

1. Record Nr.	UNINA9910488709103321
Autore	Huang Zujian
Titolo	Resource-driven sustainable bamboo construction in Asia-Pacific bamboo areas // Zujian Huang
Pubbl/distr/stampa	Cham, Switzerland : , : Springer, , [2021] ©2021
ISBN	3-030-73535-4
Descrizione fisica	1 online resource (330 pages)
Collana	Green Energy and Technology
Disciplina	624.1897
Soggetti	Bamboo construction - Pacific Area Sustainable construction - Pacific Area
Lingua di pubblicazione	Inglese
Formato	Materiale a stampa
Livello bibliografico	Monografia
Nota di contenuto	Intro -- Foreword by Yimin Sun -- Foreword by Hartwig Künzel -- Preface -- Acknowledgement -- Contents -- List of Figures -- List of Tables -- 1 Bamboo Construction Activities in Asia-Pacific Bamboo Areas -- 1.1 Traditions and Current Development -- 1.2 Raw Bamboo and Traditional Bamboo Construction -- 1.2.1 Bamboo Species Commonly Used in Buildings -- 1.2.2 Traditional Construction Activities Documented in Historical Literature -- 1.2.3 Today's Architectural Practices -- 1.3 Industrial Bamboos and Modified Bamboo Construction -- 1.3.1 Status Quo -- 1.3.2 Potential for Development -- 1.4 Questions Raised -- 1.4.1 Background of Research -- 1.4.2 Studies Issues -- References -- 2 Element Analysis of Bamboo Construction-Related Resource -- 2.1 Bamboo Forest Resource -- 2.1.1 General Distribution -- 2.1.2 Main Bamboo Producing Countries -- 2.1.3 South Asia -- 2.1.4 International Trade -- 2.2 Industrial Utilization and Processing Technology of Bamboo -- 2.2.1 "Utilization of Whole Bamboo" -- 2.2.2 Bamboo-Based Panel Production and Product System -- 2.2.3 Bamboo Damage and Preservative Treatment Technology -- 2.2.4 End Utilization Technology -- 2.3 Economic, Social, and Environmental Impacts of Bamboo Industry -- 2.3.1 Climate Challenge and Bamboo Forests as Carbon Sinks -- 2.3.2 Land Resources and Ecological Restoration -- 2.3.3 Economic and Social Impacts of Bamboo Industry -- Annex Tables -- References -- 3

Development of Sustainability Assessment Model (SAM) for Resource-Driven Bamboo Construction -- 3.1 Sustainable Architecture -- 3.1.1 Concept and Theory -- 3.1.2 Main Indicators of the Sustainable Building Certification System -- 3.2 Research Framework for Resource-Driven Sustainable Bamboo Construction -- 3.2.1 Particularity of Bamboo Construction in the Asia-Pacific Bamboo Area. 3.2.2 The Goal of Resource-Driven Sustainable Bamboo Construction -- 3.3 A Feasible List of Bamboo Construction Life Cycle Assessment Indices -- 3.3.1 Environmental Impact-Related Indices and Their Definitions -- 3.3.2 Land Cost-Related Indices and Their Definitions -- 3.3.3 Energy Demand-Related Indices and Their Definitions -- 3.3.4 Indoor Comfort-Related Indices and Their Definitions -- 3.3.5 Construction Durability-Related Indices and Their Definitions -- 3.3.6 Sustainable Material Proportion-Related Indices and Their Definitions -- 3.4 Application and Display of SAM -- 3.4.1 Relative Value of Assessment Index -- 3.4.2 Radar Chart -- 3.4.3 BRE Index -- 3.4.4 Qualitative Discussion -- References -- 4 Material Parameters of Bamboo Construction in Asia-Pacific Bamboo Areas -- 4.1 Bamboo Material Classification Methods and Representative Products -- 4.1.1 Raw Bamboo -- 4.1.2 Industrial Bamboo -- 4.2 Physical Properties -- 4.2.1 Raw Bamboo -- 4.2.2 Industrial Bamboo -- 4.3 Energy Consumption -- 4.3.1 Flattened Bamboo Panel -- 4.3.2 Plybamboo (Bamboo Mat/Curtain Board) -- 4.3.3 Bamboo Particleboard -- 4.3.4 Laminated Bamboo -- 4.3.5 Bamboo Scrimber -- 4.4 Carbon Footprint -- 4.4.1 Carbon Stocks in Bamboo Forest Ecosystem -- 4.4.2 Carbon Emissions from Production Process -- 4.4.3 End-of-Life Disposal -- 4.5 Land Costs -- 4.5.1 Introduction of Productive Land -- 4.5.2 Land Cost of Bamboo Products -- 4.6 Integration of Material Parameters -- 4.6.1 Discussion on the Currently Available Material Parameters -- 4.6.2 Dataset Generated for SAM -- References -- 5 Case Studies of Resource-Driven Sustainable Bamboo Construction in Asia-Pacific Bamboo Areas -- 5.1 Case 1 East Asia (Guangzhou, China) -- 5.1.1 Local Resources -- 5.1.2 Design of Sustainability Assessment Model for Bamboo Construction -- 5.1.3 Result Analysis. 5.2 Case 2 Southeast Asia (Vietnam and Malaysia) -- 5.2.1 Local Resources -- 5.2.2 Design of Sustainability Assessment Model for Bamboo Construction -- 5.2.3 Result Analysis -- 5.3 Case 3 South Asia (Ahmedabad, India) -- 5.3.1 Local Resources -- 5.3.2 Design of Sustainability Assessment Model for Bamboo Construction -- 5.3.3 Result Analysis -- 5.4 Discussion -- Annex Tables -- References -- 6 Climate Adaptive Bamboo Construction in Asia-Pacific Bamboo Areas -- 6.1 Introduction -- 6.2 Design of Research Model -- 6.2.1 Selection of Representative Cities -- 6.2.2 Materials and the Property Parameters -- 6.2.3 Design of Performance Model -- 6.3 Performance Optimization of Bamboo Construction -- 6.3.1 Correlation Analysis with Meteorological Parameters -- 6.3.2 Construction Arrangement -- 6.3.3 Material Selection for Construction Layers -- 6.4 Performance Comparison Between Bamboo and Timber Construction -- 6.4.1 Comparison Model Design Between Bamboo and Timber Construction Units -- 6.4.2 Static Comparison Between Bamboo and Timber Units -- 6.4.3 Annual Dynamic Performance Comparison Between Bamboo and Timber Units -- 6.4.4 Discussion on Dominant Bamboo Variants -- 6.5 Summary -- Annex Tables -- References.

---