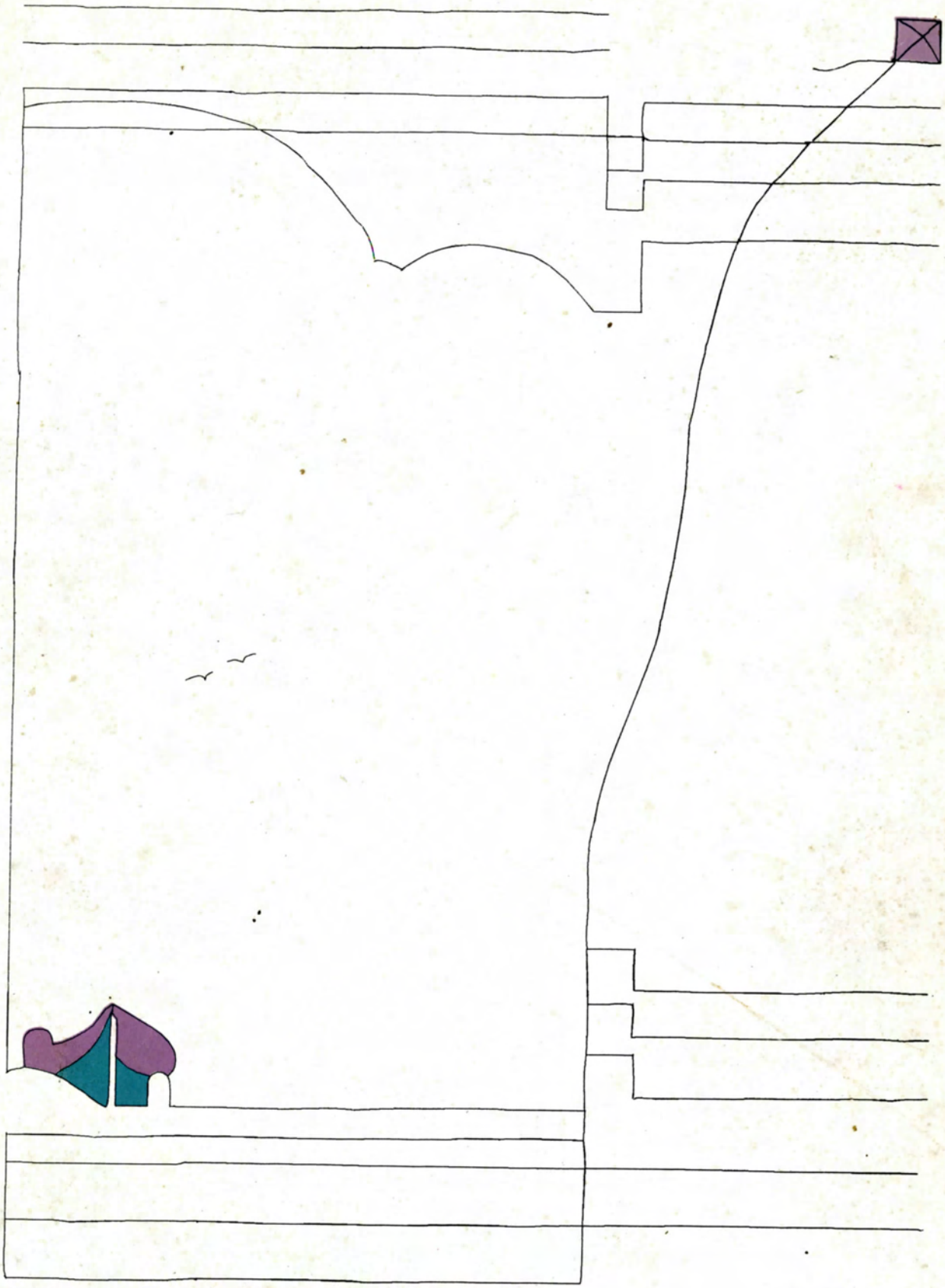

PROTIBESH

VOL. VIII, NO. 1, 1994

A JOURNAL OF THE DEPARTMENT OF ARCHITECTURE, BUET

Again heat transferred from top of the hollow brick to the bottom of the brick is a case of parallel heat flow.
q= KAdt/dx
=715.176 W or 5.1% of total solar insulation.
Where:
K=conductivity of brick i.e. 1.32 W/m C
A=area of solid through which heat is transferred
dt=Temperature difference between upper layer and bottom layer of the brick i.e. 10° C.
dx= vertical height of brick or tile wall.

The heat transferred through the air layer is a very complicated one since it is a case of temperature-inversion. This conduction through air amounts to 16W, which is only 0.33% of total incident solar radiation.

Hence we find that, for natural convection, the greater percent (20%) of total incident solar radiation is taken away by the air while only (5.1 + 0.33) i.e. 5.43% of heat energy is transferred.

Conclusion

The ruselts obtained from the above analysis indicate the promise of hollow-block clad as a mechanism of passive solar heat control

A relative comparison between the proposed hollow roof and conventional roof is as follows:

TEMPERATURE :

	COOL HOUSE	HOT HOUSE
ROOF TOP :	39 C	33 C
CEILING:	19 C	27 C
ROOM :	22 C	24 C

For 40 degree tilt and hottest part of the day

The research work had to be done in non-ventilated situation because if ventilation is allowed the total impact of solar radiation within the room through the roof cover cannot be measured. This is the reason why the difference of room temperature between the two rooms is not very appreciable, as the cool house during the night period acts relatively more as a heat store than the hot house. Thus the heat stored contributes to the following day's starting room temperature, which remains higher in the 'Cool house.'

The comparison shows that when a conventional roof has lime-terracing the cost factor is very close to that of the proposed hollow brick cladded roof. For this research Mirpur Ceramic Partition Blocks were used, the ultimate shape of which has not yet been finalized for manufacturing purposes. When tiles will be designed and specifically manufactured for use, cost effectiveness will be made possible and it may prove to be more economically viable than the existing roof insulation facilities.

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Speech and the Acoustic Design of Classrooms: A Case Study

Dr. Nizamuddin Ahmed

Abstract

In a classrom it is most importance to provide conditions so that it may be possible for the teacher to verbally communicate with his students. Volume, shape, materials, etc can adversely affect speech clarity; the consequent annoyance is not uncommon. Reverberation Time being the single most important factor in room acoustics, designers tend to compromise volume, shape, materials, etc in order to achieve good hearing conditions. Acoustical design by its very nature cannot be generalized in view of the widely varying parameters involved. The paper takes a close look at a particular classroom to examine the methodology that may be carried out wherever corrective measures are entailed.

Speech and the Acoustic Design of Classrooms: A case Study

Speech is one of the useful sounds as compared to disturbing acoustic sensations caused by traffic and machinery noise. Speech can, however, be a matter of considerable irritation depending on the intensity and content, or on the psychological condition of the recipient. Very loud or inaudible speech can be disturbing, as can be the boring or uninteresting talk. A listener may react to a speech depending on the state of his mind. Interesting or boring, the lecture in any classroom requires to be audible without distortion so that the entire class may be able to absorb its important contents.

In a room designed for speech it is obviously essential that every person in the room should clearly hear and understand the utterances. Moreover, the natural qualities of the speaker's voice should be preserved, meaning that the listener should recognise the owner of the voice.

The above may be achieved by

(a) making optimum use of the limited amount of acoustic power i.e. the intensity of the speaker's voice.
(b) ensuring that the background noise (which may mask the desired sounds) is at a level below 30 dBA.
(c) limiting the size and manipulating the shape of the room
(d) appropriate positioning of absorbing and reflecting surfaces
(e) maintaining the reverberation time of the space within a specified range.

The paper is based on an investigation prompted by observations, often bordering on complaints, that the lecture rooms in the Civil Engineering Building (of the Bangladesh University of Engineering

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and Technology, Dhaka) do not constitute acoustic conditions which may be termed as ideal for speech.

The experience of users of most classrooms of the Civil Building is that lectures are not clearly intelligible and words seem to be incomprehensible. The situation is most annoying in a situation where the speaker's intention is to transfer knowledge through verbal communication and the listener's occupation is to learn by hearing. The reasons for the disturbing situation could be as varied as the following possibilities

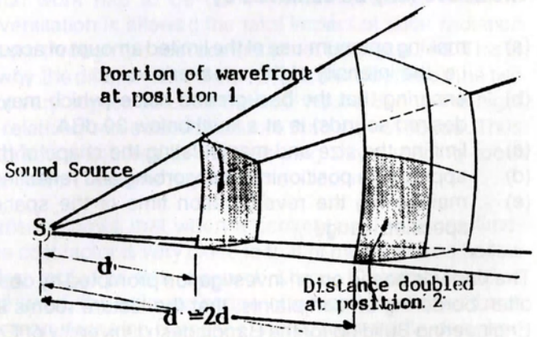
1. Weak voice of the speaker
2. Hearing problem of the listener
3. Room volume being in excess of 300,000 cft[1]
4. Room shape being conducive to acoustic problems
5. High reverberation time (RT) due to large volume and large areas of highly reflective surfaces.

Since the reported problem is of a general nature, possibilities 1 and 2 may be ruled out.

As a Case Study a typical room viz. Room 2004 of the Civil Building was selected.

The approximate dimensions of the room are 36.5 feet(length), 30 feet (breadth) and 12.25 feet (height). The calculated volume (V) of the room is 13,414 cft. This is very much within the limits of room volumes recommended for unaided voice.
Therefore, possibility 3 above can also be excluded.

Inverse Square law
Sound waves from a point source in the free-field are virtually spherical and expand outwards as shown below.



From Inverse Square law[2], it is known that sound weakens with distance and, therefore, rooms for unaided speech as in the Case

Study should adopt square rather than linear plane proportions. Configurations of 36.5 and 30 feet demarcate a plainly square plan. The seating arrangement in the Case Study also satisfies the criteria that listeners (students) ought to be within an angle of about 140° subtended at the position of the speaker (teacher) because, speech being directional, the power of the higher frequencies falls off rapidly outside this angle.

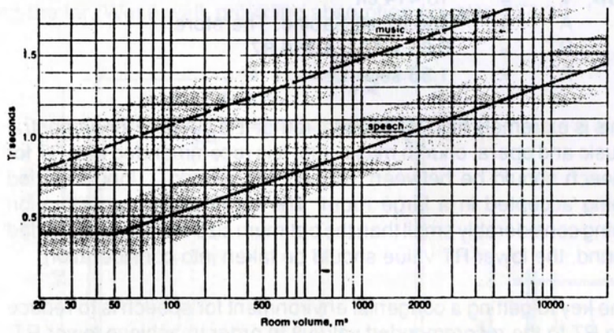
Echoes can occur if a reflected sound arrives .05 of a second after the original sound. This means that with reference to a point in the space the reflected sound has traveled about 50-60 feet more than the direct sound path.[3] In order for sound to be reverberant, the wave energy needs to be reflected as many times as possible by the bounding surfaces. Therefore, it is best to place the absorbents on surfaces that are likely to give rise to undesirable echoes and on those that may be conducive to multiple reflections, i.e. the further away form the speaker, the better.

Reflectors, on the other hand, should be near the speaker such that near-reflections may reinforce the direct sound without causing echoes.

Reverberation Time is the principal acoustical factor in the design of rooms. It is defined as the time taken for a sound to decay by 60 dBA after the source has stopped generating the sound.[4]

Excessive Reverberation Time (RT) reduces the clarity of speech by filling in the gaps between syllables.[5] Under situations of long reverberation time, the syllables (or sound) delivered earlier remain suspended long enough to blend with consecutive sounds causing a blurring effect. High RT occurs in a room because of

a. large room volume being disproportionate with absorption
b. highly reflective surfaces
c. lack of absorption



Optimum reverberation times at 500 Hz for speech and music related to volume

The optimum value of reverberation time can be a matter of debate. However, there is complete agreement that RT should be as short as possible for speech. Factors such as frequency and room volume give widely varying RT values for the same room use.[6] Generally, small rooms such as Room 2004 should be at the lower extreme of the RT range.

In order to calculate RT for Room 2004, it is necessary to find out the total absorption (A) of the room.

Surface	Finish Material	Area(Sft.) (rounded up)	Absorption Co-efficient	Absorption sft Sabine
Ceiling	plaster	1080	0.05	54.00
Floor	cement	602	0.05	30.10
Table	wood	305	0.10	30.50
Walls:				
North	open	108	1.00	108.00
	plaster	339	0.05	16.95
South	glass	72	0.05	3.60
	plaster	316	0.05	15.80
	wood	59	0.10	5.90
East	plaster	279	0.05	13.95
	blackboard	88	0.10	8.80
West	plaster	367	0.05	18.35
Air		124m^3	0.02	4.92
People		90 persons	0.40	36.00
Total Absorption, A				366.87

Existing Reverberation Time calculation

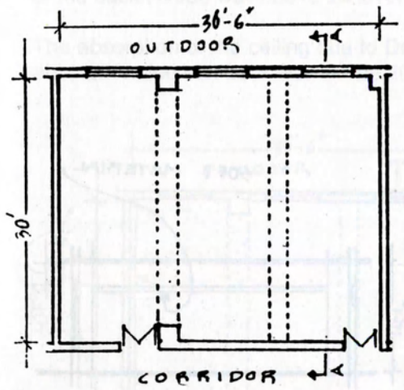
Now, V = 13,414 cft
A = 366.87 sft Sabine. Therefore,
RT = 0.05 × 13414/366.87
RT = 1.83 seconds

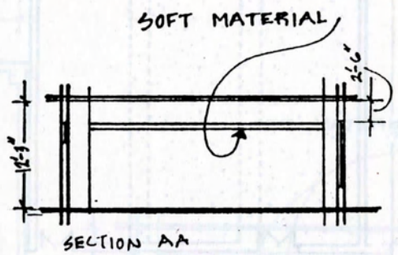
This is extremely high for speech, rather it is suitable for orchestral music and opera, church music, etc. It is recommended that RT for speech should be between .80 and 1.0 second[7], longer period being accepted in a large room. The room under consideration being considerably small than the optimum size allowed for unaided sound, the lower RT value should be taken into consideration.

The key to getting a congenial environment for speech is to reduce the RT to the recommended value.[8] In order to achieve lower RT, it is necessary to reduce the volume and also increase the absorption in the room.

Acoustic design is perfected by a trial and error method. It is, however, possible to design to the nearest recommended value and then put the theoretical to test. In the design of Room 2004, the following variations may be tested :

Design a: A suspended ceiling of a soft material (perforated partex board, gypsum board, etc.) is considered just below the beam bottom, i.e. 9.5. feet.

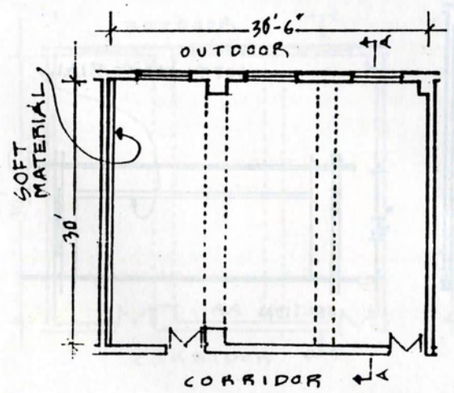


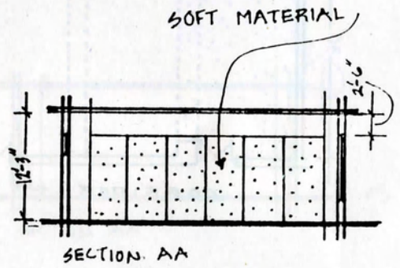


Volume will be reduced to Va = 10260 cft
Absorption due to soft ceiling is 1080×0.70 = 756
Therefore, total absorption Aa = 366.87 + 756—54
= 1068.87 sft. Sabine
Now, RTa = 0.05×10,260/ 1068.87
RTa = 0.48 second

Thus, it is not advisable to reduce the volume and apply a soft material on a suspended ceiling to the extent discussed.

