

# Implementation Opportunities and Gaps for the Development of Green Building Code in Pakistan

WORKSHOP PROCEEDINGS

11 March 2021



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# CONTENTS

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- CONTENTS ..... 2**
- INTRODUCTION ..... 3**
- INAUGURAL SESSION..... 4**
- TECHNICAL SESSION I ..... 7**
  - Sustainability and Affordable Low Cost Housing Green Building Materials ..... 7
  - Green Building Guidelines of Agha Khan Development Network (AKDN) ..... 8
  - Towards a Zero Carbon Footprint in the Building Industry Responding to Pakistan’s Ecological & Physical Diversity ..... 9
- TECHNICAL SESSION II: INPUTS FROM BREAKOUT GROUPS ON GBC ROAD MAP FOR PAKISTAN 14**
  - 5.1. Section 1: Common Questions for all Groups ..... 14
  - 5.2. Section 2: Inputs from Key Stakeholders Breakout Groups ..... 23
    - 5.2.1. Breakout Group 1 – Professional bodies, Practitioners (including Architects and Town Planners), and Academia ..... 23
    - 5.2.2. Breakout Group 2 – Builders and Developers ..... 25
    - 5.2.3. Breakout Group 3 – Civil society and NGOs ..... 26
    - 5.2.4. Breakout Group 4 – Government agencies ..... 28
    - 5.2.5. Breakout Group 5 – Corporate/private sector and Investors ..... 31
- ANNEXURES ..... 36**
  - ANNEX I Welcome Address by Mr. Irfan Tariq - Director General, Ministry of Climate Change..... 36
  - ANNEX II Address by Mr. Sven Ruesch - First Secretary, Team Leader - Economic Cooperation European Union Delegation to Pakistan ..... 37
  - ANNEX III Keynote Address by Mr. Malik Amin Aslam ..... 39

## INTRODUCTION

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A Workshop on Implementation Opportunities and Challenges of the Policy Guidelines for the development of a Green Building Code in Pakistan was convened on 11 March 2021, in Peral Continental Hotel, Rawalpindi to assess the gaps and challenges in the implementation of the country's green building code and gain insights to improve the roadmap towards widespread acceptance and use of the Green Building Code (GBC) and facilitate the incorporation of potential Sustainable and Consumption Production (SCP) principles.

The Workshop comprised of three sessions titled (1) Inaugural Session (2) Technical Session I included Panel Discussion and; (3) Technical Session II comprised of five Breakout Groups namely i) Professional Bodies (Architects, Town Planners & Academia), ii) Builders and Developers, iii) Civil Society and NGOs, iv) Government Agencies & v) Corporate /Private Sector and Investors. (Workshop Agenda & Working Paper at Annex –I).

The Workshop was attended by 46 participants representing diverse stakeholders from government, UN and multi donor agencies, civil society, builders and developers, architects,planners, corporate sector and academia. (List of participants at Annex-II).

## INAUGURAL SESSION

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The Inaugural Session commenced with recitation from the Holy Quran. The Director General (Environment & Climate Change), Ministry of Climate Change **Mr. Irfan Tariq** welcomed the delegates on behalf of the Ministry and thanked the European Union SWITCH-Asia Programme, for providing support since 2018 for initiating the work on Green Building Code for Pakistan. He explained that in the first phase the Ministry Developed the “Policy Guidelines for Green Building Code “and in 2020 the work on second phase was initiated to develop Roadmap for detailing out Green Building Code Development. He highlighted that building sector is responsible for a huge share of energy, electricity, water and consumption of materials and has the largest potential for significantly reducing greenhouse gas emissions compared to other major emitting sectors at little or no cost. He expected that the delegates will participate actively and give their valuable inputs in the workshop. (Welcome Address at Annex I).



**Mr. Sven Ruesch**, First Secretary, Team Leader - Economic Cooperation European Union Delegation to Pakistan congratulated the Ministry of Climate Change and SWITCH-Asia for organizing the event under the EU funded Regional Program. He highlighted that the EU aims to lowering their respective ecological footprint while continuing advancing the Human Development Index and per capita economic growth. The year 2021 will be key for the EU to deliver on its green ambitions and show vision and leadership on the multilateral stage. He remarked that, it is indeed a privilege to address this multi-stakeholder workshop and hopes that the workshop may lead to an easy to understand Roadmap for a Green Building Code and for the Green Building Code to be implemented soon. (Keynote Speech at Annex II).



**Mr. Malik Amin Aslam**, the Special Assistant to Prime Minister on Climate Change virtually addresses the participants and stated that in line with the commitment of the Government to pursue climate resilient and green development initiatives the Ministry of Climate Change is working on the development of the Green Building Code for greening the Building Construction Sector in Pakistan as well as introduction of Green Building practices in the Prime Minister’s five Million Naya Pakistan Housing programme. He highlighted that the realization of Green Building Code would be crucial in creating a market demand and uptake of green building techniques and practices, focusing on the production and application of environmentally supportive construction materials and sustainable building elements. He expected that the experts in the workshop will review the work done so far and will draw up the roadmap for the development of a Green Building Code for Pakistan which takes into consideration our ecological diversity, extreme weather events and is resilient to climate change impacts triggered by increasing frequency and intensity of temperature and rainfall. (Keynote Address at Annex III).



**Mr. Jawed Ali Khan**, Consultant, EU SWITCH-Asia, SCP Programme made a presentation on work done so far under the project on the Roadmap to Green Building Code. He explained that in follow up of the preparation of the National Action Plan for Sustainable Consumption and Production (SCP), for Pakistan for the Ministry of Climate Change with the support of EU SWITCH-Asia SCP Programme, a study was carried out on “Policy Guidelines for Development of Green Building Code” which was the first step towards the preparation of Green Building Code for Pakistan in 2018.

He highlighted that in 2020, the second step, was initiated to develop a Roadmap for preparing Green Building Code for Pakistan. In this respect a questionnaire survey was developed for the concerned stakeholders for their opinion towards developing a roadmap for sustainable building regulation. The key stakeholders included the Government Agencies, Builders/Developers/Contractors, Architects, Engineers, Civil Society NGOs, Academics and Professional bodies/Associations. The questionnaire result reveals that the conventional construction practices in Pakistan are already undergoing a paradigm shift due to exposure to green building construction technologies and practices.



However, it was expressed that adoption of green building technologies and practices will remain a challenge in Pakistan until the government provides adequate support and creates an enabling environment, which is crucial for transformation and adoption of green building practices by the construction industry. Major issues identified by the respondents focus on the factors influencing the green building market and its readiness.

Mr. Khan deliberated that the inputs received from key stakeholders survey were further deliberated in this multi-stakeholder workshop to identify regulations and standards for green buildings site selection, planning, design, efficient use of resources and material, construction, occupancy, operation and maintenance throughout the buildings life-cycle, without significant increase in cost. The final report will lay down the Roadmap for the development of Green Building Code for Pakistan based on the recommendations of the workshop.

*Group Photo at the Inaugural Session.*



## TECHNICAL SESSION I

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The Technical Session I constituted of Panel Discussion and was chaired by Dr. Sarosh Hashmat Lodi, the Vice-Chancellor, NED University of Engineering & Technology since March 2017. As an elected member of Governing Body of Pakistan Engineering Council for two consecutive terms and contributed in developing in five different Building Codes under PEC umbrella. He was also elected member of the Central Council of the Institution of Engineers, Pakistan and was awarded fellowship of Institution of Engineering Pakistan in 2015.

The Panellists included:

1. **Prof. Dr. Engr. Shuaib Ahmad**, JPC Chair for Centre for Affordable Housing and Sustainable Built Environment (CAHSBE), NED University, Karachi. He is Distinguished Alumnus of University of Illinois, USA is a world recognized professional civil and environmental engineer with over 40 years of experience in Academia, Code Writing Bodies, and Industry. He has authored over 175 publications and number of books and has received number of Awards for his contribution to the profession.
2. **Mr. Nawab Ali Khan**, CEO, Agha Khan Agency for Habitat (AKAH) is a development professional and brings over 20 years of experience of grass roots level community centric built environment programmes.

The agency implements a range of housing improvement programmes adopting climate sensitive green approaches. It has recently helped the Agha Khan Development Network to come up with its own green building guidelines that is being adopted by all AKDN agencies in over 30 countries of the world.

Recently under his leadership the agency was awarded the World Habitat's Gold Award for its unique approach of blending indigenous knowledge with modern science to help address Natural Disaster Risks at community level.

3. **Mr. Shahid Saeed**, is the Founder and CEO of Indus Earth Trust (NGO) since last 20 years. He is a renowned architect and has worked in many countries for more than 27 years. He is specialized in alternative energy, water, livelihoods and low cost building techniques.

### PANELLIST PRESENTATIONS

#### Sustainability and Affordable Low Cost Housing Green Building Materials

JPC Chair Prof. Dr. Engr. Shuaib Ahmad, Centre for Affordable Housing and Sustainable Built Environment (CAHSBE), NED University, Karachi presented on Sustainability and Affordable Low Cost Housing Green Building Materials.

He briefed that sustainability means the utilization of resources in a manner which allows the fulfilment of needs of the current generation while preserving natural resources for the future. He explained key components of a green building which includes energy efficiency and the use of renewable energy; water efficiency; use of environmentally friendly building materials; waste and toxic reduction; smart and sustainable growth; and enhancement of air quality. He described different construction materials e.g. adobe, cob and rammed earth, wool brick, sustainable concrete, using bamboo replacing the steel bars, structured insulated panels, insulated concrete foams, solar tiles, triple glazed windows, straw bae, cordwood etc.

He also explained concerns for the green building construction including:

- Initial building cost maybe higher than conventional building cost

- Difficult to secure funding since the technologies are relatively new
- Green Building Materials not readily available
- Finding service providers for green building is difficult
- The buildings are complex, expensive and time consuming to execute
- Require locations with adequate sunlight

### Green Building Guidelines of Agha Khan Development Network (AKDN)

Mr. Nawab Ali Khan, CEO, Agha Khan Agency for Habitat Agha Khan Development Network (AKDN) presented key highlights of the Green Building Guidelines.

AKDN has over 4000 buildings in Asia and Africa and they have developed Green Building guidelines which is built on four principles:

- Build nothing - Challenge the need for new assets. Explore alternative approaches to achieve the desired outcome, e.g. can we re-purpose existing structures.
- Build less - Minimize new construction required through maximizing use of existing assets. Optimized use of space. Efficient use of assets for multiple purposes to achieve desired outcomes with less.
- Build clever - Use low-carbon materials. Streamline delivery and construction process to create efficiencies. Minimize material usage. Adopt new technologies and good practice to optimize use of energy, water and materials during construction and operation.
- Build efficiently - Eliminate waste. Utilize efficient and new construction and operation technologies.



