

**ECONOMY OF LOW COST HOUSING IN KERALA
A STUDY WITH SPECIAL REFERENCE TO
NIRMITHIKENDRA**

Thesis
submitted to the University of Calicut
for the award of the Degree of
DOCTOR OF PHILOSOPHY IN COMMERCE

By
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Under the Guidance of
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Reader & Dean
Department of Commerce and Management Studies
University of Calicut

DEPARTMENT OF COMMERCE AND MANAGEMENT STUDIES
UNIVERSITY OF CALICUT
KERALA

AUGUST 2006

Dedicated to
My Beloved Father
K.C. Kurup Master

D E C L A R A T I O N

I, RAJEEVAN. K., do hereby declare that this thesis entitled **ECONOMY OF LOW COST HOUSING IN KERALA – A STUDY WITH SPECIAL REFERENCE TO NIRMITHI KENDRA** is a bonafide record of the research work done by me under the guidance of Dr. A.K. Sarada, Reader, Department of Commerce and Management Studies, University of Calicut. I further declare that this thesis has not previously formed the basis for the award of any degree, diploma, associateship, fellowship or other similar title of recognition.

C.U. Campus,
Date: 25.6.06


RAJEEVAN. K.

3A

**DEPARTMENT OF COMMERCE AND
MANAGEMENT STUDIES
UNIVERSITY OF CALICUT**

**Dr. A.K. Sarada
Reader & Dean**

Date: 25.8.06

C E R T I F I C A T E

Certified that this thesis, **ECONOMY OF LOW COST HOUSING IN KERALA – A STUDY WITH SPECIAL REFERENCE TO NIRMITHI KENDRA** is a bonafide record of the research work carried out by **Mr. RAJEEVAN. K.** under my supervision and guidance. No part of this has been submitted earlier for any other purpose.

He is permitted to submit the thesis.


(Dr. A.K. SARADA)

Acknowledgement

The successful completion of the Research Project is based on the help and co-operation of many distinguished persons from different areas. I express my heart-felt gratitude to all of them for their valuable services and advices to enable me to complete the work in time.

At the outset I register profound thanks to my reverent Research Guide Dr. A.K. Sarada, Reader, Department of Commerce and Management Studies, University of Calicut. The Research Scholar could not have made such an academic contribution without the proper and eminent supervision of the Research Guide. Dr. K.P. Muraleedharan, Head of the Department of Commerce and Management Studies, University of Calicut, also was much helpful in all the turning points to lead the directions and my gratitude remains always in this regard.

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Similarly I express my sincere gratitude to all the teaching and non-teaching staff, Librarian of the Department of Commerce and Management Studies, University of Calicut, who inspired me to complete this work.


Rajeevan. K.

C O N T E N T S

CERTIFICATE
DECLARATION
ACKNOWLEDGEMENT

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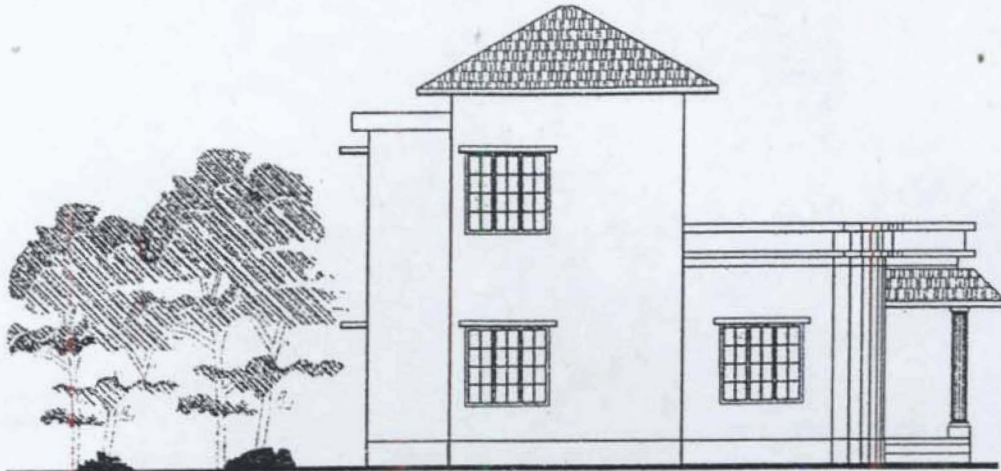
Annexure I

**Plan of Sanker's Habitat Technology
Group, Thiruvananthapuram
(10 Numbers)**

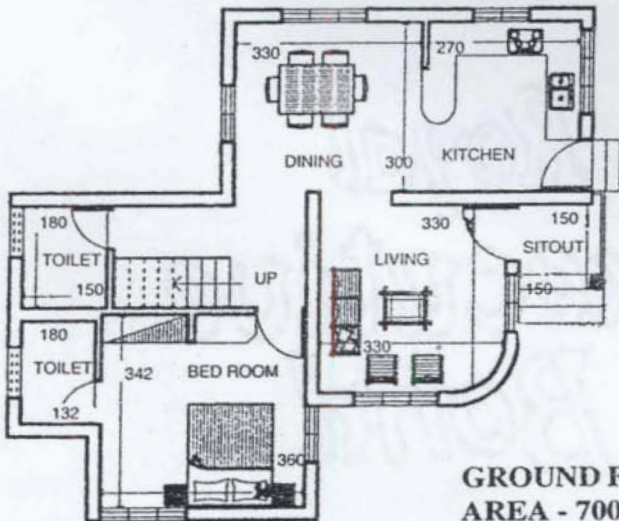
HABITAT PLAN-1

AREA - 1000 SQ.FT.

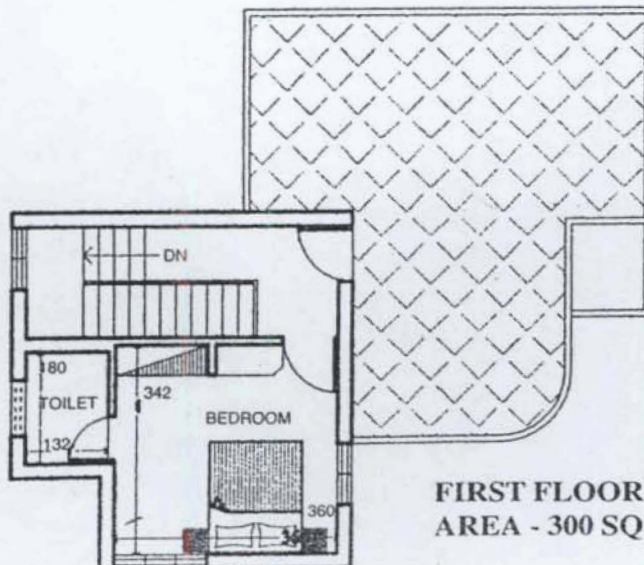
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FRONT ELEVATION



**GROUND FLOOR PLAN
AREA - 700 SQ.FT.**

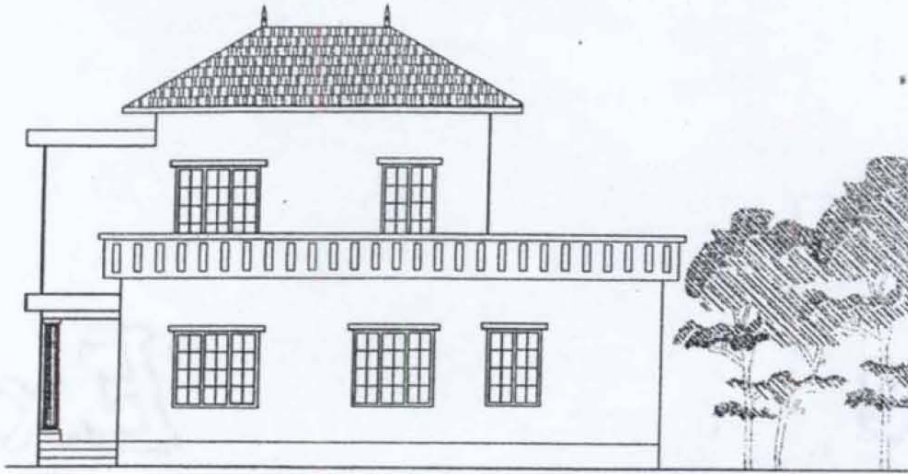


**FIRST FLOOR PLAN
AREA - 300 SQ.FT.**

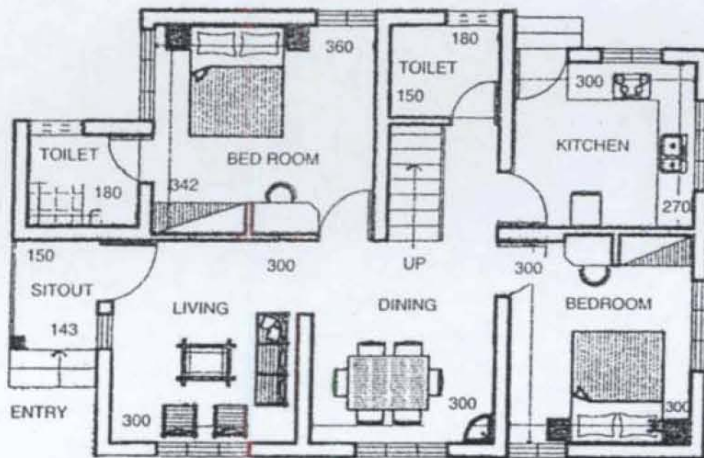
HABITAT PLAN-2

AREA - 1050 SQ.FT.

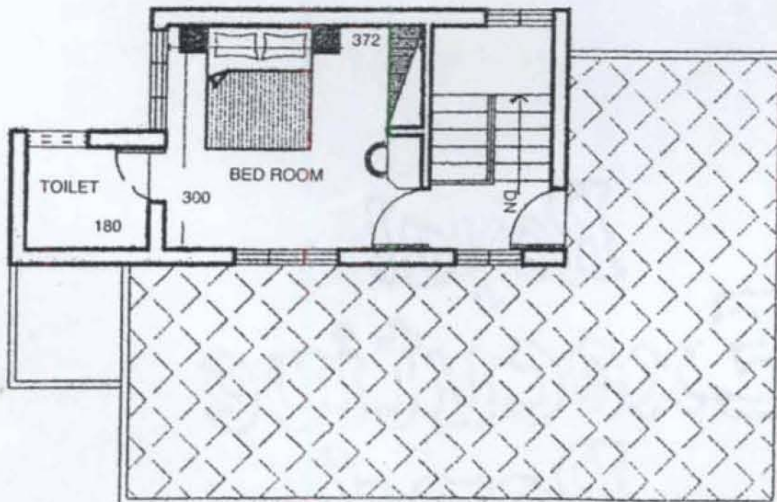
COST OF CONSTRUCTION - RS. 4, 72, 500



FRONT ELEVATION



**GROUND FLOOR PLAN
AREA - 760 SQ. FT.**

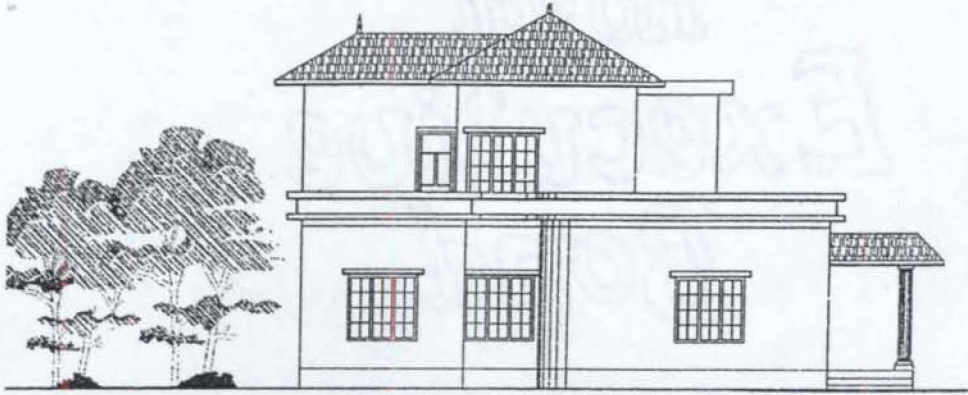


**FIRST FLOOR PLAN
AREA - 290 SQ. FT.**

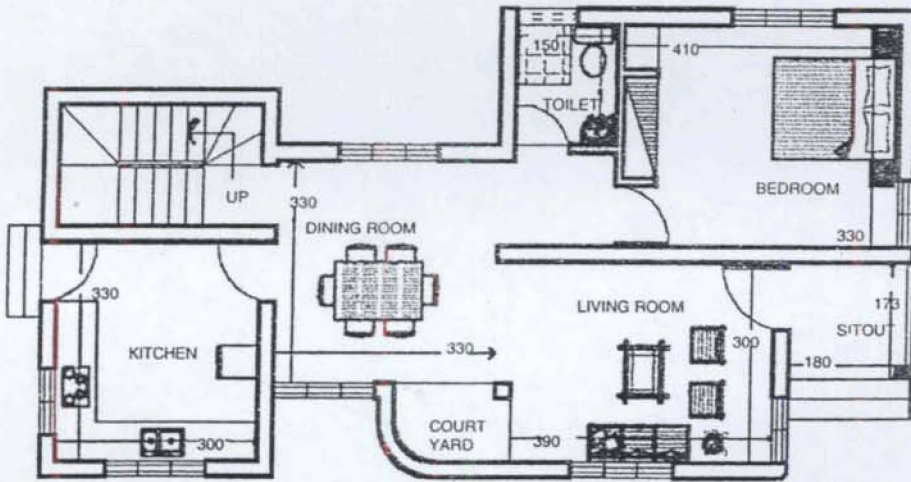
HABITAT PLAN-3

AREA-1200 SQ.FT.

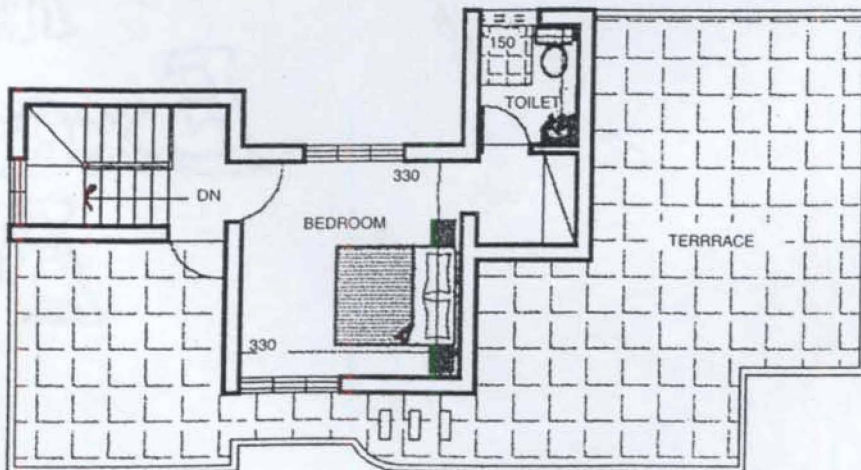
COST OF CONSTRUCTION - RS. 5,40,000



FRONT ELEVATION



**GROUND FLOOR PLAN
AREA - 900 SQ. FT.**



FIRST FLOOR PLAN, AREA - 300 SQ. FT.

HABITAT PLAN-4

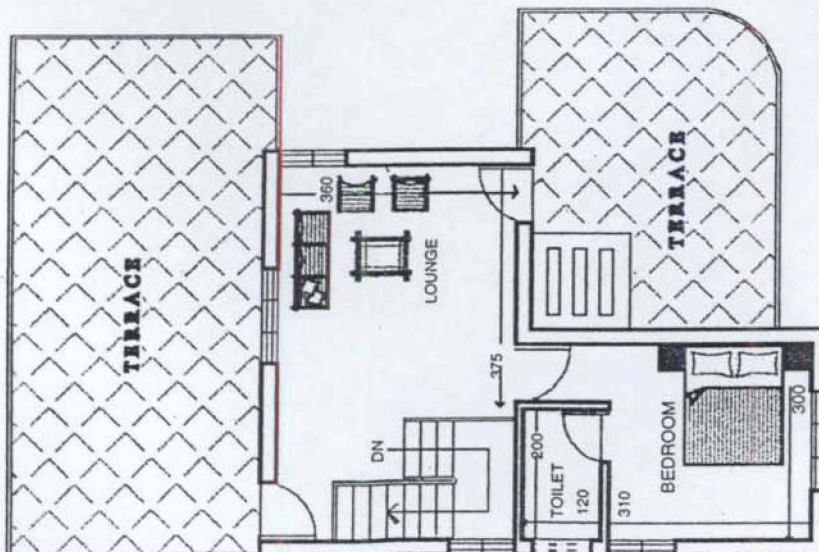
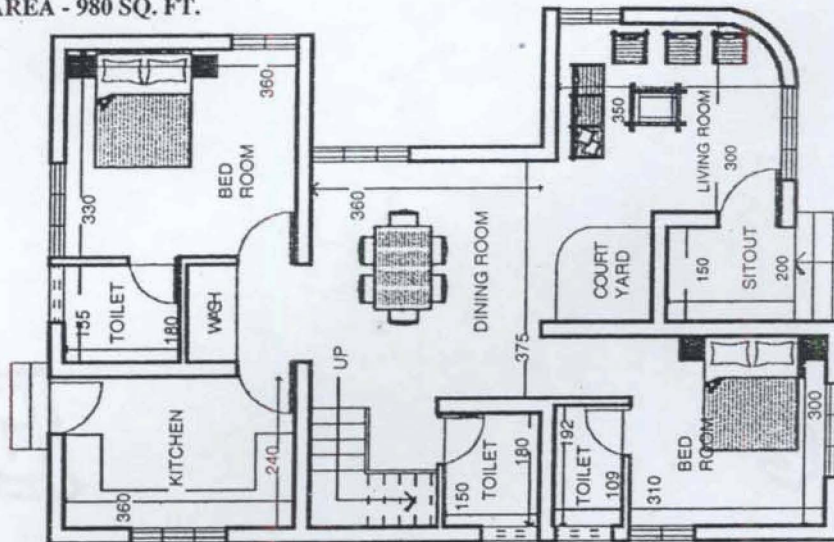
AREA- 1400 SQ.FT.

COST OF CONSTRUCTION - RS. 6,30,000



FRONT ELEVATION

**GROUND FLOOR PLAN
AREA - 980 SQ. FT.**



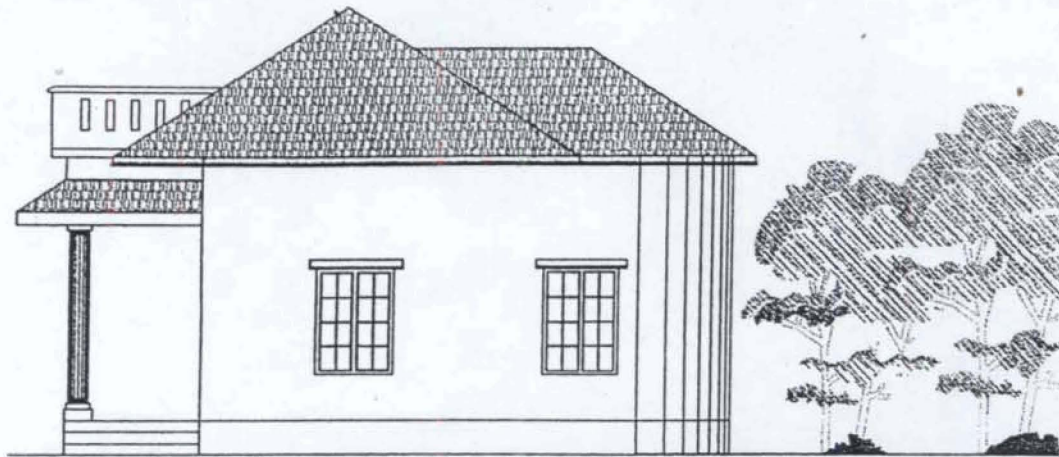
**FIRST FLOOR PLAN
AREA - 420 SQ. FT.**

HABITAT PLAN-5

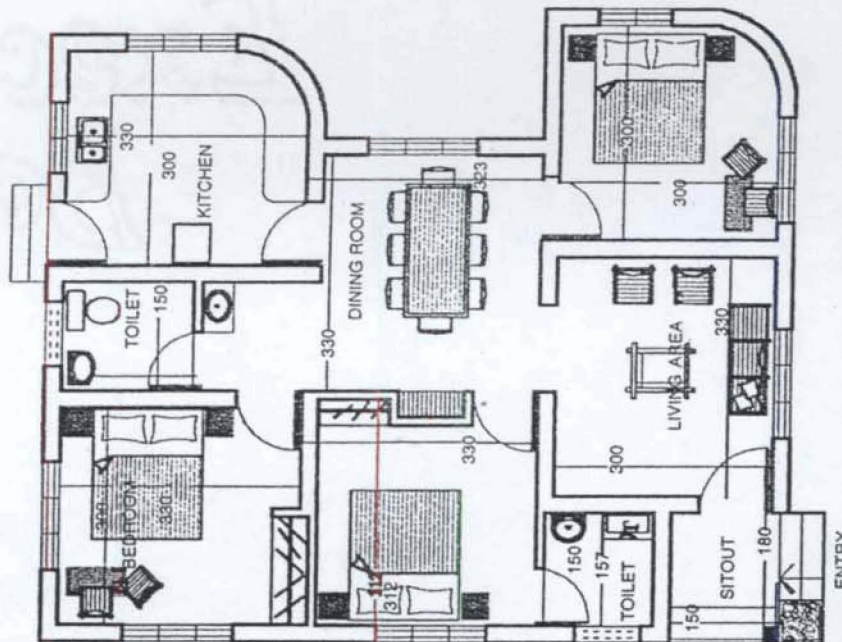
AREA-900 SQ.FT.

COST OF CONSTRUCTION - RS. 4,05,000

13



FRONT ELEVATION



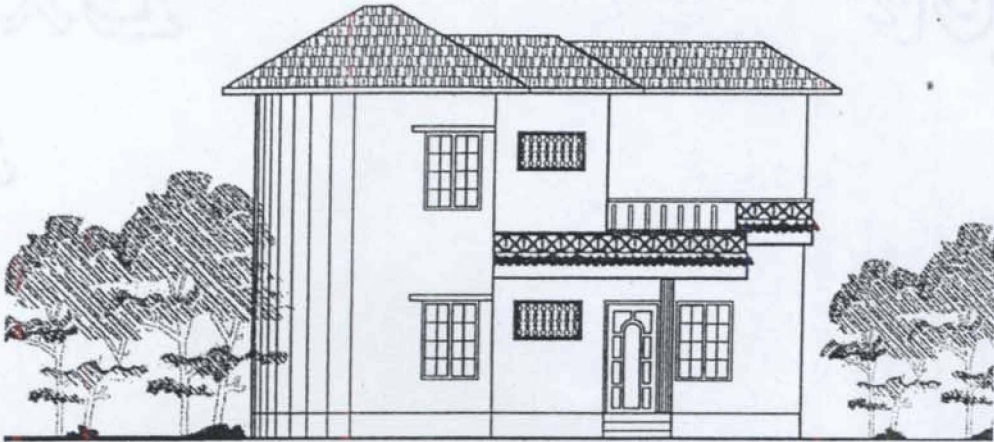
GROUND FLOOR PLAN

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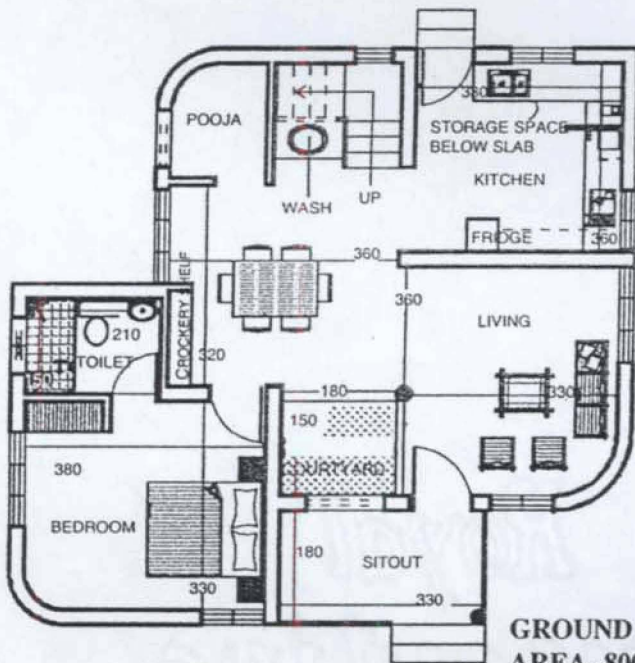
HABITAT PLAN-6

AREA-1400 SQ.FT.

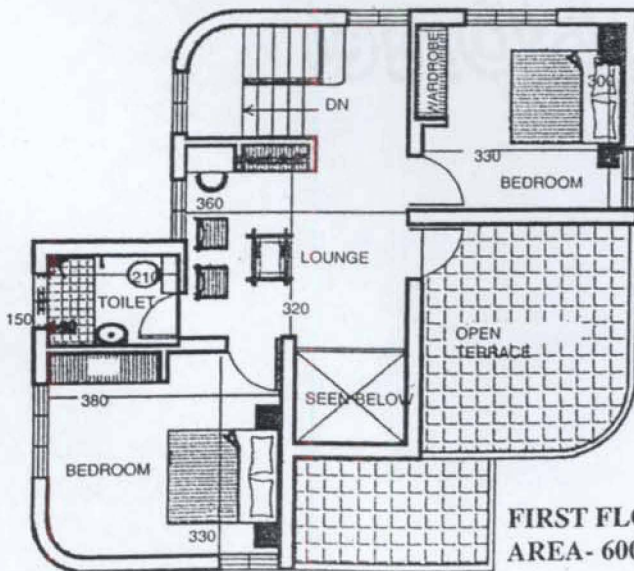
COST OF CONSTRUCTION - RS. 6,30,000



FRONT ELEVATION



**GROUND FLOOR PLAN
AREA- 800 SQ.FT.**



**FIRST FLOOR PLAN
AREA- 600 SQ.FT.**

HABITAT PLAN-7

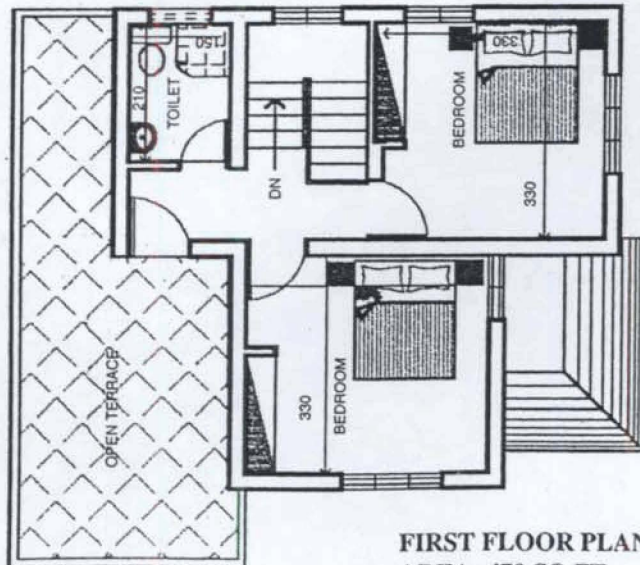
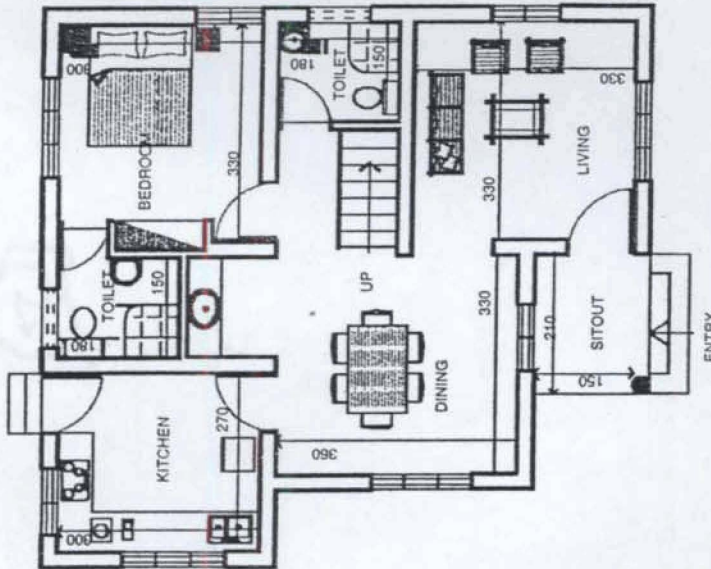
AREA-1200 SQ.FT.

COST OF CONSTRUCTION - RS. 5,40,000



FRONT ELEVATION

GROUND FLOOR PLAN AREA- 730. SQ.FT.



**FIRST FLOOR PLAN
AREA- 470 SQ.FT.**

HABITAT PLAN-8

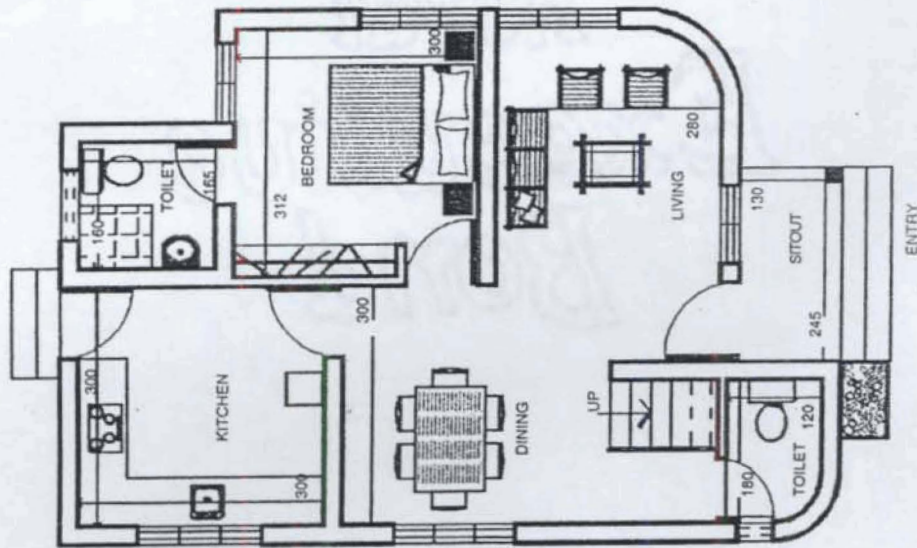
AREA-1000 SQ.FT.

COST OF CONSTRUCTION - RS. 4,50,000

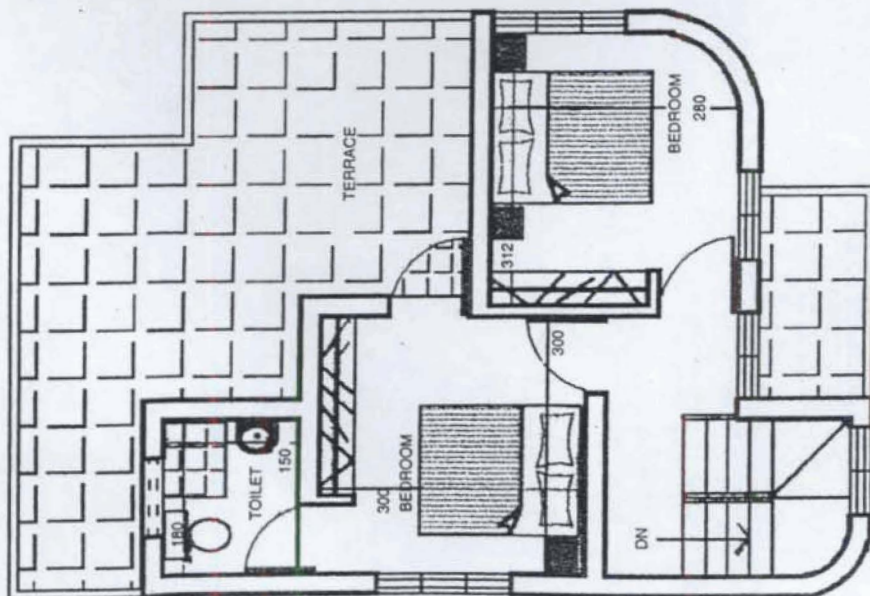
16



FRONT ELEVATION



**GROUND FLOOR PLAN
AREA- 630 SQ. FT.**



FIRST FLOOR PLAN, AREA- 370 SQ.FT.

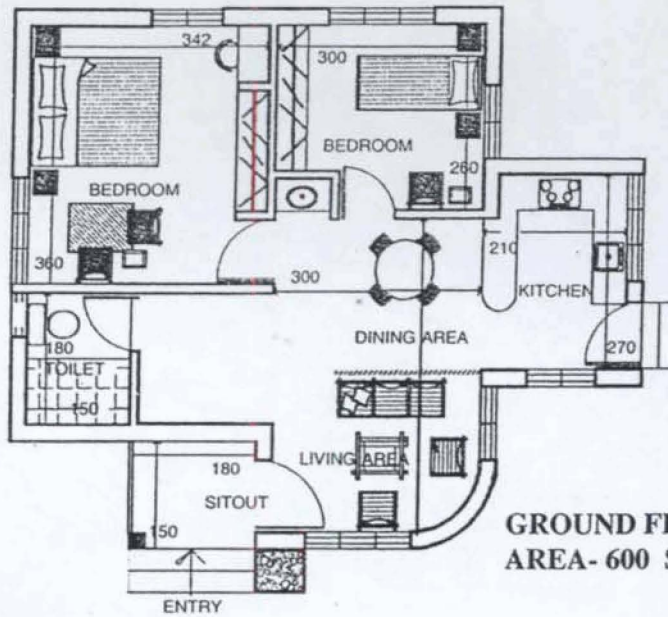
HABITAT PLAN-9

AREA-600 SQ.FT.

COST OF CONSTRUCTION - RS. 2,70,000



FRONT ELEVATION

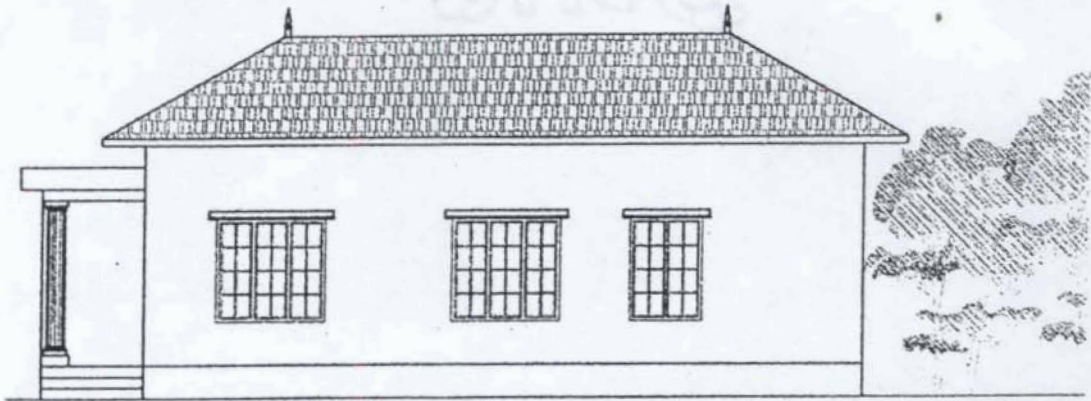


**GROUND FLOOR PLAN
AREA- 600 SQ.FT.**

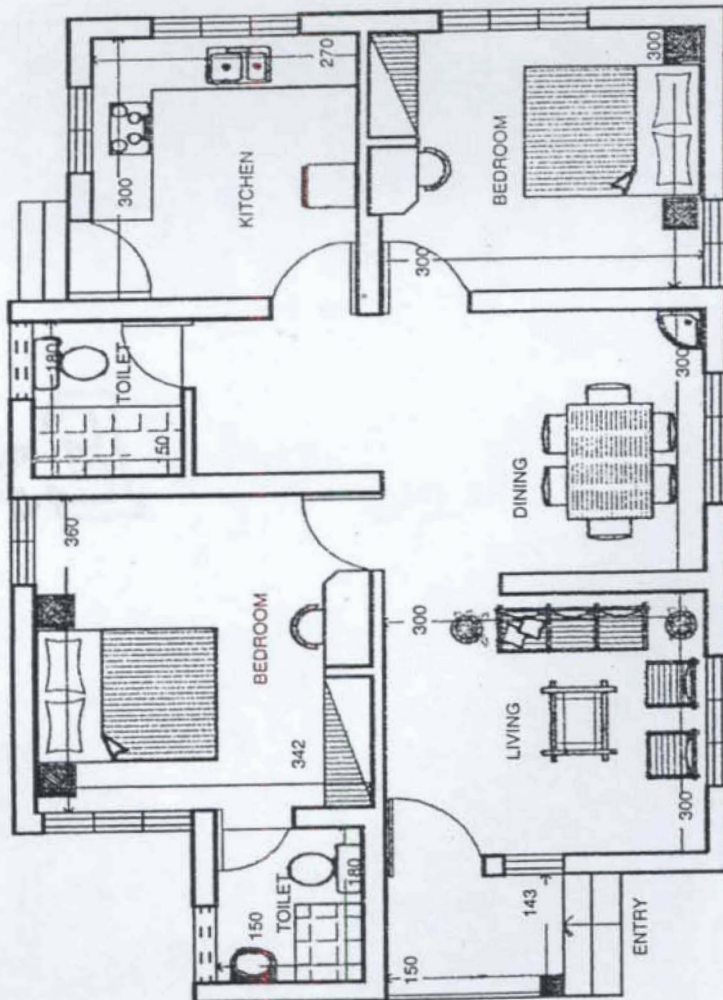
HABITAT PLAN-10

AREA-800 SQ.FT.

COST OF CONSTRUCTION - RS. 3,60,000



FRONT ELEVATION



GROUND FLOOR PLAN
AREA-800 SQ.FT.

Annexure 2

**Plan of Costford
(13 Numbers)**

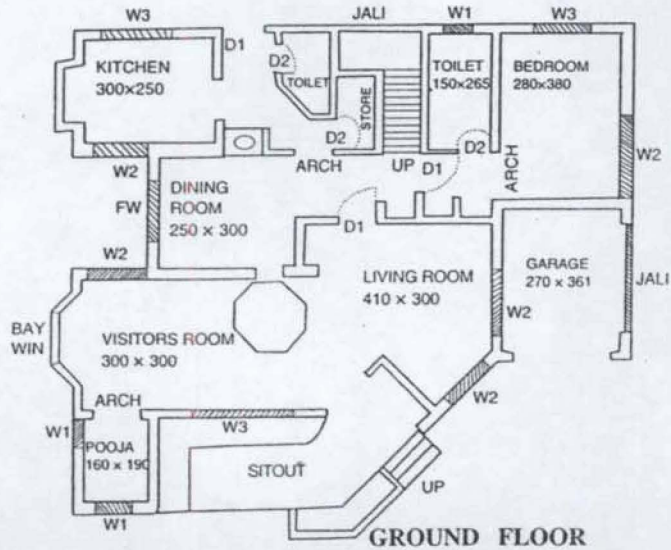
COSTFORD PLAN-1

AREA- 2000 SQ. FT.

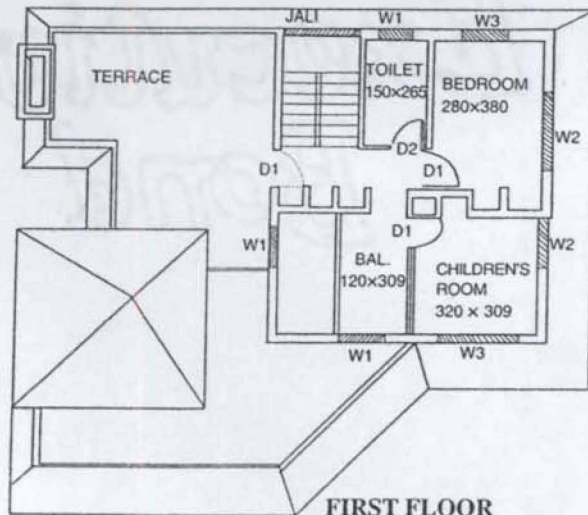
COST OF CONSTRUCTION -RS. 8,50,000



FRONT ELEVATION



GROUND FLOOR

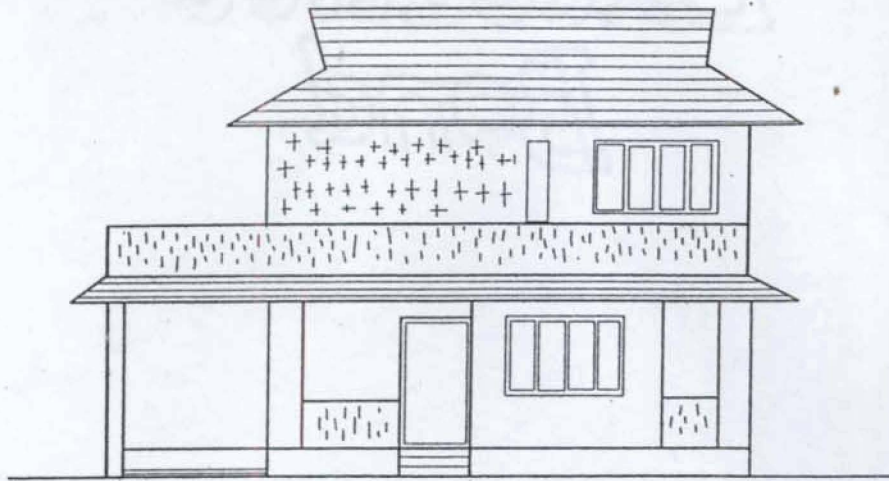


FIRST FLOOR

COSTFORD PLAN-2

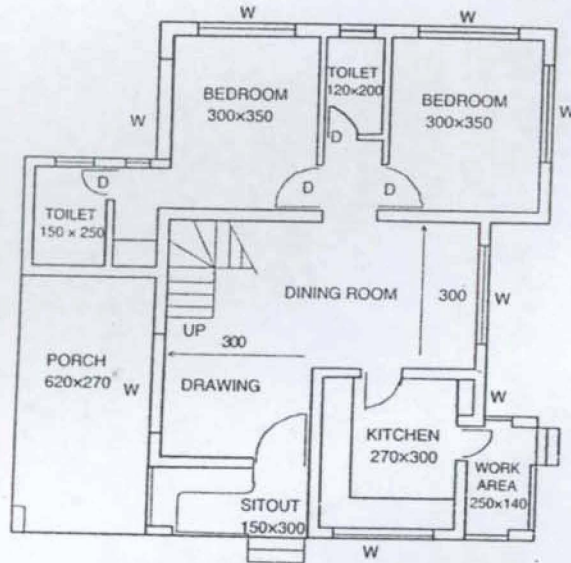
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COST OF CONSTRUCTION- RS. 5,10,000

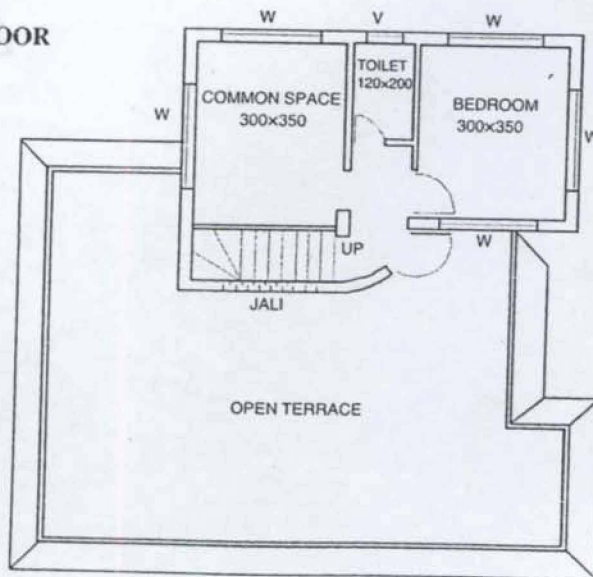


ELEVATION

GROUND FLOOR

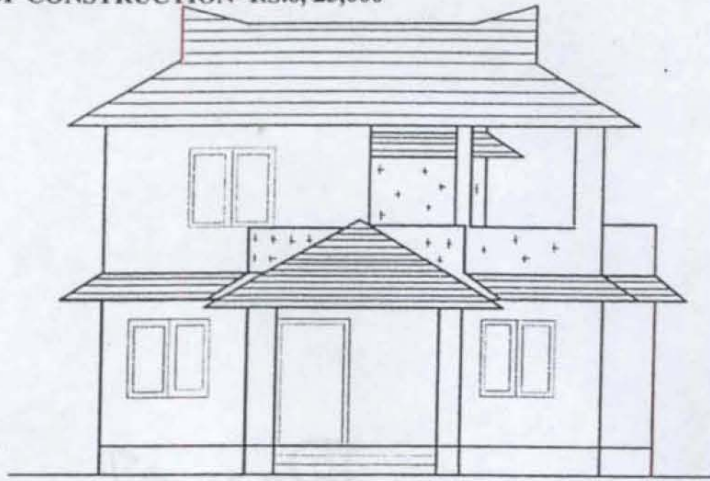


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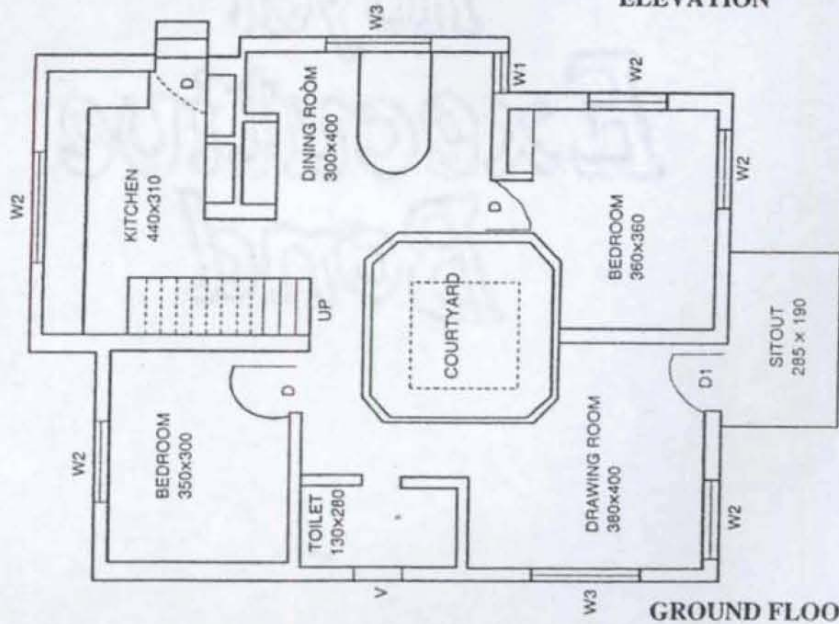


COURT PLAN-3
AREA- 1650 SQ.FT.
COST OF CONSTRUCTION- RS.6, 25,000

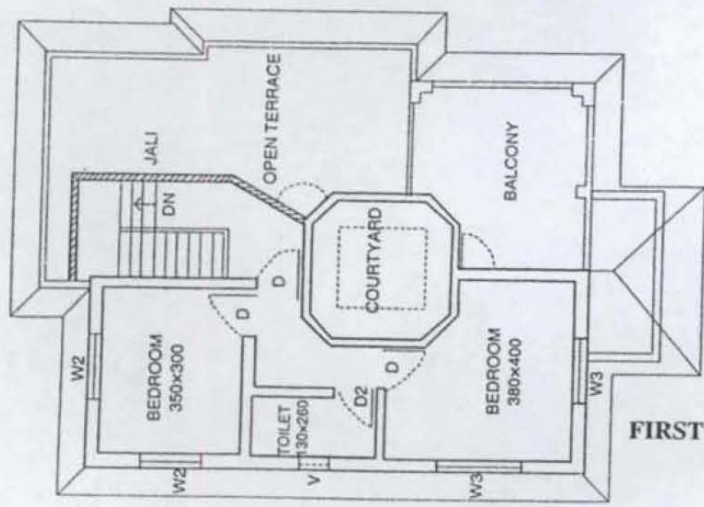
22



ELEVATION



GROUND FLOOR



FIRST FLOOR

COSTFORD PLAN-4

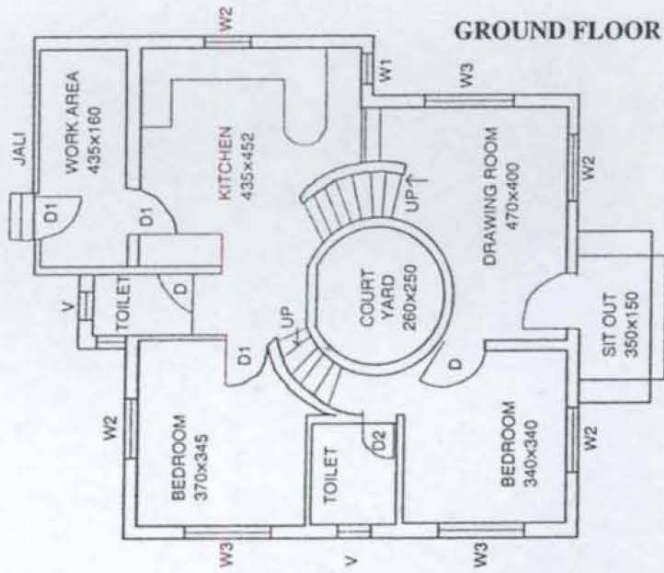
AREA- 1300 SQ.FT.

COST OF CONSTRUCTION- RS. 5,00,000

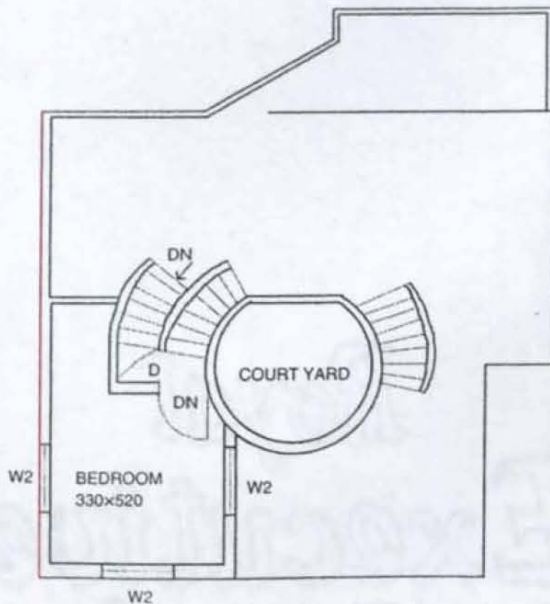
23



ELEVATION



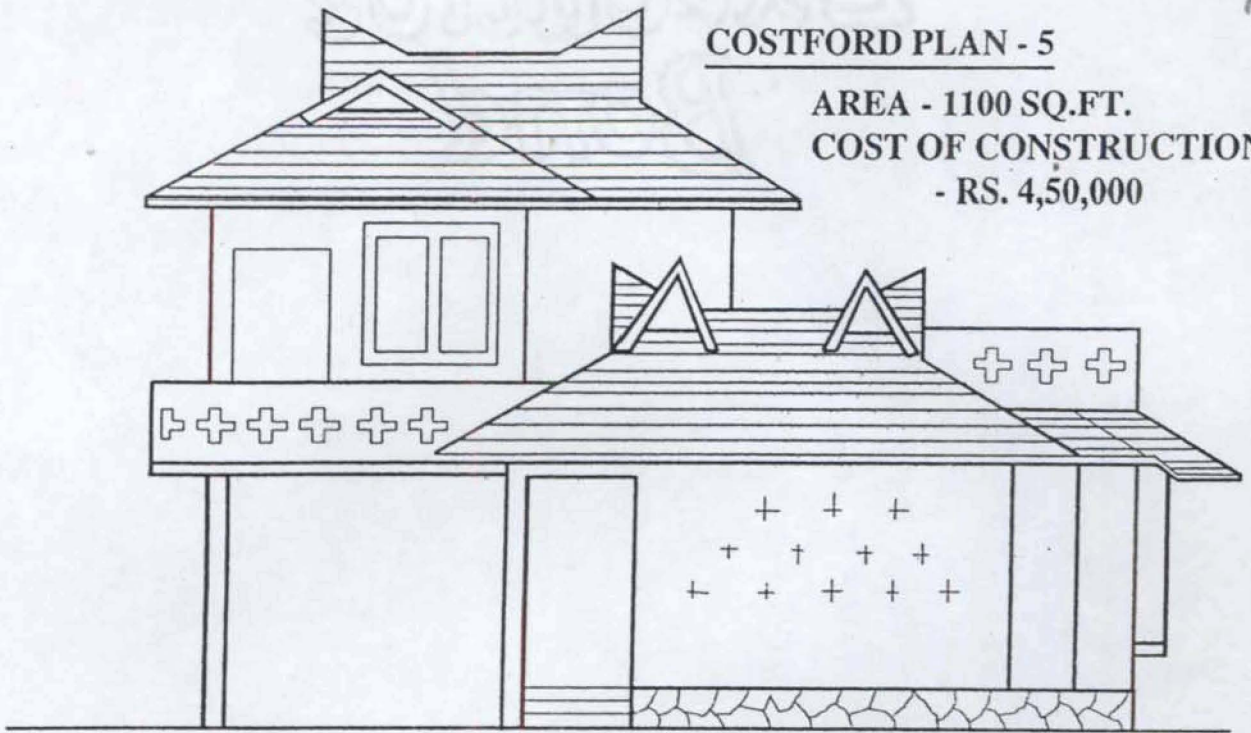
FIRST FLOOR



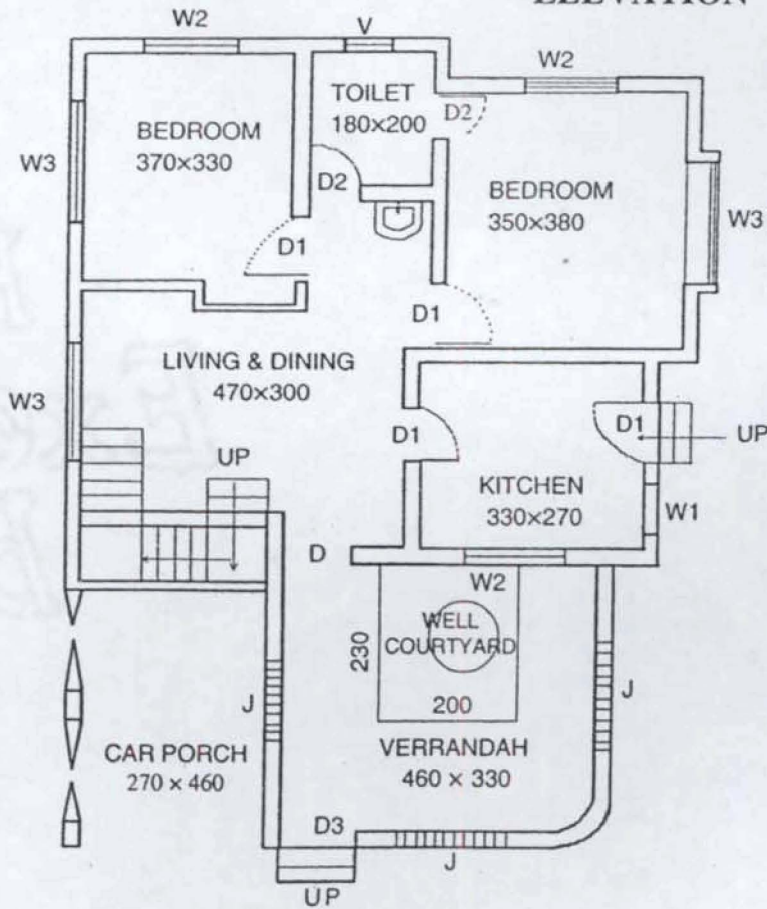
COSTFORD PLAN - 5

AREA - 1100 SQ.FT.

