Rampant Failure of Buildings in an Era of Massive Shelter Development in Ghana

Empowering The Informal Construction Labourer with Knowledge and Skill to help in providing a Solution to this Problem.

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One of the major problems facing the shelter delivery industry in Ghana is the rampant failure of buildings, both under construction and in use. This problem has been in existence for sometime now without any solution. Recently the situation has grown quite worse to an extent that not a month passes by without some news about a failed building.
Unfortunately this is occurring at a period when modern methods of construction have emerged in the shelter industry. This paper targets the informal construction labour as a useful element within the construction process to be empowered with knowledge and skill through training, to enable them to contribute meaningfully to providing a solution to this problem. This paper covers a study of ten selected sites within the city of Kumasi in Ghana, five of which have had their structures collapsed. Architectural designing, detailing, permitting, construction and regulations have been looked at, and some recommendations made. The paper has been organised into four major sections, covering the Country and City situational details, Identification and analysis of the critical shelter situation, Results of field studies, and Suggestions, recommendations and action plans. The role of the Building and Road Research Institute- C.S.I.R.in this change process as well as that of the author has been identified, and some recommendations have been made to the legislative bodies in the country. The use of the media to disseminate as much knowledge to the general public as possible has also been recommended.

Shelter Situation Analysis

Geography and Administration

Country--- Ghana

Region---- Ashanti

The Ashanti Region is centrally located in the middle belt of Ghana. I t lies between longitudes 0.15W and 2.25W, and latitudes 5.50N and 7.46N. The region shares boundaries with four of the ten political regions, Brong-Ahafo in the north, Eastern region in the east, Central region in the south and Western region in the South west.

Physical features

The region occupies a total land area of 24,389 square kilometres representing 10.2 per cent of the total land area of Ghana. It is the third largest region after Northern (70,384 sq. kms) and Brong-Ahafo (39,557 sq. kms) regions. The region has a population density of 148.1 persons per square kilometre, the third after Greater Accra and Central Regions. More than half of the region lies within the wet, semi-equatorial forest zone.

City---------Kumasi

Demography and Health

Population of Kumasi--1,170,270 accounting for 32.4% of the Region's Population, which is growing at 3.8% per alum.

Sex-age structure

Male	Thousands	Female	Thousands
All ages	9.542	All ages	9,730
0 to 14	4,039	0 to 14	4,002
15 to 44	4,342	15 to 44	4,411
15 to 49	4,671	15 to 49	4,751
15 to 64	5,210	15 to 64	5,400
65+	298	64+	328

Migration: 34.3% of the City Population are Migrants

Urbanization: 53.1% Rapid and Uncontrollable

Fertility: 3.3% Child Ever Born, 4.4 Children/ Woman

Life expectancy: Between 58years and 61years (National)

Child Mortality: 85.8% Survival and 14.2%

Household composition:

Average household size, 5.3 persons

- Household per House, 4.3
- Women headed households, 27%, City
- Total households, 231,653

Economy

GNP/capita; $ 1,900.00, With a Growth rate of 5.8%

Public expenditure: 16, 411.8 Billion Cedis ≈ 1.824 Billion Dollars

Labour force aged between 16 and 64 years

Formal Sector: Employs 14%

Informal Sector: Employs 86%

Income distribution: Annual household income $ 947

Poverty: Incidence of 36% with 27.7% in the extreme

Household expenditure: Averagely $ 2,394

Shelter Related Fact and Figures

Access to Shelter

Housing stock: 67, 434, accounting for 20.5% of the Regional stock

Housing deficit (quantitative and qualitative)

- Housing deficit: 500,000 Units
- Needed annual stock; 70,000 Units
- Annual delivery rate: 34,000 Units
- Population in Critical need 60%

Yearly percentage increase in number of dwelling units: 48.6%

Occupancy: 3.4 households/ house at 7 persons/ household

Housing standard: Poor: 2.4%, Low: 60%, Medium: 20.3% High: 17.3

Floor area per person: Average of 9sqm

Tenure of households: Rental: Ability to pay

Owners: 50 to 99 years Lease

Rental (formal and informal): Formal: 25.6%, Informal: 74.4%

Ownership (formal and informal): 90% Private owned, 10% Public owned

Housing affordability ratio: Quite low with about 6.4 % of household incomes spent on housing and utilities

House price to income ratio: 1:60

Land (formal/informal) Regional Total 24.789sqKm

Private: 72.4%

Public: 19.2%

Others: 8.4%

Housing construction: 90% privately 10 % Public

Building materials: Sandcrete Blocks, Cement, Mud, Bricks, Timber, Bamboo, Iron, Aluminium, Laterite, Glass, Gypsum Board, Plastics, Fibre Glass, Ceramic Porcelain, P.O.P., Bituminous-Felt, Gold, Asbestos, Paper

Access to and cost of Basic Services/Infrastructure

Water: -82.5% Pipe-born water@ average of C 500.00/Bucket

18.5% Well and Borehole @ between C4, 500,000.00 and, C45, 000,000.00/Lifetime.