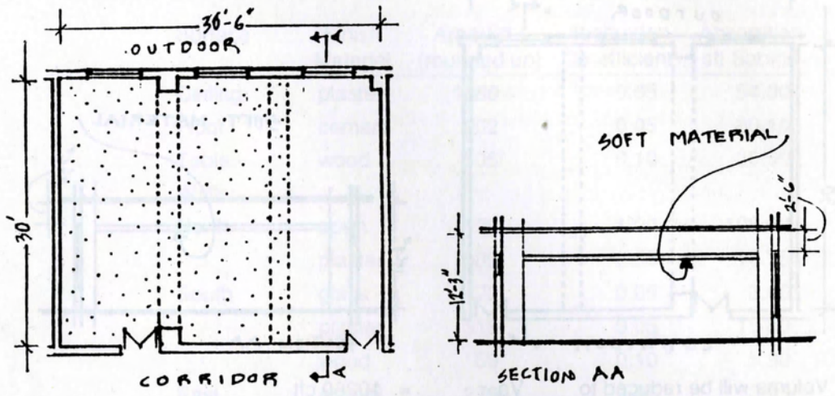
Design b: If the volume is not reduced, but a soft material is applied on the far (West) wall, providing absorption equal to 256.90.





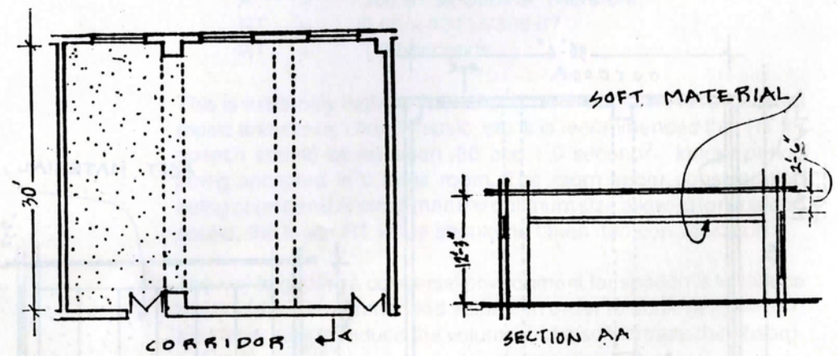
The total absorption becomes
Ab=366.87 + 256.90—18.35=605.42 sft Sabine
Now, RTb=0.05 × 13,414/605.42
RTb=1.11 second

Design c: With 1/3 of the ceiling kept untreated, the absorption is 18 and 2/3 being treated with suspended ceiling of soft material, the absorption is 504. Thus, combined absorption of the ceiling is 522.



The volume is reduced to Vc = 1150 cft
The total absorption becomes Ac = 366.87 + 522 - 54
= 834.87 sft Sabine
Now, RTc = 0.05×11,250/834.87
RTc = 0.67 second

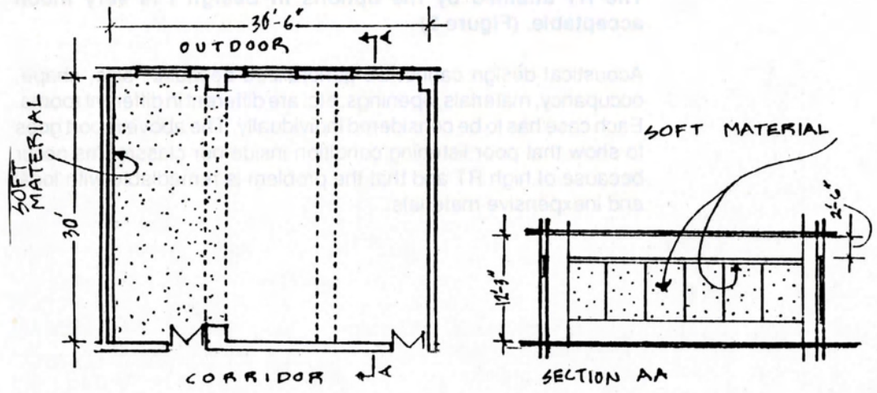
Design d: If the situation is reversed, ie 1/3 of the ceiling is treated with a suspended soft material providing absorption of 252; and 2/3 of the ceiling is kept as it is with absorption of 36, the absorption due to the ceiling will be 288.



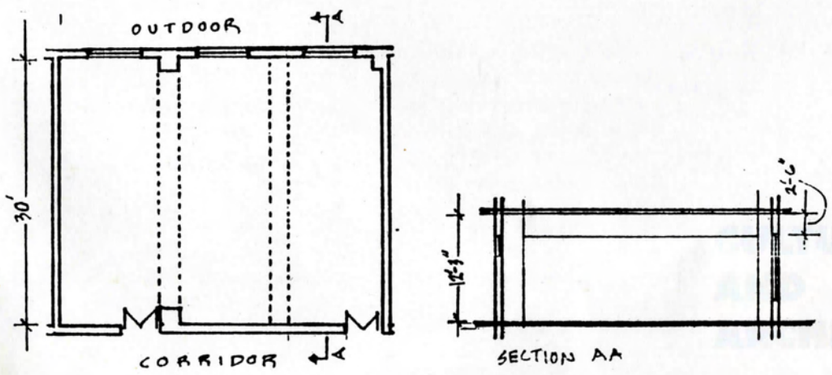
The volume is reduced to Vd = 12240 cft
The total absorption becomes Ad = 366.87 + 288 - 54
= 600.87 sft Sabine
Now, RTd = 0.05×12,240/600.87
RTd = 1.02 second

Design e: It Design d is repeated along with a soft treatment for part of the back (West) wall above sill level to protect form damage,

The absorption of the ceiling due to Design d will be 288 and the absorption due soft back wall will be 204.



The total absorption becomes Ae = 366.87 + 288 + 204-54
=18.35 +3.75=790.27 sft Sabine
The volume is as in Design d, ie Ve = 12240 cft
Now, RTe =0.05×12240/790.27 sft Sabine
RTe = 0.77 second



Design f: Gypsum Board being expensive, it may be advisable to apply locally available Partex on a suspended ceiling, the rear wall and the wall opposite to the windows. The absorption will be {(1080+292.5) * 0.25}= 343.13

The total absorption becomes

Af=366.87 + 343. 13-54-18.35+3.75=641.40 sft Sabine

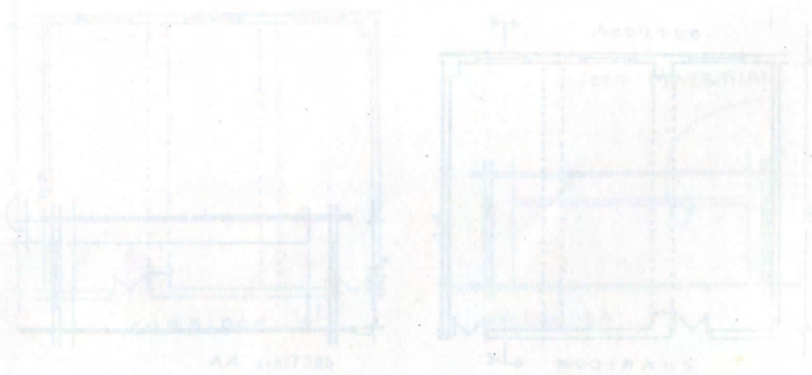
The volume becomes Vf = 10260 cft

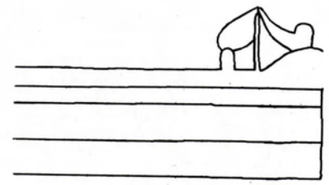
Now, RTf = 0.05×10260/641.40

RTf = 0.80 second

The RT attained by the options in Design f is very much acceptable. (Figure 2)

Acoustical design cannot be generalized because size, shape, occupancy, materials, openings, etc. are different in different rooms. Each case has to be considered individually. The above report goes to show that poor listening condition inside our classrooms occur because of high RT and that the problem is remediable with local and inexpensive materials.





CULTURE AND ARCHITECTURE

Heritage and Tourism :
Conflicts and Contextualism

Shaheda Rahman
Sheikh Ahsanullah Mojumder

Abstract

Today Tourism has become the world's largest economic activity second only to oil in dollar volume. Tourism is also to a great extent now being generated by cultural heritage More and more people are traveling for unique cultural experience. Historic monuments, sites and cities thus have become touristic resources. This form of tourism, cultural tourism, was confined to elite apanage (The Grand Tour) until 18c but since the 19c it has developed into a mass phenomena with all its perils.

The cultural tourism's staggering growth has made it a double-edge sword for historic mounments, sites and even cities. The example of Side and Bodrum in Turkey and even Singapore shows the disruption unharnessed mass tourism can infilct on traditional culture. Thus while it is acknowledged that heritage and tourism have become too deeply entwined to be studied in isolation, the impact of mass tourism on historic monuments, sites and cities, and on traditional culture has made it an object of intense scrutiny and sometimes of heated debates. Several international conferences have been held in the last two decades to debate the issues and to seek possible solutions to redress the problems that exist.

This paper overviews the heritage-tourism phenomenon in the light of the past experience of the world. It also studies the state of art in Bangladesh with attempts to identify the issues and premises of this yet untapped, unexplored and little studied phenomenon in Bangladesh.

Introduction

Travelling is as old as mankind. The world has known travellers since the dawn of civilization. Novel cultural experience, quest for knowledge, and to know the unknown has inspired man to travel from one end of the earth to the other from very early days. Ibn Batuta, Huen Tsang, Marco Polo and others amply illustrate the insatiable human zest for unique cultural experience, but those were the innocent days of tourism.

To-day tourism has become the world's largest economic activity second only to oil in dollar volume .[1] The World Tourism, Overview, a compilation of travel figures published by American Express Company, reported that overall global travel volume of people in 1983 reached 3.6 billion in 1983, despite the fact that domestic touristic activity concentrated in the more industrially developed countries of Europe and North America. A more recent figure shows that the earnings from fourism in the 24 OECD member countries amounted to nearly US $ 146 billion.[2] These are clear indicators of the phenomenal growth of tourism in the recent years.

Tourism today is partly generated by the historic monuments and sites. Unique cultural experience has a high priority in the expectation of tourists. In their travelling a growing number of people are motivated principally, or even exclusively by heritage of one's own, or of another culture in distant land. This form of tourism, known today as cultural tourism, was essentially an elitist apanage, a cultural phenomenon in the 18c (the Grand Tour). In the 19c it developed into a mass phenomenon. Today tourism is an irreversible human, social and economic experience inextricably bound with culture and heritage. This dramatic change has been induced to a great extent by better information and communication systems that exist today.

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Impact of Tourism

The staggering and ever increasing growth of tourism has made it a double-edged sword, a healer as well as a poisoner. Cultural tourism and economic development have become working partners in many instances. United Kingdom, Switzerland are perhaps the more positive examples of such harmony. In such examples it has vitalized local economy by creating jobs bringing in hard currency, giving motivation for new infrastructure and even provided incentive for conservation and preservation of the natural and built heritage. In the recent experience of the world, however, tourism, even cultural tourism, has proven to be a mixed blessing. That while there is harmony, there is also actual or potential confict. Tourism has known to throttle and cheapen the historic fabric of a place. It has destroyed, desecrated the very heritage, the very environment, and the social fabric which made the places once distinct and a veritable tourist attraction.

The impact of mass tourism on historical monuments and sites are usually :

1. Physical wear and tear, and over crowding.
2. Vandalism.
3. Changes induced in the fabric of the monuments and sites.
4. Changes induced in the environs of the historic monuments and sites.
5. Influence on the ambience and social fabric of the historic sites and towns.

The endless streams of tourists and their concentration within a specified period in historic buildings and sites cause wear and tear to the physical fabric of the monuments and sites. Over crowding also leads to vandalism. Today most world heritage sites, the best known the most advertised, and the most exciting of them are increasingly confronted with problems of over-crowding and physical damage. The caves of Lascaux have been closed to tourists since 1950's. This is because the pre-historic paintings and carvings of the caves were mortally threatened by the breath of the numerous visitors.[3]

In the Acropolis, the major monuments have reached a verge of total collapse. Stonehenge has been now cordoned off to visitors. To save this World Heritage Site tourists are allowed to visit the monument from a distance guided through a well-controlled and very defined path.[4] Today controlling the number of tourists to prevent overcrowding is a much advocated measure. In Venice it is being debated whether a "numerous clausus" should be imposed on the tourists coming to the City of Doges.[5]

Uncontrolled number of tourists frequently gives rise to vandalism People tend to touch, feel and experience the furniture and fixtures, thus wearing them off and often damaging them. Over crowding also leads to accidents. Graffiti has been a particular problem in historical buildings and sites. Tourist's invasion have ruined archaeological sites, worn out monuments, and rendered parks and natural resorts unrecognizable.

The effect of touristic invasion on historic monuments and sites has been well expressed by Peter Rumble, Chief Executive of Historic Buildings and Monuments Commission for England, when he explained as to what has happened to the pre-historic site of Stonehenge.[6]

"During August 1977 as many as 7000 people were visiting Stonehenge in a single day and some 2000 people in the single hour. All sense of isolation was lost. One was conscious of the bombardment of noise from traffic coming and going, what one saw was people milling around the stones rather than the stones themselves".

Historic centres have become prey to insensitive caterers as well. The setting, the environs, the context of historical monuments and sites are as important as their physical fabric. Often to accommodate the needs, comfort, convenience and interest of tourists certain amenities like car parks, tea-shops, signs and posts, souvenir stores are added on to historical buildings and sites, their preponderant presence being in obvious conflict with the historic settings. Often when new structures are built on historic sites it can cause structural damage to the building as has been experienced in the Lahore Fort. The excavation made for the sewer to install public toilets in the fort has caused settlement of the foundation.[7] The implication of such structural stress hardly needs to be emphasized.

The adverse effect of uncontrolled tourism does not end with individual sites or monuments. It extends well beyond the boundaries of such properties with more disastrous impact. The ambience and fabric of the towns which contribute to the sense of place, providing the context for monuments as well as being an expression of local culture are often destroyed under the ensued onslaught of mass tourism. It is not only the physical developments that induce the damaging influence but foreign touristic culture can influence the life style and values of the local population disrupting the cultural continuum and creating pseudo sub-culture. Thus, the context for the historical monuments and sites are often permanently lost with irreversible damages.

The cities of Side and Bodrum in Turkey, Damascus in Syria, and even Singapore well demonstrate the negative impact of tourism.[8] In the old city of Damascus, buildings which were originally exclusively used for habitation, 75% of them now house shops, store houses, workshops, and other commercial activities.[9] When the nature of use changes obviously it is followed by a change in the population

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24. Gupta. N, 'A People's Movement.' Architecture + Design, A Journal For The Indian Architect, Vol. VI, No. 1, Nov.—Dec. 1989 p 109.
25. Ibid.

and social structure. Even the historic cities of the developed countries have not escaped this disastrous effect of mass tourism. The university towns of Oxford and Cambridge could serve well as examples.[10]

In simple words world experience shows that in many unique places there has been progression in which, the unspoiled quality of a place attracted tourists where upon the sheer number of tourists, the accommodation they need, the industry they encourage, bring about a change which all too often is prejudicial to the very quality which attracted the tourists. Meanwhile as tourist's number grow, the change accelerate. Though there is a wide variation in effects, the proposed benefits of tourism have proven illusory more often than not, in developing countries. In these instances not only social and cultural patterns have been disrupted, consumption of scarce resources by tourists has disadvantaged local population. More unfortunately profit flowing from tourist industry has been channelled out of the country to overseas companies.[11]

Mass tourism has also given rise to the heritage industry with all it's perils. The genuine no longer seem to hold the interest of tourists on their own. As going for "cultural heritage" has become fashionable i.e. to follow a trend without really understanding it, shrewd heritage managers exploit the situation. The heritage managers invest in theme parks and heritage centres, where often harmless but mentally polluting entertainment is offered. Fake historic environment is created, yesterday and today is confused, grossly falsified past is offered to the tourists in "historic revival scenes". As most tourists do not have the necessary points of reference and are nostalgic about the past, they are uncritical about such fake heritage. In other words, mass tourism has made the past a pastiche and the historic sites and monuments a player's stage. From the cultural point of view this could be disastrous and for tourism economy it could be self-defeating in course of time.