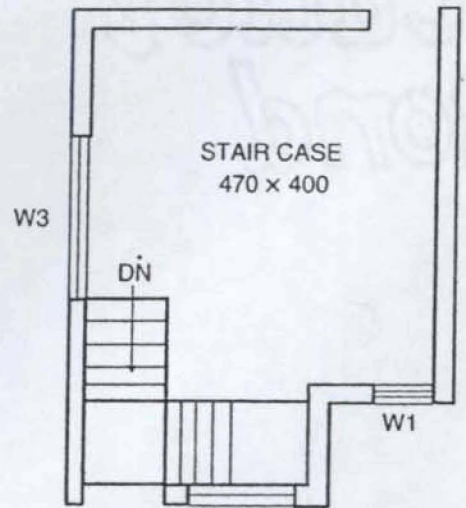
COST OF CONSTRUCTION
- RS. 4,50,000



ELEVATION



GROUND FLOOR



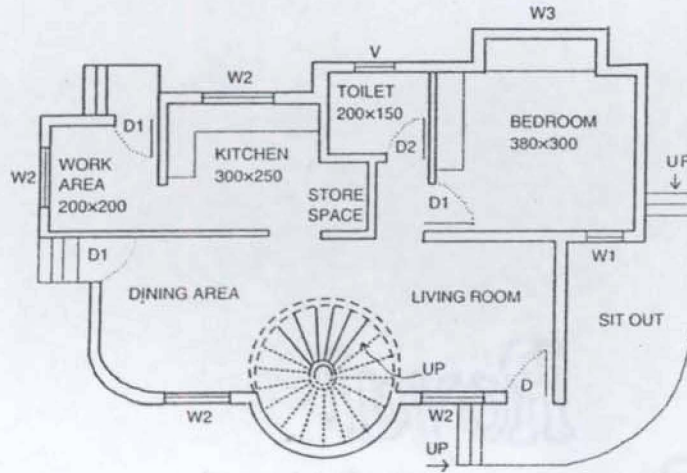
FIRST FLOOR

AREA - 1500 SQ.FT.
COST OF CONSTRUCTION-RS. 5,50,000

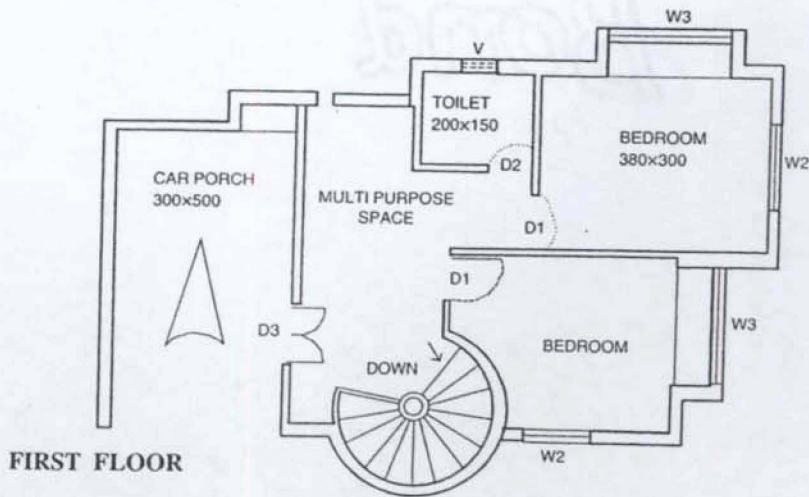
25



ELEVATION



GROUND FLOOR

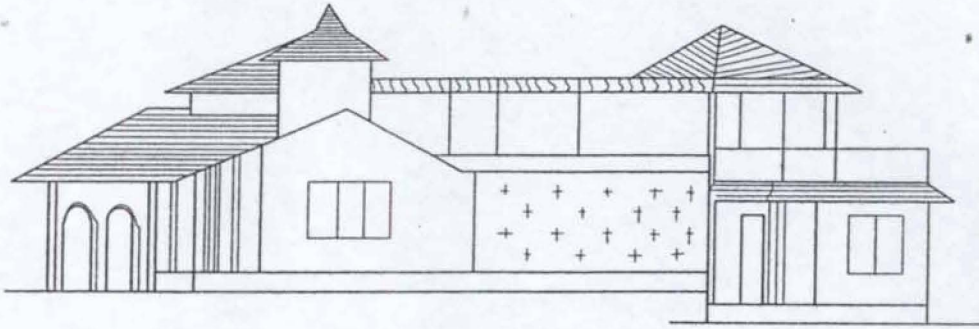


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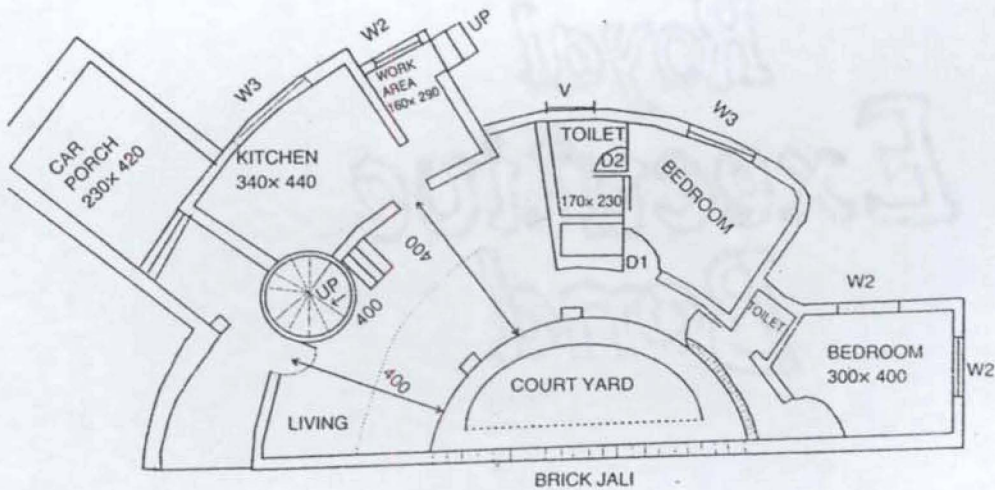
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AREA - 1900 SQ.FT.

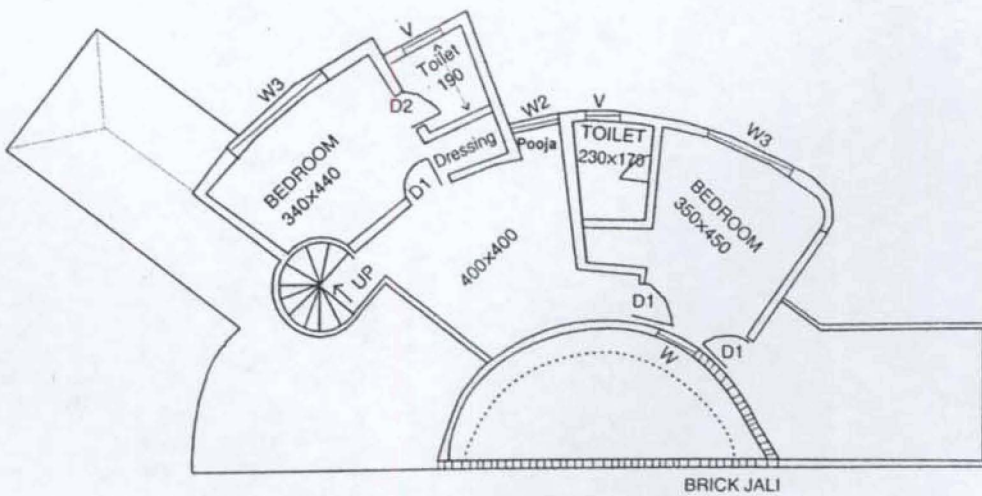
COST OF CONSTRUCTION- 7,25,000



ELEVATION



GROUND FLOOR



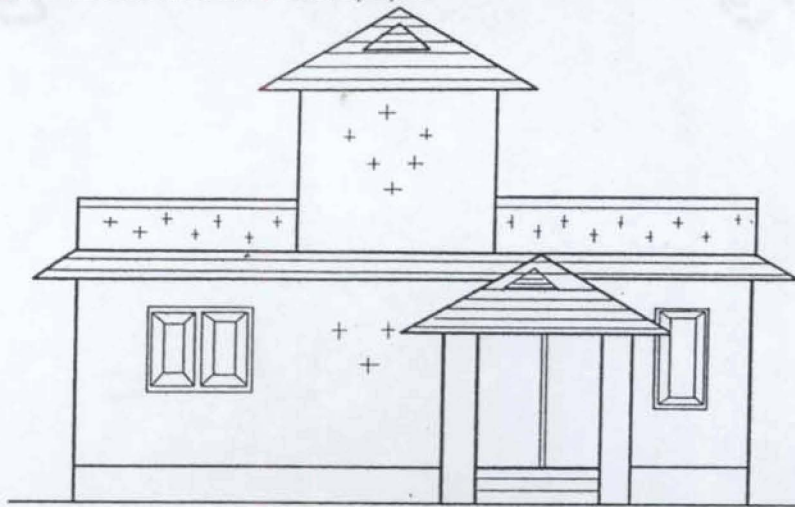
FIRST FLOOR

COSTFORD PLAN-8

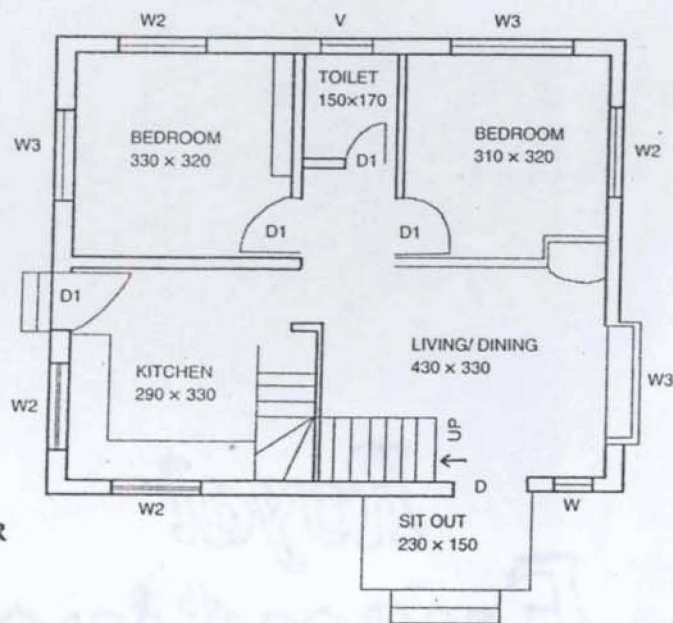
AREA- 700 SQ.FT.

COST OF CONSTRUCTION- RS. 2,50,000

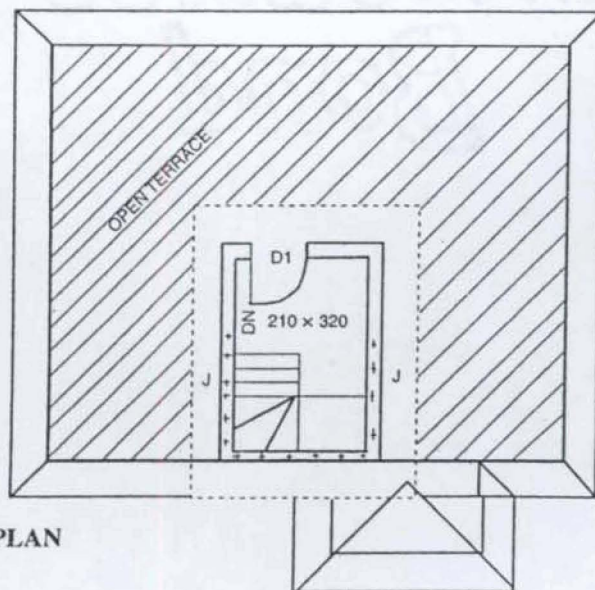
27



ELEVATION



GROUND FLOOR



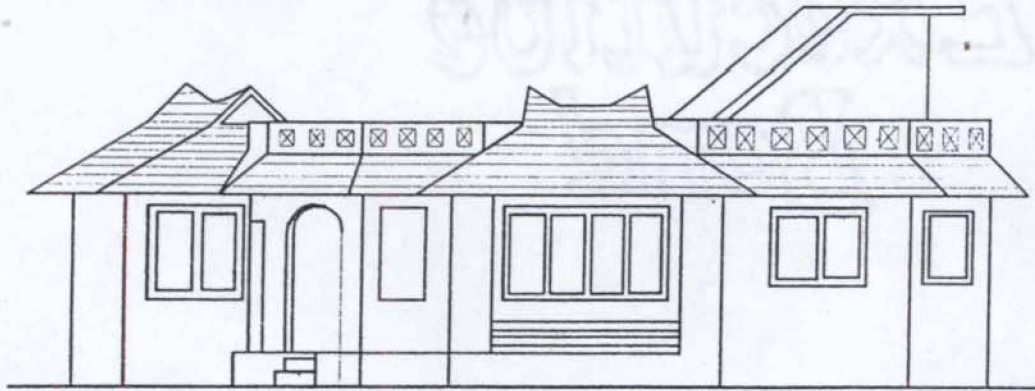
TOWER PLAN

COSTFORD PLAN-9

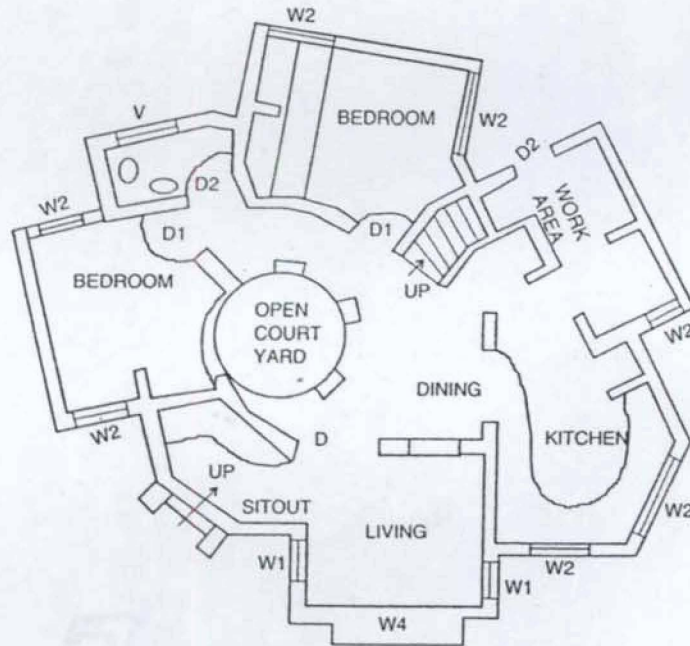
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COST OF CONSTRUCTION- RS. 3, 75,000

20



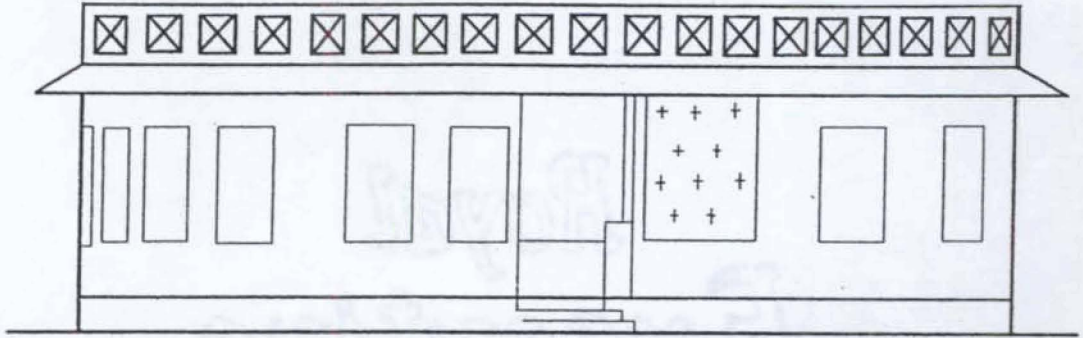
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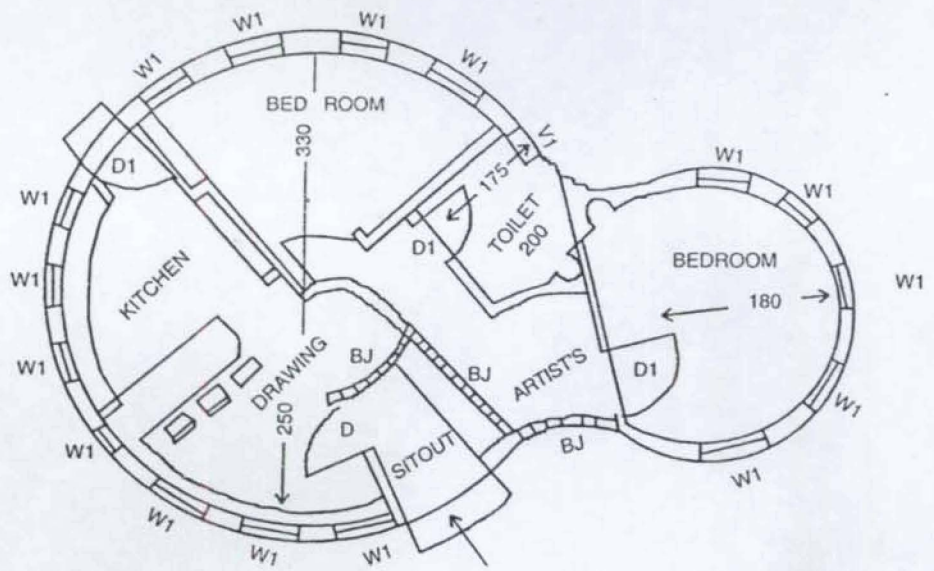
COSTFORD PLAN - 10

AREA - 528 SQ.FT.

COST OF CONSTRUCTION- RS. 1,70,000



ELEVATION

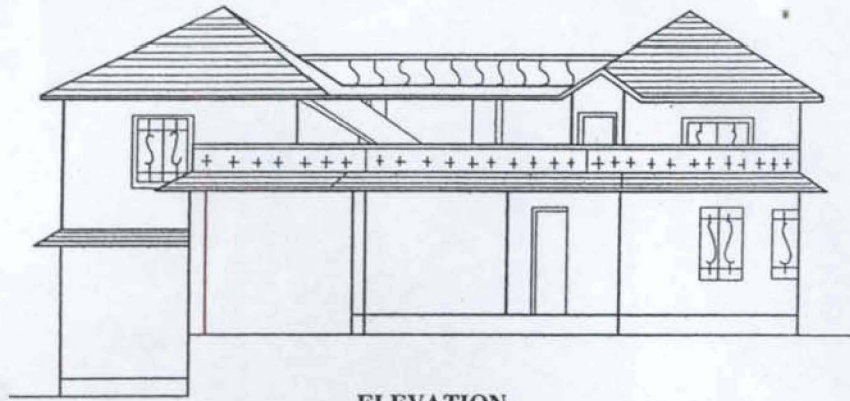


GROUND FLOOR

COSTFORD PLAN - 11

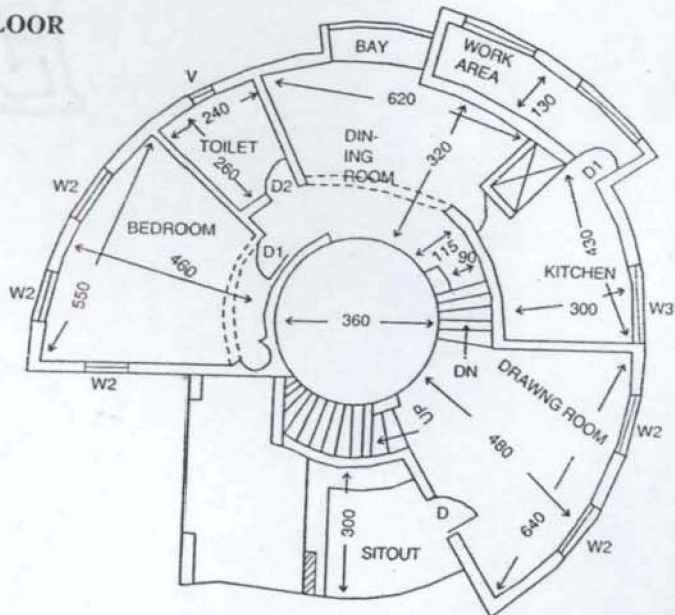
AREA - 2100 SQ.FT.

COST OF CONSTRUCTION - RS. 7,50,000

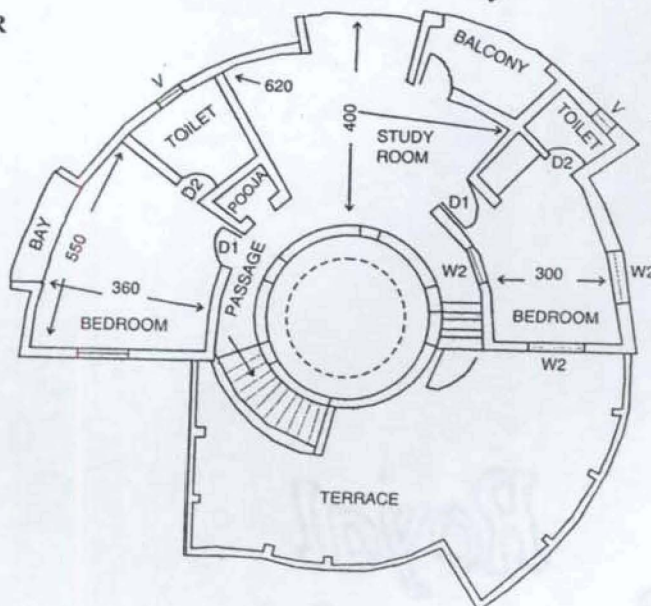


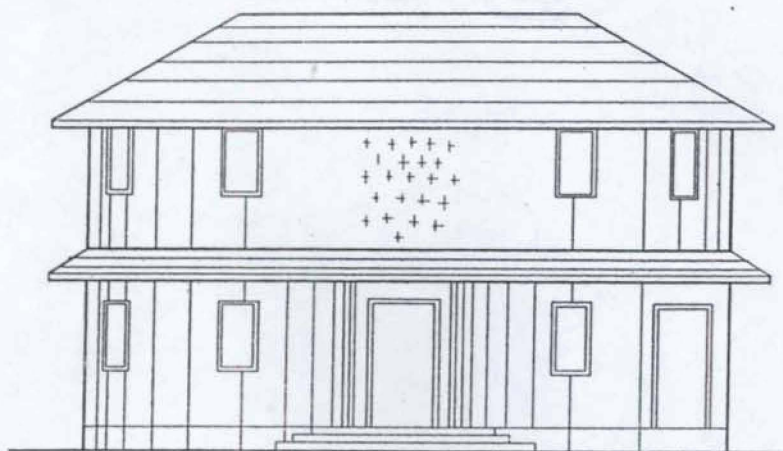
ELEVATION

GROUND FLOOR

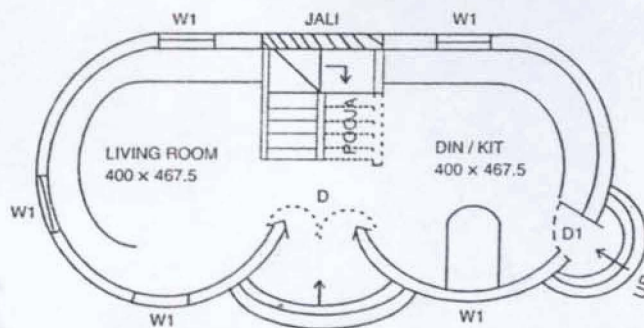


FIRST FLOOR

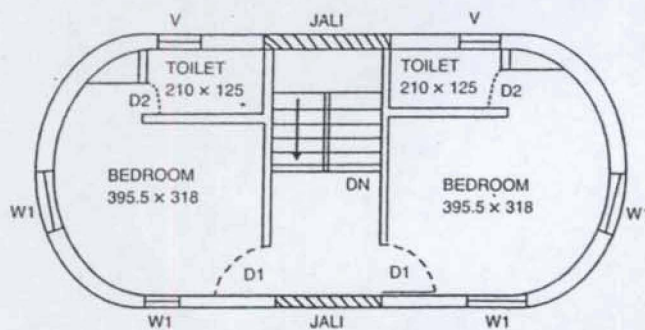




ELEVATION



GROUND FLOOR

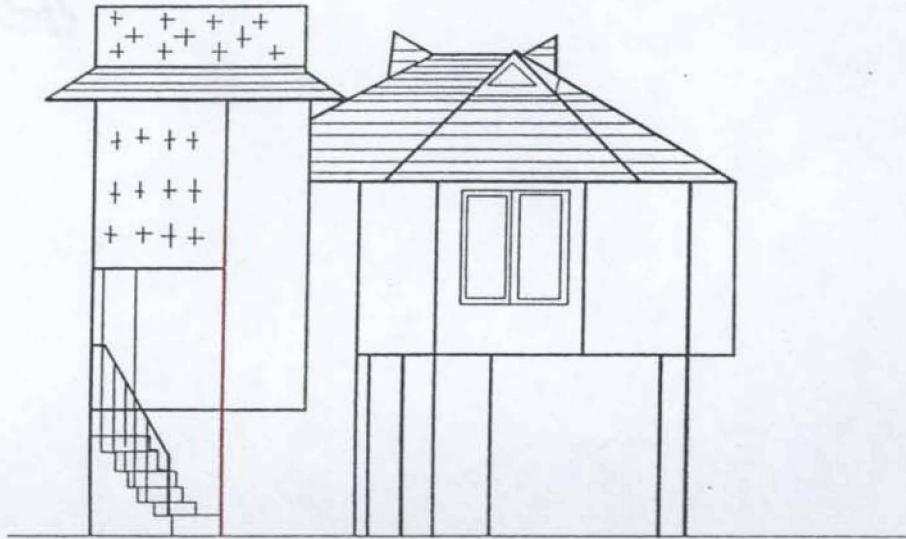


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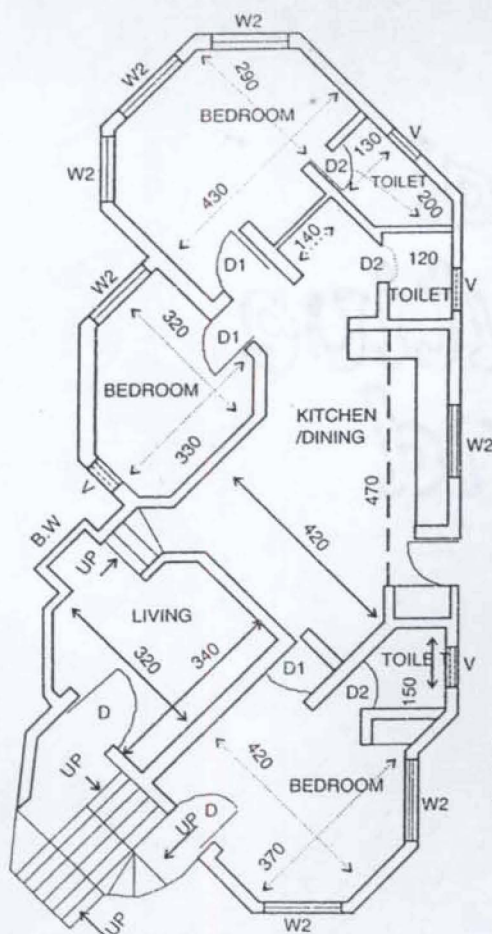
COSTFORD PLAN- 13

AREA- 1150 SQ.FT.

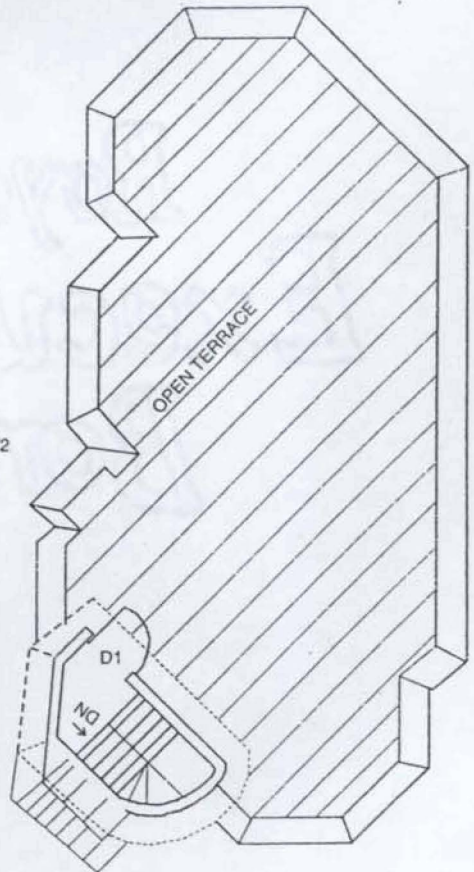
COST OF CONSTRUCTION- RS. 4, 60, 000



ELEVATION



GROUND FLOOR



STAIR ROOM PLAN

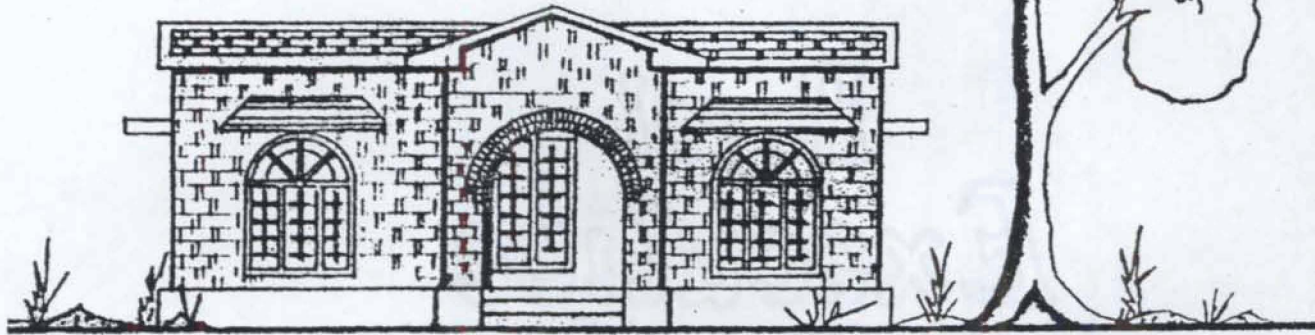
Annexure 3

**Plan of Nirmithikendra
(4 Numbers)**

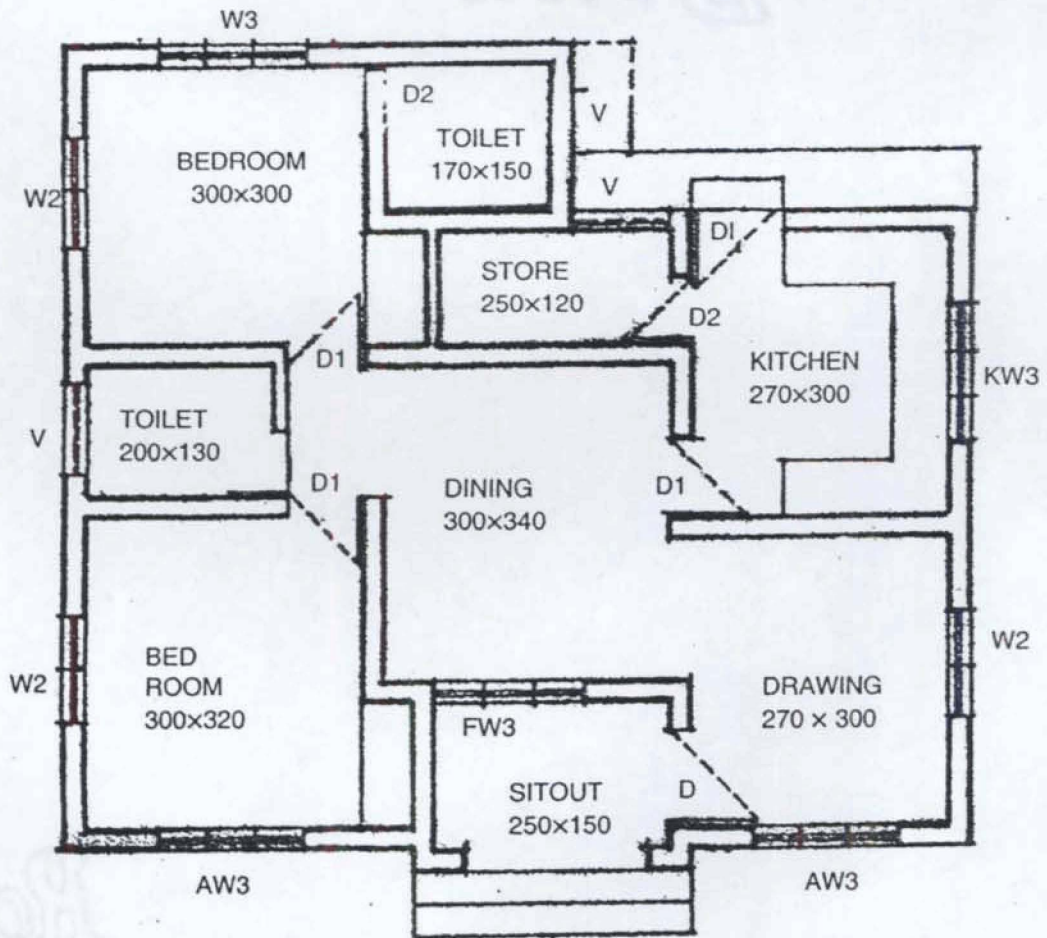
NIRMITHI PLAN-1

PLINTH AREA- 800 SQ.FT.

COST OF CONSTRUCTION - RS. 3, 20, 200



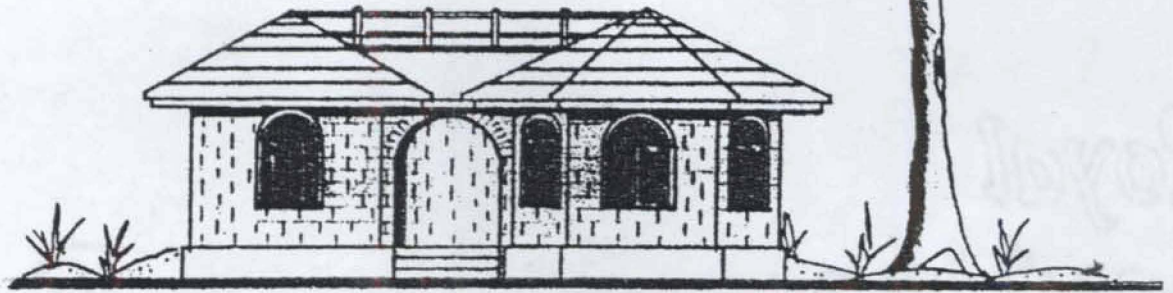
ELEVATION



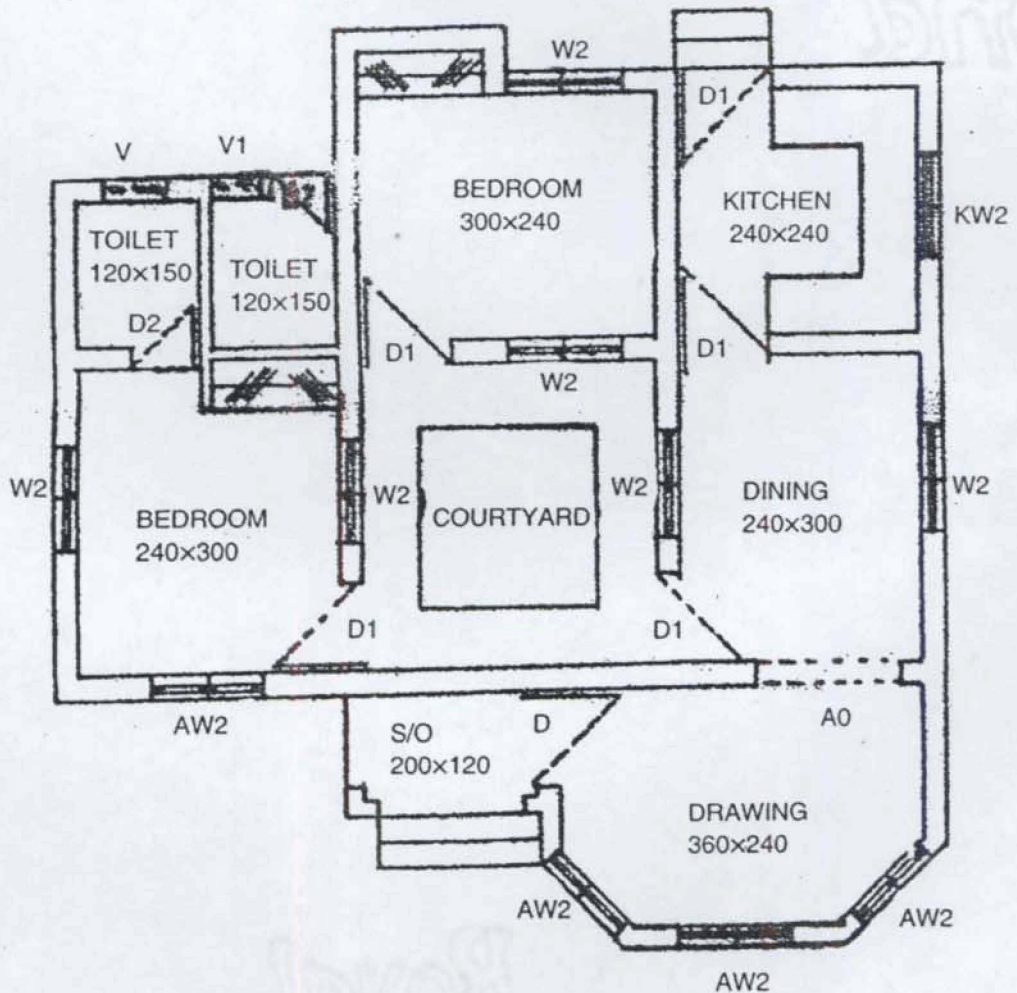
NIRMITHI PLAN -2

PLINTH AREA - 580 SQ.FT.

COST OF CONSTRUCTION- RS. 2,43,600



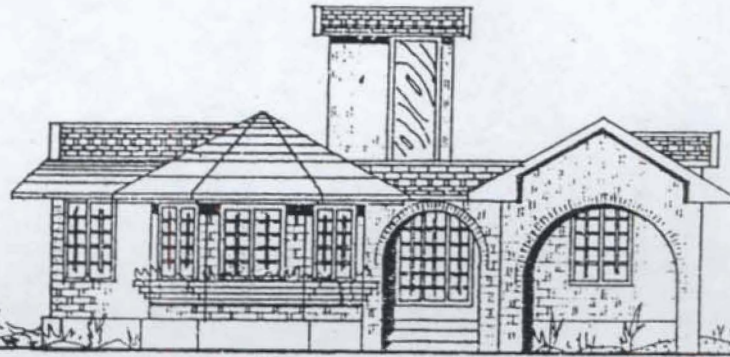
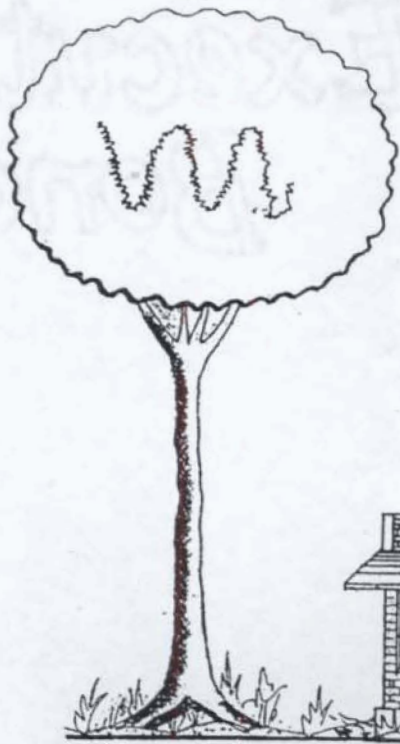
ELEVATION



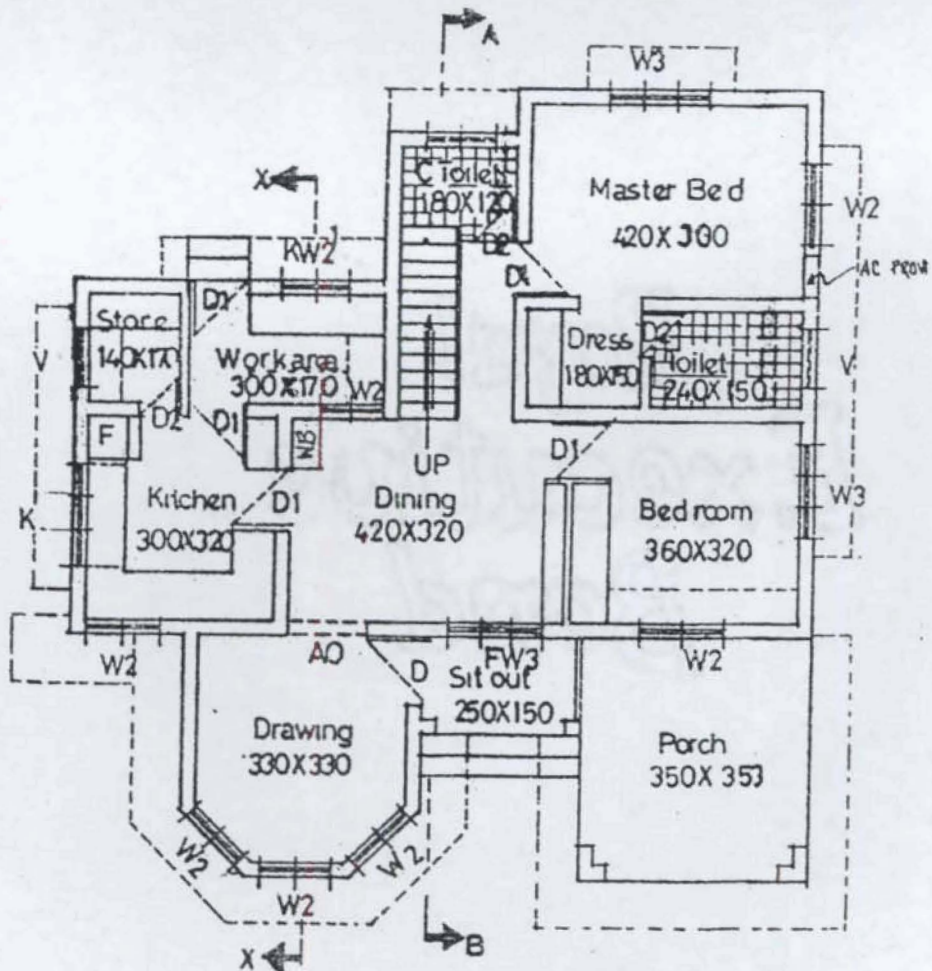
NIRMITHI PLAN-3

PLINTH AREA-1183 SQ. FT.

COST OF CONSTRUCTION- RS. 4,40,000



ELEVATION



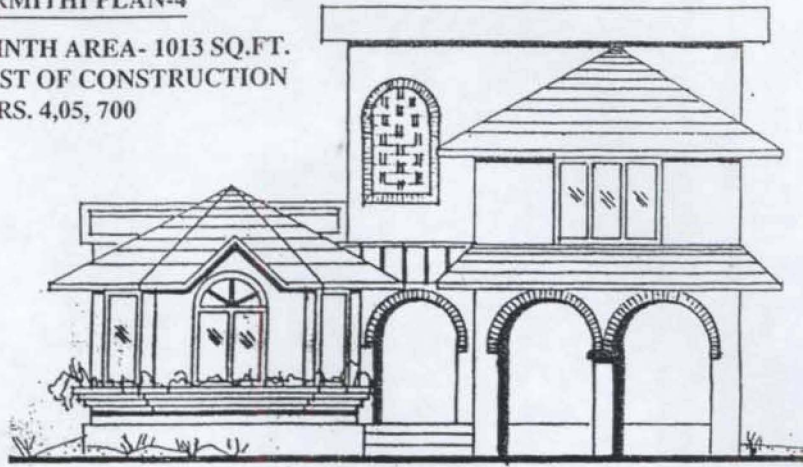
NIRMITHI PLAN-4

PLINTH AREA- 1013 SQ.FT.

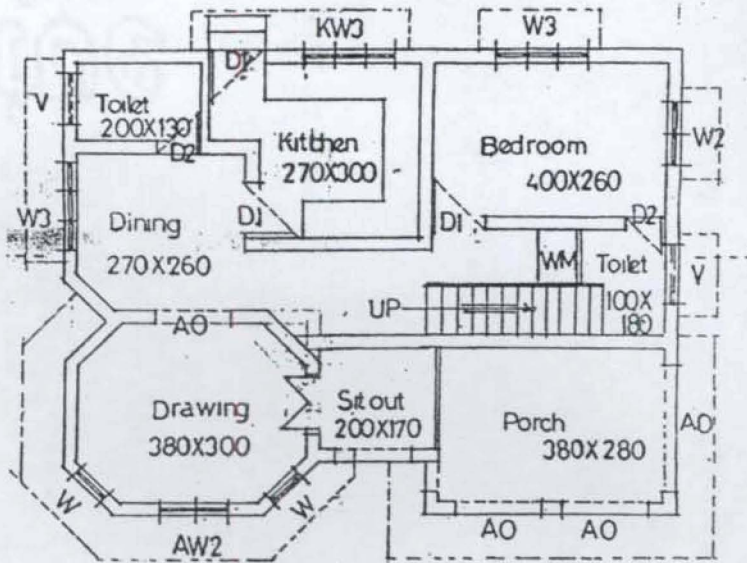
COST OF CONSTRUCTION

- RS. 4,05, 700

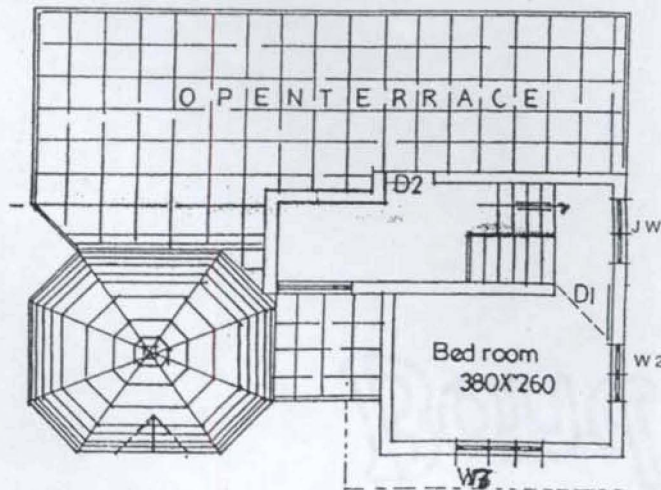
37



ELEVATION



GROUND FLOOR



FIRST FLOOR

Annexure 4

Plan of Luxury Houses

**C.V. Shaji, Architecture, Thavakkara,
Kannur**

(4 Numbers)



FRONT ELEVATION

RESIDENCE AT PULPALLY, WYANAD

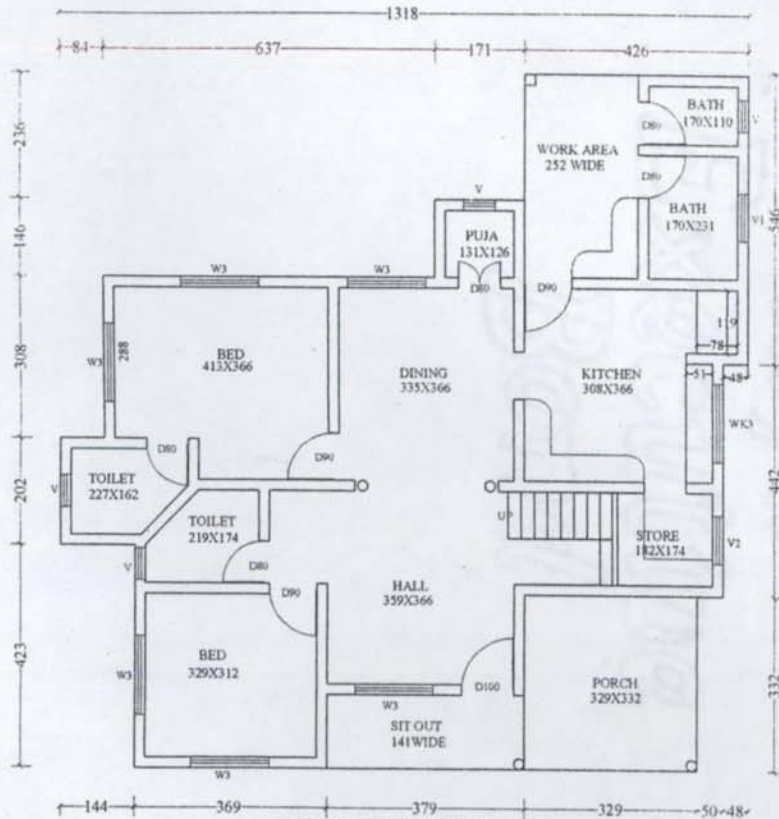
Designed by

SHAJEE V B E (Civil)
Eves Associates
Near Police Club
Thavakkara Road
Kannur.

Plinth Area = 178.80 M²

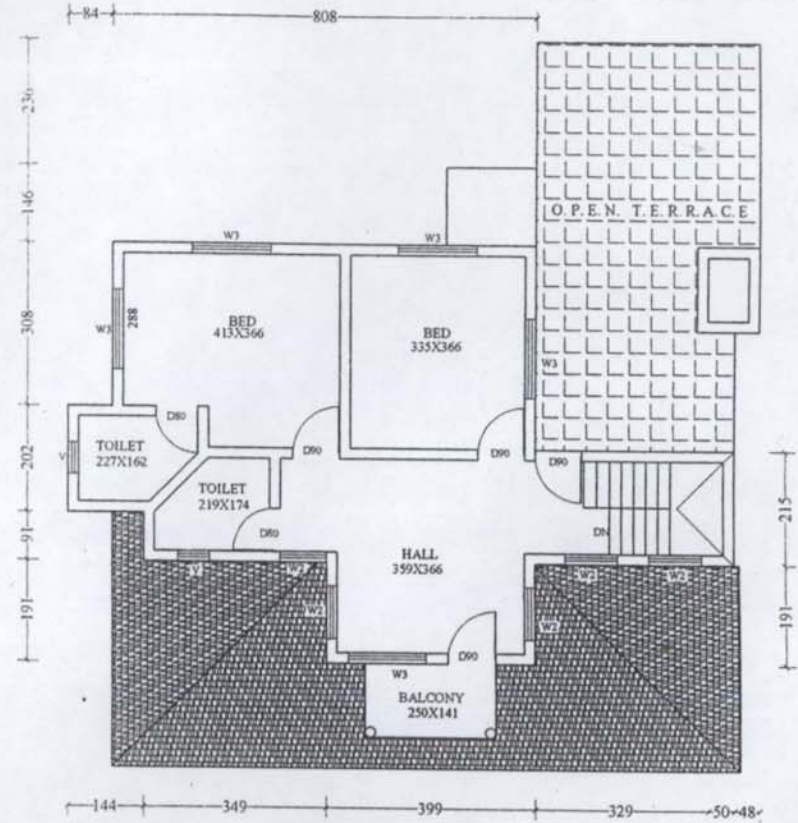
Class - Medium

Cost of construction = Rs. 9,52,000.00



GROUND FLOOR PLAN

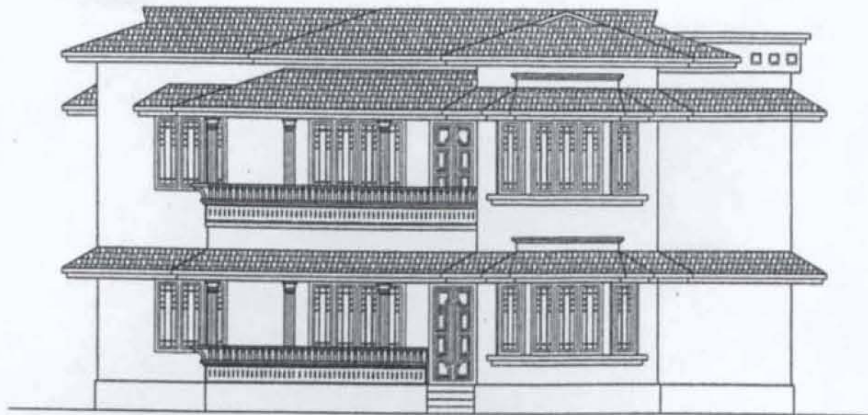
Area = 110.30 sq. m



FIRST FLOOR PLAN

Area - 68.50 sq. m

19



FRONT ELEVATION

RESIDENT AT PALLIKKARA, KASARGOD

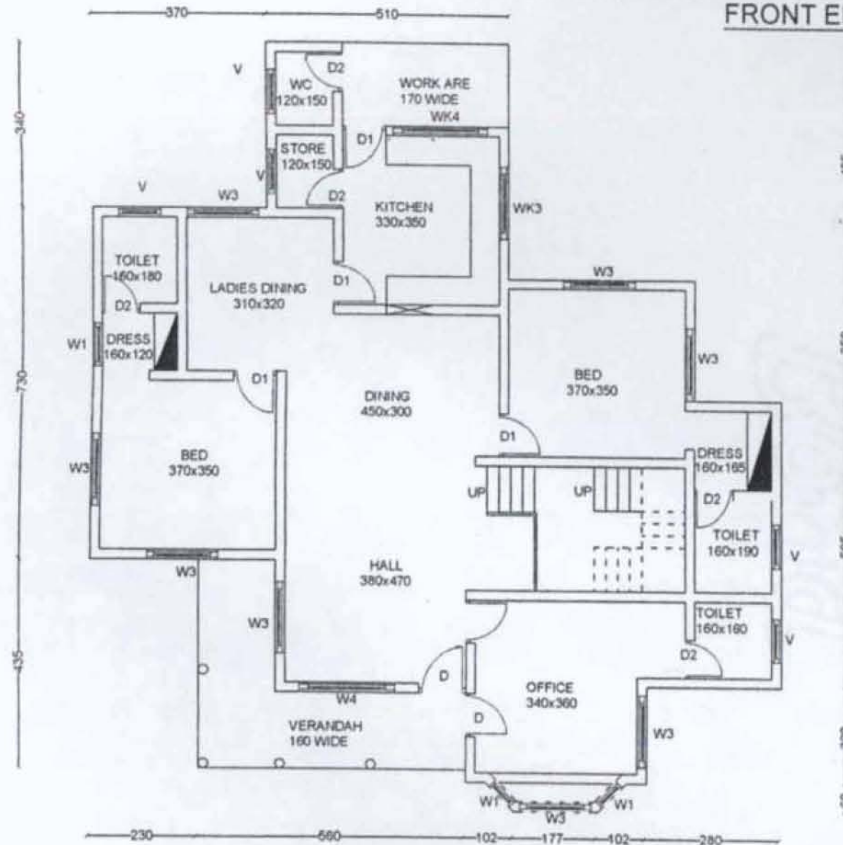
Designed by

SHAJEE V B.E.(Civ)
Eves Associates
Near Police Club
Thavakkara Road
Kannur.

