward of over a decade of training, of demonstrating the techniques, and of listening to local needs, has been to reach the point where there are daily a growing number of spontaneously built houses, constructed by trained local masons for their own clients, with no external technical support or finance. The "woodless" construction programme[3] has thus begun to have a real impact on helping people build decent and durable houses and local public facilities with resources that they can both find and afford. This would not have been possible without the continuous effort to change and adapt the techniques to suit the local needs and conditions, so they become truly used and appropriated by the builders of the region.

Postscript

Since 1980 Development Workshop has provided the technical and managerial support to the "woodless" construction initiative in the Sahel through a variety of national, regional and international organisations who have chosen to support and encourage these techniques. In particular, in recent years a close collaboration has grown between DW and IUCN (the World Conservation Union), and through this partnership a comprehensive programme of training and awareness raising is programmed in the Sahel from 1993 to 1998, with the generous support of DANIDA.

1. The founding members of Development Workshop, John Norton, Allan Cain and Farokh Afshar, worked with Hassan Fathy and Omar El Farouk in Egypt, Oman and the Lebanon in 1973. See, for example, the Climate Study - Traditional houses reference in Fathy's book 'Natural Energy and Vernacular Architecture.

2. In a region where for many travel is either still on foot or camel, and where motorised transport is still scarce and expensive, a material that has to come from more than a kilometre or two away is no longer local. Having to pay for transport under these circumstances is one factor pushing up the prices of materials.

3. A wide range of general and technical documentation on the "woodless" construction programme is available on request from Development Workshop in France.

"Construction sans bois" - the woodless construction programme in Niger and Mali

Development Workshop

March 1992

Managing natural resources and facilitating durable building

The introduction by Development Workshop of nubian vaults and domes to Niger came as a result of the recognition by several international organizations, including the IUCN and WWF, that over-consumption of wood for building was leading to depletion of timber reserves and thus contributing to the growth of desertification. Scarcity of wood, branches and even grasses has in turn made domestic building increasingly difficult and costly for the population, who in some instances can no longer find the materials they need, and in other cases have been obliged to use species of wood with very poor durability and which have to be replaced more frequently, thus speeding up the rate of overall timber consumption.

Area where woodless construction with vaults and domes had been done by 1990

A programme of building and training

Development Workshop was invited in 1980 by a small Canadian NGO, ISAID, to demonstrate the vault and dome techniques in Chikal, Niger. Following this, DW associate Peter Tunley continued to build with the same techniques, initially for ISAID and other organisations in the area of Filingué, north east of Niamey, and then subsequently in the Aïr Ténéré area in northern Niger on behalf of the IUCN/WWF programme for the conservation and management of natural resources in the Aïr Ténéré region (PAT). Work for the Aïr Ténéré Project started with the construction of their project offices, and continued over the next five years with the construction of a large number of houses and public facilities. Using the basic techniques of vaults and domes built with unstabilized earth blocks, a very diverse range of building types evolved through a collaboration with local masons and through an imperative need to find building solutions which could really meet local needs and affordability. The PAT funded buildings provided excellent opportunities for training on building sites, but to strengthen the development of builders skills, training programmes for masons were started in 1988, bringing masons from as far afield as Tchad and Mali, as well as from other parts of Niger. The techniques began to spread throughout the region, and some masons now face a greater demand than they can meet. With ongoing technical assistance being provided by Development Workshop, training has now become a key activity, with a number of masons now working as trainers, and instances of the techniques already being passed on to a younger generation in masons' families in both the Agadez and Filingué regions.

Techniques using local resources and building local skills

The woodless construction programme is based on building with unstabilized earth blocks. No presses are used, nor cement or lime, and where possible the bonding patterns of block laying are now adapted to suit the local traditional block sizes so that production is easier for the population. The basic elements are vault and dome roofs built without shuttering, and masonry arches. But in practice there are numerous variations in these elements, permitting a wide variety of built forms, and - importantly - allowing masons to develop their own distinctive styles. Over the 12 years since the techniques were brought to Niger, there has also been considerable refinement in the methods of building, to both increase strength and safety, to assure better protection from water, and to make the building process easier to learn and to use.

A growing amount of spontaneous construction

By 1990 several hundred buildings were complete, of which 25% had been built for private clients, including villas and several government buildings. But more significantly, over 20% were already the spontaneous construction by local masons using

Training builders in Iférouane

these techniques to meet their own building needs and those of their families and neighbours - including mosques as well as houses, kitchens and stores. The number of spontaneous construction is constantly increasing. Where the techniques are now known, village builders are convinced of their usefulness in redressing what they see as a problem of obtaining good durable wood, and so too are the organizations concerned with the conservation and management of natural resources. In Mali and Niger, the Ministries concerned with the environment are beginning to give their active support. Each building saves about .5 cubic metres of wood per square metre of construction, and of this, for a building of 30m2, on average 14 tree trunks are saved: all of which adds up to increased chances of trees being saved and regenerating. From the users point of view, the vault and dome roofs are proving durable, and eliminate the need to replace timber in the roofs. Costs are either the same or lower than those for building with good timber roofs. The woodless construction techniques almost completely eliminate the need to bring in non-local materials for the basic structure of a building, and it is in effect the ease of access to materials and the use of increasingly locally understood techniques which contribute to the techniques' growing popularity and sustainability. Indeed, in the Sahel, for many families there are few other options than to use those resources available locally, and in some case the woodless construction techniques have enabled families to build with no financial cost at all.

Adapting to local needs takes time and observation

Any project should go through changes during its life - and in the case of the Woodless Construction programme, time has been in its favour and a factor in the emerging success of the programme. Twelve years of almost constant technical assistance in the field along side local masons has allowed the techniques to be improved and changed to suit varying local conditions, and has encouraged the masons to take pride in their work and to maintain a high standard in their buildings. Time has also enabled small structures to be built in new regions, which can then be observed during one or more rainy seasons to monitor their behaviour and to identify improvements that need to be made, and to give time for the population to develop confidence in the techniques. The result has been that, whilst there are parts of the Sahel where these techniques are not suited, the performance of buildings over several years show that woodless construction is possible and durable in much of the region, and that it is a viable contribution to meeting building needs and conserving resources in a sustainable manner.

Roof-scape of vaults and domes in Iférouane, Niger

THE INTERNATIONAL SYMPOSIUM OF HASSAN FATHI FOR ARCHITECTURE OF THE POOR

From 20th to 22nd April 1993,
Cairo , Egypt

TITLE

APPROPRIATE TECHNOLOGY AS MEANS TO CAPTING SOURCES OF NATURAL ENERGY IN ARCHITECTURE

BY
DR. OMAR M. EL HAKIM
ARCHITTECT

ADDRESS

1 RD. 81 MAADI
CAIRO

Name:

DR. OMAR M. EL HAKIM, ARCHITECT.

1 RD. 81 MAADI, CAIRO

TEL. 3504713, TLX. 22092 PBCS UN

FAX. (202) 3500547

Title of Paper:

"APPROPRIATE TECHNOLOGY AS A MEANS TO CAPTING SOURCES OF NATURAL ENERGY IN ARCHITECTURE."

of the urban activity of the day-to-day social life... and it must be conformable with the present level of knowledge which man has reached in human and physical sciences that can not be separated when an architectural piece is being planned and designed. It is obvious today, taki the scientific analysis of data furnished by the physical and human sci ces, that many principles of designing the traditional Arabic house are still intact and valid today, the same as were yesterday. Furthermore, a part of the so-called new architecture could be considered as backward if it is judged by the same scientific criteria and standards."

Thus, by understanding the numerous sides of Hassan Fathi's personality, th forerunner of the Arab architects, and by studying what was issued of his thoughts, sayings and works, we can deduce how deep his influence was on mo architecture, this influence which can be summarized as follows:

1. His calling for the modern architecture to be original

That is to say, an architecture originating from the historical depths o the nation and expressing its identity and its belonging to civilization In this respect, he says:

" As every people have their own language which they speak and their national dress which they wear, the same is as true regarding every country's architectural art which is usually characterized by its own lines and forms that express its roots in civilization mixed wi the imagination of its people and the requirements of its environme

He used to see that in order to achieve this goal we have to re-capture the architectural art from the point we left and try to reconnect the pieces that were cut from its chain of natural development, all by analyzing the factors of change and deducing the constant elements, then by working out convenient solutions for the new factors that were not exist in the past on the light of sciences and technologies achieved by man, s that to bring the Arabic architecture to the point where it should be to not where it is in fact, that is to become expressive of the real identi of this nation, the identity which is derived from its values and cultur roots.

2. His calling for the modern architecture to be humane

That is to say, an architecture whose goal should be to satisfy the material and spiritual needs and requirements of man. In this respect, he say

.../...

A P A P E R

APPROPRIATE TECHNOLOGY AS A MEANS TO CAPTING SOURCES OF NATURAL ENERGY IN ARCHITECTURE

BY

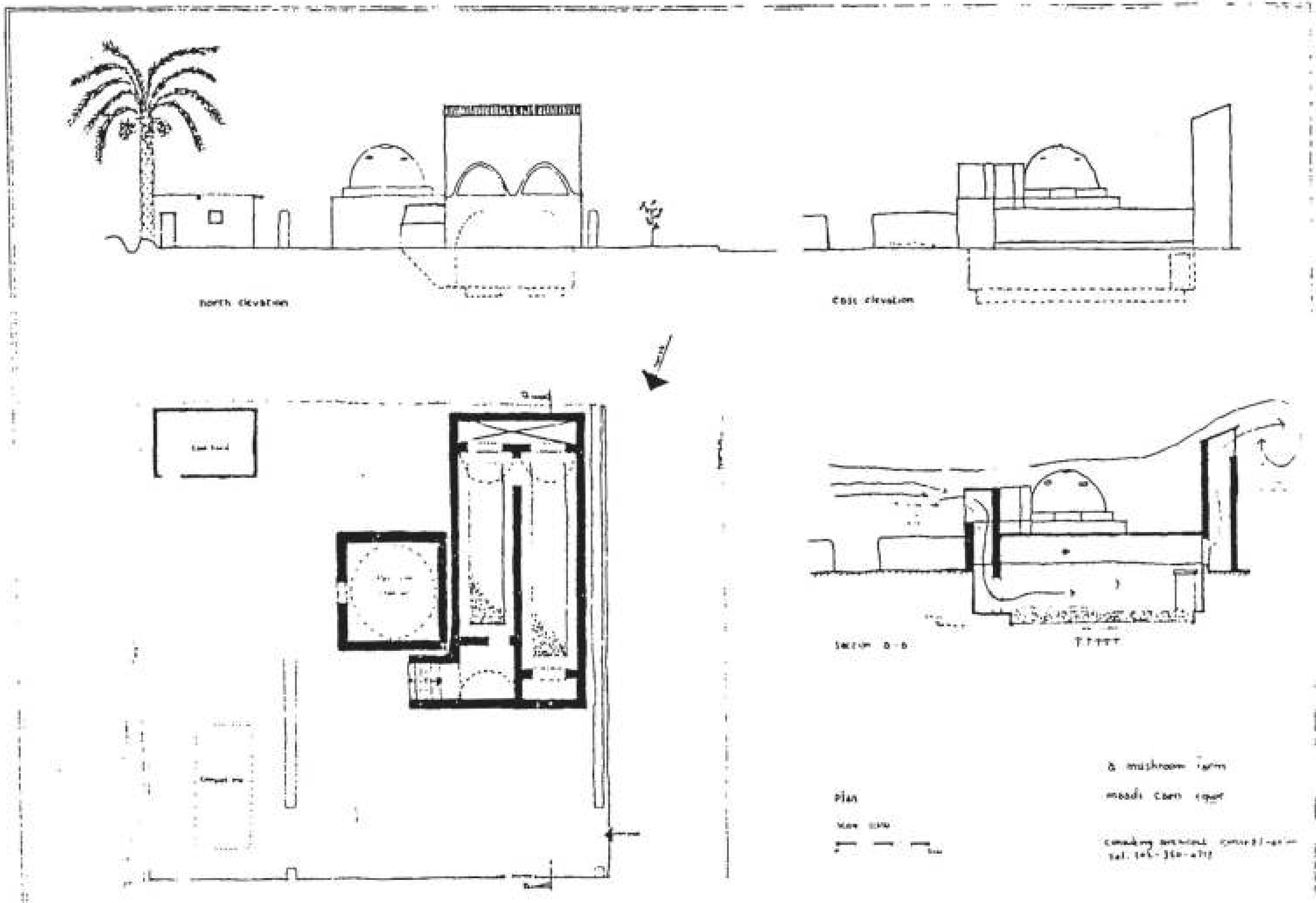
Prof. Dr. Omar El-Hakim
Former Professor of Architecture
Faculty of Applied Sciences and Engineering
Islamic Architecture Department
Umm Al-Qura University, Makkah Al-Mukarrama,
Kingdom of Saudi Arabia