Sanitation: Public Toilets 36.8%, Water Closets: 27.8%, Exclusive Others 35.4% Exclusive Open Bathroom: 15.7%, Showers: 78.6%, Open Spaces around houses: 4.3%, Bathrooms in other Houses 1.4%

Drainage: 63% of Streets are without Drains

Household waste disposal-

Liquid

Throwing on the Streets: 14.2%,

Compound within House: 18.8%

Gutters and Drains: 8.7%

Appropriate Sewerage: 8.3%

Solid:

Public Dump: 87.1%@ C500.00/head

Contractors-: 4.6%@C20,000.00/month

Anywhow-8.3%

Energy-Kerosene: 9.6%, Electricity: 88.4%, 70.9% Charcoal 70.9%, L.P.Gas:38%

Transportation-100% Accessibility at the cost of C2, 222.00/km

Communication: Postal Facility within every 10km radius

Telephone: 91.2%

Existing Housing Policy

Policy Goals and Actual Achievements

The government is supporting the provision of affordable housing in the country with. Emphasis on increasing rental , Lease Purchase and Home-ownership housing for workers and the general public, to reduce the housing shortage in the country. Apartments of one, two to three bedrooms, up to four-storey high with a floor space of 40 to 120 sq.m are preferable.

Other Policies----Tax Incentives and other Exemptions for Investors

Priorities---- Urban Slum Upgrading, Land Servicing, Infrastructural Improvement

Housing Financing

Housing Market--- Dominated by Real Estate Developers under the Ghana Real Estate Developers Association(GREDA), Private Individuals and Institutions like the Social Security and National Insurance Trust (SSNIT).Houses are priced within a wide range between $12,000.00 for a basic 2 bedroom house to the $ 450.000.00+ Gated community Executive mansions

Regulatory Framework

Ghana National Building Regulation L.I.1630 (1996)

District Assemblies Bi-Laws on Housing and Development

Housing Programmes: To Build 100,000 of the various Housing types in 2006 through Private and Public partnerships. Government has Budgeted C150 Billion to the Ministry of Works and Housing for an affordable Housing Programme

Housing Approaches and Strategies---

Institution of a National Housing Bond scheme to raise both domestic and external capital for the provision of decent, affordable and low-income housing for workers

Revising of existing Rent laws to make it more equitable for both tenants and landlords

Implementation of a Land Administration Programme (LAP) to reduce to the barest minimum, land acquisition and management problems

Ministry of Works and Housing is Sourcing for about 50,000 acres of land nationwide for Housing

Financing/Funding Schemes

Loans to Estate Developers from Banks

Mortgage Financing

Poverty Alleviation—the Government has a comprehensive Poverty Reduction Strategy for fighting poverty in Ghana.

Gender Issues---Ghana has a comprehensive Gender policy that allows equal access for both Men and Women into all aspects of life in the country.

Actors in Shelter Delivery and their Roles

State/Central Government---

Formulation of policies, facilitation, support and regulation of the Housing Industry.

Provision of Infrastructure.

Local Government ----

Regulation of Developments

Issuing of Building Permits

Inspection and Monitoring of construction Processes

Infrastructural Support to Communities

NGOs-

Monetary and Material Support for Identifiable Groups

Training for Community Based Organisations

Education and Awareness Creation

Private Sector/Housing Producers----

Provision of over 90% of the County's housing Requirement

Servicing of Plot for Sale to Potential Buyers

Provision of Infrastructure like Roads and Drains

Community Organizations----

Organising of Groups that are affected by actions and inactions in the shelter industry

Fighting for citizens rights

Awareness Creation

Research Institutions

Publishing of Research findings and Solutions to Housing problems

Training of Building Contractors, Artisans and Draughtsmen
Development of Materials, Building Manuals and standards
Monitoring of the performance of building components and Materials
Creating of Awareness and Contributing to development of Standards
Others Artisans and Labourers
Producers of Building Materials and Components