In recent times tourism has significantly influenced the practice of architectural conservation. Heritage has now become a commodity in the hard selling tourism market. Increasingly investments are being made on the viability of the monument in the tourism market Even in India where tourism is gaining momentum this trend has become evident.[12] Moreover, to capture the interest of the tourists cultural properties are often being presented in falsified context which subverts the aim of architectural conservation. The "Light and sound" programme at the Delhi Fort could be cited as such an example. Tourism while has vitalized the architectural conservation activity in many instances, if left uncontrolled, can negate and destroy the aim, object and the process of architectural conservation.

Tourism— Conservation Link

The discussion so far did not intend to undermine the influence of tourism in the field of conservation and preservation, or deny the present interdependency of tourism and conservation which has become an irreversible fact. In order to try to understand the nature of such dependency, Britain could be chosen as an example to illustrate the case. The reason for selecting Britain is that tourism in Britain is essentially built on its heritage and wealth of historic towns and cities.

While there is a clear indicator that in UK conservation projects act as strong selling points for tourism, however, proceeds from tourism tend to go to private hands. There is also very little direct financial contribution from tourist industry to conservation, as the money does not filter back through. This point was realized by National Linchfield and Associates in their study of conservation for Esher Report about York. In other words, though tourism may revitalize local economy and contribute to built environment, its direct link with conservation as expressed in economic terms is not readily quantifiable. Presently in Britain conservation of historic environment and heritage is pursued irrespective of tourism in the sense that financial benefit to conservation from tourism is not proportional to the revenues that is being earned. More indirect influence of tourism to uphold tourism is that conservation is now receiving greater public funds and attention than before.[13]

Today two schools of thought prevail over the tourism—conservation link. One group staunchly holds that the aims of conservation and tourism only appears to be complementary, when studied superficially. In reality the interest of history always crosses with interest of leisure (tourism). Tourism propagates development and change while conservation advocates controllable and minimum change. Tourism may start as a conservationist in the historical and natural environment but it rarely remains so. Tourism has to rise to the level of expectation of ever increasing number of tourists searching for novelty. Thus, when it reaches the economic climax it is already self-destructive. The other school strongly advocates tourism as a means and an end to conservation. Their view is that the present pitfalls are the consequences of not understanding the phenomenon correctly, and in their opinion therefore, correct interpretation and planning can greatly mitigate the present exigencies. It is even held that in poorer countries the importance of tourism is even greater. It is said that in the third World countries, tourism is often the principal factor, the only force which can sustains the conservation movement. The tourists not only provide hard currency but also the will to protect otherwise neglected and decaying sites. They make the authorities realize that it is the cultural heritage which provides a key to the desperately needed source of national income to feed and educate the people.[14]

While it is generally acknowledged that heritage and tourism have become too deeply entwined to be studied in isolation, the impact of tourism on historical sites and buildings as experienced in the past,

has made it an object of intense scrutiny and sometimes of heated debate. In the last two decades several international and national conferences have been held by UNESCO, ICOMOS, ICCROM and the World Heritage Convention to identify and debate the issues and seek possible solutions to the present problems.

One realization has been that cultural tourism will not diminish although it will fluctuate with economic movement. Equally true is the finding that unless tourism is marshalled or controlled it can be a destructive source for heritage. As a means to control tourism a comprehensive integrated approach is a sine qua non. It calls for the concerted efforts of those responsible for conservation and tourism. For instance to reduce overcrowding and thereby wear and tear of historic monuments and sites and its associated perils, it is being suggested that visit quotas or visit reservation system could be a possible solution in time. This can only be achieved by correct interpretation and accurate projection of trends in tourism and based on that, better management of heritage sites. The 1976 International Charter for Cultural Tourism Declaration of Manila (ICOMOS) is being recommended to be examined for local applicability.

Tourism in Bangladesh

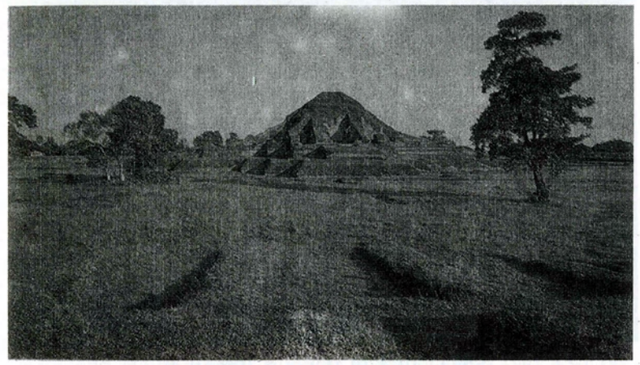
Before one attempts to analyse Bangladesh's potentials for tourism it should be remembered that tourism is essentially a product of marketing. If tourism is not a major economic activity, it is not because Bangladesh lacks the necessary assets, rather Bangladesh has not ventured into the world of tourism and its potentials remain yet untapped.

'A land of emerald and silver', in such terms for centuries chroniclers have sung praises of Bangladesh. It is indeed a befitting description of the land of the great delta with its numerous rivers and lush green vallies. It is also a land of ancient culture dating from the time of the Vedas, an assimilation of the many influences of Buddhism, Hinduism and Islam which the country has experienced. The fertile cultural synthesis which resulted may be seen in particular, on the great artistic and archaeological treasures of the land. Many of these treasures which were made from brick, a fragile material, have not survived the rigors of time, climate, negligence and ravages of war. Some as the Paharpur Buddhist Monastery (Fig- 1) and the Shait Gumbad Mosque (Fig-2) in the Mosque City of Bagerhat have survived, and have earned the distinction of being declared as World Heritage Sites by the World Heritage Council.[15]

At present Bangladesh is in the grip of the worst economic recession. The problems of conservation now faced in Bangladesh are perhaps not uncommon in the region. It is not unexpected or unnatural that physical development receives the highest priority from economists and planners while the natural and built heritage of the country

remain neglected. But can a nation progress solely on physical development? There are enough historical evidences to prove the contrary.

Given that the current government expenditure for preservation and conservation will not rise significantly in the near future alternative source of finance has to be sought. Tourism could be an answer to this. Or is it? Would tourism be compatible with conservation in Bangladesh? Would the traditional society of Bangladesh sustain the adverse effects of tourism? Would it be possible to develop the infrastructure necessary for successful tourism in Bangladesh? These are some of the fundamental questions that need to be addressed before the country can embark on cultural tourism.



Paharpur Buddhish Monastery
Fig- 1

The following discourse hopefully will answer some of these issues. Let us begin by examining the potentials of Bangladesh for tourism. Both natural and cultural resources are important touristic resources. Bangladesh is richly endowed on both these accounts. There are many natural sites all over the country which could be regarded as honey-pots for tourists. The Heron Point with rich wildlife, Jafflong, Sripur, Tamabil, Maday Kunda etc. in Sylhet, Kuakata in Patuakhali, Himchhari in Cox's Bazar. Khagrachhari in Rangamati, all competing with the garden of Eden in their picturesque quality, are few such sites to name.

The reason for citing the natural sites is that these obviously will be marketed if tourism develops and that even tourists who are attracted by nature are rarely contained by it. They too venture out for cultural experience during their sojourn. Sunderban and Cox's Bazar has been attracting visitors, even if in limited numbers when compared with elsewhere, for quite some time. If tourism develops obviously the number of tourists will sharply rise so will the number of tourist centres, and this will create an obvious impact on the heritage sites.

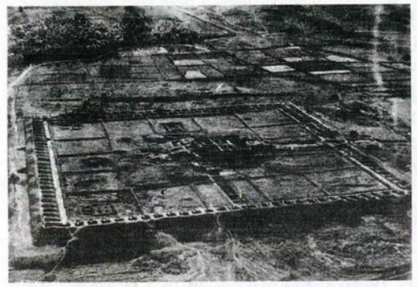
The architectural heritage of Bangladesh is of no mean stature. The archaeological and architectural treasures of the country can be said to have great potentials for tourism. The World Heritage Site of Paharpur for instance, being the worlds largest Buddhist monastery has great demand in the international market. The Japanese tourists who have avalanched the world tourism in particular promises a good source. This can be adduced from Japan Government's keen response and involvement in the preservation of the monument. Considering the great wealth of Buddhist archaeological sites of the country. Bangladesh has reasons to be optimistic. The Mahasthan Garh in Bogra, (Fig.-3) for example, dates from 3rd century AD. According to Lord Cunningham, the site of Vasu Bihar

Shait Gumbad Mosque, Bagerhat
Fig- 2

in Mahasthangarh has been mentioned by Huen Tsang in the 7c Ad. It is believed to be the place where Buddha rested, meditated and thus bears his foot mark.[16] It is also the site of Pundranagar, the Pandua Capital.[17] The Sitakot Vihara (7c-8c AD) at Charkai in Dinajpur, the 50 archaeological sites of Mainamati in Comilla (Fig-4) with Buddhist archaeological remains dating from the 80-120 AD, the Kyangs and the Pagodas of the south-east, all have a lot to offer to scholars, devotees as well as general tourists from all over the world.

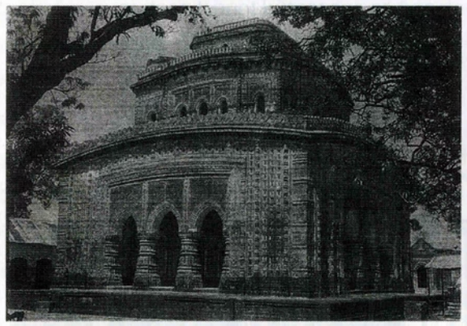
Mahasthan Garh, Bogra
Fig- 3

The Hindu and Islamic Architecture of Bangladesh while may not size up to the grandiose Indian architecture of the same period, they offer a distinctive style, and are unique in their own regional character and thereby hold great prospect for tourism.



Mainamati in Comilla
Fig- 4

To prove the hypothesis some examples may be in order. The earliest Hindu temple so far discovered is the Govinda Swami Temple at Baigram in Dinajpur district, built in the 128 Gupta era (477-78) AD). An ancient edifice as this could be well expected to inspire and impress scholars and tourists alike. The various Shikhara, Bangla and Ratna Temples found in Bangladesh can also be expected to interest the tourist. The temple of Kantanagar, an exquisite navaratna temple of composite style (Fig-5) built in 1752 is a marvelous example of the terracotta art of Bengal, and can truly vie grander structures for tourist's interest.[18]



Kantanagar tempte
Fig- 5

There are numerous historic buildings and monuments of the Muslim era dating from the Sultanate period to the late Mughal strewn all over the country. Most of these, like remains of the earlier periods, are of religious order and many are live monuments still in use. The most significant building of the Sultanate period is the other World Heritage site of Bangladesh, the Shait Gumbad Mosque of Bagerhat (Fig-2). Dhaka, the capital is a rich repository of Mughal and Colonial architecture. Most Mughal structures unfortunately are vanishing fast and would be totally lost unless prompt actions are taken to protect and preserve them. The colonial buildings being more recent are perhaps best preserved through adaptive re-use. However, they too could be desecrated and destroyed through misuse and abuse, and therefore need steps to ensure their preservation. Since the colonial buildings are mostly in use it would be difficult to open them to tourists without special measures for their protection and security.

It is not only the grand and ancient structures that attract tourists. There are many less imposing structures, of great artistic and aesthetic value, which offer good market for tourism and certainly merit conservation efforts. The old residence of the Khasi Kings belonging to 7c AD in Jaintiapur in Sylhet is a good example of this group of structures. The ruins of the palace with an adjacent series of vertical monoliths would impress any visitors, local or international.

The Painam Nagar in Sonargaon is another such historic site (Fig-6). The city built by Hindu merchants is an unique expample of linear city planning of early 20c. The city planning with its buildings not only offers an insight to the lives of the wealthy merchants of the day but also boasts of exceptional brick detailing and high aesthetic value. The painam Nagar at present is an important tourist centre and could be further developed by conservation of the area. The multitude of Zamindar Bari found all over Bangladesh like wise, are impressive in intricate details and distinctive styles and therefore can easily be developed as successful tourist centres.

Painam Nagar in Sonargaon
Fig- 5

It should be borne in mind that the architectural heritage of one country is never comparable, nor it is expected to compete, with that of another country. What Taj is to India, and Versailles is to France, Paharpur is that to Bangladesh. Moreover, when tourists visit a country or a site they are in a receptive frame of mind. They are then willing to absorb and experience whatever novelty is offered. They are thrilled by the quaint, and even the insignificant, just as much as by the grandiose, if presented in the right manner. The development and the success of the old industrial towns of UK as prosperous tourist centres amply supports the thesis.[19]

One can prove the same from local example. For most visitors to Dhaka, for instance, the sojourn is incomplete without a visit to old Dhaka and the Sher-e-Bangla Nagar. Two more diametrically opposite situations could hardly be better illustrated. Old Dhaka, represents the past and the pulsating lives of the Dhakaiyas. The Sher-e-Bangla Nagar, on the other hand, is a remarkable piece of contemporary architecture by a world famous architect. It would be of interest to readers to learn that in the recent past tourism organizations have been organizing tours for foreign visitors who come to Bangladesh exclusively to visit the masterpiece of Louis I Kahn. Thus the tourists are not nostalgic about the past alone but are eager to experience the present and the future. Therefore the ancient, the grand, the quaint, the novel even the bizarre can trigger and hold the imagination and interest of tourists, if correctly channelled.

প্রত্নতত্ত্ব জাদুঘর অধিদপ্তরে নিয়ন্ত্রণাধীন বিভিন্ন জাদুঘরগুলিতে ১লা জুলাই,১৯৮৯ ইং হতে ৩০ শে জুন, ১৯৯০ ইং পর্যন্ত দর্শক আগমন ছিল নিম্নরূপ

জাদুঘর	দর্শক সংখ্যা (জন)			
	১৯৮৯-৯০	১৯৯০-৯১	১৯৯১-৯২	১৯৯১-৯২
লালবাগ দূর্গ জাদুঘর, ঢাকা	১৩২১	১০৬৩০১	৮৯১২১	২০০০০০
মহাস্থানগড় জাদুঘর, বগুড়া	৯০৩১৮	৫২২৬১	৬৪৭৪৯	
পাহাড়পুর জাদুঘর, নওগাঁ	৬২৩৫০	২২৮৪১	১১১৪৫১	১৫০০০০
ময়নামতি জাদুঘর, কুমিল্লা	৪৯৪৫৫	৪০৮৬৪	৪৫২	
চট্টগ্রাম জাতিতাত্ত্বিক জাদুঘর	৭৫২১৪	৬৮৬৯৫	৫৩৯৬৯	১০০০০০
শেরে বাংলা স্মৃতি জাদুঘর, বরিশাল	৫১৭১	৫৭৬৮	১০১৫১৭	৫০০০০
রবীন্দ্র কুঠিবাড়ী, কুষ্টিয়া	১২৪৩৯	২১৮০১৪	১০১৫১৭	
এম, এস, দত্ত বাড়ী, যশোহর	১২৬২৫	১২০৮৮	১৫০৮০০	
	৩০৮৯৩	৫২৬৯৩২	৬৭৩৫৭৬	৫০০০০০

প্রত্নতত্ত্ব জাদুঘর অধিদপ্তরে নিয়ন্ত্রণাধীন জাদুঘর ও সাইট সমূহের জানুয়ারী থেকে ডিসেম্বর (১৯৯১) পর্যন্ত পরিদর্শনকারী দর্শক সংখ্যার তালিকা ঃ (Fig- 7)

If we accept, based on the foregoing discussion, that the potentials for tourism in Bangladesh is very rich, let us now review the tourist industry. Tourists may be classified as international, regional and domestic. From available information it is not possible to state the exact nature, or predict the recent or future trend of international, regional or domestic tourism. Chart shown in Fig-7 shows that no attempts are made at present to identify the purpose or extent of visit of those coming to this country. However, it would not be incorrect to say that international tourism, as known in the other parts of the world is virtually unknown in Bangladesh. The insignificant number of such tourists that does exist represents those visiting or living in Bangladesh for business or other official purposes. In the case of regional tourists the situation is not very different. Never the less, it may be said that in the foreseeable future regional tourism is likely to gain momentum on account of South Asian Association for Regional Cooperation (SAARC). To encourage cultural interaction and inter-travel, special discounts are offered at present for regional travel by the airline companies of the SAARC countries.