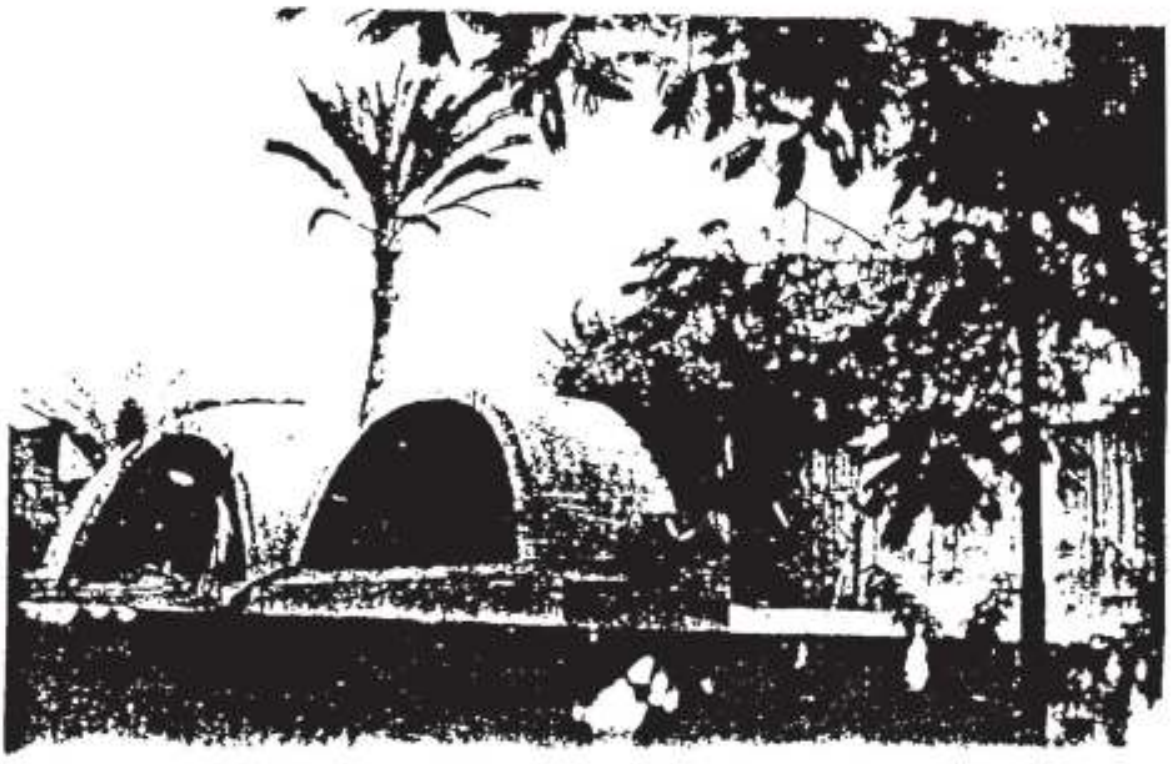
I N T R O D U C T I O N

Architectural solutions utilizing natural building materials, local labour and constructional techniques w/mud-brick, stone, fired brick or wood thought out together with orthodox principles of the design of space; led to the architectural success of the village of New Gourna at Luxor in upper Egypt[1].

Built between 1942-1949 for the Antiquities Department by Hassan Fathy that world renowned great architect and author by which he personally brought to the attention of the world at large scale a solution, that of a rural village, to the problem of low cost housing in local traditional materials, to developing a rural architecture, especially so for the 'New World'.

In his architectural solutions[2], this great architect showed the similtaneous harmony between man and the building design process of architecture, with the use of naturally available materials, orthodox techniques in designs and construction, labour force and training of builders, with utilization of natural energy for cooling; has pioneered the interest we have today amongst architects and responsible planners of what has become widely known as the vernacularity of architecture.


north elevation
east elevation
Plan
& mushroom farm



A minimum cash-outlay of finance for such a project, where industrially man-made materials such as R.C. and cement, were altogether minimized; made labour the priority for cash outlay to a second of materials. To this effortless cash-economy in building by depending on natural building materials, has made inroads to architecture most interesting to serioud minded architects, planners, economists, jurists, strategists in finance planning, financiers, politicians, and public administrators; in the reservation and upholding of a patrimony towards both the living also catalytic process of culture.

Some reserach made by Mr. Daniel Dunham[3] on traditional Moroccan courtyard houses has shown the scientific contribution of the internal courtyard as a refrigeration device of transmission for appropriately regulating energy within the architectural ensemble with its effects on man's comfort levels during the night and day as affected by such natural elements as: water, wind breezes, heat transmission from the sun also reflectivity from light.

Also, recent independent calibrated research by Dr. Amin Younes of the Cairo Building Research Station[4] is found interestingly enough in due respect. The Third World Group at the Architectural Association in London have as a result evaluated traditionally orthodox architectural design[5] solutions found in the heart of old Cairo, as mentioned previously to be well within comfort levels mainly in courtyards of residences, palaces etc. bringing refrigeration into the building with use of 'malqafs,' or wind catcher

Such research show that orthodox traditional architectural solutions are responsible directly for such human harmonions thermal comfort levels within buildings, directly so, by the ingenious design around courtyards in solutions devised as of capting also directing natural energy such as the wind, sun, breezes and water.
This harmonions capting of natural energy through which architecture as a means of energy transmission appropriatal realized is the subject of this paper.

THE PROJECT REALIZED.

The basis of this recent experiment has been developed and recorded architecturally with a specific aim: to create a natural environment for an agricultural production of edible MUSHROOMS: 'Champignon' Hygiophorus Merzoulos species and actually grown without any use of man-made energy systems such as electricity for light or heat and air conditioning units. Totally using natural building materials, mentioned together with a wind capting device, this project took 30 days to complete[6].

The natural energies of vapour water, wind, heat and light were successfully used simultaneously to lower the internal room temperature by 11°centigrade, mainly through increased wind movement through a wind-capting device 'malqaf' increasing flow of air-movement together with the overall view to maintain a lower temperature, also to increase water vapour of the air from approximately 45% to 75% R.H. using the ground water and the process of osmosis to filter up into clay pottery shards.

To implement these differing sensitive natural energies for the successfully growth of the mushroom: a traditionally

constructed building was designed and built of mud, stone, and other interesting materials using random rubble mud-brick and an orthodox roofing technique of'catenary' vaulting and'malqafs'. The sterialization chamber however erected in use was a dome on squinches built in red brick by a master builder.[7].

The separate components of natural energy in use within this localised 'Built Environment' were harmoniously integrated as follows :

1. WIND : The capting of the Northerly breezes were brought into the building through twin-malqafs, one for wind movement by suction was drawn in passing through the 'mushroom' chamber, to the winward side of the building and an another device called a 'wind evacuator' to the leeward side. The law of wind movement here applied, that the area of inlets of air be less than the area to the leeward; hereby using the following formulae: such results of wind movement by suction were obtained[8].

The rate of air-flow through the building in Cubic ft. p.h. - 3,150 (as a value) area of inlets in sq.ft.

If the areas are the same size then values: $\frac{\text{Area of Outlet}}{\text{Area of inlet}}$ - 1 i.e. 3,150

If the Outlet is larger than the inlet, then; values : $\frac{\text{Area of Outlet}}{\text{Area of inlet}}$

- 2	i.e. 4,000
- 3	4,250
- 4	4,350
- 5	4,400

If the outlet is smaller than the inlet, then; values :

Area of Outlet / Area of inlet		
	- 3/4	2,700
	- 1/2	2,000
	- 1/4	1,100

These formulae were worked out and from it we see clearly that the greater the ratio of outlet area to inlet area the greater the air flow through the building, as initially observed by Mr. Gaston Weit[9].

Increased movement of wind accross the chamber was gained by the Stack Effect of the Northernly breezes passing ove the wind-evacuator in causing clock wise wind eddies assisting the leeward evacuation of wind.

2. WATER : Ground surface water was found naturally at two and a half meters below ground level, and this base-line as decreased formed the basement level of the buildi internally. It was based in with a layer of broken potter shards about 40 cm. thick.

By osmotic pressure the water rising up filled the potter pores by a cappilary activated movement - later these water particles released themselves off by evaporation as wind drawn in from the wind-catch or 'Malqaf' flows over the pottery shard surfaces. This air movement (of ai over water caused a refrigeration effect to the enclosed air particles with a result of an internal temperature dr of 11°C. It also increased the content of water moisture in the micro-climate of upto 75% RH.

3. HEAT :

To further facilitate the action of wind movement by suction through the leeward side of the chamber the exterior top part of the chimney wind-evacuator was pointed in black. This colour causes a maximum of contact reflectivitity in heat rays impinged upon to take place; by which forcing the hot air accumulated in the wind-evacuator to rise rapidly and throughly. The simple law in application here is that as hot air rises rapidly, it is displaced by cooler air from below in stack effect. Hereby this movement or displacement volume is reciperocal to a temperature change within the chamber.

4. LIGHT :

The reflectivity levels of light coming from the sun were greatly increasrd by white-washing the exterior of buildings, in this manner heat off the building was reduced, considerably, internally no white-washing was used. Such an enclosed environment to direct also indirect sunlight brought viz. into the building; brought lux lighting levels to a minimum permitting increasing inception of the mushroom.

C O N C L U S I O N

Such experimental research shows that: these orthodox traditional architectural solutions may be responsible also in application to human conditions in producing harmonious thermal comfort levels within buildings. These solutions also designed around courtyards and with the use of the Malqaf (wind catcher) are designed also in the capting and directing such natural energy resources These may be acceptable to living conditions in hot-arid, climate zones.by applying techniques in appropriate techno

The application of these naturally controlled Environmental-Comfort Factors (criteria) in the desiderata of design for architectural projects, may be comely, viz man's relationship to nature and his natural environment.

Such appropriate solutions of achieving these comfort levels for so in rural housing projects in the 'New World' may be applied for use to man in building with a pre-occupation to regulate his thermal comfort levels naturally and appropriately.

* * *

N O T E S

1. 'Architecture for the Poor' by Hassan Fathy; published by the University of Chicago University Press, 1973. edition.

2. 'L Architecture d'Ajourdhui", Hassan Fathy edition of January, 1976.

3. 'The Courtyard House as a Temperature Regulator' by Daniel Dunham, The New Scientist, journal September 8th, 1965.

4. 'The Islamic Architecture as a means for the Building Passive Desigining System', by Dr. Amin Younes. In 'Building Energy Management' edited by A. Faist, Papers contained in the proceedings of the international Congress, Pova de Varzim, Portugal, 12-14th May, 1980.

5. 'Climatic Study of Traditional Buildings', Cairo, Egypt. by the (TWSG) Third World Study Group; Architectural Association, London, 1975.

6. The patron of the project Mr. Fa'ard Gouvernor excited by high yields in mushroom production realizing its potential later expanded a project on similar lines and was equally successfull.

7. The mason employed as master builder for the work was Ala'a El Din Mustapha he himself a prize winner of the Aga Khan Award for Islamic Architecture in 1982.

