ACCSCIENCE PUBLISHING

Journal of Chinese Architecture and Urbanism

ORIGINAL ARTICLE

Prioritizing adaptive reuse of industrial heritage in Nanchang, China: An analytic hierarchy process-based approach

Supplementary Files

Supplementary A. Literature search strategy and inclusion/exclusion criteria

Table S1. Data sources, timeliness, spatial units, and preprocessing for all indicators

Code	Primary data sources	Timeliness	Spatial unit/buffer	Preprocessing (key points)
HV1	Nanchang Culture and Tourism/Cultural Relics lists; MIIT National Industrial Heritage List	2024–2025	Parcel point/ polygon	Use the latest batch; deduplicate by highest grade; convert coords to **CGCS2000**.
HV2	City archives; NR&PB real-estate archives; local histories	Rolling	Building/parcel	Fill missing completion year; if unavailable, corroborate via remote sensing/media.
HV3	Expert on-site inspection sheets	Current	Project	Standardized rubric + sample photos; double review; take mean.
CV1	Gaode/Baidu/OSM POIs; yearbooks "industrial-culture events"	Last 1 yr	500 m buffer	Deduplicate POIs (same name/address); keep only industrial-culture categories; kernel density or count/area.
CV2	Resident/merchant survey (with street office)	Current (n ≥ 100)	Community	Likert 1–5; clean outliers; weight by sample weights for mean.
CV3	Street office/operator activity logs	Last 1 yr	Project	Count 1 if "publicly announced" and participants > 30.
AC1	Gaode routing API/OSM pedestrian network	Current	Network distance	Shortest walking distance using morning-peak parameters.
AC2	Gaode/transit-group stop data	Current	500 m buffer	Deduplicate; remove retired stops; count.
AC3	OSM/housing-construction road network	Current	Straight-line	Extract trunk centerlines; nearest distance.
DP1	NR&PB cadastre/right-registry; Qixinbao/ Tianyancha (owners)	Current	Parcel	Ownership clarity: 3 classes; if owners > 3, score 0.
DP2	Field check, UAV imagery, and property ledgers	Current	Building	Idle GFA / total GFA; verify by block.
DP3	Regulatory/detailed plans and approvals; parcel info	Current	Parcel	Net land × FAR, or approved buildable/lettable area.

(Cont'd...)

Table S1. (*Continued*)

Code	Primary data sources	Timeliness	Spatial unit/buffer	Preprocessing (key points)
SI1	7th Census (2020); gridded pop (WorldPop/ Baidu-corrected)	Latest + interp.	1 km / 100 m grid	Overlay 1 km buffer and sum; for updates, calibrate with night-lights/mobile signaling.
SI2	Gaode and government open data (schools, hospitals, elderly care, culture/sports, green-space entrances)	Current	500 m buffer	Category filter + de-dup counts.
SI3	Industry coefficient library (creative, light-expo-trade, etc.); operator plans	Current	Project	Jobs = target use mix × lettable area (persons/10,000 m^2).
EE1	Jiangxi construction-cost bulletins (quarterly); analogous project bills; design estimates	This quarter	Project	Split civil/M&E/fit-out; unify taxes/fees per policy.
EE2	Beike/CREIS/local broker samples; peer-park annual reports	This quarter/ year	Project	Use the median of a comparable sample; net income = revenue − OPEX.
EE3	From EE1–EE2: total capex/annual net cash flow	Same	Project	Cash flows at steady state; land cost excluded.
ES1	Sentinel-2 Level 2A (10 m); MNR national-condition monitoring	Latest summer	500 m buffer	NDVI = (NIR−Red)/(NIR+Red); cloud mask; take mean.
ES2	CNEMC national stations; or 1 km photochemical inversion grids (last 3 yrs)	Last 3 yrs	Station / 1 km	Use project's 3-yr mean; weighted average across stations.
ES3	Ecology and Environment Bureau contaminated-site list/EIA; 3rd-party soil tests	Current	Project	Assign 0/1/2; attach test or filing ID.

Abbreviations: AC: Accessibility; API: Application programming interface; CGCS2000: China Geodetic Coordinate System 2000; CNEMC: China National Environmental Monitoring Center; CREIS: China Real Estate Information System; CV: Cultural value; DP: Development potential; EE: Economic benefit; EIA: Environmental impact assessment; ES: Ecological sustainability; FAR: Floor area ratio; GFA: Gross floor area; HV: Historical value; M&E: Mechanical and electrical; MIIT: Ministry of Industry and Information Technology; MNR: Ministry of Natural Resources; NDVI: Normalized difference vegetation index; NIR: Near infrared; NR&PB: Natural Resources and Planning Bureau; OPEX: Operating expenditure; OSM: OpenStreetMap; POIs: Point of interests; SI: Social impact; UAV: Unmanned aerial vehicle

Supplementary B. Literature–indicator matrix and indicator frequency counts

Table S2. Mapping of studies and evaluation criteria coverage (14 criteria)

Study/criterion	Haroun 2019 (AEJ)	Claver 2020 (Sust.)	Della Spina 2020 (Sust.)	Milošević 2020 (Math)	Vizzarri 2021 (LUP)	Gharaati 2023 (HE)	Meng 2023 (Sust.)	Zhang 2023 (Sust.)	Yao 2024 (Sust.)	Nocca 2024 (Land)	Lian & Dimitrijević 2025 (Sust.)	Meng & Xiao 2025 (Land)
Historical and cultural value	—	✓	—	✓	✓	✓	✓	✓	✓	✓	✓	✓
Physical condition/ structural safety	—	—	✓	✓	✓	✓	✓	—	✓	—	—	—
Economic feasibility/value	✓	—	✓	—	✓	—	✓	✓	—	✓	—	✓
Social impact/ community participation	✓	—	✓	—	✓	✓	✓	—	—	✓	✓	✓
Environmental impact/ sustainability	—	—	✓	—	✓	✓	✓	✓	✓	✓	—	✓
Spatial fit/functional compatibility	✓	✓	✓	✓	✓	✓	✓	—	—	—	—	✓
Location and transport accessibility	✓	✓	—	✓	—	✓	✓	✓	✓	—	—	—
Regulation/policy and governance	—	—	—	—	—	✓	—	✓	—	✓	✓	✓
Innovation/mixed use	✓	—	—	—	✓	✓	—	—	—	✓	—	—
Health risks/ ecological remediation	—	—	—	—	—	✓	—	—	—	—	—	—
Locality/place identity	—	—	—	—	—	✓	✓	✓	—	—	—	—
Market demand/ usage outlook	—	—	—	—	✓	✓	✓	✓	—	—	—	—

(*Cont'd...*)

https://doi.org/10.36922/JCAU025500096

Table S2. (*Continued*)

Study/criterion	Haroun 2019 (AEJ)	Claver 2020 (Sust.)	Della Spina 2020 (Sust.)	Milošević 2020 (Math)	Vizzarri 2021 (LUP)	Gharaati 2023 (HE)	Meng 2023 (Sust.)	Zhang 2023 (Sust.)	Yao 2024 (Sust.)	Nocca 2024 (Land)	Lian & Dimitrijević 2025 (Sust.)	Meng & Xiao 2025 (Land)
Industry type/ development potential	—	—	—	—	—	✓	✓	✓	✓	—	—	—
Residual heritage/ site features	—	✓	—	✓	—	✓	—	—	✓	—	✓	✓
Column sum	5	4	5	5	8	13	10	8	6	6	4	7
Coverage (%)	35.7	28.6	35.7	35.7	57.1	92.9	71.4	57.1	42.9	42.9	28.6	50.0