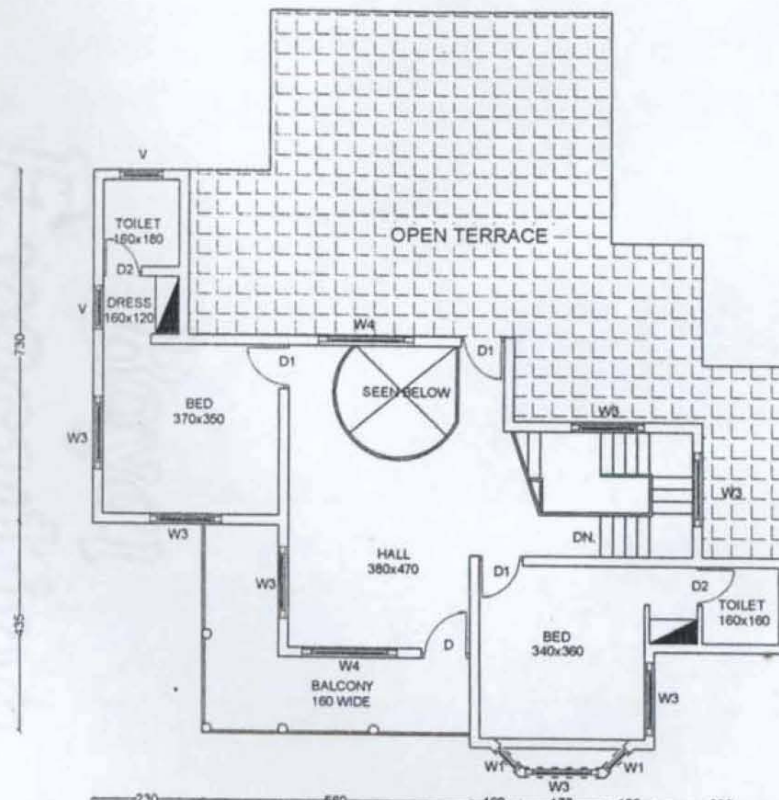
Plinth Area = 254 M²

Class - High

Cost of construction = Rs. 17,05,000.00



GROUND FLOOR PLAN
Area - 170 sq. m



FIRST FLOOR PLAN
Area = 84 sq. m

40



FRONT ELEVATION

RESIDENCE AT KOLACHERY, KANNUR

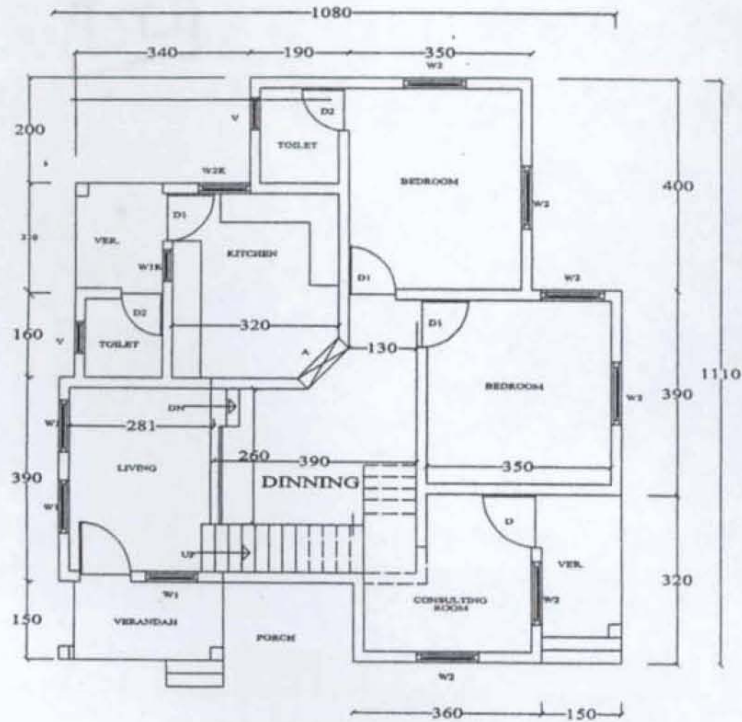
Designed by

SHAJEE V B (CIVIL)
Eva Associates
Near Police Club
Thavakkara Road
Kannur

Plinth Area = 133.44 M²

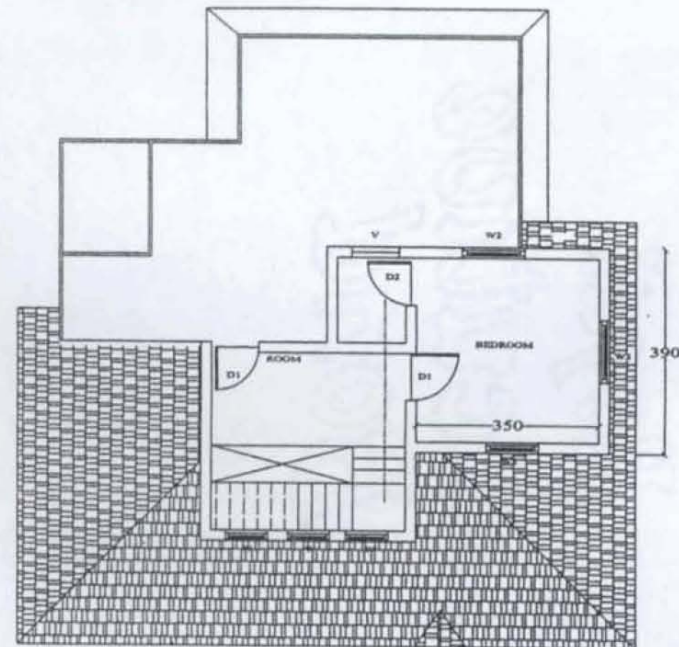
Class - Medium

Cost of construction = Rs. 5,60,000.00



GROUND FLOOR PLAN

AREA = 106.37 SQ. M



FIRST FLOOR PLAN

AREA = 33.07 SQ. M

4



Front Elevation
12/08/21

RESIDENCE AT THANA, KANNUR

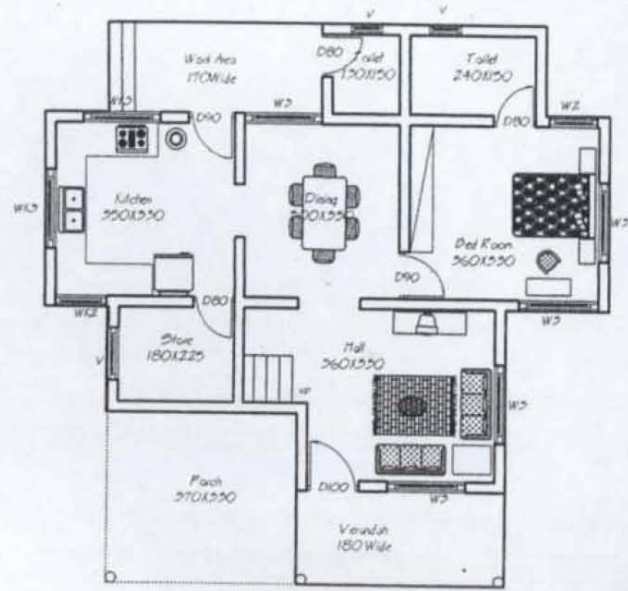
Designed by

SHAJEE E.V B.R(Civil)
Eves Associates
Near Police Club
Thavakkara Road
Kannur.

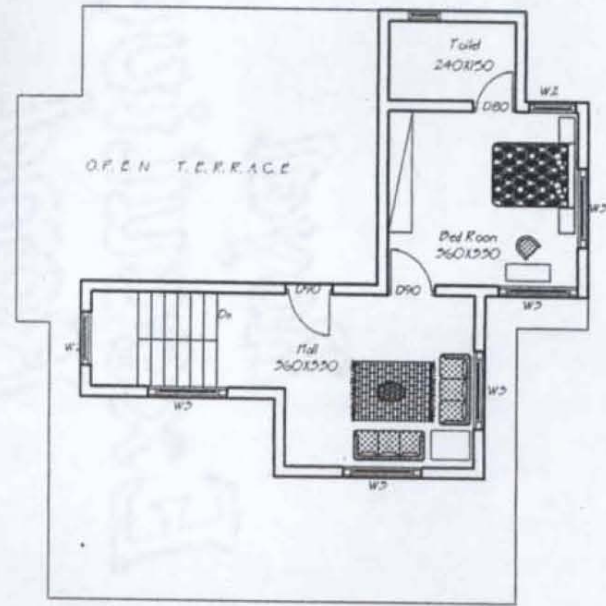
Plinth Area = 121.17 M²

Class - Medium

Cost of construction = Rs. 6.85,000.00



Ground Floor Plan
Plinth Area - 81.17 Sqm



First Floor Plan
Plinth Area - 40.00 Sqm

INTRODUCTION

Rajeevan. K. "Economy of low cost housing in Kerala a study with special reference to Nirmithikendra" Thesis. Department of Commerce and Management Studies , University of Calicut, 2006

CHAPTER 1

INTRODUCTION

An Abode is *sine que non* for every Tom Dick and Harry especially in the sophisticated contemporary society. It is hardly a place of shelter or a spot to repose. The distinction of man from other mortals is also based on his requirements like his own shelter and gown to conceal himself and his physical properties. The gradual alterations occurred in the convictions have created drastic changes in the convictions of man about his food, recreation, apparels and abodes. The undue emphasis laid on the unwanted decorations and illuminations have made the construction of a house an expensive affair. It is absurd and humorous to quote the general statement that I too have a plan to construct a low cost house with a moderate higher expenditure.

Since house is a shelter, it should absolutely contain all factors inevitable for the protection from calamities and full exposure to nature. The aesthetic sense also is significant. The average man with moderate income is expected to depend on his available income for the construction of house. Since we hail from an educated and cultured society we are not content with a shelter erected on four pillars, on the contrary our house should have the minimum facilities, securities, durability and attraction. The general

awareness compel us to make anything and everything distinctive with its own identity.

The reasonable man with prudence is more or less cautious in the preparation of his budget for the short term and long term needs. House is not a trivial matter. The budgetary provisions to be made for the purpose should cover a long term exercise. The cash in hand is only a distant dream and as such the mobilization of fund is a very crucial subject. There are restrictions for the same because the resources are meagre. In short the primary obligations of an individual belonging to the strata of middle income group is to conceive total expenditure that may have to be incurred for the construction of the abode. He should have to reckon all probabilities for and against the estimated expenditure. Even the plinth area relies on the chances of fund mobilization. Hire purchase scheme is available in the modern context but each and every penny is to be returned with interest at exorbitant rate. In short the desirable conclusion is to erect a house with maximum possible conveniences and utility and with the minimum possible expenditure and without any adverse effect on the style, profile, art, architectural value, and external charm.

Since we contemplate on the ranges of low cost constructions from the strand of Kerala, we should take utmost care about the easily available materials in the vicinity of the proposed site. Unfortunately we are more

concerned to import things from distant places to enhance beauty of our abodes. The technical skill is how we should devote to transforming the available materials more usable by application of the modern technology.

Our laterite can be made more alluring by simplified techniques. Hard stones like random rubble are available in Kerala abundant by for constructions. Similarly soft stones with flexibility are also available in Kerala. Normally the regular habitants would become fed up with even precious stones due to the constant use and repeated view of the same. We are aware that the attraction of the costly stones used for flooring is short lived and purely temporary. It is a fact that even costly granites and marbonites lose its splendour and originality within a short spell of time and comparatively fail to retain the glazing as of ordinary red oxide that prevailed for decades in the floorings of Kerala. The complexities of the mind in the sophisticated world coaxes the mass to artificial beauties and the inherent convictions of beauty has made the cost as the determining factor of the beauty of an abode. Conveniences are kept behind. Space also is not acquiring significance. The middle class men are least bothered about durability. Everything is concentrated on pretensions.

The beauty and aesthetic are studied in a distorted manner and without any realistic approach. Our education system should mould a practical concept of house and also the tables of expenditure that the new generation is

expected to be confronted in his future life. A fundamental transformation is required in our aesthetic sense. This is applicable for the craze for ornaments as well as the insistence on expensive abode. House is not a short living phenomena and hence our ideas of abodes should be moulded and redrafted repeatedly before arriving at a conclusion.

It does not imply that a uniform type of residential quarters with homogenous external appearances should be constructed for all the people in a society. This uniform pattern will create monotony. Similarly it does not ensure variety. A harmony in variety is the primary conditions of a flourishing society. It is popularly believed that compulsory uniform patterns and restrictions is not at all beneficial to retain the high standards of society. The system of restrictions is said to have spoiled the thirst for variety in a socialistic community. Hence a change is an ever living slogan. And changes is the only thing that is not subjected to change in the views of Karl Marx. Low cost housing is not at all compatible with the compulsory uniform patterns. On the contrary it is a continuous changing process. The changes are made on the basis of practical utility and without any lesser significance to beauty.

The essence of the research work is to open the vista of low cost Housing. Since a study of the economy of low cost housing in Kerala is closely associated with the social and economical life of the people, a picture

of the economic capacities in the contemporary context of the Kerala is given at the outset itself. However focus was laid on the naked fact that the new approach in the construction of low cost housing is based not only on the expected profit on the contrary it is wisely suggested that low cost housing is a new concept suitable to the social, economic and ecological issues of Kerala. More over the necessity of provincial and territorial interest also are shown as reasons for the novel venture. Ecological aspects also require adequate attention. The economic backwardness only is not the reason for pursuing a more profitable and conducive channel. The expenditure to be incurred for the construction of a house can be minimized by curtailing many extra fittings and costly materials. Plenty of substances with apparent fascination are readily available in the market. Hence it is unequivocally stated that minimizing the expenditure by all hook and crook is not the only essential criteria for the low cost housing.

A dwelling house with an average area of thousand square feet can be completed by making use of different types of goods and articles. The entire flooring work of the said abode can be completed with an expenditure of Rs.5000 only, if the owner is not reluctant to make use of red oxide. Replacement of tiles, marbles or marbonites with red oxide is not the objective of the low cost housing. Similarly inferior quality of tiles can be substituted to avoid the expenditure estimated for terrace roofing. The hollow bricks are suggested with diverse purposes. Hollow bricks ensure sufficient

air inside the rooms and curtails the weight of the dwelling place. Hence there is an acceptable conviction behind the introduction of hollow bricks. Clay is a raw material essential for the production of tiles. Many tile factories in Kerala confront the apprehension of shortage of the required quantity of clay. The availability of clay has evidently become a serious concern. Hollow bricks can be manufactured even without a piece of clay bar. Thus low cost housing is evolved as a substitute and remedial measure. Beauty is a philosophy with affinity to practical use. Clay bricks will not be beautiful at the first sight. But the thought of constant use of the same will persuade a customer to abandon all other flooring materials and rely on clay bricks. Beauty is subjective and relative and its value can be estimated only by utilitarian yard stick. This utility does not reckon external beauty only. It has been intentionally emphasized. That low cost housing is a rare opportunity for the middle class income group people for constructing and possessing with maximum facility and minimum debts.

Even though various aspects of expenditures are not fully revealed sufficient space has been set apart for the analytical approach of the construction activities of housing from the angle of expenditure. Since the majority of the people are subjected to unbearable tribulations of life in Kerala, minimizing the expenditure under different heads has become compulsory. There are short term and long term expenditure. Similarly there are recurring expenditure as well as bulk expenditure only in the beginning.

Construction of a house is an expenditure that can be categorically grouped under long term expenditure. A huge amount is to be spent in the beginning for the construction of house. Naturally nothing is to be provided for the maintenance and other expenditure during the initial days. A meagre amount may require during interval to attend to unforeseen damages like leakages. But it is invariably different from long term expenditure. The average people of Kerala are much bothered of knowledge and education. They are even thinking the installation of computers and internet in their tiny cabins. The primary school students also boast that they are well acquainted with the primary lessons of computer. There is no house without a radio set or a newspaper. Most of the houses are equipped with telephones water and electricity connections. We used to communicate with people at far away places from our drawing room with the help of telephone apparatus. A house without milk packets and gas cylinders is rare in the urban area of Kerala. In spite of the debts accrued by hire purchase and the instalment scheme, the middle class people in Kerala are not in a position to move without a refrigerator, washing and grinding machines. These are all unavoidable expenses if the Keralites. It is a matter of their pride, dignity. The lions portion of such expenditure is non-recurring and permanent. Hence an overall study of the different expenditure leads to a subject matter for research work especially in the contemporary situations of Kerala. The research work is oriented on the different aspects of expenses to be incurred for the

construction of a dwelling house and how it can be curtailed without sacrificing the splendour and grace of their abodes. It is not a mechanical approach since the expected life time of a house is about 40 years. The research can be concentrated on the easier tracks by suggesting cheaper materials for the construction of houses. There is no such guidelines anywhere in the research project. Good quality stuffs are only advised. Besides the distinguished institutions like Nirmithi Kendra has laboured much in insisting the use of superior quality goods with less expenditure. The research is not associated with expenditure only. It has its own scientific and hygenic angles. Otherwise the ordinary people would never have heard of Hollow bricks in lieu of country stones. We have to yield to practical reality that the constant use of a particular type of laterite, sand, wood would naturally leads to the scarcity of the goods. It can never be easily replenished. The clamour from different corners against the merciless extraction of natural ingredients has become habitual in Kerala. It is a situation from where we have to open our eyes. The expenditure side also is crucial and pertinent. The expenditure required for the plastering of the total walls and ceiling will be un bearable. Naturally an average man would not have calculated such a huge expenditure before hand. In one sense it is not an anticipatory expenditure. Any research program pertaining to the construction of low cost housing should pay more attention to the expenditure for plastering. The experiments under taken in Kerala with hollow bricks and un plastered walls

have proved that the total expenditure can be reduced by 25 to 35 percent only by these two aspects.

We have learned from experiences that the natural objects and materials are not perennial. The existing stock will become exhausted gradually and lost forever. There will be practically no use in lamez, find later. However we are fortunate that the inclination of the technical expertise in Kerala have already projected many feasible outlets. Nirmithi Kendra is a good instance of study. There are hundreds of manufacturing units in the different parts of Kerala which produce adequate quantity of hollow bricks, country bricks and tiles. It has been proved that the use of hollow bricks is beneficial, when examined from the hygienic angles. We are indebted and grateful to the honorable services rendered by HUDCO and such other parallel institutions which undertake training program especially on the methods for the use of unexplored sources of materials. The use of hollow bricks is not the realization of a single dream. On the contrary it is an outcome of the ceaseless efforts rendered by HUDCO and others. These training program have acquired intended result also. A new awareness has already been created and a new aesthetic approach has already been accepted.

A fundamental change will take place if we are all ready to accept the abrupt solution of minimizing the expenditure by giving up unnecessary expenditure sides. We are expected to wake up from the conventional

slumber and get ready to cope up with the realities. The gradual increase in the population and tendency for nucleous families have made it compulsory to turn towards the construction of new dwelling house. The joint family system¹ have already become collapsed. The unexpected havoc caused by in surmountable Tsunami waves have wiped off thousands of dwelling apartments. In short the construction of houses is a must. But the source of money to be gathered for the purpose is meagre. This has driven the educated people of Kerala by diverting to the area of construction of houses with low cost. Massive scale of construction of houses is required especially at the time of natural calamities. The Govt. of Kerala, Govt. of Tamilnadu and the Central Government have prepared estimate for the construction of the houses for the victims of Tsunami, while the estimated cost of a single dwelling house is 2 lakhs as per the schedule of Govt. of Kerala. It is only Rs.80000 for the Govt. of Tamilnadu. The central cabinet also proposed the construction of houses for poor people with an expenditure of Rs.40000 only. Naturally the Govt. of Kerala will have to answer for projecting such a huge expenditure. They may try to convince that the plinth area of the proposed houses is comparatively wider than that of Tamilnadu. In such context the area and width only are not the factors to be considered. There is no need for constructing a spacious house with an plinth area of 800 square feet,

¹ Joint family:- A large family which has a greater generation depth than nuclear family and members of which are related to one another.

especially when the land is very scarce. In a nutshell clear observations on a novel topic like economy of low cost housing is significant in relation with socio economic angle. Apparently it may be superficial examination on a down-to-earth subject with the sole intention of curtailing the expenditure that is to be made for the construction of a average living place. It carries a marvellous, ethical and philosophical conviction also ranging from the common cost of divine aesthetics. The hasty and conventional life dimensions have arrived to the conclusion that residence is not a mere shelter. On the contrary it is a piece of our dream. Hence every essential paraphernalia is to be equipped with and the house should be furnished and decorated and even illuminated to the maximum possible extent. But every economic theory and life concept repeatedly convince us that it is an art of “not ends” but also one of our “means”. This “means” in the materialistic sense is money, and a good artist, which ever may be the field, will do his best to achieve the “means” for the fulfilment of long term or short term project. Housing is a long term project. All the scheme pertaining to the low cost housing enlightened us that the maximum loans that can be taken for the construction of a dwelling point should not exceed our repayment capacity even if a long span of time is available for the repayment of the liability with interest in instalments. The feasible method is to utilize the possible and available amount to the fullest possible capacity. The available avenues offered by low cost housing program is the apt solution. The only

requirement is our concentration on the means and preparedness for restricting our dreams. Evidently it is a thorough reconstruction of our convictions and ideology. If it turns out well and good, it would naturally enable us to arrange all our future programs with a convenient schedule. Hence in a broader sense the principles of low cost housing renders the primary lessons for making life, “healthy, wealthy and wise”. It is a dogma descended to this earth, a succour for every Tom Dick and Harry. The constructions rendered by the distinguished institutions like Nirmithi Kendra, Cost ford, Sankers Habitat etc are worth mentioning in this context.

A research scholar should never be dumb and blind to confront the realities. It is to be admitted that the subject is a virgin one without instances and precedent. There are numerous bottlenecks to the research work to go ahead. The scope of it is wide like ocean. But it is a domain without crystal clear pathways. Besides it is not facile to convince the mass that all ventures of low cost housing are credible. Even though the variation in the cost of construction is fascinating the same consumer should be willing to abandon many of his age old convictions and interests and embrace a new technology. He should be contended with a wall which remains unplastered. He should gradually become reconciled with the beauty of the saffron colour of bricks. It is not a trivial affair especially for an ordinary man who is accustomed to the perfect spotless white colour of his wall. In spite of all the impediments this techniques will teach the modern world that the construction of a house is

not an ordinary easy program. But one with a wide range of possibilities to be opened adhered to if the consumer is so particular. This unexpected new turn of life will replenish new ideas and convictions in him. If the method is adopted in a massive scale it would automatically alter the life style itself from crest to heel.

Herculian efforts have been made to accumulate maximum possible datas and survey reports since the same is an untouched field. It required adequate evidences without which no one will dare to enter the fresh field. The consumer should not be bare footed. That is he should be equipped with a fair knowledge and he should be thorough with primary lessons. Even though the low cost housing is an entirely different branch of study in the contemporary social life, there are sufficient experiments with remarkable success carried out in the different parts of the nation. This tiny state, Kerala is also having good examples. There is no area through out Kerala without a single low cost housing. It occurred only due to concerted efforts of institutions dedicated for the purpose. It is to be believed that more than one lakh houses might have already been constructed in different parts of Kerala under the guidance of Nirmithi Kendra and Costford. Many other units also have emerged with their technical skills, but with slight alterations in designs and the consumption of materials. But they do agree in one thing that the materials to be used for the housing should be visible in the premises. This is emphasized not only because of the reduction of the cost but also because of

the ecological and environmental issues. Low cost housing lays stress not only on the external beauty, but also on the durability. The durability can never be attained by repeated use of pesticides. It is fair to select articles which can withstand the decay without any harm. Thus the low cost housing techniques involves a search and conclusion from A to Z. This research work discloses experiences of Nirmithi Kendra as well as Costford. The low cost house envisaged and subsequently materialized by these renowned institutions are not rare in Kerala. The study of contemporary social life compels to touch the remarkable achievements of such concerns. The monuments of the ceaseless efforts lay bare as examples. As a part of the introduction efforts are made for the comparative realization of the differences in the expenditure for the construction of conventional and traditional housing with low cost housing. Similarly the datas collected and included in the research work will be reticent with out necessary explanation.

Even though low cost housing seems to be a modern phenomena it is clear that efforts have been initiated for the purpose from time immemorial. Naturally this idea should have been cultivated from the time when man has made up his mind to design and construct dwelling houses under the pretext of security and secrecy. The literature in almost all the languages including classics and mythological works have some kind of imagination regarding the abodes. Sree Rama had left his palace with his devoted and dedicated wife for fourteen years. He had deserted palace and conveniences. But during the

wanderings and pilgrimages the God might have thought of types of dwelling places for the temporary stay. Sitha obtained solace even under the shelter of Ashoka tree. Since residence was not a burning issue like bread or gown, no serious studies might have been made in the ancient literature. It did not deserve much attention in those days. Population or shelter were not the issue of the time. However many indication in this subject are visible here and there. Maximum strain has been exerted in unearthing many such valuable pieces of information scattered in ancient books.

The research work is not said to be satisfactorily completed, if the names of pioneers in the contemporary context like Laurie Baker, G. Sankar, Prof. Yougin, Eapen George etc are left unmentioned. Detailed references of these authors and their books with the significance of their findings are mentioned in the second chapter in detail. A research scholar who may tread on the track in future will be highly conclusive because the path is cleared without any shrubs.

The credit absolutely goes to eminent persons like Sri. Anand Bose who had laid the foundation for the idea of Nirmithi Kendra in 1985. The unexpected havoc taken place in Kollam area in the year 1985 was an eye opening incident. Sri. Anand Bose IAS was the district collector of Kollam at that time. The flood had annihilated numerous dwelling places and the sufferings of the orphans and victims were unbearable. When the generous

hearted people expressed compassion, Sri. Anand Bose hatched a novel idea of constructing dwelling places in large scale as a remedial measure. Solution will be appreciated more than compassions. Compassion is not beneficial and as such is not a solution. Hundreds of houses were built at a stretch with Sri. Anand Bose at the helm. A new idea sprouted in his mind. Construction of large scale houses as propounded by Laurie Baker and others is a patriotic act rather than utterance of slogans. Later his footsteps were followed by many. The earthquake in Maharashtra especially in Lathur is unforgettable events of history. Almost all the houses in the area were demolished or shattered by the earthquake. Many institutions and medias came forward not only with their purses and luggages but also with the proposals for the constructions of dwelling places for the innocent folk of Lathur. Kerala also did its best and the houses constructed by Keralites are still visible in Lathur as the token of generosity and belief. The latest incidents of Tsunami was a peril in a wide sphere. In one sense it was a universal phenomena. Charitable institutions hastened for the construction of houses for the poor Tsunami victims left unwanted by the havoc. Whenever we look back from different angles to the long parts of the history, gratitude is an emotion that is expected for the sincere and dedicated services of the people like Ananda Bose. The contribution of Laurie Baker also cannot be left out and unmentioned. Laurie Baker is not only a man of ideas, but also has a heap of ideas and practices. No idea will become eternal, as long as the same is found genuine in practical

applications. In this respect Laurie Baker has unique place like Newton and Einstein in the modern physics.

Individuals and their isolated contributions are kept in abeyance for the study of group work and institutional efforts. The name of Nirmithi Kendra, Cost ford are today well known to the ordinary people of Kerala. We are all conversant with many aspects of the organizational behaviour and entrepreneur techniques of Nirmithi Kendra. Many different branches with the same motive have been recently sprouted and caught attention. A lions share of individual, and experts produced by our engineering colleges have resolved to concentrate their attention for the study of low cost housing. Thus all experiments in Kerala are supported and upheld by experts and experienced persons. It is practically difficult to mention the names of all the persons and organizations concerned with this subject. Thus it is resolved to expose the potentials of two distinguished establishment called Nirmithi Kendra and Cost ford which can be used as a mirror and cross section of the reflections of all the services and contributions they undired in this field.

This study is not exclusively restricted on the models in the present context. On the contrary the pros and cons of earlier dwelling places constructed in the past also have been referred to. Even though it may occur as absurd that the huts also have been brought into the preview of the study. The significance of the easily available materials for huts compel us to focus

on the possibility of retaining the earlier cult with necessary modifications. The conventional thought twisted our imagination to the unwanted convictions that the residence should be like durable and built with hard material like stones and tiles. Later we have become convinced that the durability of any goods is limited to a particular period like four or five decades. The tastes and fashions are also gradually changing. It is just like a cycle of events. As such in the course of circular movement styles in the remote past becomes fascinating again after a particular period.

The luxurious and star hotels and spacious mansions used to set apart certain space in the top of the building for roof thatched with coconut palm leaves. It makes the atmosphere cool and serene. Since this is comparatively cheap affair even the people hailing from middle income group and lower strata may accept this method in due course. It was not to create a bad impression on the ground that the minority group on the top are also not reluctant to abandon this new method.

The durability of dwelling places and the perishable nature of materials applied is a psychological issue. The earlier concept was unknowingly embedded in the idea that the building erected can withstand the attack of time for ever. Naturally our thought also became concentrated on the idea that the only prerequisite for the construction of dwelling house is that they should be made of durable goods only. Durability was the only criteria in

those days. Gradually it faded and we were enlightened by experience that durability does not denote eternity. This new awareness turned our attention towards aesthetics and novel models. Palm leaves are abundantly available in Kerala. The coconut trees also will decay after 30 or 40 years. The whole work of a middle class house can be completed with the use of 10 or 12 full grown coconut trees. Other woods available in Kerala also can be made use of for the construction of house without much cost. The modern sophisticated world which works on the orbit of technology ensure safe chemical applications to prolong the life of many soft and cheap woods. Large industrial units established in Kerala provide this chemical synthesis for the production of attractive wooden furniture. This method can be extended to the field of house construction also. Such soft woods and coconut trees can be planted with good object of constructing houses. The cultivation can be encouraged in a large scale. The existing example of extracting huge profit is by serving and selling tender coconut without any damage to the coconut trees. They are used as soft drinks through out Kerala, even outside. The cool water in the tender coconut is healthy, nourishing and tasty. This has taught us that coconut trees and many other soft woods like rubber can be planted and cultivated with multy dimensional objectives.

The kitchen and the fuels constantly used is not an old fashion in Kerala. No single house is seen in the urban area without LPG connection. The wheels of Indian gas have crawled on to the interior corners of our rural

areas. There is no scope for the application of dried coconut leaf as fuel and fire wood. The domestic requirements wisely and cunningly erased wood and coconut leaves from our kitchen. It has been replaced by the quick and cheap liquified petroleum gas. No crisis in this respect has yet been emerged. When a new taste is cultivated, these dried coconut leaves can again be made use for the roofs with different hues or variations for thatching. Coloured coconut leaves were not seen in the ancient times. Naturally this will enhance the possibility of female labour. Moreover it may kindle the prospects for domestic productive units.

However the research work gives emphasis on the low cost houses in the contemporary context. Eventhough there is a homogeneous approach, variations obtained from different units should also be studied with adequate caution and care. A comparative study of the low cost houses with the available terraced houses made of cement and mortar and with the firm plastering discloses that 20 to 30 percent of expenditure can be curtailed simply by avoiding unnecessary structures materials, labour and un-wanted fashions. While the construction is deliberately made in large scale, the expenditure can reduced again and again. A cluster of houses can be erected in a remote area with cheap cost of land. When construction, in a large scale is completed in that spot all the facilities can be provided in due course according to the clamour of the group.

The majority of the units engaged in the construction of low cost houses prefer to consume country clay bricks in lieu of stones, cement and bricks. This is intended to cause the calm and cool atmosphere inside. But certain factors are to be anticipated in this regard. There are numerous units for the manufacture of country bricks through out the state. They are running with sufficient profit. The raw material of the bricks is the clay taken from the barren paddy fields and certain river banks. When the quantum of clay exploited for the bricks is in the high, we can expect scarcity of clay in the nearest future. It has already become a burning issue of Kerala and has adversely effected the proper functioning of tile factories in Malabar. They have ceased the production of tiles and bricks only due to the scarcity of clay. So the industrial units concerned with the low cost housing have to chase for new and profitable products. This has paved the way for the emergence of cement bricks. Certain units concentrating on the low cost housing have turned to the random rubbles in lieu of country bricks. Even though the space absorbed by random rubble is comparatively more than the country bricks, the cool atmosphere especially during the summer days will be safely protected by them.

Apparently there are different models of houses they vary in the size of the house and the cost of the materials applied for. Similarly the plinth area also is a prominent factor. It will never attract the mass with their homogenous and identical appearance. Man believes in variety and the units

and societies engaged in the low cost housing should impart necessary directions in this field.

The research work has however grouped this different types of dwelling places into three units for the conveniences of the study. All the houses can be generally grouped and set apart in these three groups. They are

1. Houses for high income group.
2. Houses for middle income group
3. Houses for low income group.

Since the materials used are the same and without much variations, the difference in the cost of construction depends on size of the houses. More over methods and style adopted also resulted in the difference of the cost of construction. In short the plinth area and the quality of the material are the two unavoidable factors making change in the cost of construction on the basis of low cost housing.

Certain models of blue prints are *sine-que-non*¹ for detailed study. Illustrations are exhibited. They were prepared by well versed civil engineers with adequate experience in the field. For the convenience of the study comparison is unavoidable and as such four or five models of each income group are separately furnished. A glimpse of the estimate and models

¹ *sine-que-non* = essential condition.

will enable us to grasp the variation in expenditure. It is true that the cost and expenditure will soar up if we are more prone to make use of costly materials. When brass nails are substituted for cheap goods it will topple our estimate. It is contrary to the principle of low cost housing also. According to a rough estimate the expenditure per square feet will be between the range of Rs. 250 to Rs. 300.

If a thorough change in the field takes place more and more civil engineers will turn towards the construction of low cost houses. When their intelligence, skill are dedicated for the purpose, and unparalleled leap may happen in this field.

A new awareness bloomed in this area of operation has attracted novices to the track. One sector or such newly introduced genius is perfectly dedicated and has deliberately chosen this new sphere utilise their skill and eminence for the sake of the nation. Profit is not at all motive for such honest group. But the capitalistic structure of the nation is greatly guided by the profit. Hence a lions share of the engineering and administrative skills are more interested in amassing wealth. The rate of profit is the sole motto persuading them. The entry of such vicious circle will make the track stained and tarnished. It will spoil the sanctity of the object and the persons with noble principles will soon become dejected and frustrated.

Evidently the success of the new project relies on the interference of the experts. They should be alert and acquainted with up to date modern trends. The task is purely based on the reduction of cost and expenditure. An increase in the number of men craving for the construction of low cost housing will gradually increase due to the reduction in the expenditure. Unfortunately evil forces have crept in the isolated ventures and also in the institutional tracks. They are reigning un hampered and un interrupted. There is no arrangement to examine the progress in these newly introduced schemes. The amazing capacity of such socially motivated units can increase the uncontrollable continuable existence of private enterprises. It is highly pathetic to see that the profit mongers have already ensured their domination. The research project has kept sufficient space to project the corruptive trend that will spoil and mar all possible potential for the low cost housing.

Kerala is a distinct geographical sector with moderate climate temperament and the consequent conveniences ensured by the climatic conditions redeemed from two extremes. Naturally the blue print for the dwelling places of Kerala should be formulated absolutely in tune with the existing environments. Apparently the structure designed or materials consumed should be compatible with the mediocre climatic equilibrium.

The basic concept of low cost housing is solely relied on the expenditure side. But it does not imply that all other factors to be ignored.

Dwelling place is a primary requirement. But it has been gradually altered in consonance with the aesthetic standards accepted from time to time. However the undue significance emphasized on the external hallow has become mitigated to the minimum level. Durability is another essential ingredient on the study of construction of residential quarters. It has become crystalised in the minds of laymen that the dwelling places are transient and perishable. Hence dwelling places are to be designed with a view of effecting gradual modification and maintaining the beauty and stability up to a limited extent of time. All institutions associated with the construction of low cost housing have given due regard to a particular period of time. That may climb up to 40 or more years. If a large amount is set apart for this purpose of 4 decades it will be a sheer waste especially on the ground that the materials that can be obtained at the time of demolition can never be made use for reconstruction. On the contrary if wooden planks are used they won't become marred and white ants can never conquer them. If the entire structure is expected to remain for 4 decades the wooden parts which are costly will remain there for two or three generation. Thus the selection of wood is a crucial question especially in connection with the construction of low cost houses. Expensive wooden planks or beams can never be made use by the poorer sections in the society.

A new research oriented program is to be instituted in this field with a view to increase forest cover with high yielding capacity and grow them in clustered mass. A deliberate venture for the cultivation of such trees will turn out to be prospective. Certain trees are there which grow without any manure or even a drop of water. There is scarcity of even drinking water in Kerala in recent times. Hence the trees selected should be one that grow fast and even in dry shriveled land.

The afore said features are some of the worth mentioning aspects of environment friendly technology. It will be futile to focus on the wooden part only because there is a concept for low cost housing without a single piece of wood. Thus a detailed study pertaining to the materials required for flooring, roofing, plastering and many other necessary extra fittings is highly essential. There are plans of low cost housing schemes without the use of ordinary laterite. Clay bricks are substituted. The eco-friendly issue become active when we deal with the manufacturing of clay bricks. The recent studies elucidates that the continuous use of the clay especially from the paddy fields makes the land barren and a burden. It will have adverse effect on agriculture also. One of the grave problem to be confronted by the technocrats of low cost housing is about the suitable material with which clay bricks can be manufactured. Since clay is not available abundantly and will become a distant dream in the long run, their attention is to be concentrated on the

appropriate substitute like wooden pulp, plastic bricks etc. But the pioneers in this field would vehemently oppose the idea of leaning on the plastic bricks. It will be totally against the eco climatic and environmental ideology. We are not prepared to put an end to our ventures on the basis of certain foul plays. Concrete ideas should be there in lieu of abstract once. A narrow idea is given here for a study at a glance. Detailed findings on the climatic and environmental tussles will be given elaborately in due course.

Differential proportion in the estimate of housing is highly complicated and dealt with the council of experts. Similarly comparative charters and plans estimates and consolidated indents are required to enlighten the mass about the feasibility and profitability of the low cost housing designs. However a glimpse of the same has been make here just to make a reference.

The preparation of an estimate and budget is equally valuable and desirable like the blue prints, survey and plan of the house. The latter is always subject to the amount available with the concerned for the construction. It varies in terms with increase and decrease of funds. In the normal case a good instance to be indicated is the context of flooring. The majority keeps it in the bare yards of the minds and will drag it to reality at the last phase. Even though the consumer is not aware of the pros and cons of the subject, his sole idea is to make use of the most expensive substance for flooring. Their taste is guided only by the external charm. And it will be

absurd to condemn them for the same. Beauty is in all respects a criteria and a measuring yardstick. Their clamour for external beauty can be destroyed only if appropriate substitute is readily available. The new experiments in this field with clay and ceramics have almost touched the target. The primary requirement is to convince the people about the total cost to be expended for the flooring by making use of different objects. The comparative study can be completed only with the help of diagrams and tables. In one sense it is an easy affair. The low cost measuring area is fixed as unit "1x1" ("one x one feet"). It will be one square feet. A very small room with a size of 10x10 will cover an area of 100 square feet. A room with the measurement of 100 square feet will not consist maximum convenience. If additional convenience like installation of double cot, reading table, almirahs etc. the width and length of the room is to be extended by 2 feet more on both sides. Then it will about 144 square feet. If the consumer approaches a vendor he can soon realize that the cheap mosaic slabs will be available in the market with the size of 1 square feet at the rate of Rs.20 or 25. If the material cost is Rs.25, Rs.5 to 7 need to be set apart for laying charges. However the total expenditure for flooring with the ceramic tiles of inferior quality will be Rs.30 or 35 per square feet. When calculated on the basis of this the flooring of a room with 10 x 10 sq. feet by making use of such ceramic tiles will be approximately Rs. 3500/- excluding head load and transportation charges. This example is very easily digestible and can be made use of for comparative study. However the

principle of running even after the inferior types of ceramic tiles is totally in consistent with the dogma of low cost housing. Hence the exponents of low cost housing should bear in their mind that the total cost for the flooring work of a room with a size of 10x10 feet should never be above Rs.2000. But utmost care and devotion is needed to make the flooring equally tantalising. Otherwise the natural trend for oasis will start functioning in their wicked mind. Man has become much reformed and refined and he is not nearly contented with superficial apparels. He should be convinced about hygienic significance of natural objects. The detailed study on the variation in cost by minimizing the use of wood and unnecessary exits and entrances, casements and porches will be dealt with separately.

The research scholar has optimistic view of the universe and various subject under the horizon. The entire research program will be concluded with a detailed summary and conclusion. Now the research scholar is keen in investigating the possibilities for the low cost housing with the soft vegetation of Kerala. The new technology should be devised and a new ideology should be cultivated. More over the final findings is expected to penetrate in to the crude minds of the people and shower a new light in the vicinity. It will be a blessing to the pathetic economic structure of Kerala where the edge of the graph is always turned downwards. If a new understanding is born, it will create an opportunity for the multitude to construct their dwelling places with

very limited expenditure. Recent experiments by individuals and institutions like Nirmithi Kendra have established that low cost housing is an amazing phenomena which tells the tales of realities.

THE ECONOMICS AND
SOCIAL CONDITIONS IN KERALA
IN THE PRESENT CONTEXT

Kerala may be a drop of tears in the map of India in the imagination of a poet. It may be a piece of land with torrents of monsoon for the expertise in geography. Certainly it is a “rich land with poor people” in the perfect vision of an economist. It is amazing to attribute the word ‘rich’ to the land of Kerala with paradoxical link ‘poor’ to the inhabitants of the land. The word rich is deliberately given due to the valuable resources in the reservoir called Kerala. Our exchequer is much obliged to the landed property of the territory. Kerala is blessed with the beauty of nature and the panoramic views in and out. The index in the graph pertaining to the industrial development of the state is perpetually with downward trend. The densely populated state mars the prospects of numerous industrial ventures that may disturb the equilibrium of nature and the ecological balance. The most alarming aspect of Kerala is the unemployment issue. The per capita income is gradually decreasing and the prices of essential commodities are always on the increase. Even though there are programs promoting saving tendency, the last decade is highly pathetic to witness the collapses of all saving schedules.

The joint family system that prevailed in Kerala through out the last century also is on the verge of disappearance. Nuclear family¹ set up have already emerged and it is amazing to note that the construction of a house for the newly wedded people is the burning issue and the pre requisites the pregnancy. The newly born child should be acquainted with new firmament. Such burdens also cling stubbornly on the shoulder of Kerala like the old man in the legend. The period of honeymoon is vexed with the mathematical calculations regarding the construction of new house without affecting the regular income. However this has made the modern man in Kerala more reasonable and practical. He is not reigned by sentiments. But it is highly pathetic to see that the notions of an educated young man of Kerala coming under the category of middle or lower income group is guided by pretensions and vanities. He is not frank and honest and he is least bothered about the debts and credits. He is in the pursuit of all available avenues extending loans. He is not prepared to make necessary adjustments in income and expenditure to retain stability. His convictions are mostly moulded solely on hypocratic hypothesis.

The layman who is at liberty to enjoy credit facilities at his threshold itself has no reluctance to accept any amount of loan. He is hardly aware of the unbearable stipulations and exorbitant rates of interest. Since the credit

¹ Nuclear family : A family consisting of only parents and their children.

facility is abundantly available, the consumer is not much worried about a higher amount of loan. He is not prevented by the repayment capacity. Naturally the dues will accrue due to unpaid instalments which will by degrees, become a huge amount that the buyer can never fully repay. The newly constructed house which is hypothecated to a Bank will be confiscated by the bank or money lending institutions under the provision of revenue recovery act. A residing place should be considered as one that the consumer should be able to maintain for a long time and monthly or weekly instalments or periodical payments should be one that the debtor can normally handle.

House is a basic requirement especially in the modern context. While a citizen of Kerala, spare a lions share of his income for the construction of a fascinating house, he is ignoring the importance of other basic requirements like education, clothing, travelling, entertainment and health. Unfortunately people of Kerala are more concerned with spending money for the construction of huge mansions. In many other urban areas like Bombay and Culcutta the ordinary people are not at all worried about possessing a huge and fascinating abode. They are content with two or three tiny rooms, a sit out and a kitchen. Some of the millionaires in Mumbai do not prefer to spend money on the construction of a new house and staying in a rented house. Such a trend to waste a huge portion of the income as dead money has to be dissuaded by creating the feeling that even rented houses are adequate to meet the purpose. Mere possession of a mansion will never ensure any earnings. A

deposit in the bank, even if the rate of interest is lower is preferable and more profitable. But there are specific rules concerning the same. The social development is not ascertained by the glory of the house that a man has constructed. Interference of the Government with the aid of legislation is inevitable. The revenue and finance department can easily impose high rates of taxes for the luxury type abodes. The tax and duties should be different in accordance with the number of rooms and plinth area. The total expenditure involved for the construction of the house is the acceptable criteria for fixing taxes. Thus there will be a general inclination to minimize the size and lower the expenditure as far as possible. Such serious step is to be derived by legislation.

A CONCISE ANALYTICAL APPROACH OF THE CONSTRUCTION ACTIVITIES OF HOUSING FROM THE ANGLE OF EXPENDITURE

Low cost housing does not imply mechanical curtailment of expenditure by abandoning many ingredients. Similarly minimizing expenditure does not convey the idea that the beauty of the abode is being marred by the practice of rejecting many external fittings, that can be reckoned as ornamental or superficial structures. On the contrary a keen observation *ab initio*¹ is expected from the side of the consumer. He is not advised to give up the essential aspects. Similarly the consumer should be satisfied in the aesthetic sense also. Naturally scruples will be sprouted as to how the minimizing exercise of expenditure is to be cultivated.

The selection of location or site for the newly constructed house is very significant. The rate of sites vary on the basis of many factors. In certain civilized areas the cost of one cent land will be one lakh or even five lakhs. If the customer is too obstinate that the new house should be constructed in the civilized area, he will have to spend large amount for the purpose. On the contrary if he has no objection to erect his house at a comparatively distant place the amount to be set apart for the purchase the land will get reduced. Even though the purchase of land is directly related to the cost of construction

¹ *ab initio* = from the beginning.

of a house, the consumer hailing from lower income group even middle income group can think about a construction of house only after possessing suitable land. If the said person has no idea for a kitchen garden or a vast courtyard and vehicle shed near the porch he can shift the plan likewise. He can build a house in 3 to 5 cents of land. But certain consumers especially coming from village areas will become suffocated by restricted areas of housing plots. It varies from person to person and place to place. This leads our conclusion that the primary task is to fix the location. A huge amount is to be spent for this. It will be difficult to change the location after the completion of the initial processing. The accessibility of roads and transportations are the important factors at the time of computing the expenditure. If the path way leading to a particular area is narrow and all the materials for the construction of house will have to brought on human heads the labour charge will be unbearable. If one or two rupees is estimated as labour charges for transportation of a unit of material, the total unforeseen expenditure required for the entire process will be a huge amount. If everything is calculated in anticipation of unavoidable expenditure, the prudent consumer will be prone to select suitable area for the construction of his house. He will come to the conclusion that the purchase of the land and the construction of the house should be completed without excessive charges for transportation.

Fresh water is a very significant subject in the matter of constructing houses. The availability of water is not only for the construction but also for the subsequent domestic affairs. It will be highly pathetic to realize later that the householder has to fetch water from a very distant place. Many persons will prefer to engage some others for carrying water. The total expenditure will include the expenditure earmarked for the construction of wells and tanks. In many places in Kerala, water is available at a depth of ten or fifteen yards. But in certain other areas it will not be available even after digging at a depth of 30 to 50 yards. When the depth is gradually increased the expenditure earmarked will be enhanced.

The theory of natural selection propounded by Charles Darwin is applicable in this context also. There is a craze among the natives to equip their houses with materials brought from distant places. They are under the impression that the external appearance of the house will be more charming by using extra ordinary items. Flooring in most of the houses is a good instance. We are not at all prepared to make use of the stones available in the premises. Even though red stones are comparatively soft, random rubbles which is abundantly available in many parts of Kerala are hard stones. Even though apparently un-filthy and tidy, the surface portion is transformed and made glazing by chemical or mechanical operations. Ancient Temples still retain the beauty and glaze even after centuries because of the use of the random rubbles on the walls and even its pillars. If the processing of random

rubbles is started in Kerala numerous labourers will get employment opportunities. Random rubbles are stable and hence the use of the same will not adversely affect the strength of the building. Constant research will prove that random rubbles can preferably be adopted for flooring work also. Even new tiles can be made from random rubbles.

When we focused our attention on expenditure side, it is to be examined and estimated from different angles. Certain materials are easily perishable and if we apply such items it will increase the recurring expenditure. The rural areas of Kerala had once spent lot of money for changing the palm leaves or coconut leaves on the roofs every year. Mud tiles in those days were a bit expensive. If the consumer can mobilize enough fund he can cover the roof with tiles and avoid the recurring expenditure. It is evident that the expenditure for the construction of the house is to be valued only on the basis of long term and short term requirements. It is preferable to formulate a plan that will reduce the recurring expenditure. Thus the expenditure in the long run is a very important factor. Unfortunately many people are delighted in curtailing the expenditure to the maximum possible level. It is not scientific. Initial expenditure is not the only the criteria. Recently many equipments have come into existence to provide heat and light. Electricity is gradually becomes a rare mode of power. Experts in the field of technology divert their attention to sunlight. We can illuminate a house without even a speck of electricity. The apparatus for providing light

and heat are available in the open market, even though the cost of such apparatus may exceed Rs.1000 or 2000. No additional expenditure is required. It will function without electricity, coal or any other fuel. We will have initial expenditure only. But many people are thinking about initial expenditure on the strength of the fact that they cannot afford a huge amount for the purchase of such old items.

In short many factors are to be examined for the general survey of expenditure. None of the factors could be ignored. If we are all prepared to be self sufficient, we can rely on homely goods. This will create market for the abundantly available domestic goods. Similarly long term expenditure should given sufficient care before leaping to conclusion. Anticipatory measures will safely restrict unnecessary expenditure in future.

UNEXPLORED SOURCES OF MATERIALS IN KERALA

No contemplation on the low cost construction of abodes will be complete as long as it is diverted to virgin fields of concealed materials that may be abundantly available in the green vegetation of Kerala. If experiments are focused on the transformation of goods with the ulterior intention of adopting the same as novice substitutious for conventional materials. The index of cost can be lowered only by the application of alternative materials as well as revised aesthetics. Cheap labour is not at all a solution. On the contrary time factor set apart for the labour is restricted. Thus the quantum of labour consumption will gradually become reduced.

It is a venture to array certain familiar substances available in Kerala in plenty and which have not yet been converted as aids for the construction of houses. For instance there is no deficiency for trees in Kerala. The lifetime of which is only forty or fifty years. Since the supply of gas cylinders has replaced the consumption of wood as fuel to a larger extent, the civil engineers and architects can easily adopt the use of the matured coconut trees. The rate per cubic will be comparatively lesser in the case of coconut trees. It will be durable if coconut trees are of 50 years or more. This has to be insisted.

Coconut trees when sawed into required sizes are fascinating. The beauty can be enhanced by chemical or other applications if necessary. Such pieces can be used for various purposes including wooden frames for windows and doors. Now there is a craze for costly woods for the construction of houses. Coconut trees will exhibit a Keralite craze also. The low price of coconut trees persuades farmers to utilise the land for the construction of other commercial plants. There is hygienic recent trend for the utilisation of tender coconuts in the place of other artificial and synthetic soft drinks. The cutting of tender coconuts in massive scale is not at all injurious to trees. On the other hand it is more profitable also. It will prevent the entry of tender coconut from other places to the land of coconuts. Tender coconuts can be plucked for consumption within two or three months. And there is no need for waiting till they are ripe and plucked. This is profitable can be extended if there is a deliberate attempt to cultivate coconut trees in vast areas exclusively for the purpose of cutting them after thirty or forty years. The application of manure and correlated experiments will surely reduce the time to twenty five years. Coconuts or tender coconuts can be had from these trees till they become ready for the ultimate purpose.

The excessive craze for teak wood and the compulsion for obtaining jack fruit trees for the construction of houses has turned out to be a heavy burden especially to those who are branded in the middle class strata. The percentage of people who spare a substantial part of their income for the

construction of house in large in the case of middle income group. If it occurs to the civil engineers and architects that their clients are not in a position to afford teak wood or jackfruit trees, they are compelled to console them with the advise that they can rely on certain imported modern woods from Malaysia and other countries. Middle class people are naturally men of pretention and vanities. They want to convince their acquaintances that they have made use of goods of first rate quality. Then the only avenue for the contractors is to display the cheaper woods from other nations like '*PINGODA*'¹.

Coconut trees are in no way inferior to the aforesaid trees. Moreover they are accustomed to the nature of Kerala also. The beauty of coconut trees also worth mentioning. The concerned departments, architects and scholars in the field of civil engineering and those who are preparing blueprints for houses are expected to create a favourable impression. This impression will not be artificial. If such a venture turns out to be acceptable in large scale, it will create a revolution in the field of house construction. The plantation of the coconut trees also will become profitable. The site of the Panorama of coconut trees can retain the old culture of Kerala also.

The lions share of houses in Kerala were thatched with the leaves of coconut trees and palms. The modern trend adversely effected this practice

¹ PINGODA – A cheap Malaysian wood used plenty in Kerala.

and roof of house were replaced with tiles and subsequently concrete terraces. The roof of concrete is a costly affair. But apparently when the construction is completed there is no need of spending additional expense for repair works of roofs repeatedly except for the leakage that may occur in due course. But when the coconut and palm leaves are used in lieu of tiles and concrete terraces, this is to be changed and replaced every year. Otherwise it will become rusty and damaged. This is not a trivial affair to change the roof every year. That was the exact reason for the vanishing of coconut and palm leaves. Thousands of coconut leaves are lying unused and uncared for in our compounds. They are not used either for roofing or as fuel. Kerala can reach the target of social progress only if conducive uses of leaves of coconuts and palm are formulated and applied. It is highly regretted to note the idle condition of coconut leaves. The only bottleneck is its perishable nature. People hailing from low income group avoid the coconut trees only to avoid the recurring expenditure. Hence it seems to be fair and good to adopt appropriate measures for retaining the strength of coconut trees for a few years. Modern technical concept can impose wonders on coconut leaf roofs. In short we are prepared to take bold decisions and the farmers of Kerala will get opportunity to sell their coconut laves and trees. This will finally help our rural integrity and culture. Coconut leaves can be applied for various decoration purposes also. But the practice of cutting coconut leaves once or twice in a year has already become a vague memory. However we are

making use of tiles for our roofing since a long time. Even the English men had established the Common Wealth tiles factory in the coast of Malabar. The revolution of trade union movements in Kerala were in the tile factories and cloth mills.

But the present face of the tile production is gloomy and pathetic. There is demand for clay tiles made in our factories for flooring instead of roofing. The glory of the tile factories is in vain. They are limited for paving the courtyard and outside the porches.

The planning of houses in Kerala is not profitable and economic. We give predominance to external hallow only. The only alternative to divert our intellect towards the materials available adequately in the surroundings of Kerala for construction of the new houses. An abode is only a temporary shelter. And the life span of a house is very much restricted especially in the nuclear families. Hence the notion is to be developed in the mind at the time of teenage itself that the lions share of income of the family can never be diverted and set apart for the construction of houses. Today we are living in huge mansions. But the purse is full of credit slips. The general idea applicable to be agrarian sector of India that the Indian farmers are born in debt and living in debt, and die in debt is *muta-tis mu-tan-dis*¹ extendable to the inhabitants of the modern Kerala. There is no excuse for bearing

¹ *muta-tis mu-tan-dis*: with necessary changes.

unnecessary heavy financial burden up to the grave. Hence the amount set apart for housing is to be minimized. A thorough change in our concept of house is required for this purpose.

We have to conceive our plans only on the basis of the available financial resources. This fund can be utilised for the major part of the construction and the balance can be kept in abeyance for the final work consisting of flooring, plastering and painting. The plinth area of a single house should be legally restricted to thousand square feet especially when the number of the family is 4 or 5 including the children. Gradually this number is again coming down to 3. If an amount of rupees six hundred is calculated at an average for a sq. ft. the total cost of a house with an extent of 1000 square feet will exceed Rs. 6 lakhs. But at the present market rate Rs.600 is too much for the construction of a square feet. The flooring can be completed with granite stones with this expenditure. Then a new idea is automatically kindled. If the granite stones are abandoned, we can cut short the expenditure to Rs.5 lakhs. Obviously Rs.5 lakhs is not required for the construction of a house with plinth area of 1000 square feet.

The new generation will never reconcile with the idea of giving up the shining floorings. They are the victims of a shabby and shrivelled aesthetic sense. They have no experience of the earlier flooring of houses our grand mothers blending everyday with cow dung for cleaning the floors. If a new

aesthetic sense can be created we can cut short the expenditure by adopting appropriate substitutes. It does not imply that we have to go to past and live in our old huts without electricity. There was sufficient air in the corridors of our earlier houses with small windows. The air lingered inside. But when we preferred huge and wide windows all over the houses, the air hesitated to remain in the house and left outside as discontented guests. A conscious study enable us to reduce the quantum of wood essential for the construction of our house. The land is permanent and its size is not expanded. The area of forest is gradually diminishing. And by and large the availability of suitable wood for the construction of house as well as for furniture has become an impediment. Naturally one of the most important part of expenditure of the house construction is wood. It has equal importance like stone and cement.