8. OP.CIT "Architecture for the Poor" pp. 47-50.

9. OP.CIT "Architecture for the Poor" pp. 41-42.

* * * * *

THE INTERNATIONAL SYMPOSIUM OF
HASSAN FATHI
FOR ARCHITECTURE OF THE POOR

From 20th to 22nd April 1993,
Cairo, Egypt

TITLE

THE REBIRTH OF A SIWAN VILLAGE

BY

Dr. Omar Khatab
&
Dr. Nicholas Wilkinson

ADDRESS

Centre for Architecture Research
and Development Overseas CARDO ,
University of Newcastle upon Tyne,
England

A PAPER PRESENTED TO
THE SCIENTIFIC SYMPOSIUM
ABOUT
HASSAN FATHY'S PHILOSOPHY
IN
CONTEMPORARY ARCHITECTURE
CAIRO- EGYPT

THE REBIRTH OF A SIWAN VILLAGE

BY

OMAR KHATTAB

&

NICHOLAS WILKINSON

Centre for Architecture Research and Development Overseas **CARDO**, University of Newcastle upon Tyne,
England

THE PROLOGUE

Like human beings, like trees and like any other creatures, settlements have their own life cycles. They go through different stages of growth, from birth to youth through maturity and then eventually death. As man consists of a number of basic units (i.e. cells) which have a certain life-span. A settlement, also consists of a number of basic units of dwellings, which, also have a certain life-time.

Settlements die when the dwellers move away- for one reason or another leaving behind a deserted settlement. The settlement may also die for a number of reasons such as natural disasters or man-made disasters.

The death of a settlement requires the resurrection of another. Countless examples, through out the history, stand in support of this phenomenon. Among those is the case of "Shali" in Siwa oasis, one of the Egyptian Western Desert oases. Shali was born at 1203 AD and began its death journey at 1826 AD when dwellers started moving to neighbouring settlements. Yet, even at that time, the dwelling units in

this settlement were almost intact (Stanley, 1912). Shali now "rests in peace" after it has completely died during the late seventies and the early eighties.

At the same time other settlements, born long after Shali, have gone the same way. This process has given birth to new settlements of which Old Mishandid, a small settlement to the west of Shali, is a good example.

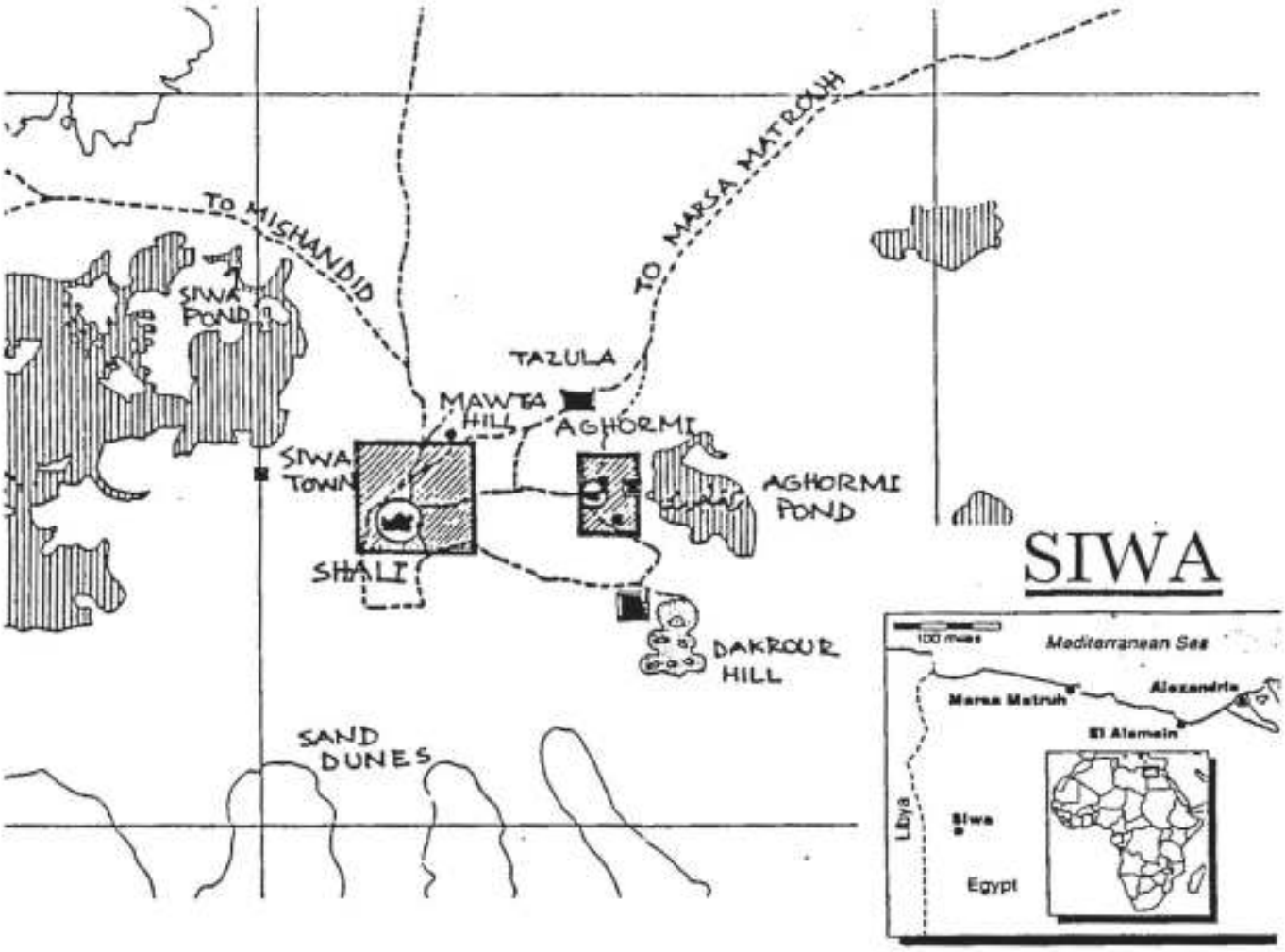
Prior to that, at 1945, there was the example of the village of Gourna. Here, however the reason was different. At that time there was a Royal decree expropriating the land on which the houses of Old Gourna were built and annexing it to the Government as public utility land (Fathy, 1989). Later a ministerial decree was issued expropriating the houses. To the Gourna village it was a death sentence (a capital punishment), and to the villagers in Gourna it was very much the same. Obviously a new settlement to evacuate the villagers of Gourna was required and that was Hassan Fathy's New Gourna.

This paper tries to analyse the death of Old Mishandid and the birth of a new adjacent settlement, comparing this with the life cycle of the original Shali settlement. There are so many parallels between the two cases.

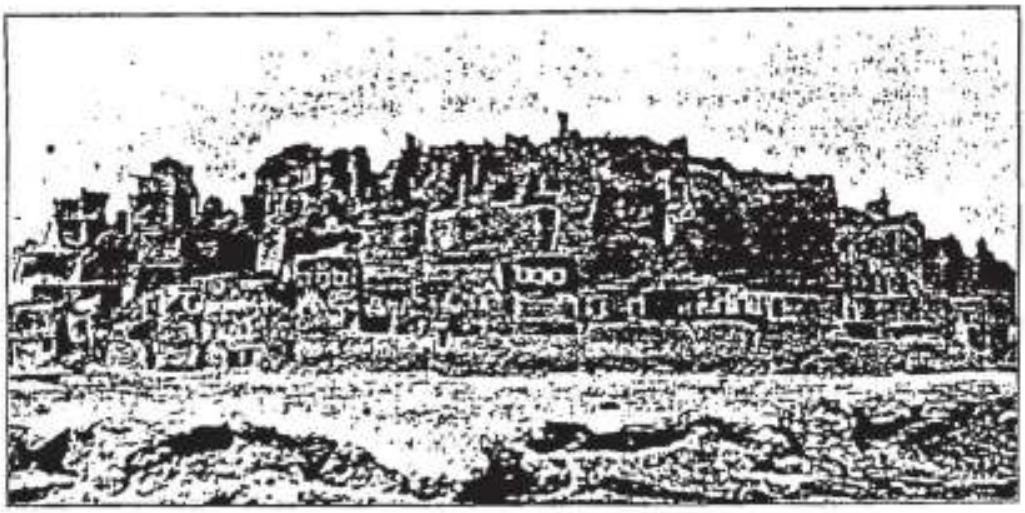
THE BIRTH OF AN OASIS

In the year 1203 AD about forty people forming seven families moved to the hilly site of Shali in the Siwa depression leaving behind the settlement of Aghormi, three kilometres away, where they were subject to continuos attacks from Berbers and Arab Bedouins.

For security reasons the settlement took the shape of an enclosed cluster of dwelling units with only one access to it in the form of a door cut out into the wall surrounding the settlement, in a compact planning sort of fashion. Having very little room for horizontal expansion, vertical expansion was inevitable over the six centuries life-time of this settlement. Building out-side the walls of the hill settlement was out of question till the year 1826 when Siwa oasis became under the ruling of Mohammad Ali the Governor of Egypt at that time and enjoyed security under his protection (Fakhry, 1982).



Shali and Aghormy in relation to Siwa oasis, Egypt. source: the Author, Observer 30.6.91



Siwa - The Town seen from east. source: Breccia, 1929

Following the first building regulations set up by the Governor's representative in the Oasis, Moses Bobash, Siwies started to build their houses out-side the city walls at the foot of the hill to the west, east and south of the existing walls, but not very far from them (Belgrave, 1923).

Expanding outside the walls, at the foot of the hill. source: the Author

Though the Shali settlement began its death journey since the year 1826, the dwellings were still physically sound till the beginning of this century (Breccia, 1929). According to the census over the thirty years ending at 1954 the natural increase in the population of the Siwa oasis was around 5% of the population at 1924, an increase which can hardly cause any pressure on the dwellers to move out. Nevertheless Siwies kept moving down from Shali to surrounding areas till it was virtually deserted at the late seventies and early eighties (Khattab, 1990).

The ruins of Shali. source: the Author

The reasons can be summarised as follows

1. There was no more fear of building houses outside the walls, i.e. on the plain valley.
2. The convenience of being near their farming land.
3. The bad feeling towards living conditions in Shali.
4. The collapse of a large number of houses on the Shali settlement due to:
   - Dereliction,
   - Not being properly built or maintained,
   - The collapse of houses sharing walls or roofs, or
   - Damp emerging from adjacent toilets or from rain water.

OLD MISHANDID

Old Mishandid, is a small settlement already existed before the death of Shali. It was one of the settlements which flourished when Siwies started to leave Shali and inhabit the rest of the areas along the Siwa depression. In fact the whole area of Maraqi, in which Old Mishandid represents an important part, has very much flourished earlier during the Greek presence in Egypt. As evidence of their presence in this area, a Doric temple can still be found in the area, as well as a lot of rock tombs. Moreover there is a series of hills named Bilad El Room, which means the areas belonging to the Romans. Further more, some studies indicate that Alexander the Great might have been buried near the Doric temple. A group of archaeologists are investigating this matter today.

The Doric Temple of Mishandid. source: the Author

THE DEATH OF OLD MISHANDID

At the beginning of the eighties, Old Mishandid began to die. The main reason was that the land produced no more dates or olives, or produced a very poor quality. Another reason behind the evacuation of Old Mishandid was the discovery of new land for cultivation along the depression of Siwa oasis through a Government programme for land reclamation. Consequently, the Government was promoting a house building package to go with parcels of land for reclamation proposal.

In addition, the state of the dwellings in Old Mishandid as in Shali, was deteriorating. Since most of the houses were constructed on agricultural fertile land with hardly any foundations, very few were able to survive for a long time.

