Indicators

1.1 CONCEPTS

1.2 LOCAL ECOSYSTEM CRITERIA
1.3 ARCHITECTURE QUALITY CRITERIA

Scale of Analysis

In this survey, Ecosystem Integration is expressed by positive interactions between Architecture decisions and solutions with Local Ecology, creating opportunities to increase at the same time the quality of design and the environment.

THE ANALYSIS OF POSITIVE INTERACTIONS BETWEEN ECOSYSTEM AND ARCHITECTURE INDICATORS, **FOCUS AT**:

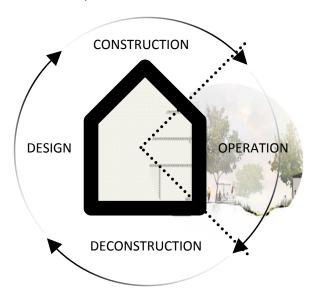
ECOSYSTEM CRITERIA:



LOCAL SCALE:

within project site limits and immediate environs

ARCHITECTURE QUALITY CRITERIA:



WHOLE LIFE CYCLE:

within the most relevant stage(s) to each parameter

Collaborative Interactions

Positive interactions - towards local ecology, architectural quality, or both - between 2 Indicators of Ecosystem and Architecture Criteria are designated as COLLABORATIVE INTERACTIONS.

COLLABORATIVE INTERACTIONS FORM THE STRUCTURE OF THE PROPOSED **DESIGN ASSISTANCE RESOURCES**:

DESIGN ASSISTANCE TOOL Assessment and communication of Ecosystem Integration in a single project

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Fresh and raw medicities resources

REGULATING

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+ REFERENCE DATABASE Catalogue of multiple project references for Ecosystem Integration

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Local Ecosystem

In this research, Local Ecosystem Criteria is based on ECOSYSTEM FUNCTIONS AND SERVICES [the essential ecological processes and tangible and intangible benefits derived to human well-being].

ECOSYSTEM SERVICES AND FUNCTIONS

ARE ORGANIZED INTO 4 AREAS:



Local Ecosystem: Services and Functions

SUPPORTING

- **E1** SOIL FORMATION AND FERTILITY Weathering of rock and accumulation of organic matter for productive soils
- **E2** PHOTOSYNTHESIS AND PRIMARY PRODUCTION Oxygen production and accumulation of energy by plants
- **E3** NUTRIENT CYCLING AND POLLUTION TREATMENT Storage, cycling and balance of chemical elements in air, soil, and water by organisms
- **E4** WATER CYCLING AND REGULATION Concentration and cycle of water through the ecosystem, runoff regulation and aquifer recharge
- **E5** BIODIVERSITY AND HABITATS Provision of food, water, shelter and reproduction conditions to endangered and native species

REGULATING

- **E6** CLIMATIC REGULATION Land cover and vegetation influence on local temperature, humidity, precipitation and wind
- E7 EROSION CONTROL AND HAZARD PROTECTION Mitigation of extreme wind, flood, landslide and soil dispersion by vegetation and topography
- **E8** BIOLOGICAL CONTROL & POLLINATION Biota role to control pests and diseases and assure plants pollination and reproduction
- **E9** PERCEPTIVE ENVIRONMENT MODULATION Moderation, filter and modulation of light and sound through natural elements

PROVISIONING

- **E10** FOOD SUPPLY Production of edible goods (agriculture, livestock, fisheries or wild food sources)
- **E11** FRESH WATER SUPPLY AND PURIFICATION Filtering, retention and storage of water for consumption
- E12 RAW MATERIALS, ORNAMENTAL & MEDICINAL RESOURCES Provision of raw materials, medicinal sources and ornamental elements

CUITURAI

- **E13** SIGNIFICANT ECOSYSTEM VALUES AND SPECIES Local significant species, historic-cultural landscapes, sacred areas and elements
- **E14** LANDSCAPE AESTHETIC FRUITION Landscape and scenery valuation and nature observation points
- **E15** LEISURE, RECREATION AND PSYCHOPHYSICAL HEALTH Sports, recreation and leisure areas, and psychophysical healing environments

Architecture Design Quality

In this research, Architecture Quality Criteria is expressed through DESIGN ASSESSMENT INDICATORS [which comprise both intrinsic and extrinsic design quality indicators and sustainability assessment factors].

