

A Close Analysis Of Engineering In Disaster Management and Preparedness Versus Disaster Management, Recovery & Resilience building In Malawi:

Gaps, Constraints and Unmet Needs

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Presentation Overview

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- The Hyogo Declaration & The Hyogo Framework for Action**
- Building –Back- Better**
- Issues & Facts**
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Take Home Issues

- ✓ What Constitutes Engineering Disaster Preparedness?
- ✓ After Disaster- Is our Infrastructure Development In line with the Principle of **Building-Back-Better**?
- ✓ Climate Compatible Engineering-Is it an Issue In Malawi?

Background

- **It is a fact that engineering solutions for climate mitigation and adaptation as well as engineering preparedness can play a vital role in as far as emergency programming and resilience building is concerned.**
- **With reference to recent incidents of different forms of natural disasters, it can easily be concluded that Malawi as a country has gaps and unmet needs in as far as using engineering in disaster preparedness and resilience building is concerned.**

The Hyogo Declaration & Hyogo Framework for Action

- **The Hyogo Declaration and the Hyogo Framework for Action formulated at the World Conference on Disaster Reduction in Japan in 2005, puts much emphasis on disaster risk reduction and preparedness as compared to disaster management and recovery.**
- **The GoM through the Dodma launched the NDRF in 2015 which was developed following the PDNA.**
- **It translates recovery and reconstruction needs into prioritized interventions in the whole program.**
- **The Framework is emphasizing on the principle of Building-Back-Better(BBB) and resilience.**

...But What is Building-Back-Better?



- BBB is a strategy aimed at reducing the risk to the communities in the wake of future disasters and shocks.
- The BBB approach integrates [disaster risk reduction](#) measures into the restoration of physical infrastructure, social systems and shelter, and the revitalization of livelihoods, economies and the environment.
- BBB has been described in the [United Nations' Sendai Framework for Disaster Risk Reduction](#) document, which was agreed on at the [Third UN World Conference on Disaster Risk Reduction](#) March 14–18, 2015, in [Sendai, Japan](#)
- BBB is a principle which is basically emphasized by the MNDRF of 2015 which was developed following the Post Disaster Needs Assessment.



Issues & Facts

- Just like other developing countries, climate change in Malawi is quickly evolving into a great threat to human survival.
- Malawi as one of the least developed
- countries (LDCs) and whose economy is agro based environment and climate together they are the country's lifeblood.



- Engineering solutions for climate mitigation and adaptation as well as engineering preparedness should be one of priorities on the government's development agenda.
- Engineering preparedness is an approach that can draw engineering solutions and strategies for climate mitigation and adaptation hence securing sustainability under climate change.
- This improves human well-being and social equity while significantly reducing environmental risks, dangers and ecological scarcities while minimizing the harm caused by climate impacts but maximizing numerous human development opportunities presented by low emissions and a more resilient future (Mitchell et al, 2010).



CC Adaptation & Mitigation in Engineering Solutions

- Just like other countries, climate change in Malawi is negatively affecting all livelihood sectors. Climate change has a negative bearing in the built environment as it affects weather pattern, one of very important element in the built sector.
- Studies has revealed that Green Building and Engineering Technologies are the sure drivers and enablers for Climate Change adaptation and mitigation as well as resilience engineering solutions.



Uptake and Adoption of GB for Engineering Disaster Preparedness.

Engineering Solutions for Climate Adaptation & Mitigation

- Engineering solutions for climate mitigation and adaptation as well as engineering preparedness should base their emphasis on climate compatible strategies and designs that embrace development goals and strategies that integrate the threats and opportunities of a rapidly changing climate.
- Engineering disaster preparedness should be viewed as moving beyond the traditional separation of adaptation, mitigation and ordinary infrastructure development strategies





- In Malawi it is evident that in all efforts, there is a common missing link in this interconnected drive, and this is a great challenge to do with engineering solutions for climate mitigation and adaptation as well as engineering disaster risk management and preparedness versus disaster management, recovery and resilience building.
- ...***Who is to blame...?????***

Objective(s)

It is against this backdrop that a study was conducted to explore and interrogate whether engineering solutions for climate mitigation and adaptation as well as engineering preparedness in risk reduction strategies and resilience, provides useful framing to bring together humanitarian and long term development, management and mitigation approaches adopted from the disaster risk reduction and disaster management angle side by side with special emphasis on Building-Back-Better.