Old Mishandid as it looks today source: the Author

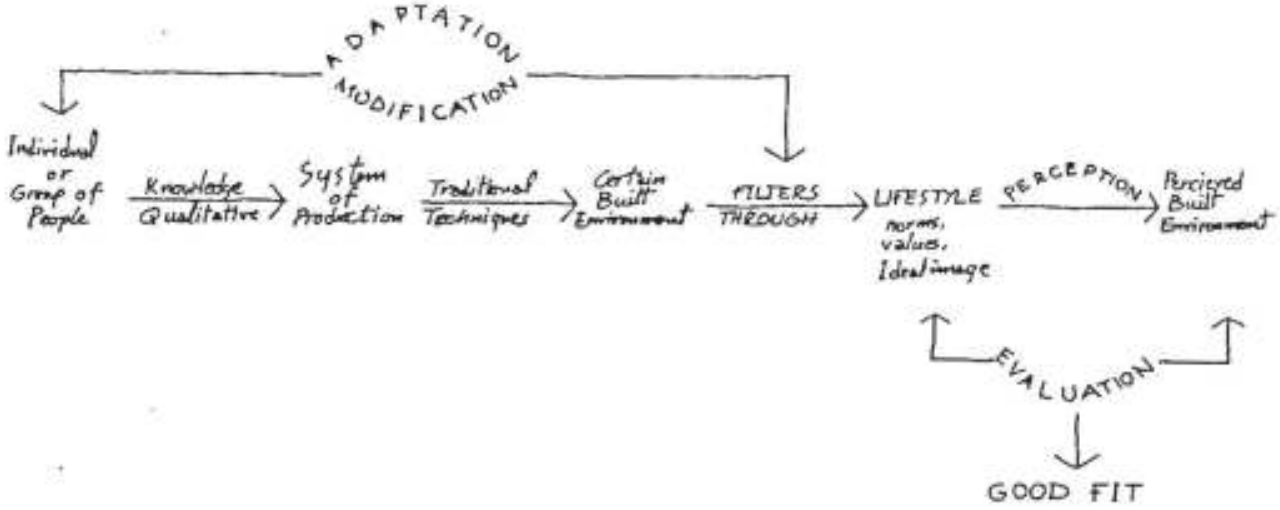
THE TRADITIONAL PROCESS

The concentration on the final product rather than the means and tools to achieve this product was the norm of Public housing policies and practices in Egypt. Though the final product, which is the house or the group of houses, is important, yet the process of accomplishing this product is important too. Turner (1972,1976) has emphasised this fact when he explained that the process in which a society builds its dwellings, extends, maintains, and after all manages them is as significant as the efficiency of the dwelling itself as a product which should stand up to certain standards.

Hence, as Turan (1990) indicates our concern with traditional or vernacular architecture should not be merely with its products or its mere appearance, rather we should be concerned with its processes and with the relations between man and his environment.

It is always assumed that traditional architecture, in which indigenous design is imbedded, is by and large in harmony with its surrounding environment. Mitchell and Bevan (1992) have proposed that the previous concept should be the measure of housing now and in the future. On the basis of how much the dwelling's design and form are affected or determined by the environmental context, and how much the individual and the community are involved in the dwelling's design, construction, extension, maintenance and adaptation, we should evaluate our housing today.

In the light of the previous two examples of vernacular architecture, of Shali and Old Mishandid, a simple map of the traditional system of production can be drawn.



Map of the traditional system of production. source: the Author

In this system the main general aim is *Environmental Adequacy* as Turan (1990) indicates. Practical knowledge or skills obtained through long, concrete previous experience with the availability of local building materials and traditional techniques were the basis for the development of traditional architecture and its appropriateness with the environment.

The concentration on the appropriateness and efficiency of the product only without setting the appropriate framework for a successful housing process, could result in the failure of the housing programme. A good example to prove this is the case of the village of New Gourna at Luxor, Upper Egypt.

THE BIRTH OF NEW GOURNA

Old Gourna never died in reality, though sentenced to death by a ministerial decree more than fifty years ago. It is still inhabited today, and it was prescribed quite recently (Sayidaty, 1993) as the calm and beautiful village hugged and surrounded by history.

Old Gourna as it looks today source: Saydaty, 1993

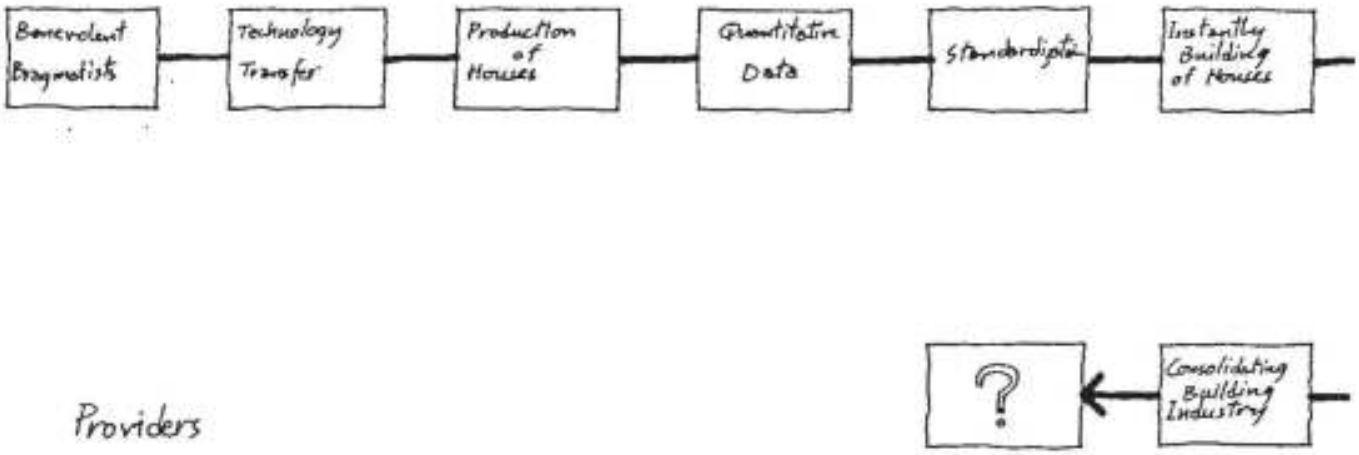
Nevertheless, a plan to create a new settlement, New Gourna, and to move 6000 households from Old Gourna to it was put forward by the housing authorities around 1945-46. The reason was that Old Gourna was occupying the important archaeological site of the Tombs of the Nobles, and the dwellers were constantly violating the historical site and stealing from it.

The analysis of the housing process in this case as an essential part of the housing provision, might be able to throw some light on the reasons behind the failure of this programme.

If we are to analyse the Public housing provision as the main thrust of the experiment of New Gourna, two separate paradigms can be distinguished (Hamdi, 1991). While the paradigms have the same aim which is to increase the production of houses, the process in each of them is quite different from the other. The first process is what Hamdi (1991) has named as ***providers paradigm***, which was dominating in post war housing policies. In that paradigm strategies like *mass housing* and techniques like *industrialised housing* were used. The equation was put as follows:

" in order to reduce the housing deficit and improve the quality of houses, the Public Authorities and the developers should control the production of houses." (Hamdi, 1991).

This paradigm can be mapped as follows;

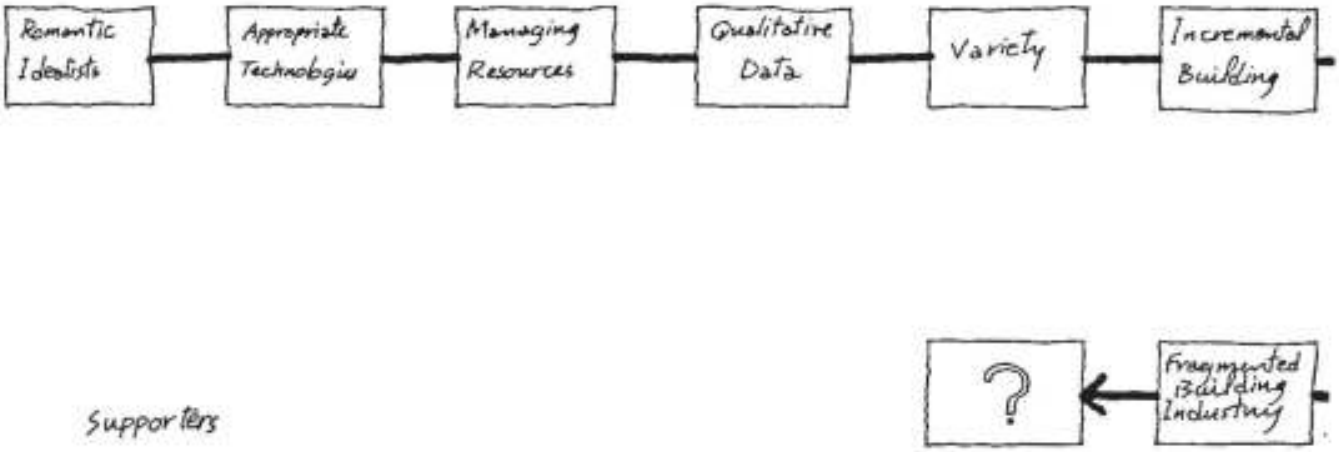


The providers paradigm. source: Hamdi, 1991

Though this paradigm was the one most practised, or in fact only practised, when Hassan Fathy was assigned to do the plans for the New Gourna he was not in favour of it as a mean of solving the problems of Rural Egypt. Fathy (1989) saw the only way to achieve a satisfactory solution in the involvement of the individual in our plans and calculations. In fact he was, whether consciously or unconsciously, calling for the second paradigm which Hamdi (1991) has named as ***supporters paradigm***.

This paradigm accepts the failure of the previous paradigm in achieving its goals as well as the deep consequences of its application ,e.g. slums, transformations,...etc., and deals with these and the like in a practical manner. It is more of a realistic approach, which does not dismiss the reality, e.g. squatter settlements, and redefines adequacy of housing in the light of the best management of resources.

This paradigm can be mapped as follows.



The supporters paradigm. source: Hamdi, 1991

One of the essential differences between the two paradigms is the way each of them values the involvement of dwellers in the process of housing themselves. On the one hand, providers treat dwellers as *users*, and regard their intervention in the housing process as a delaying factor in the struggle to produce the *number* of houses required. On the other hand supporters take dwellers as *participants* and regard their involvement as an essential component or ingredient of a successful housing process.

Looking at the process of creating the village of New Gourna, and at the two previous paradigms, one can classify this process as the one following the first paradigm, *providers paradigm*, for the following reasons.

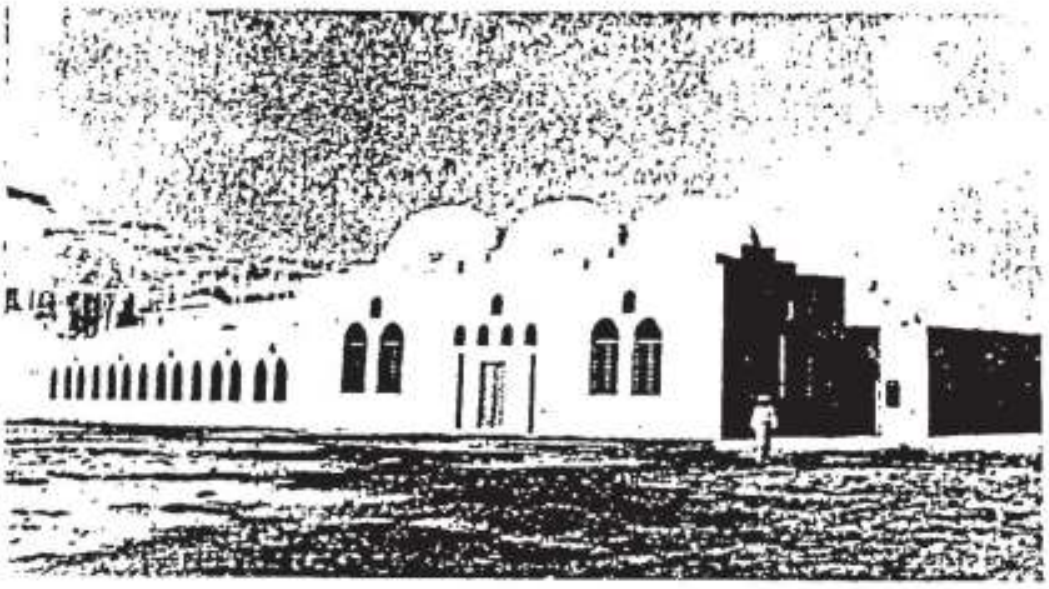
First and foremost from the political perspective, the target of the pragmatists and the benevolents, Public Authorities and professionals, was to produce houses for the Gournies, who were unwanted at that time, to solve a problem not for the Gournies themselves but for the Authorities. As Fathy (1989) describes the option of re-housing the Gournies as being the only solution, after exploring other options

like buying their existing houses or compensating them in order to enable them to buy new land and build new houses.