There are certain reputed cement manufacturing units like Malabar Cements in Kerala. A large part of the investments for housing is being exploited by cement and other allied matters. Cement plastering of houses will take more time and funds. They rely on other distinguished companies outside for our purpose like ACC, RAMCO, BIRLA etc. It is to be decided as to whether plastering and white washing walls on all sides of the house is compulsory. Another pertinent question is that how and why people are lead to white washing and expensive cement plastering. This depends on our sense of aesthetics. If it is remoulded the plastering of house will disappear without any damage to the beauty of the buildings. The approximate amount

expected for plastering will be 1/10 of the total expenditure for the construction of house.

We are depending on stones for our houses. But recently there is a change with the alternative of clay bricks and cement bricks. Hollow clay bricks are economically and scientifically preferable. It has the colour of our soil. The natural beauty can be retained with the use of the bricks. Artistic skills are being applied recently in the production of clay bricks. Even legends and attractive pictures can be drawn on the clay bricks at the time of production itself and without incurring additional expenditure. A kind of serene beauty will fetch the solace inside the houses then, the expenditure will come down again without any adverse effects. Polished tiles can also be constructed in our tile factories solely by using the clay available in Kerala.

The alteration in the roof of our houses from tiles to concrete witnessed a decline in culture, health and even in our domestic habits. Gradually we become confirmed that flat concrete roofing cannot withstand the rain and shine. Gradually the flat roofing vanished and the concrete roofing acquired the earlier shapes. It is quite amazing to see that tiles are again affixed over the concrete roofs nowadays. They are not affixed for beauty alone. The basic cause is protection and stopping leakage. There is scope for simple question from a lay man as to whether the concrete roofing is necessary below the clay tiles. But it is certain that some framework is unavoidable for laying

the clay tiles above. However the thickness of the concrete roofing can be curtailed. Because the roofing will only be for the purpose of laying clay tiles.

Clay bricks do not require plastering and evidently it ensure the construction of the low cost houses. In short, the expenditure expected for the construction of houses easily be reduced by creating a new consciousness and a an aesthetic sense. Similarly the change of materials without spoiling the beauty of the house also has a vital role in minimizing the expenditure. The material easily available in the premises should be given primary importance. It will guarantee the lessening of the transport expenses also.

The Herculean effort can only convince the people that they can retain the beauty of the houses without using cement for plastering and white washing. If the natural stones with its figures imbedded on them are exposed nothing will mar the charm of the external construction of the building. If they are so much stubborn in plastering of the house under any pretext, they can do so at their peril.

The Rubber co-operative society Kannur (RUBCO) and AGRESCO Kannur have already earned a distinguished position in Kerala. Even the 'MAVELI' who appears once in a year is seen giving commands to offer Rubber woods to his subjects. It has proved its credibility mainly on the basis of the products and raw materials, which are locally available for the

products. Rubber is a part of our culture and economy, and not merely a part of our products. Even though the rubber products are comparatively costly, repeated experiments can make them cheaper. More over new channels can be opened for the manufacturing of not only house hold goods but also the goods for the construction of houses. Generally we do not pay much attention to the administrative aspects especially when the construction works are carried out by societies and voluntary organizations. The collection of required materials for house construction in bulk quantities turned out to be highly profitable, besides the engineering skills of voluntary organisation involved sought the channels for minimizing expenditure than profit. However checking measures are frequently required to examine pros and cons at intermediate stages to avoid the prospect of unnecessary interventions of profit seeking source. The presence of profit seeking figures loitering in the field is a hurdle in Kerala. Hence the education covering the framework and guidelines of the construction of the low cost houses under the guidance of voluntary organizations will be a blessing. Then the intervention of the ordinary people in such a noble scheme will create wonders. Their contribution also will be invested in the wide planning for the emergence of large number of homogenous houses with lesser expense. It will create sense of security and equality and even in the larger extent will impart even secured feeling. Gradually such a great task will carry our new generation to the land

of construction and production instead of being dragged to fissiprous¹ tendencies.

In this context the appearance of the Nirmithi Kendra as a shining star in the social horizon of Kerala is to be reckoned. It was an introduction of the Government of Kerala itself. Nirmithi Kendra lays emphasis on the innovative methods of construction of houses. Besides it lays stress on the reduction of the quantity of the materials used for construction of houses. There is no need of apprehension in reducing the quantity of the materials like stones, wood and cement. It will never endanger the strength and durability of the building. Nirmithi Kendra is not at all interested to abandon the essential ingredients. Fashions and novelties can be introduced only by using the materials available in the localities. The materials visible can be polished and moulded for the purpose.

¹ fissiprous : reproducing by fission.

SCOPE AND OBJECTIVE OF THE STUDY

SCOPE

The waves and cripples are fascinating as long as it remains harmless. But when the waves assume the form of giant and roar those in the strand will become helpless victims. The change is sudden. Man should frame his designs in anticipation all such negative vices inherent in the nature. The economy of low cost housing is a device evolved from the ideas for the protection from such calamities. Its scope is eternal just like the sources of nature. A reasonable applicability is the core of the subject.

Evidently the subject of the research is deeply rooted in the engineering skills and genius. When the practical utility of the subject is revealed even the conviction of layman is very much significant. Then it may be out of the range of the engineering technology. Low cost housing is an entirely new subject. The scope of the subject is not very much associated with the engineering technology. Here the answers are to be delivered by the mason than the supervisor and the engineer. The low cost housing is a part of the aesthetic of man as well as the economic programming of the families. Preference and desire of the ordinary men are to be observed closely. In that sense subject of housing will go beyond the extent of aesthetic and touch the horizon of ethic and moral science. In broader sense it will be a linking of physical and moral science. While the blue print and the target is to be

sprouted from the cabin of engineering, the estimate and material is to be determined purely as a subject of conscience. However a successful completion of the thesis can shower adequate light in the field and draw the attention of the masses towards the method of low cost housing. It will convince him that the fulfillment of the dream will not be by consumption of the costly materials. Any program in the contemporary modern world will be successful only if we are prepared to consume materials available in our locality to the maximum possible extent. The research will further point out that one of the factors to be reckoned is the climate condition of the different areas as well as the quantum of income of each and every family. It is highly regrettable to note that there is a general trend to emulate the fashionable approach visible in the west as such.

The importance and scope of the study of the research will also be based on the designs of the houses for enhancing the external beauty and internal conveniences. The low cost housing will never stop the extension of some arches and corbels, if and when they are essential or if and when they seem much required to enhance the beauty of the mansion without incurring an unbearable financial load. The researcher wants to examine to whether the need of reinforced lintels can totally be avoided. The scope of the research may reach the limit of examining the preparedness of the general public to abandon the age of old systems and practices of using stones and wood stuffs

for the construction of houses without even slight variations. If bricks are used in lieu of stones, it will be highly conducive for the health of the people.

The experience of the Nirmithi Kendra are adequate to establish that the cost of construction of the houses can be reduced by 30%. But it is not trivial affair to programme the construction with accurate estimate. But such programming will turn out to be profitable.

The experiment launched by Nirmithi Kendra in different parts of Kerala especially Malabar ventilates the broad range of possibilities for the newly constructed abodes with lesser expenditure. Nirmithi Kendra has the experience of more than a decade in the respective field. This research profoundly indebted to the Nirmithi Kendra even for the nomenclature at the top of the research. Nirmithi Kendra inaugurated its functioning by laying the foundation stone for the cluster of residential houses built in the district of Kollam in 1985. The entire structure is specially intended for the lower income group. Obviously it was a blessing and solace to the beneficiaries especially on the ground that it was initiated after a horrible flood took place in the year.

District Nirmithi Kendra with its Headquarters at Kannur was registered under the society registration act XXI of 1860¹ in the month of May 1988. The objectives of the Nirmithi Kendra at the outset was to provide

¹ Bye-law, Kannur District Nirmithi Kendra, p.2, 3.

residential accommodations to the people coming under the lower and middle income group. It has been specially instructed to construct such houses with lesser and lesser expenditure. The ultimate aim was to contribute numerous low cost houses and attract the attention of the public. Naturally such a venture would convince the average men to realize that a house can be built with less expenditure and avoiding unnecessary materials and unnecessary external projection and eaves.

A set of rules and regulations was formulated detailing the objectives in the memorandum of association in 1988 itself. It has been disclosed as the object of institution to serve as an intermediary or agency to generate and propagate innovative ideas in housing, similarly it was anticipated that a production centre will be established in due course to provide standardise housing materials, bricks, blocks, shells, doors and window frames. Gradually it will pave the way for opening channels for fibre roofing sheets, sanitary wares and smokeless choolas, wood processing units also will be produced as a byproduct. However Nirmithi Kendra has no plan to remain as a mere agency to provide financial assistance and transportation for the construction of houses. On the contrary Nirmithi Kendra earnestly conceives of conducting seminar and conference and even demonstration classes to make the people acquainted with the available datas in housing. If everything turns out well and good Nirmithi Kendra is expected to develop itself as a research institution, consultant in the field of housing. In spite of

all these great ideas ahead, it is yet to be examined as to whether the activities under taken by Nirmithi Kendra during the last 18 years were remarkable achievements and as a model to apply in the study of the construction of low cost housing and also whether the initial experiment in Kollam district was repeated without any deviation in the objective and if so the outcome and consequences of the low cost houses constructed by Nirmithi Kendra in different parts of Kerala subsequent to the initial success in the district of Kollam. The personalities and administrative heads at the helm of the Nirmithi Kendra especially during the first phase also is to be studied carefully and determine the contributions extended by them. Special references, to the newly introduced materials and substitutes which reduced the cost and retained the beauty and convenience of the dwelling houses is to be made

Since Nirmithi Kendra was a new phenomena in the field of study pertaining to the subject should reveal the tracks and avenues adopted by Nirmithi Kendra for constructing low cost houses. The researcher craves to learn the techniques and technologies applied by Nirmithi Kendra and a comparative study of the identical experiments taken place in the different parts of the nation and abroad. A detailed study of the materials and quantity of materials selected may enable the researcher reach a conclusion and ascertain a list of goods and materials that can be made use Of for the construction of low cost houses. The apprehensions and scruples regarding

the durability and standard of the houses also should be removed. Locally available materials are to be projected with an ardent appeal to rely on certain materials that can be earmarked. Perhaps a list of trees that can be cultivated exclusively for this purpose may turn out to be a blessing.

There is a contemporary inclination especially among the middle class to add unnecessary extensions to their newly constructed houses. This will enhance the expenditure of the houses. For instance large number of houses are seen in urban areas with wide porches, corridors, and extending car sheds. It is amazing to know that many of the owners of such houses are not even having a motor vehicle. A new enlightenment is to be created among the consumers that a house also is a commodity for construction and as such unnecessary part and sectors will be a waste and enable to enhance only the debt. The arches on the top of medium size houses will only be a burden and a matter to ridicule. Lintels also can be avoided in many circumstances. The use of country bricks and hollow bricks will lessen the weight of the entire structure. An experiment, to make use of selected wooden panels after applying chemical substances in the place of stones and the substitute for walls can be tried.

The researcher would like to establish the importance and the scope the research on the said subject is wide, and profitable. It has far reaching implications Nirmith Kendra if it goes ahead without any lapses may acquire

the unique position as established by Laurie Baker. Thus it can be concluded that the research work will be of much important viable and reliable for the welfare of the people for the economic stability of the society with a great lesson that the wastage in the field of housing is only due to over design, use of expensive materials, lack of awareness on the part of workmen.

The target anticipated in this study is the reduction of expenditure connected with all works leading to the construction of low cost houses ultimately it will lead to the restructuring housing concept itself. Certain ventures have already been initiated in different parts of Kerala and the institution like Nirmithi Kendra will have historic role of fundamental remoulding of the concept. There are only two remedies available in the present context. The remedy is to abandon the idea of permanent abode and making the house and surrounding plot as the asset of the individual and the family. The other remedy is to reconcile with economic lot and plan everything only in line with the source of income. Obviously the most important reason for getting the debt enhanced beyond the capacity is a habit of taking loans without any restriction. If a general trend is cultivated for constructing houses with lesser expenditure, the entire social outlook and family culture will become automatically changed soon.

OBJECTIVES

Any study on the low cost housing would be barren and futile if the name of Sri. Laurie Baker is left untouched. The great ideas in the mind and imaginations are to be materialized by gradual experiments. Research Institutions like Nirmithi Kendra are not interested to indulge in the study and evolve a comprehensive structure. Nirmithi Kendra and other institutions can function as an effective link between manufactures and consumers.

The out lines of National Policies in housing tend to get blurred when project take their meandering course from file to field. The problem is complex and does not have any capsule solution.

A general conviction is to be derived, that what is practically good and profitable will be beneficial to the government also. Then a study of the technologies is to be made as a combined effort of the government and the public agencies. This can be achieved only by effective demonstrations by building programmers.

Studies about numerous village offices, primary health centres operation black board schools, anganvadies, kalyana mandapams, T.V. relay stations were taken up. In fact the credibility of the approach is boosted when public buildings go the cost effective way. The worth of cost effective technology was powerfully demonstrated by Govt. of Kerala under its science

& technology policy in the campus of the "Centre for development studies" at Thiruvananthapuram established in 1971. All the buildings in the campus were built by Laurie Baker in seventies and still remains a congenial environment for academic experience of international excellence.

Low cost construction technology has another disguised and concealed benefit. Undoubtedly it would promise more job opportunities. There is no proposal to reduce the number of labourers or curtail the wages. A hostile policy against the working class is only a part of the capitalistic program and monopolistic planning. There is no need of considering low cost housing as a threat to the job opportunities of the masons and other toiling group. No research oriented program in the field has despised the labour force and quantum of money set apart for wages in connection with the construction of housing. When the total cost incurred shows the downward trend in the graph, the number of newly constructed houses will automatically go up. The survey is not required to establish that construction work especially of residential quarters is one of the large sources for employment in a country like India. The low cost construction technology is undoubtedly labour intensive and as such highly conducive for the benefit of the working class. It would generate substantial employment opportunities according to the NBO estimate, For an investment of Rs.10 million, there will be on site employment for 923 men years and off site employment for 1477 men years. The Rajiv one million housing scheme sanctioned by the Govt. of Kerala at

the initiative of the Kerala state Nirmithi Kendra is estimated to generate additional employment opportunities for 2.5 lakhs people.¹ There is a philosophy also in housing, when looked at from the angle of aesthetics hygiene and moral concepts. There will be a general accord that the technology applied for the construction of houses should be authentic and should not oppose the environment and ecological equilibrium available in the locality. When Nirmithi Kendra insists consuming more and more mud in lieu of cement it is having a philosophical perceptible also. The entire structure conveys a favourable affinity and association with the particular climate and condition in the vicinity. Our predecessors might have accepted palm leaves on the roofs due to the intimacy with the surroundings. The tiles that appeared in the later stage also was somewhat cordial with nature because it had been moulded out of clay. But huge and massive cement blocks is having an entirely different picture. The reduction in the consumption of steel also is having such effects.

The installation of devices like choolas and furnaces for the exhaust of smoke, also is a worth while subject of study. There are abundant experiments for installing smokeless choolas and alternate energy systems. The motive behind such programming should not be merely the reduction of

¹ HUDCO Journal, National Network, January 1999, p.24.

expenditure. It should be scientific reasonable and without having much harms.

Nirmithi Kendra and other such institutions appeared with novel suggestions to ordinary people of constructing their housing in calm, lovable and alterable manner. A warm reception from different comers has made it an acceptable one.

HYPOTHESES

On the basis of the above objectives, the following hypotheses have been formulated.

- Ascertain the relevance of low cost housing technology in connection with the Kerala Economy.
- Illustrate the defective aspects of loan schemes for house construction.
- Can use the locally available materials be insisted.
- How can the reliable information connected with the subject be gathered from voluntary organizations.
- Analyse the various aspects of a particular land.
- Is the present practice of depending on solar energy is favourable or hostile to the society.

- Is it feasible to adopt all expensive programmes which the people cannot afford presently.
- Is it true to state that frequent changes take place in the existing form, style and fashion of houses.
- Are the experiments of Nirmithi Kendra exemplary.
- The relevance of academic qualification visible in the activities associated with the low cost technology.
- Can the positive aspects of loan system for construction of houses outweigh the negative aspects.
- Can any remedial measure be suggested for the curtailment of cost of house construction for the development of Kerala economy.

SIGNIFICANCE AND RELEVANCE OF THE STUDY

Since the conviction of low cost house itself is a some what novel, the adequate scope is left behind for the research oriented work on the issue. Naturally such an academic experiment will have far reaching consequences which may create numerous diversions in the applicability of the subject. It is hardly a matter of balancing the income and expenditure. More over it has become an all pervading phenomena and interludes with socio-economic and even domestic dimensions. It will not be astonishing to state that it may alter even the countenance of the premises. A particular locality, rural or urban

which ever it may acquire its vision by the number and variety of the mansions constructed by a man. Thus a thorough change in the structure of the residence will have its positive effect in the existence of the said society. More over it will make the citizen imaginative and there by making them inclined to the fresh ideas and noble aesthetics. The link with nature will be automatically become strong. Even the literary images may get transformed by the regular inquisitive craze of man for revising and modifying the present structure.

Instead of a convectional approach to possess a house somehow, people should become aware of the different aspects, conveniences and impediments of the newly constructed houses from porch to kitchen. Formerly he owed everything to the predecessors and parents and even to the masons and carpenters. His interference is only at the time of investment and disbursement of money. He doesn't have any idea even of the plinth area of a house. He is content with the knowledge about the width or space of the house or the number of rooms he should have. Up to the recent time, the owner of the house had no preferential choice regarding the colour of walls or the material to be used for flooring. But there is need for selection in everything. Vast changes occur in the shape, size, pattern and colour of different materials available in the open market. A customer who is not conversant with the general guidelines of the quality, quantity, durability, and the beauty of the materials will be caught in the horns of dilemma. Such an

individual is not expected to get redeemed easily. Ultimately he is expected to form an idea on the basis of which only the construction work can proceed. The majority of the people lie below the middle class income group. Their means of income is restricted. They can rely on hire purchase scheme to a limited extent. The repayment capacity is also a hurdle. Naturally it compels him to seek the primary lesson of extravagance. In short a direct, cautious and reasonable conclusion is sine-qua-non even in the case of the purchase of nail. Thus the problem is one of the choice or selection. This choice and selection is mainly intended to fetch everything with in the range of our capacity. Plan is to be envisaged on the basis of resource. The idea of construction of a house will be in the mind even from the infancy. Unfortunately no such idea had ever crept in the mind even at the period of adolescence. The idea of an abode in the earlier age was one of romantic like the crectures in wine and crescent in the horizon. On the contrary it would become crystal, reasonable practical and realistic. It does not mean that the practical evolution will mar the beauty of the same. A new concept of beauty is evolved on practical lines. The romantic image will become shattered. But the practical version will have perpectual effect. Naturally a discussion in the domestic sphere pertaining to the practice of material and designs of construction will become regular and create an impression of participation in everyone in the family. No one will be an obedient servant in such a context. Every one will have some feeling in their mind. They all share the delights of

the gains and also the unavoidable and unforeseen losses. These unforeseen and unpredictable losses may turn out to be a good lesson for his acquaintances. Gradually the losses and drawbacks will fade out or be substituted by more acceptable and desirable ingredients.

A house in the form of shelter is an unavoidable and primary need. Originally it is proposed as a shelter from the blistering heat and a frozen cold. It is a shield from mist and torrents. It is a protection from the attack by wild animals. The primary thought is rustic and not refined, like the attire and food of the ancient man. However man become arrogant and insolent by his impertinent thought that the houses constructed with blood and sweat can withstand the blows of nature. He used wood and stone to make houses more and more firm. But he was not aware of the devastating and annihilating vigour of the natural calamities like drought and earthquake. An ordinary flood can sweep away thousands of houses in the slums. In one sense the countries in the third world or underdeveloped world are not non aligned countries. The security of the buildings constructed in the slum areas especially on the bank of river or a sea shore will be feeble. It is perilous and insecure to erect huge buildings in the coastal areas. Unfortunately we are prone to construct huge towers as the symbols of our wealth and pride. During the world war period the bitter experience of JAPAN especially Hiroshima and Nagasaki did not made us open our eyes. But the people of Japan had made up their minds to mould the designs of houses in anticipation

of natural calamities. They are always apprehending the burst of volcanos. If a huge sum is spent for the residential houses and other buildings, irreparable loss will be the result. The recent calamity caused by the gigantic "Tsunami" waves repeatedly taught us that the man made mansions are trivial. We could witness the pathetic occurrence by the advent of tsunami throughout the Asian continent. The attack was ruthless in the coastal areas of Kerala like Karunagappally and Kollam district, Vipin and Ernakulam. However there is an apparent good lesson since the calamities are taken place in the coastal areas the loss of wealth and property by way of extermination was comparatively less due to the low cost of construction of huts with wooden planks coconut leaves and palm roofs. Otherwise it would have become terrific.

The constant use of the local material and the gradual rejection of unwanted chemical substances will enable us to retain and maintain the eco equilibrium. The consumption of imported goods may naturally become incompatible with nature and the contents may tussle against the environment. Expected decay may result and they will be compelled to apply more and more chemical and synthetic alternatives and resistance.

Provintialism and nationalism are twin good aspects when utilized in good spirits in lieu of dogmatic aspirations. A positive vein of preventionalism is the sense of self sufficiency. It leads to the tendency of

toil instead of lethargy. It will urge people to enquire into the hidden and concealed potentialities in the vicinity. He can appreciate the value and glory of the virgin fields lying unnoticed which will be marvelously cheaper than many imported goods. More over it will open the vista for the beneficial use of raw materials abundantly available in our land. A kind of harmony with nature will make the man more and more poetic and rhythm of the nature will become the Beck and call.

A peculiar branch of provincial architecture will evolve in due course. The beauty of the nature can be exposed with low cost experiments. The inner portions of the wooden planks and earthly stones contained there will enhance natural artistic designs. It will become blended with the sweat and dreams of those who toil in the land. Now almost all materials are imported and unloaded in Kerala. A new awareness will compel them to search domestic goods. Bamboos are nimble and soft. They are cheap and can be replaced easily. They are more poetic and artistic and they remind us the recurring possibilities of calamities. We can make use of all such valuable resources of Kerala, if there is a will for the application of the low cost housing. The employment chances will become enhanced. And the natives will get reasonable price also. The consequences are far reaching. We will have to heed to rhythm of the time that guides us.

The experiments innovated by Nirmithi Kendra and other such parallel concerns are note worthy. Their ventures has contributed numerous houses. They stand distinctively as a good lesson to Kerala. Those who have hugged this new practice are free from unbearable debts and loans. It is a change from convictions and practices. However the experiences restricts us to the matter of curtailing the expenditure. That should not be the only criteria for such a change. It is to be treated with respect and reverence as an epoch. Hence the research oriented program is also required to support the parallel work of such institutions. Otherwise it too will become monotonous and conventional. Gradual change and modification are the part of human thrust. Hence such a culture is to be cultivated. In fact such particular research work is a ray emerged from such a desire. Evidently it will prove that the outcome will be profitable and relevant to the economy of Kerala as well as to the nuclear family structure which has become the part and parcel of the social life of Kerala.

LIMITATIONS OF THE STUDY

Since the research is oriented on a virgin zone without adequate experience and experiments, abundant material is also not available. It is not a dream, but it is a fulfilled reality. Besides it will be futile to rely on libraries in search of materials. The subject is not one with affluent literature. There is a long gap after the translated version of Laurie Baker in Mathrubhumi

weekly. Even though some institutions concerned to our certain programs in this stage and Kerala has constructed numerous low cost houses, the experiments can be taken for the survey and study of the research. There will be difference in taste and sense. Hence a perfect, homogenous structure will be an absurd idea. Each and every isolated house varied slightly from others in many respects and as such it will be difficult to take a particular house, as a good specimen. Rearranged questionnaires may project the attitude of the people. But the answer provided will not be exactly genuine on the ground that they are raw and not much refined. Reasonable answers can be had only if the particular person is highly acquainted with technology of the low cost houses. In spite of these drawbacks and shortcomings, the research work can enlighten on the ordinary people about the need of the hour.

There are many feeble but dedicated ventures in this field throughout Kerala under the umbrella of many schemes, project, and agencies. Most of them are prone to retain their identity with the ultimate intention to defeat all others for their supremacy. The actual identity of such a noble task has not yet been achieved in Kerala. It denotes the distance of the different institutions which are expected a combined momentum. The initial venture is absolutely superficial and as such there is deficiency of a common purpose. As long as there is no correlated movement none can achieve the goal in Kerala with low cost houses. It should be a matter of pride and self respect to erect a house with our own materials than to depend goods purchased or

imported from outside. In short a clear scheme for the propaganda for the acceptance of the idea of low cost housing is highly and urgently required in lieu of the contradictory approach. Otherwise it will result in a low standard rivalry sprouted by envy. The movement should never be a commercial one. All the agencies and institutions should dwell upon the common idea of enlightening the laymen about the feasibility of the low cost houses. The different institutions can cultivate their own projects and blue prints and slight variations in the proposed materials also can be made. But this should be never be incompatible in general sense.

Evidently low cost housing is a novel idea emerged from backwardness of the beneficiaries. There was a general rush for the construction of various types of residential houses through out Kerala during last two or three decades. Naturally men associated with the construction work try to emulate models from outside. The models of blueprints and plans are readily available for verification. The programs that obtained from European countries are quite fascinating. They provide detailed accounts and all other requirements essential for the construction of such houses. A large portion of the investment is being devoted for huge buildings, institution, flats and complexes, especially in sophisticated Metropolitan cities. Such mansions are apparently fascinating. Man with lesser income will never be contented with material without external appearance. Out taste is created and imposed through our experiences. Even though we arrange the flooring

with country made brick with the comparatively cheaper rate we pursue the market of glazing tiles. As long as this tendency ceases to exist it would be a tight corner to cultivate a general awareness.

The researcher could go ahead only if sufficient quantity of literature is at his disposal. Unfortunately even a few copies of books contributed by Laurie Baker are not available in the libraries for reference. Moreover the books composed and published by Laurie Baker are very few. Since his contribution is being exploited by "COSTFORD", the other familiar agencies are not at all willing to tread the same track. Variation is a very significant factor. However no other literary movement in the field has yet been realized. In short lack of literature is one of the evident impediment that Nirmithi Kendra and other such agencies confront.

Since the study of the economy of the low cost housing is associated with the practical aspects, we are not supposed to meditate. The research has to depend on the practical experiments. Any theory is fulfilled only when the same is established as genuine through practical work. Theory and practice are twin aspects. A researcher concentrating on the study of the population (demography) is at liberty to make use of the statistical datas extended by private and approved agencies. Such a study can easily be made convincing on the basis of the year of statistics. In this context it is pertinent to note that the reliable statistical evidences are hardly available in the case of research

work on the low cost housing. Similarly, the plan and approach of different institutions related to low cost housing are different and some times antithetical. The scope will become curtailed when the range of the study is restricted to the activities of a particular individual establishments like that of Nirmithi Kendra, cost ford, Sanker habitat etc. However the research work is carried on the experience acquired by subsequent modifications made by reputed concern like Nirmithkendra. But the prospect of comparative study will become shrinken and shriveled. Thus the difficulty in the collection of statistics or generally approved or recognized reference work has turned to be an insurmountable bottle neck.

As indicated earlier those who are engaged in the construction of houses actually hail from different economic strata which can be easily classified in three groups. High income group. Middle income group and low income group. The taste and inclinations are some what different among the beneficiaries of the same income group. Thus a researcher finds it difficult or focus his study on a particular type or class. There is no homogeneous trend especially in this field. The difference and variations may lead to apprehension. Many people are not susceptible to accept this due to contradictory and incompatible convictions.

In fact most of the beneficiaries lose their initial interest in the low cost housing gradually after the construction. Many of them are compelled to

appreciate low cost housing only on the ground of the quantum of money that they could spare for the purpose. If a particular individual can mobilize four to five lakhs rupees or more, he may shift his idea for a modern type of housing with good external appearance. He will concentrate more on appearance, facilities and other modern apparatus. His idea would become heavenly and celestial. The amount reserved for a house itself create a kind of pleasure. Naturally we prefer a house with estimated value of rupees fifteen lakhs to twenty lakhs which excels in external glory than an ordinary type of house with country bricks. Such a taste is cultivated in our cultured mind on the ground that house is a durable structure. On the contrary we can demolish the negative ideology in the beginning itself, and can create a positive thinking that a house is not only a place of abode with all illuminations, but a residential zone with appropriate atmosphere. Since the span of life is short and feasibility for study of a particular individual or generation is restricted, there is no chance for making use of the sound and solid experience for the research work. It was like the Russian experience of 1917. Soviet Russia which was generally believed to be sick those days had no examples and experiences for the construction of socialistic society. Negative response accumulated there also. We are aware of the fact that there is a huge lobby lurking behind the construction work. It is a matter of crores of rupees. This greedy lobby would never tolerate the emergence of the Novice especially with a new and economically cheap technology. If the new idea is popularly

accepted it would have adverse effect on their orthodox, conventional and commercial interest. Thus they would deliberately try to put the seeds of suspension, and apprehension among the ill nurtured mind of the beneficiaries.

Naturally the scope of any scheme and project will be thwarted if and when the concerned individuals are flung to the track without any inherent inclination in the subject. Low cost house is a concept not only intended to curtail the expenditure, but also proposed to create a new life style and awareness. Persons who have adopted the same on the ground of expenditure will soon become dejected and frustrated. There will be no life in the decisions of such persons. He/She is not actually willing to construct an abode with minimum expenditure with maximum possible conveniences. Lesser experienced persons are inclined to build spacious buildings with all modern facilities. They are least bothered about their income and the ways for repayment of loans. There is no idea of economy or budgeting or family schedule in their minds. They are the victims of hire purchase instalment schemes. They do not feel it below their dignity to knock at all avenues of money lending. They have no reluctance in accepting loans at exorbitant rates of interest. Their intentions are not governed by reasoning and prudence. On the contrary they rush to compete with other acquaintances with comparatively better sources of income. In short all attempts will be futile if the common people are not enlightened of pros and cons of low cost

housing. Otherwise any research work on the subject will be toppled down. If the number of individuals accepting the track of low cost housing deliberately on the basis of their irresistible interest in the construction of residential houses with a new light and vigour will be enhanced. Then automatically the research programs also become an eventuality.

Even though the low cost housing technologies are construed as a voluntary project with out much propaganda, it could be implemented easily with massive demand, if propaganda work is also initiated. The research oriented programs on the subject should be commenced from the beginning itself. Then a student with primary education could appreciate the qualities of the low cost housing. The interference of the government can easily be made credible. The governments direction would stimulate common folk to leap over particular novel project like low cost housing. It would create a sense of security also. The government level program would be authoritative. The propaganda work from the side of the government should concentrate on all the aspects other than expenditure. It is certain that an individual should have to spend a huge amount for any type of construction including low cost housing. Low cost housing guarantees a minimum level of curtailing the expenditure. The research work also should focus on the other significant aspects of the low cost housing. The general tendency is to erect a residential house with lesser expenditure and cheaper materials. In short the lack of government level propaganda seems to be an impediment for obtaining wide

recognition for the research work on such a crucial topic. For instance the Nirmithikendra with 14 independent units functioning in each and every district of Kerala are not having a common and linking program. There is no dialogue between these units and more over they are all left to function at their liberty without any guidelines and harmonious common action. The experiments and experiences gained by different units are thus restricted to limited spheres. In fact mutual exchange of experiments is an unavoidable factor. If such an effective dialogue is ensured, each and every unit can develop their programs with giant strides. Favourable factors and negative trends can be verified easily. Each and every district Nirmithikendra can gradually make their products perfect and absolute. The permission granted to the different Nirmithikendras to function freely is like suffocating the tiny and frail units. The research work on the subject of economy in low cost housing also would be a blessing if a firm affinity is created between the district Nirmithikendras.

Low cost housing is a subject which has not yet been dragged to the track of the curriculum. Evidently this subject can be accommodated under many heads and disciplines like that of commerce, economics, sociology and civil engineering. Now grown up men are goaded by the stipulation regarding house with less expenditure. Thus adequate consideration should be given to the subject in all appropriate disciplines so as to persuade the student to brood over the research study of the subject.

Unfortunately the number of competent persons and technical experts pertaining to the subject of low cost housing are very rare. The number of technical hands with sufficient expertise are also gradually decreasing. A research scholar is not expected to contact a laymen with the experiences of the construction of one or two low cost houses. They are not at all experts but only fresh hands. They can provide very little (scant) information. Since their experiences are restricted to the construction of one or two houses the scope for deliberating comparative study also is limited. Statistical details also will not be available with them. Thus a researcher finds it difficult to get replies to his questionnaire and prepare charts convincing. The fresh hands in the field would not have studied the merits and demerits of different materials like wood, metals, stones. Flooring and roofing are two essential ingredients of the study. The support from civil engineering hands also is not available. They are also drawn to fascinating mansions in conventional styles. It is highly regrettable to note that low cost housing is not a part of the study of civil engineering students. They are all content with formal styles and tread traditional tracks. There is no venture to make experiments fully or partially. If a Laurie Baker turns up he will be condemned from all corners. Any research work will become complete, if its result is made applicable positively in the social life. But the majority of the educated people are willing to make use of a subject like low cost housing only for chatting. A research work is not intended for chatting. Hence a new light should be showered so as to

recast the conventional views so as to create an itch for the country bricks as a substitute for costly stones. There are criticisms lingering. The contemporary publications in the forces of imperialism would naturally be behind the curtains to repress all genius views. They challenge provincialism not for nationalism but for their self interest. One of the visible draw backs of globalisation is the insistence to use universal products from international market instead of local materials from local market. The idea of globalisation is framed by predominant American forces. They suppress all provincial and local developments and indirectly lead the people to utter chaos. Since low cost housing is governed by scheme of low cost, it will be absured to publish fascinating advertisements in the media. Advertisement is an expensive affair and as such incompatible with reality. The huge amount expected to be diverted for advertisement also is to be borne by customers. Advertisement is a contemporary phenomena. But advertisement is outside the preview of low cost housing. Since the market of each and every goods is actually controlled by advertisement, it will create adverse effect on the research work of the low cost housing.

In spite of all the limitations and arrived supra, low cost housing with its hygienic and climatic preference accompanied by lesser expenditure is gradually acquiring a place for discussion. The research work in one sense should be oriented and carried out in a new and untouched area without any earlier experiences and experiments. This is applicable even in the existing

housing concept with tiles, red oxide and wooden planks. Tiles replaces coconut leaf thatches without any difficulty. Recurring expenditure was an apparent reason. All objections raised on the ground of permanent structure are ignored. The changes taken place in the flooring is quite amazing. Naturally the use of red oxide was vehemently opposed by illiterate and orthodox sections as a sin and peril. They attributed purity to cow dung paste used for plastering the floor. But gradually all absurd allegations were flung to oblivion and practical merits were accepted in due course. The loss that might have occurred by the replacement of the cow dung which is undoubtedly eco friendly and comparatively cheaper is now become a subject of dream. The society is always going ahead. There will be no hesitation in accepting more favourable substitutes. Cow dung is an example, It has ugly appearance in comparison with of red oxide. Naturally the impression will be hostile when it is preached to give up red oxide or granite and avail cow dung again. Reconsideration of ideas and materials is a progressive thought. If cow dung has large number of merits and can be made beautiful by different types of application, it would create a vast change. It would be amazing to see large number of houses with cow dung flooring or cow dung bricks. Cows are becoming rare species in Kerala. The demand for cow dung is not only for manure or fertilizer, but also a material for flooring, will create a through change in the demand for cows. A new agrarian culture can be cultivated with the sight of cows and cattle in all houses. It would fetch a

world of toil and sweat. Such prominent ideas are lying possum and it has become monotonous for the research work on the topic.

PERIOD OF THE STUDY

For an intensive study, a period of five years from 2001-2002 to 2005-2006 has been selected. However a longer period has also been taken when the trend could be studied in its historical perspectives.

CHAPTER SCHEME OF THE STUDY

The thesis work depicting the different aspects of the low cost housing has been arrayed in the following chapters:

Chapter 1 : Introduction. Certain prominent features with concrete proposals on the subject laying stress on the Kerala economy has been concisely arranged in a casket which can be released and explained in detail.

Chapter 2 : Methodology and Review of Literature. Even though large quantities of literature are not available, maximum effort has been exerted in amassing the reliable informations of Low Cost Housing Technology to the maximum possible extent from near and far.

Chapter 3 : A Profile of the Functioning of Nirmithi Kendra. The peculiarity of the functioning of Nirmithi Kendra is its conversion of the original idea of cost effective environment friendly technology. The Ecofriendly twist given by Nirmithikendra has far reaching consequences.

Chapter 4 : Construction activity twin aspects : Profit and Corruption.

As in the case of Peoples Plan Programme certain unavoidable defects and errors are natural to occur in the low cost housing scheme also. In the initial phase the chances of corruption also crept into the arena like a fatal epidemic. It has to be curbed for the programme to continue on accelerated pace.

Chapter 5 : Analytical and Scientific observations on the models with illustrations: The research scholar has established unequivocally that the Low Cost Technology is a panacea for many of the economic ills that has inflicted Kerala society as a whole.

Chapter 6 : Differential Proportions in the Estimate and Proposals for the reduction in cost of construction: In spite of the existing avenues for the reduction of cost and overall expenditure, it occurs to the research scholar that certain drastic steps are sine-qua-non to modulate the economic backwardness and create a stability against the economic fluctuations.

Chapter 7 : Cost effective Environment Friendly Technology in the Context of Kerala economy : A Positive Approach : This chapter is comparatively crucial due to the specific proposals conducive for the upliftment of the Kerala economy. The research scholar has imbibed a new aesthetics and the gradual process to be included in the curriculum.

Chapter 8 : Summary, Findings, Suggestions and Conclusions : A thorough observation of all the schemes in the vicinity and all the available

reports, statistical data, graphs and charters along with models moulded by voluntary organisations like Nirmithi Kendra. The Research Scholar became convinced that Kerala economy requires a face of safeguard and investment of the mobilised funds. Hence a diversion has become essential. The State Government and the Local Self Government bodies involved in these matters have to project a new life concept which should be contrary to the practice of availing loans without any restriction and utilisation of the income upto the last drop for the construction of housing without any botheration for the production and employment as its product.

METHODOLOGY AND REVIEW OF LITERATURE

Rajeevan. K. "Economy of low cost housing in Kerala a study with special reference to Nirmithikendra" Thesis. Department of Commerce and Management Studies , University of Calicut, 2006

CHAPTER 2

METHODOLOGY AND REVIEW OF LITERATURE

A. REVIEW OF LITERATURE

Since the Nations of the third world especially belonging to Asian continent including India is experiencing the issue of dwelling as an insurmountable crisis due to the heavy financial liability required even for the construction of an ordinary type of residential cottage. The problem has already been brought to the purview of the contemporary political scientists and plan builders. Omnibus assertions are there to suggest the need as a primary requirement of the society. Otherwise it will amount to toying with a burning issue.

Naturally many valuable articles and literature projecting the possibilities for the construction of low cost houses have gradually emerged. Certain institutions like Nirmithikendra have undertaken the responsibility of propagation of the new idea supported by practical experiments. Each and every experiment in the novel enterprises are accompanied or preceded by authoritative books. Certainly there are large number of institutions like Nirmithikendra, Costford, Sankers Habitat etc. all over India and abroad working for the common purpose with somewhat different models and

suggesting various materials even though the hue and fragrance vary in the blossoms carrying identical petals. The research-oriented work concerning the contributions imparted by the establishments like Nirmithkendra are on the anvil. As a precedent, the forerunners of the convictions of low cost housing hailed from the west. They had never thought of foresaking the aesthetic ingredient. On the contrary they put more emphasis on the practical utility.

The practical utility and reconciliation with the natural climatic conditions and hygienic peculiarities got considerations in the study of low cost housing. The researcher earnestly feels that it would be a deficiency, if adequate prominent issues, are not showered on the prominent aspects projected by different authors, and publications.

There is scattered reference in epic works like Ramayana regarding the wandering life of the Majestic Prince "RAMA" with his beloved through the dense forest area of "DHANDAKARANYA". Rama never felt grieved by the unexpected loss of the splendor that enriched the palace only because of the fascinating air and tantalizing views of the forest. The trio might have become enlightened with the fact that life is a joy not because of an expensive dwelling place. The huts and hermitages made of dried grass, bamboo and palm leaves were more convenient and alluring. The writers of the epics or Puranas or ancient literature did not give sufficient significance to the study of the dwelling places. Otherwise tiny resting places erected on the banks of the

rivers should have become a subject of study and reference. There attention was directed to the philosophic angles and sectors. The halo of Rama did not become faded when he remained for years in the forest. The veteran poet of Malayalam, Kumaranasan has depicted an indelible picture of "Sithadevi" sitting under the "Ashoka tree" and "Vaka tree".

('Ariyorani panthalay sathikka oru poovaka vithirtha sakhakal'. A tiny branch of Vaka had become a "panthal" when it stretched out its twigs. Even Kumaranasan was not much bothered about the low cost residential houses because it was not his subject of study).

Ancient Chinese literature on this subject also is most relevant. Instead of spending huge amounts unnecessarily for the purchase of material, they were more eager in minimizing the expenditure. But their technique was to give emphasis to many unnoticed aspects like the direction of the different parts of the dwelling place and the location of the houses. They preferred to become contented with the position, size and other dimensions and direction of the house.

"Vasthu Sasthra, "Ningalkkoru Veedu", Energise your home experience harmony_ are some of the books that can be quoted here for the purpose. They were composed by Alahar vijay, Dr. A. Achuthan and R. Venketesh respectively. While dealing with the reduction of cost, in the construction of houses, the Chinese ancient literature turns our attention to

Chinese Vasthu concepts. Since it is a peculiar approach, the research-oriented work should cover the vast area of Chinese publications to grasp the importance of directions, dimensions and positions. Perhaps the Chinese people might have developed their theories on the basis of practical experiences of exploiting the geographical peculiarities.

The contributions of Dr. Anantha Bose IAS is the one based on experiments and experiences accomplished in the coast of Kerala. Anantha Bose was an administrative head with his IAS in career. He was endowed with the quality of propounding new ideas. He was not a mere theoretician. Dr. Anantha Bose was in harmony with theory and practice. Anantha Bose was destined to become the founder of Nirmithi Kendra. Nirmithi Kendra has got wide recognition by ceaseless effort in the field. Originally its inception was in the year 1985. It has acquired many plumes to its credit through the strivings of two decades. The immediate cause for the blooming of such an institution was the unexpected flood havoc and calamity that occurred in 1985. Dwelling areas were destructed and exterminated in extensive scale. Any experiment with snails pace would not have created intended results. Time demanded a leap. It gave an opportunity to Sri. Anantha Bose to become a pioneer. He heeded the clamor and guided the chariot somany houses of medium size with minimum facilities were built in that year. It was epoch-making event. Dr. Anantha Bose under took the task and launched the construction work wherever and whenever possible.

Nirmithi Kendra was virgin affair in 1985 with its tiny figure restricted to Kollam District. But the society acquired vigor and agility and soon crossed the hurdles and created independent units in all the districts through out Kerala. A separate and independent unit like Kerala state Nirmithikendra with Regional office for research oriented programmes was born.

Sri. Anantha Bose devoted his attention not only for the study of the construction of low cost houses, but also for the publication of literature related to the subject. Being a man with bitter experiences in the uncharted zones, Anantha Bose had to register all his wax and wanes in his books. Housing in the society of Kerala was the first outcome of his incessant research. Details of the issue are available in this book, which is prepared in the Kerala context. Dr. Anantha Bose has projected the issue in a convincing manner, Chemistry of Building material and Glimpses of architectures are the other two worth mentioning literary contributions of Anantha Bose. Low cost housing can be conceived only if institutions like Nirmithi Kendra can project certain materials, which are comparatively cheap. Another book composed by Anantha Bose is entitled "VASTHU VIDHYA". Viswakarmeeyam composed and published by Anantha Bose is also much valuable in this field.

The byelaw and rules and constitutions envisaged for the proper functioning of Nirmithi Kendra is included in the book with the nomenclature "COMPEDIUM OF NIRMITH KENDRA". It is formulated in tune with the

stipulations and regulations proclaimed in Travancore society in 1860. Nirmithi Kendra is functioning as non-governmental organization henceforth. A strict direction is given in the same regarding upper limit of expenditure so as to avoid even the distant possibility of marring the principles behind it. Similarly adequate emphasis is given for the use of materials available in the premises. In addition to the rules and regulations to be observed "Anantha Bose has deliberately included the methods of implementation at different stages. This can be reckoned as Manifesto of the newly introduced venture or as the declaration of magnacarta offered by the Nirmithi Kendra.

In this context it seems to be much desirable to refer a significant literary contribution by a distinguished Egyptian writer called Hassn Fathy. He as a prominent Egyptian architect was well conversant with the pros and cons of the issue. His book entitled "Architecture for the poor Shikago 1973" is exclusively meant for the poor people of the lower strata. This book composed approximately two hundred pages has been translated into different tongues. Hassan Fathi is more particular in dealing with all aspects of life of the downtrodden including the environment which are having numerous hostile aspects. Hassan Fathi has given a vivid picture of the contributions of different architects in Egypt for more than ten centuries and the gradual alterations taken place in due course. He discarded all costly and negative aspects and obstinately stick to the low cost construction. The keen observation could have enabled him to make comparative study and apt

conclusions. His studies are concentrated on the aspects of technology with special stress on heredity technology. This book is a blessing to a research scholar to get acquainted with the evolution and modifications effected in the technology of building construction for a prolonged period in Egypt. Hassan Fathi is optimistic to present the proper and easier track to minimize the expenditure for the construction of houses, especially for the poor is not only advice to make use of cheap labour and cheap materials but also consists practical ways in his book. "Architecture for the poor" that appropriate technological process only, is sufficient for the construction of low cost houses. Making use of cheap materials and mechanical minimizing of the size of the plinth area of houses are superficial. However he is not prepared to toil with that idea because in the general sense the idea is very valuable with far reaching economic implications. It may stimulate the local market and curtail the labour problem to a limited extent. A new appreciation of locally available materials will create a new kind of provincial mania, which is a good requirement in disguise. The peculiarities of the studies of Hassan Fathi is the method of looking at the problem from an entirely different angle no one hitherto had dared to put forth and apparently incredible suggestion. That technological analysis also is a valuable method for the decrease in expenditure. This new approach towards technology was conclusive to transform the picture from crust to heel. Hassan Fathi was a man with many languages in his sheath.

The International conference convened in Kauntan Malaysia in 1995 (April 9-13) is worth mentioning at this Juncture Delegates from different nations dealing with the subject participated in the conference with their soul and eminence. The topic selected for the discussion was "Our cities our homes" Eminent personalities presented their research papers for open and frank discussion. The detailed report of the conference was published subsequently. Scholars dedicated for the service of the low cost housing believed the same is a valuable piece of record. It had been organized by Asia Pacific regional NGO. The different methods of construction of houses in different nations with their similarities and aspects are projected wisely in the report.

Ideologies related to low cost housing can never be claimed as contemporary branch of Architecture. There were many feeble and visible attempts with incompatible dimensions, on this subject through out the modern history. Research oriented studies has not yet been fulfilled to project the achievement, if any occurred in India centuries back. Certain developments has, however taken place in India, China, Egypt, Singapore, Malaysia and other nations. We can never firmly declare that there are acceptable models to be followed in these countries. Similarly there were devoted in the transformations of architectural designs than preferring low cost materials. Low cost housing on the contrary more significant when viewed from the socio-economic angles. The world is confronting population

problem without any positive remedial measures than the preventive check on nation like flood, and tsunami. The progressive thinkers and experts in economics are concentrated in constructing residential accommodation at the maximum possible low rate and providing maximum conveniences and facilities. Such a programme has become compulsory with the ultimate motive of ensuring accommodation to all. Residence in the present context is gauged not merely as an ornamental one, but merely as a physical necessity. Hence the same trends being projected by the intellectuals of the day will not be traced out as such in the earlier period. There will be variations in this regard at the final phase and the materials required.

India is predominantly agrarian sector in the whole world. It is undoubtedly an under developed country in the third world countries in Asian Continent. Hence the research oriented programme and practical ventures will be more worthwhile than any actions taken in the west. Here comes the indelible impact rendered by Mr. Laurie Baker in this field. Laurie Baker is a combination of theory and practice. He is the founder of COSTFORD which showered abundant likes in the track and inspiration to many identical institutions and individuals. He is also considered as an incarnation of low cost building structure. Even though he belonged to England all the inexhaustible work of Laurie Baker are based on the Indian environment. He became convinced that economics is not ordinary subject of study but a life style itself. His experiences, immediately after his marriage, for two decades

in the lap of Himalayas was thrilling zestful and inspiring. Laurie Baker made up his mind to shift his residence to Wagamon in Kerala and consequently he chose Thiruvananthapuram as the centre for his work. He preferred to opt a slum area in the capital of Kerala. While his wife devoted her clinical work for the multitude Laurie Baker became absorbed in the construction of residential buildings at the maximum possible cheap rate. Laurie Baker was sorry to see that people were solely relying on cement for "Korea". Laurie Baker wisely interfered and proved the fact that lime is a more suitable substance for the purpose. The honest service of Dr. K.M. Raj turned out to be much effective. He dedicated his life for the noble task of introducing a new style of constructing low cost houses especially for the poor people of Kerala. He never longed to make it an isolated and individual affair. Laurie Baker was sure that all endeavors should be moulded in such a style. Even though he had cultivated many ideas and technologies he became convinced that there should be a deliberate attempt through out the state for getting recognition. By the newly introduced type of residential apartments Laurie baker could remodel the residences and their plans and designs.

Laurie Baker could kindle light for his dreams while constructing building for CDS(Center for Development Studies). Then the Chief Minister C. Achutha Menon and Dr. K.M. Raj the then Vice Chancellor of Delhi University we with him to support. Centre for economics also became a reality. A huge library with all conveniences also was arranged. Computer facilities

were not on vogue in those days. The ceaseless enterprises gave birth to new models of houses and they turned out to be blessings of poor people.

Laurie Baker was very conscious in choosing materials of long durability. As per the Greek version economics was "oeke" (house), Nomose (Nirvahanam). He argued that unnecessary and exaggerated significance should not be given to the concept of residence. House is a place required for meeting many domestic requirements. Hence the word "stay" exactly means to rely on a shelter.

Among the distinguished personalities who have rendered their dedicated services for the cause of propagating ideas on behalf of the need for low cost housing, especially in Kerala, P.M. John, Director of Nirmithi Kendra is worth mentioning. He has contributed a series of articles in leading periodicals with illustration. He concentrated on the various methods of minimizing the expenditure. Similarly P.B. Sajan, Joint Director of Costford, V. Suresh (Hudco Chairman), T.M. Syriac, Ashok Puthiyan, C.P. Shylesh, Sibi Raj Raveendran, S.O. Suresh Lal Architect R.K.. Ramesh, Prof. Ujin Pandyala, M.V. Devan, Dr. A. Achuthan (Former Principle of REC and Dean students welfare Calicut University) and Asalatha Thampuran have accomplished their taste in this field remarkably. The learning of Asalatha Thampuran was the vasthuidya prevalent in Kerala. A detailed account of the functioning of Gurukulam Vasthuidhya at Aranmula is available in the

write-ups of Thampuran. They were highly conducive for the research work of a scholar in this arena. Dr. A. Achuthan who is a well-versed genius in civil engineering had projected many samples and specimens in his articles. They had the touch of realism and practical values. V. Suresh, the former Chairman of Hudco, could introduce many unprecedented techniques for construction like Ferro cement. The renowned scholar Dr. Bhojraj Dwivedi in his established book entitled "Commercial Vasthu revealed that the Fuenghshow Chinese version Vasthuvidhya is more than 3000 years old while vasthu concept of Bharath is of much earlier version and existed 5000 years back. This discloses the fact that India can claim a comparatively model place in this regard. Sri. R. Venketesh another scholar in this field focused his studies on recent and contemporary trends which are cheaper for domestic purposes. A research scholar should be grateful to his work under the title "Vasthu-energise your home" experience the harmony." The details exposed in page 104-64 are teamed with modern examples like availing sun light for heat and light. The recent trends is favorable to the findings of Venketesh. He has even gone forward and suggested that even the dustbin and waste can be made use of to extract energy to a limited extent. Apparently waste has become a perplexing issue in the modern context. Hence the ideas of Sri. Venketesh should be put to practice. Sri. Alahar Vijay another noted figure in this field ventured in his book "Indian Traditional Building Science, a complete hand book of Vasthu sashtra argued that the Chinese Vasthusashtra

'FENGSHUI' is meta physical science in all respect, on the contrary Indian vasthushilpa" is based on accurate precise mathematical calculations. Indian vasthusasthra according to Pandit Alahar Vijay is more related to astrology. The numerical and mathematical application has made Indian Vasthusilpa more reliable.

In this context the research paper presented by V. Suresh on 16-11-99 in a program is worth considered. He declared in the first national conference on building centres at New Delhi that there is a pressing need for essential materials and modern techniques to substitute the old ones. His research paper is entitled "National network of building centers and overview-prospects and problems "many essential ingredients for the construction of a house like cement are having no proper substitutions. We can never abandon the available factors without introducing the cheaper and convincing alternatives. An advice to give up a particular material will naturally be futile as long as another material with all its merits and extra capacity is invented and introduced. The findings of V. Suresh has stressed on the requirement of objects or materials in place of traditional ones.

This burning issue has caught the attention of mediums like visual media and necessary coverage has been given by leading publications. Due respect is to be bestowed on Malayalam Manorama, Vanitha for the publication of a special supplement under the caption "Parppidam" in 2003,

2004 and 2005. Many recent and research oriented concept have been incorporated in them regarding the need for less expenditure. They would create a good impression in the public. If a warm reception was not there in 2003, the later additions of 2004 and 2005 would not have emerged. The repeated publication with necessary variations and amendments and introductions shows the response of the public in this regard. The consecutive publication of Parppidam itself is a crystal example for the general awareness of the people of Kerala.

Even though a general recognition and acceptability has already been achieved and a new consciousness in the field of house construction has been realized, there are certain unnecessary and unwanted negative offshoots from different angles aiming at total collapse and disintegration. Kerala is confronted such crisis through out the modern history. These criticisms are intended to thwart the projects and shake off the intended results. Laurie Baker has become a prominent figure in the subject. He visualised low cost housing through out Kerala and even a layman appreciated his ideas. Large numbers of publications especially Costford have become a reality. Range of information's naturally became wide and reached international level. Distinguished personalities in Kerala raised their hands and heads to greet Laurie Baker. They were prepared to consider to Laurie Baker as a father of the new philosophy of low cost housing. When they put their appreciation in words numerous articles originated in our periodicals and magazines. Sri. R.

Nandakumar one of the eminent figures had showered his boundless thanks to Sri. Baker in an anthology coming under the title. "Kettidathinte Paristhithi Vijnaneeyam" - "Laurie Bakerente Vasthuvidhya-Laurie Baker's rekha chithrangal ink drawing 1993" -- is a monument of Baker.

According to him it is absurd to insist the use of hollow bricks. It is foolish to stick on to such a stand of using hollow bricks. Obstinate Nandakumar held the view that Laurie Baker failed to develop his idea with premises of Kerala. He strongly argued that the low cost housing could be achieved even without hollow bricks. His proposal is to make use of some other materials easily available in the local market. Even though Sri. Nandakumar has turned against Laurie Baker subsequently his contentions can never be trifled with. It is worthwhile to note that Sri. Nandakumar still absorbed in activities concerned with low cost housing. The contributions of institutions and persons appeared in the later stage also can be accepted for a better cause. Similarly we can never turn down the ideas of Sri. Nandakumar blindly and blankly as long as he remains on the same track. Nandakumar is still in the trade and there is no justification in despising the ideas conveyed by him as imperial or colonial. The desirable method is to treat the philosophy of Sri. Nandakumar as the extension of the ideas of Laurie Baker. Apparently Laurie Baker is the pioneer and he will get that credit in the history. No one can ever spoil or mar it. It has become an indelible imprint.