Design

Physical Planning ---Used to be well coordinated but has currently been reduced to Demarcation of Building plots, Ghana currently is experiencing a very poor Planning Regime
Land Use: -Even though quite a number of Land-Use Plans existed in the past, most of them have been disregarded. Land is now being haphazardly developed without any proper plans and coordination
Population Density: Low in High Income areas, and Very high in Low Income Areas. Generally high in the Use of Public Infrastructure and Amenities
Shelter Quality: High and quite Standard in well organised housing areas with some level of sophistication, but very poor and sometimes appalling and unliveable in informal areas and slums
Function: Mostly functional in response to the Ghanaian living Pattern, culture and Climate
Safety: Safety standards in Ghanaian buildings are wide and varied. They are very high in public and most organised housing areas but mostly compromised in Low income and informal areas
Comfort: Most buildings are designed for comfort. This is also high in organised and well planned areas and low in informal and Slum areas
Social Inclusion: This is very low. Ghana has become a capitalist and property owning country where those who can afford will mostly not consider public perception and opinion in the execution of projects this sometimes occur during the execution of Government projects which are to be executed for use by the people

Gender Issues

Ghana currently has a strong Gender policy as a country but in community and social levels, activities and development still favour males

Sustainable Development: This is one of the major areas where there are a lot of failures. There is an urgent need for a comprehensive programme to ensure that the country is developed sustainably. Failure to do so is likely to grind most of the major towns and cities to a halt.

Norms and Codes: Ghana has a National Building Regulation –L.I. 1630 developed in 1996.There are other Norms, Practices and Values that everybody will adhere to, under normal conditions. Local Authorities also have their guiding local bye-Laws and Regulations for building

Failure of Buildings

One of the major problems facing the shelter delivery industry in Ghana is the rampant failure of buildings, both under construction and in use. This problem has been in existence for sometime now without any solution. Recently the situation has grown quite worse to an extent that not a month passes by without hearing of the failure of one building or the other in the news.

Unfortunately this is occurring at a period when modern methods of construction have emerged in the shelter delivery industry. It is in this direction that the informal labourers are being targeted to as a useful element within the construction process to be empowered to provide a solution to this problem.

3 Analysis of Critical Shelter Problem/problems

Buildings that fail in Ghana range from simple Classrooms, Bus-Stop sheds, Bill-Boards, and Market sheds, to large and complex structures like Churches, Factories ,Warehouses. Transmission Masts, Domestic houses, and Commercial complexes.

These failures have led to loss of lives, Jobs, Money, and a situation of social loss and insecurity. It has also led to waste of resources, loss of capital, and leaving most of the affected with very sorrowful conditions. In all these situations it the poor labourers who are physically affected. Some lose their lives others are maimed with some level of disability. This also leads to some socio-economic and demographic impacts which go a long way to affect the country in general.

Figures 1,2,3,4 and 5 are photographs of buildings that have collapsed in recent times, indicating the severity and the magnitude of the problem at hand, and the wide nature of structures involved.

Figure 1. The Remains of a Church building which failed during construction

Figure 2.A Two storey domestic building, Roofed and Wired, ready for plastering. This Building failed during a mild Storm. It is now being reconstructed into a single storey building.

Figure 3(a)

Figure 3(b)

Figures 3 (a) and (b) are sections of a factory warehouse which collapsed during its Roofing. Two carpenters lost their lives and several others were wounded here.

Figure 4.The remains of a four Storey commercial Complex which collapsed during construction. No lives were lost here but the financial losses were close to four hundred thousand Dollars.

Figure 5.A scanned copy of a news paper publication of a Church which collapsed on a Sunday morning before worshipers came to church.

On the 24th of October 2006 a Building Three Storey high under construction collapsed, killing a Chinese Engineer who was supervising the project instantly.
In all these situations, where reconstruction is being done, it is the same group of informal labourers with the same level of skill and knowledge who are contracted to work on them. This shows the severity of the problem at hand.

Causes of Building Failures in Ghana

There are two sides to the issue of building failure in Ghana.

1. The perennial failures that occur during most heavy Raining-Seasons, These occur in the form of Roof rip-offs, Collapse of structures and street furnishings.
2. The frequent partial or total collapse of structures and buildings during construction.