The choice of the site, as Ibrahim (1988) indicates was wrong and opposes what the ancient Egyptians used to do. The site chosen was a piece of cultivated land surrounded by barrages for protection from the Nile's flood. While the ancient Egyptians used to build their villages on the peripheries of the cultivated land away from the danger of the flood.

From the technological perspective, Fathy's proposed design embraced a lot of technology transfer as far as the Gournies were concerned. Gournies never used domes or vaults to roof their houses in Old Gourna, therefore they never knew the technique to build them. Hence, Fathy had to transfer this *simple* technique to New Gourna from the Nubian Architecture to the south of Aswan. Moreover, the shape of the vault or the dome was alien to the architecture of houses in Old Gourna. Villagers were only able to recognise the dome as a symbol of shrines and tombs, moreover as a symbol for death. As Ibrahim (1988) quotes Fathy, that the villagers, who used to visit the shrine of one of the holy people have gone to visit the school of Fares in New Gourna instead, and Ibrahim comments the reason was that the villagers thought that the school is a shrine of new holy person since it was roofed by domes and vaults.

Fatimid necropolis, Aswan. source: Fathy, 1989



Boy's primary school. source: Fathy, 1989

Fathy (1986,1989) has always argued that the dweller's participation in the construction process of his own dwelling is vital, since it personalises the dwelling and gives it a certain identity. He also criticises the *providers'* way of providing lots of semi- industrialised or industrialised housing to the poor, like ready-made or mass produced shoes, since it leads to worry, discomfort and loss of imagination and identity, as Ibrahim (1988) states.

But when it got down to constructing the first hundred houses Fathy never succeeded in involving the prospective dwellers in the construction process of their prospective dwellings. Fathy (1963,1989) refers that to two main reasons;

First, Gournies did not want their contribution in the construction of the houses in New Gourna to be taken as an implicit acceptance of moving from their houses in Old Gourna. And second, is his claim that Gournies, likewise the rest of the Egyptian farmers, could not know, or express what they wanted in the new houses in terms of livelihood needs and requirements.

Here we can see Fathy, as an architect, thinks that his client, in this case they should have been the Gournies, does not know what is good for himself, and he has to rely on what the architect offers him. In fact Fathy's real client was not the

Gournies, it was The Organisation for Antiquities, therefore the real beneficiaries never got involved. Fathy thought that Gournies should be accommodated the way he thinks, as an architect, is good for them and not the way they have already got used to. The superiority complex of the professional some times let him think that his client should be educated before he can be accommodated. Most of the clients' wishes seem not relevant and ridiculous to him. Fathy mentioned that a villager from Old Gourna mentioned to him when asked what are his requirements in the new houses, that all his concern is to accommodate his cattle and behind that he does not care, (Ibrahim, 1988).

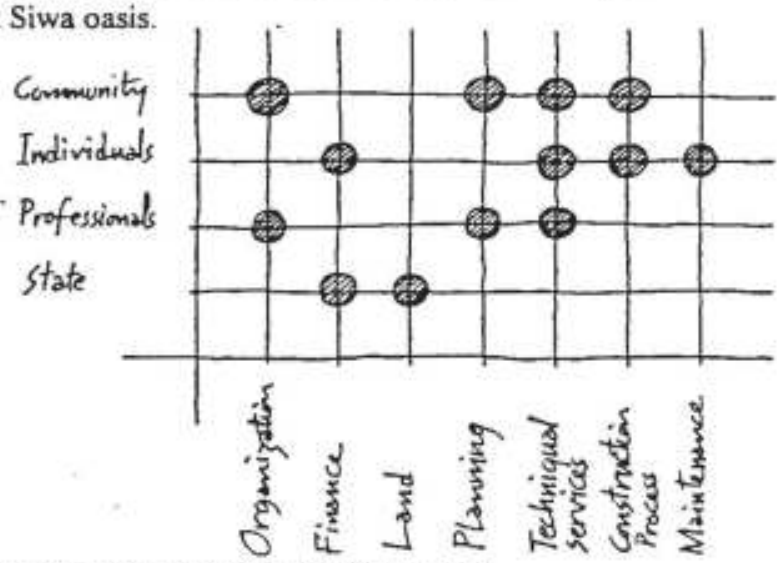
As a matter of fact, Fathy had tried to cross the gap between what the community produces as unconsciously designed architecture, and what the architect produces as consciously designed architecture, by achieving acceptable *shapes* for both sides. This could have only accomplished if the community was involved in the process, something which never happened in New Gourna.

As far as the data available to Fathy about the Gournies, it was mainly quantitative. He refers that to the lack of a sociologist in their team (Ibrahim, 1988)!

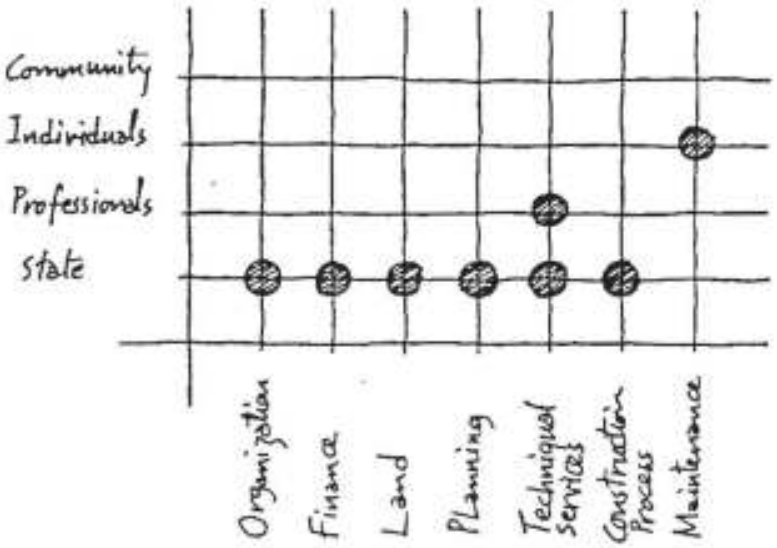
From the previous analysis to some of the aspects of the process of building New Gourna one can easily classify this process under the *providers' paradigm*. Furthermore, one can see it as another mass housing attempt, with all the deficiencies of it summarised by Turner (1972) as being not a housing *process* but merely an organised *sheltering* of people. One can see, also how interested Fathy was in the shapes and forms (the architecture) of the houses and *(the product)* which he dreamt of (Fathy, 1989), rather than the method and the means *(the process)* to actualise this dream.

Finally, one should say that the failure of New Gourna is another failure of the mass housing policy in Egypt as well as in most of the developing countries. Marginalising the role of the people in any housing programme and ignoring or expostulating what they really *want* depending only on what professionals think they should *need*, can result in the failure of this programme on the long run, if not immediately.

Getting the process right is more important than the architectural or aesthetic aspects of the final product. This formula was applied -to some extent- in the enabling housing programme for rural house building in Siwa oasis. In this experiment, unlike New Gourna experiment, people were very much involved in the different stages of the process of building their settlements. Dwellers were actually involved, as individuals or as a community, in most of the project stages, as we see from the diagram for the division of responsibility in *Tamkeen*, or enablement, programme in Siwa oasis.

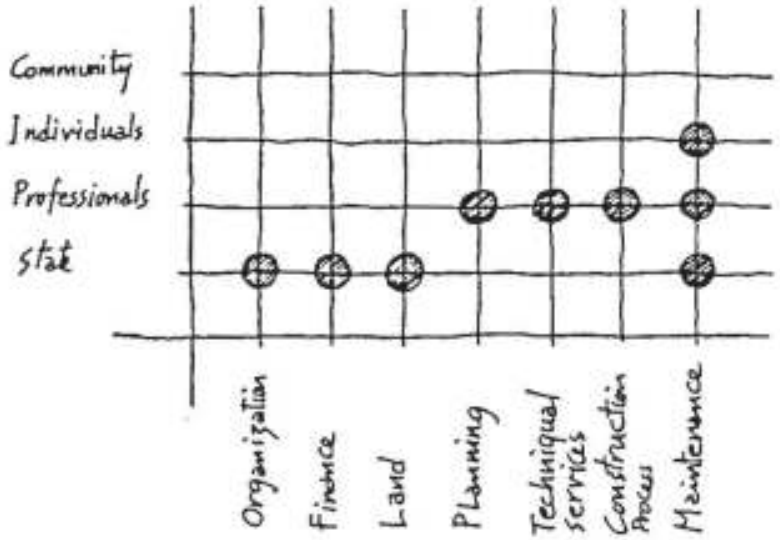


Division of responsibilities in Tamkeen Programme, Siwa oasis.
source: the Author



Division of responsibility in Helwan New communities.
source: Wilkinson, N., 1991

When comparing the previous diagram with a similar diagram in another Public housing programme like Helwan New Communities, or the same diagram for New Gourna, we can easily see the difference in the amount of room left to individuals' and community's involvement in each programme (Wilkinson, N.,et.al,1991).

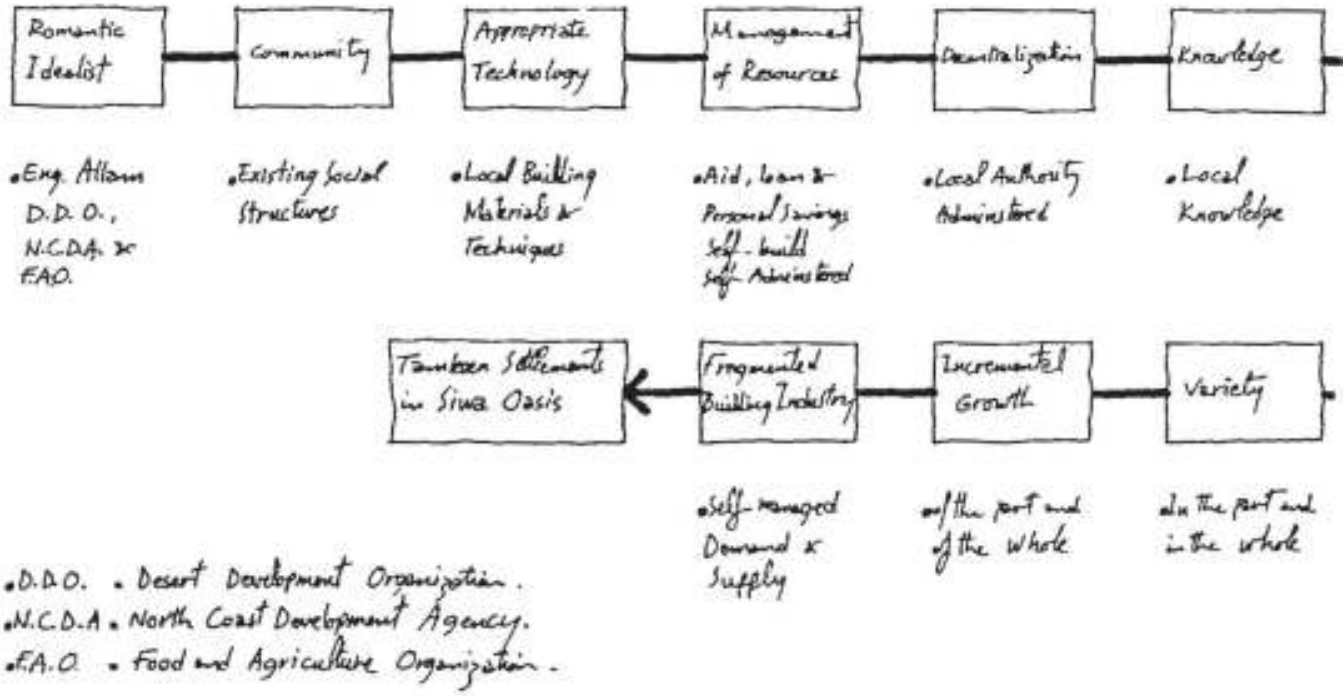


Division of responsibilities in New Gourna. source: the Author

THE BIRTH OF NEW MISHANDID

The way in which New Mishandid came into existence was more of the revival or *Rebirth* of Old Mishandid which died as explained previously. Through a Public response to people's request, about 150 houses were constructed during the five year period 1982-1987 (Khattab, 1991).

The number of houses built has reached 315 by the end of 1992, in the form of 11 settlements. The process of constructing the houses and the settlements can be classified under *the supporters* paradigm rather than *the providers* paradigm.