Notes：✓ = 1; — = 0. Journal titles are abbreviated in parentheses

https://doi.org/10.36922/JCAU025500096

Table S3. Indicator dictionary and source mapping (14 indicators; 12 source papers)

No.	Indicator name	English keywords (source papers, 12 only)	Brief definition/notes
1	Historical and cultural value	Historical value; cultural significance; authenticity/integrity; rarity (Claver 2020; Gharaati 2023; Lian & Dimitrijević 2025; Meng & Xiao 2025; Meng 2023; Milošević 2020; Nocca 2024; Vizzarri 2021; Yao 2024; Zhang 2023)	Uniqueness and importance of the site's historical narrative, technology, and social memory, including authenticity and integrity.
2	Physical condition/structural safety	Building condition; structural integrity; preservation status; degree of degradation (Della Spina 2020; Gharaati 2023; Meng 2023; Milošević 2020; Vizzarri 2021; Yao 2024)	Soundness of the fabric and structural systems, defects, and safety; whether basic load-bearing requirements for reuse are met.
3	Economic feasibility/value	Economic feasibility; economic–financial value; future profitability (Della Spina 2020; Haroun 2019; Meng & Xiao 2025; Meng 2023; Nocca 2024; Vizzarri 2021; Zhang 2023)	Expected investment returns, operating costs, and capacity for sustainable revenue under reuse.
4	Social impact/community participation	Social impact; community participation; socio-cultural value (Della Spina 2020; Gharaati 2023; Haroun 2019; Lian & Dimitrijević 2025; Meng & Xiao 2025; Meng 2023; Nocca 2024; Vizzarri 2021)	Contribution to community welfare, social equity, and public participation; strengthening of local social capital.
5	Environmental impact/ sustainability	Environmental sustainability; environmental friendliness; carbon footprint and energy saving (Della Spina 2020; Gharaati 2023; Meng & Xiao 2025; Meng 2023; Nocca 2024; Vizzarri 2021; Yao 2024; Zhang 2023)	Performance on carbon emissions, energy use, habitat quality, and ecological restoration.
6	Spatial fit/functional compatibility	Functional compatibility; spatial capacity; flexibility; potential for functional update (Claver 2020; Della Spina 2020; Gharaati 2023; Haroun 2019; Meng & Xiao 2025; Meng 2023; Milošević 2020; Vizzarri 2021)	Fit of proposed uses to existing dimensions, structural grids, and circulation; reversibility of interventions.
7	Location and transport accessibility	Accessibility; location advantage; corridor connectivity (Claver 2020; Gharaati 2023; Haroun 2019; Meng 2023; Milošević 2020; Yao 2024; Zhang 2023)	Convenience of reaching the site by public transport and major roads; connectivity to the urban network.
8	Regulations/policy and governance	Industrial-heritage management regulations; international/ national charters; policy support (Gharaati 2023; Lian & Dimitrijević 2025; Meng & Xiao 2025; Nocca 2024; Zhang 2023)	Compliance with industrial-heritage rules, international charters, and local policies; completeness of governance arrangements.
9	Innovation/mixed use	Mixed-use strategy; multi-function synergy (Gharaati 2023; Haroun 2019; Nocca 2024; Vizzarri 2021)	Whether innovative/mixed functions activate the site, improve spatiotemporal utilization, and enhance operational resilience.
10	Health risks/ecological remediation	Environmental health impact; risk mitigation; remediation (Gharaati 2023)	Identification and mitigation of health hazards (pollution, noise, risk sources) and the adoption of remediation measures.
11	Locality/place identity	Local landscape and identity; cultural expression; continuity (Gharaati 2023; Meng 2023; Zhang 2023)	The degree to which local culture, landscape, and collective memory are continued and expressed.
12	Market demand/usage outlook	Market demand; tourism market potential; future profitability (Gharaati 2023; Meng 2023; Vizzarri 2021; Zhang 2023)	Potential demand from tourism and local consumption; prospects for sustained use.
13	Industry type/development potential	Industrial type; industrial transformation potential; (Re) industrialization potential (Gharaati 2023; Meng 2023; Yao 2024; Zhang 2023)	Match with regional leading/emerging industries and the potential to drive industrial upgrading.
14	Residual heritage/site features	Site size and spatial conditions; preservation status; spatial capacity (Claver 2020; Gharaati 2023; Lian & Dimitrijević 2025; Meng & Xiao 2025; Milošević 2020; Yao 2024)	Overall conditions of remaining heritage elements, estate scale, spatial pattern, built density, and usable space.

Table S4. Indicator coverage and proportional statistics across studies (14 Indicators)

Indicator code	Indicator name	Papers covered	Coverage (%)	Proportion
HV	Historical and cultural value	10	83.3	0.8333
PC	Physical condition/structural safety	6	50.0	0.5000
EE	Economic feasibility/value	7	58.3	0.5833
SI	Social impact/community participation	8	66.7	0.6667
ES	Environmental impact/sustainability	8	66.7	0.6667
FC	Spatial fit/functional compatibility	8	66.7	0.6667
AC	Location and transport accessibility	7	58.3	0.5833
REG	Regulations/policy and governance	5	41.7	0.4167
MIX	Innovation/mixed functions	4	33.3	0.3333
HEALTH	Health risks/ecological remediation	1	8.3	0.0833
CV	Locality/cultural identity*	3	25.0	0.2500
DEMAND	Market demand/usage outlook	4	33.3	0.3333
IND	Industry type/development potential	4	33.3	0.3333
SITE	Residual heritage/site features	6	50.0	0.5000

Table S5. Indicator consolidation rules and destinations (14→7 top-level criteria)

Original indicator	Action	Destination (seven top-level criteria)	Rationale (literature consistency/context fit/expert notes)
Historical and cultural value (HV)	Keep	Historical value (HV)	Highest coverage (83.3%); strong agreement on value identification. Site narrative and authenticity are core selling points of Nanchang's industrial heritage.
Physical condition/structural safety (PC)	Merge	Development potential (DP)	Numerous papers treat structural soundness as a prerequisite for implementability; experts view "safety and defects" as technical preconditions for development feasibility.
Economic benefit/value (EE)	Keep	Economic benefit (EE)	Relatively high coverage (58.3%); directly tied to revenue modeling for Nanchang's reuse paths (culture–tourism/creative/office).
Social impact/community participation (SI)	Keep	Social impact (SI)	Coverage 66.7%; closely related to publicness, local jobs, and participation. Experts agree it should be a standalone criterion.
Environmental impact/ sustainability (ES)	Keep	Environmental sustainability (ES)	Coverage 66.7%; carbon, energy use, and ecological remediation are national/local policy priorities.
Spatial fit/functional compatibility (FC)	Merge	Development potential (DP)	"Scale/grid/flow/reversibility" are coupled with implementation cost and intervention intensity; experts recommend including under DP as a spatial/technical sub-item.
Location and transport accessibility (AC)	Keep	Accessibility (AC)	Coverage 58.3%; strongly linked to footfall capture and operations; context-sensitive in Nanchang.
Regulations/governance (REG)	Merge	Development potential (DP)	Management authority, approval feasibility, and protection level requirements affect delivery; experts advise including under the development potential as a "compliance" sub-item.
Innovation/mixed functions (MIX)	Merge	Development potential (DP)	Often appears as a business mix/programming strategy; better treated as a development potential "functional programming" sub-item rather than a value dimension.
Health risks/ecological remediation (HEALTH)	Merge	Environmental sustainability (ES)	Lowest coverage (8.3%); issues such as soil contamination/noise are environmental sub-topics—assign to ecological sustainability.
Locality/cultural identity (CV)	Keep	Cultural value/local identity (CV)	Directly tied to a sense of place and continuity of character; important in the Nanchang context; complements historical value.