Building failures may be due to one or a combination of factors. It may also be due to several complexities of improper practices that occur during a construction process.
In Ghana, most of building failures have largely been attributed to

1. Shoddy works which is as a result of a high amount of limitations of the Skills and Knowledge of most construction workers.
2. Others causes of building failures in Ghana are,
3. Inadequate details and specifications on most Drawings used for construction on site
4. Inaccurate reproduction of Architectural, Engineering and other construction details,
5. Non enforcement and adherence to building rules and regulations,
6. Lack of adequate supervision by site engineers and foremen,
7. Lack of commitment of the construction and shelter delivery regulatory bodies to ensure that the right practices are engaged during construction
8. Reduction of regulatory and monitoring activities into income generating rather than quality insistence activities.

There are other socio-economic causes of building failures. These involve a situation where developers both literate and illiterates will want to hire cheap and unqualified

labour, reduce and cut down on specifications with the wrong notion of cutting cost and saving money. They sometimes insist on their own specifications in a bid to dictate what has to be done without recourse to any technical reference.

Education of Informal Labourers

In all these situations, the informal labourers can be made to play a very vital role in ensuring that safe shelter is provided for the Ghanaian society. This group is being targeted because, in some instances where supervision has failed in a construction process, these workers are those who take some of the major and vital decisions on site.

Informal labour forms about 80% of all the construction labour force in Ghana, and even the formal sector draws it labour from here. Their only form of training is by apprenticeship, where a master transfers his knowledge informally to the apprentices. There is therefore a high tendency of a master transferring a wrong or inadequate skill to the apprentices who will in turn transferee them to others. These then becomes widespread and the common knowledge which are used by the informal labour force.

It is clear from the above, that without a properly structured form of training and adequate Knowledge and Skill, Buildings will continue to fail in Ghana.

This proposal is therefore directed towards evolving a process which will empower these groups of workers with adequate Skill and Knowledge to enable them to contribute meaningfully to the shelter delivery system in the country. The current situation facing the shelter industry in terms of building failure will be evaluated, and steps that have been taken in the past reviewed to access how the informal labour sector can be used to provide solution to the problem. This group of labourers have been targeted because they are to a large extent, the final executers of all specifications, decisions and details of most construction works in the country. It is important for the shelter industry to have a knowledgeable labour force who understand the basic principles of construction and some of the complexities involved so that that they can help to solve this problem.

Even though other factors may contribute to the collapse of buildings the most basic one is what has been taken up by this project to be addressed. Other factors may be taken up for further solutions in other studies.

However, whiles these training are being organised to equip this group of workers, it will be important for the nation to take steps to drastically address all the other identified causes. The following suggestions are therefore being made for further consideration as a way of finding an integrated solution to the problem

Parliament must consider passing a law to license all tradesmen in the industry, and to make the collapse of any building a criminal offence. This will also help in identifying most of these tradesmen for taxation.

Parliament must also consider passing a law which makes construction of any building with the absence of an Architect, an Engineer, or any competent building professional in the construction team a criminal offence.

The Ghana National Building Regulation including all provisions of the L.I. 1630 (1996) must be assessed, improved and enforced.

Details of all Drawings submitted for the purpose of obtaining building permits, must be reviewed to include more construction details.

The District Assemblies permitting and regulating system must be improved by involving all the identifiable professional bodies in the industry or privatising that function of the assemblies.

All professional bodies in the industry must begin to set minimum standards of information required on each working drawings used on site and sanction those who flout these standards

Studies on the Skills and Knowledge of Construction Labourers

Methodology

A total of ten building sites were visited. Five of these were those that have had their structures collapsed during construction and five were those with buildings still under construction. Photographs are taken and the workers interviewed to assess the level of their knowledge and skill in construction, and their awareness of Ghana Building Regulation.