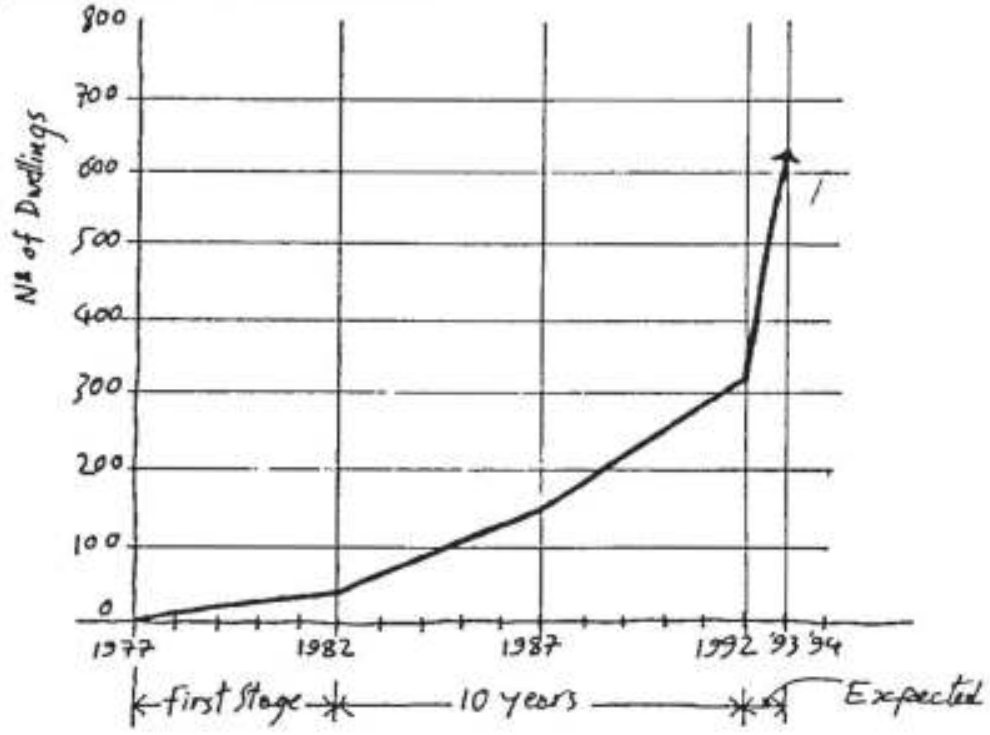


Map of Tamkeen programme in Siwa oasis. source: the Author

In 1982 Eng. Allam, Head of The Desert Development Organisation in Marsa Matrouh, decided to put aside some of the foreign fund meant for the development of the north west coast of Egypt in the form of completed farmers houses and redirect this part of the fund to Siwa oasis. At that time there was a plan to reclaim new land for cultivation in Siwa depression and this money was needed to *assist* the farmers who will be allocated pieces of land to construct their houses. The success of the a similar programme at Gara oasis, 130 km's from Siwa Town, in 1977 where 30 houses were built as an extension of the village there, encouraged Allam to repeat it in other parts of Siwa depression. Though very modest at the start, this fund started to become more substantial as the time passes, especially in 1985 after the flood which hit the oasis in this year and resulted in the collapse of a

large number of houses. Eng. Allam managed to supplement the foreign fund coming from Food and Agriculture Organisation *FAO*, mainly in the form of sacks of flower and tinned food, by a local loan from the Egyptian Government through the Ministry of Housing.

Looking at the rate of increase in the number of houses per year one could say that this programme meets with some success.



Increase in the number of houses per year through Tamkeen programme, source: the Author

The *Tamkeen* policy, as applied by The Desert Development Organisation DDO, in Siwa oasis can be considered a pioneer pilot project as far the Egyptian housing authorities are concerned. Though started through a personal initiative of an official without predetermined planning as such, the *Tamkeen* programme represents today not only a part of the DDO policies for the development of the rest of Siwa oasis, but also the whole of the Western Desert of Egypt.

This, of course, does not mean that the Tamkeen programme in Siwa has 100% succeeded in meeting the requirements of Siwans, not even near that. A number of shortcomings still have to be sorted out.

The most distinct aspect of the *Tamkeen* programme is that it puts people in charge of decision making, in control of their settlements, in responsibility for their built environment.

This, in my opinion, is the key to the success of any housing scheme. When people's requirements are met, when their opinions are being listened to and respected, when their decisions are taken into account, in short when the bottom up approach is *sincerely* implemented. This is what the New Gourna experiment failed to achieve, and maybe, after all Fathy's *Theories* about participation, which have not been applied in New Gourna, have found listening ears among the officials and decision makers of today.

REFERENCES

Belgrave, C. D. (1923)
Siwa the Oasis of Jupiter Amun, Great Britain: the Mayflower Press.

Breccia, W. V. (1929)
With King Fuad to the Oasis of Amun, Milano, Rome: Casa.

Fathy, H., (1963)
Planning and Building in the Arab World: the Village experiment at Gourna, in Berger, M. (ed.), ***The New Metropolis in the Arab World***, Allied Publishers, New Delhi.

Fathy, H., (1986)
Natural Energy and Vernacular Architecture, principles and examples with reference to hot arid climate, University of Chicago Press, Chicago.

Fathy, H., (1989)
Architecture for the Poor, American University in Cairo Press, Cairo.

Fakhry, A. (1982)
The Oases of Egypt: volume 1, Siwa Oasis, Cairo; The American University in Cairo Press.

Hamdi, N., (1991)
Housing without Houses, Van Nostrand Reinhold, New York.

Ibrahim, A., (1988)
Arab Architects, Hassan Fathy, Society for the Revival of Architectural and Planning Heritage, Cairo, **in Arabic**.

Khattab, O. (1990)
An Approach to the Development and Upgrading of the Urban Environment of Siwa Oasis, M.Sc. thesis, Faculty of Engineering, Alexandria University, **in Arabic**.

Khattab, O., (1991)
Aided Self-Help House Building: the case of Siwa Oasis, in *Shelter, Settlements, Policy and the Poor: appropriate policies and technologies for low-income settlements*, Proceedings of the 8th inter-schools conference, Intermediate Technology Publications, London.

Mitchell, M. and Bevan, A., (1992)
Culture, Cash and Housing, community and tradition in low- income building, Intermediate Technology Publications, London.

Sayidaty, (1993)
Arab Family Magazine, No. 620, Vol. 12, 25-01- 1993.

Stanley, C. V. B. (1912)
A Report on the Oasis of Siwa, Cairo: Government Press.

Turan, M., (1990)
Vernacular Design and Environmental Wisdom, in Turan, M. (ed.), ***Vernacular Architecture***, Avebury, England.

Turner, J. F. C., and (1972)
Freedom to Build, Macmillan, New York.

Turner, J. F. C., (1976)
Housing by People, Marion Boyars, ? .

Wilkinson, N., Khattab, O., DeMajo, G., Khardash, H., (1991)
Development within Development: Helwan New Community,Cairo, in *Open House International*, vol.16, No. 3.

THE INTERNATIONAL SYMPOSIUM OF HASSAN FATHI FOR ARCHITECTURE OF THE POOR

From 20th to 22nd April 1993,
Cairo , Egypt

TITLE

HOUSING AND ITS PROBLEMS

BY

Dr. Abdurahman Mahkamov
Chief of Personal Design-Studio
Head of the Dept. for Typology
of Building and Town Planning
TashZNIIEP

ADDRESS

CIS, Republic of Uzbekistan
700052, Tashkent, ul.Kotova, 8

HOUSING AND ITS PROBLEMS

More than two thirds of human life flows in his dwelling. A great variety of functions take place in it. Such biological and social requirements of an individual and a family as sleep, rest, eating, reproduction of a new generation, communication etc. are satisfied in dwellings. Well-built house with all amenities provides conditions for more complete realization of individuality. That is why nowadays in the civilized world comfortable housing becomes a vital requirement of every man and every family. Well organized family life leads to increase of free time and thus to raising of intellectual and professional levels of personality. After all, it affects cultural and economical development of a country.

Housing conditions are directly connected with the raise of living standards of population, strengthening of its health and creative activity. Dwelling with all amenities provides 10% increase of labour productivity and reduction of sick rate almost in two times. It is known that people having bad housing conditions suffer from:

heart and vascular diseases - 36%,
nervous diseases - 17%,
diseases of digestive organs - 14%,
child mortality - 27%.

Their wastes of working time, caused by diseases, are 58% more, than wastes of people living in houses with all amenities. Socialogical researches show, that in 33% of cases the cause of family conflicts is dissatisfaction with housing conditions. That is why the improvement of housing conditions is one of the most important social and economic problems. Presently housing problem is especially acute for the countries of Asiatic and African continents. There is a large difference between average providing of population with housing in Asia and in Europe. Thus, if in European countries average providing of inhabitants with housing makes up more than 40 m2 floor space per person, on the prevalent part of the Central Asian territory this index doesn't exceed 10 m2 per person. If in European countries houses with all amenities make up 80%, in Asian states that index is no more than 20%.

While in developed European countries the housing program is widely realizing the idea of highly comfortable dwelling, in countries of Asia and Africa less than a half of population has normal living conditions.

The lowest level of providing with housing is in rural areas. The state of housing in these regions is expounded in the OUN report "On the Social Situation in the World". It says, that nowadays the greatest part of rural housing resources consists of one-roomed huts, ventilation and lighting of which do not meet any requirements. There are mud floors, low dirty seilings, lack of devices for cooking and bathing.

In all times overdense housing developments and bad

sanitary conditions of dwellings have been common for the majority of villages. Presently in some regions of the world living conditions have become even worse as a result of increase of population, drop in soil fertility and devastations caused by wars and natural calamities.

Governments and public organizations of Asia and Africa realize that insanitary living conditions and lack of amenities in the majority of rural houses is a problem needed immediate settlement.

This idea has always excited Hassan Fathy. He said more than once that settlement of housing problem is the cause of all the people. His conception of revival of architectural and building traditions on the basis of using local materials (mainly mud brick) was aimed to solve the problem of housing. Similar trend takes place in the region of Central Asia.

But today it is practically impossible to solve the housing problem on the territory of a gigantic continent applying only primitive handicraft methods. And the experience of many countries is the evidence. We should develop Hassan Fathy's conception taking into consideration actual position, with maximal usage of scientific and technological achievements and potentialities of building industry.

Solution of housing problem is a very complicated task. It demands large allocations. But it wouldn't be correct to orientate ourselves only to state allocations. Only integration of efforts and means of different sources can solve the problem successfully. There are a lot of examples in the world practice when public, philanthropic organizations and large businessmen together with a state carried out wide-scaled social works on organization of public services and amenities, reconstruction of towns and solving of housing problem.

Today we are to put forward such a program before our states and try to promote it as much as possible. To begin with, I suggest to establish a Fund "Solution of housing problem" and prepare an "Appeal" to all governments, public, philanthropic organizations and businessmen to contribute the Fund. Simultaneously we should establish an "Assistance Centre" uniting intellectual potentialities of the region, that must develop the most rational ways to solve the housing problem.

Dear colleagues, be we adle to fulfil this Program, it will become a large achievement on the way of realization of Hassan Fathy's noble dreams and wishes.

THE AUROVILLE INFORMATION-RECEPTION CENTRE

A demonstration in
alternative building technology and
renewable energy

TABLE OF CONTENTS

Auroville, October 1991

1. LOCATION AND PURPOSE OF THE BUILDING:

This project is located in the international township Auroville, in Southern India. The purpose of the building threefold.

- It is the reception centre for the hundreds of visitors w visit Auroville everyday wanting to be informed about t aim of Auroville and its development.
- It is a demonstration complex for alternative technologi such as appropriate building technologies, land reclamati and afforestation, renewable energies, water management a waste recycling techniques etc.
- It has been the field of training for the local village who build it, thus experiencing soil block making a building techniques, to mobilise them to self build usi earth.

ENTRANCE TO THE INFORMATION CENTRE

The building comprises of an exhibition space, information office, shop sell handicrafts manufactured in Auroville video room, conference facility, restaurant & i kitchen, toilets.
Because of its location and purpose, this is a h visibility project.

