

# QUESTIONNAIRE SURVEY ON THE ASSESSMENT OF THE SUSTAINABILITY BENEFITS OF MODULAR CONSTRUCTION FOR ACHIEVING SUSTAINABLE DEVELOPMENT GOALS IN HOUSING DELIVERY IN NIGERIA

Dear Sir/Madam,

This is part of a larger research aimed at developing a framework for bolstering sustainability and SDGs attainment through the adoption of Modular Construction (MC) in housing production in the Nigerian construction industry. The purpose of this survey is to gather responses regarding;

- (1) The sustainability benefits of adopting modular construction in housing production
- (2) The contribution of adopting MC to the attainment of selected United Nations Sustainable Development Goals (i.e., SDGs 9, 11 and 12).

You were identified based on your experiences, knowledge, and expertise in this area. Particularly, your involvement in off-site/modular construction projects in the areas, and you have at least 5 years of work/industry experience. Kindly take about 8 minutes of your time to respond to this questionnaire.

Your responses will be treated with utmost confidentiality and used solely for research purposes. Further, no personal (revealing) information is required of you in this survey. Participation in this survey is voluntary, and you may choose not to participate even after giving consent. Also, you could withdraw at any point if you felt that completing the survey might cause you discomfort or harm.

Kindly reach out to any of the researchers should you need further information.

Kind regards.

Name :.....

Lead researcher Email:.....

Other researchers names and emails (1) Name:.....Email:.....

(2) Name:.....Email:.....

(3) Name:..... Email:.....

## CONSENT:

I have read and understood what the research is set to achieve, and have therefore agreed to participant;

- ☐ Yes
- ☐ No

## SECTION A: RESPONDENTS' BACKGROUNDS INFORMATION

Please choose from the options provided for each of the questions 1 to 5 and place a tick (✓) in front of the choice that best applied to you.

| S/N o. | Category                       | Variables           |  |
|--------|--------------------------------|---------------------|--|
| 1      | Organisational role            | Contracting         |  |
|        |                                | Consulting          |  |
|        |                                | Public organisation |  |
| 2      | Profession                     | Architects          |  |
|        |                                | Builders            |  |
|        |                                | Engineers           |  |
|        |                                | Quantity Surveyors  |  |
| 3      | Years of experience            | 5 - 10years         |  |
|        |                                | 11-15 years         |  |
|        |                                | 16-20 years         |  |
|        |                                | Above 20            |  |
| 4      | Highest academic qualification | HND                 |  |
|        |                                | PGD                 |  |
|        |                                | BSc/BTech.          |  |
|        |                                | M.Sc/M.Tech         |  |
|        |                                | PhD                 |  |
| 5      | Professional membership status | Fellow member       |  |
|        |                                | Corporate member    |  |
|        |                                | Probationer member  |  |

## Modular construction Sustainability impacts awareness and adoption levels

Please choose from the options provided for each of the questions 1 to 2 and place a tick (✓) in front of the choice that best applied to you.

|   |                                                                      |           |  |
|---|----------------------------------------------------------------------|-----------|--|
| 1 | Level of awareness regarding MC contribution to sustainability goals | Very low  |  |
|   |                                                                      | Low       |  |
|   |                                                                      | Moderate  |  |
|   |                                                                      | High      |  |
|   |                                                                      | Very high |  |
| 2 | Level of practice/adoption of MC in projects                         | Very low  |  |
|   |                                                                      | Low       |  |
|   |                                                                      | Moderate  |  |
|   |                                                                      | High      |  |
|   |                                                                      | Very high |  |

## SECTION B: SUSTAINABILITY BENEFITS OF MODULAR CONSTRUCTION

Based on your knowledge and experience, kindly rate the importance of these variables' contribution to housing affordability and sustainability on a 5-point Likert scale.