But it does not imply that we have to follow only Laurie Baker. The best method is to open the windows and let the light and wind pour in.

The contemporary experience with the models propounded by Laurie Baker also is to be examined. The traits of Laurie Baker philosophy are visible through out Kerala. But the use of same type of hollow bricks is suspected to be monotonous, and disguising. There is an irresistible craze for alternatives. Sri. Nandamukar has wisely pointed out that the number of low cost houses constructed in the line of Laurie Baker is gradually decreasing. We have examined and evaluated the reason. The idea is not to abandon the concept itself. It is high time to brood over certain modifications and transformations. Sri. Nandakumar is reluctant in criticizing Laurie Baker. He explained the necessity of substitutes.

The view point of Sri. Nandakumar is not baseless. His ideas are sprouted on examples and experiences. New experiments have become essential. They have hit the target in many places in Kerala. The SANKER'S HABITAT, with its head quarters in Thiruvananthapuram. Mr. Sanker was hardly prepared to make use of hollow bricks. He preferred to adopt sticky mud for the construction of firm walls. Such clay like mud is adequately available in Kerala. It is more eco friendly also.

In spite of all endeavour the general trend of the people in Kerala is still with conservative and orthodox methods for many reasons. Even the

consumers who are willing to take up the message of low cost housing are not well contented. It is not a trivial affair to shake off our old thoughts and concepts. Perhaps they have some hidden qualities, compatible with our mind and nature. Mind and nature are prominent elements and factors in all ages. Many ideas illustrated by the reverend Kanippayyur Namboothirippad hailing from central Kerala are praise worthy. There is a flow of the experts from different places seeking his advice. He is somewhat orthodox in approach and as such sticks to his principles firmly. He gives more importance to the symptoms, signs and locations of the buildings. Sri. Kanippayyur gives his opinion about the place to be set apart for porch and kitchen instead of the materials to be used for the purpose. According to him ventilation from particular angles is essential for the well being of the inhabitants in the house. He may be conservative, but we are not losing anything if we select the spot for porch and kitchen and corridors according to his suggestions, since there is a wide spread recognition to such theories in Kerala. An attempt to make a harmony will be more practical and profitable. The modern people in Kerala are not mere dwellers like our pets. The sophisticated people possess many new convictions regarding each and every aspect of life. An all-embracing attitude is relevant at this juncture.

It is crystal clear that the experiments in this field are extremely modern. And these are not predictable. Even though there are certain trials in different corners by devoted persons and institutions like Nirmithkendra and

Costford. Ultimate success is still at a distance for many reasons. The scarcity of experiments and experience is a strong impediment. We are poor in connected literature also. Most of them contained theory without practice. They have applied only living context and we will have to wait and see the results. We slide back to Laurie Baker concept if it occurred as if alleged in Kerala, the causes are to be exposed honestly and frankly with the idea of making amendments.

The Research scholar has deliberately undertaken a noble message of the time which is explicitly beneficial to Kerala society. Eventhough, seemingly trivial, the low cost housing technology is a serious subject in different aspects. The Research scholar has made Herculean efforts to evaluate many programmes undertaken by various voluntary organizations. The Research scholar laid emphasis on very significant point inspite of all impediments and defects. Low cost technology of housing, especially suggested by Nirmithikendra is a blessing. The Economy of Low cost housing in Kerala a study with special reference to Nirmithi Kendra is a novel attempt. It is relevant and favourable.

B. METHODOLOGY AND DATABASE

NB 4999

This chapter provides an array of details collected and presented in concise form directly imparting general picture. Since the voluminous books and authoritative and authentic bookish informations are scarce. A Research scholar is prone to rely on the materials and datas available in the contemporary context and especially confronted during the research studies. In fact various sources like Nirmithi Kendra and Costford and District industrial centres are available through out Kerala. The Research Scholar had visited different centres and institutions dealing with the project work associated with low cost houses. All the ventures in this field are absolutely homogenous and identical. Eventhough the theoretical base and ulterior motives are apparently one and the same, the attitudes and sketch lines and blue prints or even the material recommended for the purpose are different. It may be due to the deliberate intentions of safeguarding the identity of each and every institution connected with such a noble scheme. Naturally this enables the research scholar to find the differences from the corridors itself. There is adequate scope for the study of alterations imparted by different establishments. A comparative study and contrast of divergent aspects will open the vista for further studies and desirable conclusions. This research scholar is thankful to the institutions mentioned infra for his material creations and comparative study programmes.



1. District Nirmithi Kendra, 14 districts in Kerala
2. Costford
3. District Industrial Centre
4. State Nirmithi Kendra
5. Sankar's Habita
6. Vasathi Kozhikode
7. Kerala State Nirmithi Kendra. etc.

The structural and external differences are obvious in the southern and northern parts of Kerala. While the admirers of the southern parts are stubborn in erecting the abodes with solid bricks, while those who hail from the north some how prefer laterite.

The experiences in various parts of Kerala were effective in convincing the fact that, the District Nirmithi Kendra was in Kannur, Kozhikode, Malappuram, Thrissur and Kollam are working efficiently with marvelous traits. There is no initiative and independent movement in such ventures in the remaining parts of Kerala. The balance sheet pertaining to this area gives discontentment only. The emoluments and other service conditions extended and ensured to the staff members in the northern regions are extremely favourable and inducing. This is a very essential fact for dedication and serious and sincere involvement of staff members in the venture. If the

authorities are prepared to enhance the emoluments and thereby bestowing due respect to the staff members in the subordinate level, they would rise to the occasion and exhibit obligation of their souls for dedication. The awkward service conditions existing in the working sector will be monotonous and by all means there will be the lack of inertia, and momentum. The sweat and blood of the labourer can be utilised equally and rewards are guaranteed pre requisite. The visits to District Nirmithi Kendra with similarities and counterparts enabled the research scholar to make an observation of clear cut savings in their construction projects. The expert opinions gathered from certain sources are highly conducive. Pre-concepts of many novel construction methods became projected during the interviews with eminent personalities in this field. The primary sources and datas abundantly available in many regions were inspiring.

Frank discussions with some beneficiaries of this scheme is a peculiarity of this research project. It was intended to study theory and practice. But it is to be understood - that a kind of contempt and aversion is growing in some of the beneficiaries. Perhaps they may be guilty of such unwanted apprehensions. However a revaluation process with open heart is necessary for the gradual rectifications and while some of the observations regarding the applications of technological aspect are to be discarded without any review certain questions contain a spec of genius. The general trend is to get at par with Non Resident Keralites (NRK). It is shameful for them to

construct low cost houses. The initial delight and pleasure in creating a new type of residence will gradually vanish and results in ultimate dissatisfaction.

Some of the house holders were prepared to permit an observation of their residence and become convinced with their observations. The interview and group discussions with beneficiaries are highly significant in this research study. Eventhough they could not provide details of technical aspects, the drawbacks and demerit in the practical side were readily available during the interviews and group discussions. The comments recorded in brief are varied. The comments were collected from low income group, middle income group and high income group. This was repeated in all different centres with a view of preparing a questionnaire. This enabled to prepare questions exceeding one hundred regarding "economy of low cost housing in Kerala a study with special reference to Nirmithi Kendra. In spite of the inherent varieties, it is worth mentioning that the middle income group are more favourable towards the constructions of the low cost houses in different parts of Kerala. This is an indicator to conclude that the middle income group are gradually become acquainted with realities and of thrift based on the restricted source of their income. They are willing to divert their limited income to more beneficial and convenient matters. The investigators in his turn, found it as research oriented concept for his subsequent programme. The next step was the rearrangements of heap of questions originated during interviews for scrutiny and valuation. Discussions were held with competent

persons and the research supervising guide. The suggestions were accepted and at the end it was put in a casket after abridgement. The final questionnaire contained 36 (thirty six) questions only. A specimen copy of the questionnaire is appended herewith for perusal and verification. The questions were focussed on the relationship between the beneficiary, the construction, and the respective sources of income. The choice of materials and educational qualifications possessed by the beneficiary also were included in the questionnaire.

SAMPLE

The sample of the present study consists of two hundred and one respondents residing all over Kerala. The sample includes low income group middle income group and high income group. The preliminary step adopted has divided them on the basis of the above mentioned income strata that is **LIG**, **MIG**, **HIG**. And it was done by the method of stratified random sampling method.

TOOLS

Since the activities are going on in many rural areas of Kerala, the research scholar opted mother tongue for the preparation of the questionnaire wisely. This gave an opportunity to the layman to offer their remarks without any further consultation. Their suggestions were frank and matured and extracted from their own experiment. The investigator consulted experts in

the field of low cost housing like Engineers, architects, contractors, technicians supervisors, masons and prepared more than hundred questions related to the study area. It was collected through interviews and group discussions. After discussion with the supervising guide and some experts it was again recast and some questions were deleted and some were added and the final questionnaire consists of thirty-six questions.

The final version of the questionnaire contained many prominent aspects of life. It contained questions regarding the marital status of the beneficiary as well as their annual income and academic qualifications. It was intended to gather the variations in the tastes of different groups belonging to different income group. It required the details compulsorily as to whether the beneficiaries are having the previous experiences in this field. This enabled to know their moods and aspirations based on their level of income. The proposed plinth area and the facts whether they are content with locally available materials were sought in the questionnaire. The questionnaire is self-explanatory. It was convenient and educative. It reflected the contradiction between dream and realities. It gave way to the beneficiaries to reconcile with their income.

The questionnaire is divided into three parts. The first part dealt with the personal perspective of the beneficiary. The second part is exclusively related to the mode of construction and material preferred. Comparatively this part is more significant. This is more research oriented from the sociological point of view also. The filling up of such a part of questionnaire may allow for a self evaluation of the beneficiaries. The last and final phase of the questionnaire is entirely set apart for the technical and technological aspects. A kind of economic observation also is added. This part is important from the environmental and ecological angle also. The source of fresh water is sought in this part. The availability of fresh water is a grave issue in the present context of Kerala. There are lot of identical materials recommended by different institutions for the construction of the low cost houses. Different establishments preach the importance of the materials. They concluded, one of the reasons for the advent of numerous institutions is basically on the ground of different objects or material, proposed by them than the method of construction by minimizing the expenditure. Elaborate discussion with engineers, architects, contractors, technicians and masons were held. In addition to supervisors and experts all the beneficiaries offered their own wise opinions. They attacked the questions from the different dimensions portrayed.

PROCEDURES

The method of completing the different stages of research work will be solely on the basis of the search conducted in line with the different factors and aspects associated with the system of house construction already in progress and new patterns emerging in the field. The basic idea behind the research is to curtail the expenditure to the maximum possible extent without any adverse effect on the primary needs for normal functioning of the residence. Similarly due attention should be given for the durability of the newly constructed buildings by avoiding the use of cheap quality materials for the construction of houses. Hence the thesis is proposed to develop strictly on the basis of projecting the use of materials available in Kerala.

The researcher has already discussed with personalities dealing with low cost housing program in Kerala, teachers and experts in civil engineering, visit of the institutions like Nirmithi Kendra in all the districts in Kerala, state Nirmithi Kendra, costford, vasathi Kozhikode and collected details and discussed with them about data collection and also their mailing addresses. More than six hundred specimen questionnaires were mailed enclosing self addressed envelopes to return the data to the people under different strata in different parts of Kerala and also to those who are constantly associated with the task. Similarly the questionnaire were distributed to some experts in person also. The lions share of the recipients were prepared to offer their

remarks and views. Since the responses of many were not up to the mark and contained superficial and shallow reactions. They were kept aside. At the same time many questionnaire contained reliable informations. Some of them were actually beyond the expectation and paved the way for a new approach. Ambiguous information contained in some of the questionnaire were not accepted because the questionnaire itself was intended to get an absolute picture. While some of the filled up questionnaire were incomplete, some others lacked clarity. Unfortunately some others could not comply with the pattern suggested. They were indifferent. Even though answered questionnaire received directly and indirectly exceed more than four hundred. It was reduced to two hundred and one for final consideration.

STATISTICAL DESIGNS

For testing - the following statistical methods were used. Percentages, Frequencies, mean, median, mode and cross tabulation.

The analysis were done as per statistical package for social sciences (SPSS). Such a measure adopted turned out to be favourable so as to make the research program precise and accurate. It also enabled for the proper arrangements of details by mathematical devices.

RESULT AND DISCUSSIONS

The cross tabulation process with the aid of SPSS computer package was convenient for comparative studies. Number of datas scattered all over the project could never be compared by manual methods. There are answers from different angles for 36 questions. Each response varies from different angles. The observations made by beneficiaries of different strata itself is a tedious task to study. The answer to questions against the serial number 5 for instance is very simple. There are only two alternatives either "yes" or "no". But such a simple question and response are having far reaching consequences. It is too closely evaluated with the reactions of the beneficiaries to some other questions in the same questionnaire. All the heap of answers to questions and differences in similarities could be evaluated by all possible means and comparative strategies with the help of SPSS.

Consequently the research scholar could derive at certain results and conclusion. 26 tables were depicted in the following pages. Each table has specifically mentioned the comparative results also. The tables are finally prepared only on the basis of the responses projected in the datas.

TABLE 1

**COMPARATIVE ANALYSIS ON THE BASIS OF MARITAL STATUS
AND THE FACT OF CONSTRUCTIONAL EXPERIENCE OF ABODE**

Cross Tabulation For Knowing The Relationship Between Marital Status (Q5)
And Have Constructed Own House (Q9)

Count row Percentage Column Percentage		1.0	2.0	Row Total
Q5	1.0	1.93 98.5% 98	3 1.5% 75	196 97.5%
	2.0	4 80% 2	1 20% 25	5 2.5%
Column Total	197 98	4% 2%		201 100%

Chi square	Value	DF	Significance
Karl Pearson	8.52709	1	00350

Source: Primary data.

A detailed survey was conducted meticulously by the Research Scholar on the basis of a questionnaire prepared exclusively with the object of securing a data pertaining to the inclination of the laymen belonging to different strata in connection with the concept of construction of dwelling houses, by ascertaining their fancies and methods of construction by ascertaining their fancies and methods of construction.

The questionnaire is divided into three parts indoctrinated by the Research Guide and with relentless effort to avoid unwanted details. While the initial part is devoted for drawing the personal index, the second part is exclusively set apart for the various modes of construction in the contemporary context. The final phase is concerned mainly to the materials applied and originally intended to apply with the idea of observing the gradual decline in the total cost by substituting cheaper and safer goods ranging from marbonite and cowdung paste.

The Table 1 depicted at the outset has tried to focus on the questions against serial number 5 in part one and number 9 in part 2. Eventhough numerous persons of varying interest were contacted for the purpose and the replies to questionnaires prepared by them were collected for the ultimate selection of 201 from among them for the purpose of the Research oriented study. Out of the 201 individual 196 are married and the percentage of married persons will cover 97.5%. Since the subject is associated with the construction of dwelling place it was preferable to contact persons with families than individuals. However 5 unmarried persons also were subjected to study. The un married section covers 2.5 percent only. It is quite amazing to see that 98.4 percent of the selected persons possessed their own houses and only 2 percent of the selected were having no dwelling places of their own.

The calculated value of the data is (3.84) and the same is higher than Table value (0.05). Therefore the Research Scholar observed at the conclusion that the Number of houses being constructed annually relies on the number of persons getting married in that particular society during the specified period. Withering away of the joint family culture also paved the way for the emergence of Nuclear families. The newly wedded couples, irrespective of all differences like creed, religion, language and culture are prone to take farewell and move away on their wings. Hence the criteria to be adopted to draw a graph or the enhancement of the number of houses are the marital status and impetus for tracing dens for the couples and their offspring. One of the significant feature visible in the study of an expenditure chart of married circles is a leap into installment schemes and a search for the sources. These two factors are correlated.

TABLE 2

DETAILED STUDY OF THE TYPE AND STATUS OF RESIDENTIAL HOUSES

Status of Residential House (Own/Rented/Others) (Q8)

Own Construction Type (Tile/Concrete/Others) (Q10)

Count row Percentage Column Percentage			Row Total	
	1.0	2.0		
Q8	1.0	13 6.7% 100	182 93.3% 96.8	196 97%
	2.0		4 100 2.1	4 2
	3.0		2 100 1.1	2 1
Column Total	13 6.5%	188 93.5%	201 100%	

Chi square	Value	DF	Significance
Pearson	.42766	2	.80749

Source: Primary data

Apparently the survey conducted as seen in Table 2 is connected to. Q. No.8 in part one and also in the succeeding part. 201 responses for the Questionnaire collected from the different individuals are used for the detailed

study as indicated in Table 2 in this category the calculated value is lesser than the table value. It implies that the reasons are independent Another pertinent aspect discovered by the Research Scholar is that the type of the house is hardly related the choice of the persons. Table 2 is self explanatory and convinces that the percentage of consumers contented with consumption of ordinary tiles is below 7 percent. At the same time the lions share of the people exceeding 96 percentage have a craze for concrete construction.

TABLE 3

PLINTH AREA OF THE RESIDENTIAL HOUSES AND THE STATISTICS OF INDIVIDUALS WITH THEIR OWN DWELLING HOUSES

Own Construction of Houses (Q9)

Approximate Square feet of a House (Q11)

		Count Row Percentage	Count Column Percentage	1.0	2.0	3.0	
Q9	1.0			4	71	122	197
				2	36	61.9	98%
				66.7	100	98.4	
	2.0			2		2	4
				50		50	2%
				33.3		1.6	
			6	71	124	201	
			3%	35.3%	61.7%	100%	

Chi-square Significance	Value	DF	
Pearson	31.73287	2	.0000

Source: Primary data

The calculated value is comparatively higher than the Table value and as such we accept H_1 the attributes we associated. It means that the Plinth

area of the newly constructed residential houses always vary on the basis of the number of persons dwelling in their own houses.

Eventhough there is an apparent apprehension about the gradual increase in expenditure there is a dismal contradiction to the picture. That seem incredible when the Research Scholar put forth the fact that the 62% of the consumers prefer to have house with a plinth area exceeding 1000 square feet. The number of individuals contended with plinth area of 500 square feet is 2 percentage. A meagre portion of the population only are prepared to purchase residential quarters constructed by others. This may be due to the reason that style and fashion adopted for the house are not according to the tastes of the new Beneficiary. But the position in the graph may always turn around. And there is probability for a like in the number of persons demanding newly constructed houses. They can avoid all unnecessary botheration of getting entagled with the intricacies connected with the construction. Thus in future the percentage preferring the houses constructed by others and the well equipped flats will increase.

Since 62 percent of the total population selected for the purpose are stubborn in possessing, residential quarters with plinth area exceeding 1000 square feet. The Research scholar is compelled to devote his attention on the interest of this category. The Research Scholar earnestly feel that there is no need of spending money unnecessarily for a larger area. A dwelling house

with a plinth area of 1000 square feet is sufficient to meet the requirements . It is certain that a house with the plinth area of 700 square feet can provide three Bed room in addition to the Porch, Sitout, Drawing Room and Dining Room, Kitchen and Work area. Undoubtedly a house with a plinth area of 1000 square feet is excess for an average family consisting of husband, wife and two children. An area exceeding 1000 square feet is a luxury. The Government of Kerala has tried to restrict the area to 3000 square feet. Recently there is a trend to impose higher tax rates on Luxurious goods and services. The Research Scholar genuinely feels that the present approved slab can again be minimised to 2500 square feet. A house with the area of 2500 square feet is hardly affordable for a single family in all senses. The size of the house should never be reckoned as symbol or watchword of greatness.

TABLE 4

AVENUES FOR MOBILISING LOANS

Own Construction of Houses (Q9) Loan Taken for House Construction (Q12)

		1.0	2.0	Row Total
Q9	Count Row Percentage Count Column Percentage			
	1.0	173 87.8%	24 12.2%	197 98%
2.0	2 1.1	2 7.7	4	
Column Total	175 87.1	26 12.9	201 100%	

Chi-square	Value	DF	Significance
Pearson	4.979841	1	0.2567

Source: Primary data

Table 4 is more concerned about Loan facilities. The special circumstances existing in Kerala Society is not favourable for investment and as such the production field has become frozen. The Banks and other Financial Institutions are having their cash chests filled with-out any outlet in the form of Loans. The interest rate for the loan also has been curtailed due to the gradual decrease in the number of Beneficiaries.

Out of the 201 persons who have been chosen for the purpose only 4 persons, have purchased constructed houses from others. On the contrary 98 percentage of the total, (The actual number is 197) have constructed houses of their own by exploiting and extracting all possible channels for the mobilisation of the money. It is a matter to be studied cautiously. Only 24 persons could complete construction of houses without Loan facility. Thus the number of houses being constructed every year is dependent on the total amount that can be disbursed by Banks and Financial Institutions. The easy availability of loans construction Materials and the contract Labour work without payment of advances naturally inspired the people to seriously engage in the construction of houses. The loan facilities available in our consumer state is highly conducive for the construction of large number of Houses in varying magnitudes, forms and styles. This trend of imitation has totally swept over our age old traditional views of social life. The calculated value is higher than table value in this case also. It means that the attributes are associated. It also indicates the entire construction work will cease to exist if there is any attempt to restrict the Loan amount. Loans are advanced by the Banks without much interest. The Research Scholar has come to the conclusion that the Loan facilities are the main indicator to the number and style of the dwelling houses.

TABLE 5
CONSTRUCTION PREFERABLY WITH LOCALLY AVAILABLE
MATERIALS

Own House Constructed (Q9) Local Availability of materials for
construction (Q13)

		Count	Row Percentage	Count	Column Percentage	Row Total
Q9	1.0	181	91.9%	16	8.1%	197
		97.8		100		
	2.0	4	100%			4
		2.2				2%
Column		185		16		201
Total		92%		8%		100%

Chi-square	Value	DF	Significance
Karl Pearson	.35293	1	.55244

Source: Primary Data.

The question number 13 is intended to deal with the scope for availing the locally available materials for the construction of new houses. The major work of construction is still made with the help of material like Laterite, Sand, Random Rubble, Wood available in the locality. The main ingredient that we have to depend is cement. But in due course this also can be compensated by the new cement factories that the Government may set up in the different

parts of Kerala. 91.9 percentage of the Beneficiaries are inclined to consume locally available materials. The calculated value is not higher than the table value. The attributes are not associated. The use of locally available materials has not yet turned up to be a hindrance.

TABLE 6

APPLICATION OF ACADEMIC COMPETENCE IN THE CONSTRUCTIONAL SPHERE

Educational Qualification (Q 2) Knowing Construction

Technology (Q 14)

Count Row Percentage Count Column Percentage	1.0	2.0	3.0	Row Total
1.0	13 6.7%	182 93.3%		6 3%
2.0	100 87.3%	96.8 9.5%	2 3.2%	63 31.3%
3.0	32 50%	33.3 41.7%	18.2 8.3%	12 6.6%
Q 2	3.5	27.8%	9.1	
4.0	44 88%	4 8%	2 4%	50 24.9%
5.0	25.6 38 88.4%	22.2 1 2.3%	18.2 4 9.3%	43 21.4%
6.0	22.1 24 88.9%	5.6 1 3.7%	36.4 2 7.4%	27 13.4%
Column Total	14 172 85.5%	5.6 18 9%	18.2 11 5.5%	201 100%

Chi-square	Value	DF	Significance
Pearson	22.31205	10	.01359

Source: Primary data

The statistical data depicted in Table 6 exclusively denotes the correlation between the Educational qualification acquired by the consumer as shown against question number 2 and its apt application in the selection of construction Technology. In this context, calculated value is much higher than the Table Value and as such we inherently accept H_1 . It also implies that attributes are associated obviously with any kind of information and piece of knowledge acquired by any means will lead him to better selection process in any field including that of moulding a dwelling shelter. The Educational qualification is practically valuable especially to get acquainted with many matters of Down to Earth interests. The educational qualification always prevents us from making awkward conclusions. Among the selected responses of 201 individuals it is worth mentioning that almost 50 percent of selected data, possess either degree level or Post Graduate level academic education. The actual number of post-graduate degree holders is 38. And it reveals that about 19 percentage of the selected few are having first-class academic qualification. The standard and level of academic competence in Kerala can be deduced from the table disclosing the number of persons who could not leap over the verge of S.S.L.C. examination. A notable feature in table 6 is the declining of index in the graph which is favourable to the low cost construction of houses. Apparently 172 persons out of 201 (86 percentage) prefers to traverse on the same conventional and hereditary track. Some of them have certain level of interest to make a deviation. But ultimately

they all cling and perch on the conventional twigs. The number of people in the entire data preferring to go beyond low cost housing is eighteen only. It means the percentage adopting the new method is below ten percentage. The difficulty revealed in the analysis is that the homogenous tendency to stick on the hereditary line does not vary even in the case of post-graduate. The Research Scholar is not in a position to say that it is due to flaw and defect of Academic atmosphere that only one individual out of 201 is seen willing to be contended with a low cost house. The Research Scholar is compelled to sum up that mere Bookish knowledge will not be adequate to fling unrefined and shabby shriveled sort of notions.

TABLE 7
IMPLICATION OF EDUCATIONAL EXPERIENCE IN THE INTERVENTION IN THE MODE AND DESIGN OF CONSTRUCTION

Educational Qualification (Q 2) With House Construction (Q 15)

Count	Q15					
Row Percentage		Count Column Percentage	1.0	2.0	3.0	Row Total
	1.0	5 83.3%	16.7%	3 3%		6
	2.0	3 63 100%				63 31.3%
	3.0	37.7 63 100 37.7				12 6%
Q 2	4.0	10 83.3 6	1 8.3	1 8.3		50 24.9%
	5.0	36 83.7 21.6	7 16.3 21.2			43 21.4%
	6.0	15 55.6 9	12 44.4 36.4			27 13.4%
Column Total		167 83%	33 16.4	1 0.5		201 100

Chi-square	Value	DF	Significance
Pearson	46.17688	10	.0000

Source: Primary data

While the second question given deliberately at the outset of questionnaire illustrates the academic strata of the beneficiaries and its inherent implications in many practical instances, the question projected against serial number 15 is intended only to study the preferences of Beneficiaries and their willingness to undertake the construction work. It occurred well and good to the Research Scholar that the actual number of persons out of the selected few who are much eager and interested to undertake the construction work voluntarily. Since it is risky and perilous affair due to the direct involvement in the action, the consumer should not be an average man or layman. A heap of academic degrees also will not be sufficient. Practical and Technical expertise is more relevant. Such persons can make use of their academic skills also in discharging or carrying out their plans and schemes. A kind of lethargy and laziness that reigns the Kerala consumer in the contemporary context is not at all helpful for the trend of taking such a risk. Obviously there is much myth in the direct involvement of in the construction work. We should be aware of the practical utility of the materials. And gradually we become conversant with the chart of preferences and we know there is an option not only in the matter of salary fixation or the choice of spouse. But also in the matter of selecting the best slab available for the flooring of his porch. The direct involvement reveals his preparedness to confront any crisis. This will create much optimism in the Beneficiary. Beneficiary can make sure the stability and durability of the goods.

Eventhough there will be some hesitation and chaos in the beginning, gradually they will vanish and becomes a trivial affair. The calculated value in this juncture is higher than the table value and thus we adopt H_1 itself as in the earlier case. Attributes are Mutually associated and all these sectors establish the affinity between the educational qualification and mode of construction of houses. A pertinent point of disgrace peeping out in this context from the given table is that more and more educated persons discard the way of direct involvement and they entrust the entire work to the contractors. They are more delighted in accepting the key from the contractors on the day of House Warming Ceremony. They have nothing to say about the mode of construction and even about the quality and the quantity of materials made use of for the construction of houses. On the contrary the Beneficiary who is fully absorbed in the construction activities of his house gradually becomes aware the pros and cons of the construction and also the profit and loss of its complexion at the final phase. Such consumers can rectify the defects and remould even the structure or redesign the project and plan according to their source of income and mobilised fund. Out of the 43 post graduate –holders as seen in the given Table only 7 persons are inclined to entrust the work with the contractors. However the recent tendency is to handover the entire work to the contractors and thus enjoy the solace.

TABLE 8

**AN ANALYSIS OF THE LOW COST HOUSING TECHNIQUES WITH
THE FIRM SUPPORT OF THE EDUCATIONALLY COMPETENT
PERSONS**

**Educational Qualification (Q 2) Knowledge of Low Cost
Technology (Q 16)**

Count	Q16	Q2		Row Total
		1.0	2.0	
1.0	83.3	5	1	6
		2.6	14.3	3
2.0	98.4	62	1	63
		32.0	14.3	31.3
3.0	91.7	11	1	12
		5.7	8.3	6
4.0	92.0	46	4	50
		23.7	57.1	24.9
5.0	100	43		43
		22.2		21.4
6.0	100	27		27
		13.9		13.4
Column Total		194	7	201
		96.5	3.5	100

Chi-square	Value	DF	Significance
Pearson	10.17736	5	0.7036

Source: Primary data.

The contents in Table 8 is associated with the details endowed in the questionnaire against serial number 16. The question is direct as well as simple. A crystal clear interrogation was put forth as to whether the consumer has ever heard of Low Cost Housing Technology. Naturally the answer expected either negative or positive with No or Yes.

The calculated value becomes lesser than table value and thus it is clear that the attributes are nor associated. The Research Scholar has to conclude with pain that the educational qualification is not at all related to the Low cost Housing Technology put forth by the institution like Nirmithi Kendra and coastford. There is a ray of hope in the fact that the majority of people in Kerala are aware of such low cost housing technology, It means the institution like Nirmithi Kendra and coastford which have acquired prominence without having propaganda. Nirmithi Kendra has constructed large number of such houses which still remain as living documents. The difficulty in acquiring funds or money required for the construction is the sole reason that persuade them to go for the low cost technology. If there were abundant channels or sources of money many would have turned towards the technique instead of going for the Low Cost houses with wounded souls. The Research Scholar has come to the conclusion that it is unfortunate that not even a man or woman with post graduate or Degree level education is having knowledge of low cost technology. Inspite of the marvellous works that they have completed, there is no popular recognition for the work done by the Nirmithi Kendra.

TABLE 9

**CONSTRUCTION WORK OF RESIDENCES AND THOROUGH
AWARENESS OF NIRMITHIKENDRA EFFECT**

Own Constructed House (Q9) Awareness of Nirmithi Kendra (Q18)

Count	Q18	Count	Column Percentage	1.0	2.0	Row Total
Q 2	1.0	186	94.4	197	11	98
		97.6	100	4	2.0	4
	2.0	4	2.1	190	11	201
		100	94.5	5.5	100%	
Column Total						

Chi-square	Value	DF	Significance
Pearson	.23628	1	.62690

Source: Primary data.

The Research Scholar has intentionally intended to project the lack of knowledge of the Benefits that can be derived from the application of the Nirmithi Kendra Technique for the construction of dwelling houses. This newly developed technique is hardly hostile to the fashions and modern trends. It directly shakes our conscience with a question as to whether they are aware of the economic benefit and convenience of the techniques.

Eventhough ordinary people can pretend ignorance in this respect, it is absurd and a matter of ridicule if the educationally competent persons and a black mark to the dignity of the society to own up that they have not 'yet heard of Nirmithi Kendra. However it is fortunate that 94.5 percentage of the selected persons are aware of the Nirmithi Kendra Phenomena. It is an indication of the wide recognition and popularity. The welfare scheme of Nirmithi Kendra was acquired by their activities hitherto. The calculated value is evidently lesser than the table value. In this respect the attributes are not associated. The research Scholar, however is not pleased because a wide recognition of an institution like Nirmithi Kendra has no equivalent in the personal life of many. This can be created only by enhancing the number of houses constructed on the basis of low cost conventions.

TABLE 10

**SOURCES OF INFORMATION ABOUT THE CONSTRUCTIONAL
ACTIVITIES OF NIRMITHIKENDRA AND THE FAR REACHING
CONSEQUENCES OF LOW COST HOUSING**

Awareness of Nirmithi Kendra (Q 18) Media of Awareness (Q19)

Count Q19
Row Percentage

Column Percentage	.0	1.0	2.0	3.0	4.0	Row Total
1.0		164 86.3 100	1 .5 100	2.2 11.6 100	3 1.6 100	190 94.5
2.0	11 100 100					11 5.5
Column Total	11 5.5	164 81.6	1 .5	22 10.9	3 1.5	201 100

Chi-square	Value	DF	Significance
Pearson	201.0001	4	.0000

Source: Primary data.

The Research Scholar is very particular in focusing the over all functioning of Nirmithi Kendra with its limitations and defects. The two questions given in the concluding phase of the part two against serial number

18 and 19 are exclusively given for this purpose. The Research Scholar is not content with a conventional response that we too are aware of the activities of Nirmithi kendra. No one is going to the abysses of its implications and that is why the majority of people in Kerala and denied the benefits and from the trade of Low cost housing. It is suicidal for them to accept a flooring of Red oxide and wall with Hollow bricks. Some persons are obstinate in making use of all the age-old techniques and least bothered about cost and Benefits. Practical utility is a sign of significant things. Out of 201 individual from whom the responses were selected the lions share have heard of the low cost housing techniques put forth by the Nirmithi Kendra. Eventhough seminars and conference with the demonstration of models and Blueprints are more prospective index; it is quite amazing to know that only one isolated individual happened to attend a seminar in this connection. The role of media is worth mentioning in this respect. 86.3 percentage of the selected few had become aware of Nirmithi Kendra through News papers and other media. This also reveals that the cultural and intellectual graph of Kerala is having its ups and downs only in accordance with the publicity given by the media. The calculated value is higher than the table value. The attributes are associated. That means, the knowledge about the Nirmithi Kendra and the different sources and the achieved score are closely related.

TABLE 11

THE STRUCTURAL VARIATIONS OF LAND AND THE CONSTRUCTION OF BASEMENT IN TUNE WITH THE NATURE OF THE LAND

Own Constructed House (Q9) House Foundation Constructed Structure (Q20)

Count	1.0	2.0	Row Total
Row Percentage			
Column Percentage			
1.0	185 93.9% 98.4	12 6.1% 92.3	197 98%
2.0	3 75 1.6	1 25 7.7	4 2
Column	188	13	201
Total	93.5	6.5	100

Chi square	Value	DF	Significance
Pearson	2.31708	1	.12796

Source: Primary data

The experiences and experiments with the Traditional constructional activities and the low cost housing Techniques has compelled the Research Scholar to examine the different steps of construction from Basement to the Roof with appropriate interpretations and comparative analytical studies

making use of the yardstick of Practical utility. The Research Scholar is neither stubborn nor Blind and deaf towards certain methods accomplished by the laymen in the process of construction of dwelling houses. The Basement of a House is a good example. In certain cases the expenditure can be reduced if the land chosen has rocky foundation or Firm Laterite base. Similarly comparatively huge amount is to be incurred in some other cases like sticky mud area. Even concrete belts are to be recommended in such areas. The Basement Techniques varies from place to place according to geographical and ecological variations. The first question prepared by the Research Scholar in part three against serial number 20 is very pertinent. The question compels the beneficiary to make a self evaluation of the foundation of the house to be constructed perfectly in tune with the lay and nature of the land. The calculated value is evidently smaller than the table value. Therefore the attributes are not related. The ordinary educated people in Kerala are not much concerned in arranging the Basement of their Residential House perfectly in tune with the nature of the land. The recent havoc occurred in the form of Tsunami gives us a clear indication of the necessity of having a firm foundation.

TABLE 12

THE CONSUMPTION OF SOLAR ENERGY FOR ELECTRIFICATION

**Educational Qualification (Q2)
House Electrification-Solar Energy (Q29)**

Count Q29 Row Percentage Column Percentage	1.0	2.0	Row Total
1.0		6 100 5.1	6 3%
2.0	16 25.4 19.0	47 74.6 40.2	63.31.3
3.0	2 16.7 2.4	10 83.3 8.5	12 6
4.0	28 56 33.3	22 44 18.8	50 24.9
5.0	20 46.5 23.8	23 53.5 19.7	43 25.4
6.0	18 66.7 2.4	9 33.3 7.7	27 13.4
Column Total	84 41.8	117 58.2	201 100%

Chi square	Value	DF	Significance
Pearson	25.79396	5	.0010

Source: Primary data.

Since there is a recent development to exploit the maximum possible sources of nature in an eco friendly manner we turned towards the immense power of sunlight also. This is more visible in urban areas. Lamps made using solar energy are abundantly available in the market. And the application of the same reduced the consumption of the hydel electricity which is scarce in the modern context. However the inclination towards solar system is only in the initial stages. The Research Scholar selected details from 201 individuals even regarding, the solar set ups only in anticipation of its gradual increase, especially if the cost and investment is comparatively cheaper and if the consumption is self regulated. The available details are given in Table 12. The calculated value is higher and their attributes are closely associated. The educationally competent persons prefer the New substitute of solar system.

TABLE 13

EXPENDITURE ON EXTERNAL APPEARANCES IGNORING THE FINANCIAL LIABILITIES

		Loan Taken (Q12) Wall Painting (Q30)				
Count	Q30	1.0	2.0	3.0	4.0	Row Total
Row Percentage						
Column Percentage						
		42	19	102	12	175
		24%	10.9%	58.3%	6.9%	87.1%
		1	6	16	3	26
		3.8	23.1	61.5	11.5	12.9
		2.3	24	13.6	20	
	Column Total	43	25	118	15	201
	Total	21.4	12.4	58.7	7.5	100
Chi-square		Value		DF		Significance
Pearson		7.72115		3		.05214

Source: Primary data.

The Research Scholar has combined a very significant and crucial issue in this Table. As it is well known there is a gradual process for the construction of building. The entire expenditure can be categorised as unavoidable expenditure. Expenditure that can be kept in abeyance and unwanted Hippocratic expenditures. The Basement and Roofing are the most important factors of a shelter. All others are either evolved in due course as conveniences. Besides there are certain luxurious parts of expenditure also.

Only citizens of Higher class can afford it. But there is a tendency even among the middle class to emulate everything as is performed by the people hailing from higher strata. This has become a curse to the Kerala society. No one is prepared to make use of red oxide or some other cheaper substitute in the place of Marble or Granite. In olden days our walls were white and we were all contented with lime plastering. It was beautiful, hygienic and cheapest. As such the average man could meet such a recurring expenditure. But unfortunately now a days we hang behind the style and fancies of Rich People in the Business circle. Hence either the wife or Husband is obstinate in purchasing costly materials for wall painting and interior decorations. Some of the beneficiaries totally rely on financial institutions and moneylenders to raise the required amount. Without least botheration about their incapacity for repayment. The Banks or the moneylenders offer loans only on the basis of solid securities or sureties. In the long run they will resort to the ruthless measure called attachment. Then the entire dream will shattered. The question projected against serial number 30 contains four options. There is no one to offer positive answer to the fourth column because it is practically impossible for the family to make use of anything. At least they will prefer lime. The general tendency of the middle class is to choose between cement paint or Emulsion paint. Naturally it is impertinent for a middle class citizen even to stare at column 3 (Emulsion paint) because it will enhance the total amount of debt and he cannot be listed

as a person with the capacity to repay a loan amount in a lump or by instalments. Out of the 201 individuals selected for the study about 90 percent are in search of Loan Facilities. Out of the Beneficiaries of Loan facilities about 60 percent cling to the taste of the Emulsion paint. But the case of those who have not availed the Loan and construct their dwelling place without a penny of Loan are comparatively satisfied with other cheaper methods. In this context the calculated value is evidently lesser than table value. It is quite astonishing to see that there is no relationship of availing loan amount and expending money on external painting.

TABLE 14

MAKING USE OF LOCALLY AVAILABLE MATERIALS FOR EXTERNAL BEAUTIFICATIONS AND ILLUMINATIONS

Local Availability of Construction Materials (Q13)

Wall Painting (Q30)

Count	Q30	1.0	2.0	3.0	4.0	Row Total
	1.0	43 23.2	25 13.5	106 57.3	11 5.9	185 92
	2.0			12 75 10.2	4 25 26.7	16 8
Column Total		43 21.4	25 12.4	118 58.7	15 7.5	201 100

Chi-square	Value	DF	Significance
Pearson	13.83153	3	.00314

Source: Primary data.

Question number 13 in the Questionnaire prepared by the Research Scholar is closely associated with the expected answers to several other questions. They are all interlinked or correlated. The verification of datas and statistics enabled to the Research Scholar to come to the conclusion that the middle man of Kerala is having no apprehension at all in availing Loan facilities. They are benefited by the Loans not only for bare necessities but

also for unwanted luxuries. Any one can face the comments in the construction without having a single penny in his pocket. Hire purchase systems and instalment schemes have created a kind of cultural degradation. Today we are least bothered about the Loan amount or the interest rate we see our target in the infinity. The contemporary Research oriented studies put much emphasis on using locally available materials to ensure safety and durability and adaptability. If there is a statutory insistence to make use of locally available materials, it will be highly conducive and revolutionary. Research Scholar has to presume that the hasty chasing of Laxurious items are persuaded because of external forces. The capitalist and imperialist nations are gradually trying to convert the under developed countries in the Asian continent their market. Hence a deliberate intervention from the higher level is required to create a new trend in the style and functioning of construction. It is highly pathetic to know that only 106 persons prefer Emulsion paint out of 201. Table 14 shows the graphic infavour of the table value which is higher than the calculated value. The Research Scholar projected table 14 for the purpose of establishing the fact that the use of Locally available materials is well related to the materials chosen for enhancing external appearance of houses.

TABLE 15

CONSTRUCTION OF LINTEL FOR MODERN HOUSES AND THE PROPOSALS PUT FORTH BY THE NIRMITHI KENDRA IN THIS RESPECT

Awareness of Nirmithi Kendra (Q18)

Type of Lintel of House (Q22)

Count	Q22	1.0	2.0	3.0	Row Total
	Row Percentage				
	Column Percentage				
1.0		106 57.3	1 .5	6 3.2	190 94.5
2.0		6 54.5	1 9.1	4 36.4	11 5.5
Column Total		189 94%	2 1%	10 5%	201 100%

Chi-square	Value	DF	Significance
Pearson	32.639493	2	.00000

Source: Primary data.

The Research Scholar is much inclined to reveal the contributions of Nirmithi Kendra especially in the field of construction of low cost houses. Question number 18 is a simple and direct enquiry about the knowledge of Nirmithi Kendra with the implications of those who give the answer 'No' who

are totally ignorant about the recent development and beneficial programmes in this field. It seems to be awkward and disgrace to pronounce 'No' because a man without having a prima-facie knowledge of Nirmithi Kendra and like institutions are not competent to plan and lead domestic life in this world. Eventhough it seems to be trivial, the answer to the question number 22 has far-reaching consequences. Nirmithi Kendra and other such organisations are not involved only in the work of low cost construction. They have their own explanations and justifications. They focus much on adaptability to ecology and environment by restricting the use of locally available materials and substitution of comparatively cheaper goods without having any adverse effect on Beauty, grace or glory. The voluntary work undertaken by Nirmithi Kendra ultimately indicates to a new aesthetic and a new philosophy. There are three columns against the question number 22. It is not an easy task to choose from one among them. It is related to our standard of life and the concept of residence. The Research Scholar portrayed three columns wisely out of the 201 individuals the majority are having a slight intimatism of the where about of Nirmithi Kendra. 96.3 percentage of the selected few are going after RCC* system.

* RCC - Reinforced Cement Concrete.

The trend that developed in the last decade in favour of arch type building has vanished. Infact it was emerged only as a protection against Leakage. But it was not much protective. The calculated value is higher than the table value and accordingly they are correlated. The gradual familiarity with the beneficial and convenient methods of construction wisely put forth by Nirmithi Kendra is related strongly with the new types of Lintels appeared in Kerala.

TABLE 16

CHANGES FREQUENTLY OCCURRING IN THE STYLE OF ROOFING

Awareness of Nirmithi Kendra (Q18)

Roof Type (Q23)

Count	Q23	1.0	2.0	Row Total
	1.0	185	5	190
		97.4	2.6	94.5
		95.9	62.5	
	2.0	8	3	11
		72.7	27.3	5.5
		4.1	37.5	
Column Total		193	8	201
		96	4	100

Chi-square	Value	DF	Significance
Pearson	16.52026	1	.00005

Source: Primary data.

Question number 23 of the questionnaire has the definite purpose of directly exposing the different types and styles of Roofing calculated from different angles. Nirmithi Kendra has a unique place in this respect also. Formerly the Keralites celebrated their modern houses with newly introduced clay tiles. They were much proud of the emblem mark beneath their tiles 'the Common Wealth Trust Limited.' In those days the external roofs were slanted

with provision for avoiding the linking of the rain and thereby leakage. But the modern society evolved with fascinating pictures of flat roofs. In fact they were constructed absolutely on the basis of models blindly borrowed from the west. Many old houses were reconstructed with the flat roof systems. The durability of the modern concrete constructions is limited to twenty years. The flat roofs became damaged within years. The adaptability also a curse. The flat roofs were made of concretes and iron steels, the shrinkage of which resulted in gaps and hollows. The iron steel also became rusted. It was in such a crisis the ideas propounded by intellectual giants like Lauri Baker were imported to this gracious land. It may be an alien idea. All theories and ideas emerged in the west are not bad. More over the idea of low cost housing could create a sense of nationalism in the minds of people. They preached the use of locally available materials for the construction of their residences. They could easily convince the people of the problem of adaptability to new craze of hollow bricks emerged in the distance which draw nearer and nearer in course of time. Nirmithi Kendra kept on extolled the adverse effect of flat roof. Once again the external roof became slanted. It was a mere repetition but with intended results. Out of the 201 persons whose datas provided in the questionnaire were examined by the Research Scholar stated in one voice that the Lions Portion coming to 97.4 percent have already abandoned the former style of wood and tile roofing. The latest development in this regard is that tiles are again used to spread on the

concrete roofs for beauty as well as safety. The details available in table 16 shows that the calculated value itself is higher. The Research Scholar is much delighted to see the knowledge of Nirmithi Kendra has some good points and effect on the style and material chosen for the construction of roof.

TABLE 17

A STUDY ON THE MATERIALS APPLIED FOR THE CONSTRUCTION OF CASEMENTS AND WINDOWS

Awareness of Nirmithi Kendra (Q18)

Type of material used for windows (Q24)

Count	Q24	1.0	2.0	3.0	Row Total
	Row Percentage				
	Column Percentage				
	1.0	1 .5 50	12 6.3 92.3	177 93.2 95.2	190 94.5
	2.0	1 9.1 50	1 9.1 7.7	9 81.8 4.8	11 5.5
	Column Total	2 1	13 6.5	186 92.5	201 100

Chi-square	Value	DF	Significance
Pearson	7.93361	2	.01893

Source: Primary data

Wood is sine que non-for roofing. It will maintain the adaptability also. To a larger extent we can agree with the proposal that a firm wooden door is a must for the exits and entrances. But there is a grave issue of spending money unnecessarily for certain other construction activities like Windows, and Casements. The recent development nourished by voluntary

organisations like Nirmithi Kendra has genuinely convinced the people that they can give up the costly affair of depending on Teak Wooden Planks for such unwanted purposes. Evidently this is a drastic change introduced by Nirmithi Kendra and other such organisations. The low cost housing system has pervaded all over Kerala as a new slogan. Out of the 201 individuals whose responses, have been accepted for the Research study has disclosed the fact that the people of Kerala still have a concealed desire for wood and wooden stuffs. The calculated value is lesser than actual value and higher than ten Table and they are correlated. It is implied that the general acquaintance with the Nirmithi Kendra has some strong tie with the habit of reducing the use of wood for windows and casements.

TABLE 18

IS PLASTERING A SINE-QUE-NON FACTOR FOR DWELLING APARTMENTS

Awareness of Nirmithi Kendra (Q18)

Wall Plastering (Q25)

Count	Q25	1.0	2.0	Row Total
	1.0	186 97.9 95.4	4 2.1 66.7	190 94.5
	2.0	9 8.8 4.6	2 18.2 33.3	11 5.5
Column Total		195	6	201 100%

Chi-square	Value	DF	Significance
Pearson	9.27988	1	.00232

Source: Primary data.

The general conviction predominant even among the laymen is to possess and own a shelter with flooring, walls and a roof. These are primary requisites. But the people are not prepared to restrict there and go on seeking fascinating house by enhancing the beauty of external appearance. However the majority were contented with a whitewashed outer space. It was comparatively cheaper. Gradually luxurious articles crept in and wiped off

the white coloured outer surface. This was justified on several grounds including that of the retaining the wall without being stained easily. The intervention of Nirmithi Kendra and other similar isolated ventures has given a new conviction, which is not easily acceptable to all. They argued infavour of having no plastering at all on the outer part of the wall. This will enable to reduce the cost to a large extent. This serves a double purpose including cost of materials and Labour charge and a new approach. The cost of sand and cement are always on the raise. The Toil exerted for plastering of a wall of a single room with the plinth area of 100 square feet will exceed 3 or 4 days for a labourer. The labour charge thus estimated will come to about Rs.2000. There will be additional charges towards the material cost as per the general estimate; the plastering of the said area will need 6 sacks of cement and half a load of sand. A rough calculation of the cost of these items will come to about Rs.3500/- (The present rate of cement per bag is Rs.178) and half a load of sand is Rs.750. Apparently the question shown against serial number 25 of the questionnaire with relation to question number 18. Awareness of Nirmithi Kendra, seems trivial but the Research Scholar has included such a question with a definite purpose. The fancies and tastes are undergoing changes. And Today people are well acquainted with fact and their dwelling places are not permanent structures, but transient abodes. These convictions should lead the people to their efforts of making estimates. The Research scholar intends to propose that fascinating diagrams can be depicted on the walls in lieu of

adding additional weight of sand and cement. Out of the 201 individuals selected for the Research study 190 persons have already acquired some knowledge about Nirmithi Kendra. The calculated value as per the verification of table 18 is higher than the table value. There is no scruple in the subject that the intimacy with such a noble organisation will naturally and gradually induce common men to forego the age old convictions like plastering of the walls.

TABLE 19

DIFFERENT MODELS AND METHODS ADOPTED FOR THE PRESENT STYLE OF PLASTERING

Awareness of Nirmithi Kendra (Q18)

Plastering Materials (Q26)

Count	Q26	1.0	2.0	3.0	4.0	Row Total
	1.0	2	174	12	2	190
Row Percentage		1.1	91.6	6.3	1.1	94.5
Column Percentage		100	94.6	92.3	100	
	2.0		10	1		11
			90	9.1		5.5
			54	7.7		
Column Total		2	184	13	2	201
		1.0	91.5	6.5	1.0	100%

Chi-square	Value	DF	Significance
Pearson	.35590	3	.94919

Source: Primary data

While there is an indication in Table 18 to adopt a new style for plastering the walls. It is to leave the walls free with out unnecessary additional weight. The liberation movement among the opposite sex has created the wonderful trend of relinquishing ornaments and getting the notion that identity of an individual is not governed with external gowns and

garments. The recent trend among the contractors and consumers of constructing Abodes is to reduce the cost of construction by giving up all unnecessary decorations like plastering and there by saving the maximum possible amount from the estimated cost. Question number 26 examines the different types of mixtures presently applied through out Kerala for the purpose of plastering. There are four columns given against the question number 26 the second and third are conventional practice of using either cement or lime. There are very few persons who only make use of hereditary type of sticky mud for plastering. Sticky mud abundantly available in Kerala is profitable for many reasons. The Sanker's habits with Head quarters at Thiruvananthapuram apply solid mud for their walls. There are lots of houses even with double story, which retain beauty as well as strength. The new method of abandoning the plaster and substituting ceramic tiles marble and, granites are unnecessary and unaffordable to the ordinary man. The last column is vaguely left for seeking other materials if any, used by any constructing agencies anywhere in Kerala. The reply furnished is no. The calculated value is higher than the table value and there is apparent correlation. While choosing the appropriate method and material for plastering, the practical know-how about the programmes of Nirmithi Kendra will help the consumers.

TABLE 20

THE GUIDELINES SUGGESTED BY NIRMITHIKENDRA AND THE EXPERIMENTS CONDUCTED BY IT IN THE MATTER OF FLOORING

Awareness of Nirmithi Kendra (Q18)

Flooring Materials (Q27)

Count	Q27	1.0	2.0	3.0	4.0	Row Total
	Row Percentage					
	Column Percentage					
1.0		1	72	114	3	190
		0.5	37.9	60	1.6	94.5
		100	87.8	99.1	100	
2.0			10	1		11
			90.0	9.1		5.5
			12.2	.9		
Column Total		1	82	115	3	201
		.5	40.8	57.2	1.5	100%

Chi-square	Value	DF	Significance
Pearson	12.10518	3	.00703

Source: Primary data

Flooring and Plastering are inter related and people go after costly materials for both, only to get the maximum beauty and durability for their houses. Flooring is not at all a cheap affair. Fifteen percent of total estimated cost will be covered by the amount earmarked for flooring. The consumers

become agitated when they confront the interrogative as to whether, they are satisfied with the conventional type of Floorings. Our market is full of glazing materials and it will be suicidal for the consumer to give a positive answer in favour of *cowdung paste* and even red oxide. External beauty is the only criteria. The people are not bothered about hygiene or the health factors otherwise people would not have given up the 'kadappa' slabs obtained from the internal area of Andhra Pradesh and Karnataka. The beauty and novelty of *Mosaic* flooring also could not live longer. For the last one or two decades the first preference of Kerala was Granites, Marble slab, or Marbonites high cost persuaded them to adopt artificial ceramic tiles. There is nothing to grumble about the natural stones. But the question is to whether an ordinary person can set apart a huge amount of nearly Rupee one lakh, only for the flooring work of the newly constructed dwelling places? If there is a pressing demand for cowdung paste again in Kerala, the interest for fostering cattle will rise in Kerala. There is a general trend to go after luxury in all spheres of life. Even the experts in the medical Arena often counsel in favour of using ordinary Natural materials. The calculated value in this context is higher than Table value. Eventhough there is no general trend to accept natural substances for flooring the awareness of the lessons extended by Nirmithi Kendra will transform the present position.

TABLE 21

**SUBSTITUTES RECOMMENDED BY NIRMITHIKENDRA FOR
SANITARY PURPOSES**

Awareness of NirmithiKendra (Q18)

Sanitation Facility (Q28)

Q28		1.0	2.0	Row Total
	1.0	160 84.2 98.2	30 15.8 78.9	190 94.5
Q18	2.0	3 27.3 1.8	8 72.7 21.1	11 5.5
	Column Total	163 81.1	38 18.9	201 100%

Chi-square	Value	DF	Significance
Pearson	21.98733	1	.00000

Source: Primary data.

The Research Scholar found it a sin and a crime if he had left the different aspects of sanitary conditions closely associated with the housing facilities. Density of population in Kerala is an insurmountable issue Kerala is having more population than entire Canada. Our life was simple. Thus our concepts of life also were simple. The emergence of Nuclear families and the

disappearance of joint family set up has shook up the Kerala way of life during the last two decades. The present set up of erecting huge and sky-touching flats also have created more problems. There is no proper drainage system in many urban areas. There should be convenience for doing away with the waste. The Research Scholar has earnestly put forth three simple questions against serial number 28 of the questionnaire. The majority of the people are well equipped with the knowledge of septic tank. 163 persons (81.1percentage) prefer septic tank. The calculated value is much higher than table value. The method and style of sanitation adopted by many people are solely guided by their intimacy with the Nirmithi Kendra.

TABLE 22

THE RELATIONSHIP BETWEEN THE ACADEMIC QUALIFICATION ACQUIRED AND THE SELECTION OF SCIENTIFIC SANITARY FACILITIES

**Awareness of Nirmithi Kendra (Q18)
Sanitation Facility (Q28)**

Q28	1.0	2.0	Row Total
1.0	3 50 1.8	3 50 7.9	6 3
2.0	37 58.7 22.7	26 41.3 68.4	63 31.3
3.0	10 83.3 6.1	2 16.7 5.3	12 6
4.0	44 88 27	6 12 15.8	50 24.9
5.0	42 97.7 25.8	1 23 2.6	43 21.4
6.0	27 100 16.6		27 13.4
Column Total	163 81.1	38 18.9	201 100%

Chi-square	Value	DF	Significance
Pearson	39.93573	5	.00000

Source: Primary data.