AKDN have built structurally safe and resilient structures in remote areas of Pakistan well adapted to local settings.

The key takeaways from his presentation are:

- Whole-life approach is key for a green building
- Reducing operational energy and cost



- Use of local knowledge and materials, coupled with modern techniques to maximise benefits from green design
- Create awareness and build capacity: entire value chain
- Regulate standards
- Provide incentives
- Build on the country's great potentials
- Renewable energy
- Tree plantation
- Local building materials

## **Towards a Zero Carbon Footprint in the Building Industry Responding to Pakistan's Ecological & Physical Diversity**

Mr. Shahid Saeed, CEO Indus Earth explained the participants that the building's carbon footprint is the amount of CO<sub>2</sub> it produces during its operations and activities. Considering a building's carbon footprint is something that affects both new construction as well as existing buildings. He explained that every year, 6.13 billion square meters of buildings are constructed. The embodied carbon emissions of that construction is approximately 3729 million metric tons CO<sub>2</sub> per year. By the year 2050, accounting for all the new construction in that 30-year span, embodied carbon emissions and operational carbon emissions will be roughly equivalent.

Unlike operational carbon emissions, which can be reduced over time with building energy efficiency renovations and the use of renewable energy, embodied carbon emissions are locked in place as soon as a building is built. It is critical that we get a handle on embodied carbon now if we hope to phase out fossil fuel emissions by the year 2050. A huge wave of new construction is projected to accompany population growth and urbanization over the coming decades. Embodied carbon will represent the largest portion of emissions associated with this global new construction between now and 2030, highlighting the important role that repurposing existing neighborhoods and prioritizing the adaptive reuse and renovation of existing buildings will play in reducing embodied carbon.

He explained that as the work on development of green building codes in Pakistan has already started, we now have a critical window of opportunity, to identify tools needed to address the massive amount of new construction before its operating emissions are locked-in for decades to come.

### **QUESTION ANSWER SESSION**

#### **Questions/Comments from the participants:**

1. We have already talked about the green building code various times but what is worrying is that so far no concrete steps have been taken towards its implementation. Therefore, our top concern should be towards the introduction of interventions practically as soon as possible.
2. The green building code has ignored the seismic code of Pakistan. The authors of this code should visit the seismic code side by side building code of Pakistan in order to make the Green Building Code more comprehensive.
3. We should also look at the Planning Reference Manual which specifies the use of spaces. Until and unless we control land usage, we can not control the buildings. The Supreme Court of Pakistan decided in 2010 that anyone who owns 5 marlas can construct whatever they like. As such, it is not possible for the Government of Pakistan (or CDA, in case of Islamabad) to control development. Furthermore, all this development is seen in concrete, brick and steel. So, to conclude, it becomes

impossible to consider implementation of the GBC in such areas without visitation or consideration of their current development and projected scenarios.

4. Excellent work in identifying dangerous buildings and they have identified 500 dangerous buildings. I would like to listen about this as It is very interesting as they are talking about the building codes as already referred to like energy provisions etc. I'm sorry to say but we have failed in the implementation of the building codes but the question is that before the current implementation, have we observed what we have done previously and learned from the mistakes of those? And how are we integrating green building code with the other codes as already present?
5. The term Green building code needs to be rightly elaborated as in to define what is and what not is a green building. Specify the users who will be understanding this and educate them. It is not just the people residing in the building but rather even those who are working on projects like the masons. Most of the projects constructed are not even by those who are professionals rather by contractors. So how will we be tackling this challenge?
6. We talk about bamboo construction a lot. Precipitation load is one of the factors in its construction that needs to be noted. How do we make that work, especially in coastal areas?
7. Also considering we initially had traditional planning like the courtyard system etc, have we moved away from that and come towards a more fancy way of construction?
8. How can we define a green building in AKDN?

#### **Responses:**

The Chair Dr Sarosh Hasmat Lodi, responded to the questions as follows:

- 92.5% of buildings in Pakistan are non-engineered. The remaining 7.5% are considered with specialized engineering. Also, we have a huge mess of buildings and XYZ was asking that it's impossible to do anything currently. Let's be careful in the future.
- The other point that my colleague from CDA and this young lady has made: there has to be an integration course otherwise we will keep on talking in different languages for the same building. And I know that the Pakistan engineering council is trying very diligently to harmonize all these efforts. You have to have one umbrella where harmony of these things are done. In countries like ours, the bottom-up approach for specifications and building codes are not possible. It has to be top-down. Regulations, facilitations are made and then enforced which we try to do without realizing that the capacity of implementation is not there.
- The major stakeholders in implementation are the regulators which are the: the Ministry of Built Environment, PCATP, Pakistan Engineering Council, PSQCA (Pakistan Standard and Quality Control Authority). Apart from the Ministry of Climate Change and the Ministry of Housing, there are no regulators; rather, all are policy makers. But we always forget that the implementers are building control authorities or the building control sections in the Development Authorities and this is where the missing link exists in the entire chain. Unless they all get involved, these ideas will cripple down. That's why it is important to challenge the challenges.
- We understand that a green building is such that physiological properties are such that it has minimum carbon emissions plus it has a healthy and comfortable environment to its users. That's what we consider a green building at the minimum level. Now we follow the EDGE standard (EDGE Advanced), for normal building and its operations and EDGE Net Zero for a higher level of standard, for larger operations. It is an international standard and thus known by major practitioners.



**Virtual Questions/Comments:**

1. Arrange more capacity building programs and building codes sessions by the relevant regulatory bodies.
2. The panelists have covered a wide scope of Pakistan construction technologies. Can they also share Pakistan's social experience while sharing their response to their advocacies?
3. What green aspects have they found people to be most interested in and are likely to adopt? What are the people least interested in and unlikely to adopt? What are the reasons for either?

**Responses:**

- As far as the first question is concerned it was more of a comment and that it is surely a need of capacity building in government institutions responsible for implementation of building codes.
- As far as the second question is concerned it sort of a one question that what are the preferables and what are not and why. As far as the capacity part is concerned, it needs to engage the complete cycle of users, masons, architects, engineers, government and policy makers who are at the level who come up with legislation. Overall capacity building drive needs to be taken into consideration.
- What we have taken into our scope is by first of all measuring our carbon footprint so each agency is monitoring and measuring their carbon footprint and accordingly are reporting. So around that awareness was created to those people who are primarily the designers or implementers or are involved in the operations of these buildings. This was the first step. Then in the second step we worked with the designers to discuss our context, availability of local materials and the need of these buildings so it's all range of activities that are considered and the whole program needs to be developed and implemented. And since our country is so diverse, each province and location has a unique scenario so it's difficult to paint everything with one colour. So you have to make your capacity building also diverse.

**Virtual Question:**

How do we ensure that net zero buildings provide proper living conditions while not costing more than conventional construction? Are there any such examples in Pakistan?

**Responses:**

- I don't know of any examples of zero carbon footprint in Pakistan. I know that we are headed towards it, but as said in the talk/panel presentation, I don't think it will be possible to reach zero footprint in this country. We will get close to it but not reach it.
- What is zero Carbon? Zero Carbon means that no carbon is emitted in the process of constructing and in the process of creating that building (such as concrete and steel which are also the two main issues). If we choose indigenous materials, then the carbon is non-existent in their use. And it is important to realize the value of these indigenous materials. It is very effective and very comfortable in the sense of environmental control both externally and internally.

**Virtual Question:**

1. What steps will be taken to enforce green building code this time around?
2. What is the one practical short term action that can be operationalised easily?

**Responses:**

The first step is to put the doable that is add most lowest hanging fruits in the process meant to say in one basket and then it will be outlined in prime ministers housing program. So that a program is developed based on doable interventions so that will be the first outcome. And as mentioned before in the zero carbon discussion that the end objective in the medium term in couple of years after completing this process we will head towards developing the code so we will go through the process as other codes have been developed and we refer to expert committees to look into this and then come up with regulatory mechanisms to achieve these objectives. And net zero carbon building is actually taken by offsetting other interventions you take. It is not that you don't use carbon, it is that you use carbon to the extent that is required.

**Questions & Comments**

1. What is the linkage of this building code with other initiatives? First we developed the National Building Code of Pakistan, then we developed the Energy Model Balance, then we prepared Seismic Codes etc. with the result being that none of these codes are enforced. So the question is, how to enforce the present building codes? It may be an oversimplification that this may be done through regulatory or housing authorities because housing is a continuing activity with a need for universal code rather than based on a single project. I also suggest that some artwork should be included as seen in the presentation. As presented to people, they would appreciate some artwork for their understanding.

Green building actually means green materials. Even in the cement industry and those who are producing the materials are kind of underrepresented in the process. I consider that representation of these stakeholders in the industry is significant.

2. Second concern is implementation. Taking example from Quetta; until now, 1937 British Code Rules are in practice. But even considering this, only 27 buildings in Quetta City core are according to those rules. I consider implementation the most important part. If the GBC is a separate document of codes, how are these implemented if a parallel code exists? Should they be part of existing technical codes or suggestions of green building 'materials'?

**Responses:**

- Number one is about the enforcement of the codes. The implementers have no idea and hence they never owned the document. Till there is no ownership of the document, the implementation is out of question.
- Building capacity and retaining capacity is the same as being in love. So when you are in love you have to keep on saying i love you even though the other person knows. This is exactly what we need to do. You build capacity, people will move out and people do something else and build the capacity somewhere else. But you have to do it in a sustainable manner.

- The other concept is that there are several building codes. Eventually what will happen is that all these buildings codes will become chapters of one building codes book. E.g building code of Pakistan seismic provisions, construction safety provisions, energy efficiency provisions etc so actually these are provisions of a bigger document that has yet to be integrated. This green building code will also become one chapter in this document. This is how this problem will be solved
- As far as illustrations are concerned, it will be a very technical topic and it is not for everybody. None of the building codes has illustrations in my knowledge so the language should be enough for any technical person to understand. These codes are primarily for designers.