Objective(s)

The presentation will also briefly outline policy gaps, challenges, unmet needs and recommendations to policy formulators and other players which may act as general guidelines in as far as engineering disaster risk management and reduction as well as disaster management and recovery is concerned .

Methodology

We collected qualitative data from anonymous respondents from the Dodma(10), members of MIE (12), Consulting Engineering firms(8) and members of the community(40) from disaster prone areas of Mzuzu ,Karonga, Mangochi,Zomba,Chikwawa and Blantyre through KIIs and IDIs as well as a critical analysis of national and international publications which included policy and strategy documents including the UNFCC, UNCED1992 & others

Methodology.....

- In the light of the identified challenges with engineering solutions for climate mitigation and adaptation as well as engineering preparedness in risk reduction strategies and resilience (in a Malawi context), the study focuses on a number of priority intervention areas both cross-sectoral and sectoral in nature.
- These are critical if Malawi is to be successful in taking advantage of the opportunities that arise from emerging approaches in as far as building resilience and adoption of climate compatible engineering disaster preparedness is concerned.
- Observations were clarified & discussed during interviews and these observations were important for knowledge comparative analysis. Observations were recorded in tally sheets and were used during data analysis as appropriate. Notes were categorized out into summaries, which were cross-checked for accuracy. Summaries were reviewed based on themes relating to engineering in disaster risk management and preparedness versus disaster management, recovery and resilience building. Data analysis was being made on a continuous basis using tally sheets.

Key Findings

The study identified critical bottlenecks, gaps, challenges, and unmet needs affecting engineering solutions for climate mitigation and adaptation as well as engineering disaster preparedness, risk reduction and resilience building versus disaster management and recovery programs amongst stakeholders in Malawi as follows:

A Closer Analysis

- **Disaster Risk Management and Preparedness**
- Versus**
- **Disaster Management and Recovery**

Disaster Risk Management and Preparedness

- This is about risk reduction approach which recognizes the fact that while disasters will always occur, efforts should be made to mitigate against its impacts in advance and wherever possible reduce or prevent disaster occurrences.
- This is being prepared for disaster. This includes having an up to date Early Warning Systems, Climate compatible engineering and infrastructure development and incorporation of traditional and indigenous knowledge and practices in disaster risk management.
- This involves designing of CC buildings that can withstand disasters, settlements , public awareness, construction of Dykes,Walls,River Bank protection

Disaster Management and Recovery

- This is about a proper response to disaster when it has occurred.
- This is like a “Fire Fighting” approach hence Sometimes “Emergency” Response”
- This is a “Re active approach of which Malawi as a country seems to be very comfortable with.



Reactive Vrs Proactive

- Ironically in Malawi it is disaster management and recovery programs that are but reactive yet expensive, that attracts about 87% of response interventions in form of publicity, sympathy, attention and support while disaster risk reduction, preparedness and management interventions that are but proactive yet affordable attracts only 13% of the same.

(World Bank Group Report-Shock Waves 2010).