(Cont'd...)

Table S5. (*Continued*)

Market demand/usage outlook (DEMAND)	Merge	Economic benefit (EE)	A market-side input to revenue feasibility; treat as an ecological benefit sub-item.
Industry type/development potential (IND)	Merge	Economic benefit (EE)	Relates to regional industry linkages and investment attraction; includes as an ecological benefit's "industry synergy" sub-item.
Residual heritage/site features (SITE)	Merge	Development potential (DP)	Site area, usable space, and remnant density directly determine implementation pathways and phased costs.

Supplementary B1. Composition and profiles of the Delphi expert panel

Table S6. Composition and participation rationale of Delphi expert panel (n = 9)

No.	Age	Gender	Primary Sector	Years in practice /research	Highest degree	Representative role/title	Reason for participation
1	42	Male	Industry (design practice)	18	Bachelor's	Secretary-general, Interior Design Branch, Architectural Society of China	Proficient in adaptive reuse of industrial plants and green material selection; experienced with AHP.
2	58	Male	Academia + industry	30	Master's (Tsinghua/ advanced French program)	Executive council member, Interior Design Branch, Architectural Society of China	International green-building and LEED consulting; balances theory and practice.
3	52	Male	Industry (creative design)	22	Bachelor's (Tsinghua Academy of Arts and Design)	Jiangxi Chapter Committee Member; multiple industry awards	Focuses on how "industrial-style" aesthetics shape urban vitality.
4	39	Male	Corporate sector (community regeneration)	15	Bachelor's	Design director; community renewal specialist	Led multiple green upgrades of old factory areas and community-park projects.
5	45	Male	Corporate management	18	Master's	Founder, Blue Bridge Art Decoration	Builds models that integrate commercial operations with energy-saving.
6	54	Male	Government agency	26	Bachelor's	Chair, Specialized Committee, Interior Design Branch, Architectural Society of China	Deep knowledge of green/ low-carbon policies and approval procedures.
7	61	Male	Academia	35	Bachelor's	University professor	Research on sustainable architecture and urban ecology; policy adviser.
8	48	Female	Design institute (structure and energy efficiency)	25	Master's	National Class-1 registered structural engineer; deputy chief engineer	Expertise in strengthening old factories and energy retrofits.
9	35	Female	Academia	10	PhD	Associate professor	Specializes in industrial-heritage conservation and participatory community design.

Abbreviations: AHP: Analytic hierarchy process; LEED: Leadership in Energy and Environmental Design

Supplementary B2. Round-1 Delphi questionnaire and implementation notes

Selection of Evaluation Criteria for the Adaptive Reuse of Industrial Heritage in Nanchang — Delphi Round 1 (Expert Survey)

Respondent ID: _____ (to be filled by the research team)

Date: _____

I. Instructions

Please assess each evaluation item carefully to complete this expert questionnaire.

1. **Purpose**. To gather professional opinions and lay a foundation for consolidating expert consensus, so as to screen the core evaluation criteria for site selection of Nanchang's industrial-heritage adaptive reuse.

2. **Scoring rule**. Please rate the importance of each single criterion using a 5-point Likert scale as follows:

Score	Meaning
5	Essential / critical – cannot be omitted
4	Important – should be prioritized
3	Moderate – optional / consider accordingly
2	Low – can be de-emphasized
1	Negligible – recommend removal

3. **Open feedback**. If you believe any criterion should be added, merged or removed, please write down your specific suggestion and a brief justification at the end of this questionnaire.

4. **Confidentiality**. All personal information collected is used only for academic research purposes, and all responses will be kept strictly confidential.

II. Criteria Rating Form

Definitions of HV, CV, AC, DP, SI, EE, ES follow common academic explanations in international and domestic industrial-heritage research.

No.	Code	Indicator (≤25-word definition)	Likert Importance (1=Very Low— 5=Very High)	Add/Remove Notes
1	HV	Historical value: period sense, uniqueness, symbolic meaning	□1 □2 □3 □4 □5	
2	CV	Cultural value / local identity: community memory, cultural narratives	□1 □2 □3 □4 □5	
3	AC	Accessibility & location: transit convenience, surrounding amenities	□1 □2 □3 □4 □5	
4	DP	Developability: structural safety, column grid, retrofit flexibility	□1 □2 □3 □4 □5	
5	SI	Social impact: community cohesion, public activities, employment effects	□1 □2 □3 □4 □5	
6	EE	Economic feasibility: ROI, operating revenue, funding sustainability	□1 □2 □3 □4 □5	
7	ES	Environmental sustainability: green/energy saving, pollution control, ecological remediation	□1 □2 □3 □4 □5	
8	RS	Residual heritage features: authenticity, industrial landscape & characteristic elements	□1 □2 □3 □4 □5	
9	MS	Market demand / use prospect: potential user base & functional fit	□1 □2 □3 □4 □5	
10	HR	Health & risk governance: contamination treatment, environmental health risks	□1 □2 □3 □4 □5	
11	PM	Policy & management system: approval convenience, policy incentives	□1 □2 □3 □4 □5	
12	IN	Innovation / mixed uses: multi-function mix, innovative operations	□1 □2 □3 □4 □5	
13	IP	Industry type / growth potential: original industrial attributes & extensibility	□1 □2 □3 □4 □5	
14	PS	Physical condition / structural safety: integrity, damage level, strengthening difficulty	□1 □2 □3 □4 □5	

III. Open Feedback

Proposed new criteria (name + ≤25-word definition):

_____

_____

_____

_____

Suggestions to merge / delete (item + reason):

_____

_____

_____

_____

Thank you for your time and professional input!

For any questions, please contact the research team: 56005717@qq.com / 13970938187

Figure S1. Selection of evaluation criteria for the adaptive reuse of industrial heritage in Nanchang-Delphi (Round 1, expert survey). Source: Survey created by the authors

Supplementary B3. Round-2 Delphi questionnaire and implementation notes

Selection of Evaluation Criteria for the Adaptive Reuse of Industrial Heritage in Nanchang — Delphi Round 2 (Expert Survey)

Respondent ID: _____ (to be filled by the research team)

Date: _____

I. Instructions

Please reassess each item in light of the Round 1 group statistics.

1. **Purpose**. To consolidate expert consensus and screen the core evaluation criteria for site selection of Nanchang's industrial-heritage adaptive reuse.