# TECHNICAL SESSION II: INPUTS FROM BREAKOUT GROUPS ON GBC ROAD MAP FOR PAKISTAN

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## 5.1. Section 1: Common Questions for all Groups

**1. Name Key Stakeholder Agencies in addition to the Pakistan Engineering Council, NEECA, Ministry of Housing and Works, UN Environment, EU SWITCH-Asia, UN-Habitat, for the development GBC Road map.**

- Ministry of Climate Change, Government of Pakistan
- Ministry of Planning, Development & Special Initiatives (Physical Planning & Housing)
- Ministry of Housing & Works, Government of Pakistan, and PAK -PWD
- Environmental Protection Agencies (EPA)(Federal, Punjab, Sindh, Baluchistan KP)
- National Disaster Management Relief Fund, Government of Pakistan
- Naya Pakistan Housing Development Authority
- Planning & Development Departments of the Provincial Governments of Punjab, Sindh, Balochistan, KP, Gilgit-Baltistan, AJK
- Local Government, Rural and Community Development Departments
- PHED Departments and WASAs
- Representatives of Provincial Building Control Authorities (LDA, CDA, SBCA, BDA, PDA)
- Representatives of Provincials Planning and Development Departments (Sindh, Punjab, KPK, Balochistan)
- All Provincial Urban Development Departments/Units
- City development authorities such as CDA, KDA, LDA, PDA, Building Control Authorities
- Pakistan Council for Architects and Town Planers (PCATP),
- Pakistan Council for Research and Development.
- National Ozone Unit (NOU), Ministry of Climate Change
- Housing, Town Planning / Urban Planning and Development Departments
- Representative of State Bank of Pakistan
- House Building Finance Corporation.
- Banks specializing in Mortgages and loan for building materials
- Green Building Council, Pakistan
- Aga Khan Agency for Habitat,
- Aga Khan Rural Support Programme (AKRSP)
- Communication & Works Departments, Central Design Offices, and Building
- Research Stations
- Institute of Architects Pakistan,

- US Pakistan Centres for Advanced Studies in Energy (NUST and UET Peshawar, Lahore & Taxila)
- Donor Agencies such as JICA, KfW, etc.

## **2. Suggest Composition of the National GBC Expert Group and names of the Technical Committees that could be relevant for the development of the Green Building Code for Pakistan?**

National Expert Body: The National Expert Body (NEB) will guide development of GBC and will be constituted and chaired by Ministry of Climate Change. The NEB will give more focus on implementation of the Sustainable Development Goals # 3, 6, 8,9,13 and 15 through greening of building construction in Pakistan.

The NGEB will set up Experts Technical Committees (ETCs), to work on various aspects of the GBC:

- *Structural Engineering Committee*: Constitute a structural Engineering committee that will consist of Structural Engineering Experts from Academia and Industry, and this committee will suggest structural models of buildings considering ground morphology, ecology and to insure natural and environmental aspects of the region concerned. This committee constituted taking members from all over Pakistan.
- *IT based Committee for Website Development*: which could be a primary vehicle for distribution of public review information and receipt of comments.
- Committee for Evaluation of New Technology and Systems: involving PSQCA – for evaluation of new and innovative products for which no standards exist, and for products for which standards exist but no third-party certification has been established.
- *Committee for GBC Compliance Rating System*
- **Committee for incentives for Market Development:**
- Green Building Design and Materials Committee
- Committee on Environmental and Sociological Aspects, Adaptability & Compliance
- Committee on Green Financial Model Development
- Committee on International Resource Material for Development of GBC

## **3. Provide input on the definition of the aim, scope, writing process, impact assessment and a technological framework required to be prepared for the GBC.**

***Aim:*** GBC is an internationally recognized integration of all building codes developed so far to reduce the impact of buildings on climate change by using modernized green products and efficient technologies. The major aim is sustainable production and consumption of resources. Green building is the practice of creating structures by using the process that are environmental responsible and resources efficient throughout life cycle of the building starting from design, construction, operation, maintenance, revocation and demolition.

***Scope:*** the scope of GBC is to use environmental responsible and resources efficient process throughout the life cycle of the building i.e.

- Energy efficiency and the use of renewable energy
- Water efficiency
- Use of environmentally friendly building materials
- Waste and toxic reduction
- Smart and sustainable growth

- Enhancement of air quality

**Writing Process:** For the writing process, in the first phase, the Core Committee (National Expert Body) comprising expert's representation from academia, industry, commerce, legal, financial, planning and development sector, architectural & town planning, water, waste management, energy efficiency, and building control authorities etc. would be notified.

In the second phase based on the recommendations of Technical Committees after literature review of international green codes and resource material, the committee of experts would decide the writing process of the code, it may be selected as a base document for making indigenization process (incorporating local data and materials in the code) by the technical experts.

**Impact Assessment and techno-legal framework:** Develop mechanism for impact assessment and techno-legal framework for supporting the GBC implementation at the national, provincial and local levels. A Techno-Legal Framework must be prepared for the GBC, along with its effective implementation mechanisms (at federal and provincial levels), to undertake following measures:

1. Accreditation, testing and calibration of electrical, mechanical and water supply equipment and systems.
2. Definition of performance goals, including theoretical energy consumption ranges for proposed building systems;
3. Parametric analysis and life cycle cost analysis;
4. Adapting by construction industry of modernized green building architectural, structural, and energy systems designing through software technologies;
5. Production of green construction materials and methods as per international standards and marked with Green Rating Stars;
6. Capacity building for skilled and unskilled human resource for designing and construction of green buildings;
7. Capacity building of Authorities Having Jurisdiction (AHJ);
8. Preparing a Schedule of Works as per the GBC as well as standards and specifications for both existing and new buildings;
9. Ensure compatibility of specified construction standards & specifications with IT software based applications for adoption of up-to-date construction practices; and
10. Capacity building of architects, engineers, designers, skilled workforce (masons) and labour.

The above-listed 10 measures identified for Techno-Legal Framework will support strong implementation mechanism after approval by the competent forum, for supporting the GBC implementation up to local level. The Techno-Legal Framework should also facilitate the Accreditation and Application of the specifications of green products and technologies, in conformity with Life Cycle Assessment of green buildings.

All concerned Public Officials be trained to implement the laid-down SOP of green building; and must undergo training in using such soft-wares, so that they have a prior knowledge of the proposed interventions; including the accreditation, testing and calibration of electrical, mechanical and water supply equipment/systems; besides, the analyses of water consumption, energy consumption, and techno- economic benefits.

Adopt integrated design approaches, involving the stakeholders and requesting the transparency in development of standards and codes to ensure buy-in and market-level support and compliance.

A dedicated Media Airtime through Audio Visual Movies for the quick awareness of masses along with the behavioral changes in the residents of green buildings, is mandatory to transform the adoption of



GBC as it will provide ease in understanding and end user will start recommending the GBC and ultimately the promotion of GBC will be fueled up.

In the first phase the GBC road map would provide the fundamental change by introducing first-ever green building design (green architectural, modes of green construction and allied facilities). According to survey results, only 1% people are aware in Pakistan regarding the green building concept, this huge gap in the market would be the game changer by introducing new green technologies with cost effective technologies by transforming the conventional built environment.

The deliberations indicated that as per the regional competitiveness construction price index, Pakistan prevails the highest construction price in the region due to high energy cost, long payback periods, high interest rates etc. Hence, it is very much needed that alternative green construction technologies be introduced in the country as adopted by the neighbouring countries as well. Transfer of green technologies is the need of time for market competitiveness and also essential for strengthening the local industry. For instance, the role of Naya Pakistan Housing Development Authority (NAPHDA) is vital in adoption of green built technologies.

#### **4. Provide input for the effective implementation mechanisms at federal and provincial levels. What other techno-legal considerations should be made?**

The GBC should have both technical and implementation strategies/specification/provisions. To implement the provisions of GBC in the country there should be provisions for penalties on the violations.

- Green construction finance – better than market-rate loans for green building construction (Policy for financial loan product(s) to promulgate green building construction)
- Green Building Certification (like EDGE, LEED, BREEAM, Green Building Council, Pakistan)
- Design for future climate and create CCA Plan
- Audit services should be included as part of the GBC. When a project claims credits for incorporating green technologies, a system should be in place for independent auditors to review the design and ENSURE that it has been executed on site. These audit professionals would be certified by the green building council
- While rebates and incentives would be a welcome step to popularize green building practices, equal effort should be put into regulatory processes. A system of certifiers and auditors should be in place – where certifiers report to the green building council auditors report to certifiers, and project owners get projects reviewed by the auditors.
- Amendment in building byelaws to make provision for GBC implementation and make it mandatory.
- Categorization of immediate, midterm and long-term measures for implementation of GBC for existing buildings and future projects?
- Immediate interventions can be suggested, keeping in view the Pareto principle/the 80:20 rule
- The GBC may be integrated into existing Building Byelaws at Federal, Provincial, Local and Municipal level. For this existing status of building byelaws at different levels be explored.
- Main challenges will be regulating and enforcing of GBC by institutions, adaptation and acceptance by builders and Quality standards conformation by the Industry.
- Incorporation of GBC in the Town Planning Regulations and building by laws and ensure they are implemented.

The techno legal framework shall devise the following framework:

- Mandatory compliance for all new buildings except single or double story residential buildings for the first five years.
- Optional compliance for existing buildings within five years' grace period.
- Government should introduce incentives for developers, builders, town planners, owners of mega housing projects i.e. Bharia Town, DHA etc.
- Green retrofitting of existing buildings by introducing energy efficient lighting systems, rainwater harvesting initiatives, segregation of grey and back water, water efficient plumbing systems, replacement of centralized HVAC systems with inverters etc.
- Modification in designs of existing buildings
- Green Building Code will be notified by the Government of Pakistan for all Pakistan.
- Chief Secretaries of four Provincial Governments shall be taken on board for compliance.

**5. What further capacity building activities could be implemented in addition to a comprehensive and integrated programme for capacity building and skill development, stated in the Working paper.**

As per outcome of the workshop, in Pakistan 92% buildings constructed without compliance of building code despite developing four building codes, the major reason is lack of capacity building and technical trainings, lack of guidelines and code handbooks for the architects, engineers, technicians, masons and labour as well, therefore code compliance is weak.

To bridge this gap, it is recommended that capacity building tools should be part of the GBC provisions and should have implementation strategies and violation penalties as well.

Before devising the Policy, Laws and Implementation Framework regarding the Techno-Legal Framework of GBC; the Capacity Building up-to local level is necessary. An Advance Program of Capacity Building be launched and made compulsory for the Authorities having Jurisdiction to evaluate and accreditate the designing and construction of green buildings (i.e. a Technical Workforce In Building Departments, including Engineers, Architects and Skilled Workforce/Inspectors).

The Contractors engaged on green building projects be mandated to engage the Certified Technical Manpower trained in green construction works. The GBC complaint architectural, structural and energy systems" designs, based on Software Technologies (including Soft and Hard Components) be developed, and standardized as per the internationally adopted on basic scales of Life-Cycle Assessment and Mandatory Deterministic Energy and Water Consumption Ranges for each type or category of green buildings.

Detailed guide/ hand book of GBC shall also be developed in parallel for onward dissemination of information of GBC among the building control authorities, provincial departments dealing with planning and development projects.

