

# Sustainable Buildings in Myanmar

## ABSTRACT

( Presented by Than Shein )

*Half a century ago , there was only one 6 – storey building in Yangon and it was claimed to be the tallest in Myanmar. Today there are already several buildings towering over 20 storeys in Yangon alone , the height of which have gradually grown over the years since the past one and a half decades ago. During that period , exposure of Myanmar engineers to overseas countries has widened and technology as a whole has rapidly developed. It seems that the present trend will continue at the same pace. Should it turn out as anticipated , it is likely that the future of Myanmar’s building industry will be desirably promising. It is also hopefully expected that sustainability in this area will go hand in hand with its development.*

## Background Overview

Union of Myanmar lies within the most distinctive physical environment in the Orient , because it has but one core area within a bounding framework of mountains . This environment is a group of converging lowland alluvial valleys ending in a broad delta fronting on the bay of Bengal , and surrounded by a series of mountainous uplands. In the North , the framework is high and rugged , and the valleys are narrow. To the South , the mountain frame spreads out widely and the valleys become broader and flatter until they merge with the delta. While about a third of Myanmar lies outside the tropics , its configuration is such that the whole may be regarded as a tropical climate. The North central portion of the basin is a dry zone , while the remainder of the country is subject to South West Monsoon. Rainfall intensities are lower in upper Myanmar( less than 40 inches )in contrast to the 80 to 172 inches in lower Myanmar. Monthly mean temperature ranges from 13°C to 33°C. The type of buildings varies from bamboo mat walling under thatch roofing in the rural area to reinforced concrete and few steel framed structures in the urban region. Unfortunately , detailed data on buildings for the whole country are not available. This paper could therefore touch upon the whole country in general only , although buildings in Yangon has been discussed in particular.

## **Type of buildings**

Type of buildings usually found in Myanmar may be divided into the following categories in general:

- bamboo mat walling with thatch roofing ( only few )
- bamboo mat walling with G.I roofing ,
- Timber building with G.I or A.C roofing ,
- Masonry buildings ( only few )
- Brick buildings ,
- R.C buildings and
- Steel framed buildings ( mostly in factories and tall structures ).

Yangon City Development Committee has been authorized to issue permits to construct new residential buildings or to alter ( reconstruct ) existing ones upon receiving the applications from the clients to do so. It categorizes the buildings in Yangon as follows:

- masonry,
- semi-pucca,
- brick-nogging,
- wooden and
- others.

Myanmar produces timber in abundant quantity - so abundant that it can export its surplus timber to foreign countries . Perhaps it is one of the reasons why most Myanmar still prefer timber buildings to others. And perhaps it is because timber buildings go in harmony with the natural environment ( climate ) , topography and culture of the country , provided of course affordable land can be available.

## **Builders**

Construction organizations or contractors may be divided into there groups as follows:

- public
- co-operative and
- private

Almost all governmental buildings were constructed by public organizations in the past. Today all tall buildings ( 20 storeys and above ) and large buildings are being constructed by private companies for various reasons ( financial , political and

resources ). It should of course be commendable in the sense that it helps solve a large part of the unemployment problem by creating job opportunities , it improves technology ( in design , construction and aesthetics ) through competitiveness , it offers better quality and it becomes more cost – effective.

### **Housing Demand**

Myanmar has a population of 52 million residing within an area of 676581 sq.km indicating that population density is in the order of 77 people per sq.km. country – wide. With the rural migration to urban areas , Yangon Division becomes the most densely populated region out of the 14 states and divisions , its population density reaching 11624 people per sq.km. The demand for shelter also grows with it. The public authorities therefore undertook residential housing schemes to meet this challenge . An example undertaken by the Department of Human Settlement and Housing is presented in Table ( 1 ) and ( 2 ) of the Appendix . For lower income family , the Government is also implementing a low cost Housing Scheme. Low cost housing uses timber for posts and walling and G.I for roofing. It can only offer the bare necessity and utility space than aesthetics or luxury. Despite such arrangements , it still needs a long way to go to solve this demand satisfactorily.

### **Technology and Materials**

Way back a century ago , only locally available materials ( such as bricks , rubbles and local cement of those days ) were used just because the materials could be purchased anywhere in the country at low prices and therefore affordable ) and the technology was far behind that of today. The tallest building constructed some 50 years ago by Ministry of Construction was only 6-storey high. Today several tall and large buildings higher than 20 storeys have been and are being constructed. The use of pre-stressed concrete , high grade structural steel , composite ( or ) hybrid structural steel and other better materials has also been introduced. This fact alone suggests that technology has also developed to a certain level through global and regional co-operation and contacts.