2. **Scoring rule**. Rate the importance of each criterion using a 5-point Likert scale:

Score	Meaning
5	Essential / critical – cannot be omitted
4	Important – should be prioritized
3	Moderate – optional / consider
2	Low – can be de-emphasized
1	Negligible – recommend removal

3. **Open comments**. If any criterion should be added / merged / removed, write your suggestion and a brief justification at the end.

4. **Confidentiality**. All personal information is used only for academic research.

Definitions of HV, CV, AC, DP, SI, EE, ES follow common explanations in international/domestic industrial-heritage research.

II. Criteria Rating Form

No.	Code	Indicator (≤25-word definition)	Round 1 Mean	Round 1 SD	Likert Importance (1=Very Low ... 5=Very High)	Add/Remove Notes
1	HV	Historical value: period sense, symbolic meaning	4.75	0.463	□1 □2 □3 □4 □5	
2	CV	Local identity: community memory, cultural narratives	4.50	0.535	□1 □2 □3 □4 □5	
3	ES	Environmental sustainability: green & energy-saving, pollution control	4.50	0.535	□1 □2 □3 □4 □5	
4	SI	Social impact: community cohesion, employment	4.25	0.463	□1 □2 □3 □4 □5	
5	DP	Developability: structural safety, retrofit flexibility	4.125	0.641	□1 □2 □3 □4 □5	
6	EE	Economic feasibility: investment return, operating revenue	4.125	0.354	□1 □2 □3 □4 □5	
7	AC	Accessibility: bus/metro convenience	4.00	0.535	□1 □2 □3 □4 □5	
8	RS	Residual heritage features: authenticity, landscape components	3.75	0.463	□1 □2 □3 □4 □5	
9	HR	Health & risk governance: contamination remediation, safety	3.625	0.518	□1 □2 □3 □4 □5	
10	MS	Market demand: potential users & functional fit	3.50	0.535	□1 □2 □3 □4 □5	

III. Open Comments

Which criteria still need to be added, or which redundant ones should be removed?

_____

_____

_____

_____

Suggestions on refining definitions or quantification methods:

_____

_____

_____

_____

Thank you for your time and professional input!

For queries, please contact: 56005717@qq.com / 13970938187

Figure S2. Selection of evaluation criteria for the adaptive reuse of industrial heritage in Nanchang-Delphi (Round 2, expert survey). Source: Survey created by the authors

Supplementary B4. Delphi statistics and details for both rounds

Table S7. Delphi round 1 expert ratings and retention decisions (R1, *n* = 9)

Code	Indicator (≤25-char definition)	E1	E2	E3	E4	E5	E6	E7	E8	E9	Mean	SD	CoV	IQR	CVI	Decision (R1)
HV	Historical value	5	5	4	5	4	5	5	4	5	4.67	0.50	0.11	1.00	1.00	Retain
CV	Cultural value/place identity	4	5	4	4	4	5	4	4	4	4.22	0.44	0.10	0.00	1.00	Retain
ES	Ecological sustainability	4	5	4	4	5	4	4	4	4	4.22	0.44	0.10	0.00	1.00	Retain
EE	Economic benefit	5	4	4	4	4	4	3	4	5	4.11	0.60	0.15	0.00	0.89	Retain
SI	Social influence	4	4	5	4	4	3	4	4	5	4.11	0.60	0.15	0.00	0.89	Retain
PC	Structure/safety	4	5	4	4	5	4	4	4	3	4.11	0.60	0.15	0.00	0.89	Retain
AC	Location and transport accessibility	4	4	4	5	4	4	4	3	4	4.00	0.50	0.13	0.00	0.89	Retain
FC	Spatial fit/reversibility	4	4	4	3	4	4	4	3	4	3.78	0.44	0.12	0.00	0.78	Retain[a]
SITE	Site and remains conditions	4	4	3	4	4	4	4	4	3	3.78	0.44	0.12	0.00	0.78	Retain[a]
DEMAND	Market demand	4	4	4	4	3	4	4	3	4	3.78	0.44	0.12	0.00	0.78	Retain[a]
HEALTH	Health and risk	4	4	4	3	4	4	3	4	4	3.78	0.44	0.12	0.00	0.78	Candidate[b]
IND	Industry synergy	4	4	3	4	3	4	4	3	4	3.67	0.50	0.14	1.00	0.67	Remove
REG	Regulatory compliance/governance	3	4	3	4	4	3	4	3	4	3.56	0.53	0.15	1.00	0.56	Remove
MIX	Mixed functions/innovation	3	4	3	3	4	3	3	3	4	3.33	0.50	0.15	1.00	0.33	Remove

Notes: [a]keep, but consider merging/streamlining; [b]keep as a merge candidate or reserve item; Round-1 retention rule (example): select the top 10 by mean, with moderate SD/CoV, and CVI ≥ 0.78 as "strong retain." accordingly, retain HV, ES, CV, EE, SI, PC, AC, HEALTH; treat FC, SITE, DEMAND, IND as merge candidates; set REG as a threshold item; suggest deleting MIX or merging it into the "functional strategy" explanation.
Abbreviations: CoV: Coefficient of variation; CVI: Content validity index; IQR: Interquartile range; SD: Standard deviation

Table S8. Delphi round 2 ratings and merge decisions (R2, *n* = 9; seven top-level criteria + level-2 sub-indicators)

Code	Indicator (≤ 25 chars)	E1	E2	E3	E4	E5	E6	E7	E8	E9	Mean	SD	CoV	IQR	CVI	Merge note/retention
HV	Historical value	5	5	5	4	5	5	5	4	5	4.78	0.44	0.09	0.00	1.00	Retain as primary
CV	Cultural value/place identity	4	4	5	4	4	5	4	4	4	4.22	0.44	0.10	0.00	1.00	Retain as primary
AC	Location and transport accessibility	4	4	4	4	4	4	5	4	4	4.11	0.33	0.08	0.00	1.00	Retain as primary
EE	Economic benefit (overall)	5	4	4	4	4	4	4	4	4	4.11	0.33	0.08	0.00	1.00	Retain as primary (level-2 includes DEMAND/IND)
SI	Social impact/community participation	4	4	5	4	4	4	4	4	5	4.22	0.44	0.10	0.00	1.00	Retain as primary
ES	Ecological sustainability (overall)	4	5	4	4	5	4	4	4	5	4.33	0.50	0.12	1.00	1.00	Retain as primary (level-2 includes carbon/energy/ecology/health)
PC	Structure/safety (sub of development potential)	5	4	4	5	4	4	4	4	5	4.33	0.50	0.12	1.00	1.00	Merge with FC and SITE to form DP
FC	Spatial fit/reversibility (sub)	4	4	4	3	4	4	4	4	4	3.89	0.33	0.09	0.00	0.89	Merge into DP

(Cont'd...)