Mobile phone application may also be developed for mass awareness program

Dedicated website of GBC may also be launched for greater circulation of Green Building Designs, Integrated Details of Green Products/ construction materials/ typologies of green construction method.

For effective implementation at grassroots, capacity building/ skill development of architects, engineers, technicians, masons and labour is vital otherwise green building code would not be effectively implemented.

Role of TEVTA, donor Agencies USAID, ILO, JICA GIZ, UN Habitat is vital to support the capacity building and skill development

Green Building Examinations be made mandatory for the Departmental Promotion. Emphasis be given to practical implementation techniques and the awareness about savings in recurring costs as a result of GBC interventions.

The local development authorities like CDA and LDA etc. should be having the capacity built by making their team members like architects and engineers to get LEED certificates and other degrees and certificate like them to award certification of Green Building Code implementations and must have a data base developed to communicate and educate the builders and house owners in the form of booklets and other digital formats giving them before a home is designed.

The potential areas for GBC training and capacity building were identified as follows

- Members of the professional bodies of engineers, architects and planners.
- Green building Auditors,
- Training for Community Based Organizations (CBOs)
- Green practices e.g. water conservation, energy conservation should be introduced at elementary school level to increase awareness of the user.
- Familiarization with GB techniques, materials to builders, labour and construction inspectors in building authorities and municipalities
- Promoting GB practices adopted with customization, localization and adaptation, relevance to local culture, climate, norms, behaviours, practices and economy worldwide
- Introduction of a course on Green Buildings and GBC in civil engineering and architecture curriculum of engineering and architecture schools in the country.
- Introduce short course on GBC in vocational technical institutes.
- Professional bodies, universities and other relevant institutions should run short courses on GBC.
- Develop strong and effective electronic and print media campaigns for different activities and stakeholders.
- Familiarization with GB techniques, materials to builders, labor and construction inspectors in Building authorities and municipalities.
- Promoting GB practices adopted with customization, localization and adaptation, relevance to local culture, climate, norms, behaviors, practices and economy.
- Awareness and capacity building of construction and manufacturing industries and GB material importers to adapt to GB techniques and codes.

**6. What initiatives could be proposed for induction of GB concepts and innovative technologies in addition to the vocational training institutions, engineering and technical universities through public private partnership and promoting strong linkage with industry and academia for producing accredited professionals and creation of a cadre of professionals for municipalities and building control authorities to support the GBC.**

Contractors and developers who are working on mega projects with imported construction materials have a practical approach and understanding of applications of innovative technologies for building construction and some of them are continuously improving the effectiveness of different technologies related to building construction industry need to be connected with academia by sharing their expertise and knowledge with researchers to further improve the effectiveness of the building technologies like solar systems, structural systems, windows and building automation systems etc. in this regard the builders can built energy in homes for examples in the university campus's compound where different

simulation tools like data loggers etc. can be fixed and others energy simulation systems can be implemented to improve the effectiveness of these innovative technologies.

Besides above initiatives following are proposed initiatives for induction of GB concepts and innovative technologies:

- Promote the locally available GB materials through advertisements
- As part of CSR, architectural and structural designs services could be provided, to a certain %age of beneficiaries, free or charging a symbolic fee. A substantial stock of buildings/houses particularly in rural and peri-urban areas are non-engineered and/or being constructed using carbon intensive designs by developing guidelines manuals, holding workshops, seminars launching training the trainers programme. Dissemination of knowledge and orientation of awareness through electronic and print media.
- Creating a green building standard, with different tiers e.g. gold, silver. This standard would be based on industry practices in Pakistan and. can be incentivised to project owners and builders, for example, by allowing them extra buildable area if they meet the gold standard. India has its own green building standard in place which is more widely accepted than other global standards.
- Intensive campaign (at federal, provincial, LG level) on GBC in context of CC adaptation and mitigation through mass media communication to aware the society of modern environment friendly construction techniques and their necessity.
- Explain the long-term cost effectiveness to the end user. For example, the government can finance the similar projects.
- Introduce mechanism for purchase of CO2 emission reduction by corporate sector through CSR from low and middle income households and the carbon credit earned by the corporate sector may be invested in GBC to transfer benefit of earning carbon emission credit to low and middle income households.
- Promote the provision of Built Green Houses, instead of developed plots and repeated sale of vacant plots.
- The Green Houses plans and code-specifications be standardized, to enable their mass production, and Market economy of scale.
- Regulate to fully implement the Standard Plans and Housing Layouts.
- Promoting GB practices adopted worldwide, as per SDGs & Carbon credit limits.
- Enforcement & compliance of GBC through fiscal & financial measures such as:
  - Low or Zero tax on certified sustainable materials
  - Low interest loans for those using green materials and methodologies
  - Green mortgages for purchasing housing using GB materials & methodologies
  - Tax exemptions and Reduced taxes on green materials import

The principle of Corporate Social Responsibility (CSR) be additionally used as a vehicle to promote and support programmes on innovation and local production of green building materials by the small and medium scale entrepreneurs. The GBC Implementing Authorities could potentially declare some mandatory sustainable measures for all corporations and industries.

**7. Name some incentives programme the government should develop to attract builders, developers and investors to GB practices, to support acceptance and implementation, in addition to the following;**

- Promoting GB practices adopted worldwide,
- Enforcement and compliance of the GBC through fiscal and financial measures such as:
  - Low or zero tax on certified sustainable materials
  - Low interest loans for those using green materials and methodologies
  - Green mortgages for those purchasing housing using GB materials and methodologies
  - Tax exemptions
  - Carbon credits
  - Reduced taxes on green materials import
- Enforcement of GB compliance be made voluntarily at least for 5 years at the initial phase, after expiry of this period the compliance may be made mandatory.

The incentive programme of the government to attract builders, developers and investors to GB practices to support acceptance and implementation could be offered by providing incentives through regulatory provision i.e. registration, certification, validation and implementation of GBC would need a triple E approach i.e. education, engineering and enforcement.

Donors may be encouraged to support development of GB inovative projects for research and development and promotion of local green building materials, investing in people through training and capacity building programmes.

There is evidence that the construction of Green Building compared to Conventional Building reduces the negative impacts, on both human health and natural environment. The green buildings are more energy- efficient, and resource-conserving. Such savings can be augmented through system design and value engineering from all building construction and engineering disciplines.

Therefore, an Integrated Green Design Process may be adopted by the Government through involving the Architects, Engineers, Contractors and Academia to develop Optimal Green Building Code for both residential and other buildings, with more focus on construction technology, sustainable materials and energy savings.

**8. What other gaps and opportunities do you recognise as necessary for the GBC in additions to the recommendations mentioned below for the new GBC?**

Recommendations for the new GBC include:

- Gradual adoption of green building technologies with coordinated efforts by all the relevant stakeholders
- Benefit analysis communicated to educate and develop a potential market
- Refinancing scheme offer from the State Bank for renewable energy
- International Green Building Rating Systems and Certification be tailored to local conditions
- Additional support to link industry and academia
- Mechanisms need to be set up for development, distribution and availability of green materials
- A dedicated programme for bringing on board Green Building Construction and Performance Rating Professionals

- Customised training programmes for different tiers should also be developed by EC, NEECA, etc. together with the Provincial Designated Agencies, SDMA, Municipal Committees, and Development Authorities, NESPAK, HVACR Society and Public Sector Universities, etc.
- Training and capacity building of professional cadre including the officers of C&W;LGRDD; Irrigation, Public Health, WSSP; and P&D Departments
- Updating and revision of existing codes
- Link the GB Code with local building and planning control, and permissions/approvals processes
- Implementation of mandatory vs. optional features of the GBC along timelines with an initial 5 years' grace-period
- The Government should undertake green building initiatives in all legislative and regulatory frameworks
- Priority should be given to green building while implementing the National Housing Policy, Naya Pakistan Housing Schemes, and concerned Sectors National Plans
- Life Cycle Assessment of green buildings should be undertaken to improve IEQ; health and productivity of occupants, based on regular data- monitoring of carbon footprint in various steps of building life cycle, including pre- and post- construction operations
- GBC should be based on efficient resource-use and environment friendly construction practices, in accordance with the updated scientific data as per international benchmarks and specifications compatible with the IT software based applications
- A rebates or credit programme would help the owners of building/house to opt for green building, instead of conventional construction methodology
- Other incentive instruments to be considered on-merit, are institutional incentives, subsidy and rebate programme, tax incentives schemes, low interest mortgage loan, voluntary certification system and technology assistance

In addition to the above recommendatins for the GBC Roadmap are as follows:

- Include the GBC in educational curricula at all levels. More emphasize be on the awareness regarding saving in energy, water and natural resources; and their economic benefits. This would be a main leading force for the success of introducing green building codes in Pakistan.
- To promote Indigenous Technologies Adaption for carbon emission reduction and conservation of natural resources, in rural areas, a Ban on Concrete Structure Houses/Buildings be imposed.
- An early approval of Green Building Code will expedite its enactment and implement the following measures:
  - Since there are no existing mandatory directions to implement GBC, it should be applicable on the both Existing and New Buildings.
  - Priority be given to large buildings in urban and semi-urban areas with emphasis on the Retrofitting of Existing Buildings.
  - Promote the use of Solar Thermal Panels and other sources of non- conventional energy, the green buildings be encouraged to work towards on- site energy generation; to reduce dependence on Power Grid.
  - Employ more the Waste Management to minimize the burden on municipal waste management facilities.

## 5.2. Section 2: Inputs from Key Stakeholders Breakout Groups

### 5.2.1. Breakout Group 1 – Professional bodies, Practitioners (including Architects and Town Planners), and Academia

#### Focus: Planning, Design & Technology

This group focused on the design stage of the building. The decisions made during this phase have major impacts on all other life cycle stages. The design requirements are established by green building codes and they determine the architecture of the building, which materials and technologies can be used, how the building is constructed and how it will be used; it can even plan for how the materials will eventually be recycled.

#### Response to Guiding Questions:

##### How can sustainable production and consumption be integrated in the planning of building projects?

- Products used in building design and envelope should be low carbon.
- How does the industry go from raw materials (in its production) to final design?
- Principal base document for the GBC should provide guidelines without restriction of material/product to achieve guideline-based data (for example: guideline on R-value on south side in national code so a variety of materials may achieve R-value in different regional conditions; similarly glass e-value and glazing ratio may be provided).
- There exists a gap between accounted and non-accounted materials in the MRS. These need to be covered and accounted for.
- Lifecycle of products used in planning and designing projects must be considered in all capacities of every sector in production.
- Quantification of carbon impact in this lifecycle should be done as well.

##### What is the status and role of BIM and 3D model-based planning in Pakistan?

- BIM and 3D model-based planning are in their initial stages and often are not implemented for green building considerations.
- Performative standard rather than prescriptive method for 3d-based planning should be guided.