DESIGN ASSESSMENT INDICATORS

ARE ORGANIZED INTO 6 AREAS:



MACRO-LOCAL RELATIONS



ENVIRONMENTAL BALANCE



SOCIO-ECONOMIC RFI FVANCF



CONCEPT &
PERCEPTIVE
QUALITY



COMFORT AND FUNCTIONALITY



BUILDING CONSTRUCTION

Architecture Design Quality: Assessment Indicators I

MACRO-LOCAL RELATIONS

ENVIRONMENTAL BALANCE

SOCIO-ECONOMIC RELEVANCE

- **A1** ADAPTATION TO ECO-PHYSICAL VALUES & RESTRAINTS Site selection and project adequacy to hydrography and topography
- **A2** SENSE OF PLACE AND CULTURAL IDENTITY Local context references, landscape integration, socio-cultural adequacy and relevance
- **A3** FUNCTIONAL ARTICULATION W/ CONTEXT Relation with infrastructures & volumes, access to daily functions, & low impact mobility

- A4 ENERGY CYCLE [AND ATMOSPHERIC EMISSIONS] Energy consumption through life cycle, passive performance and renewable energy use
- **A5** WATER CYCLE [AND EFFLUENTS] Consumption of water, rain water harvest, waste water management, treatment and reuse
- **A6** MATERIALS CYCLE [AND WASTE] Local, renewable and low impact materials, deconstruction, recycling and biodegradability
- **A7** EXTERIOR AREAS AND LOCAL POLLUTION Landscape and amenities, control of light pollution, noise, heat island effect and glare
- **A8** SUSTAINABLE LIFE-STYLE SUPPORT Provision of kitchen gardens, compost, bicycle parking, laundry dry

- **A9** CUSTOMIZATION AND OPERATION Interior space, comfort and envelope control, possibilities of extension and modification
- A10 COMMUNITY
 PARTICIPATION AND USER
 SATISFACTION Participatory
 processes, engagement with
 local communities &
 stakeholders and user targeting
- A11 ECONOMIC DYNAMICS
 AND LIFECYCLE COSTS
 Economic impact and
 distribution, balance of initial
 investment, operation and end
 use costs
- **A12** HUMAN HEALTH AND WELL BEING Human health and wellbeing and other psychosociological aspects

Architecture Design Quality: Assessment Indicators II

CONCEPT & PERCEPTIVE QUALITY

- A13 CONCEPT ORIGINALITY
 AND INNOVATION Artistic and
 conceptual valuation,
 contemporaneity, innovation,
 logic and intention
- **A14** VISUAL Scale, rhythm and volume, colours and texture, transparency-opaqueness, lightshadow, and view framing
- **A15** ACOUSTICS Sound reflection, insulation and absorption, sounds from uses and materials
- **A16** OLFACTION, TACTILITY & MOTION PERCEPTION Surfaces texture, pavement regularity and steepness and height levels, scents from materials & uses

COMFORT AND FUNCTIONALITY

- **A17** LIGHTING Optimization of natural light sources, and luminance adapted to function and comfort levels
- **A18** INDOOR AIR QUALITY Air renovation, elimination of VOCs (volatile organic compounds), dust particles and humidity condensations
- A19 HUMIDITY AND TEMPERATURE Hygrothermal comfort through daily and annual cycles
- **A20** ADEQUACY TO FUNCTION, OCCUPANCY & CIRCULATION Functional and program organization, and circulation flows

BUILDING CONSTRUCTION

- **A21** DETAILS AND FINISHES Coherence, quality and attributes of details and finishing materials
- **A22** EXECUTION QUALITY & PROCESS MANAGEMENT Rigor of construction methods, onsite management during life cycle and quality control
- **A23** STRUCTURE STABILITY AND DESIGN Resistance to use and regular loads and structure design quality
- MAINTENANCE Long life cycles of systems and materials, ease of substitution or repair, and local maintenance