In Bangladesh domestic travel is not motivated by heritage. People travel to visit relatives and village homes for vacation rather than for cultural experience. Often people travel to sites of archaeological significance for outing as picnics. Unacceptable as it may be it is not uncommon for picnic spots to develop near the heritage sites. Sonargaon, Paharpur, Mahasthangarh, etc. are some of such sites. People visiting the heritage sites for scholarly research do not truly conform the category of tourists.

It would not be accurate to say that heritage sites do not draw visitors, only that from the existing data it is difficult to infer what priority it holds for people, or what the trend is. When a historic site, monument or building is within a city its frame of reference changes. In such cases these places act as a breathing place and a recreation centre for the city dwellers, and draws visitors in significant and ever increasing numbers. Ahsan Manzil, Lalbagh Fort and even the Savar War Memorial and Central Shahid Minar are good examples of this.

Problems Associated With Tourism in Bangladesh

If we try to analyse the possible negative impacts of tourism in Bangladesh, the most imminent danger to be expected is physical damage, or wear and tear of the monuments. Most common building material of the region is brick, a fragile and impermanent material susceptible to weathering, sulphate attack, and rank vegetal growth.[20]

Most of our ancient edifices are today in a state of decay. In their present state these structures are unlikely to sustain regular concentrated pressure from the expected large number of people for whom it was never designed. Before contemplating any form of

tourism it is essential to take measures to protect and preserve the historic sites and monuments.

Another danger, which though hard to define, is the clandestine trade. It is not to say that clandestine trade of heritage materials do not exist at present only that it is likely to accelerate tremendously with tourism. It would not be an exaggeration to say that at present in Bangladesh the concern for heritage, or its preservation and conservation is almost nonexistent. In the present unprotected state the historic monuments would be stripped bare of valuable artifacts, and thereof their historic significance. The only measure against this is to develop the concern for heritage in Bangladesh. If the people of Bangladesh cannot respect and protect their heritage then the tourists coming from other countries cannot be expected to have any respect for it either.

Conclusion

Despite the present interdependency between heritage and tourism, the aim of conservation has to be defined outside tourism. It has been said that in most developing countries the economic condition does not facilitate conservation for historical value alone. It would be also wise to remember that culture forms the life tenure of all countries and no country is in a position to squander what it may have. It is not only prudent but also mutually beneficial that heritage remains an indirect source of encouragement for tourism. For tourism can be a culture imposing and culture destroying force, and can reduce conservation to preservation of a disrupted mutilated image.[21]

It should further be stated that the Bangladesh Parjatan Corporation, the National Tourism Organization, is not properly educated and informed about the heritage of Bangladesh—its history and significance. The reason for this remark is Parjatan's brochure on archaeological sites and monuments printed in 1989 reads "The architecture of the pyramidal temple (Paharpur Buddhist Monastery)..... profoundly influenced by those in South-East Asia, especially Burma and Java". The fact is the architecture of Paharpur has influenced the Buddhist architecture of S.E. Asia particularly that of Borobodoor[22] and not the other way round as deemed by the Parjatan Corporation.

Bangladesh on account of its natural scenic beauty, rich cultural heritage and archaeological treasures has indeed great tourist potentials. However it should be remembered that tourism is as much a product of marketing as it is of environment.[23] Therefore if Bangladesh is to embark on cultural tourism there has to be a comprehensive development on a sound pragmatic basis.

At this point in time it would be prudent to promote domestic and regional tourism in Bangladesh rather than international tourism in

the truest sense. Even a country like Sri Lanka, which already has a strong international market, is reticent to rely on international tourists. Sri Lanka, though recognizes the importance of the tourist industry for country's economy believes that the mainstay of the industry should be domestic tourists. It is held that international tourists may be variable and unreliable, even if lucrative and supportive for economy and conservation. This philosophy is obviously sustained by the fact that in Sri Lanka most historic sites i.e. the tourist resources, are religious sites, and pilgrims are the most numerous and regular visitors to these places.[24]

The importance of domestic tourism lies in the fact that it is a good catalyst for conservation. In India most major cities have their own conservation societies, viz. the Conservation Society of Delhi (CSD). One of the main activities of these societies is to promote local tourism. The objective being to make people aware of their own heritage and instill a sense of pride in them and thus developing the concern for conservation.[25] For Bangladesh it can be considered even more important to promote local tourism to achieve this end.

To envisage even domestic and regional tourism at present is quite ambitious for Bangladesh as the necessary bases for the industry are non-existent. The unprotected state of the heritage sites further aggravates the situation. A systematic development plan both for tourism and conservation can be said to be a necessary pre-requisite. The urgency today is first to preserve and protect the historical sites and monuments. This can only be possible if there is a responsive and comprehensive conservation policy, a step Bangladesh is yet to take. The necessary expertise and infrastructure obviously need to be developed. Since without the political will and community support no policy can ever become a reality, efforts must be given to motivate both the public and the people in office for the conservation of our heritage.

It is being acknowledged that tourism can be a powerful tool and supportive to conservation and national economy. However, the process must be deliberate and controlled. The process would also have to be supported by strict and well observed regulations, and permanent dialogue between the responsible people namely, the Directorate of Archaeology and the Parjatan Corporation. Each must be aware of the tremendous responsibility that they would be holding. Any lapse by either party would bring disaster for Bangladesh.

No matter what course of action is chosen the issues of conservation should never be made secondary to the profits from tourism. The aims of conservation must be defined outside the phenomenon of tourism.

Earth Architecture of Bangladesh and Future Directions for its Conservation and Upgrading

Iftekhar Ahmed

Abstract

In the deltaic environment of rural Bangladesh thrive splendid examples of earth architecture Different methods of construction have evolved in the three major physiographic zones which comprise the alluvial land of Bangladesh. Bamboo technology is prevalent in the **Lozoen Caze** where different techniques of wattle-and-daub are evident. In the **Tertiary Hills** buildings built on stilts are mostly of timber and bamboo, but the use of earth blocks can also be observed in this area. Most earth buildings are located in the **Pleistocene Uplands** where buildings built in the layering technique and with large earth blocks are common. The base of earth buildings are susceptible to deterioration by water and various methods of protecting the raised earth plinth and the use of time-pozzolanic cement have been explored in this paper. Earth structures represent living cultural traditions; their maintenance and preservation are vital for the cultural continuity of architecture in this region.

INTRODUCTION

Bangladesh is mostly comprised of a large riverine delta formed by alluvial sedimentation deposited by rivers and their myriad branches. The fertile soil, abundance of water and warm climate support a principally agricultural and rural mode of living. The life of rural inhabitant is intricately linked with the water and soil of the land. Water flows throughout the delta depositing annual endowments of alluvial earth. The gift of the rivers is used ingeniously to build remarkable earthen buildings. But the annual riverine floods, the incessant monsoons and the insidious humid air gnaw away these buildings- as if the generous donors demand the return of their gifts. A continuous battle is waged against the adverse elements to preserve the earthen buildings , the same buildings which protect the rural inhabitant from those elements.

This paper is about architecture that uses earth as the main building material. In environmental conditions of extreme wetness, the use of earth as a building material faces serious constraints. Yet it is one of the most readily available resources in the alluvial land. For this reason examples of earth architecture abound here and adaptive ways of using earth have evolved over time. Earth architecture typologies can be classified on the basis of three major physiographic zones based on altitude or relief: Recent Plains, Tertiary Hills and Pleistocene Uplands. The variety of earth building types have evolved largely in relation to topographical conditions, macro-climate and availability of resources in each zone.

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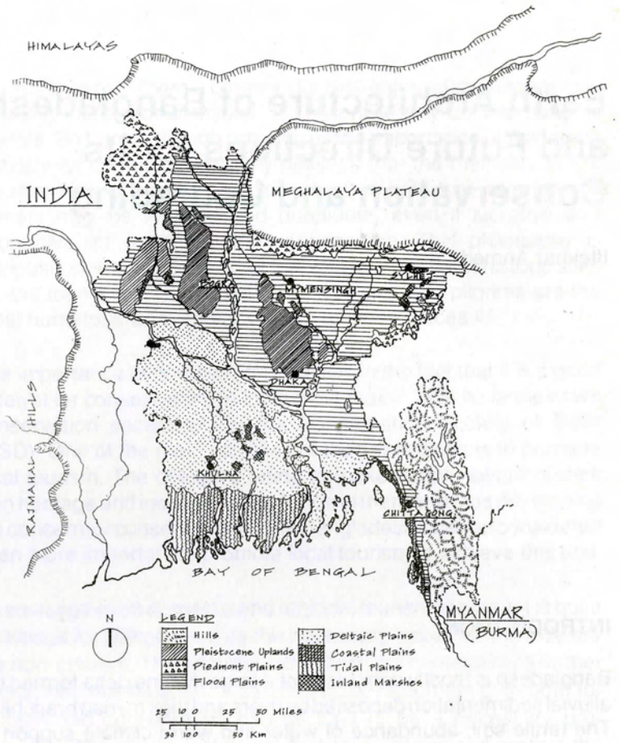


Fig. 1 Map of Bangladesh showing physiography

Figure-1

Physiographic Zones and Earth Architecture

A. Recent plains

This area comprises a major part of Bangladesh. It is mostly coastal and has been formed by successive sedimentation of alluvial deposits. Locally available bamboo is used extensively and in a variety of ways for building in this region However earth is also often used in combination with bamboo and this combination has created a local vernacular idiom. Soil in these riverine plains is generally clayey[1] and due to its properties of shrinkage during drying, it is difficult to build monolithic walls with clayey soil as the walls develop serious cracking.[2] For this reason earth is used with a reinforcing frame work , made of bamboo and reeds which is a form of wattle-and-daub.

There are two main variations of this technique. The most prevalent method is that of mats made of interwoven split bamboo plastered with earth. Such bamboo mats (Chatai or bera) are quite common

1. Sowers George B. and George, F. Introductory soil mechanics and foundations The Macmilan Company New York 1970, pp. 45-48, where the soil composition in flood-plains have been described.

2. Bergland, Magnus. Stone, Log and Earth Houses The taunton Press, Inc, Connecticut 1986, p 103. The author has discussed the properties of sandy, silty ad clayey soils.

in Bangladesh and are made in a variety of weaving styles. Cowdung is used as a binder, which is considered suitable for clayey soil. plastering is usually done on one side but sometimes both sides are plastered, especially near the base[3] which is prone to deterioration by water. Quite often the top of the matted walls are left unplastered to allow ventilation and it is common to find buildings which are part earthen and part bamboo-screened. Bamboo buildings in coastal areas are subject to strong wind and stormy weather. Even the high tensile strength of the bamboo frame cannot always with stand these environmental stresses. Possibly for this reason plastering is done to provide sturdiness to the structure. In this form of construction buildings are built on a raised plinth of compacted earth resulting in a bare, hard earthen floor inside. In fact, this plinth is characteristic of most areas of Bangladesh and is a typical feature in the Recent Plains as well as in the Pleistocene Uplands.

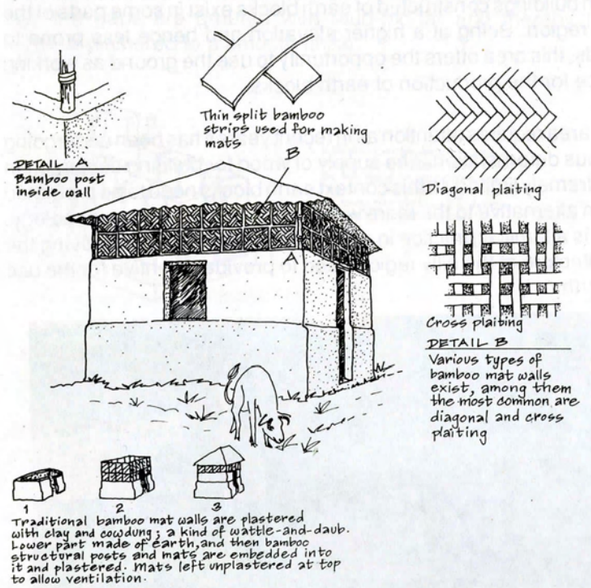
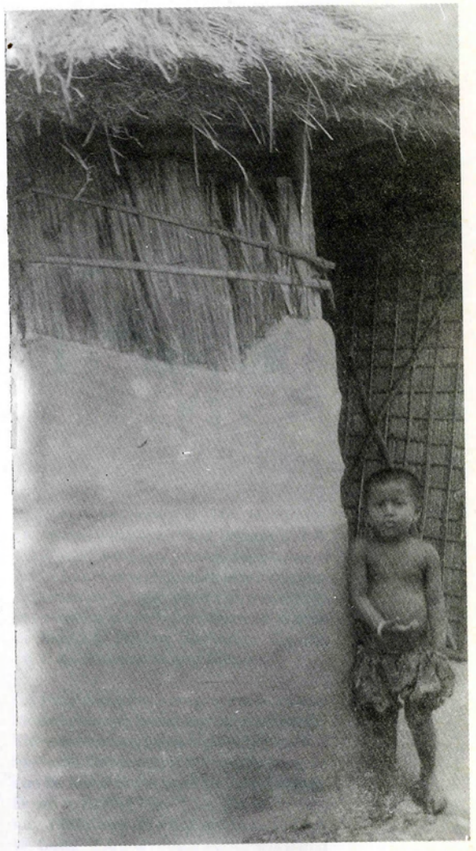


Fig. 2 Wattle-and-daub with bamboo mat walls
Fig. 3 Wattle-and-daub wall

The other type of wattle-and-daub technique is the well developed system known as Ekra a kind of half- timbered construction. This technique is prevalent in the marshy areas of Sylhet. A timber frame is built and the gaps between the framework are filled in with interwoven bamboo laths. Each bamboo is split in half and the split members arealigned horizontally or vertically. Then mud plaster is



3. Hasan, Dewan M. A. Study of Traditional House Forms in Rural Bangladesh M. Arch. thesis, BUET, Dhaka 1985, pp 60-62.

applied on the surfaces. To resist the annual heavy rainfall in this area, the wattle-and-daub system here consists of a heavy and substantial bamboo wattle or framework. During heavy rains the entire wall cannot be washed away and after the rainy period subsides, the walls can be re-plastered and easily repaired.

B. Tertiary hills

In Bangladesh hilly terrain is largely limited to the south-eastern low hills comprising the Tertiary Hills zone. There is a prevalence of various tribal cultures in these areas. Because of the uneven terrain, buildings are raised on stilts in order to place them on the steep slopes of the hills. The typical raised earth plinth is not very common in this area. Raised platforms of mud-plastered wood or bamboo planks serve as floors. Earth is not used extensively: rather a variety of vegetable-matter, or organic materials, such as reeds, thatch, bamboo and wood are utilized as building materials. Examples of earth buildings constructed of earth blocks exist in some parts of the hilly region. Being at a higher elevation and hence less prone to floods, this area offers the opportunity to use the ground as working space for the production of earth blocks.

This area requires attention as in recent years it has been undergoing serious deforestation. The supply of wood for building construction is extremely limited. In this context earth blocks need to be promoted as an alternative to the more widespread use of timber technology. This is a familiar practice in many areas; attempts at improving the architecture of the hilly region need to provide incentive for the use of earth.

Fig. 4 Houses on stilts in the hilly region

C. Pleistocene uplands

This region in the north was formed earlier than the other deltaic land and is relatively dry and at a higher elevation than the coastal

areas. The somewhat dry environment has supported the widespread prevalence of earth buildings. In fact, the majority of earth buildings of Bangladesh are located in this region which has a long tradition of earth architecture. Even examples of two-storied, large earth buildings exist in some places. Early descriptions of travellers confirm the existence of this continued tradition. Captain Thomas Williamson in1810 has specifically described earth construction as "mud laid in strata of 18-20 inches in depth, each stratum being allowed to dry before the next was added"[4]. Examples of the wattle-and-daub technique can also be seen, but it is less common than building with large earth blocks or the layering technique.

When building with blocks earth is shaped into blocks of about 1 cu. ft. (0.025 cu. m) and then lifted into place to be laid in successive layers. As each layer dries the next one is built. Vertical gaps are kept between the earth blocks which gradually become larger as the earth dries and shrinks. After the walls have been completed and dried, the gaps are grouted with mud-mortar and thereby the surface is plastered to a smooth finish.