##### How can cultural or vernacular architecture be incorporated into the GBC?

- Local knowledge and expertise already exist to improve building planning for a more efficient design. However, it is undocumented.
- How vernacular can be transferred to engineered?
- Conversion to form technical accuracy rather than thumb rules.

##### What is the role of technologies and local architecture practices in achieving implementation of the GBC?

- Academia to form integration with curriculum to combine vernacular knowledge with design during study and for understanding in practice.

- Provision of calculation for vernacular data (full scale testing and analysis models) [Note: there is a lack of specialization for such calculations among field experts presently]
- To form an in-between method which can certify the technology and digitized models provided by designers and builders (introduction of a third party which can do cost performative analysis)

What technologies and trends exist in the sector to support the GBC? What technology/knowledge gaps exist in Pakistan?

- We have not quantified the vernacular or cultural data available to us.
- Most present trends in building design require imported equipment (specially for MEP requirements). Though their efficiency may be high, cost of transportation increases carbon impact.
- There is a need for inclusion of qualified local persons (as per project) who can guide designer on how the preferred result can be achieved.
- Local knowledge consideration and the documentation of this knowledge.

What new methods and materials can be promoted?

- New materials are being considered and are in progress (A new material has recently developed: a non-ferrous/non-metallic pre-bar which is non corrosive and thence durable)

What other existing codes in Pakistan need to be considered? What international codes can serve as guidance for Pakistan's GBC?

- Relevant info exists both in Pakistan and internationally. Codes such as ASHRAE, seismic code provisions, EDGE information can be utilized by recreating the baseline data by using expertise from international knowledge.

What is the role of green building certifications and rating systems in the GBC?

- LEED does not officially exist in Pakistan and EDGE is underutilized. Local certification systems have been recently developed and need to progress further.
- Certifications are already being digitized which is a step in the right direction. Common use and acknowledgement are in process as well.

What other elements of planning, design and technology should be included in the scope of GBC?

- As a first step, feasibility reports on project should be made mandatory.
- GBCs should be considered in the initial stages of planning a project. Planning and designing should be done with contextualization of the project (as per location, topography, climate etc.)
- Inception considerations should be made part of GBC certification submission requirements (rather than addition as per after-thought)
- Impact Assessment should be mandatory of every project.



## 5.2.2. Breakout Group 2 – Builders and Developers

### Focus: Construction

This group focused on activities developed from the beginning of the construction until the completion of the building. This plays a large role, accounting for many of the major environmental impacts of buildings such as water and energy use.

### Guiding questions:

What are current construction trends in Pakistan?

- National Codes do not incorporate any green strategies and even international green building codes are not implemented.

What policies already exist for construction in Pakistan and can contribute to the new GBC? What types of buildings should be covered by the GBC? What other elements of construction should be included in the scope of the GBC?

- Strategies to convince the end user like long term benefits should be told and other measures as community benefits. The end user is never convinced and always reluctant to invest on the strategies
- Less energy consumption

What materials allow cleaner, faster, and less resource-consuming on-site processes? How can the use of these materials be built into the GBC?

- Use of innovate materials, technique leading towards to cost effective strategies and light weight building materials.

How can sustainable new methods and materials can be promoted within the GBC?

- Induction of GBC in curriculum of universities and technical institutions, so that the new graduates come out of institutions with the necessary knowhow and technical solutions to implement GPC in future projects
- Make it mandatory to carry out periodic Energy Audit of buildings and industry and rectify the causes of additional energy consumption
- Impose a tax on carbon emission beyond certain approved range, worked out on the basis of GBC and life cycle assessment.

### DISCUSSION NOTES:

#### Questions raised:

- What is the cost comparison for building construction with conventional method and provisions of GBC?
- What is the cost benefit analysis of implementing GBC over the building life cycle?
- Can cost saving be another a Use of innovate materials, technique leading towards to cost effective strategies and light weight building materials.
- and major factor pushing the developer towards adoption of GBC?

- Does the existing Construction industry has capacity and skills to adopt and implement GBC?
- Would the end user be ready for the additional cost of GBC if any?

**Discussion:**

- Use of innovate materials, technique leading towards to cost effective strategies and light weight building materials.
- No, national codes do not incorporate any green strategies and even international green building codes are not implemented.
- We must promote strategies and promotion on the larger scale as well as on the smaller scale.
- Requirement of the day should also considered.
- The end user is never convinced and always reluctant to invest on the strategies.
- Strategies to convince the end user like long term benefits should be told and other measures as community benefits.
- Less energy consumption.
- Long term promotion in education institutes and on a smaller scale for professionals should be trained in construction and gain more knowledge about the material strategies.
- Increase the outreach
- Government should play the role in promotion by models, examples, and case studies.
- Initial cost increases and long-term benefits promotion and awareness.
- To make people aware of strategies while change the mindset f the people and should provide them with linear and effective solutions.
- Two face awareness in long term run and short term run to professional and architects.

### 5.2.3. Breakout Group 3 – Civil society and NGOs

**Focus: Use of building**

This group focused on the daily operation and maintenance processes, which involve energy and water consumption, in addition to waste generation. This also relates to repair and replacement of building components. This is typically the longest stage for a building with many problems associated to it, especially in a changing climate.

**Guiding questions:**

How can the GBC support digitalization help to mainstream sustainable energy use in buildings?

GBC can help creating laws for inclusion of digital technologies as part of building construction, i.e. building automation systems, heating and cooling loads calculating devices. Similarly, on the other side GBC can provide guidelines for creating are an e-Library, Blogs and Websites containing the data and research material projecting the usage of sustainable energy use in buildings easy to understand and applicable by a common man. This is possible with inclusion of Ministry of Information Technology, local development authorities like CDA, LDA and Metropolitan Corporation etc. For example, the mayor’s office in Islamabad has taken initiative to work on the same lines. Also the expertise and data base of NGOs and civil society organizations can be helpful for this program.

#### What are current trends in the usage stage of a building in Pakistan (increased cooling activities, etc.)?

There is an increased excessive usage of glass on building exterior which increases the cooling loads on air conditioners eventually increases the usage of energy in the form of electricity and increases the greenhouse gas emissions to the climate. Water and sewerage pipelines are not used as per requirement i.e they have smaller or bigger diameters than required resulting in additional wastage of water for day to day activities. There is no culture of making green roofs to reduce the solar heat gain through the roof surfaces, instead there is no heat insulation practice which again increases load on cooling devices like air conditioners and room air coolers etc.

#### What technologies and trends exist in the sector to support the GBC?

Double glazed windows are available in the market but are expensive as they are imported which makes it difficult to common man to purchase and install in their houses to reduce heat gain and heat loss of the building. Solar panels are also available in the market at comparatively lesser prices but again for poor common people are not accessible. Energy efficient air conditioners are available in the market which also reduce emission of greenhouse gases. Geothermal cooling systems are available with locally skilled engineers but again are expensive when it comes to common man. LED lights are also available and are used at commercial scale.

#### What technology gaps exist in Pakistan?

The only problem faced in Pakistan while adopting / using the green building technologies is their high cost and lack of research and development of cheaper solutions for common people. Building automation systems for smart buildings are not practiced due to unavailability of engineers who are trained to design the drawings for applications of these systems in buildings.

#### How can the GBC plan for buildings to adapt to new environments in a changing climate?

The GBC needs to project and make the suggested applications of technologies to masses so that people who are unaware of the available provision be able to know and use these technologies. The GBC can help departments to be equipped to help the people who want to apply these technologies.

#### How can the GBC support monitoring and reduction of natural resources (energy, water, etc.)?

The GBC can help and create space for NGOs and civil society organizations to have access to different concerned authorities to get help for implementations of green building solutions for common people for application and monitoring purposes.

#### How can the energy performance of appliances be guaranteed with the GBC?

The GBC can recommend the usage of double glazed windows as mandatory for buildings which can help reducing the heating and cooling loads on appliances which can help their effective performance.

#### What communication activities can ensure the citizens are aware of conserving water and energy resources?

Electronic and print media campaigns can help increasing the awareness and the NGOs and civil society organizations are the best suitable channels for this task as they know how to reach the people especially in rural areas of Pakistan.

#### What other elements of building use should be included in the scope of the GBC?

The GBC can recommend the incorporation of courtyards and patios which are part of our culture and social life as well and their presence can help keeping buildings environment friendly and can make peoples life healthier.

### 5.2.4. Breakout Group 4 – Government agencies

#### **Focus: Nurturing an environment for a GBC**

This group focused on the linkages and synergies of policies, the SDGs and NDCs with a green building code. Pakistan's National Action Plan on SDG 12 (NAP-SCP) can act as a tool for this group to incorporate the SCP principles into the roadmap and implementation of the GBC. The United Nations SDGs comprise 17 different goals with 169 targets aimed at addressing complex global challenges and envisioning a global sustainable future. Given the significance of the construction sector, it is also important to consider the built environment for the long-term goals established by the Paris Agreement and NDCs.

#### **Guiding questions:**

#### What is role of national policies, legislations & national initiatives for GBC?

The GBC be a performance-based document to achieve sustainable results, rather than meeting only technical requirements for individual building components, or larger units (e.g. energy efficiency of buildings, instead of the thickness of thermal insulation, etc.).

To effectively implement the Pakistan GBC, it has to be based on a performance system, and inclusive of the following 3 components:

- I. Green Building Standards, as per the relevant Specification (Reference-wise); and describing the methods for complying with the GBC (where necessary).
- II. Green Building Code Compliance Evaluation Tools (i.e. Rating Systems), based on the methods to review and verify the adoption of green designs and building standards; and to also facilitate in undertaking the Environmental Audits.

After the formal approval of Pakistan GBC, the Ministry of Climate Change needs to immediately interact with all Provincial and AJK Governments to firstly finalize the following.

- i. The **Green Building Standards**, applicable in all Urban Local Governments' Municipal Bodies;
- ii. The Urban Local Governments i.e. Municipal Building Control Agencies will incorporate and enact the **GBC Complaint Provisions** in respective Building Regulations; and
- iii. the Ministry of Climate Change will decide an appropriate GBC **Compliance Rating System or s**, readily applicable in all urban areas; along with implementing a nation-wide capacity building program.

After the completion of Green Building Standards, along with the Complaint Provisions and Compliance Rating System, the Ministry of Climate Change will **notify a Cut-Off Date** to enact the GBC in all urban areas throughout Pakistan; in two Phases as under.

- i. **First-Phase (spanning 3 to 5 years):** With effect from the announced Cut-of-Date, the application of Pakistan GBC would be mandatory for the all new Government funded New Public-use Buildings and Residential Units in urban areas.