Study Details

Number of sites studied----------10

Number of sites under construction---------- 5

Number of sites with collapsed buildings----------5

Number of workers interviewed----------50

Age range of workers----------18 – 57 years

Sex ----------Males = 36 Female = 14

Table 1:- Results of studies conducted at ten different sites

	Foremen		Carpenters		Steel Benders		Masons		Unskilled Labourers		Total
Number Interviewed	10		10		10		10		10		50
	YES	NO	YES	NO	YES	NO	YES	NO	YES	NO	
Understanding of Working Drawings	8	2	4	6	5	5	5	5	0	10	50
Formal Training	8	2	2	8	0	10	2	8	0	10	50
Informal Training	2	8	8	2	10	0	8	2	10	0	50
Knowledge in Bldg. Tech.	10	0	4	6	6	4	6	4	0	10	50
Awareness of Building Regulations	8	2	0	10	0	10	2	8	0	10	50
Willingness to train	6		10		8		10		10		50

Table 1, indicates the backgrounds of fifty workers interviewed at ten different sites, their knowledge in construction, and their readiness to go for further training. It is clear from the table that when supervision fails or a developer decides not to engage a professional to supervise a project, there is a very limited amount of skill and knowledge that will be available to the workers on site. It is important to note also, that most developers are just entrepreneurs who have limited knowledge in construction.

	Foremen	Carpenters	Steel Benders	Masons	Unskilled Labourers	Total
Uneducated	0	3	0	2	8	13
Primary	0	5	2	2	2	11
JSS	1	2	5	4	0	12
SSS	1	0	3	2	0	6
Tertiary Inst.	8	0	0	0	0	8
Total no. of workers interviewed						50

Table 2: Educational levels of the fifty workers interviewed at the ten different sites

Design Details

Out of the ten sites visited,

Number of sites designed by Architects---------- 6

Number designed by Draughtsmen---------- 2

Number designed by Owner/Mason---------- 2

Number of designs with construction details---------- 0

Permits

Number of sites with submission for permit---------- 5

Number of sites with permits---------- 2

Number without permit---------- 8

This situation also indicates that, there is the need to properly streamline and control the activities in the design and permitting sectors of the industry.

Existing Housing Policy

The government of Ghana is currently supporting the provision of affordable shelter in the country, with emphasis on increasing Rental, Lease Purchase and House Ownership for workers and the general public, to reduce the housing shortage in the country. The shelter industry has therefore become a very lucrative sector, where both skilled and unskilled labours turn to for their income.

With the informal labour market contributing about 85% of the labour force to the construction industry it is envisaged that their empowerment with Knowledge and Skill in construction technology should go a long way to help ensure that good quality buildings are provided for the people. Their training will also have a positive impact on the industry.

The government also intends to carry out a rigorous Urban Slum Upgrading, Land servicing,

Infrastructural Improvement and Housing Financing. These can only be achieved with a Skilled and well informed labour force.

Steps that has been taken in the past to solve this Problem

In the past, there have been several attempts to put together a building regulation that will regulate shelter delivery in the country. Ghana therefore has a comprehensive building regulation in the form of a Legislative Instrument L.I. 1630 (1996).This document contains every detailed technical information that is needed to ensure sanity and good practices in shelter delivery but has never been effectively utilised in any way to enhance the performance of the shelter industry.

This situation has been as a result of the fact that there is not much education on this document. Surprisingly a large majority of the players in the industry including the general public are not aware of this document, and the Architects Registration which was tasked to insure it enforcement was dormant for a very long time and for that matter lost its, ability to do so. Even when it was revived, it has not been able to effectively regulate the industry. This can be attributed to its name which suggests that it only exists to regulate only architects, who unfortunately are not the only players in the industry. The council itself seems to have also been overtaken by events and trends in the industry, causing it to lose control entirely of its regulatory role. There has been no Education, Sensitisation or Awareness creation on this document for a very long time. This has created a very high level of indiscipline in the shelter industry.

There are other organisations who play very important roles in the industry, like the Ghana Institution of Engineers and the Ghana Institute of surveyors but these are only guided mostly by their organisational Constitutions and Code of Ethics which mostly boarders on moral and ethical issues more than on good technical practices. It

is only the Architects Registration council also, which is only backed by law making it impossible for these other institutions to meaningfully contribute to ensuring best practices and good standards. It will be necessary to also come up with a proposal to ensure that a more inter-professional regulatory body is set up to enforce compliance to these regulations. Such a body must have a name that also matches up to its level of power as a mandated body to regulate the entire shelter industry.

Architectural and Structural detailing in Working Drawings

Another impotent observation that is gaining currency in the shelter industry is the scanty nature or inadequate design and detailing information provided by Architects and Engineers. Unfortunately this cuts across all sizes and magnitude if projects in the country. Since there is no regulatory body to decide on how much information and details an Architect or an Engineer should provide for a particular project, this is decided on by the professional in charge, and this has been found to be very limited without sufficient information to ensure that the drawings are well understood by the workers on site. This causes a lot of decision vacuum, leaving the workers on site with not many options but to either guess or make assumptions according to their level of understanding. This situation will have to be addressed to some extent, if the whole programme should be successful.