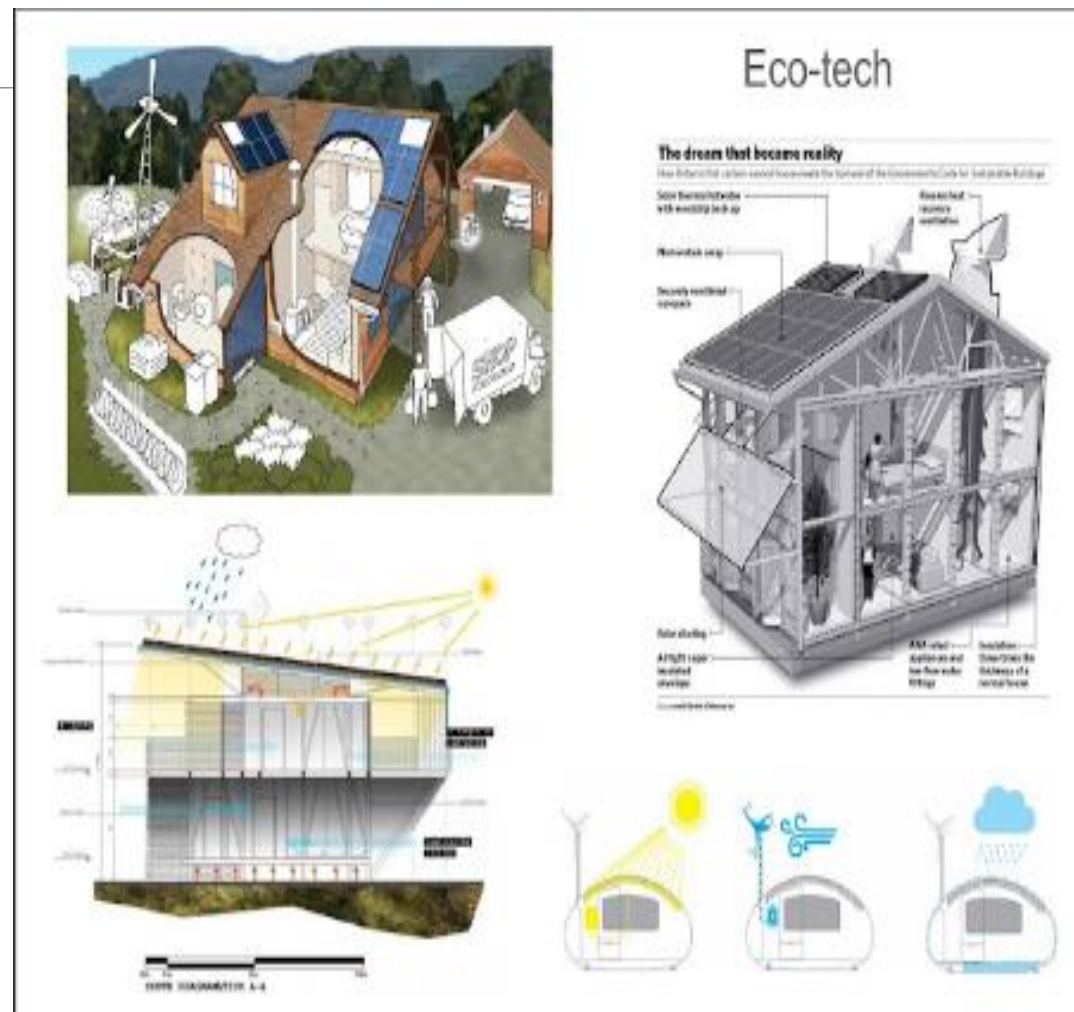
Low Uptake of Green Building

- Green Building(GB) also known as Green Construction or Sustainable building refers to both a structure and the application of processes that are [environmentally responsible](#) and [resource-efficient](#) throughout a building's life-cycle, from planning to design, construction, operation, maintenance, renovation, and demolition.
- With Climate Change perturbations becoming more frequent, variable and intense GB is viewed as moving beyond the traditional separation of adaptation, mitigation and infrastructure development strategies.



Green Building

- It is Green design and infrastructure development that are some of the sure drivers and enablers towards engineering solutions for climate mitigation and adaptation as well as engineering preparedness and sustainable construction in Malawi whose economy is agro and natural resource based coupled with climate change perturbations.
- It is evident that very little seems to be done in looking at these as emerging concepts that need to be embraced in the planning, designing and development of all public and private infrastructures.



Eco-Friendly Engineering Solutions

Apart from this, the development and adoption of clean and environmentally friendly, eco-labeled building materials and clean energy technologies such as Wind, Solar power and Biogas in the built industry is at a lower scale and not impressive hence Building-Back-Better (BBB) principle as emphasized by the Malawi National Disaster Recovery Framework of 2015 is still a nightmare.



Factual Gaps...Financing Challenges

- The built /Engineering sub- sector in Malawi is lacking support systems and interventions as there is a continuous lack of political will and strong financial resources to translate policies into viable sustainable programs. –Disaster Preparedness Engineering solutions

- Creating an enabling environment that aims at facilitating sustainable engineering solutions for climate mitigation and adaptation as well as engineering disaster preparedness through surveying, designing, promotion and development of the built industry in Malawi seems to be at a low pace as such the building/engineering sub- sector is lacking government support to enhance and fulfill the principle of BBB under the MNDR F - 2015.