During First-Phase, the Private Developers of new Buildings or House Builders will be encouraged through social-media awareness campaign to design and construct their projects as per the GBC; besides, the provisions of incentives like monetary-concessions and more loans for green building; approval of plans; incorporating relevant GBC Provisions in the Business Contracts; etc.

- ii. **Second-Phase:** After expiry of the First-Phase, the application of Pakistan GBC would be **declared as Mandatory** for the new public and private buildings and residential units in all urban settlements.

The Pakistan GBC is recommended to be adopted up to the Urban Local Governments' level.

The GBC be given Legal Cover under existing Building and Housing Policies, Bye Laws and Acts. For this purpose, the most relevant Institution, Authority and/or Council be specifically notified.

To adopt the Pakistan GBC up to the Municipal Governments' level, the application of GBC after a Cut-of-Date be made an essential pre-requisite under the all in-vogue Housing and Urban Development Policies, Programs and Annual Plans. Accordingly, the In-Charge Institutions responsible for the effective compliance of the GBC (both, during construction and post-occupation O&M of green buildings), be identified up to Local Government levels.

Future Physical Planning, Housing and Urban Development Programs should ensure the compliance of GBC. To explore the international support to effectively implement Green Code, align the GBC's provisions with the goals/targets of WB-SDGs11 & 17; the UN-10YFP and the New Urban Agenda of Habitat. Accordingly, the GBC must provide a common framework of green standards and practices acceptable to all public institutions, development authorities and building departments, receiving budgetary funds.

The GBC should also be applicable for the old buildings, through such GBC Rating Criteria; which augments the implementation of GBC, and also serves as an evaluation tool to measure the environmental aspects of retrofitted buildings through their life cycle.

The GBC be implemented simultaneously at Federal and Provincial levels.

#### What policy is needed (regulatory, advisory, financial,) to support GBC?

Regulatory policies (e.g. Product standards, building codes, sustainable procurement obligations, mandatory certificate of buildings, certification & renewable energy solution, mandatory labeling of products, smart meters, etc.); and also, the fiscal instruments/incentives (energy or carbon taxes, tax exemptions & reductions, public benefit charges, grants, soft loans etc.), are required.

#### How to make the GBC more practical as to reach scale?

- The GBC needs support of regulations and financial incentives. The Government needs to make sure that the higher tiers are well aware of GBC's basic concept. It will be helpful in efficient implementation of Green Code Provisions, and also a Safeguard against any Conflict or Litigation.
- The Stakeholder's involvement, and their capacity building will be the good contribution to reach the scale as per GBC's Thresholds.
- Construction of Model Green Buildings as Pilot Projects, along with a campaign on print and electronic media for public awareness, will perpetuate the trend of shifting from traditional construction to Green Building Construction.
- Ensure the availability of Green Building Materials and Application Tools, etc. in local market at reasonable and compatible costs.

- By incorporating the Carbon foot printing of new buildings, and introducing green procurements and financing based on certification system (i.e. EDGE), will speed the *GBC to reach scale*

#### How can GBC help achieve commitments under Paris Agreement & SDGs?

- In Paris Agreement, the member countries are committed to decrease 1.5 to 2 degree, so that the GBC can play a vital role in managing the temperature. For this, an involvement and acceptance of all relevant stakeholders is needed. The GBC implementation can add into such efforts of the stakeholders.
- Since Pakistan is a signatory to the Paris Agreement and SDGs; therefore, it is mandatory for it to shift to Green Building Code instead of conventional techniques. However, for that it is recommended that Regulatory Option should be introduced, only when the basic necessary level of awareness, capacity building and practical models are available.

#### How can the GBC help in localizing the SDGs?

- The GBC can be localized by more awareness, capacity building and incentivisation. It can be implemented in buildings financed under the Federal PSDP Projects, as model followed by Energy Audit and their replication in the projects funded by Provincial ADPs.
- Workshop, Seminars and Trainings of the GBC on regular intervals will be helpful in localizing the SDGs. The SDGs targets need working for clear environment, ending poverty and implementing GBC through stakeholder. Then, it can localize the SDGs and give understanding as per top to bottom approach.

#### How can the social and cultural dimensions of sustainable buildings be encouraged (quality of life, communities, safety, etc.) by the GBC?

- By keeping in view quality of life, communities and their safety, the GBC can augment the social and cultural dimension of green buildings; as well as, their occupants. So it is highly recommended that all GBC Stakeholders must be the part of strategic process.
- Taking the benefit of best practices around the World in Green Building Construction, which can easily be opted in Pakistan.

#### How can the GBC promote the different SDGs, including: Ending poverty (SDG 1); access to affordable, clean energy (SDG 7); safe, resilient and sustainable human settlements (SDG 11); and sustainable consumption and production (SDG 12)?

- GBC has a potential to promote the SDGs. It is suggested that firstly, a Preliminary Format of GBC be prepared, and its usefulness and application-importance be disseminated through the training/seminars/webinar etc.
- SDGs relate to clean water and sanitation (SDG6), access to next-generation energy (SDG7), and other targets along with the climate-focused commitments in the National Determined Contributions (NDCs) to Paris Agreement. Also, the Green Bond Markets be explored; along with Renewable Energy, and other projects that address high priority GHG Emissions Reduction Targets.
- Private developers involved in mega buildings should be targeted and trained, followed by their awareness session. The Government resources are limited, and the involvement of Private Sector will result in more spread of development activities; which may reduce poverty (SDG-1),

improve access to affordable clean energy (SDG 7); ensure safe, resilient & sustainable human settlements (SDG 11); and will result in sustainable consumption and production (SDG 12).

**Last, but not Least:** The GBC will remain an academic exercise, if the ownership is not given to the most appropriate Authority/Institutions. Simultaneously, the Green Building Rating and Products Labelling of Materials, Fixtures and Instruments are to be made mandatory for Local Industry and Market.

Currently, the GB concept is new for local markets and more effort is needed to develop its value in the market, as well as in the community. There remains a gap in market awareness regarding the carbon emissions and certain steps would be required to help reduce it. Therefore, the Government Institutions must gain support from the all stakeholders for the development and widespread adoption of GBC; besides, the sensitization of public about the Green Building Code, Bye-Laws, Regulations, Standards and Specifications.

The Government is requested to integrate the suggestions and recommendations made during Today Workshop, and to accordingly further develop the GBC; in order to mitigate the existing and forthcoming impacts of Climate Change. Also, incorporate the Green Building Construction Interventions in the National Cooling Plan under Ozone Depletion Strategy, etc.

All National Development 5 Year Plans should specifically include the Programs and Action Plans to control Carbon and GHG Emission, etc. as listed down in the National Action Plan on SDGS and Climate Change Protocols. Also, the Annual Policies need to include Specific Regulatory and Advisory Measures to Promote GBC Construction through Widespread Marketing and Technical Expertise of GBC Implementation

### 5.2.5. Breakout Group 5 – Corporate/private sector and Investors

#### **Focus: Financing environment**

This group focused on contemplating the possibilities of financial support for the implementation of measures within the value chain. Financing green building design and energy efficiency measures in construction still represent a major challenge. Different concerns revolve around lack of awareness of financiers, perceived risk exposure, or long payback time. Therefore, these barriers should be addressed to stimulate the market for green buildings in Pakistan.

#### **Guiding questions:**

What kind of finance is needed for a broad uptake of the GBC in the case it is implemented on a voluntary basis?

As the GBC would be implemented on a voluntary basis, it shall attract a large number of people by introducing innovative green built designs, water & energy efficiency, and quality of life with global concept of sustainable housing. It is worth mentioning here that government has approved the largest house built finance in Pakistan, For example, the State Bank of Pakistan in consultation with stakeholders and commercial banks has approved and launched the first-ever **low-cost housing finance** in Pakistan as follows:

- a) Covered area of the housing unit / apartment up to 850 square feet
- b) Maximum value of the housing unit/apartment up to PKR 3.5 million
- c) Loan size up to PKR 3.15 million

Other commercial banks, (Askari, National Bank of Pakistan, JS Bank, Bank Alfalah, Allied Bank, House Building Finance Corporation etc.) are offering financing to house construction. Multiple finance is available but green building code is missing link to tap all this huge finance into the green built environment.

### How can a business case for green buildings be communicated to planners, builders and developers?

Policy makers, financial institutions, insurance companies, industry and academia with the help of Building Control Authorities and development agencies shall first modify the building regulations and byelaws by incorporating innovative green built architectural and sustainable housing features for approval of all new building plans by giving voluntary options. Transformation of advanced options, green built designs and sustainable housing technologies have great potential to make space in the value chain of construction market. These value additions give better returns to real-estate business partners including planners, builders and developers). Mass awareness and effective communication by promotions and incentives, green branding and marketing be launched to cater to the huge market of new 300,000 housing units per year. Role of ABAD and CAP is vital in encouraging the introduction of green built technologies. Green approval fees shall be incentivised by building control authorities to promote green and sustainable housing culture in Pakistan.

### What schemes have been successful for fostering previous building codes?

#### *Role of Building Code of Pakistan Seismic Provisions-2007:*

After the devastating earthquake 2005 wherein 80,000 people died, the government immediately encouraged and introduced various schemes for seismically safe building construction to avoid such kind of lateral damages in the future. The Building Code of Pakistan (Seismic Provisions-2007) developed and notified by the government on war-footing basis, for successful implementation of seismic code, then the Prime Minister of Pakistan directed all policy makers and building control authorities for launching various incentives schemes for successful implementation of the code, accordingly, the policy makers, regulators amended their regulations and bye-laws of building control authorities in light of seismic provisions. The biggest national reconstruction and rehabilitation scheme extended the various social welfare schemes. For example, all leading international relief organizations and national organizations reconstructed thousands of schools, buildings of emergency responders, police stations, hospitals, rescue centres etc. New homes for thousand people constructed with new and improved seismic code 2007. Now, the builders and developers are introducing various new schemes attracting customers by developing the seismically safe and tested buildings across the country.

#### *Role of Building Code of Pakistan Energy Provisions-2011*

For successful launching of Building Energy Code-2011, the already executed national scheme "Alternative and Renewable Energy Policy-2006" played a vital role in its effective implementation.

For instance, The Prime Minister introduced a national energy efficiency scheme and 5-10 kWh solar systems were free of cost installed under Prime Minister's Solar Initiative Program on famous public places i.e. Shrines, Mazar-e-Quaid, Supreme Court of Pakistan etc. These famous schemes fostered the effective implementation of Energy Code, first ever the concept of energy audit was introduced in public and private buildings in Pakistan. The government offered incentive schemes up to 50% financial assistance without mark-up on installation of solar systems for residential and agriculture, industrial consumers. Similarly, other codes (seismic, fire and electric safety) initially enforced as voluntary compliance for the first 3 years.

