Table 1: Descriptions of the data/information required for the GBA framework

Components of GBA framework	Data required	Description
BIM system	BM	BIM model (contains a coordinated architectural, structural, and building services design, drainage designs).
	CS	Specification for the building projects.
	MR	Modeling results and outputs, e.g., energy simulation, lifecycle assessment, ventilation modeling, flooding & hazard assessment, thermal modeling results, etc.
Regulatory Documents	BC	Building contracts (or excerpts from the BC) between the client and contractor, and/or other stakeholders. BC should detail the relationship between the client and parties involved, and their roles in the project.
	PP	Project plan schedule for the design and construction stages. It should detail the responsibility matrix, that is, who is responsible for each aspect of the design and construction stages.
	TPC	Third-party assessment standards and codes (safety, labor, environmental & energy standards, etc.).
Data & Evidence	FS	Feasibility study report. It should consider site-wide issues to be addressed during project development.
	PE	Photographic evidence of the buildings' components, parts, systems, spaces, etc. as required in the C-SDSS documentation.
	RDI	Relevant records, data, and information as it might be required for each stage of assessment, e.g., utility records (logs of energy usage, water, waste, and other utilities), maintenance records, purchase records, surveys, and feedback, and commissioning records, etc.
	SR	Surveys and reports from specialists' consultants and subcontractors (land surveyors, geologists, ecologists, etc.), test results such as site investigation, IAQ plan, acoustics, water run-off, flood risk assessment, ecology, heat island effect, risk assessment study reports, etc.
	TPAR	Third-party assessor reports of the building projects and site to confirm its compliance with the sustainability criteria.
	TPCC	Third-party compliance certificates (e.g., from ISO, environmental organizations, government agencies, or other designated and accreditation bodies).
	TPI	Third-party data and information such as public transportation routes map and timetables, manufacturer and technical manuals, maps, etc.
Sustainability Assessment Criteria (BSAM)	A – H	A- Sustainable Construction Practices; B- Site and Ecology; C- Energy. D- Water; E- Material and Waste; F- Transportation; G- Indoor; Environmental Quality; H- Building Management.
C-SDSS	IR	Interim review of the sustainability performance of the building design (*assess project, view project SER, compare projects* [AVC]).
	IR & C	Interim review of the sustainability performance of the building design and certification (*AVC*).
	IA	An interim assessment of the sustainability performance of the building project and certification (*AVC*).
	FA & C	A final assessment of the sustainability performance of the building project and certification (*AVC*).

Table 2: Demographics of the experts involved in the validation process

Description	Frequency	Percentage (%)	Description	Frequency	[a]Average year
Major profession or occupation			**Positions**		
Architects	4	20	Top-level managers	9	15
Civil Engineers	1	5	Middle-level staff	8	5
Project Managers	2	10	First-level staff	3	2.5
Quantity Surveyors	7	35	**Total**	**20**	
Estate Valuers	2	10			
Builders	1	5			
Academics	3	15			
Total	**20**	**100**			

Note: [a]Average year – The average year of experience (of the respective expert's management level) in the construction industry.

Table 3: Validation survey results of the GBA framework

Code	Validation statement/questions	Level of agreement (%)					Mean
		Strongly agree	Agree	Neutral	Disagree	Strongly disagree	
VS1	The identified GBA framework's components and its process maps adopted to achieve a holistic evaluation of the sustainability performance of buildings in reasonable.	20	75	5	-	-	4.15
VS2	The required documents within each GBA framework's component and its process map are adequate and appropriate.	15	75	10	-	-	4.05
VS3	The information required from each GBA framework's component to assess a building sustainability performance at each building lifecycle stage is adequate and appropriate.	10	65	25	-	-	3.85
VS4	The developed GBA framework and its components' process maps are easily understandable and easy to use in practice.	25	50	15	10	-	3.90
VS5	The developed GBA framework is inclusive, comprehensive, and of a logical structure.	15	75	10	-	-	4.05
VS6	The development of the GBA framework sufficiently addresses the objective of the study.	20	75	5	-	-	4.15
VS7	The appropriate adoption and use of the GBA framework as a tool would lead to a successful implementation of smart and sustainability practices in buildings.	35	55	10	-	-	4.25
VS8	The GBA framework as a tool is suitable and adequate to assess the sustainability performance of buildings.	15	65	20	-	-	3.95

Note: VS – Validation statement