Engineers and the BBB Principle

- Much as it is evident that engineers through MEI, can play a greater and vital evolving role in achieving engineering solutions for climate mitigation and adaptation as well as engineering disaster preparedness hence fulfilling the BBB principle, to this end chronic shortages of financial resources are very critical if both environmentally friendly and sustainable development is to be integrated into national overall development initiatives.

Lack of Harmonized Policies

- Sustainable climate compatible engineering solutions and efforts that can embrace BBB principle in Malawi seem to be uniquely undermined by the concurrent negative impacts of not having harmonized policies.
- Policies in environment/ climate change, disaster management and recovery with special emphasis on Climate proofing and compatible engineering solutions translating into the BBB principle, are not harmonized hence it is one of the unmet needs in as far as engineering disaster management and BBB is concerned.
- For instance though climate change, global warming and the many associated ills are affecting every sector, these issues are basically tackled in isolation of each other hence there is a gap in enhancing the disaster risk preparedness and resilience building expertise and disaster management, response and recovery that can benefit the local communities via a harmonized policy frameworks.

Policies....

- A good example is Climate Change adaptation and mitigation. Consequently, adaptation was seen as a viable option in reducing the vulnerability associated with anticipated negative impacts of climate change, however with time it is increasingly viewed that mitigation and adaptation can yield better results if both strategies are complementing each other.
- This is justified by a study recommendation to integrate adaptation and mitigation strategies into all other climate change policies. (Nyong et al. 2007).

Recommendations

- ❑ Sustainable engineering solutions for climate mitigation and adaptation as well as engineering disaster preparedness should be seen as critical factors in achieving the BBB principle under the National Disaster Recovery Framework .
- ❑ It is now time for the government of Malawi and its partners to design and engage into critical, analytical and systematic thinking which will eventually conceptualize, understand and address these linkages and issues to do with building knowledge and capacities for resilient engineering disaster preparedness.

Recommendations

- **There is a great need to enhance Climate Change Adaptation as well as building capacities for climate resilience building solutions through Green Building amongst quantity surveyors, architects, engineers and the general population hence integrating knowledge and Green building technologies in a drive to sustainability in the built enterprise hence achieving the BBB principle, the UN SDGs as well as Africa Agenda 2063- The Africa we Want.**

Recommendations

- Institutions of higher learning (Colleges and Universities) can facilitate research and development in the areas of knowledge and technology transfer and encourage innovation amongst rural communities in disaster prone areas.
- It is a fact that research and development are mainstays of university education, as knowledge is produced, transformed into new ideas and disseminated. Research, development and innovation, with respect to the development and growth of climate compatible and environmentally friendly infrastructure development as well as disaster preparedness engineering solutions and systems underlie long term sustainability hence meeting the demands and needs of for Malawi as a country.
- Climate change adaptation related to the built/engineering sub-sector should look beyond mitigation since mitigation alone is not enough to stave off the adverse effects of climate change on infrastructure development. This study recommends that Malawi should utilize opportunities that arise from emerging approaches such as Green building and climate compatible infrastructure developments.

Recommendations

There must be a deliberate policy to encourage and enforce engineers, designers and planners as well as contractors to be eco efficient, produce more with less resources and less pollution/emission while remaining competitive, more innovative and more environmentally responsible. Climate compatible development should be seen as a critical factor in achieving sustainable development as such it is now time for the governments of Malawi to fully support institutions like MEI to design and engage into critical, analytical and systematic projects which will eventually conceptualize, understand and address these linkages and issues to fully adopt BBB.

Opportunities

Established bodies already in place like MEI, MCCCCI, MIRTDC can collaborate with the Ministry Of Environment and Climate Change Management, NCIC together with the Department of Energy Affairs and being in the fore front to adopt positive Green Building and climate compatible construction projects by incorporating, integrating and increasing the uptake of Green building, engineering solutions for climate mitigation and adaptation as well as engineering disaster preparedness.

Conclusion

- **Engineering solutions for climate mitigation and adaptation as well as engineering preparedness interventions should clearly highlight risk management, preparedness and resilience building programs and prioritize on building interventions and efforts in which communities living in the disaster prone areas can become more resilient.**
- **The fact that disasters will always occur, engineering programs and projects under risk management should be designed to build resilience to disasters and trying as much as possible to reduce or preventing its impacts on humans in Malawi of which engineering solutions for climate mitigation and adaptation as well as engineering preparedness are key intervention tools.**

Thank You for your attention !!!