#### *Role of Building Code of Pakistan Fire Safety Provisions 2016*

In Pakistan, every year several thousand fire incidents occurred, for handling this traumatic state of fire incidents, the National Disaster Management Authority on the directions of the Prime Minister initiated development of the first ever Fire Safety Code in 2016. The first code which provided the most effective implementation schemes and extended the fire audit of all public and private buildings.

The scheme of fire code made responsible to the owner and the occupant as well in case of negligence and compromising the fire safety parameter. Now, policy makers, regulatory agencies, builders, developers are successfully implementing the fire code in letter and spirit in all mega projects.



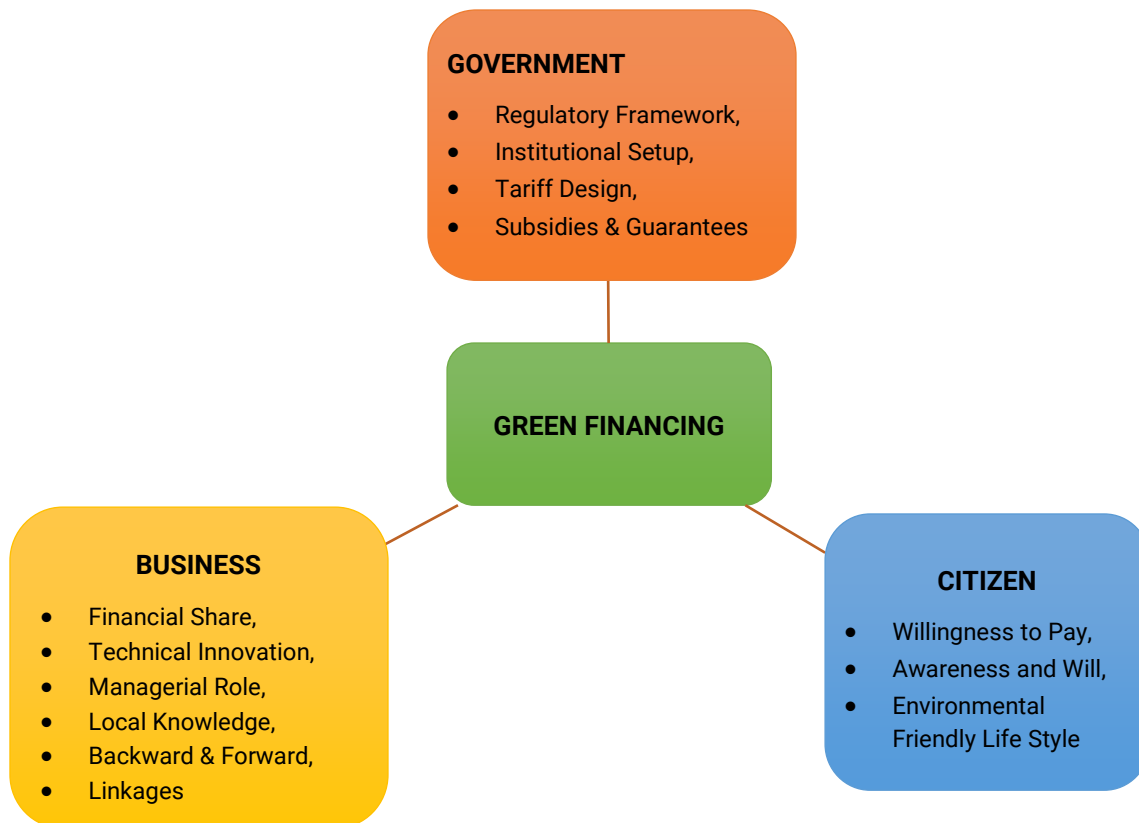
Which financial incentives are able to encourage the implementation of the GBC?

For financial incentives and effective implementation of GBC, the government may take on board the relevant stakeholders (manufacturers, builders, planners, corporate sector and commercial banks) and shall first devise a **“National Green Finance Housing Policy”** by incorporating the following incentives:

- Policy instruments have significantly stimulated the development of green housing.
- Identify major issues, gaps, barriers, strength and opportunities for green financing initiatives,
- All new green construction be encouraged and supported by building control authorities by offering 50% discount on grant of approval for green built design and construction,
- Green bond or fund and green insurance may be launched,
- Green public housing schemes have significant spill over effects on the private housing sector for adaptation of new green built environment,
- The success story of China's existing energy pricing mechanism has lessen the cost-saving motivation
- Green products manufactures be encouraged and zero taxation be offered for next 10 years for transfer of green technologies at local level,
- Green loan for green construction, green retrofitting be introduced and launched,
- Green certification, rating systems and incentives be offered,
- Emission reduction and trading be launched for local industry,
- Korean green finance scheme be replicated in Pakistan being a comprehensive model.

How can financiers be involved in the implementation process and roadmap?

A national green financial policy and plans must make evident the fundamental green projects with cost and benefit analysis that the financiers need to invest with government backed securities. The capacity building and training of financiers and building control authorities are encouraged for tracking the Key Performance Indicators related to effective implementation of GBC processes. According to UNEP the following green financing regime is described the role of the Government, corporate sector and citizens for promotion of green financing:



#### How do we achieve sustainability in the building sector?

The built environment accounts for 45% of total carbon emissions, 32% of landfill waste comes from the construction and demolition of buildings, 13% of products delivered to construction sites are sent directly to landfill without being used. For achieving the sustainability in the building sector of Pakistan, there are various environmental protection legislation is promulgated by the Ministry of Climate Change, for instance, as per National Environment Quality Standards (for municipal & industrial waste, transportation, ambient air quality, drinking water quality etc.), Environmental Impact Assessment and Initial Environmental Examination Reports are sufficient tools to ensure sustainability of the buildings sector in Pakistan. In this regard, capacity building, skill development and transfer of new technologies and equipment for Pakistan Environmental Protection Agency and Provincial Environmental Protection Agencies would further strengthen the effective monitoring of sustainability in the building sector.

#### Are there sufficient financing opportunities?

Yes, there are sufficient financing opportunities available in Pakistan, the Government of Pakistan is envisioned and committed to overcome acute shortage of housing units in Pakistan, the State bank of Pakistan in consultation with stakeholders defines the approved the largest low-cost housing finance as follows:

- Covered area of the housing unit / apartment up to 850 square feet
- Maximum value of the housing unit/apartment up to PKR 3.5 million
- Loan size up to PKR 3.15 million

Through NAPHDA and National Housing Authorities in all four provinces, the government backed housing projects directly or indirectly funded by the government and commercial sector banks and the housing building finance corporation as well.

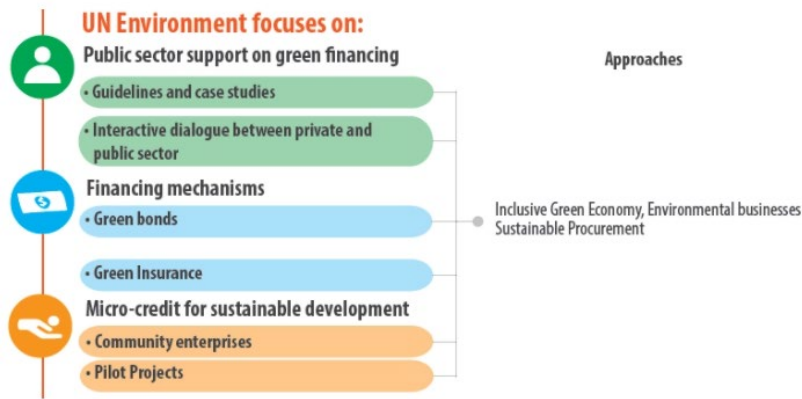
According to survey results conducted in the preliminary session to the workshop, it was found that less than 1% people are aware about the green building. Despite the importance of green buildings, unfortunately, in Pakistan the subject of green building has not been backed by the government agencies yet.

The road map of GBC shall include the proposal for devising a **“National Green Finance Housing Policy”** to encompass the best financial models as per indigenous retirements.

It was found during the survey that NAPHDA has been receiving offers from various countries who offer the precast / pre- fabricated green built technologies to Pakistan but due to certain financial and technical issues it is difficult for NAPHDA to launch such kind of new green technologies. In this regard, a joint venture between NAPHDA and leading international manufacturers of green built technologies is suggested. Unless Direct Foreign Investment or funding government agencies are reluctant to adopt the green built technologies despite having the huge market and shortage of 1.2 million houses in the country. The financial institutions are also reluctant to recommend any new green technology which they have not even tested or accredited its durability.

What are suitable financing models for green buildings?

UNEP described that Green financing is to increase the level of financial flows (from banking, micro-credit, insurance and investment) from the public, private and not-for-profit sectors to sustainable development priorities. A key part of this is to better manage environmental and social risks, take up opportunities that bring both a decent rate of return and environmental benefit and deliver greater accountability. UN environment focuses the important role of the government backed suitable financing models for green buildings as indicated in below picture:



# ANNEXURES

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## ANNEX I

### Welcome Address by Mr. Irfan Tariq - Director General, Ministry of Climate Change

Honorable Special Assistant to PM on Climate Change Mr. Malik Amin Aslam,

First Secretary, EU Delegation, Pakistan Mr. Sven Ruesch ,

Honorable Panelist,

Respected participants from Government, Professional Bodies, Academia Architects, Town Planners, Builders and Developers, Civil Society, NGO and Corporate & Private Sector.

Ladies and Gentlemen

Assalam-o-Alaikum and Good Morning.

On behalf of the Ministry of Climate Change I feel delighted to welcome you all here to participate in this Multi stakeholder Consultative Workshop. This workshop is planned for a thoughtful discussion, highlighting the opportunities and gaps for the development of Green Building Code for Pakistan. The overall, aim of this workshop is to assess the gaps and challenges in the implementation of the country's green building code and gain further insights to improve the roadmap based on due recognition of the level of socio economic and technological barriers that need to be adequately addressed.

The Ministry of Climate Change, is thankful to the European Union SWITCH-Asia Program, for providing support since 2018 for initiating the work on Green Building Code for Pakistan. In the first phase the Ministry Developed the "Policy Guidelines for Green Building Code "and in 2020 the work on second phase was initiated to develop Road map for detailing out Code Development.

The Code will provide guiding principles to save water, energy and material resources in the construction and maintenance of buildings and will reduce or eliminate the adverse impacts of buildings on the environment and occupants.