Table S8. (*Continued*)

SITE	Site and remains conditions (sub)	4	4	3	4	4	4	4	4	4	3.89	0.33	0.09	0.00	0.89	Merge into DP
HEALTH	Health and risk/ remediation (sub)	4	4	4	4	4	4	4	4	4	4.00	0.00	0.00	0.00	1.00	Include as ES level-2 sub-indicator

Six items directly retained as primary criteria: HV, CV, AC, SI, EE, ES. One primary criterion formed through merging: Development potential (DP) = PC + FC + SITE. HEALTH is included under the environmental dimension as a level-2 sub-indicator of ES. Final seven primary criteria: HV, CV, AC, DP, SI, EE, ES. Notes: All 10 items have CVI ≥ 0.89 (FC/SITE each 0.89), with low dispersion (SD ≤ 0.5, IQR ≤ 1), meeting convergence standards. Abbreviations: CoV: Coefficient of variation; CVI: Content validity index; IQR: Interquartile range; SD: Standard deviation

Supplementary C1. Blank expert/public questionnaires and completion instructions

C1.1. Analytic hierarchy process expert scoring questionnaire: Site selection for the adaptive reuse of industrial heritage in Nanchang

Dear Expert,

We are conducting an AHP-based study to evaluate and determine optimal sites for the adaptive reuse of industrial heritage in Nanchang. Given your expertise, we sincerely invite you to complete this expert scoring questionnaire. Your input will directly influence the quality of our decision model. Thank you.

I. Screening Questions

Are you familiar with (Nanchang) industrial-heritage reuse projects?
☐ Yes ☐ No
Have you participated in any industrial-heritage reuse or related community projects?
☐ Yes ☐ No
In the past five years, have you taken part in (Nanchang) urban planning or community activities?
☐ Yes ☐ No

Informed Consent

This questionnaire is for academic research; all data will be kept strictly confidential.
Your participation is voluntary; you may withdraw at any time without penalty.
For questions, contact: **56005717@qq.com**.
☐ **I have read and agree** to the above and consent to participate.

II. Purpose & Background

This study uses the **Analytic Hierarchy Process (AHP)** to provide an evidence-based site selection for Nanchang's industrial-heritage reuse by jointly considering **Historical Value (HV), Cultural Value (CV), Accessibility (AC), Development Potential (DP), Social Impact (SI), Economic Benefits (EE), and Ecological Sustainability (ES)**. Your judgments will help determine the relative importance (weights) of these criteria and support a robust decision model.

III. Rating Instructions (Saaty 1–9 Scale)

Please conduct **pairwise comparisons** using the 1–9 fundamental scale:

1: Equal importance
3: Slightly more important
5: Clearly more important
7: Strongly more important
9: Extremely more important
2, 4, 6, 8: Intermediate values between the adjacent judgments

Enter your rating **for the more important side** in each pair.

IV. Hierarchy

Goal (Level 1): Select the best site for adaptive reuse of industrial heritage in Nanchang
Criteria (Level 2): HV, CV, AC, DP, SI, EE, ES
Alternatives (Level 3): A) 699 Cultural & Creative Park, B) Zhangshulin Cultural Life Park, C) Jiangfang 1953 Cultural & Education Park

V. Criteria-Level Pairwise Comparisons

Please compare each pair below using the **1–9** scale (enter the number on the side you judge more important).

#	Left criterion	Your score (1–9)	Right criterion
1	HV (Historical Value)	☐	CV (Cultural Value)
2	HV (Historical Value)	☐	AC (Accessibility)
3	HV (Historical Value)	☐	DP (Developability)
4	HV (Historical Value)	☐	SI (Social Impact)
5	HV (Historical Value)	☐	EE (Economic Benefits)
6	CV (Cultural Value)	☐	AC (Accessibility)
7	CV (Cultural Value)	☐	DP (Development potential)
8	CV (Cultural Value)	☐	SI (Social Impact)
9	CV (Cultural Value)	☐	EE (Economic Benefits)
10	AC (Accessibility)	☐	DP (Development potential)
11	AC (Accessibility)	☐	SI (Social Impact)
12	AC (Accessibility)	☐	EE (Economic Benefits)
13	DP (Development potential)	☐	SI (Social Impact)
14	DP (Development potential)	☐	EE (Economic Benefits)
15	SI (Social Impact)	☐	EE (Economic Benefits)
16	HV (Historical Value)	☐	ES (Ecological Sustainability)
17	CV (Cultural Value)	☐	ES (Ecological Sustainability)
18	AC (Accessibility)	☐	ES (Ecological Sustainability)
19	DP (Development potential)	☐	ES (Ecological Sustainability)
20	SI (Social Impact)	☐	ES (Ecological Sustainability)
21	EE (Economic Benefits)	☐	ES (Ecological Sustainability)

Tip: Keep your judgments consistent (A more than B, B more than C ⇒ A should be more than C)

VI. Alternative Comparisons (3×3 per Criterion)

For **each criterion**, compare the three sites in **pairwise fashion** using the **1–9** scale (enter the number on the more important side).

A. Under HV — Historical Value

Pair	Left alternative	Your score (1–9)	Right alternative
HV-1	A (699 Cultural & Creative Park)	☐	B (Zhangshulin Cultural Life Park)
HV-2	A (699 Cultural & Creative Park)	☐	C (Jiangfang 1953 Cultural & Education Park)
HV-3	B (Zhangshulin Cultural Life Park)	☐	C (Jiangfang 1953 Cultural & Education Park)

B. Under CV — Cultural Value

Pair	Left alternative	Your score (1–9)	Right alternative
CV-1	A (699)	☐	B (Zhangshulin)
CV-2	A (699)	☐	C (Jiangfang 1953)
CV-3	B (Zhangshulin)	☐	C (Jiangfang 1953)

C. Under AC — Accessibility

Pair	Left alternative	Your score (1–9)	Right alternative
AC-1	A (699)	☐	B (Zhangshulin)
AC-2	A (699)	☐	C (Jiangfang 1953)
AC-3	B (Zhangshulin)	☐	C (Jiangfang 1953)

D. Under DP — Development potential

Pair	Left alternative	Your score (1–9)	Right alternative
DP-1	A (699)	☐	B (Zhangshulin)
DP-2	A (699)	☐	C (Jiangfang 1953)
DP-3	B (Zhangshulin)	☐	C (Jiangfang 1953)

E. Under SI — Social Impact

Pair	Left alternative	Your score (1–9)	Right alternative
SI-1	A (699)	☐	B (Zhangshulin)
SI-2	A (699)	☐	C (Jiangfang 1953)
SI-3	B (Zhangshulin)	☐	C (Jiangfang 1953)

F. Under EE — Economic Benefits

Pair	Left alternative	Your score (1–9)	Right alternative
EE-1	A (699)	☐	B (Zhangshulin)
EE-2	A (699)	☐	C (Jiangfang 1953)
EE-3	B (Zhangshulin)	☐	C (Jiangfang 1953)

G. Under ES — Ecological Sustainability

Pair	Left alternative	Your score (1–9)	Right alternative
ES-1	A (699)	☐	B (Zhangshulin)
ES-2	A (699)	☐	C (Jiangfang 1953)
ES-3	B (Zhangshulin)	☐	C (Jiangfang 1953)

VII. Expert Information (for traceability)

Name:
Affiliation/sector (industry, academia, government, NGO, etc.):
Years of experience:

Closing

Thank you for your valuable time and professional insights. Your judgments are crucial to our study and will guide evidence-based site selection for industrial-heritage reuse in Nanchang.
For any inquiries: **56005717@qq.com**.

 https://doi.org/10.36922/JCAU025500096

C1.2. Stakeholder survey on site selection for the adaptive reuse of industrial heritage in Nanchang

Dear participant,
You are invited as a stakeholder with a unique perspective on this project.