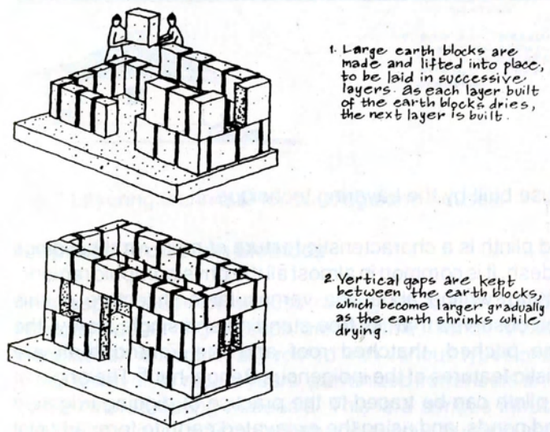


Fig.5 Construction with Large earth blocks

The majority of earth buildings in Bangladesh are built in the layering technique, which is similar to the "pise" technique. [5] In most cases a mound of earth is shaped and compacted to form a plinth, on top of which the walls are built in successive strata of 1-1.5 ft (30-40 cm.). No finish is applied on the surface of the plinth, except for a layer of mud slurry to achieve smoothness. Otherwise the plinth is left bare and serves as the floor inside. Also in some cases shallow foundation trenches are dug and walls are built from within the trenches. Even in this type of construction the floor is of bare, compacted earth on a raised plinth.

4. King, Anthony D, The Bungalow. Routledge and Kegan Paul, Boston. U.S.A. 1984, p 20. King has provided accounts of the indigenous architecture of pre-colonial and colonial Bengal, based on the reports of travellers in the region, such as, Comte du Modave, Francis Buchanan. Captain Thomas Williamson and Nilsson.

5. "Pise" is another name for the technique more commonly known as "rammed earth". There are various types of pise construction methods. Descriptions of these techniques can be found in the book by Jean Dethier, Down to Earth (New York: Facts on File, Inc, 1983) and also the article by Jeffery W. Cody, "Earthen Walls from France and England for North American Farmers, 1806-1870", 6th International Conference on the Conservation of Earthen Architecture (New Mexico: Getty Institute for Conservation, 1990), pp. 35-43. Pise is somewhat different from the layering technique in the fact that no forms are used in the latter. They are similar because in both techniques the walls are built in longitudinal strata, each stratum drying before the next is added.

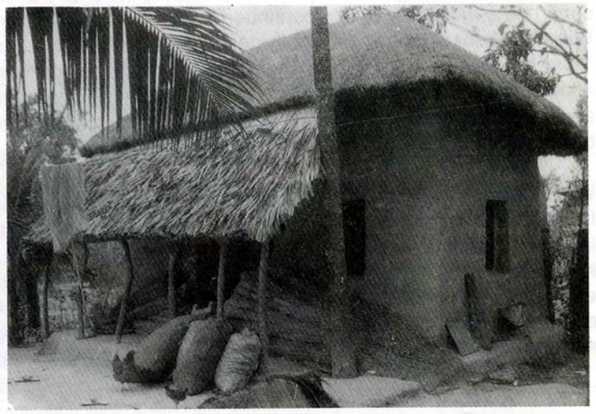


Fig. 6 House built by the Layering technique

The raised plinth is a characteristic feature of most rural buildings in Bangladesh. It is common in almost all the physiographic regions. Anthony King, writing about the vernacular architecture of this region, has observed that "its free-standing and single storey, the plinth., the pitched, thatched roof and the verandah-all are characteristic features of the indigenous Bengal hut"[6] The origin of the earth plinth can be traced to the practice of digging irrigation canals and ponds, and using the excavated earth to form artificial mounds.[7] In most area this is done to protect the buildings from floods, but its widespread prevalence also in relatively dry area may be an indication that its use is not only a functional one, but is rooted in stylistic adaptation due to cultural precedence.

At the time that the earth walls are erected in layers, openings for doors and window are retained. The soil is taken from the site, or if suitable soil is not available, it is brought to the site and a cohesive mixture is prepared, using straw or rice-husk additives to provide strength during drying and shrinkage. The surface of the earth walls are plastered with a layer of mud slurry mixed with cowdung to achieve a smooth finnish. This plaster is regularly maintained and requires frequent attendance in the rainy season.

6. King, ibid p. 28.

7. Hasan, ibid pp. 32-35.

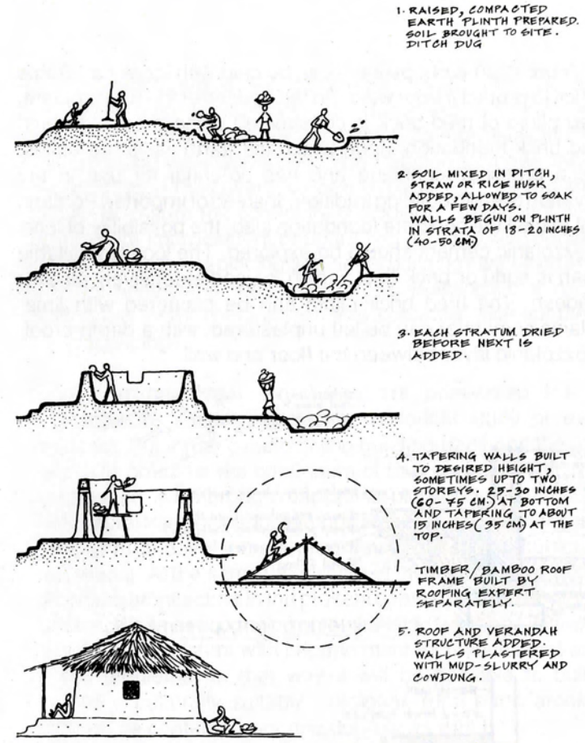


Fig 7 Layering technique for building earth houses.

Proposed Protection Methods

This paper does not discuss roofing as this is a wide area of research deserving a separate treatise. Rural architecture in Bangladesh is traditionally roofed with various types of thatch and tiles. However, in recent years, galvanized iron sheets are replacing these natural roofing materials. This is a serious intrusion in the cultural continuity of Bangladeshi indigenous building tradition, and attempts at incorporating this material or developing alternatives have to be made at this stage.

Broad roof eaves generally protect the earth walls from rain and the minimal damage caused is amended from time to time. The earth plinth requires more maintenance than the walls, as it is exposed to accumulated rainwater on the ground during the rainy season. While the walls generally perform well, they are susceptible to deterioration at the base. Walls of most earth buildings are built directly from the ground or from the raised, earth plinth. Due to the capillary action of dampness rising from the ground into the walls, the structure can be greatly weakened. The floor also admits rising moisture from the ground and can became quite wet.

Where there is an earth plinth, it can be clad with locally available fired brick to protect it from water. In the houses of the rural affluent, a raised plinth of fired brick is constructed using a concrete and stepped brick foundation, upon which the earth walls are builds. This is a practical technique and has potential for use in the preservation of earth building tradition. Instead of imported Portland cement to cast the concrete foundation slab, the possibility of local lime-pozzolanic cement should be explored. The locally available pozzolan is surki or brick dust, which is used extensively all over Bangladesh. The fired brick plinth can be plastered with lime-Pozzolanic cement or can be left unplastered, with a damp-proof, lime-pozzolanic layer between the floor and wall.

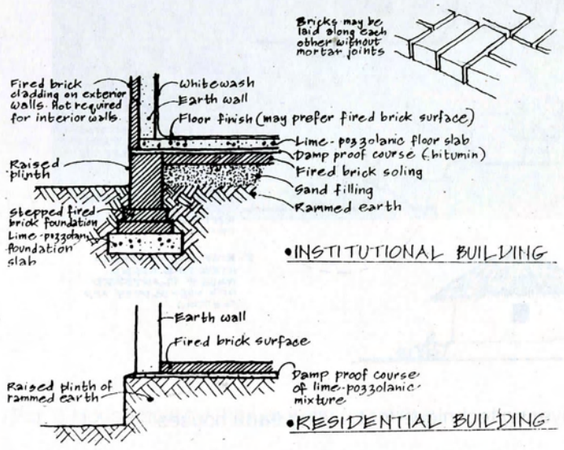


Fig.8 Some proposed methods of damp-proofing floors of earth building.

The problem of avoiding a moist floor in the raised earth plinth is a serious one. Instead of a cement floor, which can be quite expensive for most rural inhabitants, the alternative would be to cover the floor on the raised plinth with fired brick bonded together in place without any mortar. A layer of lime-pozzolanic cement laid under the brick surface would protect the floor from rising dampness. Even in cases where fired brick is unaffordable, the lime-pozzolanic cement layer would mitigate the capillary action to a large extent.

CONCLUSION

The issue of maintenance has become more important in recent years. Due to the advent of factory-produced and imported building materials, earth is losing popularity rapidly. International commerce and national poverty have greatly weakened the economic status of the rural Bangladesh. The traditionally rooted construction and maintenance practices have been disrupted and replaced by industrial products; in many places it has led to neglect and apathy.

Is tradition destined to perish this way? Even if it can be deemed acceptable that tradition should not stand in the way of development, total insensitivity to tradition cannot be the alternative. New forms and materials derived from tradition can have relevance; their success in the cultural context depends on the way they are devised to ensure the continuity of tradition. Traditional buildings often require improvement or upgrading to cope with demands of the age. However, replacing traditional buildings with modern ones does not necessarily lead to progress. Buildings that disrupt or totally break away from tradition may culturally alienate the users of such buildings.

Historic monumental structures are preserved for visual contemplation, spatial experience, historical study or even for recreation, But in the case of living building traditions the issue at stake is to preserve the continuum of their development. What is now required is a thorough reappraisal of the intrinsic values of the great cultural traditions of indigenous architecture on various national levels: in rural development programs, educational curricula and mass media. At the same time, some of the technical drawbacks of indigenous architecture in the present context deserve professional attention. While a recognition of the building traditions is necessary it should be consistent with improvement techniques that address present problems. In that way it will be possible to build and preserve a culturally suitable., regional, rural earth architecture which will be contemporary and durable as well.

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Neighbourhood Satisfaction: Comparative Analysis of Various Approaches

Dr. Mahbubur Rahman

Abstract

An environment is planned and desiged by the planners and the architects while people extract satisfaction from living in such environment and using the built forms. As such, the purpose of planning and designing would be to satisfy the users. Satisfaction is the resultant effects of several aspects. Therefore, identification of those aspects is a critical and important stage in a design exercise. Over the years, different approaches have been taken for the purpose which evolved in three major models of determining satisfaction. This paper compares the models and looks into the merits and demerits of the normative approach against that of the popular approach. This forms the basis of a model for measuring housing satisfaction developed by the author at the University of Not ting ham in 1987-88. The terms house, home, dwelling unit, residence, neighborhood and community have been used interchangeably in this article.

INTRODUCTION

Housing is one of the three basic human needs. Moreover, a home is a multi-purpose envelope of many activities, as well as a key factor in economy. It accounts for a large share of wealth and consumption expenditure. In a survey, housing was found at rank four among twelve domains of life satisfaction.[1] It means that It looms large not only in people's budget, but also in their opinion.

Satisfaction with one's own house, or the greater neighbourhood is one of the determinant of the quality of the house form and the settlement pattern. To determine satisfaction objectively, researchers and designers/planners traditionally have taken several approaches. In all these approaches, it has been tried to ascertain or quantify peoples attitude towards certain objective and subjective aspects related directly or indirectly with the neighbourhood. People are, however, subject to many constraints imposed by their environment and constraints which in one way or other they impose upon themselves.

Views differ in the way people interpret the extraction of satisfaction. But all those agree on one point that a single aspect cannot fully determine satisfaction with a house, neighborhood or greater environment, it must always be an accumulation of interactions with several aspects.

Dr. Mahbubur Rahman, B. Arch., Ph. D., Associate Professor.

01 Classical Models

Research on neighbourhood satisfaction has tended to follow either one of two classic models of determining satisfaction. *Belief-Affect* model proposes that people evaluate their neighbourhood by retrieving their subjective evaluations of a number of its aspects. Afterwards, an overall estimation of satisfaction can be made by summing up the evaluation. In this method, a determination of predictors of satisfaction would require to gather evaluations of a wide variety of neighbourhood aspects. Otherwise, the probability that particular aspects that are shown to be important to overall satisfaction would be included will depend on the researcher's selection criteria, rather than the respondents, belief.

The second classic model is named *Community Approach* since this method regards one's identification with the neighbourhood as an expression of his satisfaction. According to this model, people will be economically and emotionally linked to a neighbourhood only to the extent they like it. Growing reliance on the community facilities and services can also increase commitment to a community. So the degree of involvement or link with the community would be correlated with satisfaction with that community.

Both the classical models rely on human judgements which involve analysis of information available to the assessors at that particular instant. Some critics argue that specific salient or representative bits of information may influence the process of evaluating a complex object. There are some who doubted the existence of the link between beliefs about an object and its evaluation.[2] They proposed that evaluations of objects are processed more quickly than factual belief about objects and that they are processed in separate portion of the cognitive system. Therefore, evaluations should look beyond the recognisable aspects of an object.

02. The Third Model

According to the third model, the *Availability Approach*, only the factors that define an object may not be used to determine its evaluation. Satisfaction is based on a combination of evaluations of the neighbourhood's actual qualities and more generalised beliefs about the neighborhood. Such beliefs may be popularly shared but not objectively verifiable. This however may influence the interpretation of objective information that is available on the neighbourhood; for example, expectation or possibility of whether: the neighborhood will improve in near future.

Criteria by which the elements of a satisfaction judgement are chosen is different in belief-affect approach than that in the availability model. In the former one, to maximise accuracy, a person has to sample and test a broad range of qualities of the object. The latter model suggests that the elements of satisfaction judgement will only be chosen for their availability in memory. In this case, ability

1. Campbell,A.; P.E., Converse & William L. Rodgers , Quality of American life-Perceptions, Evaluations and Satisfactions, Russell Sage Foundation, NY, 1976.
2. Zajonc, R.B: Feeling and Thinking: Preferences need no Inferences; American Psychologist, Vol. 35, 1980, pp 151-175.

to provide an accurate glossary of the full range of neighbourhood qualities is unnecessary. It means that the perceivers will be drawn to rate the specific qualities and as well as more abstract or generalised beliefs. In a sense, the availability model specifies the belief-affect model by caring more about the selection of satisfaction predictors.

The process applied in commitment model is slightly different from those in the other models. According to this model assessment is done indirectly by measuring the degree of one's involvement in a community. It stresses the role of objective processes (having actual ties) in the determination of subjective evaluation. Thus commitment variables are normally offered to explain people's liking of their neighbourhood.

03. Which Approach?

The three different approaches discussed above were operationalised in a survey-study where all three were found to have several positive aspeccts.[3] However, the findings suggest that these may not be equally useful in predicating satisfaction. In the above study it was found that the belief-affect approach was able to account for variances in residential satisfaction. However, it is difficult to specify the neighbourhood qualities that are more important in creating satisfaction.

Commitment model tries to examine satisfaction indirectly by taking a secondary approach. So deductions from such data may not be always correct. Most of the commitment approach variables were not significantly related to overall neighborhood satisfaction in the above study. It means that the use of certain facilities cannot be translated directly into its liking. For example, considerable involvement and investment commitment in a community may be related to the desire to stay in a place. Thus it ignores the role of choice. Constraint, besides commitment, may force somebody to live in a house which even he might not have liked . Also, people may grow a sense of belonging for the place they used and lived in for a long period even if they initially did not prefer to live there.

Tests have revealed substantial overlap between belief-affect and availability approaches. Never the less, the availability approach cannot fully replace the belief-affect approach in determining housing satisfaction. Availability approach predicts that the most salient general and as well as specific beliefs can be used in predicting satisfaction. Belief-Effect model proposes that people weight their actual experiences against their expectations in evaluating each aspect of a community. The availability approach makes no assumptions about beliefs arising from actually verifiable experience.

3. Miller, F.D., Tseemberis, S., Tseemberis, G.P., Malia, G.P. & Grega, D. Neighbourhood Satisfaction among Urban Dwellers, Journal of Social Issues, Vol. XXXVI, No. 3,1980, pp 101-117.

Inddeed, beliefs specified under availability approach are often not verifiable. For example, cynicism, future expectation, efficacy fear of crime etc.