Coming thus far , it was not always easily achievable. It requires investments ( local and foreign ) which were sometimes costly, training and support of the Government. The attempt started some one and a half decades ago by hiring overseas specialized agencies and experts to receive technology transfer. Result of this attempt is not

unsatisfactory. One living example is that Union of Myanmar had won the following awards in ASEAN competitions:

- for Construction of the highest number of irrigation dams - 2002
- for Energy efficiency and buildings ( Energy Efficiency award ) - 2002
- for Construction of the highest number of road bridges - 2003

Now that part of these foreign experts have been replaced by local engineers and technicians and this plan will of course go on.

### **Standards and Quality Control**

When it comes to standards and specifications , Myanmar has relied mostly on B.S and A.S.T.M , simply for the reasons that these standards are very common internationally and also because Myanmar has its own guidelines on limited issues only and as yet do not cover the entire field of engineering . Only now that , Myanmar has started preparing its own. One recent development is the formation of High – rise Building Quality Control Committee which gives guidelines , scrutinizes and approves the drawings and designs , inspects construction and decides the acceptance.

### **Conclusion**

Everywhere in this globe , natural environment is there since the time immemorial. It is the human beings who alter it , who spoil it , who improve it \_ its natural beauty, its purity , its virginity.

The emergence of high –rise buildings does obstruct the vision of beautiful skyline to a certain degree , if not the other environmental virtues. At the same time , man-made environment is not always objectionable , because it adds grace to beauty \_ but not always.

Judging from what is going on in the Union of Myanmar in building industry and sustainable development in this area , it seems reasonable to predict that the present trend ( from 1½ decades ago to present ) will continue. To keep it on the right track , it will certainly need the support of the Government , the co-operation and willingness of the developers and entrepreneurs , foreign assistance and the keen participation of the architects and engineers concerned.

Sustainability in buildings is a precious necessity to take care of .More precious is the development of this sustainability .

**TABLE (1) - RESIDENTIAL BUILDINGS COMPLETED BY THE DEPARTMENT OF HUMAN  
SETTLEMENT AND HOUSING DEVELOPMENT**

S.N	Year	Yangon		Other Towns		Total Cost of Construction (K million)
		No. Of	Total Family	No. Of	Total Family	
		Buildings	Units	Buildings	Units	
<b>ANNUAL CONSTRUCTION</b>						
1	1980-1981	48	132	16	40	15.13
2	1985-1986	35	273	13	52	28.55
3	1990-1991	5	76	-	-	13.40
4	1994-1995	4	24	-	-	7.20
5	1995-1996	1	6	-	-	2.00
6	1996-1997	2	26	-	-	35.00
7	1997-1998	-	-	1	6	3.96
8	1998-1999	47	418	11	48	1,091.90
9	1999-2000	9	240	3	36	282.77
10	2000-2001	10	220	3	64	531.52

<b>CUMULATIVE TOTALS</b>						
1	1980-1981	1853	10277	1254	3411	233.02
2	1985-1986	1991	11248	1314	3620	317.63
3	1990-1991	2415	12855	1353	3799	533.75
4	1994-1995	2458	13105	-	-	606.05
5	1995-1996	2459	13111	-	-	608.05
6	1996-1997	2461	13137	-	-	643.05
7	1997-1998	-	-	1354	3805	647.01
8	1998-1999	2508	13555	1365	3853	1,738.91
9	1999-2000	2517	13795	1368	3889	2,021.68
10		2527	14015	1371	3953	2,553.20

Source: Department of Human Settlement and Housing Development.

**TABLE (2) COMPLETED RESIDENTIAL BUILDINGS CONSTRUCTED UNDER  
RESIDENTIAL HOUSING SCHEME**

S.N	Particular	1980-81	1985-86	1990-91	1994-95	1995-96
	<b>HOUSING SCHEME</b>					
1	Public					
	a. Bulidings ( Number )	24	24	5	4	1.0
	b. Family Units ( Number )	121	278	76	24	6.0
	c. Floor Space ( sq.ft )	148573	111943	36662	20880	4,212.0
	d. Cost ( K million )	13.6	17.4	13.4	7.2	2.0
2	Co-operative					
	a. Bulidings ( Number )	40	18	–	–	–
	b. Family Units ( Number )	51	47	–	–	–
	c. Floor Space ( sq.ft )	25624	57180	–	–	–
	d. Cost ( K million )	1.6	9.3	–	–	–
3	Private					
	a. Bulidings ( Number )	–	6	–	–	–
	b. Family Units ( Number )	–	6	–	–	–
	c. Floor Space ( sq.ft )	–	12000	–	–	–
	d. Cost ( K million )	–	1.8	–	–	–
4	Total					
	a. Bulidings ( Number )	64	48	5	4	1.0
	b. Family Units ( Number )	172	331	76	24	6.0
	c. Floor Space ( sq.ft )	174197	181123	36662	20880	4,212.0
	d. Cost ( K million )	15.2	28.5	13.4	7.2	2.0