2. THE AUROVILLE BUILDING CENTRE (AV-BC) & THE AUROVILLE INFORMATION RECEPTION CENTRE:

The *Auroville Building Centre (AV-BC)* is a research cum training organization in Appropriate Building Technology which forms part of the national network of Building Centres set up with HUDCO's assistance. The *Auroville Building Centre (AV-BC)* has two specialities until now: mud and ferrocement technologies. AV-BC also produces a whole range of prefabricated ferrocement elements.

The *Auroville Information Reception Centre* has been designed and is being built by the *AV-BC* as a demonstration project for alternative technologies and its completion is expected by the end of 91.

VIEW OF THE COURTYARD CUM AMPITHEATER

3. GUIDING PRINCIPLES FOR THE CONCEPT OF THE BUILDING

The building had to lend itself to be used by various types of people, had to be inviting for visitors who would be drawn to explore the space and become aware of the possibilities offered by various appropriate technologies.
The requirement for the building was as follow: information office, exhibition spaces, restaurant, video-room, shop for handicrafts, conference facilities, toilets and an open air amphitheatre as a focal point.

Appropriateness to the locally prevailing conditions was found to be a major requirement:
Appropriate to the climate: The climate in the area being hot and humid, natural ventilation is a must for comfort, but during the hottest part of the year, there is almost no breeze, we tried to use passive solar ventilation techniques using solar chimney which by heating up causes wind draft in the room below it.

Appropriate to the skills available: Auroville is in a rural area of the state of Tamil Nadu in India. The local population is mainly farmers who have less and less to do in the fields as their lands are very impoverished. Their building skills are very rudimentary.

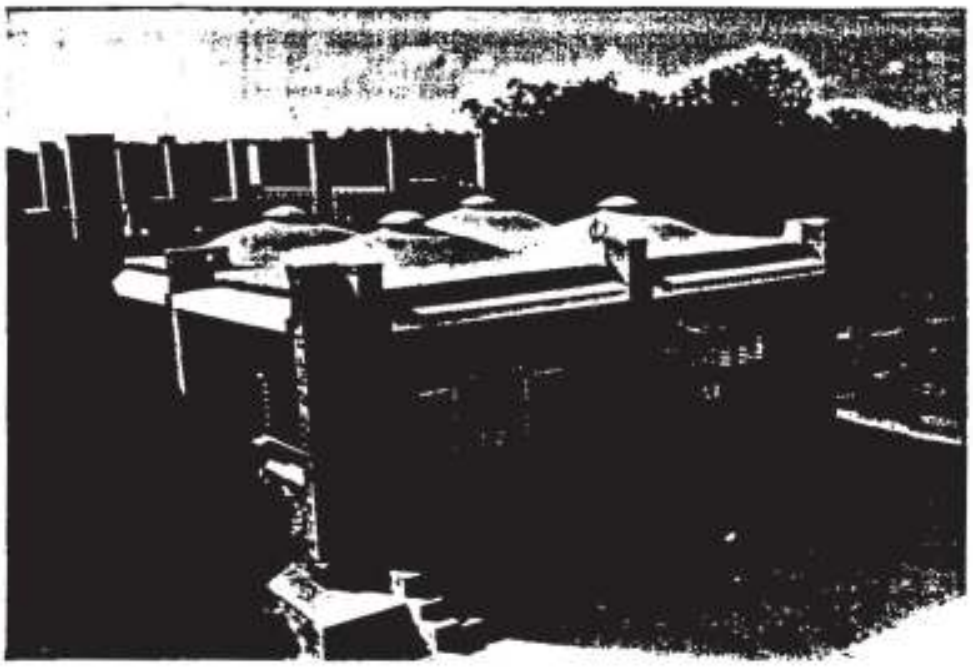
Appropriate to the locally available material: Here, fired bricks are of very poor quality, but the soil of the area is very suitable for making blocks.

Appropriate to the energy situation: (repeated load shedding). As the building will not be connected to the grid of the Tamil-Nadu Electricity Board but will tap only renewable sources of energy, a special emphasis had to be laid on natural lighting and ventilation.

Appropriate to the economic situation: The building had to be built using low cost techniques to reduse the cost per square metre to create a viable alternative.

ARCHED AND CORBELLED OPENINGS

In order to reduce the cost and simplify the construction, it was decided to adopt a grid pattern of 4 meters x 4 meters in which the pillars are load bearing and all openings are arched or corbelled.
The build-up area is about 1,200m² and soil stabilized blocks was used to build the pillars and arches, some spaces are covered with domes constructed with (5cm thick) soil stabilized blocks which at times has a first floor above it.
Some other spaces are covered with prefabricated ferrocement channels which, at times too, has a first floor above it.
Taking into consideration India's diminishing forests, the cost of wood and its vulnerability to termites, its usage has been forsaken.



VIEW OF THE DOMES

4. TECHNICAL DATA ON CONSTRUCTION:

4. A. FOUNDATION & PLINTH:

4. A. a. FOUNDATION WITH GRANITE BLOCKS:

The foundation for the main building is of a composite typ the holes for the pillars which are load bearing, are alwa dug up to the clay and gravel strata which varies between 75 and 120cm below the ground level.

This type of foundation was chosen because:

* Most of it could be done by unskilled labour,
* A material that has more load bearing capacity than the stabilized blocks had to be used; such is not the case the fired bricks locally available, but of granite which mined not far away.
* It is less time consuming to construct.
* It also came out to be cheaper than normal fired brick foundation.

4. A. b. FOUNDATION WITH STABILIZED RAMMED EARTH:

This type of foundation was used for the two fired vaults do by Ray Meeker. Earth which was excavated from the trenches w mixed with cement and gravel (1 gravel / 1 earth) from t site and rammed back in.

Volume of loose earth when mixed	: 19.8m³
Volume of the earth when rammed	: 13.75m³
Compression ratio	: 1.44
Bags of cement / m³	: 2.18
Volume rammed / 6 mixers, 3 rammers, 2 woman /day	: 5.5m³
Volume rammed / labourer /day	: 0.5m³
Cost price / rammed m³ (incl. labour 1990 rate)	: Rs 182

4. A. c. PLINTH:

To make the surface even, a normal cement plaster was lai above which a primer of bitumen and kerosene was applied a then a layer of hot bitumen. This is expected to be sufficient damp proof course and an anti termite barrier. Actually this did not prove to be such a good idea as t pillars, pushed by the arches and domes, started to sl outwards. This was corrected by drilling horizontal holes the base of the pillars and anchoring them with steel bars.

4. B. MUD STRUCTURE:
4. B. a. ELABORATION ON THE MATERIAL:

Building with earth always requires to have a good knowledge of the soil available in order to do the optimum with the material. Usually the following basic analysis are required:
- grain size distribution (sieving & sedimentation)
- Atterberg's limits (liquid limit, plasticity index, shrinkage limit...)
- Proctor

When the *Auroville Information Reception Centre* started, AV-BC's soil laboratory had not yet been set up. No lab analysis was done, but a number of tests were conducted with various mixes (soil/sand/cement) and with the 2 different soils available on site: a gravely soil and a yellow sandy soil.
To choose the optimum material, one has to take into account 2 main parameters:
- The need.(in terms of cost, quality, requirement, kind and aim of the project...)
- The quality of the product. (dry and wet compressive strength, water absorption, quality of the surface and edges).

After obtaining the results of these tests we chose to manufacture 2 kinds of compressed soil blocks: 5% and 4% of cement (calculated by weight) with the following mixes:

* 5% blocks (ground floor pillars) = 95% (by weight) of soil mixed (1/5 of gravely soil, 4/5 of yellow sandy soil)
5% (by weight) of cement
+ 11% of moisture content

* 4% blocks (1st floor pillars) (& other walls) = 96% (by weight) of yellow sandy soil)
4% (by weight) of cement
+ 11% of moisture content

4. B. b. ELABORATION OF TOOLS & EQUIPMENTS:

As 160,000 blocks had to be made for this site and as we at AV-BC intend to take up other construction sites later on, we made a number of tools adapted to our specific needs: standard wheelbarrows to carry the soil, flat wheelbarrows to carry the blocks, metal sieves with various sizes of mesh, steel centerings for the arches, compasses for the domes, and a new manual press for soil blocks : the AURAM.

We decided to design and build in Auroville this completely new press with high output and many unique features, because the 3 ASTRAM we had already acquired were only able to manufacture the 30.5 x 14.5 x 10cm blocks. But, we needed also other sizes of blocks: 3/4 blocks (22.5 x 14.5 x 10cm) and 1/2 blocks (14.5 x 14.5 x 10cm) for the bonds; and also thinner blocks of 4/4, 3/4, 1/2 size for the domes (30.5 / 22.5 / 14.5 x 14.5 x 5cm).
After 3 months of study and construction, the 1st prototype of the AURAM was operational on site (ref Chap.3).

4. B. c. BRICKYARD ORGANIZATION:

The brickyard was organized in order to reduce the handling and the distances of transport at all stages:
The quarry was only 10m away from the building, we installed the brickyard under a keet(leaves of coconut trees) shed as close as possible from the quarry and the stacking area just along the building.

BRICKYARD STRUCTURE FOR BLOCK MANUFACTURING

The process for each machine was as follow:

- Digging + sieving + soil carrying	= 2 men
- Mixing (dry & wet)	= 2 men
- Moulding	= 2 men
- first stacking (cure)	= 1 men
- final stacking (using a flat wheelbarrows)	= 1 men
Total	= 8 men

The production per day with 8 men/machine was of 500 blocks in 6 hours.

The screening was done in the quarry and the waste left there.

The mix was as follow:

* 5% blocks with gravely soil:
  40 liters gravely soil
  160 liters yellow sandy soil
  1/3 bag of cement (16.6Kg)
* 5% blocks with yellow sandy soil:
  220 liters sandy soil
  1/3 bag of cement (16.6Kg)
* 4% blocks with yellow sandy soil
  200 liters sandy soil
  1/4 bag of cement (12.5Kg)

EXCAVATION AND SEIVING OF EARTH FOR BLOCK MANUFACTURING

Note: The calculation of the percentage are always done by weight of dry material, but on site, all the dosages are done by volume (buckets of various sizes, wheelbarrows of 100liters). Then to do the conversion from weight to volume, one needs to know the dry density of the soil and of the cement.

The mix was done dry first and only when the dry mix
homogeneous (uniform color) the water was poured on it wi
water can, and then mixed again - the mixes were quite s
so that they would not wait for more than half an hour: a
that, the cement starts to set and the mix goes waste.

When the blocks are moulded, they are laid in long and
piles (7 blocks high) and covered with a plastic sheet to
the moisture content during the first 2 days. After that,
are removed out on the final stacking area where they
cured twice a day during 3 weeks. After that time, the bl
are ready to be used.

4. B. d. QUALITY CONTROL:

Quality control was done at 2 levels:
- On site during production,
- In the lab after curing.

On site, the control was done first by the workers themselves; it is important during the training to insist on self checking. It works very well if the workers on the job are involved and if a good atmosphere can be created during the work - of course, the supervisor must check from time to time the work.

The quality is checked on the following points:

* Mix:
  - Regularity of the dosage,
  - Homogeneity of dry and wet mix,
  - Moisture content (feeling with hands and test with the falling ball).
* Moulding:
  - Regularity of filling of the mould,
  - Test with the penetrometer (5mm of penetration at 4.5Kg was tolerated).
  - Weight of the blocks (accurate wet weight: 9.5 to 10Kg/block).
* Curing:
  - Careful laying of the blocks,
  - Neat covering of the piles with plastic sheets

In the laboratory, the tests were conducted on the dry and wet compressive strength and on the water absorption. The tests were carried regularly on one month old blocks.