So far, in this discussion, it is seen that belief plays a vital role in forming the attitude towards something. As the nature of attitude determines the level of satisfaction, so finding people's beliefs on every aspects, and hence seeking opinion on all the components of a form, is necessary to measure their satisfaction situation. Experiencing the aspect (descriptor) to be rated is not a must in this case, what really matters is the respondents attitude towards that. If the attitude is negative, irrespective of actually experiencing it, or availability of data in favour of it, he is less likely to agree to face it. The belief-affect model ensures that the specific aspects have also been included in the array of descriptors since it tries to accumulate all possible aspects.

The availability approach suggests that overall belief, such as optimism, may influence the utilisation of the specific aspects of a neighbourhood and their interpretation. Satisfaction may be influenced by the efforts to change both more general and more specific available beliefs. Efficacy and optimism need a tangible basis in real improvement. One disadvantage of this model is that no empirical rule exists for a priori selection of predictors of satisfaction. Also, non reliability of self-reporting makes the existence of influential factors questionable. This model, however, reduces the labour of testing by selecting only specific items. It is also effective for testing the psychological process involved in satisfaction evaluation.[4]

04. Normative Approach

If a designer knew the most significantly contributing factors of the quality of a house, it would be of great relevance to him. Most of such inquisitions have an implicit goal in common: to maximise the goodness of fit between the inhabitants needs and his dwellings, i.e. the individual's wellbeing so far as it is dependent on his physical, habitat.[5] Normative approaches generally assume that the designers can distinguish good from bad in neighbourhoods and can isolate features that are related to overall quality.

However, there are criticisms which raised the basic question of considering a planner's (or designers as such) judgement solely to be congruous with that of his client.[6] As an alternative , he suggested the development of a model for determining residential satisfaction by analysing the relationship between planners and citizens' values. His proposal was for two types of predictors of

4. ibid
5. Burisch, M; Evaluation of Housing Quality; Journal of Consumer Policy, 3.1, 1979, p 69.
6. Lansing, J.B. & R.W. Marans: Journal of the American Institute of Planners, Vol.. 35, 1966.

neighbourhood quality: planners assessment of special features of the environment and the residents own statements about other features.

There are authors who have cast their doubt on the success of traditional framework of evaluation on criteria set by designers.[7] The greatest portion of man-made environment is controlled not by trained designers, but by human wants, conditioned and fulfilled by those outside the discipline. So according to them, design criteria should also be set or approved by the majority of users.

Expert judgement approach can be criticised on four grounds. First: none was directed towards an exploration of the total domain of residential quality. Thus, these yield a less comprehensive list of potential elements which exposes its inadequacies. Moreover, it does not cater for increasingly talked about issues like symbolic value of them, or how these values are transmitted through the socio-economic scenes etc. Second: the experts tend to differ from each other and there is no basis for determining the superior categorisation. Thirdly: experts and lay-public also do not agree since they do not share the same concepts of environmental quality. Lastly: *personal preferences are unstable which make a decision fixed by experts unrealistic and unwise.*

Though such studies at times could prove useful in gaining insight into peoples needs, yet if the attitudes among the respondents differ too much, it is more likely to yield only an average and genaralised result. Burisch reiterated clearly that normative evaluation is not feasible as peoples perception do not neatly fit into such system.[8] Yet, it sometimes may prove to be a very economical method of evaluating housing quality. However, he agreed that the ultimate selection of descriptors should be based on the investigator's judgement.

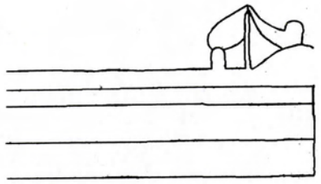
Expert oriented approach ignores the importance of choice. Mass housing, which communicates a paternalistic attitude is an example of the worst case. Though the past trend of normative evaluation has been criticised heavily, it has also been agreed that we cannot totally avoid experts' judgement. Burisi further advised not to rely heavily on peoples opinion as it might block innovation in design though well-informed, self-aware people have to decide for themselves what is best for them in the end.[9] Others have also pressed the necessity to go directly to the individual for its own description of quality.[10]

7. Studer, R.G. & Stea D.: Architectural Programming, Environmental Design and Human Behaviour, Journal of Social Issues, Vol. XXII, No. 4, p 128. 1966.
8. Burisch, M. (nd): Expert and Lay Opinion in the Evaluation of Housing, mimeographed lecture note, Deptt. of Psychology, University of Hamburg.
9. Burisch, M: 1979. op. cit.
10. Campbell et al (1976): op. cit.

Conclusion

The above discussions were intended to compare the different approaches used in determining satisfaction with a neighbourhood. After considering the pros and cons of the approaches, it is found that the belief-affect approach is clearer in conception and would also be the easiest to operate and interpret. However, inclusion of some descriptors that are used by the models will be worthwhile (in the sense that it will safeguard against the omission of important descriptors). Such an operation will maximise accuracy and reliability which are the major criteria of a credible study.

Such a study should look towards peoples descriptions or their idea of sources of satisfaction with the house form or neighbourhood or community etc. In this regard, a preliminary survey to determine the particular aspects that would have to be judged should be carried out among a small group of public from all walks of life. Then all those aspects cited by most of the respondents may be included in the final exercise.



HOUSING AND SETTLEMENT

Housing Cooperatives for Affordable Apartment

Dr. Mahbubur Rahman
S. M. Najmul Imam

Abstract

Housing problem in the urban areas of Bangladesh is acute. It stems primarily due to high housing cost and low afford ability. Therefore, the solution lies in narrowing the gap between the cost and affordability. However, there are certain parameters within which the economy works, and hence, there is no single answer to the problem. To make the efforts of closing the gap more effectively, other innovative means capable of supplying affordable houses to the target groups are required. This article evolves around the general premise that Cooperative Housing is an effective vehicle to provide affordable housing. Cooperative housing societies in Bangladesh have failed to play their desired role; they have mostly turned-out to be profit-motivated real-estate companies. Side by side, commercial apartments are also being developed, products of which can only be afforded by the affluents. Nevertheless, it is possible to make the apartments affordable to a greater population by adopting the cooperative system. This paper advocates the system and presents some case studies to enhance the postulations. It is based on the filed work of the first author's Ph. D. thesis and a research undertaken by the authors entitled *Feasibility of Multi-storied Apartments as a Solution to the Present Urban Housing Crisis in Bangladesh*, sponsored by the CASR, BUET.

Introduction

A housing cooperative is a society established to supply house required by its members only. At the end, it may corporately own a housing estate bought out of accumulated savings. The major function of the society is either to mop up household's savings in consumers' cooperatives to be utilized for further housing related activities; or in producers cooperatives, to produce and sell houses or to provide easy term housing credits. Housing cooperative can thus be instrumental in providing affordable housing; its fund could be used in more beneficial way than by the limited finances from the conventional sources. This is a distinct alternative, and is one of the forms of cooperation closest to the objectives of the cooperative pioneers: *the building of a number of houses in which those members desiring to assist each other in improving their domestic and social condition may reside.*[1]

Cooperatives can contribute towards housing the midle-income urban group by initiating housing solutions tailored to individual needs and using private sector resources. At the same time, these encourage a sense of community responsibility for finance, public services and the components of housing that the families cannot provide for themselves.[2] In this sense, these can be grown in parallel to the provisions of housing resources like land, finance, services, materials etc. by the government, and thereby increase the laters responsibility to provide incentives to them.

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Home-ownership programmes through cooperatives have been successful all over the world, particularly in the second half of this century. Ownership of dwellings provides an efficient method of improving the housing stock. Without ownership, there is no incentive for individuals to contribute either their money or labour to improve the value of their properties. Owners are in the best position and have the greatest incentives for individuals to enhance the standard of living and the equity through self-labour. Such *sweat equity* is often the only means available to the poor to have their shelter.

Bangladesh has a serious housing problem, more acute in its urban areas having a population of 22 million. Annual new housing requirement in the capital city alone is more than 50,000 units;[3] most of it is required for the middle-income group. Governmental provisions, though grossly inadequate, cater for either the low-income group or the high-income group. Middle-income group, who mostly have fixed income, relies on rental houses and only dream of owning a home. This article advocates cooperative apartments by sharing a land among a group of like-minded aspirants and building a multi-storied apartment thereon with some assistance from the lending institutions as one of the means of providing affordable housing.

Housing Cooperatives in Bangladesh

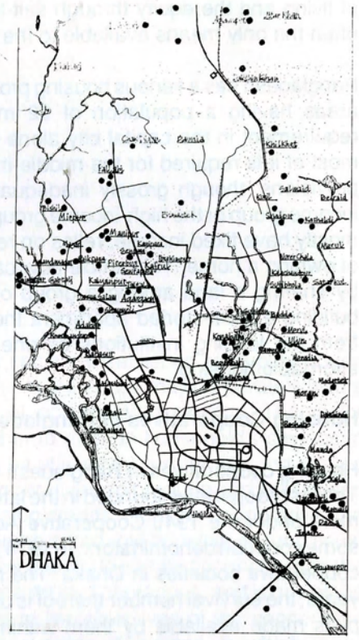
Housing cooperatives in Bangladesh have a very limited success. The first cooperative founded in the late 50s were followed by some more under the 1940 Cooperative Act, open to members having some common denominators. In 1974, there were very few housing cooperative societies in Dhaka. The number rised to 84 in next 7 years; the survival number thereof is unknown. The total number of plots made available by them within or close to the city do not exceed 10,000. This catered for only 1.0% of the total housing requirement since the Independence in the capital city.

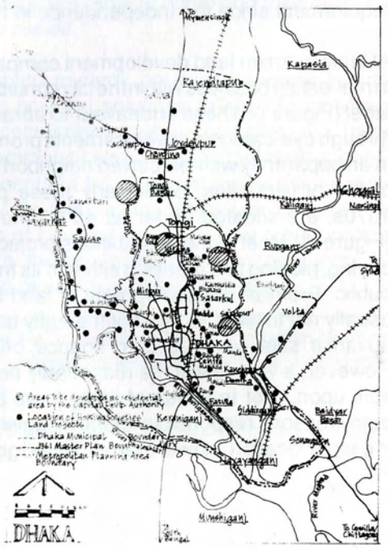
At least a dozen land development companies are presently active in real-estate business within the city conurbation under cooperative's label (Figure I). These endeavour to attract the prospective buyers through eye-catching advertisements promising a piece of tranquility in an apparently well-perceived neighborhood (Figure II). But many of the project sites, particularly those proposed since the mid-1970s, are situated as far as 40 kilometers from the city centre (Figure III) Most of these ambitious projects ended up in mere land buying, plotting and reselling either to its members, or to the general public. Promise of development of land or service provisions are usually not fulfilled. In most of the early cases, collections from the advance sale were used to finance original land procurement. However, a very few of the reasonably developed plots have been built upon, not to speak of living there by the members. Among many reasons responsible for the sluggishness are lack of finance, improper location, slower than expected growth in the area, absence

Notes & References

1. Hands, J. 1975 : *Housing Cooperatives* Society for Cooperative Dwellings, London; p 5
2. Grimes, Orgille F. Jr. (1976) *Housing for Low-Income Urban Families*; John Hopkins University Press, Washington DC,
3. Several estimated figures are available. For example, the number is 58,800 units/year according to World Bank(1981) : *Bangladesh Urban Sector Memorandum*, WB Report No. 3422, Washington DC 1981. while Shankland Cox & Partnership (1981): *Report on the Dhaka Metropolitan Area Integrated Urban Development Projects* . GOB-UDD, Dhaka, estimated it at 49,330; Rahman's(1991) estimation was 60,460 units a year. The latest estimation is made by UNDP-UNCHS 1993: *Draft Final Report of the Urban and Shelter Sector Review*; Dhaka. The number is 83,330 units/year including backlog clearence and replacements.

of utility services, lack of transportation links etc.[4] Activities of the housing societies were heavily criticised by the Enam Committee in 1985. They are accused of malpractices like account irregularity, cheating and swindling, land hoarding and speculation, pushing the land price artificially high, etc.[5] Cooperatives working as real-estate agents, a narrow interpretation of the producers' cooperative theme, are the major defaulters.



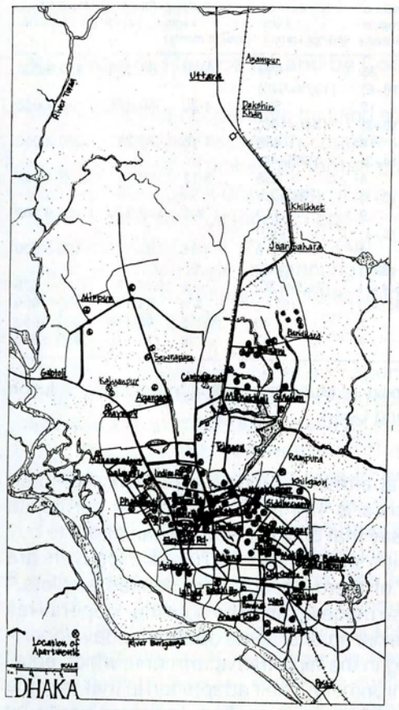


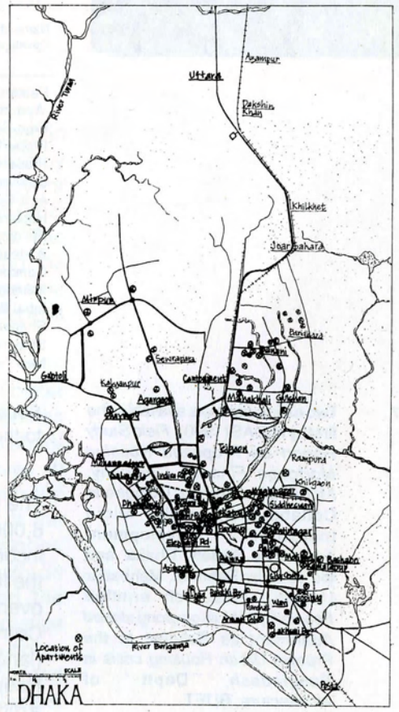
4. Detail discussions may be found in Navaratnam, A 1985 : *Review of Housing Finance in Bangladesh*: GoB-UNDP-UNCHS, Dhaka; Islam, *Emdadul (1987) Problems with New Settlements in Dhaka with Special Reference to Uttara Satelite Town*, Unpublished M.Phil dissertation, University of New Castle-upon-Tyne, UK; & also in Salimullah, M. (1987): *A Study of the Problems and Prospects of Uttara Model Town*, Dhaka, unpublished MURP thesis, Bangladesh University of Engineering and Technology (BUET), Dhaka. Also see three unpublished MURP theses done at the Department of URP, BUET. These are Quiyum, A. S. M.(1987): *Financing Urban Housing in Bangladesh*. Hai, Jalalul(1981) *Housing Societies of Dhaka City: their role and performance in solving the housing problem* and Seraj, T. M.(1983): *Taxation Policy on Urban Housing Property in Bangladesh*.

5. Ibid.

Apartment Developers

In recent years, apartment development, particularly in Dhaka, has become an increasingly popular and rewarding business. The projects are mainly concentrated in the intermediate and core areas of the city most of which are upper-income area (Figure IV). These began in the late 1960s and gained momentum in the 1980s. No accurate figure is available on the present number of developers and total number of units produced. But follow-ups of advertisements put in the leading newspapers of the country for selling flats over 1989-90 and 1992-93, complemented by city-wide spot surveys, showed that at least 40 such companies has proposed apartment projects of various sizes (75-300m^2 each flat, 2-4 flats on each floors in 4-35 storied buildings) which are under different stages of construction. According to some researchers[6] the number is at least 50, whereas Real Estate and Housing Association of Bangladesh (REHAB), a recently formed organisation of the apartment developers, has only 17 members.





6. For example Seraj. T. M. & Alam, M. S(1991): Housing Problem and Apartment Development in Dhaka City; in *Dhaka Past Present and Future* edt. by Sharif Uddin Ahmed; pp 471-489, Asiatic Society of Bangladesh, Dhaka.