(where 1 = very low importance, 2 = low importance, 4 = moderate importance, and 5 = very high importance).

| Code       | Benefits of adopting MC                                              | 1 | 2 | 3 | 4 | 5 |
|------------|----------------------------------------------------------------------|---|---|---|---|---|
| <b>ENB</b> | <b>Environment benefits</b>                                          |   |   |   |   |   |
| ENB01      | Minimise carbon emissions                                            |   |   |   |   |   |
| ENB02      | Better building energy efficiency                                    |   |   |   |   |   |
| ENB03      | Reduction of construction waste on-site                              |   |   |   |   |   |
| ENB04      | Promote materials reuse and recyclability                            |   |   |   |   |   |
| ENB05      | Minimise pollution and offer a neater on-site operations environment |   |   |   |   |   |
| ENB06      | Reduced the embodied energy of building materials                    |   |   |   |   |   |
| ENB07      | Enhance the deconstruction, recovery and reuse of material           |   |   |   |   |   |
| ENB08      | Enhance the management of materials resources                        |   |   |   |   |   |
| ENB09      | Efficient environmental lifecycle performance                        |   |   |   |   |   |
| <b>ECB</b> | <b>Economic benefits</b>                                             |   |   |   |   |   |
| ECB01      | Reduce the cost of labour and equipment on-site.                     |   |   |   |   |   |
| ECB02      | minimise the ordering risks of materials                             |   |   |   |   |   |
| ECB03      | Ease of snag identification and rectification                        |   |   |   |   |   |
| ECB04      | Reduction in the cost of preliminaries                               |   |   |   |   |   |
| ECB05      | Savings in design and construction cost and time                     |   |   |   |   |   |
| ECB06      | Faster return on investment (ROI)/chance of early rental income      |   |   |   |   |   |
| ECB07      | Little or no repair on site (low maintenance cost)                   |   |   |   |   |   |
| ECB08      | Improve productivity and quality of buildings                        |   |   |   |   |   |
| <b>SOB</b> | <b>Social benefits</b>                                               |   |   |   |   |   |
| SOB01      | Minimise disruption of community activities                          |   |   |   |   |   |
| SOB02      | Job creation and crime reduction                                     |   |   |   |   |   |
| SOB03      | Better working conditions and the safety of workers                  |   |   |   |   |   |
| SOB04      | Promote faster housing provision during the disaster period          |   |   |   |   |   |
| SOB05      | Enhance urban resilience                                             |   |   |   |   |   |
| SOB06      | Minimise inequality and access to urban housing                      |   |   |   |   |   |
| SOB07      | Promote social cohesion and inclusivity                              |   |   |   |   |   |

## SECTION C: LEVEL OF AGREEMENT ON THE CONTRIBUTION OF MODULAR CONSTRUCTION TO SDGs 9, 11 & 12

Based on your knowledge and experience, kindly rate these variables on your level of agreement with the statements on the contribution of modular construction to the attainment of each of the selected SDGs 9, 11, and 12, on a scale of 1 to 5.

(Where 1 = very low agreement, 2 = low agreement, 3 = moderately agreed, 4 high agreement, and 5 = very high agreement)

| Code          | Selected SDGs                                                                                                                   | 1 | 2 | 3 | 4 | 5 |
|---------------|---------------------------------------------------------------------------------------------------------------------------------|---|---|---|---|---|
| <b>SDG 9</b>  | <b>Industry, Innovation and Infrastructure</b>                                                                                  |   |   |   |   |   |
| SDG9-01       | Modular construction uses industrialised building techniques and an automated process.                                          |   |   |   |   |   |
| SDG9-02       | MC minimises on-site activity disruption, utilises lean manufacturing principles, and supports smart infrastructure provisions. |   |   |   |   |   |
| SDG9-03       | MC supports resilience and scalability due to its shorter building times                                                        |   |   |   |   |   |
| <b>SDG 11</b> | <b>Sustainable Cities and Communities</b>                                                                                       |   |   |   |   |   |
| SDG11-01      | MC led to sustainable urban development as it produces less waste and emissions.                                                |   |   |   |   |   |
| SDG11-02      | MC improves affordable housing and urban development                                                                            |   |   |   |   |   |

|               |                                                                                                                                                  |  |  |  |  |  |
|---------------|--------------------------------------------------------------------------------------------------------------------------------------------------|--|--|--|--|--|
| SDG11-03      | MC promotes temporary housing to meet disaster needs and supports the provision of faster urban housing with minimal energy consumption.         |  |  |  |  |  |
| <b>SDG 12</b> | <b>Responsible Consumption and Production</b>                                                                                                    |  |  |  |  |  |
| SDG12-01      | MC offers better-quality control, reducing errors, rework, and resource usage.                                                                   |  |  |  |  |  |
| SDG12-02      | MC promote the use of green/sustainable and recyclable materials.                                                                                |  |  |  |  |  |
| SDG12-03      | Factory-made components/systems help minimise materials waste and support an efficient supply chain, which allows for recycling and reusability. |  |  |  |  |  |

### THE END:

Thank you for your valuable time and contribution to this survey