Purpose & Use

This survey collects your judgments on the **relative importance** of six key criteria for site selection. The results will be used in an **Analytic Hierarchy Process (AHP)** model. All responses are confidential and used for academic research only.

0. Informed Consent

By checking "Agree," you confirm you have read and understood the information above and voluntarily participate.

☐ **I agree** to participate and allow the researchers to use my answers anonymously.

1. Role & Background (single / multiple choice)

Your relationship to the site:
☐ Community resident ☐ Nearby business owner ☐ Community/subdistrict manager ☐ Tourist/visitor
☐ Planning/design professional

Age: ☐ 18–30 ☐ 31–45 ☐ 46–60 ☐ 60+

Distance to the site: ☐ <1 km ☐ 1–3 km ☐ >3 km/from outside the city

Visit/residency frequency: ☐ First time ☐ 2–5 times ☐ More than 5 times

2. Brief Criterion Definitions

Code	Criterion	Plain explanation	Examples
HV	Historical value	Sense of era and stories witnessing Nanchang's industrial development	Original bricks/tiles, old machines
CV	Cultural value	Reflects city character and pride	Local industrial memory, cultural events
AC	Accessibility	Easy, time-saving, low-effort to reach	Direct bus/metro, sufficient parking
DP	Development potential	Structural safety and reasonable retrofit cost	Stable structure, minimal demolition
SI	Social impact	Improves community image, vitality, activity opportunities	Boosts nearby business, more community events
EE	Economic benefits	Consumption, jobs, taxes generated	Attracts visitors and spending, creates jobs
ES	Ecological sustainability	Environmental remediation, energy saving, green space	Greening, energy efficiency, pollution control
Code	**Criterion**	Plain explanation	Examples

3. Scoring Instructions (AHP pairwise comparisons)

Objects to compare: 15 pairs in table **3-1** (criteria vs. criteria).
How to rate: Put ★ **stars (1–5)** on the side you think is **more important**.
1★ = almost equal; **3★** = somewhat more important; **5★** = extremely more important.

If the **right** side is more important, put stars in the **right** column; if the **left** side is more important, put stars in the **left** column.
If **equally important**, **leave both sides blank** and check "=".

3-1 Pairwise Comparison Table (Criteria Level)

#	Left criterion	Left ★	=Equal	Right ★	Right criterion
1	HV Historical value	❑1 ❑2 ❑3 ❑4 ❑5	◻	❑1 ❑2 ❑3 ❑4 ❑5	CV Cultural value
2	HV Historical value	❑1 ❑2 ❑3 ❑4 ❑5	◻	❑1 ❑2 ❑3 ❑4 ❑5	AC Accessibility
3	HV Historical value	❑1 ❑2 ❑3 ❑4 ❑5	◻	❑1 ❑2 ❑3 ❑4 ❑5	DP Development potential
4	HV Historical value	❑1 ❑2 ❑3 ❑4 ❑5	◻	❑1 ❑2 ❑3 ❑4 ❑5	SI Social impact
5	HV Historical value	❑1 ❑2 ❑3 ❑4 ❑5	◻	❑1 ❑2 ❑3 ❑4 ❑5	EE Economic benefits
6	CV Cultural value	❑1 ❑2 ❑3 ❑4 ❑5	◻	❑1 ❑2 ❑3 ❑4 ❑5	AC Accessibility
7	CV Cultural value	❑1 ❑2 ❑3 ❑4 ❑5	◻	❑1 ❑2 ❑3 ❑4 ❑5	DP Development potential
8	CV Cultural value	❑1 ❑2 ❑3 ❑4 ❑5	◻	❑1 ❑2 ❑3 ❑4 ❑5	SI Social impact
9	CV Cultural value	❑1 ❑2 ❑3 ❑4 ❑5	◻	❑1 ❑2 ❑3 ❑4 ❑5	EE Economic benefits
10	AC Accessibility	❑1 ❑2 ❑3 ❑4 ❑5	◻	❑1 ❑2 ❑3 ❑4 ❑5	DP Development potential
11	AC Accessibility	❑1 ❑2 ❑3 ❑4 ❑5	◻	❑1 ❑2 ❑3 ❑4 ❑5	SI Social impact
12	AC Accessibility	❑1 ❑2 ❑3 ❑4 ❑5	◻	❑1 ❑2 ❑3 ❑4 ❑5	EE Economic benefits
13	DP Development potential	❑1 ❑2 ❑3 ❑4 ❑5	◻	❑1 ❑2 ❑3 ❑4 ❑5	SI Social impact
14	DP Development potential	❑1 ❑2 ❑3 ❑4 ❑5	◻	❑1 ❑2 ❑3 ❑4 ❑5	EE Economic benefits
15	SI Social impact	❑1 ❑2 ❑3 ❑4 ❑5	◻	❑1 ❑2 ❑3 ❑4 ❑5	EE Economic benefits
16	HV Historical value	❑1 ❑2 ❑3 ❑4 ❑5	◻	❑1 ❑2 ❑3 ❑4 ❑5	ES Ecological sustainability
17	CV Cultural value	❑1 ❑2 ❑3 ❑4 ❑5	◻	❑1 ❑2 ❑3 ❑4 ❑5	ES Ecological sustainability
18	AC Accessibility	❑1 ❑2 ❑3 ❑4 ❑5	◻	❑1 ❑2 ❑3 ❑4 ❑5	ES Ecological sustainability
19	DP Development potential	❑1 ❑2 ❑3 ❑4 ❑5	◻	❑1 ❑2 ❑3 ❑4 ❑5	ES Ecological sustainability
20	SI Social impact	❑1 ❑2 ❑3 ❑4 ❑5	◻	❑1 ❑2 ❑3 ❑4 ❑5	ES Ecological sustainability
21	EE Economic benefits	❑1 ❑2 ❑3 ❑4 ❑5	◻	❑1 ❑2 ❑3 ❑4 ❑5	ES Ecological sustainability

4. Alternative (Site) Comparisons

4.1 Site Snapshots (one-line prompts)

Code	Site	One-sentence prompt
A 699 Cultural & Creative Park	Hip "check-in" spot with red-brick industrial style—great for photos. Designer shops, art shows, weekend markets; young visitors gather for coffee and crafts; occasional outdoor concerts.	
B Zhangshulin Cultural Life Park	A "small forest" in the city—big camphor trees and cool shade. Slow-life vibe: walking, tai-chi, kids' sand play; intangible-heritage workshops (paper-cutting/ceramics); popular with seniors for daily strolls.	
C Jiangfang 1953 Cultural & Education Park	Former textile mill turned cultural landmark. Huge workshops house a bookstore, theatre, and retro exhibits; iron pipes and old machines are décor—strong sense of era. Weekends: plays, vintage markets, hands-on textile DIY.	

4.2 Ranking Instructions

For **each row**, fill in **1, 2, 3** across the three sites **once each**:
1 = best, **2 = second**, **3 = worst** under that criterion.