The three largest companies, the Eastern Housing Apartments Ltd. (EHL), Property Development Ltd. (PDL) and Free School Street Property Ltd. (FSP) have built 60% of 3,200 units built so far (Table I). Over 150 units are now being produced annually.[7] EHL, with a total of 1,074 units, is the biggest developer. Flats in some of its early projects were lowly priced and completed as pledged. This helped in creating a strong goodwill base for the company (Plate I). PDL prefers medium-rise buildings (5-7 storied) beyond which project cost escalates rapidly. FSP has built 344 luxurious apartments mostly in the Siddheswari-Maghbazar belt (Plate II); the most popular of these are low-rise and set within a compound. Building Technologies and Ideas Ltd. has focussed on luxury condominiums in posh areas. City Development Company, Sheltech Apartments, Concord Condominiums, New Age Apartments, Iqbal Brothers and Hamid Constructions are other noted apartment developers who have been active in recent years (Figure V & Table I).

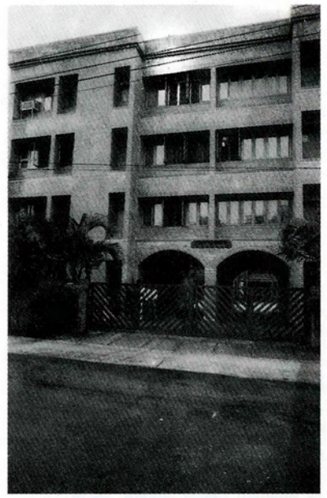
Table I Ten Most Active Apartment Developers in Dhaka

Name of the Developer	Year of Inception	Number of Projects (compl.+prop.)	Numbers of Flats (compl.+prop.)	Building Hight (nos. of storey)	Flat Size (sq.m)	Price Range (Tk thousand)
Eastern Housing Apartments Ltd	1976	26 (18+8)	1614 (1074+540)	6-18	66-280	450-3,000
Free-School Street Property Ltd	1978	12 (10+2)	534 (344+190)	4-20	80-285	280-2,650
Property Development LTD	1983	17 (14+3)	405 (365+40)	4-10	70-280	1,000-3,200
Aziz Cooperative Housing Society LTD	1975	4 (3+1)	258 (226 +32)	5-12	79-151	252-1,400
Building Technology & Ideas Ltd.	1983	9 (5+4)	143 (77+66)	6-9	112-279	1,150-3,500
Concord Condominiums	1989	9 (2+7)	110 (14+96)	4-16	186-418	3,500-6,500
Iqbal Brothers Ltd.	1982	5(4+1)	74(54+20)	6	381-457	1,313-1,575
Sheltech Apartment	1988	4(2+2)	(51+)	5-6	74-120	650-1,800
Shaymoli Housing	1976	2	40	5	80-116	500-1,050
New Age Appointment.	1988	2	37	16	176-210	1,850-2,800

Source : Field-Work, Feasibility of Multi-Storey Apartments as a Solution to the Present Urban Housing Crisis

The present price of the apartments range between Tk. 850,000-6,000,000. The lowest price is 100 times the nations per capita income; it is needless to say that only the affluent can afford to buy the flats. Two recent studies showed that 45-70% of the buyers are overseas earners; most of them already own houses or plots.[8] Complaints similar to those made against the housing cooperatives (land development) also exist against some apartment developers. People have started living in the high-rise apartments which entail a different than usual environment. Their adaptation to that, and the pressure on the utilities and the surrounding, is a case yet to be tested through the time.[9] Nevertheless, true cooperatives in apartment building could bring some relief to the housing crisis, particularly to those of the middle- and upper-middle-income groups. Production of apartments follows one of the two most dominant

7. Two estimations are available; the first by MIDAS (1990): *Field Study Report on Proposed Housing Mortgage Finance Company*, Africa Asien Bureau, Cologne in Collaboration with Micro Industries Development Assistance Society, Dhaka and the other by Rahman, Mahbabur (1993a): Research entitled *Feasibility of Multi on giong storied Apartment as Solution to the Present Urban Housing crisis in Bangladesh*, Deptt. of Architecture, BUET
8. ibid.
9. There are many studies and researches, for example Saadullah, M (1991): *Environmental Effects of High-Rise Buildings*: unpublished MURP thesis, BUET.



modes: 1. the development company buy land, construct a multi-storied apartment and sell the flats, 2. it forms a separate project-specific company with the land-owner as a partner to evade gain tax and transfer fees, and thus keeps the cost low. Buyers either buy the entire estate in the form of a cooperative's member (if the developer is a cooperative), or they buy an aportionedl and individually and assign the developer to build the apartment and afterwards form a cooperative to maintain it. Two other modes of apartment development can also be identified. In the first form, a group of people, normally 4-10-, buy a piece of land combinedly and construct a multi-storied building on that comprising of at least as many units as the number of members. Such ventures are attempted, mainly in Rajuk-developed high-income areas. The second form is the roof selling where the buyer is given the right to construct an upper floor (vertical extension) on an existing building. There is yet another form of development adding to the number of apartment owners. In this last form, rental flats in a multi-storied building (not commercial apartment) are sold by the owner to raise fund for some other purpose.

Provision of Finance for and by Cooperatives

The concept of cooperative building society is long established in some of the commonwealth countries. The society is formed by members, but not limited to, for the purpose of raising money for housing. Because it is a society, it is per definition also a non-profit making institution distributing operating surplus to members. The society's policy is to conduct sound business by protecting the money of its depositors by granting only safe loans. But at the same time, it attempts to keep an interest differential between its deposit and the lending rate.

Housing cooperatives have an important role to play in shelter programmes. The activities of housing developers in many countries are closely linked to housing finance institutions who provide short-term loans to the cooperatives. The housing cooperatives in Bangladesh have not been able to establish a rapport with the financial institutions, which, as some identified[10] is one of the reasons for most of the societies to operate as real-estate developer. Since domestic savings is very low and housing is costly in Bangladesh, meagre savings are incapable of meeting the expenditure for the construction of a house. Therefore, the societies cannot accumulate adequate fund out of subscribers' contributions. They need soft credits for acquiring, developing and servicing land and to forward loans to end users (members) to construct houses. However, there is no finance scheme specially tailored to the cooperatives' need.

Housing societies could borrow from Bangladesh House Building Finance Corporation (BHBFC) under the group loan scheme. A Developer who wishes to sell the flats constructed with the loan

10. For example, Navaratnam (1985), op. cit.

could apply for remission to the HBFC to transfer the liabilities to the buyers of the flats. However, group loan was available to only a 4-8 member group while the cooperative act requires a minimum of 10 members to form a society.[11] There have been only a dozen cases of HBFC loans made to the housing societies. Also, there are complaints of misappropriation;[12] it turns out to be difficult to recover a bad debt from a group rather than from individuals. These difficulties forced the HBFC to discontinue group loans; they reintroduced the scheme along with apartment loans only recently. In its present form, each owner of a flat can avail a loan of Tk 520,000- Tk 780,000 (60% of the cost of a 121 m^2 flat). The building should be at least 4-storied in height with 8 flats in it. The loan is repayable in 18 years at an annual interest rate of 13%.

Contributions by the middle-income cooperative members are not sufficient to meet the total housing expenditure. However, it is expected to form down-payments in securing further housing loans.[13] Housing cooperatives in Bangladesh failed to reach the middle-income families because of high rate of subscription. Therefore, these could not make any notable contribution to the overall housing stock except producing some expensive housing. Up to mid-1987, 16,829 members held Tk 5.2 million as share capital in 84 housing societies in Dhaka division. They took up loans from the financial institutions to the tune of double their deposit; however, only 5% loan recovery figure makes them less than welcome to the lending agencies.[14]

Government and the Cooperatives

Housing cooperatives in Bangladesh could be regulated by a variety of means to make them play an effective role in providing houses to the urban middle-income group. The intervention by a housing finance institution by providing short-term loans to the cooperatives and long-term loans to the buyers could prevent the exploitation of the latter by the former. Additional intervention could be made by Town Planning Regulations controlling designs and standards.[15] This would divert the private housing developers from their present activities and make them serve the need of the larger section of the community.

A policy of housing the middle-income groups through cooperative apartments was introduced in the First Five Year Plan (1973-78). It also proposed to encourage and organise government employees to form housing cooperatives. This was followed by the formation of a committee to formulate strategies; recommendations of the committee were never implemented. In subsequent long-term national plans, the government criticised the undesirable spreading of housing cooperatives in the private sector and felt the necessity to guide and regulate them. Inspite of the concern, the government itself is still persuing the highly subsidized staff housing schemes.[16] It has a policy of providing various concessions to the housing

11. For detail, Enam, K. (1984) *The Sharing Problem of Multi-Ownership Flats*; unpublished M. Arch thesis, Deptt. of Architecture, BUET can be seen.
12. See MIDAS (1990),op. cit.
13. Lewin A. C. (1981) : *Housing Cooperatives in Developing Countries*: John Wiley and Sons, Chichester.
14. For tail figures, *Statistical Yearbook of Bangladesh, 1989-90* Published by the Bangladesh Bureau of Statistics, Ministry of Planning, Dhaka, and other official statistics may be consulted.
15. For a discussion, see Grimes (1976), op. cit. Asso Rashid, K. (1993) : Tall Buildings in Urban Design; paper presented at the International Conference on "Tall Buildings: Tall Buildings in Developing Countries" held in Dhaka, June 16-17, 1993, Council on Tall Buildings and Urban Habitat, pp 15-24.
16. For example, see the Chapter on Housing and Physical Planning Sector in *The Second Five Year Plan 1980-85*, Ministry of Planning, GoB.

societies. It may undertake compulsory land acquisition on behalf of the society and arrange soft-term housing credits for the members. Exemption from various taxes is available to the borrowers of housing loans; transaction fees may also be waived. However, no society could avail the full incentives so far.

Despite the incentives, and the growth of housing cooperatives over the last two decades, only a few housing cooperatives for apartments have been formed (Case Study A & B). Reasons for the failure is attributed to inactiveness of the organisations, inefficiency in administration, defective organisation, inadequacy of financial resources, lack of proper governmental supervision, scarcity of land and building materials etc.[17] Managerial and operational problems, absence of initiation and the ignorance of government incentives made the situation worse.

Apartment Cooperative as a Solution

It has been observed that prospect of owning a home will inspire savings and make unspecified amounts available for down-payments.[18] Since the affordability of the middle-income group is low and limited, hence only a saving scheme tailored to their need and ability may generate adequate funds. The scheme, if given momentum well before the starting of the actual project, would yield a better result.[19] Initial participatory bar should be made flexible to allow more people to participate and benefit. Reduction in the standard is a major strategy to reduce the housing cost for the middle-income group. This will also increase the ability and willingness to contribute regularly in the housing cooperative fund.

Guided and regulated, the cooperatives could be made a useful vehicle to serve the middle-income group.[20] Cooperative Act, 1940 has provisions for societies to accept deposits, issue debentures with the approval of the government and to extend loans to their members to act as a proper housing cooperative finance society. But the provisions of the act and the advantages attached to those have never been availed. There is no intermediary institution to train and negotiate on behalf of the cooperatives. These need be developed which can also promote cooperatives.

Since constructing apartments with joint ownership on a shared land has already been started in Dhaka (Case Study C), this can be appreciated by providing incentives in the form of low-cost plots, materials on credit and soft-term loans. Less complicated property inheritance laws should also be enacted to facilitate such developments as the present acts hinder the growth of multi-ownership apartments and makes the transfer of ownership costly. There is also a lack of proper rules and regulations and exclusive apartment laws to promote this particular type of development. Also, there is a need for appropriate rules related to utilities and other service.[21]

17. For detail discussion see Quiyum (1978) & Hai (1981); of. cit. Also, Helaluzzaman, K. M. (1984): *A Co-operative Housing Development and Ownership Project for Lower-Middle-Income Government Employees in Dhaka, Bangladesh*, unpublished M.Sc. thesis, Asian Institute of Technology, Bankok.
18. There have been several studies which showed that up to 100 times the income may be available as initial investments in prospective home-ownership scheme. For example, see Helaluzzaman (1984) & Lewin (1981). Also Tym, Roger (1984): Finance and Afford ability in G. K. Payne edt. *Low-Income Housing in the Developing World*. pp 201-222, John Wiley and Sons, NY; and Rahman (1991): *Urban Lower-Middle-and Middle-Income Housing, Dhaka, Bangladesh investigation into afford ability and options*; unpublished Ph. D thesis, University of Nottingham, UK.
19. ibid; also Rahman (1992): Extension of Housing Affordability through Saving; paper presented at the 5th International *Housing Research Conference*; University of Quebec at Montreal, Montreal, July 6-10, 1992.
20. See Grimes (1976) & Navaratnam (1985), op. cit.
21. See Enam (1984), op. cit. Also Seraj, T (1993): Highrise Development in Dhaka: Prospects and Problems; Paper presented at the International conference on Tall Building: "Tall Buildings in Developing Countries" held in Dhaka, June 16-17, 1993. Council on Tall Buildings and Urban Habitat, pp 3-14.

It has been estimated that a 88 m^2 flat with moderate finish in a 6-storied apartment located in peri-urban areas can be made available at as low as Tk. 300,000 (including the land cost) which can contain a loan component of up to Tk 240,000 (85% of the construction cost). A smaller sized unit with finishes of lower standard would bring the cost affordable to upper 60% of urban population (paying a quarter of income as loan repayment; (Table II)[22]

Table II: Home-Ownership Schedule through Cooperative Apartnents

Location	Land Size (sq.meter)	Unit Size1 (sq.meter)	Aportioned Land Cost[2] (Taka)	Building Cost[3] (Tk/unit)	Project Cost (Land+Unit) (Tk/unit	Loan[4] Component (Tk/unit	Participation Cost (Tk.unit)	Affordable 10%(top%) of popltn)
Central	200	70	109,000	385,000	494,000	327,000	167,000	42.3
Area	335	120	182,000	660,00	842,000	560,000	282,000	17.9
Intermediate	200	70	55.000	330,000	385,000	280,000	105,000	70.4
Area	335	120	91,000	570,000	661,000	485,000	176,00	39.0
Peripheral	200	70	27,000	280,000	307,000	240,000	67,000	88.4
Area	335	120	46,000	480.000	526.000	410.000	116.000	64.5

Notes :
1) 11 units in a 6-storied building, the smaller units have 3.5 rooms while the larger units have 4.5 rooms, for sample plan,(Figure VI)
2) Per katha land costs in central, intermediate & peripheral areas are Tk 400,000, Tk 200,000 & Tk 100,000 respectively including the registration cost:;
3) In central location, building cost with standard finishing Tk 515/sft; in intermediate location, building cost with average finishing Tk 440/sft; in peripheral location, building cost with moderate finishing Tk 375/sft;
4) 85% of the construction cost as loan at an annual interest rate of 10% repayable in 20 years; (Rahman, 1991) ;
5) loan repayment to match a third of income, down-payment (participation cost) up to 20 month's income to be met from savings in a housing deposit scheme: (Rahman, 1991) .

Therefore, constructing apartments on cooperative basis is a feasible means to provide affordable houses to a majority of the urban population. Three case studies, each based on cooperative concept but one different from another in operational mode, are presented here to strengthen the contention.

Case Study A: Aziz Cooperative Housing Society

Aziz Cooperative Housing Society was formed in 1975 to meet the housing need particularly of those who have little savings and cannot make large instalments. At present, its office is in its last project building at Shahbag, Dhaka. The Society works on cooperative basis, and is run by a 10-member Executive Committee (*Panchayet*) formed through election. The EC office beaers receive honorariums from the Society. Usually, no detailed feasibility study is carried out to determine a project, new projects are undertaken with the decision of the committee. It selects a land and makes a partial payment towards the price. Consultants are appointed by the

22. See Rahman (1991), op. cit. pp 120-151; also Rahman(1992): op. cit. & Rahman, M(1993b): Housing Attainability: a concept in solving the urban housing crisis in Bangladesh; paper presented at the *Seminar on Planning for Better Living Environment in Asia*, University of HongKong, Hong Kong, August 26-28, 1993

Society to carry out design and preliminary cost estimation. Afterwards, it starts collecting members from the general public who wants to own units in that particular project; membership fee is Tk 1,000 only. People are joining the Society almost spontaneously, and hence, it usually does not resort to advertisement. The price of the land is met equally from the members; ownership is equally apportioned among them.