Building sector is responsible for a huge share of energy, electricity, water and consumption of materials. The building sector has the largest potential for significantly reducing greenhouse gas emissions compared to other major emitting sectors at little or no cost. Green building concept, in broader terms, involves a building, which is designed, built, operated, maintained or reused with an objective to protect occupant health, improve employee productivity, use natural resources wisely and reduce the environmental impacts. In other words, the green building process incorporates environmental consideration into every stage of the building construction. This process focuses on design and development efficiency, energy and waste efficiency, resources efficiency, indoor environmental quality, building-owner maintenance and the buildings overall impact on the environment.

I appreciate the hard work of the technical team led by Mr. Jawed Ali Khan, which made it possible to successfully steer and coordinate the process of development of the code with Government, Professional Bodies, Academia, Builders and Developers, Civil Society, Corporate & Private Sector.

I look forward for active contribution and valuable inputs in the thematic area of discussion in this workshop. With these words, I welcome you all again and look forward to sharing ideas and suggestions for devising an effective Road Map for development of Green Building Code for Pakistan. I wish you all, a great success in this endeavour.

Thank you.

## ANNEX II

### Address by Mr. Sven Ruesch - First Secretary, Team Leader - Economic Cooperation European Union Delegation to Pakistan

It is a great pleasure and honour to be here with you today to bring to you heartfelt greetings from the Ambassador of the European Union to Pakistan, Ms. Androulla Kaminara and the Head of Cooperation of the European Union Delegation to Pakistan, Mr. Ovidiu Mic, who are currently on other duties and asked me to deliver these remarks to you.

The EU is very pleased to contribute to Pakistan's actions under its "National Action Plan on SDG 12, Sustainable Consumption and Production", specifically to support through this large workshop the finalization of the draft "Roadmap to a Green Buildings Code" so that it may become an easy to understand guide showing the steps to be taken by specific partners.

According to UN projections, Pakistan's population will be over 380 million by 2050, and Pakistan will become the world's fifth largest population and 16th largest economy. This may underline the value of enacting policies today, which make our economies, our production and our consumption sustainable and truly circular.

Please allow to recall two parameters that signify congruent objectives on the part of Pakistan and the EU: the Ecological Footprint and the (ii) Paris Agreement of 2015:

(i) Today, on world level, we are still on a path of a growing deficit of the per-capita ecological footprint vis-à-vis the per-capita available bio capacity. Specifically,

- Both the EU27 on average and Pakistan exceed twice their respective bio capacity. According to data of 2016 the EU-27 Footprint was 4.6 global hectares per person, twice the size of its bio capacity. Pakistan's footprint is about 0.8 global hectares per person against a bio capacity of 0.4 global hectares per person and hence it also exceeds its bio capacity twice.
- Both the EU and Pakistan aim to lowering their respective ecological footprint while continuing advancing the Human Development Index and per capita economic growth.

In other words, lowering our ecological footprint while further raising economic growth and the Human development index is our common goal but is new in empirics.

Both Pakistan and the EU know that if our current path of ecological footprint would continue, which is mainly made up of the carbon footprint, we would not achieve our joint goal of limiting global warming to below 2 degrees Celsius, compared to pre-industrial levels. This leads to the second mentioned parameter, the Paris Agreement of 2015.

(ii) Both Pakistan and the EU signed together with 194 other countries the Paris Agreement in December 2015 within the United Nations Framework Convention on Climate Change, a legally binding international treaty on climate change. And both Pakistan and the EU are delivering on it. Being a country highly vulnerable to climate change outstanding examples of how Pakistan is delivering on the Paris Agreement include the following:

- Its "Intended Nationally Determined Contribution (INDC)" to reduce its greenhouse gas emissions by 20 percent below the projected 2030 emissions.
- The Billion Tree Tsunami launched in 2014 by the government of Khyber Pakhtunkhwa restoring 350,000 hectares of forests and degraded land to surpass its 2018 "Bonn Challenge" commitment as a follow up of the Paris Agreement of 2015.
- The Clean Green Pakistan Movement with the Clean Green Pakistan Index launched in October 2018 by the Prime Minister, which addresses five components: plantation, solid waste management, liquid waste management/hygiene, total sanitation, and safe drinking water. This movement has a specific focus on empowering citizens to seek access to basic services but also making themselves equally accountable and responsible for Clean Green Pakistan. These actions prove Pakistan's efforts to change our behaviour and strengthen institutions.

And the European Union is delivering under its new comprehensive “European Green Deal” to achieve climate neutrality not only in the European continent, but globally with our partners. The EU aims to achieve no net emissions of greenhouse gases by 2050. With our new target to cut EU greenhouse gas emissions by at least 55% by 2030, we are determined to play our part. Going beyond the EU’s borders, we are promoting the Green Deal as an integral part of the EU’s response to the 2030 Agenda and the Paris Agreement. Environmental sustainability and building back better after the COVID-19 pandemic are global goals – also shared by our partner Pakistan. We can also see others aligning themselves with our ambitious course. China set a climate target to achieve carbon neutrality by 2060. South Korea has set the same target for year 2050, the same as Japan. The United States is also returning to the global climate table. Our recent ‘Biodiversity’ and ‘Farm to Fork’ strategies set out the EU’s ambitions to protect 30 % of land and sea areas in Europe and around the world and boost the transition to sustainable food systems. Our green recovery efforts will be based on a ‘do no harm’ principle, meaning that we will not support investment in fossil fuels or development of carbon intensive economic activities. With the new multiannual financial framework, we also start our programming, which sets the course in line with the paradigm shift brought about by the 2030 Agenda, the Paris Agreement and the priorities of the European Commission – especially when it comes to green, digital and human development. Our new budget includes a 30 % spending target for climate-related action and ambitious spending targets for biodiversity. We are currently preparing flagship proposals, called Team Europe Initiatives, as they are coordinated with the EU member states present in Pakistan and of course the Government of Pakistan.

The year 2021 will be key for the EU to deliver on its green ambitions and show vision and leadership on the multilateral stage. The upcoming UN Climate Change Conference (COP26) in Glasgow and the UN Biodiversity Conference (COP15) in Kunming as well as the Second Finance in Common Summit and the World Food Systems Summit, create a crucial momentum for our engagement. We join forces with the Government of Pakistan, civil society, local authorities, financing institutions and the private sector. The EU recognizes that it is critical to mainstream green action into our entire cooperation with Pakistan. We need to develop integrated responses focusing on a green and fair transition, contributing to human development, post-COVID recovery and reduced inequalities. Education is a prime enabler for the green transition. Europe will be stronger in the world if we succeed in building a global Green Deal with our partners, and especially Pakistan. So, let’s make it happen and your work in this workshop is proof of this will.

And please allow to mention one fact which pertains to those observers who may rightfully point to the qualification which was attached to Pakistan’s intention to reduce its greenhouse gas emissions by 20% below the expected level by 2030: this qualification is the availability of international financial support. And therefore, the Paris Agreement of 2015 includes a chapter on financing to developing and vulnerable countries for climate mitigation and adaptation. For this purpose, the so-called Green Climate Fund is offering a large array of financing instruments, including loans, equity, guarantees and grants to design bespoke solutions that tackle specific investment barriers. In addition, and only for developing countries this fund is offering financing for public sector projects which can include loans and grants and also include public sector entities, such as state-owned enterprises. Therefore, lack of financing should not be a reason for not being able to achieve the ambitious climate mitigation targets, especially reducing the greenhouse gas emissions. Please let us jointly explore how Pakistan can make full use of this available financing.

Against this background it is indeed a privilege to address this multi-stakeholder workshop that aims to improve the roadmap for implementation of Pakistan’s Green Building Code and hence for its acceptance and incorporation of potential SCP principles. And it is a privilege to be able to address you in the presence of the Minister of Climate Change, which testifies to the importance of your work.

The EU is most grateful for and interested in all your efforts in this great workshop under the EUs SWITCH-Asia programme and hopes that it may lead to an easy to understand Roadmap for a Green Building Code and for this Green Building Code to be implemented soon.

Thank you very much dear Minister, thank you very much dear contributors to this workshop, and thank you very much dear organizers for your efforts and kind attention!

### **ANNEX III**

#### **Keynote Address by Mr. Malik Amin Aslam**

Excellences,

Ladies and Gentlemen

Assalam-o-Alaikum, and a very Good Morning,

It is my great pleasure to see that a galaxy of professionals and key stakeholders from academia, national regulatory bodies of engineering, architecture and town planning, builders and developers and civil society organizations, have gathered here to deliberate on the road map for “Implementation Opportunities and Gaps for the Development of Green Building Code for Pakistan” being supported by EU SWITCH-Asia SCP Programme. This work was initiated in 2018 with the support of EU SWITCH-Asia SCP Programme, UN Environment and UN Habitat which led to the development of “Policy Guidelines - Green Building Code for Pakistan.

Let me reiterate that, in line with the commitment of the Government to pursue climate resilient and green development initiatives the Ministry of Climate Change is working on the development of the Green Building Code for greening the Building Construction Sector in Pakistan as well as introduction of Green Building practices in the Prime Minister’s five Million Naya Pakistan Housing programme.

Ladies and Gentlemen

I am looking forward that the experts will review the work done so far and will draw up the roadmap for the development of a Green Building Code for Pakistan which takes into consideration our ecological diversity, extreme weather events and is resilient to climate change impacts triggered by increasing frequency and intensity of temperature and rainfall.

I am sure adoption of Green building practices will make structures and processes, environmentally responsible and resources-efficient throughout the building's life cycle. Substantial savings can be made through integrated planning and adopting environment friendly designs, by involving the architects, engineers, city planners, contractors and clients to develop an optimal design in terms of technology, materials and energy savings. Moreover, the construction of green buildings will also support in achieving certain benefits, in line with the Sustainable Development Goals

Ladies and Gentlemen

The realization of Green Building Code would be crucial in creating a market demand and uptake of green building techniques and practices, focusing on the production and application of environmentally supportive construction materials and sustainable building elements. It will also promote the use of locally manufactured products that are non-toxic, reusable and recyclable.

By building green, we can reduce the impact of our buildings as it will generate less greenhouse gases, because they encompass structure's planning, designing, construction, operations and end-of-life recycle impact.

Green Building Code will indicate requirements and standards essential to achieve eco-friendly sustainability in different elements of building, aiming to use less water, optimize energy efficiency, enhance indoor environmental quality, generate less waste, and provide healthier spaces for occupants to increase their productivity, encourage resource use efficiency, reuse the building materials as far as possible, maximize positive and minimize negative environmental impacts on building construction and reduce GHG emissions.

The Green Building Code is intended to be an Overlay Code to be used with all existing Codes, including the Building Code of Pakistan, Energy Conservation Code, Fire Safety Code and Seismic Provisions Code, and the relevant Building Regulations and standards.

Thank you.