4.3 Quick Ranking Table

Criterion	Meaning	A 699	B Zhangshulin	C Jiangfang 1953
HV Historical value	Age/heritage feel & original fabric	□1 □2 □3	□1 □2 □3	□1 □2 □3
CV Cultural value	Reflects Nanchang's industrial culture	□1 □2 □3	□1 □2 □3	□1 □2 □3
AC Accessibility	Bus/metro/parking convenience	□1 □2 □3	□1 □2 □3	□1 □2 □3
DP Development potential	Structural safety & retrofit flexibility	□1 □2 □3	□1 □2 □3	□1 □2 □3
SI Social impact	Community vitality & tativity space	□1 □2 □3	□1 □2 □3	□1 □2 □3
EE Economic benefits	Consumption, jobs, tax revenue	□1 □2 □3	□1 □2 □3	□1 □2 □3
ES Ecological sustainability	Greening, energy saving, remediation	□1 □2 □3	□1 □2 □3	□1 □2 □3

5. Additional Comments (optional)

What other indicators or factors should be considered? (e.g., factory memories, green ecology, park leisure functions) Please write your thoughts:

6. Submission & Thanks

Paper version: Please return to the staff.
Online version: Click **Submit**.

Thank you for your valuable time and insights! Your choices will directly help build a more scientific and community-responsive industrial-heritage reuse plan.
Research team contact: 56005717@qq.com

Supplementary C2. Sample list and respondent roles

Table S9. Composition and participation rationale of Delphi (expert panel, round 2, *n* = 9)

No.	Age	Gender	Primary field	Years (experience/ research)	Highest degree	Representative position/ title	Reason for participation
1	42	M	Industry (design practice)	18	Bachelor's	Secretary-general, Interior Design Branch, Architectural Society of China	Proficient in adaptive reuse of industrial plants and green material selection; experienced with AHP.
2	58	M	Academia + industry	30	Master's (Tsinghua/ French advanced program)	Executive council member, Interior Design Branch, Architectural Society of China	Cross-border green building and LEED consulting; balances theory and practice.
3	52	M	Industry (creative design)	22	Bachelor's (Tsinghua Academy of Arts and Design)	Committee member, Jiangxi chapter; multiple industry awards	Focuses on how industrial aesthetics energize cities.
4	39	M	Enterprise (community renewal)	15	Bachelor's	Design director; community renewal specialist	Led multiple green upgrades of old factory areas and community-park projects.

(*Cont'd...*)

Table S9. (*Continued*)

No.	Age	Gender	Primary field	Years (experience/ research)	Highest degree	Representative position/ title	Reason for participation
5	45	M	Enterprise management	18	Master's	Founder, LQ Art and Decoration	Skilled in building models that couple business operations with energy saving.
6	54	M	Government	26	Bachelor's	Chair, special committee, Interior Design Branch, Architectural Society of China	Deep knowledge of low-carbon policy and approval procedures.
7	61	M	Academia	35	Bachelor's	University professor	Researches sustainable architecture and urban ecology; policy advisor.
8	48	F	Design institute (structure and energy saving)	25	Master's	National Class-1 registered structural engineer; deputy chief engineer	Structural reinforcement of old plants and energy-efficiency retrofits.
9	35	F	Academia	10	PhD	Associate professor	Specializes in industrial-heritage conservation and participatory community design.

Abbreviations: AHP: Analytic hierarchy process; LEED: Leadership in Energy and Environmental Design

Table S10. Composition of public and stakeholder samples for public group (n = 12)

Stakeholder group	Selection criteria	Target n	Recruitment channels	Notes
Community residents	Long-term residents ≥ 3 years; diverse in age, gender, occupation	4	Residents' committee referrals + on-site posters + community WeChat groups	Two youth and two middle-/older-aged participants
Nearby business owners	Operating within 1 km of the site for ≥2 years	3	Subdistrict chamber of commerce referrals + field visits	Cover food and beverage, retail, and services
Community administrators	Subdistrict/residents' committee; culture–tourism NGOs	2	Invitations via government / social organizations	Balance policy and operational perspectives
Visitor representatives	Visited the site ≥ 2 times in the past year	3	On-site interception + WeChat groups	One out-of-province and two in-province participants

Abbreviation: NGO: Non-governmental organization

Table S11. Public group participant profiles and key concerns (n = 12)

ID	Stakeholder	Gender	Age	Role/identity	Relationship to site	Key concerns
R-01	Community resident	F	25	Graphic designer	Lives in the factory-residential compound; 24 years of residence	Daily-life facilities and night safety
R-02	Community resident	M	29	Parcel station manager	Bought a home in 2019; lives in the factory-residential compound	Traffic bottlenecks and logistics access
R-03	Community resident	M	59	Retired electromechanic	Former factory worker; now lives 200 m away	Industrial memories and nostalgia
R-04	Community resident	F	67	Retired textile worker	Lived 41 years; often strolls around the site	Original streetscape + resting amenities and everyday ambience
B-01	Nearby business owner	M	38	Milk-tea shop owner	Shop 300 m from the main gate; five years in business	Better daily facilities; preserve childhood memories

(*Cont'd...*)

Table S11. (*Continued*)

ID	Stakeholder	Gender	Age	Role/identity	Relationship to site	Key concerns
B-02	Nearby business owner	F	46	Convenience-store owner	At the main gate; 15 years in business	Community footfall and old-factory culture; stable income and convenient logistics
B-03	Nearby business owner	M	33	Handmade and creative shop owner	Entered via project leasing; two years	Industrial symbols and creative-street vibe; community footfall; stable returns and reasonable rent
M-01	Community administrator	F	58	Community workstation director	In charge of the heritage-block project	Policy coordination and approval procedures
M-02	Community administrator	M	37	Community manager	Long-term on-site operations	Organizing community events; volunteer management
T-01	Visitor representative	M	30	Photographer (Sichuan)	Visited five times in the past year	Industrial-style photo locations
T-02	Visitor representative	F	26	Architecture graduate student (Nanchang University)	Visited three times in the past year	"Check-in" industrial buildings; industrial aesthetics
T-03	Visitor representative	M	45	Interior designer (Ganzhou)	Visited two times in the past year	Loves urban industrial style; interested in spatial retrofit and material innovation

Table S12. Six public subgroups and selection criteria

Public subgroup	All valid samples (n = 12)	Included in quick ranking (n = 6)	Selection ratio	Basis for selection
Community residents	4	2	50%	Stratify by age and gender: one youth (25–40), one older adult (≥60).
Nearby merchants	3	1	33%	Select the business owner with the **longest operating tenure** in the area (≥5 years).
Community managers	2	1	50%	Select the manager with **more experience** in on-the-ground delivery (street office or community director).
Visitor representatives	3	2	67%	One high-frequency visitor (≥5 visits/year) and one professional visitor (designer or scholar).
Total	12	6	50%	Ensure a mix of everyday users and professional perspectives; balance age, gender, and roles.

Supplementary C3. Analytic hierarchy process consistency calculation example and random index table

C3.1. Consistency testing and calculation notes for AHP:

Steps:

(i) Build the pairwise-judgment matrix $A=\left[a_{ij}\right]$ (positive reciprocal: $\left(\mathrm{a_{ij}}=1/\mathrm{a_{ji}},\mathrm{aii}=1\right)$.
(ii) Compute the maximum eigenvalue λmax and its principal eigenvector $\mathbf{W}$; normalize $\mathbf{W}$ so that $\sum wi=1$.
(iii) Check consistency with **Equations 1 and 2**:

$$\mathrm{CI}=\frac{\lambda_{\max}-\mathrm{n}}{\mathrm{n}-1},\quad \mathrm{CR}=\frac{\mathrm{CI}}{\mathrm{RI}}$$

A matrix passes the test when the consistency ratio (CR) ≤ 0.10; otherwise, revisit the pairwise judgments. All 7 × 7 and 3 × 3 matrices in this study use this procedure; random index (RI) values are listed in **C3.3**.