A separate committee is formed to run the project along with the EC. To initiate the construction work, each member generally deposits 25% of the estimated cost. The members are provided with a kind of pre-ownership document in which the position of his unit is clearly marked. The owner-member can use this document to get loans from financial institutions. In fact, most of the Society members have availed loans of up to 75% of the cost; the Society renders help in this regard. Rest of the cost has to be paid in instalments, amounts and frequency of which depends on the progress of construction. After the completion of the construction work, units are handed over to the owner-members along with the full ownership documents. A welfare association is formed by the occupant to undertake the responsibilities of the maintenance and security aspects. Thus, the EC remains no more responsible for that project.

Since the very concept of forming, executing and running of the Society and the project is not profit-motivated, therefore, the total cost of a unit remains very low. For example, the unit project cost in its last project is Tk 9,100/m^2, whereas, the market rate of apartments in Dhaka is Tk 13,500-16,000/m^2[23]. Size of the units in its early projects was only 79m^2 which has been gradually increased in subsequent projects up to 151 m^2 (Table III & Figure VI) Due to the increase in unit size and building height, the flats are increasingly becoming expensive and hence is being occupied by higher income families.

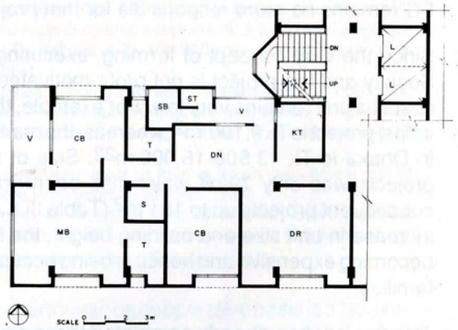
The Society has already completed three projects while one third work of the fourth project is still remaining (Plate IV & Plate V); it has a total of 258 units in its four projects (Table III). Certain extra facilities are provided in some of its projects. For example, there are provisions for parking 32 cars in Project No. 3 and 128 cars in Project No. 4. Also, there are provisions for lifts in both the projects which could not yet been installed due to the shortage of fund. However, no fire escape is provided in any of the projects.

Table III: Projects by Aziz Cooperative Housing Society Limited

Project (Location	Starting Year	Land Area (acre)	Number of Buil-dings	Number of Storey	Number of Flats/ floor	Total Nos. of Flats	Flat Size(m²)	Flat Cost (Taka)
1. Jafarabad	1975	0.4463	5	5	2	50	78.97	252,000
2. Purana Paltan	1980	0.1653	2	91	2	32	134.71	450,000
3. Bijoynagar	1980	0.1983	1	6	8	48	97.55	350,000
4. Shahbug	1983	1.2562	8	122	2	128	150.97	750,000

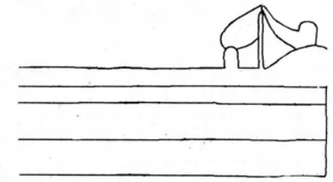
23. For more information see Seraj M. T. (1993): Findings from Formal Sector Developers Survey; Paper Presented at the *Second Seminar on Formulation of Land Development Control and Procedure for Dhaka City*, ADB-GoB, Dhaka, April 21-22, 1993, & Rahman (1993a), op. cit.

Notes :
1) Parking in the Ground Floor:
2) A Commercial -cum-residential project. Five hundred 15.61 m^2 size shops on bottom three floors costing between Tk 120,000-300,000. Parking on the 3rd floor, rest (4th-11th) are flats of which the last two are incomplete:
3) The cost increased over the years from Tk 1,050,000 in 1988 to Tk 1,400,000 in december, 1993.



Case Study B: Aminabad Housing Cooperative Society, Siddheswari

Aminabad Cooperative Housing Society was formed in 1968 to provide housing to the members of the *Ismiliya* sect living in Dhaka; it is one of five such cooperatives by them. It took two years to complete the project comprising of 56 flats of 148 m^2 each in seven 4-storied buildings (Figure VII & Plate VI). Cost of the units (including land cost) were only Tk 40,000 in 1970. Most of the owner-members of the society left the country during or after 1971 either by abandoning the flats or selling those at low price to the locals. Presently, only one fourth of the flats are being occupied by the original members. Since the emergence of the new country, the society or the community did not attempt any more of similar project. The society and the maintenance of the housing estate is still run by its members on cooperative basis.



EDUCATION AND ARCHITECTURE

Architectural Education : Ends and Means

Khaleda Rashid

INTRODUCTION

Architecture is an art, but not in the same sense as painting or sculpture. The purpose of painting and sculpture do not project beyond their intrinsic, aesthetic or emotional spirituality. Architecture has an additional dimension. It must serve the needs of its users. The failure or success of architecture may be measured by the degree of user satisfaction, both physical and emotional.

Architectural Education and National Objectives

If we accept that architecture is the exploration of the aesthetic, social and humanistic dimensions of technology, then it has to advance towards the goals of National Development whose main objective is the welfare of the society at large. Therefore, in the formal training of architects , technical and professional competence remain a latent and active objective, but a long-term perspective of issues such as self-reliance, economic and social independence also remains in demand. The increasing potential of the modern man to alter the environment devolves a greater responsibility on those concerned with the built environment. Architecture defined as exploiting of available resources to provide the environment to serve the need of Man, clearly implies an increasing involvement of the profession in national development. As architecture is an integral part of a larger discipline of environmental design, the professionals have to work with a clear understanding of human needs and resources. Rapid increase in supply of new building and finish materials, newer techniques and accelerating rate of change in the international scene, are continuously influencing our socio-cultural pattern. It is inevitable that the cultural domination of the

ABSTRACT

This paper looks at the course curriculum of the Department of Architecture, BUET and traces its course development from its start to the present day. Architecture is a subjective discipline. There is no absolute right or wrong in it and consequently there cannot be a 'perfect or ideal' curriculum valid across time and place. Various forces continually condition the concept and the teaching of architecture as a discipline. Perhaps the best an architecture school can do is maintain a balanced curricula that will be subject to continual review, monitoring, evaluation and revision to keep to the changing demands of time.

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economically developed nations over the less developed ones shall have positive as well as negative impacts in architecture as in all other spheres of life. Under such circumstances mere knowledge of the finite solutions is not enough. Architectural education must be broad based and must deal essentially with the fundamentals whereby one can effectively tackle present problems and those yet to come.

Architectural Education and Changing Concepts

Architecture being a subjective discipline incorporates within it both the intuitive and analytical processes. Design is an intuitive process, while it is analytical in the use of technology. There is of course some elements of creativity in technology too, but not in the same sense of the term as applied to artistic pursuits. For a subjective discipline, no single concept can define the spirit of the discipline in its totality. This truth is reflected in the varying emphasis on aesthetics, function, cost and other determinist of architecture in different schools of design. On a subjective level there is no absolute right or wrong. One is right or wrong only within the limits of ones own convictions. An idea is not necessarily better than the other, they are just different. In the words of Michael Graves, there is room for everyone.

The advent of Modern Movement in Architecture brought with it an unprecedented break between past and the present way of designing and building. The modernists rejected past architecture on the grounds that its use as model for the present could only result in uninspiring imitations. Thus it was believed that architectural expressions could only be deduced from the study of the available advancement in technologies. This was what came to be known as the 'International Style'. International Style emphasized the univer sality of design principles and over reliance on technology. There was little room for influence of culture, people and place—a proposition dissociated from reality. Thus modernists eventually gave way to 'post modernism' or 'historic eclecticism', which did not find wide acceptance. General discontentment with the prevalent stream of the thoughts stimulated a move for the appreciation of the tradition and culture. The mid seventies were marked by a commitment for cultural identity and national consciousness. The International Style has diminished in influence, and post modernism has disconcerted professional and critics alike, but regional architecture - one that is contemporary yet reflective of tradition, has found favour and substance. Thus architectural education yielding to changing concepts, differed from region to region, country to country and also from school to school.(Fig 1 and 2)

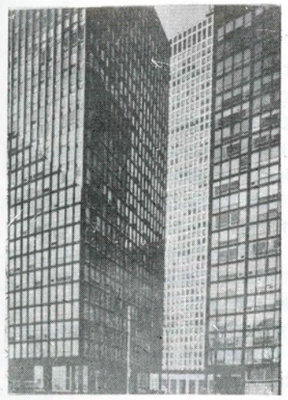

Fig: 1a International Style, Architect Mies Vander Rohe

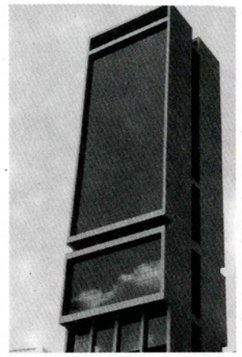

Fig: 1b Thesis Project by Azizur Rahim Final year B. Arch Programme.

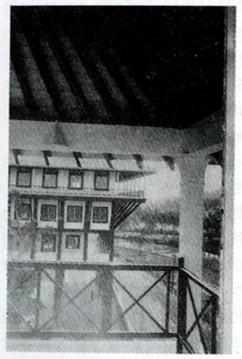

Fig: 2a Contemporary Building Representing Regionalism, Architect Gcoffery Bawa

Fig: 2b Class Project (Third Year) by Nasreen Hussain, B. Arch Programme

Fig 1 to 2 Changing Concepts in Architecture and the reflections in Student's project.

Architectural Education in Bangladesh

The Department of Architecture of the Bangladesh University of Engineering and Technology (BUET), Dhaka, was established in 1961 to fill a vacuum in the design field in the then East Pakistan. The curriculum was drawn in line with that of the Texas A & M University, USA.

Till 1990, this was the only school for training architects. Consequently, it shouldered a great responsibility. In its initial stage, the curriculum aimed at producing graduate architects who would be able to design buildings independently. Both the curricula and the teaching methodology were based on universally valid principles and practices of architecture.

The debate between architecture born of philosophical concepts and solutions based on technology alone is of fundamental importance. Too much emphasis on technology may produce architects who may be oriented towards solving only technical problems and satisfying functional needs. But a multi-disciplinary broad-based curricula may produce architects equipped with problem solving techniques rather than attempting finite solutions. As such, the courses in the Department have changed from time to time in response to the changing concepts and needs. Courses like planning, housing, health facility, urban design, climate and design, visual and sonic environment and analytical methods were incorporated in the eighties. These changes are in line with promoting objectives of the general welfare. With the introduction of the course system at the undergraduate level from 1990-91 academic session, a search was initiated for a vocabulary and style of architecture of Bangladesh emphasizing tradition and regionalism. As such the existing curriculum was thoroughly scrutinized and courses like Society and Architecture of Bengal, Architectural Conservation, Urban Anthropology were incorporated.

In a variety of perceptual understanding, values or intellect, concepts of aesthetics are at odds with one another. As is often said, design cannot be taught, but students can be exposed to theories of architecture, basic principles of design, its vocabularies and idioms to help students bring out their latent, inherent design talents. Basic courses are usually propagated as being applicable world wide. Gradually more specific historical knowledge on building and build environment, is given. Courses on social sciences attempt a socio-psychological understanding of the cultural phenomena, while technical sources deal with implication of technology on architectural designs. After thirty years of the inception of the school, greater social involvement of the architects is not only expected but desirable. The objectives of the architectural education should be based on an appropriately balanced curriculum, which will enable every graduate to develop individual aptitude, skill and interest for a role in society. Hence the question remains: Does architectural programme of the Department of Architecture, BUET, equip graduate architects with knowledge and skill to:

- advance national objectives, i.e. to contribute to the welfare of the society;
- design buildings that make appropriate and correct use of technology; and
- design that are traditional yet capable of satisfying present day needs.

Despite good intentions an 'ideal' mix of courses that will make an 'ideal' architect is perhaps difficult, if not impossible, to achieve. Department of Architecture, BUET is confronting similar dilemma.

Recommendations

The recommendations here do not attempt a definitive solution to all problems of architectural education. The recommendations are a logical outcome of the dynamism of the environment, where architects should be able to adjust and readjust to the possible changes.

No profession should ignore the national goal or disregard international trends. When the virtues of 'regional' and 'traditional' or 'contextual' architecture are being extolled everywhere, the school has to capture the spirit. The policy should be encouragement and emphasis on contextual or regional architecture. More exposure to the potentials and shortcomings of local, traditional building materials and building techniques; and exploitation of relevant resources should be sought. A questionnaire survey in 1990 reveals that both the professionals and the final year architecture students of BUET feel that exposure to traditional building materials and techniques in architectural courses in the Department, is lacking.(Fig 3)

Fig 3 House built of especial type of reeds, eventually to be plastered with mud or cement, extensively used in Sylhet region, Popularly known as Ekra wall, is hardly known to students even professionals.

To promote growth responsive to the built environment that accommodates change and diverse human activities, users participation in the design process should be incorporated.

Even in class projects students should be encouraged to incorporate user perceptions and inputs at different stages of the design. The Fourth Year architecture students of 1989-90 sessions interaction with the inhabitants of East Islambagh neighborhood in connection with their class project, 'The Urban Regeneration of a portion of Islambagh, Old Dhaka'

Was particularly helpful in understanding vital community issues. It is not self evident that users should get what they want. What is, however, important is that they must be given the necessary information and choice.

- In addition to the theory classes, examples from local context with proper analysis may create a profound impact Majority of the student respondents felt that they have learnt more about traditions;, society, culture, climate and other determinants from discussions in the design studios, than from theories.

- While it is said that design cannot be taught, it is also true that examples are better than precepts. Exposure to local architecture-both traditional and modern, through field visits and slides will enhance sensitivity and concern about the architects' role in society and imbibe in the students a sense of history and tradition. Both the professional and student respondents in the survey were enthusiastic about practical training prior to graduation. Though there are problems in finding appropriate placement for training, possibilities should be explored. The revised curriculum under course system have provision for compulsory professional training for students of Level 5.

- Due to lack of knowledge, concern and sensitivity many fine old structures of significant cultural and architectural value are in ruins and many more have been torn down without proper evaluation and nanlysis. To create a consciousness among the public and the professionals, the school, in addition to offering courses, can also encourage and facilitate discussions, workshops, lectures and short term block courses.(Fig 4)

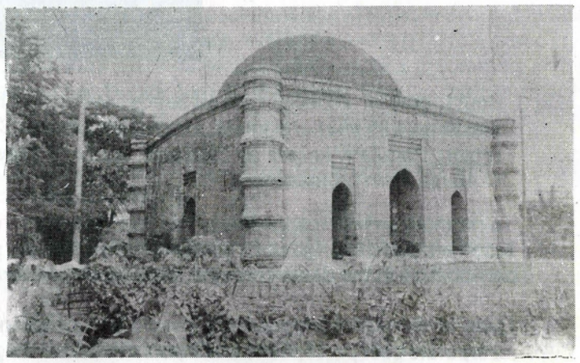

Fig 4 An ancient mosque situated a few miles from "Shat Gumbad Mosque, Bagerhat. This beautiful proportionate structure is seldom referred and is gradually under decaygoing.

- Reorganization of some of the courses and course contents may be worthwhile. The survey reveals that the senior students and young professionals value the importance of psychology, sociology and other social sciences, but the way the courses are structured has little relevance to architecture. Some of the courses have been restructured to make them more relevant. The impact of such changes should be closely monitored and evaluated, with a view to keeping the curriculum dynamic and responsive to changes

- Architects should have a clear idea of the technical implications of architectural design solutions. Perhaps the engineering courses should be recast to give the students a better understanding of technologies in architecture.

- The school should initiate and sustain a programme of continuing research on various aspects of man's built environment.

Conclusion

There is no 'perfect or ideal' curriculum valid across time and space. Knowledge, value and culture consciously and subconsciously condition concepts. Notwithstanding the subjective nature of judgment, the curriculum of the Department of Architecture attempts to give a comprehensive view of architecture, its determinants and the required tools required of an architect. The Department has produced more than 500 graduates who are making worthwhile contributions to the development of architecture in the country. In recent years young architects and students of this school have won honours both at home and abroad.

There is perhaps no school that fully equips the graduates to practice architecture. Academic education invariable has to be supplemented on the job training. It is not the intent of the school to produce architects of excellence, but to train young minds in the art and science of architecture. Perhaps through perseverance and dedication to learning and the profession some of these young men and women will achieve the mark of excellence.