Action Plan

In this proposal which is being directed towards a total change in practices, a rigorous Education and Training program will be designed to ensure that as much knowledge, skill and information is passed on to the target group in particular and the public in general. In this process, other factors that contribute to this situation will be analysed as they emerge to ensure an integrated approach to finding a solution to the problem. This is also to ensure that the training and information dissemination is done in totality by highlighting all areas that need to be addressed.

This Training will be multi-directional and not focused on the informal labour force only, even though they are the main target. There is the need to create some public awareness to also equip the public with enough information, to help in ensuring that buildings are built safely.

The Training will basically be in two forms

A radio program, which discusses construction processes and methods, with a phone-in segment that allows listeners to call in and ask specific and general questions for them to be addressed. Resource persons and experts in the various fields of the shelter industry will be invited to the radio studio to address some of these issues that might arise.

A formal training program where construction workers will be identified and given both practical and theoretical training to improve upon their skills and knowledge. This can be done at their various work sites. Another form can be partly done at their various sites and partly in a classroom.

The training can be categorised and tailored to suite a wide range of people in the shelter delivery industry who may be identified as having a role to play in and ensuring that structures are built to specification in the various communities. This would be allowed inspire of the main target group.

The Role of C.S.I.R. - B.R.R.I in the Shelter Industry in Ghana

The Building and Road Research Institute is mandated to carry out research into various problems and issues in the building and road industry in Ghana, and come out with solutions and technologies that will enable the country to solve the problems in these industries. It has seven divisions dealing with research into Traffic and Transportation, Structures Design and Planning, Materials Development, Geotechnical Engineering, Construction Technologies, Information Dissemination and Administration.

It can boast of a lot of Research, Technologies, Solutions, Knowledge and Information in its research area, and has conducted a wide range of training for most of the major players in the Shelter and Road sectors of Ghana. The institute has the capacity, knowledge base, solutions and technologies to address most of the problems in these sectors of the country. It annually organises a “Research week” where presentations of research works are made, and normally adopts one of these research works as a flagship project, where all members of staff are enjoined to take part.

SWOT Analysis

Strengths

As an Architect working in a research institution it is possible for proposal to be adopted as a flagship project where the institute will draw on all the available strength, support and opportunities to implement the project.

It is possible to solicit for funding of this programme if it is well packaged.

If the project is adopted by institutes everyone is enjoined to make an input.

The fear and pain of disasters is likely to allow this project to enjoy official support.

Weaknesses

People's attitude to change

Complacency should be avoided

Unavailability of time and resources.

Opportunism

The current efforts by the Ghanaian Scientists to ensure that research findings and proposals do not end up on the shelves but are furthered for public consumption.

The insistence of the (Council for Scientific and Industrial Research) my employers that scientist come-up with solutions to our national problems.

The rapid growth of the shelter delivery industry.

Threats

Financing

High cost of buildings which brings about unreasonable cost cutting?

Weaknesses

The wide and large nature of the construction industry.

Action Plan – Short term

Step 1 - To collect and analyse available data to establish the reality of the situation and organise it into a good presentation.

Step 2 - To organise a seminar within my Institute, district and municipal assemblies, to lay bare the facts and its implications to

My colleagues in the office

The principal players in the shelter industry and

Other decision-making bodies in the industry.

Identifiable Regulatory and Legislative Bodies

Step 3 - Present my proposal and identify my target group and explain the rationale behind their selection.

Step 4 - Come up with the form and method including syllabus and direction for the dissemination of the information.

Step 5 - Create public awareness through a radio programme to assess and analyse public opinion and a whole subject.

Step 6 - Draw on my colleagues to help assess the various implications and commitments that are likely to arise during the implementation i.e. Financial, Technical, Institutional, Accommodation and Materials.

Step 7 - Step out a test for the proposal and see it viability and possible implications and amendable areas.

Action Plan Long Term

Set up an agenda of academic development to ensure that I am able to attain promotion to a high decision making level.

To refine and tune the contents of the proposal to suit immerging trends in the shelter industry.

Start the project on a small level and then increase its pace and scope as and when necessary.

Continue to rigorously create awareness in this direction and also to size any opportunity at anytime to make people aware and whip up support for the programme

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