The details arrayed in table 22 by the Research Scholar it self is explanatory. There is no wonder that 100 percent of the beneficiaries with professional degrees, have constructed septic tanks with their houses. Even people with bare minimum qualification of SSLC, Spend money for the construction of septic tank. The use of ordinary tank is harmful and perilous for their family as well as for their neighbours. Facilities for environmental education grow, the *impetus* for constructing septic tanks also will increase. This reveals the fact that the construction activities are having human face, more precisely to say a scientific face. This table 22 also studies the relationship between the educational qualification and the mode of sanitary facilities. The calculated value in this respect also evidently higher than the table value and they are correlated.

TABLE 23

A TIE WITH LOW COST TECHNOLOGY AND ECO FRIENDLY TECHNOLOGY

Knowledge of Low Cost Technology (Q16) with Percentage of Earning Profit by the Use of Cost Effective Eco Friendly Technologies (Q32)

Q32	1.0	2.0	3.0	4.0	Row Total
1.0	11 5.7 64.7	174 89.7 99.4 87.8	7 3.6 100	2 1.0 100	194 96.5
2.0	6 85.7 35.3	1 14.3 .6			7 3.5
Column Total	17 8.5	175 87	7 3.5	2 1.0	201 100%

Chi-square	Value	DF	Significance
Pearson	55.91820	3	.00000

Source: Primary data

Eventhough the aforesaid issue will become a subject of study only in the advanced stage the timely interference of Nirmithi Kendra and other such voluntary organisations parallel with conventional methods have brought a new awareness with far reaching consequences. Out of the 201 individuals, 194 are still out of the orbit and ambit of the new phenomena. Otherwise they

could also have reaped benefits. The contemporary crisis is how to impart education and awareness among the ordinary people about the scope and profit of Eco Friendly Technology, compatible with Low Cost Techniques propounded by Nirmithi Kendra and others. The calculated value is higher than Table value and as such there is correlation also. The Research Scholar earnestly feel that it is an indication that there should be a harmony of theories practices of House construction.

TABLE 24

**NEGATIVE AND POSITIVE ASPECTS OF LOAN FACILITIES IN
KERALA FOR CONSTRUCTION OF HOUSES**

Loan Taken for House Construction (Q12)

Satisfaction of House Construction (Q33)

Q33	1.0	Row Total
1.0	175 100 87.1	175 87.1
2.0	26 100 12.9	26 12.9
Column Total	201 100%	201 100%

Source: Primary data

Construction of houses will remain a distant dream if the financial institutions and the Money Lenders hesitate to come forward and advance Loans for the purpose. This has become a wide spread style of life and a withdrawal from the same is practically difficult and impossible. The money lending agencies extend loan only on the strength of sureties and securities. They have nothing to worry about the repayment of the consumer as long as there are statutory provisions for the attachment of the property. One of the reasons for massive suicides in Wayanad district is none other than this. They have diverted their loans for other purposes. They will be able to repay the

entire amount, if they have used the same for the original purpose. Out of the 201 persons who have offered their remarks, the thumping majority is in favour of availing Loan facilities. The calculated value is higher than the table value and both are correlated. The beneficiaries are satisfied and delighted due to the fact that the funding agencies are generous and liberal and not at all adopting hard measures.

TABLE 25

CESSATION OF CONSTRUCTION WORK DUE TO THE NON-AVAILABILITY OF LOAN AMOUNT IN TIME

Loan Taken (Q12)

Stop Work (Q34)

Q34	1.0	2.0	Row Total
1.0	109 62.3 87.2	66 37.7 86.8	175 871
2.0	16 61.5 12.8	10 38.5 13.2	26 12.9
Column Total	125 62.2%	76 37.8%	201 100%

Chi-square	Value	DF	Significance
Pearson	.00538	1	.94155

Source: Primary data

There are certain instructions and binding guidelines as a prerequisite for the enjoyment of the Loan amount advanced by funding agencies. No Bank or Financial institution will offer the huge Loan amount requested for and sanctioned it in a lump. Periodical verification and completion certificates from the competent persons at different levels are highly essential. The Loan amount is being released only in instalments. This is a security measure to see that the Loan amount has been fully utilised exclusively for the

construction purpose. Another defect of the present loan awarding method is that they are simply verifying the plan and estimate. They should verify and give certificate to the effect that the work completed partially was done in good spirits. There is a craze and competition among the people to emulate others and spend all the money for the construction purpose. This will adversely effect the Kerala economy as a whole. The calculated value is smaller than table value. There is no relationship between frequent experience of cessation of construction under the pretext of not releasing the – sanctioned amount of the loan

TABLE 26

**THE GRADUAL INCREASE IN THE COST OF MATERIALS
REQUIRED FOR THE CONSTRUCTION PURPOSE**

Stoppage of Work (Q34) with

Rise in the Price of the Building Materials (Q35)

Q35	1.0	2.0	Row Total
1.0	125 100 64.4	72 37.9 87.8	125 62.2
2.0	69 90.8 35.6	7 9.2 100	76 37.8
Column Total	194 96.5%	7 3.5%	201 100%

Chi-square	Value	DF	Significance
Pearson	11.92858	1	.00055

Source: Primary data

Out of the 201 individuals selected by the Research Scholar from among those who have furnished the required details in the questionnaire, 194 beneficiaries had to withhold the construction work due to the unexpected hike in the cost of material and labour charges and also due to the shortage of funds. The Research Scholar keenly observed the responses and the precautions of consumers in the event of frequent hike in the cost of materials. Naturally the actual expenditure incurred will be much higher than the

estimated calculations. In fact the gradual increase in the cost of materials has become a regular feature like future depreciations of machineries. This unexpected amount required for the purpose of construction also should be included in the Rough and the Final Estimate Prepared for the construction work. A very pertinent question has been projected against serial number 35 under part 3. This should be read with the auxiliary question given against serial number 34. If there is any cause for the temporary cessation of construction work, it will be only the hike occurring in the cost of materials. The persons who were not compelled to withhold the construction are negligent in number and the percentage of the same is 3.5. So the calculated value in this respect is obviously higher than the table value and as such there is associated.

A PROFILE OF THE FUNCTIONING OF NIRMITHIKENDRA

Rajeevan. K. "Economy of low cost housing in Kerala a study with special reference to Nirmithikendra" Thesis. Department of Commerce and Management Studies , University of Calicut, 2006

CHAPTER 3

A PROFILE OF THE FUNCTIONING OF NIRMITHIKENDRA

Nirmithi Kendra is Kerala's modest answer to the complex problem of mass housing started as a pioneering experiment in Kollam District to propagate the message of low cost housing in society.

Nirmithi Kendra is primarily an organisation to disseminate information on low cost building technologies and materials. The broad objectives of the Kendra are:

1. To serve as seminal agency to generate and propagate inevitable ideas in housing.
2. A clearing house of information and data bank on housing which would bring the fruits of research from lab to land.
3. A production centre to prefabricate standardised housing materials.
4. A training house to impart skills to local work men in inevitable housing techniques and create a cadre of trained workers in all the blocks in the districts.
5. A chain of retail out lets for low cost housing materials.

6. A research and Development institution and consultant in the field of housing.

The Nirmithi Kendra is a charitable society registered under the Travancore-Cochin literary scientific and charitable societies Act. It is a voluntary organisation with the active involvement of non officials and officials. The governing body of the Kendra consists of three types of members.

1. Individuals
2. Institutions
3. Ex-officio members

Such an organisation pattern helps being under a single window the resources and talents available at the government and non- government levels. It also provides sufficient flexibility to take up housing and related activities avoiding the procedure and other rigidities of the government system. Such an approach has helped bring together all important agencies and personel working for the low cost housing of the district levels.

The cost of construction is increasing at a rapid rate now days. This makes the building constructions quite unaffordable to the common man of the country and forced them to set aside the dream of housing.

There are various factors which contribute to this high cost of construction. The increasing cost of building materials, cost of labour, larger wastage of construction, conventional methods of construction etc. Economising all or few of the above factors can significantly reduce the cost of construction. The use of locally available materials in place of conventional materials of high cost will definitely reduce the construction cost. Development and implementation of some innovative and cost effective techniques so as to minimize the amount of wastages and to make use of the best value for money will serve a lot to this trend.

To bring such an innovation in the field of construction has become the task of time. Nirmithi Kendra has a lot to do in this regard. The major portion of the construction work in our state are usually entrusted to Public Works Department or other agencies. Unfortunately, these departments and agencies are functioning in such a manner that they will not permit a change in their traditional style and procedures. They also exhibit less interest in promoting innovative and cost effective construction techniques.

They are functioning in an orthodox style with rigid rules and procedures. Some also followed "over designing" (A design using more than that required) in many areas which results in loss of large quantities of materials and labour. These unhealthy practices should be restricted

immediately. Therefore the promotion of the concept of low-cost or cost effective construction deserves a more intensive attention.

The development of an innovative technology involves various stages such as inception, growth, maturity etc. The role of agencies like Nirmithi Kendra is to coordinate all the processes involved and direct them to achieve the objective of economizing the construction. The cost of production can be applied in all phases of construction with the use of locally available materials and new methods of construction.

In north Kerala, natural stones like laterite are available cheap and hence laterite rubbles can be profitably used for basement. Laterite cut stones can be used for walls in place of costly bricks or concrete. Where as in south Kerala, laterite is not available and usage of laterite becomes uneconomic than the bricks. Hence our choice of building depends on its local availability and relative cost.

Another way to minimize the overall cost is to in minimize the usage of costly elements of construction, and adopt the alternative materials, if any. Presently, the timber is one of the costly elements of construction. The research works and studies show that we can replace the use of timber with that of alternative materials like pre-cast R.C.C. and the steel component. The doors and windows frame can be made with pre cast reinforced concrete with much convenience and cost effectiveness. The cost of a pre-cost R.C.C

doorframe is about 40% only to that of a wooden frame. Adopting use of concrete frame can reduce the cost of doorframes for internal opening. The purpose of providing a doorframe is to facilitate the fixing of shutters. But only a small portion of wooden frame is actually utilized for fixing the shutters with hinges. The method is to provide two or three wooden pieces, having hinges embedded in walls with metal clamps during the construction. The shutters can be conveniently fixed on these wooden pieces with hinges. Hence, we can serve the purpose of a door frame with two or three wooden pieces instead of full wooden frame and hence the cost can be reduced considerably.

The use of steel windows in place of wooden windows also help to save the cost by about 50%. Similarly the cost reduction can be applied to roof construction by applying filler slab techniques in place of R.C.C. slabs. In wall constructions by adopting rat-trap bonding and cavity walls in place of connectional solid brick wall etc.

Before implementing any technology in the field, it is necessary to identify, study and analyze the need for the same. Even though there is a couple of scope for innovation in the field of construction, the people are not aware of these. They are still very reluctant to use these innovations. They have strong traditional beliefs and concept regarding the construction materials and methods.

They do not think that new materials are as strong as traditional ones and new methods are effective in many ways. They are not ready to take any risk in their own construction. Another limitation is related to the existence of Nirmithi Kendra itself. Presently the Nirmithi Kendra do not getting any Govt. grant or subsidies and it is functioning with its own income. The complete concentration of all of its efforts and resources in the field of low cost housing badly affects its financial position. Hence it has to function on commercial basis for its existence. This diversion from the established objectives is a limitation indeed as far as the organisation is concerned.

Nirmithi Kendra has become a household word in the state and those who venture upon construction of house with a limited budget invariably look up to the Kendra for guidance. Nirmithi ordinarily undertakes three types of building construction.

1. Public Building
2. Remunerative works
3. Economically weaker section housing.

The first category of work is meant to establish credibility for low cost technology. The popular misconception that low cost mean low quality or that low cost technologies are meant only for the poor man is sought to be dispelled by trying out these technologies in the construction of public buildings. Nirmithi Kendra have constructed village offices, schools, hospital

buildings, quarters, hostels and number of public building through out the state. This has gone a long way in establishing credibility for these technologies and materials among the public. The Nirmithi approach to house construction has new earned wide appreciation from all sectors of the public.

In the case of remunerative works include construction of shopping complexes, private residential buildings and in this category Nirmithi undertakes direct construction or provides guidance and technical support as required by the builder. These works are undertaken at less than the prevailing market rate. The modest surplus that is generated from these are used for the maintenance expenditure of the Kendra and also for undertaking research and development activities.

Nirmithi Kendra undertakes construction of economically weaker section houses giving adequate emphasis on the local requirements. New design is drawn up depending on the location and the requirements of the occupational groups.* Nirmithi concentrates on construction of houses in inaccessible tribal areas, fishermen colonies, scheduled caste habitat and in area predominantly occupied by coir workers, cashew workers, beedi workers and the like.

* Nirmithi Kendra - A pioneer in housing (V. Sureh-AIHDA Journal volume 87/2 New Delhi June 1987)

Housing for the weaker sections has been at the core of government priorities in Kerala in the last few years and about a lakh of houses are completed in the state. The concept made the desired impact in the field due to the following reasons.

1. Lack of dissemination of modern low cost housing techniques resulting in the continuance of traditional techniques.

2. Continued use of traditional materials for the construction of house and the general lack of awareness of use of more economical substitutes.

These factors have contributed to create situation where the launching of a massive low cost housing programme in the state has pushed up the price of housing materials. The very concept of low cost housing might tend to get defeated in the absence of necessary back up services for mass production and distribution of good quality low cost housing materials at reasonable prices.

The shortage of housing is very acute all around the world, more particularly in the developing nations. The inflationary trends of world economy have escalated the costs of Building materials to the extent that many of the conventional building materials can no longer be considered as reasonable propositions for the construction of low cost housing scheme.

There are mainly two parallel ways for solving housing problems. One is the usage of abundant and cheap local materials by means of techniques

which do not call for sophisticated instruments or skilled labour. Second one which must go along the first is to make acceptable by the population concerned the techniques which are proposed to them. Since the hesitation to accept local and cheap material is far from negligible while considering the cheap and locally available materials, soil finds its own place in the list. The utilisation of earth in the construction is one of the oldest and most common methods used by a bigger percentage of population in developing countries. It is the most readily available and cheap material found every where indeed in many regions in the world is earth, and still is a commonly used building material.

The main reason for advocating the use of soil products in low cost housing project is their cost effectiveness. It has been observed that all construction cost can be reduced even by more than half by substituting the conventional wall construction materials such as concrete blocks, stone block etc with appropriate walling materials such as stabilised soil blocks etc.

Stone blocks and concrete blocks are too strong and costly and hence has to be replaced for low cost housing requirements if good soil are readily available at or nearby the building sites and when house owner participates in the production of the soil products and actual construction of their houses on self-help basis, the cost effectiveness will be maximum. As a building material earth is easy to work with, requires less skills and as such it

encourages and facilitates unskilled individuals and group of people to participate in their house construction on self help basis. It offers very high resistance destruction by fix of houses and provides a comfortable living environment due to its high thermal and heat insulation value.

Undoubtedly this has got certain outstanding short comings. The poor and very low load bearing capacity makes it unsuitable for supporting heavy roofs from large span building. The low resistance to moisture destructive effect and high moisture absorption ratio results in the crumbling of soil products and in turn leads to structural failure one exposed to moisture. Earth particles have got very low building strength and this reduces its compression strength. Earth product when exposed to different weather conditions, major structural cracks results as the result of high shrinkage/swelling ratio which in turn makes them unsuitable for big construction purpose. Its low resistance to wear and tear leads to frequent repairs and maintenance when used in building construction works. It is this weakness, which cause a lot of fear, doubts and hesitation among designers, developers, users, decision makers, financiers etc. in trying to accept soil product for building construction work. These are justified reasons and no one should be blamed for not accepting the material.

The use of appropriate cheaper local building materials in low cost housing projects is one of the key solutions to the provision of adequate decent shelter to the poor. However getting the concept accepted by the

different groups involved in the implementation of such programs is not light. It calls for joint efforts from all groups namely the researchers, the planners, designers, the policy and decision makers, the developers, the financiers and the users to adopt a positive attitude towards the project. This calls for intensified practical research project supplements by erecting demonstration structures to serve as example for all the group to see and judge what such material can offer in terms of quality of the product, durability, cost effectiveness etc. It also calls for much more financial inputs in such programmes that is what currently being provided by most developing countries, international bodies private and professional firms to facilitate such research projects to be carried out to their conclusions and applicability stages. It is highly regretful to note that adequate focus has not been given to the study of low cost housing from top to bottom. Certain exceptional, superficial studies pertaining to the construction of gigantic building on highly sophisticated methods of production in large quantities with high capital technology. There is no much talk of research on ferro cement element, prefabrication use of new plastics, ceramics etc. which are not relevant in the low cost housing in the third world countries where more attention is to be given to rural housing with local materials, local talent and for the improvement of living conditions and environments keeping in view the culture and social habits.

Today various types of building technologies exist related to economic level of Kerala. Somany people are occupying single room dwellings, because the cost of construction of building has exceeded all the affordable limits. Substitution of cheaper, locally available structurally suitable material is the solution for reduction in the cost of housing.

With rising prices of fuel needed for firing the bricks and for transportation and the damage being caused to the top soil by brick manufacturing it is imperative that alternative building materials are to be developed. Compressed soil blocks offer an alternative to brick and also generate labour employment potential.

Soil has been used for building in a great variety of ways, which vary according to the climate and type of soil available. In different traditions it is used for walls, flooring, roofing and in some cases for all of these. There are essentially five different ways of using soil as a wall material.

Ferro cement is another form of reinforced cement concrete in which the cement mortar is reinforced with layers of continuous and relatively small diameter wire meshes. The proportion and distribution of the reinforcement are made uniform by spreading out the wire meshes throughout the thickness of the element. This dispersion of fibers in the brittle matrix improve many of the engineering properties of the material such as fracture, tensile,

toughness, fatigue resistance and also provide advantages in terms of fabrication of products and components.

Ferro cement is used in thin walled structure where strength and rigidity are developed through form or shape. Hence member with undulated cross sections namely trapezoids channel l - sections and built up sections are often adopted in practice. It has the distinct advantage of being mouldable and of one-piece construction.

The constituent materials of Ferro cement and application of Ferro cement as roofing and flooring cannot as elements shelves and lintels in the low cost construction technology. Ferro cement is a replacement for timber components. Due to its versatility, timber is expensively used in the building in the form of load bearing employment and decorative elements. The increased demand for timber has led to rapid depletion of forests and it poses a serious problem to ecological balance on which man survives. Ferro cement is, one of the possible substitutes for timber. The application areas could be divided into the following groups.

1. Building component
2. Built in component
3. Furniture

A large number of building factors which are traditionally made in timber can be suitably adopted in Ferro cement. Partitions doors, decorative

walls. Ceiling units' lintels etc are typical examples. Ward drive between rooms utility cabinet of various sizes and fixed to wall such as in kitchen store etc similarly racks for books, decorative and display items can be made and fixed at suitable places. A variety of furniture items with new designs to suit ferro cement can be made considering the severity of weather outside. Ferro cement is more suitable for garden furniture as compared to timber. The cost of various units of Ferro cement used as a replacement of timber lies between Rs.60 and Rs.100 per square metre as against the cost of timber which varies between Rs.200 and Rs.300 per square metre depending on the quality of timber used. So many other materials readily available in Kerala also can be traced out and applied in the field of construction of cheap houses. If a move is made, it will naturally have a flow and in that flow many sound patterns will emerge.

In cities where more sympathetic re-housing policies prevail most Government programs are unfortunately alien in nature in the sense that they seek to apply standard western solutions to the urban housing problems of the third world. Such schemes are characterised by their reliance on capital, intensive technologically sophisticated industrial methods and invariably takes the form of massive high rise blocks while the urban poor are often disturbed by cultural change involved interlocation to high rise housing. The principal defect of this type of program is the cost. Even if generous subsidies are made, rents are usually relatively high with extra charges

frequently being made for water, electricity and similar basic facilities. In addition hidden expenses are also involved if the new building is located in the urban periphery. Since the cost of the journey to work has increased and the number of part time jobs for children and wives are drastically diminished. As a result of this cultural and financial pressure the urban poor who manage to gain access to such accommodation frequently sell out or sublet to middle income families eager to alleviate their own housing problems. In some instances entire blocks remain unleased or unsold and are even totally allocated to employees of the civil or military services who already receive favourable credit facilities in the open market. Despite their obvious defects western planning principles have continued to characterise most Govt. response to low cost housing needs. There are many reasons for this apparent paradox but the most important can be linked to the political and economic position of third world countries in relation to the metropolitan powers. One of the many legacies of colonialism has been to enshrine the western house as the legal embodiment of an acceptable dwelling with current building regulations geared to meeting the standards of an inter war western bourgeoisie and a building industry which continues to import most of the construction materials from overseas. This depends on alien standards and supplies have been intensified by the post war emphasis on high rise solutions. The growth of such schemes has not only been due to competitive selling by the many western firms which specialise in their construction but

is also the result of enthusiastic encouragement given by many third world politicians themselves. For those government programs the visual prominence of high rise construction in the urban land scape fulfills a psychopolitical role designed to impress electorates rather than meet any real needs of the urban poor.

In recent years the failure and the falls of high rise housing have caused planners to look for more appropriate housing programs and over the last decade it has been argued that a cheaper, more political and more satisfactory way to improve the living standards of the urban poor by utilising energies of the people themselves in aided self-help scheme. The proponents of this approach suggest that if the government prepares the land provide basic infrastructural services and possibly cheap materials then the residents themselves will build acceptable accommodation. The aided self-help concept or indigenous approach is based on the premises that all non-conventional housing is a normal response to housing shortages and indicates the determined effort and ability which the urban poor invest in order to consolidate and improve their life in the city. It is possible to argue against this premise on the grounds that it is wrong to consider as normal, the unequal distribution of economic and social resources which gives rise to squatter settlements. All that aided self-help programs is to maintain this inequality.

Decentralisation of joint family set up might have cultivated the tendency of individual liberty and self reliance. But it has its perilous counterpart. It has spoiled the cultural integrity so far prevailed. Hence the emergence of single nuclear family system has become an unavoidable social reality naturally the affinity between the family members is shattered and almost vanished. It can be restored by the concept of individual liberty by constructing a cluster of houses as a colony with an almost acceptable budget with in the same compound or in the neighboring area. In that sense low cost housing scheme carry the message of a new culture for the kith and kin.

There is a recent development in the activities of Nirmithi Kendra. which is totally contrary to the true spirit of its message in the initial stages, Nirmithi Kendra was much eager to offer their service for anyone willing to construct low cost houses. They levied minimum level of supervision charges. Nirmithi Kendra played the role of the facilitator to convince the consumers of the need of a house with bare necessities and also the waste of luxurious articles with high cost. Gradually Nirmithi Kendra was also subjected to the influence of Vicious circle. Some of the officials along with other Bureaucratic apparels began to move away from the track of original dreams. They also served for money and made profit their sole interest without any concern of the quality of the articles used and the cost that the consumers had to bear. Corruption did not creep into the field in the initial stages. Bureaucratic implications also meddled with the crises.

Any institution requires a good office consisting of adequate staff members and well-equipped apparatus. But unfortunately many of the offices under the control of Nirmithi Kendra are not housed in proper buildings. The number of employees appointed in Nirmithi Kendra is far below the requirement. The most difficult of hindrance is the lack of employees. We hear the slogans but the slogans are not materialised. In the absence of adequate number of staff members, the existing and available staff members are being diverted for other works. The frequent changes taken place in this field has thoroughly changed the picture. No checking measures, no Departmental Auditing and upkeep of proper accounts. The top level officers are free to adopt each and every aspect of construction. The Research Scholars think to suggest that the people's representatives should be included in the Governing Body of Nirmithi Kendra. The representative of the presidents of Grama Panchayaths Block Panchayaths and the president of the District Panchayath should also be made the members of the committee so as to ensure affinity and correlation.

Nirmithi Kendra actually represents the accurate and desirable idea focused on reducing the cost and expenditure in the field of house construction with out any adverse effect on the grace and firmness of the structure. Naturally construction of the Residence is an unbearable process, as far as the layman is concerned. Such a riddle is to be confronted positively. More over an appropriate conclusion or effective remedial

measure is to be suggested. In fact Nirmithi Kendra is a governmental agency. The method adopted by Nirmithi Kendra for the purpose is a compilation of a fascinating blue print, hereditary Arch type, harmony with nature, self-sufficiency of energy and restricted consumption of the materials. Research oriented institutions have already proposed and developed certain low cost housing materials and technique intended for the purpose of Nirmithi Kendra. Solely relying on the said techniques stabilised Mud Block, Rubble Filler Block, Funecular shell, etc., are good instance of the cost effective environment friendly technology. In this field by making use of low cost construction techniques like Hollow layering, Arch Type, Jally, and Ferro cement. This technique could make a reduction of twenty five percent in the construction of house.

The Research scholar could scrutinise this issue elaborately and precisely and that one of the prominent bottleneck in this regard is that the activities of Nirmithi Kendra and other such well designed voluntary organisations with domestic concept is restricted to the areas under the district level and state level administration. Since Kerala also is a cogglomeration of thousands of villages and a wide acceptance of the said programme in the Rural areas is a must for going a-head. Now even the Government and the ruling class is much concerned about the village economy and thereby the preservation of vegetation and agriculture, no one is dared to take a firm decision for establishing the Nirmithi Kendra in the villages of Kerala. There

is no set up for executing the above mentioned programmes in the villages. Nirmithi Kendra should undertake the issue of starting village level centres and it will show amazing results.

There is a specific portfolio for looking into the activities of Nirmithi Kendra. But no concrete proposals have so far been put forth by the government of Kerala. The standard of living in Kerala is comparatively more scientific and subjective. Today the citizens impart equal attention for the construction of dwelling house and appreciates it as the burning problem like food, water, air and cloth. If the dignitaries in the administrative platform are willing to bow a bit, necessary arrangement can be made in the rural areas for the proper functioning of village Nirmithi Kendra. According to the Research scholar the inception of village Nirmithi Kendra will be a turning point in the contemporary Kerala history.

CONSTRUCTION ACTIVITY-TWIN ASPECTS PROFITS AND CORRUPTION

Rajeevan. K. "Economy of low cost housing in Kerala a study with special reference to Nirmithikendra" Thesis. Department of Commerce and Management Studies , University of Calicut, 2006

CHAPTER 4

CONSTRUCTION ACTIVITY-TWIN ASPECTS PROFITS AND CORRUPTION

The concept of housing should be moulded on the base of basic requirements like safety and protection from natural calamities in lieu of a place for heaping of waste materials and storage of goods for the posterity. Unfortunately a kind of apprehension has reigned over our wounded spirits and we are more prone to future than the existing contemporary life. Hence we are not willing to construct a building that will remain durable for two or three decades only. This unnecessary urge for long standing residential buildings has adversely affected an aesthetic sense itself. Residence is only one side of the basic needs. However it comes only after the primary requirements like food, attire, water, medicine, etc. Dwelling places are essential in the civilised sophisticated society. We are not pilgrims and the essence of the spirit of the family is derived from the idea of permanent settlement. Modern History, Culture and moral values are all sprouted from the thought for settlement. It was the commencement of family consisting of parents, offspring, and others along with our fostering animals. A garden teemed with fragrant blossoms occurs only in the later stage. The greed for material benefits and succeeding tendencies for Hoarding are its evil aspects. A layman in the Modern world cannot even conceive of purchasing a few area

of land with in the range of square feet in an urban area. There is heavy demand for land even in the distant rural areas. A plot with all modern facilities can claim exorbitant rate of price which is always on the increase. In such a situation a kind of ideology is to be cultivated among new generation persuading them not to invest large amount for the construction of a magnificent mansion and also that the fulfillment of life is not valued on the basis as to whether one has settled in a building with a cost of lakh of Rupees.

While the honest efforts of voluntary organisations like Nirmithi Kendra are to be appreciated in true spirits, stringent measures are to be adopted simultaneously to obstruct all the possibilities for occurring corruptions during the long process of construction beginning from the preparation of the Blue prints, Estimates and also the purchase of Raw materials for the purpose. The modern mind is infiltrated with the evil thought of amassing wealth. This will naturally reflect in the minds of the workers affiliated with the aforesaid voluntary institution. Now they are all known as professionals or Technocrats instead of voluntary workers of organisations. Their contentment is relied on the actual amount roarded by them than the pleasure derived from the ultimate success of construction. The Research scholar thus made up his mind to spare an adequate space to disclose the unhygienic tendencies gradually growing in the innocent minds of those who had devoted their skill for services than profit.

The gradual increase of the cost of land has become an insurmountable obstacle. There are lot of youngsters with their restricted source of income try to make both the ends meet and reserve a part of their income with much toil and sacrifice for the construction of the dwelling place, in the maximum possible and fittest manner. But it is beyond the capacity of Tom, Dick and Harry to spare Four lakhs or Five lakhs of Rupees only for the purchase of land. And that itself at a distance of Ten Kilometre from the Town. They can realise it only if they are prepared to spend whole lot of money they have garnered so far. Then the remaining functioning, that is, the construction of house will be left unachieved. There are many Novel facilities like instalment schemes and Hire purchase schemes offered by the banks voluntary organisation More over certain other organisations are there to extend the plot and house to a family on lease. In such cases they can occupy the houses and posses the same with out absolute ownership.

However so many schemes and programmes have been evolved as per which so called institutions purchase vast lands at cheap rates and equip the land with all facilities. They construct large number of houses in that plot. These residential spots will have resemblance in size and projections and eves. They create a kind of identical and homogeneous feeling among the inmates. Moreover a kind of socio economic equilibrium is also created. Certain voluntary organisations prepare playing grounds, kindergarten and even old age protection centres and medical aids inside this complex. They

are not at all flat like structures. They are individual houses and thereby having conveniences of isolated units. They provide courtyard, backyard and a space for kitchen garden. Water tap facilities also are provided with separate units while a social awareness will develop with the positive results, the individual ideas for ownership and possession also becomes materialised.

The purchase of land by different individuals is not a trivial affair. In many parts of Kerala there was successful ventures for the purchase of vast plots on co-operative basis. Since the both the husband and wife are employed in the modern context and a number of the families are restricted to not exceeding four including the parents. None of them is having time to spare for the supervision of the construction of residential houses. It is not an affair that can be completed within weeks. The issue of labourer is a tedious task. Then the only alternative remedial measure is employing some one else or engage a contractor for the construction works. This single contractor doesn't know the difficulties of purchasing, transportation and labour charges. Such unbearable issues can be solved and minimised only by the joint ventures and purchase of materials in mass scale. The risk and profit of the contractor will be with the voluntary organisation. The ordinary man can possess the key and start a new life only by spending a part of the whole amount and with the assurance of the payment of the balance amount in equal installments. The voluntary organization may take some commission as profit in addition to the interest for the capital amount.

While voluntary organisations and institutions like Hudco can invest huge amounts for the purchase of vast barren lands at cheap rate and divide them into small holdings with all conveniences. Individuals are not at liberty to purchase barren plots and make them useful by application of machineries and ensuring transportation facilities and these requirements can be met with easily by way of bulk purchase only. Individuals or consumers creep in only at the secondary stage. The institutions can afford alterations and material transformations in a plot intended for the construction of houses for more than hundred persons. They can undertake such task within a couple of days, by hiring JCB and Tipper lorries. The uneven lands will acquire a new and fascinating appearance as if by the touch of a feather. However utmost care and precautionary steps are essential in such dealings because the amount spent is not a meager one. There is also chance for corruptive practices especially when things are carried out by Bureaucrats and authorised agents and the unfortunate individuals will have to bear all the risk and the loss incurred by the corruptive practices. An apparent and transparent measure to avoid the chances of foul practices is to adopt the procedure like auctions, Bidding and quotations easily accessible by any one.

Even though large number of houses are being constructed in the present decade through out Kerala and the majority of such abodes are being moulded in accordance with novel Blue prints and plans and Thereby endowing an urban face to Kerala. The consumers and those who are prone to

think of their own 'Nests' are hardly acquainted with the pros and cons of construction of dwelling spots. Even educated sections are thoroughly ignorant of the Total estimate proposed for the construction and even the plinth area prescribed for the house. Such persons will naturally not be aware of the mobilisation of materials required for the construction. This is the worst aspect prevalent in Kerala. Even educated persons are having least knowledge of the materials which are more practically useful and profitable. They are more concerned of the materials brought from a long distance. And they are prepared to purchase the same at any price demanded for the same. It is highly humorous to see that certain Keralites will prefer to adorn their porch or drawing room with cow dung paste if the same are made available in attractive packets and with the indications that the same is produced or manufactured from a distant place or with a foreign label. Lack of preference to the locally manufactured materials is one of the evident defects regarding the construction of buildings in Kerala. We have to rely on the goods readily available in the local markets. Naturally the materials caubemoulded and formed in the vicinity by making use of the mud and hay and other stuffs available abundantly in the locality. Unfortunately, we retain a kind of aversion and disgust towards locally available materials. We want to boast that the wood, flooring materials and other decorations for illuminations are all brought from different nations. Research scholars put emphasis on goods available in the local market, not due to narrow minded nationalism and blind

provincialism. The goods imported from overseas will not be suitable to our climatic conditions and they will not be able to withstand the adversities of weather. Moreover, Hudco and other such familiar institutions can win the confidence of the mass and create contentment in their souls only by avoiding even the spec of a chance for corruption in the dealings. In this context, bulk purchase will be acceptable and profitable even though we prefer the goods that can be made available easily from the local markets, we are not hostile to many fascinating and durable goods available in distant market also. This is more applicable in the case of construction of mansions or palace like buildings. Locally available goods are not fit in such cases. The price of goods is a trivial concern we are more concerned of the grace, elegance and beauty of the buildings. It is not proper to be obstinate in declaiming goods purchased from distant strands. On such occasions we should be guided by the principles of aesthetics. No individual can buy and carry magnificent and costly goods from distant markets. He will have to bear the cost of Transportation also. But the cost of transportation will become curtailed when efforts were made to purchase goods from distant places in bulk. The rate of unit also will become affordable. The only issue is regarding the quality of goods. Locally available goods can be returned and exchanged when they are found not suitable or damaged. But such an exchange is not practically possible when the goods are brought from a distant land. Then the quality of the goods is to be ascertained in advance. This can be done only on

the basis of the samples. We can rely on samples only if the manufactures are trust worthy and the concerns are reputed. No individual can undertake this easily. Hence these are carried out only through authorised agents who will supply goods of genuine quality and charge reasonable price only. If the authorised dealers are not familiar to the beneficiaries and are not honest the chance of corruption would creep from all directions. Corruption certainly mars the beauty as well as the financial stability of the consumers.

One of the profitable business avenues in Kerala, especially in urban sectors without any spec of loss or risk is the bulk purchase and retail sale of flooring materials like marbles and granite stones. There is a pressing demand for the glazing tiles and marbonites etc. Even middle class people prefer the use of precious flooring stones due to its perfection, glazing and durability. They have no reluctance at all in investing a comparatively huge amount for flooring and even for wall tiles. It will avoid frequent repair works and recurring whitewashing and cleaning etc. Moreover it will enhance the market value of the constructed building also. The widespread use of Red oxide has gradually paved way for marbles, granites and, artificial tiles, Unfortunately all these materials are not available in abundance in Kerala. No ventures once large scale has yet been started for the manufacture of the same in Kerala. Factories are not launched for the manufacture of artificial tiles. Similarly no one has dared to invest money on this aspect for the conversion of rough Random Rubbles into glazing slabs. Infact it will be

a very profitable venture, if such slabs with natural beauty can be prepared in massive scale. The present step is matured only to marketing of flooring substances brought from distant places. There was a huge demand for Rajasthan marbles through out last decade. The development of internal market curtailed the risk and difficulty of individual transportation, however there was no arrangement to ascertain the quality of marbles and also to variety the corruptive practices that might have occurred due to unwanted interference of intermediaries for the accumulation of undue commission and brokerages. Gradually a system is on the anvil for the verification and a scrutinisation of all, these things. The excessive demand for marble stones and a craze for fashion resulted in the unrestricted hike in its price. And the same was determined by the market and producers in Rajasthan. Whatever it may be the unexpected increase of internal markets for the flooring materials has created a standard value quality and market price. And has caused in establishing a credibility also. The Research scholar is under the grip of apprehension that the emergence of artificially made tiles with adequate sizes, thickness and dimension may adversely effect the inflow of granites and marbles in to the Rural areas of Kerala.

This may topple the existing market atmosphere. But the Research scholar is much delightful to say that the replacing of marbles and granites by such glazing tiles is desirable in the tiny geographical sector, if Big Business magnets are willing to open factories through out Kerala for the production of

Glazing tiles. It would curtail the price of tiles. Even people in the lower strata of income group can use these beautiful tiles in their porches, kitchen, and Dining rooms. Even the walls of abodes will become concealed in wall tile in the nearest future in Kerala. The other part of such a social Transformation will create job opportunities also.

A curse of Kerala is the appearance of mediators in all spheres of life. They have no role either in the manufacturing or the marketing zones. Their foul play by way of link between the consumers and the manufactures is to be checked and arrested. Ordinary people are today compelled in Kerala to set apart a share of the proposed amount accumulated by them for the satisfaction of these brokers and intermediaries. The service of the reputed contractors and sub contractors is unavoidable in Kerala in the present context. It is practically impossible to find suitable labourers starting from Masons for the construction of the houses. Ordinary people are not thorough with the different aspects of construction including the purchase of material. The mediators turn up cunningly and ensure the arrangement of all without delay. The Keralites are forced to bow before these mediators. Their service and exploitation will not be over by arranging the contractors, labourers and other such requirement. They dig the wet ground again at the time of purchase of many types of materials at different levels of construction. The beneficiaries have no direct approach with those who supply laterite stone, sand, metals, etc. The carpenters in olden days came and completed their works with the

wooden planks and slabs provided to them. They were contented with the wages and lumpsum amount given after completion of the work. But today they earn more they guide beneficiaries to the saw mills of their preference and quantum of exploitation is based on the quantum of innocence of the beneficiary. The manufactures and merchants hail them heartily and promise them commission and rewards. The foul play between the intermediaries and the businessmen results in the unexpected and intolerable loss to the consumers. The research scholar earnestly feel that 15 to 20 percent of the total amount retained for the construction of the house is being given as commission or brokerage to the mediators who are already profited as laboures engaged for the purpose. A wise suggestion for the abrupt stoppage of such, vicious practices are not. But yet to be invented by joint efforts. Dependence on the co-operative sector is the easiest solution suggested by this Research Scholar. There will be a limit to profit extracted by co-operative sectors moreover co-operative movement is a success through out Kerala. They bother more about the satisfaction of consumers also. The mediators will become helpless, if there is deliberate move to give up other market and rely on co-operative sector. The electrical contractor or the head of the carpenters can only give prescriptions. The supply of required goods should be shifted from the intermediaries to the suppliers directly. The amount set apart by an individual by way of commission for different purposes related to the construction of his house may seen trivial. But the

same if calculated accurately, reasonably and scientifically, we will come to the amazing conclusion that crores and crores of rupees are merely wasted in a calender year for such unnecessary task of appeasing the greedy intermediaries. The vanishing of such a section of people is a must for the advancement of Kerala society. Unfortunately even the technically skilled person is not in a position to give the exact calculation of expenditure to be incurred for the construction of domestic houses. The different aspects of construction are not made a part of curriculum even in the Higher secondary level of education. We are all low human beings and led by merciless mediators.

In this connection the initiative taken by Pinarayi co-operative industries in Kannur district is worthmentioning and remarkable. The Research Scholar has personally called on the Pinarayi Industrial Co-operative society and examined various aspects and activities prevalent and undergoing in the society. The society is functioning as a profitable unit, the most significant service taken place by the appearance of Pinarayi industrial co-operative society in Kannur is that it has thwarted the incessant exploitation made by the mediator supplying wooden material for the construction of houses and manufacture of furniture through out Kannur District. Today they supply directly. They threw away the heinous insect of intermediaries from the market. They import 'Pingoda' from Malaysia and supply either prepared goods or wooden planks to the consumers. It will

ensure work and employment to numerous persons associated with the same. Gradually such co-operative ventures will give scope for massive plantation of trees in Kerala itself and these by avoiding unwanted import from outside. Unemployment is a burning issue of the modern Kerala. The Research scholar appreciated the services rendered by the Pinarayi Industrial service Co-operative Society Kannur and wish to propose that a study in this field in the higher levels and under the guidance of eminent personalities is sine-quo-non in Kerala. If Pinarayi industrial co-operative society in Kannur can undertake the task of supplying the finished wooden materials, there is all scope to stock and delivery of electrical and plumbing goods thro the co-operative sectors through out Kerala; Immediately it would have wonderful result. All the co-operative units would flourish with in a couple of years. It will wipe out even a feeble chance of exploitation and deception by the mediators. The Research Scholar earnestly feel that the universities and centres of learning with well equipped laboratories can concentrate their attention in the manufacture of electrical and plumbing goods with constant changes and modifications. If the universities can undertake the responsibility, the scope will become enlarged and international level perspective can be ensured.

The Uralungal Labour Contract Co-operative Society (ULCCS) in the premises of Madappally, Vatakara, Kozhikode can boast that they give employment facilities to more than thousand. The Research scholar was

fortunate to visit the Head Quarters, of ULCCs and consult the authority about the progress attained by the society in a nut shell. Their first project was to undertake road construction work in the premises especially in the Rural areas of Vatakara. In this connection it is pertinent to note that Uralangal and Pinarayi are certain villages in North Malabar which are reputed for the development of co-operative movement. The gradual service and sacrifice enabled ULCCS' to quote for the construction work National highway from 'Ramanattukara to Thondayad extending over a distance of 10 km. The work of the construction of the said road is reputed as one completed in war bace. It was profitable to them. The Research Scholar earnestly feel that the construction work entrusted with the ULCCS' will be treated as a silver line in the Annals of History of Malabar. This will give a new vigor to the homogenous co-operative sectors. The university should investigate and conduct a thorough research project on all aspects of the National High way work 'Ramanattukara Pantheerakavu' the first reach and 'Pantheerakavau to Thondayad second reach. The sacrifice involved in the construction will be a good lesson. It has taught us wisely how to avoid unwanted link with mediator, Formerly there were large number of intervention the time of inviting tenders either for the construction of Roads, Bridges, Building, or for the minor and major repair work. There is no prescribed way, to control and check the activities and those who are posted in the supervising cadre are either Dolls or Puppets.

As in the words of Milton¹ "They also served" by extending their hand, for their share of commission. When ULCCS acquired confidence, many giant faces cunningly, withdrew and went away in search of other profitable trades. The succor offered by the Government of Kerala by giving an opportunity of 10% increase in the estimated tender value was a blessing to the society. However the word 'Uralangal' has turned out to be an adjective meaning of a joint venture of sincere, and talented persons with out any profit motive or vested interest. The study of the Research scholar in this respective field compel to remark that similar ventures in cooperative sector will surely be a panacea to many economic problems and can work as a factor to check the vices and corruptions. Since the base of the development of ULCCS, is the name sake profit derived for various construction works, it discloses the picture of huge amount extracted by the mediators in this field so far.

If the interference with much profit to the consumer and lesser profit to the society can function very effectively by undertaking the construction work the gains will be more if attempts are made in other different associated fields also. The Research scholar is an optimist and dare to say that highly Research - oriented programmes conducted with the participation of inter disciplinary skills will create a new horizon of development in Kerala. To harmonise the technically educated persons with special learning on civil Engineering with

¹ Milton. The great English poet who wrote "The Paradise Lost"

the specialists in social economic Arena is urgently acceptable to Kerala society.

The presence of intermediaries has become an unbearable curse throughout the construction of houses in the contemporary Kerala atmosphere. We are compelled to rely on these unwanted elements even for the bare necessities like laterite stone and other primary requirements. There is a general conviction that an amount of exceeding 10-15% of total cost is being exploited as commission and brokerage by mediation. If the cost of a single Lateriate stone at the point of moulding and shaping is about 4 or 5 rupees. But the same become enhanced to Rs. 12 at the present rate when it reaches the point of construction. There is more than 100% increase. It is imperative that remedial measures are to be resorted to curtail the same to Rs.7 or Rs.8. This enables to avoid an unwanted expenditure also. Total expenditure can be reduced to 10 or 15 percent by such intelligent conclusions. Co-operative sectors can intervene and drive away the mediators and ensure the delivery of articles at a reasonable rate as and when required without further ado. The experiences and comparative study persuaded impelled research scholar to derive the response that the absence of the apt transportation facility will create an additional expenditure at the rate beyond our estimates. If there is no proper path atleast to fetch the material in a mini lorry vehicle, the individual who is engaged in the construction of house will have to meet the additional expenditure of a huge amount. It is feasible to

bear transportation facility than to appease the labourer carrying the loads to the site from ordinary lorry if there is no transportation facility to site, the entire materials will have to be unloaded at a distance of one or two or three *Furlongs*. The mere unloading of 200 laterite stone from the lorry will incur an expenditure of Rs. 150/- approximately. Another set of labourer are again to be engaged to carry these stones safely one by one to the distant sites by incurring the labour charges of another about Rs. 600/-. This expenditure concerns the transportation of a single load. This is to be considered as a waste. Nirmithikendra and other such social service organisations should never stick on merely to the Blue print of the newly constructed houses. The modern sophisticated world is one with full of transportation facilities to all sites. This is a part of urbanisation and reconstruction of modern urban concept. The decentralised administrative units pay excessive attention on the widening of the roads. This will give a new light and vigour to the society and all parts of the nation will become mutually linked and communicated. House construction societies bear the obligation of convincing the beneficiaries of the need of transportation facility.

The density of population is the sole reason for the rural section acquiring and assuming the shape of urban features. The land value in distant rural areas have leaped up-to incredible rates. Formerly the land area consumed by individuals for construction of dwelling places in rural areas was invariably a large one because spacious location was freely available in

the rural areas. Especially due to disappearance of paddy fields and other cultivations. But the recent development crawled in to the village segments have made it almost impossible to purchase even half an acre of plot for single residential purposes. Man is a social animal and is not contented with only by quenching his thirst, hunger and shelter from blistering heat. He is a slave of dreams and his imagination contains garden, roof gardens and other available avenues of cultivation. Exclusive research oriented programmes undertaken by the Horticulturists and Research associations in the Agrarian field have prepared many new schemes for modern nuclear families with very restricted areas under possession. The latest development in this area is the kitchen gardens especially planted in the terraces and spare spaces. Such roof gardens teemed with vegetables and other preliminary requirements are visible far and wide. Employees and many other individuals hailing from middle class and upper class families are inclined in this novel experience for many reasons. Experiments have proved beyond doubt the lions share of the vegetables required for a single family can be cultivated on the top of the terraces with the application of soil manure and water. This will enable the members in the family to become acquainted with modern agrarian technique. The basic principle behind this venture is to make the family self sufficient in many aspects. It is not trivial to ridicule, on the contrary it is learned that such a good practise will save the expenditure upto Rs.20 or 25 per day, that is being spent for purchase of vegetables from the open market. Evidently

this is a revolutionary step. Even plantains can be grown in terrace in addition to of tiny plants of vegetables and many other creepers. There were abundant examples to establish that the idle space left for the scorching heat on the terrace top also has become a valuable one. Many female members in the urban areas dared successfully to cultivate costly plants providing fascinating blossoms. The ordinary house owners can spend the excess amount saved by reduction of expenditure for the repayment of loan and other debts that they might have acquired at the time of construction of the their residential houses.

Modern science and Technology are earnestly involved in inventing new methods for meeting their requirements without additional financial liabilities. Apparently an ordinary house holder will have to set apart definite amounts from their limited income for the payment of many instalments and regular and recurring expenditure like Telephone charges, Electricity charges, water supply charges, identical charges on many such unforeseen articles and service. The modern experts and technologists have wisely projected that we have to rely on alternative remedial measures for Electric power, water and many other such consumptions. Government and voluntary organizations have turned up with the assurance of supplying electricity for the use of heating water from solar system. Apparatus for the purpose will be provided at reduced rate by way of subsidy. This is extended in other such areas like Gobar gas plant and method of making compost mixtures and method by

using crumbles of food and other such materials. There is wide acceptance these novel experiments in Kerala. The primary reason for such an acceptance is the gradual increase of interest in the case of products and services.

A general recognition of the proposals and projects envisaged by Nirmithikendra and other identical organisations can hit the target only if the same is made credible and affordable to the lay man. Most often total variation occurs in the actual expenditure incurred and naturally the consumers will not have made necessary adjustments to accommodate the excess expenditure. This will lead to discontentment and a tryst to dissuade others from accepting the low cost housing. The variation will not be meagre and this creates much ado. The reasonable estimate is one that covers almost all expenditures including the unforeseen items. If there is a bit hike in the actual expenditure than the estimated expenditure it can be reckoned as caused by the recurring hike in the rate of materials, especially in appropriate seasons. This will lead to apprehension and a general concept that even an ordinary institution like Nirmithi Kendra fails give an accurate estimate. This will also be considered a fluke venture to fascinate the beneficiaries by giving a false and distorted picture. Evidently there will not be much ambiguity in the estimated expenditure but there is a natural tendency to curtail the figure to the maximum possible extent and also to induce the consumers to make a comparative study inspite of the craze for costly

mansions. The beneficiaries are prepared to sacrifice the Whims and Fancies only because of the fact that certain organisations draw their attention to the possibilities of erecting house with lower cost. When an enhanced amount is shown as the actual expenditure to be incurred not with a slight variation but a leap in costs, the entire picture will become gloomy. Accurate expenditure is highly essential. Moreover the actual and estimate expenditure should be almost one and same without a variation. Certain voluntary organisations usually give a lower estimate and the consumers are thus cheated by the foul play. This is not proper and justifiable when the constructors of luxurious apartments offer mansions with modern comforts at a higher rate of Rupees 800 to 1200 per square feet of plinth area. All are aware that this is a transaction of loss. But one thing is certain, the approved agencies complete the work within the stipulated time and entrust the key as assured in the beginning. There is a reciprocal delight and pleasure. On the contrary voluntary organisations working in the co-operative sectors extend a rough estimate of Rupees 500, 400, 300 per square feet and undertake the task for their approved low rate. In such contexts the beneficiaries submit themselves to the profitable range and accept the same without any reluctance. It can be justified on many reasons and grounds. If the rate per unit gets enhanced by a margin of even Rupees 100, we can convince the beneficiaries without difficulty. But if the hike is more than 100% percentage it will adversely affect the mutual trust.

In short there should be certain rigorous measures *ab initio* for delivering an accurate picture and accurate estimate without much exaggerations. There is no justification for a hike in the total expenditure under any circumstances. The recent ventures undertaken by Kannur district Nirmithi Kendra with its Head quarters at Thalassery are worth mentioning. The Research scholar is well conversant with the aforesaid programme of the Nirmithi Kendra. For instance Nirmithi Kendra is entrusted with the work related to Government modernising programme (GMP), a thorough restructuring of the civil station building of Kannur was profitable in all respects. All intermediaries are avoided and huge profits abandoned, the estimate prepared and submitted by the Engineering skills of Nirmithi Kendra has been acclaimed as scientific and reasonable. The work was satisfactorily completed within time with out much variations in actual expenditure. The new collectorate building annex in Kannur is a good model to behold.

The construction work of additional and adjacent buildings in numerous schools throughout Kerala as a programme under Sarva Siksha Abiyan (SSA) is a good example of contemporary progress undertaken by Nirmithi Kendra. In this connection it is to be noted that the Nirmithi Kendra functioning in each and every district in Kerala are absolutely independent units without any relationship. The mode of work and treatment of all these Nirmith Kendra are not homogenous. While certain units in some districts are willing in extend almost the reasonable and prudent estimates, some others

are quite indifferent and negligent and try to exploit the consumer by their misleading figures and estimates. Nirmithi Kendra in each district is under the direct control and supervision of the concerned Collector. There is no guideline generally applicable to all the Nirmithi Kendra through out Kerala. They are separate entities. The projects and estimates prepared and submitted by Nirmithi Kendra in a particular district is subjected to the scrutiny of Engineers empowered for the purpose in the PWD of its jurisdiction. The approval of the estimate is left to the discretion of that particular engineer. The state government can intervene and interfere safely by formulating certain guidelines, criteria and norms for finalising the estimates. The lack of such a general guideline binding is a visible impediment. Thus the work completed by Nirmith Kendra in some district will be trust worthy and are with minimum expenditure.

The goal will be unique only when it is achieved by proper and genuine means. Nirmithi Kendra and other like voluntary organization have already put their seeds with a new message with the far reaching philosophic and aesthetic contents. District Nirmithi Kendra Kozhikode has already vowed give an accurate estimated expenditure. The reception to such a move is much exciting but unfortunately certain other units of Nirmithi Kendra in other Districts exploit the opportunity and extract maximum possible profits. The interventions of burocratic officials with their shrivelled and shaby notions also contribute much to the decay and downfall of a noble cause.

The estimate given at the initial stage to the Beneficiary should be an authentic document and reliable records, it should also be self explanatory giving chance to the consumer and overall comprehension. If such an estimate is vague and not transparent the general ideas of the laymen and labourers like masons can never meddle with their own intelligent interpretations. The consumer expects an estimate not in the form of a pricelist obtained from grossary or vegetable merchant. They are accustomed to the items in the grossary as a part of their routine. But the construction of a dwelling house only once or twice in whole life span, the beneficiary is not expected to make use of the experience extracted at the time of construction of his house. The estimate and proposal prepared by Nirmithi Kendra in Kannur is obviously reasonable and comparatively acceptable. The Research Scholar has made a thorough verification and examination of the Estimates of certain works with the object of making some drastic changes in the proposal and the plinth area of the newly constructed building in the schedule. The quantity and the quality of the material required and not specifically mentioned in details. However Nirmithi Kendra is giving a vivid picture of the cost and price of all the required individual materials. Even though the rough estimate of the labour charge for the entire construction work is connected with in the estimated expenditure, the break up details of the same is not available. The Research scholar earnestly feels that the total labour charge for the construction of an individual building will come around 30% of

the total estimate. Thus it is evidently a huge amount. There are different type of labourers involved in the work like that of Masons, carpenter, Electrical fitters, plumber, interior decorators, skilled labourer in the flooring etc. to categorized list of labour charges are to be appended with the estimate to make it convenient for the consumer under which heads the estimates varies beyond expectation. He can put interrogatives to the authorities of the Nirmithi Kendra and Nirmithi Kendra in its turn is bound to offer exact reasons for the variation of the charges fixed for labourer in a particular sphere. The Research scholar suggests that such a practise will be good and fair to convince the consumers of the labour charges incurred at different levels, of constructions.

Unfortunately much manual work is being put with in the four walls of the Nirmithi Kendra for the preparation of the estimated expenditure proposals. The application of computer facilities is still a dream. It has become essential to rely on computer for making them scientific, proper and accurate. The introduction of CAD² package through computer for the preparation of well designed plans has its own benefit in the office of Nirmithi Kendra if such a system can be wisely applied for the preparation of plan, the same can be applied with similar benefits on the tables dealing with accounts. Thus a more accurate and precise expenditure data will come out

² A computer Aided Desing

within a short time. In short modernisation of the office procedure will make the work more effective more convincing and more credible. It will avoid the chance of exaggerated estimates. Today it is practically impossible for an ordinary beneficiary of house construction to know the quantum of different materials purchased and used for the construction work. He is only bothered about the total expenditure. And all the remaining aspects are left unnoticed. According to the Research scholar a CONSOLIDATED INDENT is highly required. It will ensure the physical presence of the consumer through out the process.

A general awareness of the different aspects of construction, only will help the beneficiaries to redeem themselves from the grip of greedy contractors. There should be definite in and outs for minimising the rate of profits. The contractor should be able to create credibility. Otherwise the consumers will become embarrassed at the concluding phase of taking measurement and settlement of accounts. The proceedings from heel to crust should be transparent. It will be desirable to give short notices now and then to consumers so as to enable him to become acquainted with the quantity and quality of materials and also the actual expenditure incurred at different levels. No one can undertake constructional activities without obtaining a bare minimum of profits. Because that is the means of livelihood. Certain rate is levied only as a charge for supervision. The Technical experts and Engineers also impose certain amounts for their involvement. The present

rate of supervision charges fixed by Nirmithi Kendra is ten percent of the total cost of construction. Corruption is a more serious affair. It is being practised as a bonus in addition to the normal rate of profits. Some contractors are prepared to undertake the construction work at lesser percentage of profits because there is a chance of Maladjustment . Corruption has become a contagious disease. If a drastic measure is not taken to prevent corruption and imposing higher rates profit, the message envisaged by Nirmithi Kendra and other voluntary organization will become absurd.