The average results for 5% cement blocks were:
* Wet compressive strength: σc wet = 20Kg/cm²
* Dry compressive strength: σc dry = 60Kg/cm²
* Water absorption (from % to saturation) = 8.5%
* Absorption speed (by capillarity) = 2.5 to 3mm/hour

4. B. e. COST OF THE BLOCKS:

	4%	5%
Soil	Rs 0.17 = 11.7%	Rs 0.18 = 10.6%
Cement	Rs 0.90 = 62.5%	Rs 1.15 = 67.6%
Manpower	Rs 0.25 = 17.4%	Rs 0.25 = 14.7%
Machine	Rs 0.07 = 4.9%	Rs 0.07 = 4.1%
Brickyard	Rs 0.05 = 3.5%	Rs 0.05 = 3.0%
TOTAL	Rs 1.44 = 100 %	Rs 1.70 = 100 %

Note:
- Value of August 1990
- Extraction of soil = Rs 21/m³
- Cement = Rs 90/bag
- Manpower = Rs 21/man/day: 6 x21 /500 blocks/day
- Machine = Rs 7,000 fully depreciated after 100,000 blocks
- Brickyard=Rs 10,000 fully depreciated after 200,000 blocks

Comparison with the fired bricks locally available:
If one compares compressed stabilized earth blocks with fired bricks by same volume, one finds:
Compressed stabilized earth blocks 4% = Rs 0.52
Compressed stabilized earth blocks 5% = Rs 0.62
Locally available fired bricks = Rs 0.45 to 0.50

At first sight compressed earth blocks are much more expensive, but if one takes into account the wastage of each material, one finds finally:
Comp. stab. earth blocks 4% = Rs 0.52 x 3% = Rs 0.535
Comp. stab. earth blocks 5% = Rs 0.62 x 3% = Rs 0.64
Fired bricks Rs 0.45 to 0.50 x 20% = Rs 0.54 to 0.6

Finally there is not so much difference and the quality of the compressed blocks is much higher than the locally available fired bricks.

4. B. f. BRICK LAYING:

The mortar used for all the brickwork was a stabilized mud mortar.
In order to obtain the same strength with the mortar as with the blocks, we stabilized it with 7.5% cement (1.5 times more than the blocks). Also, to limit the shrinkage, we added some river sand.
The mix was:
7.5% stabilized mud mortar = 75 liters yellow sandy soil
35 liters river sand
¼ bag of cement (12.5Kg)

All the bonds of the pillars, walls, coping... were drawn before starting so that no problem would arise later on the site.
A typical cross pillar 48cm was built in 2 days by 1 mason + helper + 1 woman (165 blocks +4 corbels incl. moving the scaffolding and cleaning the work).
The arches were built on steel centering. 2/day were built by 1 mason + helper + 1 woman (120 blocks incl. setting up of the centering, moving the scaffolding and cleaning the brickwork).
As soon as 1 arch was completed, the centering was removed and the arch loaded with 10-15 blocks.

The domes are 5.30m diameter and were build on corbels
pendentives. The mason did not use a centering, but a com
set up in the center to keep the radius.
After training, one mason + helper + 1 woman were doing
dome in 4 days (± 1,300 blocks of 5cm height [4/4, 3/4,
blocks] incl. moving the scaffolding, setting up the comp
cleaning the brickwork).
Some holes in the pendentives were left in order to reduce
reverberation in the domes; this feature will be tested
later stage.

DOMES WITH HOLES TO REDUCE SOUND REVERBERATION

4. C. PREFABRICATED FERROCEMENT CHANNEL ROOFING:

These elements were prefabricated in the *Auroville Buil*
Centre workshop. They have been used extensively in Aurovi
and neighbouring villages. In the *Information Centre*, it
been used over areas of circulation, toilets and kitchen
will be used to roof the first floor. They span 3.70 meters
the ground and up to 4.6 meters on the first floor.
A load test was conducted in situ on the *Information Cer*
site: a grid of 4 x 4 meters (5 channels) was loaded up
560.4 Kg/m² (8 persons/m²) before the first hair line cra
appeared. As the required loading is 400 Kg/m², we decided
add an 8mm bar with 1:1:3 concrete in the valley between
channels in order to increase the safety factor.

5. CONCLUSION:

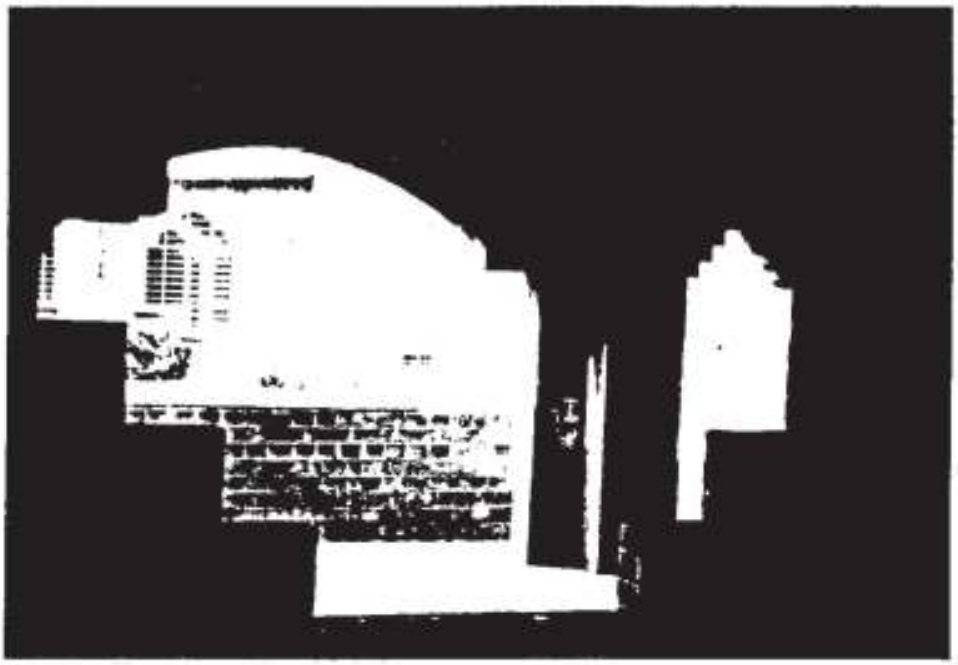
The local villages have been using mud to build the walls of their houses but they are not able to build more than a metre high because the cob walls cannot go higher and the roofing is mainly leaves from palm trees or coconut trees. These kind of houses are rarely well light, ventilated, hygienic and welcoming. So when we designed the information centre we wanted to use and train the masons in a building technology that they could adapt easily to their needs and would not cost as much as the fired brick and concrete houses that they see in the towns. Also mud had come to symbolize for them 'poverty' because they could not imagine that the same material could be used otherwise than what they did with it.

DOORS AND WINDOWS IN STEEL GRILL WORK

So the design of the building had to answer to their aspiration for a contempary look and at the same time show that the venacular use of space could be satisfied with the same technology.We can state that we have been sucessful in fulfilling this objective. The coolies (labours with no building sill) were trained to manufacture these blocks and they were also taught simple tests to self check the quality of bricks they were making. These coolies are now self employed to make these blocks on various construction sites and they in turn are training others.

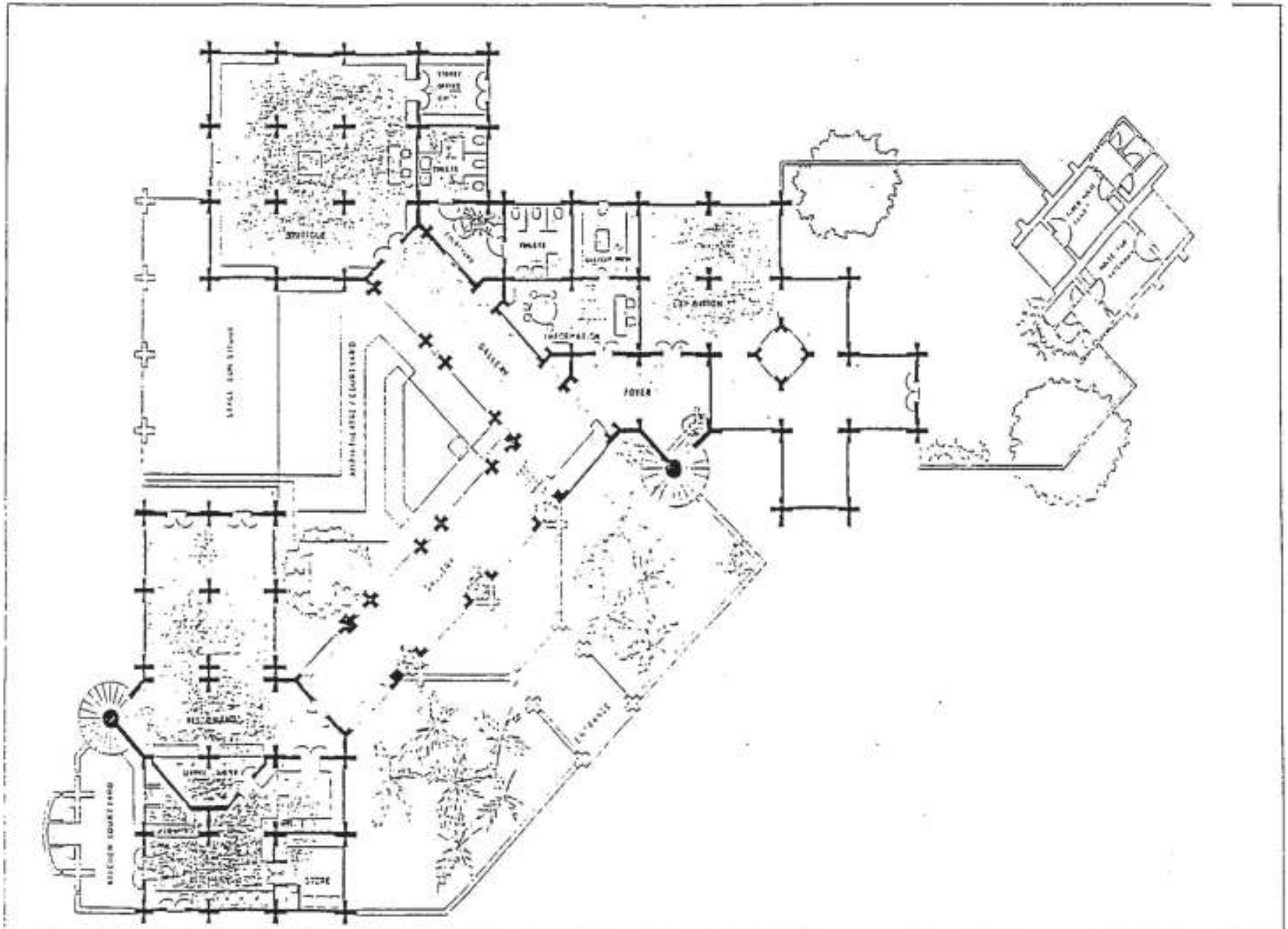
We did not want to use concrete and steel as these mater involve shuttering. Scaffolding use of a concrete mixe vibrator and big teams of people as this is expensive and replicable for the local population. So most of the build is built using soil stabilized blocks in form of pill arches, domes and corbel.

The masons were trained to build in an organized manner, w usage of spirit levels and mason plumbs (not a common tool the local mason here) to have an efficient construction w very little material wastage. We were very fortunate to hav cyclonic storms during construction because people could these bricks were non erodable and even the domes made th bricks which were not waterproofed stood up. This helped us pass the security test.



VIEW FROM INSIDE THE ROOMS

The training of the masons to build arches and domes usi soil stabilized blocks was very successful, inspite of the initial resistance as they had never done it before. Now th have the skill to self build their houses in a more permane technology. We hope that this project is only the beginning the regeneration process for this area.



AUROVILLE INFORMATION RECEPTION CENTRE

GROUND FLOOR PLAN 1:100

6. INFORMATION ON THE CANDIDATE ORGANISATION:

ADRESS

AUROVILLE BUILDING CENTER
CENTER FOR SCIENTIFIC RESEARCH
AUROSHILPAM
AUROVILLE - 605 101
INDIA

SUHASINI AYER-GUIGAN	ARCHITECT AGE-30 yrs Design and conception of the building, in-charge of the construction.
SERGE MAINI	ARCHITECT AGE-32 yrs Design and technical assistance in trainning and organisation.
GILLES GUIGAN	ENGINEER-CIVIL AGE 44 yrs Project conception and management; Engineer in charge.
TENCY BAETENS	SOCIOLOGIST (MANAGEMENT) AGE 41 yrs Production and Management of ferrocement elements.