ANALYTICAL AND SCIENTIFIC OBSERVATIONS ON THE MODELS WITH ILLUSTRATIONS

Rajeevan. K. "Economy of low cost housing in Kerala a study with special reference to Nirmithikendra" Thesis. Department of Commerce and Management Studies , University of Calicut, 2006

CHAPTER 5

ANALYTICAL AND SCIENTIFIC OBSERVATIONS ON THE MODELS WITH ILLUSTRATIONS

The Research Scholar has made a Herculean attempt to collect various models adopted by different institutions, and organisations with adequate models to show the differences in the mode of construction and the charges incurred and imposed on various heads. There is prima facie evidence to establish that the models moulded by certain voluntary organisations like Nirmithikendra and Cost Ford for the low cost housing techniques are more scientifically prepared and Echo-friendly. Moreover they are rather durable and cost effective. The new trend created by such a phenomena will have long lasting implications upon the life concepts itself of the people. It will ensure a transformation from the conventional and sophisticated style to a reformed and moderate approach in all spheres of life. The tragedy of the modern urban culture is the wild chasing of external beauty. This is visible from the examples of toilet soaps and sofa cum beds. Models of all sources available are extracted and exhibited for the purpose of comparative study. Perfection is intended in the research oriented programme and as such models of all possible varieties of apartments have been mentioned in this chapter. Even the models of expensive and luxurious dwelling houses are

also given to give an accurate and precise picture. Even though there are certain apparent similarities and identities among all the contemporary housing designs, models and techniques, a close observation will clearly show the dissimilarities and variations. Even a slight variation carries particular meaning, and objectives and each design preserves its own identities that can be focused by careful and analytical study. Even though every consideration is given in respect of the reduction in the expenditure for the construction of houses, voluntary organisations like Nirmithikendra and Cost Ford and many other individuals following in the same track have laid stress on the scientific approach. No deviation in scientific angles are permitted.

The last two decades witnessed a revolutionary leap in the methods applied for the construction of houses. The blind adoption of Western technique which is not adoptable in the East was imitated throughout the state in olden days. A novel idea was hatched due to the inevitable thought for surmounting the unbearable expenditure estimated and proposed for the construction of dwelling houses. The price index is always soaring up and the percentage of hike in each and every material required for constructional activities also could not be prevented. Naturally there were discussions surrounding this subject. Similarly the monotony and lethargy caused by the repeated use of the same models also paved the way for a new model. This idea became gradually matured from different places altogether. Collective ventures under the banner of societies and voluntary organisation

are worth-mentioning. Even though the fruits of these endeavours are more or less the same, a research oriented glance, shows the differences and similarities between different types of models projected by different organisations. In spite of many positive aspects and profitable angles the modes proposed by different institutions so far will not be absolutely equal with the diagrams and the targets depicted and achieved by Nirmithikendra. The most deserving characteristics strictly adhered by Nirmithikendra is its willingness to undergo changes and making necessary amendments, modifications and alterations in accordance with the need of the time.

Dwelling places and apartments are evidently Dead Assets, which can never be counted as either investment or deposit. The concept of construction in Kerala has to undergo a thorough change especially in respect of, using costly materials and ornamental fittings to give them a magnificent and gorgeous appearance. These ideas have been sprouted from sheer vanity. The advent of a flourishing middle class with a heap of complexities and hipocracies persuaded Keralites to cling to the pretensions. There is no apprehension or concern for becoming victims of indebtedness. Recently large number of nuclear families with immense wealth came forward with the demand for houses of anormous sizes soaked in fascinating hues. But unfortunately such luxurious cottages soon turn out to be a waste. The consumer will also be disgusted with constant use. It is not a trivial to make alterations with the changing moods and fashions. The educational system

has, wiped off unnecessary conventional crazes and as such there is a growing inclination even among the people in lower strata for the construction of low cost houses. They believe that a dwelling place is a temporary arrangement and there is no use in spending large amount for that purpose. The middle class people now forego the unwanted elements to decorate their houses. They have become more cautious of the economic stability and financial positions. They prefer to have a library or a play ground than a spacious dining hall. The government also should undertake the responsibility of mobilising the funds such people can set apart for some productive purposes and also by ensuring them the share of profits or dividends. Eventhough eminent architects like R.K. Ramesh, Kozhikode, T.M. Siriack, Environmental Weapon, Trivandrum, C.P. Shylesh and Sibiraj Raveendran, Architect, Wynad, Sureshlal S.D, Lal Associate, Kochi, Shajee E.V, Thavakkath, Kannur in Kerala try to retain the taste for luxuries quarters the huge mansions and voluminous appartments and luxurious flats with gigantic sizes have started threatening the peace and security of the urban areas. The luxurious appartments is not a panacea for the cultural deterioration.

The contemporary crisis reported in the district of Wynad is a subject of study. While the agricultural labourers toil without any discontent or contempt or grumbles, the farmers with restricted holding of some acres of land anticipate, huge earnings from their yield without the slight knowledge of the undercurrents dominating over our markets. They seek all kinds of

loan facilities and are in a mood of the milk-maid dreaming of prospects if all the eggs in her baskets are hatched. But it is absurd to erect mansions on dreams because all eggs are not hatched naturally. Blind imitation has spoiled the early culture with small houses and pleasant life in Wynad. Indebtedness is a present phenomena and Kerala confronts innumerable suicides.

The research scholar has resolved to conduct the research mainly on the basis of the experiences of voluntary organisations and individuals who have contributed in this field. Nirmithikendra and Cost ford are the two prominent pictures. There are many other worth mentioning establishments like Sankers habitat with their head quarters in Thiruvananthapuram. Television medias have given much stress and publicity on the endeavours undertaken by Sankers habitat. Sri. Sanker is an intelligent Academician and Architect and formulated his own principles for the widely recognised forms of low cost houses. His insistence on the use of locally available mud and sticky mud, for the construction of houses is a distinguishing peculiarity in this field. Sanker's Habitat is mainly concentrating in the two Southern most districts like Thiruvananthapuram and Kollam. The *Annexure 1* is a good illustration of the model shaped and developed by the skill of Sanker Habitat. They are obviously eco friendly and cost effective. Mr. Sanker might have got inspirations from the initial activities associated with the Kerala Sastra Sahitya Parishath. Their smokeless ovens with lesser cost fuels has got wide recognition through out Kerala. Sanker had no hesitation in seeking lessons

from Nirmithikendra and Cost ford for various aspects of construction. Laurie Baker also enabled him to create his own track for low cost houses.*

Models of *Ten plans*¹ are shown for the comparative study of similarities and variations. The construction of houses undertaken by Sanker's habitat for a minimum cost has attracted many people coming under lower income group and middle income group for saving money. It is an easy affair for a consumer state like Kerala to accumulate funds from various sources, for the construction of houses also. Banks and financial institutions have also become more interested to advance money for such productive purpose like construction of houses. Sanker's habitat has not adopted a stubborn stand. Sanker is prepared to implement the necessary modifications in accordance with aesthetic variations of the consumer. But Sanker is invariably giving significance to the cost side of construction. Thus there is a perspective of social commitment especially in the context of development of economics in Kerala. Another peculiarity of Sanker's habitat is the application of 'Filler slab' for rooting. The idea behind it is the reduction of iron material as far as possible. This venture can be estimated well as the contribution of a particular individual. Sanker's habitat is supposed to develop as a whole and spread all over Kerala with their expertise.

¹ Plan- of Sanker , Director, Habitat Technology Group, Trivandrum, taken from 'Chelavukuranja Bhavanam' Edited by Joshi M. Joseph, Avanty Publications, Kottayam.

The Research Scholar is much delighted to observe and study the effective functioning of the Centre of Science and Technology for Rural Development (Cost Ford) with their headquarters at Ayyanthol, Trichur. Most probably they are the pioneers in this field. If cost ford had not resolved to function in Kerala before a few decades, the name of a Lawrence Wilfred Baker would have been unfamiliar in Kerala. The message of Laurie Baker was procured by this voluntary organisation. Their activities is not much effective in the Northern spheres of Kerala and their ventures restricted to the Central and Southern part of Kerala. Cost ford is generally considered as an institution with adequate roots throughout Kerala. They are functioning as per the provisions, of Societies Act. The prominent figure Laurie Baker who had visited India along with his wife for some social work happened to grasp the need for secured shelter for the poor people in Kerala. He had become disgusted with the habit of pouring money by some persons for the construction of houses. He could impart a new message on aesthetics and economic stability. It is quite astonishing that an establishment like Costford which could withstand all challenges for more than two decades was fostered by a European and even without the aids and support from the side of the government. It was a purely a non-governmental activity yet he could accomplish a noble task. No one can discard the significance of the public library in the University of Kerala which has imprinted an indelible mark in the history of building construction. Thus Laurie Baker proved that the

concept of low cost construction is equally applicable and advisable to other enterprises like that of dwelling apartments. The building constructed for the department of drama at Aranattukara at Trichur is also a good model for the low cost construction. The reputed concern Cost ford also had to face the vehement criticism on flimsy grounds. For instance leakage in the roof is a common feature. No one will dare to challenge an architect for the erroneous and defective construction. But it is easy to creep up on a frail man.

A prominent peculiarity of the mode of construction adopted by Cost ford is a peeping appearance of European style. Perhaps it might have evolved by the inherent qualities inherited by Laurie Baker with his roots in European continent. The external appearance with its particular curves and arches has imparted such European style. Perhaps it may adversely effect the modern slogan of a state on its own wheels- 'That is Kerala Model'. But such an opposition will be blind and not practical.

Forsaking the unnecessary extra fitting like latches, hinges and the compulsion on the use of hollow bricks are the peculiar features of cost ford. But these aspects are economic oriented and only intended for the curtailment of cost. This had intended result also. Even though it may take time and endurance to become accustomed with a new style proposed by the cost ford, it will create wonders in the economic field of the state. A new tendency has evolved to set apart a negligent part of our income only, for the construction

of the apartments. A house is a mere shelter and a temporary arrangement like our gowns. Hence, it is absurd to spend all our savings for such purpose. More over the dependency on loans also has created unexpected perils in Kerala. Laurie Baker earnestly advised that there is no need of external plastering. This will save sacks of cement. Laurie Baker has preached practically to avoid cement mixture and make use of lime as a proper substitute. The different types and styles contributed by cost ford fascinated the new generation. It lead to the emergence of a new concept of house construction. The apparent defect of that the research scholar noticed as an impediment obstructing the growth and development of cost ford is the lack of administrative skill and defective organisational set up. However Kerala is much grateful to cost ford for their leadership and also for the construction of thousands of models of low cost houses in different parts of Kerala. It is highly pathetic to know that such an institution is now declining and its process has become slackened. *Annexure-2* contains the *thirteen*² different plans contributed by Cost ford. These plans were much condusive for the research programme of the research scholar. Profound gratitude is registered for the help rendered by the Joint Director, Cost ford, Trichur who has facilitated the arrangement for thirteen plans. The authorities of cost ford vehemently opposed the practice of digging and removing the mud deeply for the construction of the basement. According to them it is an absurd

² Plan taken from P.B. Sajan Joins Director, Cost Ford.

conviction that the digging the mud as far as possible will strengthen the basement. Cost ford had specifically insisted that the honest commitment to the materials and technique is more significant than unscientific digging. Similarly cost ford preferred Filler Slab on the top of the houses for the reason that it will enable the consumer to get thirty percent of expenditure lessened. Variations are permitted in the mode of construction in consideration with the geographical, climatic and environmental alterations. Alleppey in the Southern part of Kerala is a land of soaky, drenched mud. Hence the district level office bearers of cost ford in Alleppey made slight changes in the construction of basement there, by using coconut tree stumps and bamboo parts in the muddy area with the intention of ensuring the strength of basement. These bamboos and coconut stumps are firmly placed beneath the basement.

As per Annexure-2 model 1, the plinth area of the dwelling house is 2000 sq. ft. Naturally it will be adequately spacious with two stories. The estimated expenditure of the same is the 8,50,000/- only. The approximate expenditure per square feet Rs. 425/-. It is to be noted cautiously that the average expenditure incurred per one square feet for the modern type of construction will exceed Rs. 700 or Rs. 800. It is implied that their is an enhancement of about hundred percentage in expenditure. This is not a meagre amount and a trivial affair. There are other plans or models, designed by cost ford, the expenditure of which for one square feet will come only to

Rs. 350/-. A thorough verification of the thirteen models, appended with special stress on expenditure, style, convenience mode of construction has enabled the research scholar to derive at the conclusion that cost ford is willing to undertake the construction work on the basis of the capacity of the consumer to spare funds. Hence it will be acceptable for almost all income groups.

The Research Scholar feels it discriminatory if no reference is made about the contribution of Kuttanad Vikasana Samithi, in respect of their services, especially in the construction of huge reservoirs for storing rain water. With the use of Ferro cement made that establishment much reputed through out Kerala especially among those who are engaged in the task of construction. The word 'Ferro' has actually derived from Feroos. The actual meaning of the word is iron. The application of Ferro cement is a perfectly profitable modern technique. And the world owes much to the French Engineer Joseph Louis for the introduction of Ferro cement. The expenditure of the construction will come down at an incredible rate. The initiative undertaken by Kuttanad Vikasana Samiti has been appreciated by various organisations and there are about twenty eight concerns providing reservoirs for storing rain water on demand in Kerala. The application of Ferro cement is gradually increasing and Kuttanad Vikasana Samati is recognised as the pioneer for the debute of Ferro cement. The cost of construction is comparatively cheaper mainly because of the use of '*chickenmesh*' instead of

iron. Father Thomas Peliyanikkal is responsible for the over all development of the Kuttanad Vikasana Samiti. The society is prone to the issues of a particular geographical sector. They came forward with their reservoirs for rainwater with this objective and also to save Kerala from draught. Since Kuttanad area is not one with a firm mud base there are instances of constructed houses going down. Hence Kuttanad Vikasana Samiti resolved that it should curtail the weight of the apartments. That was the main reason for the abandoning of iron to the maximum extent. Slanted roofs is another peculiarity of the construction model's of Kuttanad Vikasana Samiti. It is quite to amazing to see that the construction cost of these models will come about Rs.200/- only per square feet. Since the construction techniques are simple it can be completed with in a brief span of two months. The thickness of the well is 2.5 inches only. And the chance of leakage is remote. Lastly Kuttanad Vikasana Samiti is much concerned of avoiding recurring expenditure like frequent repairs. The research scholar felt much contented by the fact that the services and contributions of the said society is not exclusively restricted to the Southern districts. The reservoirs for keeping rainwater can be attached to houses and huge building like Bio Gas Plants. Their is a pausity of rainwater in many parts of Kerala and as such a new enterprise introduced by Kuttanad Vikasana Samiti acquired warm reception.

A comparative study of the activities of the aforesaid Trio (i.e., Sanker Habitat, Cost ford, Kuttanad Vikasana Samiti) discloses that all are perfectly

eco friendly in their attitude. Similarly all these organisations are very particular in curtailing the expenditure without any adverse effect on the external grace and beauty and internal conveniences. Slanted roofs are another apparent peculiarity. Cement plastering both inside and outside has been forsaken. All of these organisations earnestly appeal the general mass to give up unnecessary extra fittings. Their venture is a fight against extravagance. Similarly it is a challenge of age old conventions, and prejudiced practices. They are heartily willing to reconcile with conventional aesthetic sense.

Sanker's Habitat concentrating their service in Southern part of Kerala caught the attention of those related with construction because of their use of locally available sticky mud. They do not want even a piece of stone for the construction of abodes. The Central Building Research Institute in Roorkey has recognised the use of Sanker's Non-erodable mud plaster. No costly materials, zero-energy, eco-friendliness, and minimum labour are the peculiarities that made Sanker's Habitat a distinguishing concern. On the contrary cost ford are more interested in the techniques and style of construction. The low cost housing method gradually become popular using by hollow bricks. This world is always trying hard to find out methods for low cost housing construction. A particular style has been evolved by Costford which is popularly known as 'Cost ford style'. The use of hollow bricks paved the way for numerous units of bricks manufacturing from North

to South of Kerala. The door of Cost ford is opened for all income groups of people. Their plans and designs are not artificial. The Cost ford moulds plan only in connection with economic capacity of the consumer to provide funds and avail loans with arch type lintels and filler slab roofs.

Even though the research study has concentrated on the techniques and styles evolved by Cost ford and Nirmithikendra, the achievements made by various other organisations and eminent personalities on the parallel lines also should be mentioned specially when the topic of research is associated with low cost construction in Kerala.

Among such worth mentioning figures the most prominent one is Prof. Yujin Pandala, Head of the Architecture Department, J. K.M Engineering College, Kollam, another leading figure in this field is Sri. Eapen George, Perumbavour, the product of Surat Regional Engineering College. Renovation of old style technology is the contribution of Prof. Yujin Pandala. This professor has constructed different models of houses with the use of random rubble, solid bricks and mud. The repeated use of materials is a peculiarity of Yujin model. Eapen George, on the contrary thought about the preventive measures for the natural calamities like Earth quake, Tsunami etc.. Eapen George proposed to construct houses with pre-stressed beams and hollow-shells.

The aforesaid observations were made with an intention of giving special stress on the economic aspects of Kerala. The research scholar has deliberately appended *Four*³ plans of luxurious houses in *Annexure 3*. The details of plans estimates and elevations are shown separately to indicate and convince that it is a sheer waste. Evidently luxurious apartments is a piece of mental delight of upper class people. Their identity is marked by the costly articles and materials used for the construction of spacious mansions. The investment of large sum has no results or gains. They are dead assets. The imitation of styles and frequent alterations in the same building is also a curse. The Keralites turns to west for many thing but not to the geographical and economical peculiarity and climatic variations. Vast paddy fields are unnecessarily filled up for the construction of apartments only on the ground that the paddy cultivation is not profitable. This will result in the economic drawback and negative withdrawals from agriculture. Each model in Annexure-3 has been selected for the purpose of depicting different types of luxuries and waste of expenditure. Here Kerala witnesses the competition only on the basics of money. Crores of Rupees is wasted every year. Interference of legislation is highly essential to prevent such uneconomic and negative investment. Such a luxurious dwelling place is also against the spirit of democracy and equality and welfare planning. A naked exposure of such waste of earnings is visible in the huge and spacious houses erected by non -

³ The plan extracted from the model envisaged by Architect Sri. Shaji, Thavakkara, Kannur.

resident Keralites. They spend a lions share of their earnings for this purpose and become pauper. At length they are compelled to sell the whole structure at a comparatively cheaper price to get redeemed from the burden of debts. Since the gradual alienation from agriculture and rural life with all its innocence and intimacy also is a cause for haste in constructing luxurious houses. The transition occurred in Kasargod and Wynad districts is manifested in the two models coming under Annexure-3.

Among the programmes enunciated in Kerala for the construction of one thousand low cost houses, the most worth mentioning and effective contribution is rendered by Nirmithikendra which is functioning with independent head quarters (correlated by the apex body State Nirmithikendra throughout the state) in all districts in Kerala. Nirmithikendra came to existence with Cost Effective and Environmental Friendly Technology (CEEF) in 1985. The introduction in the Southern part of Kerala, viz., Quilon was a great success and in due course it penetrated into different sectors with a viable message. The credit for the initiation of Nirmithikendra goes to Sri. Anantha Bose, IAS the then District Collector of Quilon. The demolition of house in large scale consequent on an unexpected flood in Kollam district motivated Sri. Anantha Bose to brood over a plan conducive for the construction of shelters in large numbers at a stretch and at the minimum possible cost. When there was a subsequent earthquake in Maharashtra, Nirmithikendra extended succor and guided for the construction of low cost

houses. In Maharashtra they adopted perfectly the model of the ones that Nirmithikendra had already constructed. This instance itself is adequate to establish that the low cost model by Nirmithikendra is a good model for Cost Effective Environment Friendly Technology. This naturally persuaded the government of India to establish such centres through out the country with the aid and direction of Hudco and under the banner "Building Centres". Evidently these building centres are the transformed versions of the low cost houses originally constructed in Kerala by Nirmithikendra. The Human Settlement Commission (HSC) of United Nations Organisations (UNO) appreciated the talented interference of Nirmithikendra in a burning issue and it was resolved in 1993 at *Nairobi* to emulate this model and undertake construction works in all the member nations as per the plan designed by the Nirmithikendra.

Nirmithikendra is not boasting or claiming any credit for the introduction of a particular type of low cost technology which is entirely different from all other former and contemporary schemes. While Sanker's Habitat, Cost ford and other like concerns, always boasted their peculiar styles and particular technologies Nirmithikendra is very polite and recognised the amazing capacities and potentials of all such technologies. Nirmithikendra is just making certain amendments after consolidating all other technologies and low cost methods. Nirmithikendra has no hesitation in accepting. Ferro cement, Filler slab introduced by other cost effective

technology concerns which they never claimed as their own technique. Since Nirmithikendra accepted all reliable qualities from identical establishments, gradually the popular feeling become strengthened that it was all the contribution of Nirmithikendra itself. However Nirmithikendra also has introduced certain new styles like funicular shell, and brick arch. It could preserve its own style and retain an entirely different external appearance.

Annexure-4 contains 14⁴ plans along with Plans and Elevations for a detailed comparative study of the style, model and techniques adopted by Nirmithikendra and other such concerns. The technique and style adopted for each are invariably different. The cost of material applied is comparatively cheaper and locally available. Nirmithikendra holds first position in respect of curtailing the expenditure to the maximum possible extent. Bare minimum of materials only are advised for the construction by Nirmithikendra. However it insists in preserving the aesthetic grace in all magnitudes. All the 'Janasevankendra Buildings' in Kerala are constructed by Nirmithikendra in line with low cost technology. The average expenditure required for the construction per square feet is Rs. 400/- only. Even though they are prepared to lay marble slabs for the floorings as and when the beneficiaries compel, all endeavours were made to make use of low cost marbles. There is no need of apprehension that when the consumer recommends the low cost articles it will spoil the splendour and elegance of the apartments.

⁴ The Plan extracted from the model envisaged by Nirmithi Kendra

The Research Scholar has made keen observation all positive and negative aspects of the different modes of plans and designs projected by the reputed voluntary organisations as mentioned above and individual concerns. The researcher has also verified the low cost techniques and materials selected by these establishments. Even the administrative talents have been properly examined. The main concentration was on the economic aspects with the special stress on its implications in Kerala society. All the ventures propounded by these organisations are unanimously eco-friendly. Slight changes in the material proposed there.

The research scholar has come to the conclusion that Nirmithikendra with its far-reaching perspective and designs moulded on economic angles is the best one compatible with the present Kerala society. Development in economic aspects has descended to the lower levels, soon after the introduction of Peoples Plan Programme (PPP) in Kerala. Each village society is earnestly making proposal to adopt these techniques. Number of Civil Engineers, Diploma Holders and Draughts men are abundantly available in Kerala. Each panchayat can take over the risk of ensuring a convenient and eco-friendly house to each individual family. Such a sweeping change will create wonders. There are different programme now and then announced by the Government, to provide housing facilities to scheduled tribe families especially in the hilly areas, Crores of Rupees are set apart for this purpose. This will evidently leads to exploitation and corruption. If the organisation

like Nirmithikendra are permitted to undertake such programme it will be more profitable to the beneficiaries. Similarly the vision of the Government also will become fulfilled.

The research scholar prefers to recommend to the Government to make it a slogan that each panchayat is provided with "Panchayat Nirmithikendra". Such a concern can gradually acquire knowledge pertaining to construction aspects along with preparation of estimates and as such become conversant with a heart to challenge any type of corruption and foul play. Similarly it will pave the way for marketing the locally available goods. More over it will turn out to be a source for labour and employment. An all pervading growth of Nirmithikendra will kindle light for a welfare society in Kerala.

DIFFERENTIAL PROPORTION IN THE ESTIMATE AND PROPOSALS FOR THE REDUCTION IN COST OF CONSTRUCTION

Rajeevan. K. "Economy of low cost housing in Kerala a study with special reference to Nirmithikendra " Thesis. Department of Commerce and Management Studies , University of Calicut, 2006

CHAPTER 6

DIFFERENTIAL PROPORTION IN THE ESTIMATE AND PROPOSALS FOR THE REDUCTION IN COST OF CONSTRUCTION

The Research Scholar earnestly feel that a harmony of the practical knowledge acquired through hereditary and customary practices and the academic aspects whetted by a proper curriculum is preferable and advisable for the construction purpose of low cost housing. Each and every activity in the individual life is socio-economic and as such people make all their proposals on the basis of their precise and the reliable calculations. There are index card, graph, designs, blue prints, statistical data and plan and estimates in the society. Evidently they are all devised with the objective of achieving maximum utility with minimum expenditure. The words maximum utility itself is a relative concept because it varies from people to people and time to time. Hence a detailed and over all perspective should be there to firmly ascertain the plinth area, quality of materials, quantity of materials, and other extra fittings and furnishings. The Research Scholar is compelled to reiterate that a thorough reconstruction of our aesthetic convictions is essential for the introduction of a progressive and prospective programme. Construction and preparation of estimate are counterparts and twin aspects of the same subject. There are certain sources undertaking these two separately without any

interlinking. A combined move will make the venture profitable since the laymen unaware of the different aspects of construction and estimates- the documentary and practical aspects. Thus today it is very simple to cheat the consumer by showing artificial figures and huge amount as expenditure to be incurred for the construction of house. The modern Kerala life is one of indifference, lethargy and laziness. The average man is not at all bothered about the price of articles or the cost of construction at different levels.

Sanker's Habitat has wisely moulded certain definite plans with detailed estimates for the use of average income group and middle income group people. According to their estimate a fascinating house with all comforts and conveniences with the total plinth area of 1493 square feet can be constructed with an amount of Rupees 7.25 lakhs. They provide sufficient space on the roof which can also be converted as rooms in due course. Sanker's Habitat have designs with the shelves and other such provisions attached to the house itself. The total estimate will include the amount to be expended for the purpose. There is no need to worry about the purchase of furniture. More over such a plan will save space also Sanker's Habitat assure that a house with plinth area of 1270 square feet in the down floor and 1120 square feet in the upstairs containing four bedrooms and two living rooms can be constructed at an estimated cost of Rs.10 lakhs but if such a house is entrusted with a modern architect, the total expenditure for the work will exceed Rs. 18 or 20 lakhs.

The peculiarity the estimate drawn by Cost ford is the guarantee for the reduction of 30% in expenditure by using Ferro cement on the roof. If a single item can make remarkable cost variation, the general trend about construction of house will undergo a positive change. Even though the conventional thickness of wall of an average house is 9 inches the Cost ford if comes forward with the solution of zigzag construction of walls it will reduce thickness to 4 inches only. The space in the room can be expanded if this type of experiment is made. Costford has no hesitation to implement certain ancient methods and styles like internal yards ('Nadumuttam'). It will make the atmosphere somewhat eco-friendly and envisages a kind of conventional comfort. Trained labourers can discharge the functions easily and smoothly. This will lead to specialisation or expertise of labour, cost ford is more particular in avoiding unwanted external glory and concerned with practical benefits.

The significance of Nirmithikendra in this field is the introduction of certain number of technology adoptable to modern context for cost reduction. In addition to the hollow bricks on the walls Nirmithikendra is particular in using *Rat Trap Bond*^{1*} exclusively with the idea of a cool atmosphere inside. The estimate proposed by Nirmithikendra is prepared by experts. The Plan and Proposal designed by Nirmithikendra contain every thing from tail to

¹It is a method of keeping space between the stones or bricks laid for the walls. There by providing chance for filling up Air in the empty space so as to create a cool and convenient atmosphere with solid construction.

head. The ideal preached by the pioneers of Nirmithikendra is that sacks of money can never construct a convenient dwelling place.

The Research Scholar considers that it will be fair and good to have a glimpse at the income structure of the people belonging to the different strata in Kerala with a special stress on the portion of income that an average Keralite can afford to spare for the purpose of house construction and also with a comparative study of the house in reality and the house in imagination. The disintegration and withering away of the joint family system belonging to 'Marumakkathayam' and 'Makkathayam' systems have wiped out the former family set up in Kerala. The Liberation Movement of women also leading to a thorough restructuring of family budget and family requirements.

According to different surveys undertaken by reliable authorities, the average monthly income of a middle class family in Kerala is approximately Rs.6000/- If a typical family consisting of spouse and two children and parents from either part has to expect average monthly expenditure exceeds that amount. This implies that an individual belonging to salaried class of middle income group will be incapacitated to construct his own house without depending upon other sources. If he/she is availing loan facilities, the monthly instalment of repayment will totally effect their planning. The normal age of retirement is 55 years at present and 58 for the Central Government employees and 60 for those employed in Bank or other private

sectors. Even though the normal age of completion of graduation is 20, one can expect to get an opportunity to earn at the age of 30 or above. This prevents all the possibilities for accumulating funds for the construction of house. Moreover the average or middle class man is compelled to set apart a lions share of his income for the education of their children. Medical treatment and marriage of self and children also are insurmountable burdens.

The minimum size or area of a house that can be constructed for a man hailing from middle class family is 900 square feet. The area is very much restricted and will provide bare necessities only. He will have to contend with a tiny porch, narrow corridor, in addition to kitchen, work area, bathroom, sit out, dining room and two or three bedrooms. None of the rooms will be spacious enough. If the concerned individual is much particular in adopting modern technique of construction and if he is obstinate in using marbles or granite, tiles for the flooring, the total expenditure may exceed. Rs. 5 lakhs. There is an option left to him. He can turn towards low cost housing system. This will bring the expenditure down and if the concerned person is cautious and reasonable he can construct a very convenient and hygienic dwelling place with an estimate of 3 lakhs. The pertinent question related to Kerala economics is whether an average Keralite Coming from middle income group is willing to forego baseless and absurd dream and be contended with a low cost house as per the scheme provided by Nirmithi Kendra and other such establishments.

A typical individual as illustrated above can expect to obtain any amount from the different financial institutions infested all over Kerala. But he will have to undertake the perilous risk of repayment with exorbitant rates of interest. Another significant factor to be borne in mind that the Total expenditure estimated is solely for the construction of House. The person without a strip of Land of his own will have to make available funds for the purchase of land also. Similarly he will have to set apart a large amount for the purchase of furniture, extra fittings and other paraphernalia. However we can deduce that the total amount of repayment of the principal amount with minimum interest only will come about to Rs. 3500/- monthly. No financial expert can offer an apt suggestion to make both ends meet.

The Research Scholar has calculated and found a solution for this issue thereby upholding a socialistic pattern. It is to be resolved that both the husband and wife should have an economic activity. The income of a family is to be planned taking only the income of the spouse. It means the modern Kerala society consist of members, employed irrespective of sex. Then a part of the total income of the family can be utilised for the mobilisation of funds intended for the construction of house. There is no need of apprehension as long as there are two sources of income simultaneously. The more pertinent point is the firm decision to throw away conventional styles and adopt more profitable and convenient forms. The method of low cost house construction should be appreciated and wide propaganda for the same should be given at

Government level. The employed class in Kerala society has to accept the same as their motto. This will gradually convince the people that "Low cost" means "Low waste".

The average Kerala man confronts identity crisis today. He wants to get himself manifested and recognised in the society. He is in the hot pursuit of external appearances and hollow vanities. This is the only reason behind the construction of huge and palace like buildings as a shelter for four or five persons. In urban areas people are prone to minimise the area of the purchased land. He is satisfied with 3, 4 or 5 cents of land. But at the same time he is very particular in constructing a huge house that spreads all over the available area.

Consolidated indent simply means a perfect estimation of different types of materials required for construction of a building at a given place using a well thought of plan within a fixed period of time. The estimate signifies the price of materials and the total cost incurred for the purchase of the same along with transportation and labour charges. This estimate varies in accordance with the site and the distance from the road and also depends on many other factors like the distance of the place from the market etc. Consolidated indent and estimate are correlated. Infact the consolidated indent itself differs on the basis of the quantity as well as the quality of the materials. More over a reasonable quantum of expenditure can be mitigated

by the preparedness of the consumer in forsaking unnecessary extra fittings to the maximum possible extent. The aesthetic sense working behind this is very much relevant. A thorough transformation can be expected only by converting the social outlook itself. Nirmithikendra and other identical concerns have undertaken this risk in an amazing manner. In certain areas even in Kerala a new tendency is visible that investing a substantial amount for the construction of a building is a waste especially due to the fact that there will be no yield from an apartment constructed for the use of self constructed for the purpose of giving on rent and also for business or like activities are an exception.

High technique and long sightedness is required to prepare consolidated indent by an Engineer. The technical expert applies his mind to make the concerned person aware of the total quantity of materials required for each and every construction. There will be differences in the normal estimate prepared at the outset and the actual estimate calculated at the last stage. If the difference is more it shows the expertise applied to it also not matured. Consolidated indent is prepared by the supervising engineer on the basis of the estimate to avoid waste of materials. A keen observation of both the consolidated indent and the estimate will show the necessity of the former. An analytical study of a gradual process of construction is a must for the preparation of consolidated indent. The engineer interferes in each and every step with the sole intention of avoiding the waste of materials and corruption.

The Research Scholar came to understand that there is no provision for this consolidated indent in the Government level department and as such the preliminary estimate prepared in the beginning by those in the subordinate level will evidently be a false and fabricated one. To the limited knowledge of the Research Scholar there is no proper method to defend the foul practises and corruptive measures which takes place in the construction activities of public utility by the Government Departments. In the absence of checking measures the consolidated indent in excess of the estimate rates are prepared and approved. The bureaucracy from A to Z become culprits and co-associates in swindling. A rigorous law is to be implemented to the effect that no plan or estimate can be approved without consolidated indent and subsequent adequacy verification.* This does not imply that there is no need of a preliminary estimate. Estimate is essential as an initial step without which a consolidated indent cannot be derived at. Even though many strict building rules and regulation are imposed by KSS. They are not practically implemented, for instance there are IRC, MDSS, KSS* with their guidelines and instructions. But not one dares to verify the same and put them into practise.

* Adequacy Verification of Materials. Utilisation of materials with reference to accepted site, plan, design, method of construction etc.

* IRC = Indian Road Congress

MDSS = Madras Detailed Standard Specification

KSS = Kerala Standard Specification

The Research Scholar has depicted below a model picture of materials and the quantum of work in line with many other proposals, plans and estimates prepared by the technical experts in the construction field.

A. Digging for the Basement

For $10\text{m}^3 = 6$ person

B. Basement C for 1 m^3

1. Random Rubble with mud

Random Rubble = 1 m^3

Labour

Male – 1

Female – 1

2. Random Rubble 1 : 6 with Red lime

Random Rubble = 1m^3

Cement = 72 Kg

Sand = 0.3 m^3

Labour

Male – 1

Female – 1

3. Laterite 1:3 with white line

Laterite (Dressed) = 60 Numbers

(44 x 22 x 14 cm)

Lime = 0.05 m^3

Sand = 0.16m^3

Labour

Male – 2 (inclusive of one skilled labour for laterited dressing)

Female – 1

C. WALL (For 1 m³)

1. Laterite 1:3 white Lime/Red Lime

Lateriate (Dressed) = 60 Numbers

(44 x 22 x 14cm)

White Lime = 0.05 m³ /Cement 45 kgm

Sand = 0.16m³

Labour

Male = 2 (including one skilled labour for laterite work)

Female = 1

2. Solid Bricks (ordinary) 1 : 3 White Lime /Red Lime

Ordinary Solid bricks = 500 Number

(20 x 10 x 10 cm)

Sand = 0.25m³

White lime = 0.08 m³ / Cement = 60 Kg

Labour

Male = 2 (including one skilled labour for brick work)

Female = 1

D. ROOF

1. Concrete Work

1:2:4 concrete For 1 m³

20mm Metal = 0.9m³

Sand = 0.45m³

Cement = 330Kg (6.6 Sack)

Labour

Male – 2

Female – 1

Note : (Steel and Framing work for concreting is not include)

2. Common wealth Tile/Mangalore Tile

For 10 square feet

Roofing Tile = 150 Numbers

Carpenter = 1

Helper = 1

Note : Wood work, Plastering, Flooring and Painting are not included.

The only charges that would not vary is the labour charges irrespective of the type and method of housing from conventional type to modern sophisticated style. In fact the main and apparent reason for the enhancement in the expenditure is caused by luxurious items especially the extra fitting, super audit, flooring tiles and paints. Thus the scholar conducting research on the subject has to focus in this expenditure and make definite proposals. The proposal will become acceptable only if it ensures the preservation of beauty and elegance.

The Research Scholar now ventures to interfere in the given estimate above with the yardsticks extended by the entrepreneurs of low cost housing technology like that of Nirmithikendra. The plinth area and the labour charges remains one and the same. According to the calculations the

remarkable difference occurs in the case of materials used for flooring, plumbing and electrification as well as the painting.

The peculiarity of the contributions of Nirmithikendra is its economic effect. The common man is not aware of the reduction in expenditure. While the conventional type of construction requires Rs. 7 or 8 lakhs, low cost housing system curtails the same to Rs. 3.5 or 4 lakhs.

The Research Scholar now projects the findings from the study of related matters that it will be feasible to make a square plinth area instead of a rectangular type. Similarly unnecessary projections from walls also should be avoided. The height of rooms is a very important subject of study. If the heights is reduced to lower level thousands of rupees can be saved. According to figures there is a scope of reducing 18% of cost by this method. The possibility of avoiding the cost and expenditure required for the construction of basement can be curtailed by erecting multi staired building or atleast two storied building for individual housing facility. The additional expenditure in such a circumstance is that of a staircase. Yet it is more feasible and practically profitable. This is highly acceptable in the urban areas where the cost of land is unaffordable.

Another practical solution that the Research Scholar is desirous to propose is to make the thickness of the internal walls to the maximum lesser thickness. The use of Ferro cement also is advisable. The height of the walls

especially of bathroom and storeroom can be reduced as far as possible. The roof of the houses should be the same size in order to avoid unnecessary eaves and projections. Another pertinent point to be projected in this context is to decrease the number of wooden doors. For instance there is a no need of a door between dining hall and drawing room. A wooden curtain will suffice. Similarly the number of doorframes also can be minimised by substituting wooden planks fixed on the walls. A blind approach is not suitable in the construction of houses. Importance should be given to the locally available materials. It will be absurd to fetch large quantities of solid bricks from a long distant places when the lateriate stones abundantly available in the particular place.

The Research Scholar prefers to opt a time schedule and the preparation of list of all the required materials kept ready in store in advance. Since the skill and specialised labourers will not be available at the calling distance storing of goods will be beneficial and can be provided to them as and when then required. Then there will be no need to wait for the supply of materials when all the required labourers are present for the work, the aforesaid matters may seen trivial. But these apparently insignificant factors would definitely bring down the expenditure. Even though it is unavoidable to engage a contractor with undue haste of the day to day life. The beneficiary should take an active role throughout and should be well conversant with the expenditure as well as the quantity and quality of the

materials. The beneficiary has to ascertain whether the progress of the construction is going on in confirmation to the estimated expenditure. The beneficiary should ensure his interference in all the pros and cons at each stage of construction.

The failure of modern technology in the construction of houses is the inability to anticipate sweeping changes approaching with giant strides, fashions keep on changing and each newly introduced concept would become old fashioned and monotonous soon. This occurs when the beneficiary is very particular about the external and artificial beauty. The modern beauty concept is perilous. The Research Scholar finds it fit and proper to suggest that a short cut idea regarding the construction method to be included in the curriculum. Any student other than a civil engineering/diploma holder can make the calculation of expenditure and fix the plinth area required for his dwelling spot.

COST EFFECTIVE, ENVIRONMENT FRIENDLY TECHNOLOGY IN THE CONTEXT OF KERALA ECONOMY- A POSITIVE APPROACH

Rajeevan. K. "Economy of low cost housing in Kerala a study with special reference to Nirmithikendra " Thesis. Department of Commerce and Management Studies , University of Calicut, 2006

CHAPTER 7
COST EFFECTIVE, ENVIRONMENT
FRIENDLY TECHNOLOGY IN THE
CONTEXT OF KERALA ECONOMY -
A POSITIVE APPROACH

Kerala with the tiny size of an eye drop in the whole geographical sphere of India is confronting a crisis and stagnation in the path of economic development. Industrial backwardness and agrarian withdrawals are the obvious reasons for the same. Inadequate opportunities for job also is an important hindrance. These bottlenecks cannot be survived or surmounted merely with a magic wand. Even though birth control and the emergence of nuclear families has its proposed results during the last three or four decades, the population explosion and density of population in urban area has made the pathetic condition more entangled and complicated. The primary lesson in economics and an analysis of economic issues in Kerala gives us a picture that the basic problem of Kerala economy is that of investment of the accumulated and mobilised funds as well as hot pursuit for the hire purchase system and instalment scheme. The availability of loan sources has become a curse in Kerala. Lakhs of Rupees gained through the sweat and toil in the distinct deserts of Arabia could not be properly channelised. The Research Scholar earnestly feels that proposals for the channelisation of accumulated sources and even human resources are highly required in Kerala. An impetus

for production is also inevitable. The life structure and life style of Keralites also should be transformed into a positive and profitable moulds.

In this respect house construction which is a continuous affair in Kerala seems to be much significant. Thousands of houses are being built in Kerala every year. Construction of buildings in the public sector accompanied by waste and corruption also is a regular feature.

It is a matter of regret and disgrace to see that the willingness to toil is gradually vanishing especially among the youngsters. They are leading an Utopian way of life with spacious palaces and shining nymphs in their reveries. Hence they do not adhere to the practical aspects and for a compromise between 'Demand' and 'Supply'. Unfortunately, there is no equilibrium at all in this regard. The average Keralite is always far behind the optimum. The standard of living and the spread of Science and Technology has remoulded the psychological convictions of Keralites with certain after effects like Lethargy, Drowsiness and Slumber. A deliberate attempt to make them feel that a small apartment with maximum possible conveniences is to be adopted as a temporary arrangement. There should be a psychic contentment with the available facilities and an impression that a dwelling place is a temporary arrangement and a spot for changing wares and a place to dine, keep ourselves fresh and sleep. If such a highly magnificent idea can be

inculcated, we can expect the growth of Kerala economy at an accelerated rate.

The idea of cost effective construction was initiated by the technical experts of Costford. Actually they were trailing behind the unique ideology propounded by ancestors. They too had applied their skills for blending and making a harmony between the two. The appearance of Laurie Baker was undoubtedly a boon. Despite his inclination to European style Laurie Baker laid stress, on the curtailment of funds earmarked for the construction of houses. Evidently he had to examine the various aspects of construction. He found that the selection of material itself will enable the beneficiaries to make comparative study and reduction in the expenditure. The appearance of hollow bricks was a turning point in the modern history of Kerala. It had served double purpose. While it offered an opportunity to minimise expenditure, paved the way for the introduction of thousands of centres with small scale ventures for the manufacture of bricks from the sticky clay available in the barren lands and paddy fields.

Even though Costford introduced a cost effective method, the uniform pattern and homogenous style made it highly mechanical. The blind practise of insisting hollow bricks also has its negative effect. It is a folly to compel the use of hollow bricks in a place where lateriate stones are abundantly available. Since it was a new idea and a new technique we have to convince

the users about certain drawbacks and defects. Cost ford concentrated only on the cost without any botheration of varieties, novelties, specialisation and fashions. Modern people in Kerala are disgusted with uniform patterns. They want to establish their identity in each and every walk of life. Cost ford could have solved this puzzle by introducing different patterns with slight variations. But it was not the only reason for the discontentment of the people. They had easily become disgusted with brick walls and unnecessary projection and curves inside the houses as designed by cost ford. However the contribution of cost ford can never be undervalued. The cost effective philosophy is the stepping stone only, we are still on the other side of the threshold.

Nirmithikendra was destined to appear on the arena. They did not abandon the basic concept introduced by cost ford. It was not a thorough denial on the contrary it was a reconciliation and an acceptable harmony or a profitable compromise. Then naturally a question arised as to how did Nirmithikendra refined and reformed the original ideas postulated by the followers of Laurie Baker.

"Environment-Friendly-Technology" turned out to be astonishing phenomena with its far-reaching consequences in Kerala economy. Nirmithikendra simply applied or, more precisely applied as in the computer language "pasted it" with the original idea innovated by Cost ford- cost

effective. Thus Nirmithikendra under the guidance of Sri. Anantha Bose linked them together very wisely and profitably. A total denial of plastic or semi-plastic substances was the peculiarity of the constructional concept of Nirmithikendra. They dislike the use of plastic even as pillars, doors, or planks. Nirmithikendra reckoned the use of plastic as an antithetical interference in the natural serenity. Nirmithikendra devoted their attention in the selection of wood for the construction of housing. The windows proposed by Nirmithikendra are wider than that of Cost ford. They wanted to let the light and air pour into the interior portion of the house. Even though Nirmithikendra prefer certain special types of wood like 'Ayaniplavu'¹ for the purpose, there is no concrete proposal growing such trees in large scale simultaneously. The importance given to nature by Nirmithikendra, alienated them from CSTFORD.

In a broad sense the spirit derived from the ideology of 'naturopathy' itself is applicable to the constructional technology projected by Nirmithikendra. They emphasise the use of "locally available materials" on the ground that they are more environment friendly and are cost effective. They admitted that both these aspect should be entertained and taken into consideration. But a wild and irresistible insistance in using a particular stuff is a symptom of insanity. A good instance can be quoted, there is a spot where laterite stones are abundantly available. Perhaps hollow bricks/solid

¹ Available wild jackfruit tree in Kerala

bricks may be more attractive in another sense. But it is absurd to fetch the hollow bricks from a long distance and spending a huge amount of money. That was why Nirmithikendra accepted the triple words- "locally available materials". They will act both as cost effective and as environment friendly technology.

The efficient use of mud is one of the special feature of low cost technology. This development and rejuvenation of mud architecture is a sustainable solution to the burning problem of housing. This new method is environmentally sound and energy efficient. Another aspect is that it is highly labour intensive and generates opportunities for employment. Mud is cheap readily available and provides excellent heat insulation. Accordingly the inside portion of the house will be cooler in summer season and hotter in winter, in contrast with steel and concrete. Moreover it is strong when compressed and so makes good walls. Nirmithikendra offers well designed technology options. This method is more concerned with the need of the society than the aspirations of individuals. The priorities are fixed to fulfil the needs in a cost effective manner.

Low cost technology brings down the overall cost by adopting appropriate house construction techniques. The consumption of costly materials like cement can be limited by adopting innovative designs. The buildings are supposed to merge with land by keeping to the land profile.

Low cost technology considers climatic conditions in the area and it means that there should be variations in the application of technology and variations in the materials prescribed for the economy is a significant factor and as such Nirmithikendra give much priority to the sources of income of the beneficiaries. The need for reinforced lintels are totally avoided by the efficient use of arches and corbels. Country burnt bricks, sun dried bricks and even stabilized mud blocks as such are good enough building materials.

The ultimate objective projected by Nirmithikendra and other identical establishments is to bring the total expenditure for the construction down without any adverse effect on the conveniences. Maximum utility with minimum expenditure is the accepted slogan of low cost technology. However much strain has been taken by the experts to ensure the maximum extent of utility in this regard. The philosophy of sheltering apart from other facilities is to be reckoned wisely. The activities in a sophisticated urban area is restricted to dining, cooking, sleeping and other such normal functioning. Life is a serious engagement and intended for many other grave affairs. Thus low cost technology offers a new philosophy of life. It introduces reading, thinking and discussing rather than the primary needs. Thus we become acquired with the practise of giving up posh materials and luxurious articles.

Modern life is one of specialisation and of high mechanisation. It has shrunk man to mere numbers. There is an automatic withdrawal and

elopement from realities in life. That was why Thomas Hardy² composed a novel "Far from the madding crowd". The modern world is becoming disgusted with the urban vanities. There is a replacement of nature in all aspects of life. A cup of crystal clear water is more worthwhile than 9 purchased bottle liquid. Experiences have taught men that country bricks are preferable and healthier for the flooring than any costly and glazing materials readily available in the market. The hue of nature is that of mud and the same is inherently refined. It is a distorted impression crawled in to our mind that the saffron bricks are not much fascinating. The vigour and beauty of the substance lies in its resemblance with nature.

Nirmithikendra and all other organisation with identical banners are firmly suggesting to become more and more eco-friendly and cost effective. Natural objects possess perishable beauty and the same are having no negative aspects. On the contrary a modern design and plan for construction is a cogglomeration of artificial substances. The people in the urban area delighted by the use of synthetic rubber instead of the real one.

The environment friendly technology is cost effective and eco-friendly, it can mitigate the evil aspects of pollutions. The urban area is teemed with huge area are teemed with huge furnaces with the site of gigantic chessmen. They emit fuel and smoke like the numerous vehicles. The entire atmosphere

² A famous English novelist during the Victorian age.

becomes stained and vicious. There is a trend for returning to old agrarian world for the enjoyment of serenity, solitude, and peace.

Even though modern society always go ahead ogling towards the west. In spite of the constant changes taking place in the technology, there is always on opposite side to the same. We are not mentally prepared to throw away our roots and heritage. Unknowingly our mind and dreams are with the old world. Yet, we opt modern technology of construction.

The difficulty of the construction of houses on the basis of low cost is the recurring expenditure incurred for the decorations, external beautifications and superficial illuminations. They are all unwanted expenditures. A firm decision for the boycott of artificial life will bring an automatic and a abrupt abandonment of such a hasty life. Gradually a new aesthetic sense will emerge. That will prefer soft, divine and refined goods instead of an artificial way of life in a huge mansion. The low cost technology is also a good device to equip ourselves within our limitations.

As long as the pioneers fail to adopt appropriate measures for creating any equilibrium in the economic condition in Kerala, it will be absurd to exaggerate our convictions on a cost effective technology. A general preparedness and overall management are essential for retaining the balance. When a boat is sinking, a drastic step to retain the same and lift it over the ripples without being swallowed and overturned is required instead of trying

to save one or two passenger or crew or part of the vessel. Similarly a thorough restructuring of economies should be the target in Kerala. A reshuffling of different factors is a must. This is applicable in the case of construction of abodes also. Primary lessons on savings as well as on investments are to be taught with a strategy for social uplift. There is a need for concentrating on productive and reproductive aspects also. Production is a yards tick to measure economic progress. Huge furnaces are the symbols of production and industrialisation. It is a matter of regret and disgrace that no yield can be expected in the field of house construction. There is no yielding or economic benefits other than saving rental charges. Hence a new ideology is to be evolved impelling citizens to mobilise funds as far as possible and utilise each and every penny for productive purposes. So the whole income should not be diverted for the construction of a tiny house with a cost of five or six lakhs of rupees. There will be no scope for mini industrial motivations. The Kerala economy confronts the lack of investment in the industrial sector as a burning issue. All efforts should be focused on this subject. Unfortunately Economics is a subject which is despised by the people of Kerala. No practical application of Economics is there in Kerala life. Ordinary people and even graduates are not much concerned of a graphic presentation of their income and expenditure. The index showing the debts and loans are always on the high. We are totally unaware of debits and credits.

The superficial temptation of advertisements rush us from behind to approach all money lending avenues and knock with expectations of accepting the maximum possible loan amount. The administrators, rulers, economists, commercial experts, and industrial magnets have no reluctance to surrender to any demands of the international level money bending agencies like ADB (Asian Development Bank). All are reconciled to kneel down and bow before ADB. They impose conditions with a pleasant smile. Individuals also pursue the sources of loan. A lions share of the advertisements in our medias are covered with thrilling, influencing and catching slogans of money lending agencies. Money lending has become a profitable enterprise in Kerala and it has turned out to be a curse to Kerala economy. The interest rate for Bank deposits is descending and ultimately it will lead to withdrawal of the deposits. Huge amounts of deposits are withdrawn in Kerala for two purposes mainly

1. Large scale money lending business for the exploitation of the ordinary people, ruthlessly and without a peek of compassion. This money lending business is hardly productive.
2. Another apparent reason for the withdrawal from the Bank is the construction of apartment for the beneficiary as well as for erecting a huge shopping complex or flats. Crores of rupees are expended for this purpose every year in Kerala. This will not lead Kerala to a safe

economics. On the contrary it leads the state to stagnation. As long as the government is not willing to implement vigorous steps, this trend cannot be arrested or stopped.

A peculiar feature of the modern Kerala economy is the deliberate involvement of people in all economic aspects from ground level. This has become popular especially after the introduction People's Plan Programme (PPP). In one sense the mass participation of in the PPP is a direct threat and challenge to LPG (Liberalisation, Privatisation, Globalisation). The ordinary people were mere witnesses in the past. But now they are active participants in all decision-making bodies. Groups of people ("Koottayma") bestow their ideas for frank discussion and wise decisions emerged out of such discussion taking place in the corridors of houses. 'Ayalkoottam' (Get together of inhabitants in the neighbourhood) turned out to be decisive factor guiding PPP. If the potential forces of people are not checked and restrained Kerala economy can expect a bloom in the near future. The Research Scholar is much eager to expose or unfold the contributions of Nirmithikendra and many other identical entities in the co-operative sector. When the self-financing system is directly implemented in the education field in Kerala, a certain co-operative venture came forward to undertake such a system and also opened even professional colleges. They imposed reasonable rate of fee only. The services rendered by Urclungal labour contract co-operative society in Kozhikode District could also boast of their successful undertakings.

The Research Scholar has no doubt that certain guidelines will be formulated from the higher level and conditions be imposed with the ulterior intention of making dwelling apartments smaller and smaller. The tax imposed on small size houses should be minimum and affordable. The government should impose rate of taxes on the basis of the size of the houses. For instance if the annual building tax of a residential quarter with the plinth area of 700 square feet Rs.70 and the house with the plinth area of 1000 sq. feet is rupees, 100 or 125. The tax rate should be doubled when the plinth area is also enlarged. Similarly the government should fix the maximum size of houses and if there is a pressing demand for getting sanction of a house with the proposed plinth area exceeding the maximum area permitted, government should impose additional and extra super tax. Thus the democratic liberty can be ensured and the income of the government safeguarded.

In Urban areas there is a tendency to accommodate the self in one part of the house and offer the other part to the outsiders for rent. This is acceptable on the economic point of view also. This ensures the maximum utility of the house. Since density of population is the burning issue in Kerala, the system of partition of the house and letting parts of the house to other parties is one of the solutions. This will offer a regular income also the concerned individual. If a part of a huge house consisting of a tiny kitchen, Porch, work area, dining hall and two adjacent cabins are given for rent, the

owner can naturally expect a monthly rent of Rs. 1500/- This can be used for the repayment of the instalment amount of the loans availed from the Banks.

In short a re-arrangement in the existing structural analysis only is adequate to ensure stability and economic progress in Kerala. Outsiders look at the present Kerala with much discontentment because it has become a loathsome and abominable piece of land, it has shrunk and shrivelled as a consumer state with a wide opened mouth to eat and extend limbs to receive everything offered from any corner without any considerations. The Research Scholar still see rays of optimism in the distant horizon and still believe that Kerala too can awake and arise and meet the issues, trials and tribulations of life.

SUMMARY AND CONCLUSION

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CHAPTER 8

SUMMARY AND CONCLUSION

The entire research work has targeted at a novel conviction of creating channels in abundant numbers through out a vast area after ensuring the lowest possible cost and maximum possible convenience. After an elaborate study it can be wisely concluded that the low cost housing concept can be properly implemented by concentrating on two dimensions.

1. The structural aspects and the auxiliary ingredients
2. sourcing of various materials and easy availability and cost effectiveness.

Another significant aspect derived at is selection of materials without any contradictory counterparts. Similarly the maintenance of aesthetic equilibrium is inevitable because a state where the majority of the population is academically and otherwise educated will not be prepared to yield to any design imposed upon them. Voluntary acceptance is compulsory.

Socio economic and political awareness and encouragement to the parallel activities which can be undertaken by co-operative enterprises. In this connection the organizational activities performed by the labour unions especially connected with Nirmithikendra is worth mentioning. For instance

there was a rigorous attempt put forth in 2001, the beginning of this century. Adequate advocacy was imparted for the purpose, popular opinion was mobilized through pamphlets and circulars, certain concrete suggestions were submitted to the state government also as part of agitation and propaganda. Consequently certain suggestions were heeded and concrete measures adopted. The cautious intervention of Nirmithi Kendra and other such auxiliary institutions were proved to be effective. Besides the research work has concluded with gratitude to the service rendered by the popular medias in Kerala in addition to large volumes of book published by different agencies like Nirmithi Kendra, Costford, Sanker's habitat, regular news papers, magazines and weeklies which could appreciate the taste of the public for low cost houses. Otherwise the majority of the consumers would have been compelled to go after low cost houses with reluctance and indifference only because of the reality that they are not endowed with adequate funds, so as to construct huge mansions and palaces in accordance with their whims and fancies. It is apparent from the statistical data that lions share of the consumers and admirers of the low cost housing belongs to the middle class economic strata in lieu of the poor down trodden sector of the public. It is quite amazing to note that there is a favourable move even from the higher section of upper middle class people and dignitaries of the society who are financially sound. It means that the whole programme scheduled and chalked out in Kerala for the wide popularity of the low cost housing were not

intended exclusively for minimizing the space and area of the houses and for using several materials on the basis of its costs. Thorough restructuring of aesthetic interventions have taken place in Kerala in this field. The popular media and sources of publications are keen in projecting the tastes and wishes of the middle class and upper class people. They are least concerned of the items regularly consumed by the poor people like tapioca and sardine. There is no need of an advertisement for such substances. The best thing that has taken place in Kerala is the interference of the media in deliberately moulding positive taste and hygienic selection in case of house construction.

The curtailing of expenditure is only one of the factors to be reckoned. Scientific experiments and comparative studies have been launched and successfully completed through out Kerala. In a nutshell a new idea has come to effect. The slogan became "more convenience" "and maximum fascination with minimum expenditure."

Vigorous attempts were made out to convince the people that they are liable to spend a huge amount for the construction of a house. More over the construction of a house is a very rare occurrence in the life of an individual man. The resources are very limited and the possibilities for the mobilization of fund is scant. Hence all aspects are to be repeatedly examined from heel to crust before leaping into a hasty conclusion. Agrarian reforms have substantially reduced the plinth area possessed and owned by families and

individuals. The market value of land is actually intolerable and unaffordable to layman. Middle class people purchased and owned land for house construction after investing whole or almost the maximum wealth saved by them. Even then they will have to mobilise funds from some financial institutions or housing societies on high interest. The debt will be a long term one. In such a context the construction of a house is an additional burden. Even if both the husband and wife are employed, there is a possibility for devoting a part of their monthly income for the repayment of the debt that they have already availed. Naturally, the findings extra finance is a burning issue. It is to be borne in mind that the wife and husband have their long cherished dream of a spacious mansion with steeples and towers.

The only available remedy before them is to come to a compromise and make an adjustment by restricting their plans in accordance with the sources. Obviously the path and trade drawn by Nirmithi Kendra, Costford, Sanker's Habitat and large number of similar institutions have enabled a lot of people to save themselves from mass scale suicides. In this regard, it is pertinent to know that Nirmithi Kendra and other such institutions could cultivate a new culture and sense of aesthetics. Thus the research from the superficial layer to the abyss has proved that the new culture hatched up in Kerala in the last few decades has been accepted by Kerala with much enthusiasm contentment and delight. It was not at all felt as an alien conviction imposed upon them. Another appreciable lesson is to minimize

the area for the construction of housing and utilization of the balance area for some positive purposes. For instance, there is a new trend in many areas even in the urban sector to make use of the upper roofing of terraces for laying out kitchen gardens. There is large number of professional technical experts who spend not a penny for the purchase of vegetables from the market. Eventhough the conical surface structure of the low cost housing seemed to be hindrance, alteration and modifications can be introduced and implemented. There are enough examples to cite for such roof gardens in the houses envisaged and materialized by the project of Costford.

Nirmithi Kendra can also claim that they have a role in creating a new habit in the general public for reducing the debts to the maximum level. It taught them that the debt is a personal one and purely personal. They all have to be relieved from unnecessary financial burdens. Even though the dreams are pleasant, experiences and realities cannot be ignored. A comparative study is essential and "choice" and "selection" are two important lessons of modern life. The next and most important step is the process of selection. A list of preferences is to be charted with great care. Alternative arrangements should also be projected. Since something is to be sacrificed, it is to be determined before hand about the cost and expenditure at particular levels and points and for specific items. If there is no chart and comparative study it may ultimately lead to confusion. The original plan with all grace and pomp should be there. It is to be designed only on the basis of the ideas concealed in

the mind of beneficiary. Then it is the obligation of the architect to convince him of the cost and expenditure side. Similarly he/she should be very careful to determine the preference of sacrifice of the customer. Finally he also should be satisfied. The ultimate consent of the consumer is gained without any spec of doubt in his mind. If the same individual had constructed a spacious building with all decorations and illuminations he should not have been much worried after the completion of the construction because his initial concept stands only on the basis of his dream and without any realistic approach.

The concept of housing includes the preconceptions of furniture and other equipments. Formerly it was all done subsequently without any anticipatory measures. But now-a-days we give much emphasis not only to the location of the building and the availability of water, but each and every item to be furnished inside after the completion of the construction work. Thus housing in the modern context is to be drawn on a broad canvas. It includes the work area and water tank and involves kitchen garden and a ladder leading to the roof. Similarly the modern trend is to equip every thing properly and adequately from teaspoons to bookshelves. The project should calculate the expenditure in detail, at the time of the preparation of the blue print or plan.

The site plan is prepared perfectly in consonance with the shape of the available land, that is the length and width of the area. Necessary modification will have to be made. However it is desirable to convince the beneficiaries that bedrooms in square size are not much acceptable if the length is extended a bit it would have its intended results. The research work enabled the scholar to understand that the space for each and every article can also be determined in advance if possible with the ulterior motive of enhancing the beauty. There should be definite ideas in the matter of materials to be used in the different parts of the house. Big sized wooden planks are not easily and readily available. Besides it is not easy to afford the same by ordinary people. He should be prepared to abandon the idea of sticking to the use of costly wooden parts. If the estimated expenditure of the units of the wooden structure is rupees 2500/- a cement pillar of the same size and dimension can be constructed with 1/5 of the expenditure i.e. Rupees 500/-. We can guess the soothing effect by the comparative study. The change between a metal and wooden plank or pillar can be realized only by physical touch. But that realization does not make any difference in the case of consumption. The consumer will gradually realizes that many aesthetic feelings are hypothetical and inculcated in them with conventional and traditional habit. A new aesthetic on the basis utilitarian value should be developed. It is a part of welfare society also.

Additional fixtures and fittings are also worth mentioning in this context. In fact the research scholar has found that a detailed study of additional fittings or extra fittings is to be worked out with a view of saving the space and minimizing the expenditure. No research work has yet been initiated in this respect. Unfortunately it is still considered as a trivial subject. Evidently the quantum of expenditure to be set apart for the additional fittings is one of the major items. It can never be totally abandoned. Some writers and technocrats in the fields have pointed out that the additional fittings will avoid extra expenditure. Even though seemingly insignificant, many additional fittings can be installed underneath sofa cum beds and cots. There is no need for extra space for book shelves, soap and mirror stands and press railing. There is the facility of metal strings and screw and steel parts, which can be projected out by pronging and can be restored back by bending. These extra fittings in fact avoid many levels of expenditure. Cloth hangers can be fixed behind the bedroom doors. Bags and baskets to place fresh dress and bed sheet and valuable pieces of papers can be arranged likewise. If it is applied in the kitchen the use of wasted metal bars can be made use of for waste paper baskets etc.

Proper guidance is required for the fixing the spots for doors. It is wise to arrange all the doors in the same directions. Similarly the doors of the bedrooms and bathrooms should not be permitted to overlap. It may reduce the facilities of the bedrooms and bathrooms. It may reduce the facilities of

the bedroom. There is a controversy and different opinions in the matter regarding the fixation of doors. While some argue that it is better to select the center portion of the wall for the doors, some other bitterly oppose the same and claim that the best place for the door is the corners. When we take the maximum utilization of the space of the room, it is better to go after the argument of the fixing of the doors in the corners.

There is a general trend to give instructions to have bath-attached rooms. The research scholar examined thoroughly the specimen of many houses and learned that attached bathrooms for all the five or more bedrooms are not at all essential. On the contrary it is a sheer waste. It may help the beneficiary to boast at the time of house warming ceremony and that he too possesses a building with five or six bedrooms and also that they are all bath attached rooms. Here we forget the family concept of Kerala in the twenty-first century. Nuclear family system has already become a truth. There is no frequent visits and reciprocal visits among the family members. Mobile communication and messages have become sufficient. Visits to a house is a rare phenomenon. Even if some one calls on, the conversation is not lengthy and they need only few refreshments. It is only the matter of hours and no one will stay in the shelter of others. The modern Keralites are self centered. Some body residing in our house is very rare but only due to the compulsion of circumstances like death or marriage. They are the closest of relatives without any compulsion for having privacy. The research scholar now

ventures to observe that a general bathroom as was a practice in the earlier period is enough for a house. We can provide all maximum possible facilities in that bathroom. If it is not agreeable and if some one may condemn it as a revolutionary step, we can adjust and reduce the number of bathrooms constructed inside. If the space of three such bathrooms is saved, it will naturally ensure additional space in all the existing rooms approximately a space of more than 50 square feet. There is no need for extra fittings like closet, washbasins, wall tiles, mirror etc. Gradually modern man in Kerala will admit that the additional expenditure and space set apart for the unnecessary bathrooms is a loss. And in all aspects it is an idle investment.

There is an unwanted inclination among the middle class sector to expose their variety in the external decorations and construction work. Even though there is a remote possibility for the purchase of motor vehicles with meagre monthly income and other trivial financial sources, many are unknowingly succumbed to the desire to devote an additional spacious outer space for car-porch. Some times it may cover an area exceeding 225 sq. feet. It is pertinent to note that the carporch require a terrace above and it involves a waste of money. This is being done only with the hope of parking the vehicle in the event of purchasing the same. It is a sheer waste and an expenditure that could be abandoned at the beginning itself. This enhances the funds for many additional expenditure like plastering polishing, flooring and miscellaneous items. If the consumer is prepared for a second thought,

the area could be diverted to other beneficial purpose like a courtyard, garden or for vegetable garden.

Similarly a thorough recasting of convictions can be applied regarding this planning. For the terrace or the roof portion coconut leaves are substituted by Tiles and the contribution of the Basel mission and the common wealth factory is note worthy. The raw material for tiles is clay and as such there is a direct application of natural object. The introduction of tiles enable numerous families to give up the unnecessary and recurring expenditure of frequent replacing the rotten coconut palm leaves. More over it gives more grace and beauty. The external appearance can be absolutely altered. A kind of urbanization is set to have taken place by that time. Thus the introduction of tiles made of clay and baked in furnaces with appropriate heat is following a culture that prevailed decades ago in Kerala. In one sense it continued in the flooring. The agrarian concept of rural atmosphere with dried cowdung paste on the floor mixed with black charcoal had undoubtedly a Keralite appearance. Unfortunately cows became a rare phenomena like elephants in Kerala. Thus the system of flooring gave way to redoxide and subsequently mosaic chips.

The re-modeling of roofing with heavy cement and metal with steel turned out to be an unwanted advent especially in Kerala. It is absolutely in contrast with the climatic conditions available in Kerala also. It can never be

established to have enhanced the external charm. If the colour of the tiles gradually became faded and filthy, it is equally applicable to cement terrace also. Annual maintenance is essential in the case of newly constructed abodes. Formerly the white-wash with lesser expenditure retained the glory and grace of the residence. The amount to be set apart for white washing annually is comparatively cheaper and affordable. But the insistence of multi-colour and glass like paintings involves an additional expenditure without any further convenience or beauty. Eventhough the tiles were replaced there is a trend to make use of new models of tiles on the roofs and walls. This has guaranteed job opportunities also. The low cost housing is not much concerned about the colours, and decorations. It has taught a good lesson that the abodes are transient and not external. They are temporary arrangements for shelter. There is no use in devoting additional expenditure for this purpose. Fashions and designs undergo frequent changes and it is not an easy task to adopt all these changes from time to time. A huge portion of the income is being unnecessarily invested by many for the construction of houses. This affair is not yielding or profitable. It results in extra expenditure like taxes, which varies according to with the pomp and space of the building.

The steel and iron which is being used with metal and cement for concreting the terraces will undergo changes in accordance with the climate like blistering heat. It may shrink and expand according to climatic changes and there by create cracks which leads to leakage. Iron and steel will become

rusty and undoubtedly not compatible for roofing in Kerala which experiences extreme heat cold occasionally. At the same time clay tiles can with stand all the climatic tortures. It won't expand or shrink as the iron and steel. Even if one or two tiles are damaged or broken, the same can be replaced and repaired with minimum expenditure.

In fact the architects and constructors of the building might have preferred concreting on the roof due to the non-availability of wood which is a must to pave the tiles on the roof. It is amazing fact that wood is not abundant in Kerala which is a land of green vegetation. It is too costly. There is no program for the plantation of trees to compensate the loss of the existing ones. Replantation and caring of trees is to be handled with care as a very essential subject. Wood can be made available through out Kerala. Even if a large amount is spent for concrete roofing the expected life of such a construction is three or four decades. Our apprehension that the non availability of wood gradually is the sole reason for turning to concrete roofing. We are all bothered for ensuring the use of teak wood or least jack fruit tree for furniture items as well as for doors, window frames and even for reapers on the roof. If the obstinate habit is diluted a bit we can make use of other woods that will remain undamaged for 20 or 25 years. Even the matured mango tree can be safely used if the same is dipped in mud water of the rivers for three or four months. Varnishing or painting can make the appearance of all wood alike. Similarly the varnish and other pesticides can

consumer becomes convince that all factors required for the grace and beauty and convenience are to be abandoned. There is no need of an expert or architect for such a change. The enterprise launched by architects of 'Vasathi Kozhikode' is a good instance to be mentioned. They offer low cost houses worth Rs.50000 to anyone within a short notice. The research scholar became appalled by a mere glance of such a house without any proper roofing flooring and other compulsory attributes. No one will be satisfied by such a low cost house. Laterite stones can be substituted by bricks. Similarly low cost wooden structures can also be made applicable with proper scientific applications. With a view to retain or enhance its grace, another thing that the vasthu builders could have incorporated is to do something to make the flooring more fascinating. If they convinced the consumer, he/she would be prepared to spend an additional amount not exceeding Rs.1 lakh or so. The architect can make the structure more comfortable and more luring.

Another worth mentioning contribution from Malabar area is that of Sri. Jayan Bilathikulam. He has proved his expertise in making use of the unused materials kept idle by the beneficiaries as the most attractive material of the newly built house. The middle income group people in Kozhikode are indebted to him for his services in transforming the age old materials brought from the corporation office Kozhikode, Homoeo Medical College, and Railway Station of Kallai. He has kept many ready-made materials for sale. The consumers can purchase and affix them at suitable locations of their

be applied to avoid the possibility of the attack of white ants. Thus a thorough re-modeling of our conviction is highly required in this matter. New Fashions, beauty and conveniences can be maintained and introduced without additional expenditure. Now Kerala is depending for Fowl, flowers, eggs, milk, vegetables and fruits on other states. Cattle breeding is not a profitable business now-a-days. At the same time cow-dung is not available for biofertilisers. Any enterprise and venture for remodelling of the flooring, especially with a view of natural and unsophisticated style, adequate chances will be available totally depending on cowdung. Colours can be mixed and chemicals also can be added in restricted way. Consequently there will be high demand for cow dung. It does not mean that we will have to go to past. Beautiful tiles can be manufactured with cow dung and milk, that may induce many unemployed persons in Kerala to start cattle breeding in large scale. The vanished grace may come back and scope for mini Industry will soar simultaneously.

Such a change may not be acceptable to all in the beginning. Hence the research scholar has some suggestions at his disposal. It can be proposed as substitution for reconciliation.

A temporary adjustment with the continuation of the existing set up with small modifications in the initial stage can be tried. The thickness of the concrete can be reduced and the shape can be made slanting to avoid leakage.

Similarly thick sheets like tarpolin with life duration of 5 to 6 years can be introduced for the roofing. Especially in open areas without the possibility of getting the roof damaged by something falling from the trees. The necessity of huge and heavy burden of the roof is to be avoided. There is no justification in safe-guarding our shelter with expensive roofing. A firm roofing is desirable but an expensive one is a waste. The concept of low cost housing carries the ideology of cultivating a trend in human souls that the abodes are mere shelters from rain, mist, wind and heat. Natural calamities can be prevented to limited extent only. The recent happenings of cyclones like Kathreena, Reetha, Wilma etc. in America are sufficient to make our eyes open. This occurred in Japan not because of World Wars but on the basis of preparations to confront the volcanoes. It is a fact that an average man has no reluctance to spend 10 or 12 lakhs for the purchase of land and construction of houses. Generally the calculations are arrived at with the decisions to set apart 3 or 4 lakhs of rupees for the purchase of site and the balance amount for the construction of house. A rethinking with beneficial motive will create wonderful results. Then the middle class people and even a part of the richer section will become convinced that it is profitable to expand the area as far as possible. Most of the people are contented with 3 or 4 cents of land in an urban area. In metropolitan cities the price of land is calculated even on the basis of square feet. If the area of land purchased is enhanced from three or four cents to 10 or 12 cents the additional area can be made use for the

various purposes like kitchen garden, poultry farming and even cattle breeding. A part of the plot can be sold in emergency also. Thus a man with 10 or 12 lakhs of rupees at his disposal is prepared to take a bold decision that he will spare 3 or 4 lakhs rupees only for the construction of the house. He can enhance the area purchased, the value of which is always on the increase.

Work area store room are adjacent items of kitchen. In many cases they are not compulsory. Yet the female members working in the kitchen argue in favour of them without least botheration of various aspects of the same. It is not feasible to think of a modern kitchen for the laymen. Bricks can be used along with ferro cement slabs and doors with cheap wood or other softwoods. Readymade racks are available to keep the dishes and bottles on the wall. If sufficient storage is ensured inside the kitchen itself there is no necessity for the additional storeroom. Since almost all the houses are having refrigerator for keeping the cooked food items, vegetable, sweets and milk additional space for the same purpose is a waste. The area conceived for store can be attached to the kitchen and there by the space of kitchen can be expanded. A spacious store room is not only a luxury especially for the nuclear families. The total number of men in an ordinary shelter in the present century is 3 or 4 or at the most 5. All of the members in the house will be out during the day time. And they are inclined to turn to nests only for a reclination. Thus the research scholar prefer to focus his attention in advising the builders to give shape to a new model kitchen with the available

space and have all extra fittings within the kitchen itself. That is on the walls or the kitchen

The area to be marked for the construction of the house should be small. If the beneficiary longs to have additional rooms or other arrangements in future he can construct the same on the top of the roof. An open space on the terrace is beneficial on the hygienic ground also. Fresh air and distant view will be available there. Such a space can be used for chit chatting also. Another benefit of using the small area is that they can make use of the balance area for other purposes. The Research scholar has become convinced that two storeyed or three storeyed building will serve double purposes. It would be convenient to have sufficient space for the sanitary conditions and also for drainage. If the building is constructed in the entire area, it is to be treated as a wretched and wide plan. There are certain houses without spaces even for hang around house. Even sweeping will become difficult. This will naturally obstruct the aesthetic sense of coming generation. They will have no idea of blossoms and they will have no conviction of vegetation. If a store room is additionally built up as a case of need or fashion it should be designed without any hindrance to ventilations in the kitchen. The research scholar is convinced that ventilation especially in town areas is a grave issue. Smokeless choolas are preferable in work area or kitchen.

Another significant fact noted by the research scholar is the utilization of space for the staircase. Special stair cases are recommended by many institutions. It varies in accordance with size of houses. However the stair case should be constructed with a provision keeping sewing machines or other such conveniences underneath. The same place can be safely used for placing television, or music systems. More over the space for fixing wash basins or dressing tables can also be shifted to this place.

There is a relevant contemporary dialogue appertaining to the climatic firmament and domestic atmosphere. Hence the expertise of the architect relies not solely on the mansion erected and its architectural excellence, but also on the "feeling" Consumers satisfaction is a significant yard stick. One of the prominent architect called Jayagopal, "Feel good factor" should be the center of discussion. This feeling is caused by the intelligence which cannot be repudiated. The general trend visible in Kerala is that the majority of the people are eager to construct and own residences. This is a peculiarity applied to Kerala. Each and every nuclear family prefers to possess their own "Idams"¹. Cultural background also is a subject of study of the clients. The Egyptian and Mughal Architects are good examples to establish the knowledge regarding space in connection with the construction of houses. In fact the freedom struggle and Gandhian concept had moulded and rescheduled an architectural space absolutely. This meant that there is a revelation of

¹ Idam A colloquial term for house or shelter

different ideologies and philosophies in all contemporary architects. Political dogmas and religious conviction also have profound influence in contemporary architecture. Since we are the inhabitants of a democratic country a new made architecture is to be evolved. In the present context "Democratic Architecture" should be the one that is easily accessible for the ordinary people. There lies the prominence of low cost housing. Scattered huts which were the symbols of feudalism have already vanished along with the past. Unfortunately a feudalistic architectural firms still prevails in some parts of India. The structural variations visible cannot be witnessed in the modern Kerala. A kind of more or less equal and uniform pattern of residential apartments is the peculiarity of the democratic and socialistic structure of Kerala.

There is a reputed building called falling water in Pennsylvania. All the structures of that building ensures mathematical accuracy. The competence of that architecture is its command to the river to flow in accordance with its shape. It is amazing that even the birds in the surroundings chant the music appropriate to the concrete flat and the structure of building. The melodious notes of the birds become some what artificial. There is a scope for the argument in favour of "Return to nature." The ideology behind the low cost housing is hardly not one sprouted from the gospel. "Return to Nature." It is evidently a leap forward in the evolution of

constructural designs, in lieu of setback or restoration of the dead culture. In short "falling water" is a huge success reaped by the modern world.

A segment of society in a democratic world can be taken for scrutiny and verification. For instance, public places is a novel concept evolved in the democratic set up like public taps and common burial grounds. Market places, cinema theatre and many other common concepts are there. But the possibility of nuclear family system is gradually wiping out all these public affairs.

Abodes is a decentralized phenomena in the modern world. The new market culture also has its repercussions. The feudal convictions had obstructed the liberty of dames, accordingly kitchens were constructed in private and confidential areas behind the houses. Only a hidden casement was given them to peep out. The world of broom stick has absolutely been erased. But the new culture of tools and machines appeared on the shoulders of new democratic and capitalistic system had brought vast and thorough changes. Today the opposite sexes are almost on the brim of equality. Naturally kitchens have acquired much prominence in the field of house construction. It has totally demolished the privacy.

A laterite stone will cost ten rupees approximately. The laying and plastering charges also will have to be calculated. The Question is whether partitions within the house also are to be constructed with laterate stone or

hollow bricks. The purpose is to make a feeble separation. The modern architects are indulged in the thought of extending a substitute like thick clothing or canvas as curtains of narrow walls. This is not the case with the outer or external walls. There is the problem of safety and security. Contentions regarding the need of a shell or cabin or a house is recurring especially on the ground that we are gradually reducing all the prominent structural features of the building. When eminent persons of Naturopathy preached the use of raw vegetables and renunciation of drugs, the critical view advocated vehemently that these ardent admirers of 'nature' are engaged in the task of carrying us to dark age. They humorously and ironically remarked that such an absurd thought may lead us to dream world. Similarly the devotees of modern sophisticated technology will also be in dream world. Windows and walls may lead to *Anarchyam Bohemian* type of society. They may quote the words of "David Thore" that human beings also can live without building and abodes like "Flora and Fauna."

The "Vasthu Architecture' in Kerala is being blamed as a kind of restoration of the classic styles. There is a deliberate attempt to alter the structural designs and aspects of construction to that of ancient times. There was a natural and cheapest style of construction in Kerala which was based on tiles, hay, wood, bricks, sand etc. These materials were abundantly available in Kerala. The use of locally available materials is admirable. They will withstand the climatic blows. It does not mean that the Democratic culture in

Kerala in the past was homogeneous. There were variations depending on the variation of localities and communities. It is to be owned up that the difference in the external appearance was devastated by the advent of concrete structure. The economic stability and financial capacity of the middle income group people has been questioned by the unnecessary and unwanted construction of colonial styles and the installation of costly and unwanted modern extra fittings. Both are not favorable to the interest of the modern people of Kerala. They are part and parcel of profound pleasure. The tendency among the socially backward classes of Kerala is to construct their houses copying the constructions by the upper class sections of the society is harmful. Such decoration and illumination can be used for public places and buildings. It is futile to construct pillars as seen in the old fashioned houses. The theory of utility is to practically put into effect. Then we will become aware of the waste, the "pillars, "much" and "charupady" are only certain signals or symbols of bygone days. There is a great influence if Persian and Gulf countries in Kerala architecture. The "pravasis" which is the apt word to the gulf returned people have created an unwanted trend based on affluence. Spacious and palace like mansions have been built through out Kerala during the last two decades. Each and every penny earned has been spent for this purpose. Many pravasis failed to make both ends meet.

They might have spent almost the whole of their earnings for the construction work. Later many such dreamers were compelled to sell them at

a loss. The failure is due to the fact that they construct homes with no proper character or style. We can formulate plan successfully and make original blue prints only in accordance with the availability of funds. Even though housing is an unavoidable need, it is to be borne in mind that there are other requirements also in our domestic and social life. Certain minority like Parsis and Gujarathis who have opted the places like "Gujarat street" in Calicut consider construction of houses as unnecessary expenditure. A house is also a mere shelter or roof to them. They do not like to store costly foods. On the contrary they prefer to divert their funds for further profitable business programmes. They calculate the monetary value and firmly uphold that they would get a convenient and comfortable place for living on the payment of Rs.4000 or Rs.5000 per month. They can also move to better convenient places at any time on the basis of a written agreement. They would get time to shift to other abodes only after some time limit to be specified in the notice. If they have to construct such a huge building and equip the same with all paraphernalia they would have to spend a huge amount exceeding Rs.10 lakhs. Since they hail from a business community, the comparative study found them to prefer rental houses. This is a method adopted by some other Brahmin community in Kerala. However this trend of forsaking living house is not much desirable in Kerala. The pravasi trend of investing huge amount only for residential quarters also is not equally acceptable. These too apparent facts made the research scholar to propagate low cost housing

scheme for the middle class Keralites as well as for upper class sections. Even the people living below the poverty line also can venture to own their houses by using available technology. This "House for all" campaign through out Kerala has naturally created a feeling of security. Since the people are permanently settled in their own houses apart from the styles of gypsy like groups, 'a kind of neighbourhood cult' has developed and paved the way to social or community feelings. A kind of homogenous life including that of house cult were conducive for the Democratic architect culture evolved in Kerala.

It would be wrong if the research scholar unknowingly leave the superstitious feature gradually crept in the view and outlooks of Kerala people. They observe certain styles only to console their vanities and become contented by having wooden "charupady" and wooden "ummarappady" and even a "nadumuttam". If possible they are least concerned of the conception of the houses and they have no grudge and grumble to see the dismal atmosphere in their newly built houses because they feel that they too have become the owner of a Nallukettu. Every aspects has undergone a massive alteration. These changes have resulted very positively in constructing homes with bewitching beauty. Keralites here become known nationally for their "extravagant spending on houses."

The superstitious convictions descended on the modern world succumbed even the middle class people who launch the construction of houses on loans and debts celebrate stone laying ceremony or "Bhoomi Pooja." These are being observed by all sections of the population, irrespective of their caste or religion. We are not at all prepared to complete the construction with an ordinary flooring or painting. Mosaic has gone out of favour. Ceramic tiles vitrified tiles, granites, marbles and marbonites are in demand in different corners. In certain areas, the latest trend is to make wooden flooring wholly and partially. In such a context the "economy building materials" which is a significant factor of low cost housing is to be evaluated in full extent.

All building materials including door frames, windows, ventilators, septic tanks and water tanks are available in the market at "affordable rates." All these items are entirely made of concrete. The people in Malabar appreciate newly made articles. The manufacturing units of low economic building materials are functioning in Palakkad and Shornur with retail outlets at Meenchanda Kozhikode and Kavungal in Malappuram.

The philosophy of low cost housing is formulated for the laymen and the people of the upper middle class. The details available in the web sites are concentrated on the rare species exclusively reserved for immensely rich classes. There are certain usages like "Gate way to god's own country" and

"your window to Kerala. Sri Homi Baba once conceived in his book "Cultural Translation" that an outsider can utter a few words about a particular society from a distant and virtual picture. This is a part of business propaganda to catch the attraction of foreign tourists. Residence in Kerala is not a burning issue. Foreigners who conducted occasional pilgrimages or excursions to distant places of vegetation like Kerala. The authorities of media and those who pull and push behind the web sites should dedicate their skill for the manifestations of the genuine and honest condition of Kerala. A deliberate cultural move for propagating the benefit and beauty of the low cost housing can only serve the purpose. Even though the construction of identical types of dwelling houses is advisable with a view to democratic social status. Alternate arrangements also should be devised in anticipation, to spare the monotony that may grow up due to the identical style. As indicated earlier there is a natural tendency for the people for alterations and modifications. Unfortunately some of the institutions dealing with low cost housing program, gradually gave up all aesthetic senses under the pretext to construct a house with the least possible expenditure. They forget that man is not a tamed domestic pet animal. Variations should be made in all practical senses. Besides, general awareness programs should also be cultivated. Thus we spend more money on our vehicles and abodes on the ground that they can be sold at higher prices subsequently. Such an artificial concept has made a pressing demand and clamour for house sites. Originally the land value was

fixed purely on the basis of yielding capacity. The lands lying on the burden of Agricultural lands are required for the construction of buildings. But Agricultural lands are being converted into commercial sites due to failure of Agriculture and hike in land price. At this shows the ruin of Kerala. Such a ruin has actually occurred due to the vanities that has intoxicated the middle class people of Kerala.

An unwanted term like "furnishing" has created much chaos. The amount spent for this purpose is not meagre while the essentially required materials like table, chair, sofa set etc. are treated as "Hard furnishing. The remaining external and extra fittings like bed sheets, bedspread, curtain, cushion carpet under the name of "soft furnishing."

Many European countries adopt "use and throw" method regarding their needs of furniture. We must respect and admire such a tendency. We want to make every thing durable. The Keralites are even make use of disposable glasses after waiting for decades. Kerala can never escape from the evil, if it fails to keep away from "disposable goods or a disposable styles. Use and throw practice has much relevance in the present context of Kerala. It can transform our concepts of housing. It is highly deplorable to see that we are more contented with sticking to them without examining the utility.

One of the notable defects that dissuades the beneficiaries from relying on the low cost housing is its so called weak appearance. The ordinary

consumer becomes convince that all factors required for the grace and beauty and convenience are to be abandoned. There is no need of an expert or architect for such a change. The enterprise launched by architects of 'Vasathi Kozhikode' is a good instance to be mentioned. They offer low cost houses worth Rs.50000 to anyone within a short notice. The research scholar became appalled by a mere glance of such a house without any proper roofing flooring and other compulsory attributes. No one will be satisfied by such a low cost house. Laterite stones can be substituted by bricks. Similarly low cost wooden structures can also be made applicable with proper scientific applications. With a view to retain or enhance its grace, another thing that the vasthu builders could have incorporated is to do something to make the flooring more fascinating. If they convinced the consumer, he/she would be prepared to spend an additional amount not exceeding Rs.1 lakh or so. The architect can make the structure more comfortable and more luring.

Another worth mentioning contribution from Malabar area is that of Sri. Jayan Bilathikulam. He has proved his expertise in making use of the unused materials kept idle by the beneficiaries as the most attractive material of the newly built house. The middle income group people in Kozhikode are indebted to him for his services in transforming the age old materials brought from the corporation office Kozhikode, Homoeo Medical College, and Railway Station of Kallai. He has kept many ready-made materials for sale. The consumers can purchase and affix them at suitable locations of their

houses and get noticeable projections and views. They naturally glorify the look of the house. Sri. Jayan has ensured to magnify the beauty of the structural design with such artificial and mobile things. Since wood is a costly material Jayan has brooded over some alternative arrangement. There are plenty of housing sites constructed by Jayan with magnificent charupadies attached with the porch. There is no difference between such charupadies and the teak wood or jackfruit charupadies, which were, hallows of splendid old "Nalukettu". But there is a notable twist given by Jayan. This Jayan twist is popular throughout Malabar. Many institutions in the southern parts of Kerala have also adopted this method. A significant feature of the modern houses is their charupadies. No architect will dare to suggest a house without a 'charupadi' or 'umarathoonu'. When we observe the Jayan twist we will be amazed to see that there is not even a wooden nail in the modern charupadies formulated by Jayan. This is a fantastic leap and blending of dissymmetrical and opposite culture. Sri. Jayan has simply introduced cement slabs without any adverse effect to grace and appearance. However the "charupady" and "ummarathoonu" concept have been sprouted from the feudalistic nostalgia or an urge for revolution of feudalist form of architecture. Even though cement slabs and moulds are substituted in lieu of wooden planks, it is still an expensive and unwanted affair. This is an extravagant elaboration or enlargement of disrupted version of human needs for attractive abodes.

The recurring natural calamities and the threat to the environmental equilibrium also compel us to divert our architectural temperament towards the cheapest and least expensive residential quarters. The only thing is to accommodate with the short term duration of houses. Instead of the prolonged durability, the new generation prefers lesser luggage. They are contented with folding umbrellas, ready-made garments, mobile phones and portable cots bedspreads and computers. Their thoughts and dreams are reigned other elegant and splendid subjects. Such a generation will not argue in favour of spacious mansions or costly domestic articles. They can even insert the whole range of information and panorama of the universe in a tiny disk and exhibit them or the wanted portion as and when required. Huge volumes of books and expensive bookshelves have become part of history. A CD will do the work more effectively and precisely. All these facts carry us to the conclusion that low cost housing is much compatible to modern life and civilized people. The identity of the modern man is not fixed by the magnitude of his house or the design of his gowns. On the contrary their identity depends solely on their intelligence and competence for performance.

However, there is a paucity in the large-scale application of low cost housing scheme especially through out the urban areas. The sight of scattered dwelling houses with homogeneous appearance has marred the feasibility of alignment. Apparently none of the beneficiaries of the low cost houses are contented with tent like houses. The construction of a house and the choice

of finance happens only once in the lifetime. If the choice is an imposed one, the facts of discontentment will create chaos as undigested foodstuff. The design of the house constructed may not be in confirmation with the house in his dream in all respects. The consumer is compelled to satisfy himself with the available house and do away his dreams. The psychological drawbacks of such a crisis is that the beneficiaries has to simply pretend as if satisfied by the newly constructed house. The psychological term or such a plight is "repressed elements". They will be lying possum always seeking an exit to burst. This may lead to diverse or some criminal offense in marital life. The effect of repressed element in the case of dwelling house is the unpleasant mood and melancholy spread on the faces of beneficiaries. The mental preparedness for such a tiny shell with hollow bricks is highly essential. Fortunately institutions and societies like Nirmithi Kendra, Costford, and Sankar's habitat have come forward with their pamphlets disclosing the possibilities for making homes with available funds. In fact the consumers are Cutting short their dreams in accordance with the availability of funds. On the contrary they should have been brought to higher levels by teaching new lessons of philosophy and aesthetics. As long as such a noble task is discharged in a wide scale, the noble program can never claim to have the least and soul of the most. Jayan Bilathikulam have advices about the use of antique furniture. Another solution proposed by this dynamic young man is the use of low cost curtains. Since the purpose of bathroom is much trivial,

there is no need to set apart large area for the same. It is worth mentioning that Sri. Jayan is very particular in making constant changes in the style and design of constructions. According to him a meager amount of Rs.4000 will be sufficient in place of Rs.2.5 lakhs for wooden parts. The research scholar wishes to indicate that group discussion with such eminent persons and techno crats will ensure better results.

Sri. M. S.Sudhakaran of Trichur is another notable figure who is deeply immersed in the construction of low cost houses. The product of the concern of Sri. Sudhakaran is the Ferrocement. He condemned the people of Kerala for the reluctance and delay in accepting changes. He is not at all an opponent or antagonist to the hereditary styles. Ferro cement is the panels of Chicken mesh or steels of lesser thickness. These steels are fixed with cement and sand. 'Baby Jilly' is applicable for this purpose. He suggested the use of spiral stare case. The spiral stare cases were seen only in huge theaters till that date. Sri. Sudhakaran strongly proposed the use of Ferro cements for the construction of shelves and stands. Ferro cement hoods are fixed in many kitchens. This can be moulded and prepared in the shape of chimneys. However the ordinary people are not much inclined to such a vast and thorough changes. A thorough observation of skillfull application of Ferro cement is seemed self-explanatory to the research scholar. Any one will agree that the reasonable use of ferro-cement with cheap and thin steel for various purposes in the houses will curtail the expenditure up to or above 30%

of the estimated expenditure. It will tantamount to gross negligence if the government or higher authorities make lapses in co-coordinating the different skills and intelligence with amazing potentials for the noble cause of low cost housing. Otherwise many of the inherent genius will become either wasted or exploited by foreign countries. Any novel idea will attract the attention of the world market like indigenous and unknown drugs. Thus it is essential to convene conferences on the subjects giving opportunity to such persons seeking recognition for their contribution. The research scholar happened to meet many intellectual giants in these fields during his material collection drives for the research project. It is an agonizing fact to leave them to oblivion. Some of them are having extra ordinary insights. The research scholar prefers to conduct a new housing policy to be evolved and accepted ultimately after high level discussion and dialogue.

Sri-Eappan George and Anil Joseph are other two worth mentioning figures in the low cost housing field. When the earth quake demolished huge buildings on a devastating scale these two engineers prepared their blue prints with special care which can resist and withstand the blows of earthquake. The low cost houses proposed by them are known as E3 houses (Economical, Everlasting, and earthquake resist). They demonstrated their Ventures successfully in the earth quake infested area of Andhra Pradesh called "Mukhal Gunda". The various aspects of E3 houses proposed by these two Malayali Architects are highly admirable. Especially in a condition when the

contemporary sophisticated world is being repeatedly shaken with unbearable loss and death of mortals. Sri. Anil Joseph and Eapen George drew a plan of mini house with 400 square feet plinth area. They have not only introduced but also implemented and established that an "E3 House" can be constructed within 2½ days and the total estimated expenditure will not exceed Rs.40,000. The recognition gained by these two blooming Architect is quite astounding. The Chief Minister of Andhra Pradesh, Chandra Babu Naidu had invited them to Andhra Pradesh; no wonder if the method and plan of such E3 houses are adopted to 25% . 38% of profit can be expected when Flats are constructed in the line of these two pioneers.

The roof of E₃ house was made of Hollow Shells and Pre-Studded Beems. While the expected life period of conventional house is 60-70 years. E₃ Apartments ensured the durability of about 150 years. According to the report furnished by SERC Chennai these E₃ houses have the capacity to withstand any type of earthquake occurring in India. Their technology has introduced vast changes in the roofing as well as in the basement pre studded beams. The weight of the centre structure of these pre studded beam was used for the construction of bridges formerly. The height of such a beam is only 10 centimetres while the breadth below 8 centimetres. It will be only 2½ centimetre at the top. Two steel rods are used in the upper levels. Three high carbon steels are inserted to prevent the white ant attack.

The deep perusal of graphic datas of reliable experiments enabled the Research Scholar to derive at certain conclusion with acceptable suggestion with the ulterior objective of making the project precise and perfect. The low cost housing still seems to be far away from its achievement through out Kerala. Carelessness, malpractices, corruption, lethargy, indifference and so on of the agencies and institutions pledged for the programme have turned out to be an insurmountable hindrance. Lack of dedicated service is an apparent reason for the present state. Every venture gradually acquires the form of a profession with profit motive in Kerala. Capitalistic inclination is a vice dominating the Kerala society today. Every thing is being done either for profit or superficial variety. The last decade has witnessed the emergence of numerous dwelling parks made of country bricks and having saffron wrapper. It is a fact that those who dwell in such low cost houses soon become fed up with the model of their house. This is not a withdrawal from to traditional methods. The history of a decade is one of absolute sacrifice. Numerous persons with technical skill and expertise devoted their energy for the construction of such low cost houses. The advent of country brick houses has favourably supported the economic structure of Kerala and the individuals coming under the average per capita income. It lead to the total restructuring of economic scales, and projects. Middle class families could earn or save two or three lakhs of rupees by the bold step of curtailing expenditure for construction of houses. But there is the another part that none of them are

enjoying maximum satisfaction. The factor of keeping a huge amount as balance would be delightful only when the inmates are contended with their abodes. There is a general inclination even among lesser-educated persons in Kerala to have their shelter, food and other requirements with its natural status and benefit. The urge for 'Nadumuttam' is a good instance to quote.

However the method of low cost housing require drastic change and amendments. This involves psychological and behavioural treatment also. Unfortunately a new sense of aesthetic was not established or even envisaged. Otherwise there would have been a clamour from different corners for the residential quarters constructed at par by institutes like Nirmithi Kendra and Cost Ford. Nirmithi Kendra and Cost Ford also cannot pretend innocence. They also concentrated in their arguments and conventions merely on the reduction of expenditure. Hollow bricks can be substituted for laterite stones. An question immediately crops up as to why there is no deliberate insistence for the use of locally available building materials for the construction of houses. A comparative study similarly discloses that the huge palace like buildings, mansions and ordinary houses have demonstrated that there are variations in the form of model of such houses. These differences are highly essential to appease the irresistible urge for change in man. Homogenous and uniform abodes would be acceptable as in the case of uniforms for school children. "Laksham Veeds" scattered all over Kerala are having the same conical appearance and slants. The height and width are also identical. There

should be variations in many respects. Those who had absorbed in the task of constructing low cost houses failed to convince themselves that they had to create a new history in lieu of treading the conventional tracks. The Research Scholar earnestly feel that all newly introduced schemes intended for the construction of low cost houses should fascinate the beneficiaries by their sole application of their brains for implementing some alterations in all aspects. Even the temple, churches and mosques are not constructed alike except in the shape of tomb and compound walls. Then there is no justification in compelling for the adoption of homogenous houses. The people are not living in the grave yards with their dead thoughts.

Findings:-

There is no harmony between theory and practise in many of the activities associated with the low cost technology. Practical knowledge is highly required to implement any theoretical aspects. The Research Scholar laboriously ransacked many of the scattered realities dominating over the imaginations of an average Keralite in the contemporary firmament. Accordingly it has been revealed that there is a mad and wild pursuit behind many novel ideas. There is a widespread irony in Kerala that some beneficiaries demand the construction of low cost dwelling at any cost. Evidently it is a fact and the lions share of the people accepting cost effective technology are more modern in following a novel innovation for the sake of

alterations. Perhaps it may give a different identity and different profile to his apartment. The statistics and reliable data with graphic representation and models to be-hold have established another fact that inspite of boundless restrictions, a tendency has gradually developed especially during the last decade to minimise the expenditure set apart for the construction of dwelling places. But unfortunately this acceptable trend is visible only in the case of upper class section or who have adequate fund to expend for the construction of house. They are willing to forsake their earlier inclinations for luxurious apartments on the ground of twin aspects. (1) The possibility of diverting the excess fund for certain other reliable and profitable investment or productive purposes. (2) The new awareness that the knowledge acquired by them regarding the aesthetic sense. The Research Scholar is highly agitated to note that this sacrifice shown by people in the upper strata is not descending to lower strata. Even though there is no total rejection from the segment occupied by the middle class people; a minority of them are prepared to construct a house with maximum possible low cost not on the ground of forgoing the existing conveniences but only on the basis of an artificial and mechanical craze to emulate the method undertaken and carried out by those in the upper class. Unnecessary competition for displaying the capacities also is a perilous phenomena existing in the Kerala society.

Even though crores of rupees in flowing into Kerala from outside, especially from the Arabian countries annually, it is an admitted fact that the

state government lead by different compulsion have miserably failed in utilising the enormous resources automatically flow in to Kerala economy. The Non Resident Keralites (NRK) have shed their blood and sweat in alien lands not only to win their bread or butter or the means of livelihood, but with a definite intention of amassing wealth and fulfil their long cherished dreams. The government ought to have channalised the source on income and deposits properly and scientifically. The Research Scholar could not see any spec of evidence of a deliberate venture for profitable investment of the earnings of Non-Resident Keralites any where in Kerala. No joint enterprises were launched and no programmes outlined to make use of the "unused" money for definite productive purposes.

A prominent positive aspect that the Research Scholar point out is the uniformity and the homogenous appearance of the newly constructed low cost houses. Apparently a lofty principle of socio-economic equality, can be perceived in these identical structures. More over such a uniformity created by voluntary organisations like Nirmithi Kendra and Cost Ford have wiped out the earlier conventional aesthetics. Conveniences and facilities are gradually being substituted by luxuries. Twenty percent of total expenditure can be curtailed by avoiding unnecessary and unwanted extra fittings. Their external appearance and fascination is purely temporary and subject to decay and monotony.

In spite of the shortcomings, the ideological and practical formulae projected by Nirmithi Kendra excels all other contemporary institutional activities. Nirmithi Kendra could create a new slogan by adding environment friendly technology as a suffix to cost effective theory. The practical experiences acquired by the officials and organisers of Nirmithi Kendra have concrete proposals to put forth. Nirmithi Kendra is more concerned with the conveying of message and technical know-how to ordinary people.

The emergence of nuclear families and decline of joint family system in Kerala has naturally paved the way for a new economic and social concept. There is a tendency for isolated and individual, enterprises. The majority of the middle class people are hardly contented with a small plinth area for their house only due to the vanities guiding them. A total estimate of Rupees 5 or 6 lakhs in the mind of lower income group people is beyond their capacity and it would adversely effect their "Purchasing capacity". Which is an apparent yardstick and index to show the economic stability and progress and also of the per capita income of the people. An equilibrium and balance will be lost if ordinary people launch luxurious houses. Thus the contribution of Nirmithi Kendra is worth mentioning especially in the context of parallel extensions for the economic stability. The Research Scholar has appreciated the spirit and endeavour concealed behind the multipurpose project of Nirmithi Kendra. A profound influence of the low cost construction activities of Nirmithi Kendra is visible in the Kerala economy.

Suggestions

Drastic and bold steps only can save the visible issue about the problem of population. An apparent suggestions of the Research Scholar sprouted from the Research oriented study of the subject is that the government should further reduce the existing rate of plinth area of individual houses as well as other residential quarters with a view of minimising the expenditure and reducing the per capita expenditure involved in the affair. The nuclear families consisting of 3 or 4 members require a minimum area for their dwelling purpose. The present Kerala atmosphere shows the empty and vacant abode during the day time. The parents are employed and children are day scholars. They are getting space for other activities in their working areas or educational institutions. Even cafeteria, parks, public houses, parlours, libraries and cultural centres offer temporary and proportional spaces for all individuals. Hence the ordinary houses or the concept of dwelling has become mere places for dining and sleeping. There is no need of a house with the plinth area of 2000 square feet for such a tiny family. They can never afford the total expenditure incurred for the construction as well as its maintenance. A general awareness programme should also be there to convince the people of the need of a convenient but small house.

Cement is an essential ingredient. Other substitutes perhaps gradually emerged. If the government takes a bold step for the starting of more cement

factories it will enable to offer employment facilities and also to supply sufficient quantity of cement. This will indirectly help Kerala economy by way of reduction in the price of cement and it will cut short the proximity of cement factories there by reducing the transportation charges.

Another significant suggestion of the Research Scholar is the inclusion of both theoretical and practical aspects of the low cost house construction technology in the curriculum by educational institutions. If the growing generations becomes acquainted with various aspects and factors of construction and ensure their involvement in the constructional activities.

The Research Scholar accepted a new concept of ensuring participation of the beneficiaries in the process of construction. Since transportation is a tedious affair, members of family will not be able to carry out such a risky job. On the contrary, the family members themselves can participate in the construction of their own house. If huge and heavy machine cut laterite stones are suggested and used, the beneficiaries will be helpless even to lift them. But, on the contrary all the members in a house including children can participate in the construction especially when the interlocking system is introduced. It will reduce the expenditure expected for the construction also. Interlocking system is purely a novel idea and it will curtail the quantity of cement required. A varnish coating is sufficient to make them more durable and save them from getting damaged. New technical devices are yet evolved

in the field of civil engineering expertise, it will be highly astonishing if prominent and eminent persons in the field would come up with wooden planks of low cost for the inner side walls and partitions. Another important suggestion of the Research Scholar is that the beneficiary should be prepared to make use of two firm by closing doors in front of the house as well as in the rear. All other doors inside are decorative and in some senses unwanted. Some beneficiaries should take up the help of Nirmithi Kendra to avoid unnecessary framework and doors and fix steel windows in place of wooden windows.

In short the Research Scholar proposes starting of the units of Village Nirmithi Kendras as a connecting link. Similarly, Nirmithi Kendra should be made a nodal agency in all the construction activities to be taken up in Kerala. The inclusion of peoples representatives in the governing bodies of Nirmithi Kendra also is a desirable suggestion. The Research Scholar is an optimist and holds the view that the scientific and prudent moves of Nirmithi Kendra will have its positive and amazing results in the Kerala economy.

Conclusion

After a detailed analysis of the pros and cons of the "Economy of low cost houses in Kerala a study with special reference to Nirmithi Kendra". The Research Scholar feels it, well and good, to conclude that the Kerala economy with all its limitations and frailties is indebted to the different projects relating

to low cost construction of dwelling houses. However there are numerous urgent steps to be adopted by the authorities for the preservation of the acquired success with frequent and continuous interventions and innovations by experts, technocrats and eminent persons emerging in the field. In short a joint effort will be more desirable. The changes have to be moulded and developed from grass root levels.

Those who have attained academic qualifications in civil engineering should bestow themselves by extending wise counsel to the laymen render their wholehearted service in the realm of construction. They too would put forth something concrete suggestions and perhaps their suggestions may turn out to be more fundamental and realistic.

We can also accept any suggestions from laymen. Such men may be mere labourers and have nothing else but their toil for the cause. However their suggestions will be moulded and became matured in the furnaces of experiences. They are sincerely constantly in touch with mud paste and laterite stones. The harsh sound produced by the hammers and the cleaning of unwanted projections by the sythe are their poems. Obviously, "the cleaning of unwanted projections" is the basic issue related with the low cost construction of houses.

The Research Scholar is more concerned about the aspects of the subject as to how this new approach of construction would save and help the

economy of the state. The verification of all available details and data enabled to draw a transparent conclusion that the society which is undoubtedly transformed lot of individuals which has a vital role in endowing a concrete version to its economics. The primary lessons in economics focuses on the percapita purchasing capacity of individuals. Hence all attempts should be concentrated on the lifting up the percapita purchasing capacity to the maximum possible extent. The availability of goods in abundant quantity is lesser in significance than the capacity of the citizens to purchase them. The implied meaning is that the average citizen in Kerala should have the said capacity to purchase sufficient quantities of his necessities and other preferable conveniences. Then comes the issue of luxuries. The Research Scholar has no contempt or loathing towards the use of luxurious goods. It is certain that the extra fittings and costly additional items will enhance the glitter and glaze of a mansion. But generally the students of Economics and Commerce apply the principle that everything relies on the fact as to whether the individual can afford a particular thing. Unfortunately a hollow and shallow conviction has already gained control over the hearts of the middle class people as well as the people hailing from the lower income group through out Kerala. This unscientific Mania has created all the mess. Accordingly the entire schedules and plans have collapsed. People are compelled to structure their plans and figures without any consideration of their income. There should be a balance between inputs

and outputs. Since there is a limit to the inputs, they have to be well arranged so as to satisfy the maximum possible requirements. House is only one of the needs of a man. According to many business communities a dwelling place is only a temporary shelter or arrangement. They are satisfied if proper places are arranged on rent. This is a very hopeful trend that the Research Scholar wish to project. But the common applicability and acceptability of such a revolutionary change depends on the reasonable interference of the leading figures in socio-economic-political arena.

The low cost construction of a house in Kerala is a virgin subject and the research study has gone to the abysses to the maximum possible extent. Being a developing subject with firm link to our day to day life as well as our hypothetical dimensions and moral, ethical and philosophical convictions, the same is yet to go ahead. It is frankly left to the Civil Engineers and the common people who are the unfortunate victims or the actual beneficiaries of all material programmes. The study conducted on different aspects of Kerala economy and the low cost construction concept is viable in all senses and will lead to concrete directions from higher levels in the future. The crux of the subject is the contributions of different tributaries keeping pace towards the ultimate destination of the ocean of Kerala economy. The perils and crisis and the tight corners confronted by Kerala economy is impatiently waiting for positive answers. The Nirmithi Kendra with its experiences of two decades heed to the call of time and the reciprocal consent has created amazing results.

It is a folly to put forth silly interrogatives based on apparels and adornments. The sword is more important than its leather strap. The Research Scholar earnestly register gratitude to the services rendered by Nirmithi Kendra with a special keynote of disagreements and disapprovals. They are only positive and put forth for betterment and rectifications.

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APPENDIX I

APPENDIX II

ECONOMY OF LOW COST HOUSING IN KERALA A STUDY WITH SPECIAL REFERENCE OF NIRMITHIKENDRA

SURVEY QUESTIONNAIRE

Dear friend,

This questionnaire is about construction of house. A kindly record your opinion in this questionnaire. This is only for research purpose.

PART-1

1. Age
2. Educational Qualification
 Below S. S.L.C S.S.L.C P.D.C Degree
 Post Graduation Professional Qualification
3. Job
4. Monthly Income (approximately)
5. Married man/married woman : Yes No
6. Employment of wife/husband: Yes No
7. Name of place in which you reside
8. Your house: self/rented/others

PART II

9. Have you constructed a house Yes No
10. Yes- If which type.
 tiled concrete other type
11. Approximate plinth area of the house.
 500 sq.ft 1000 sq.ft above 1000 sq.ft

12. Have you taken loan to construct the house?
Yes No
13. Whether materials for construction available locally?
14. What type of construction of house you know.
 conventional low cost others
15. Constructing of house
 self contract others
16. Have you heard of low cost construction
Yes No
17. If yes what are they.
.....
18. Have you heard of Nirmithi.
Yes No
19. If yes how is it.
 media
 seminar
 friends
 others

PART -III

20. Is the basement of the house which you have constructed/being constructed is according to structure of the soil.
Yes No
21. Which technology you have used for construction/wall being constructed.
 stone hollow bricks burn bricks Not any
22. Which type of linte you have used for construction.
 RCC arch wood/iron

23. Which type of roof have you used for construction of the house.
 RCC wood and tiles others
24. The material you used for window for the construction of your house or the house being constructed.
 iron concrete wood aluminium
25. Do you intend to plaster the house you have constructed or being constructed.
 Yes No
26. If you intend to plaster which mixture you will use.
 conventional mud cement cement lime others
27. In which manner your flooring is done.
 cowdung flooring (conventional type)
 cement
 mosaic/marble/ granite/ceramic tile
 clay tile
 other type
28. In which type your sanitation is used.
 septic tank
 ordinary tank
 others
29. In electrifying have you used solar energy.
 Yes No
30. In which way your wall is painted.
 lime
 cement paint
 emersion paint
 not any of them
31. In which way your water source is used.
 well
 borewell
 KWA connection
 others

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32. In construction of your house how much percentage you have saved through eco-friendly technology.

- No profit
- below 10%
- below 20%
- above 20%

33. Are you happy with the house you have constructed/ being constructed.

Yes No

34. Have you stopped construction of the house at any time.

Yes No

35. In construction of your house the rise in price of the building material has effected the expenditure/estimate of the house.

Yes No

36. If yes how much percentage.

NB 4999