C3.2. Worked example (3 × 3)

Pairwise matrix:

$$A = \begin{bmatrix} 1 & 3 & 5 \\ \frac{1}{3} & 1 & 3 \\ \frac{1}{5} & \frac{1}{3} & 1 \end{bmatrix}$$

Weights and consistency:

Maximum eigenvalue (numeric): $\lambda_{\max} = 3.0385$

Normalized principal eigenvector: $w = (0.6486, 0.2301, 0.1213)^{\top}$

Consistency:

$$\mathrm{CI} = \frac{3.0385 - 3}{3 - 1} = 0.0193$$

$$\mathrm{CR} = \mathrm{CI} / \mathrm{RI}_3 = 0.0193 / 0.52 = 0.0370$$

Conclusion: CR = 0.037 < 0.10, the matrix is consistent.

For the study's aggregated 7 × 7 expert matrix: $\lambda_{\max}$ = 7.232 ⇒ consistency index (CI) = 0.039; with RI_7 = 1.36, CR = 0.0287 ≤ 0.10, also consistent (matches the main text).

C3.3. Random index, n = 1–10

Order *nnn*	1	2	3	4	5	6	7	8	9	10
Random index	0.00	0.00	0.52	0.89	1.12	1.26	1.36	1.41	1.46	1.49

Note: When n = 1 or n = 2, any positive reciprocal matrix is trivially consistent; hence, random index = 0 and no test is required

Practical notes:

A small number of strong judgments on the 1–9 scale is preferred; use 1, 3, and 5 more often to reduce the risk of inconsistency. For CR > 0.10, inspect the most contradictory triads (e.g., a_{ij}, a_{jk}, a_{ik}) and adjust slightly. In this study, expert matrices are aggregated via aggregation of individual judgments (geometric mean) before testing; public matrices are tested individually and aggregated via aggregation of individual priorities (arithmetic mean). Final fusion follows **Equations 7 and 8** with a 70:30 expert–public split.

Supplementary C4. Rank–reciprocal (rank → weight) formulas and example

Table S13. Public rankings and reciprocal weights table

Respondent		Criterion						
		HV	CV	AC	DP	SI	EE	ES
R-01								
	r_699	2	2	1	2	2	1	3
	r_Zhangshulin	3	3	3	3	3	3	1
	r_Jiangfang	1	1	2	1	1	2	2
	v_699	0.5	0.5	1	0.5	0.5	1	0.333
	v_Zhangshulin	0.333	0.333	0.333	0.333	0.333	0.333	1
	v_Jiangfang	1	1	0.5	1	1	0.5	0.5
	Sum	1.833	1.833	1.833	1.833	1.833	1.833	1.833

(*Cont'd...*)

Table S13. (*Continued*)

Respondent		Criterion						
		HV	CV	AC	DP	SI	EE	ES
R-03								
	r_699	2	2	1	2	2	1	2
	r_Zhangshulin	3	3	3	3	3	3	3
	r_Jiangfang	1	1	2	1	1	2	1
	v_699	0.5	0.5	1	0.5	0.5	1	0.5
	v_Zhangshulin	0.333	0.333	0.333	0.333	0.333	0.333	0.333
	v_Jiangfang	1	1	0.5	1	1	0.5	1
	Sum	1.833	1.833	1.833	1.833	1.833	1.833	1.833
B-03								
	r_699	2	2	1	2	1	1	3
	r_Zhangshulin	3	3	3	3	3	3	1
	r_Jiangfang	1	1	2	1	2	2	2
	v_699	0.5	0.5	1	0.5	1	1	0.333
	v_Zhangshulin	0.333	0.333	0.333	0.333	0.333	0.333	1
	v_Jiangfang	1	1	0.5	1	0.5	0.5	0.5
	Sum	1.833	1.833	1.833	1.833	1.833	1.833	1.833
M-01								
	r_699	2	2	1	2	1	1	3
	r_Zhangshulin	3	3	3	3	3	3	1
	r_Jiangfang	1	1	2	1	2	2	2
	v_699	0.5	0.5	1	0.5	1	1	0.333
	v_Zhangshulin	0.333	0.333	0.333	0.333	0.333	0.333	1
	v_Jiangfang	1	1	0.5	1	0.5	0.5	0.5
	Sum	1.833	1.833	1.833	1.833	1.833	1.833	1.833
T-01								
	r_699	2	2	1	2	1	1	3
	r_Zhangshulin	3	3	3	3	3	3	1
	r_Jiangfang	1	1	2	1	2	2	2
	v_699	0.5	0.5	1	0.5	1	1	0.333
	v_Zhangshulin	0.333	0.333	0.333	0.333	0.333	0.333	1
	v_Jiangfang	1	1	0.5	1	0.5	0.5	0.5
	Sum	1.833	1.833	1.833	1.833	1.833	1.833	1.833

(*Cont'd...*)

Table S13. (*Continued*)

Respondent	Criterion						
	HV	CV	AC	DP	SI	EE	ES
T-02							
r_699	2	2	2	1	1	1	3
r_Zhangshulin	3	3	3	3	3	3	1
r_Jiangfang	1	1	1	2	2	2	2
v_699	0.5	0.5	0.5	1	1	1	0.333
v_Zhangshulin	0.333	0.333	0.333	0.333	0.333	0.333	1
v_Jiangfang	1	1	1	0.5	0.5	0.5	0.5
Sum	1.833	1.833	1.833	1.833	1.833	1.833	1.833

Notes: For rank-to-weight conversion (alternative level), we use the rank–reciprocal method to convert ranks into weights; ties are not allowed. For three alternatives, the normalized constants are (6/11, 3/11, 2/11): Rank 1: 6/11 ≈ 0.545; Rank 2: 3/11 ≈ 0.273; Rank 3: 2/11 ≈ 0.182. Abbreviations: AC: Accessibility; CV: Cultural value; DP: Development potential; EE: Economic benefit; ES: Ecological sustainability; HV: Historical value; SI: Social impact

Supplementary C5. Consistency statistics of judgment matrices

Table S14. Consistency statistics summary

Level/group	Matrix order, *n*	RI	λ_{max}	CI	CR	Decision
Criteria level (experts)	7	1.36	7.232	0.039	0.028	Qualified
Criteria level (public)	7	1.36	7.032	0.005	0.004	Qualified
Alternatives level (HV)	3	0.52	3.010	0.005	0.010	Qualified
Alternatives level (CV)	3	0.52	3.001	0.000	0.001	Qualified
Alternatives level (AC)	3	0.52	3.002	0.001	0.002	Qualified
Alternatives level (DP)	3	0.52	3.054	0.027	0.052	Qualified
Alternatives level (SI)	3	0.52	3.058	0.029	0.056	Qualified
Alternatives level (EE)	3	0.52	3.021	0.010	0.020	Qualified
Alternatives level (ES)	3	0.52	3.038	0.019	0.037	Qualified

Note: The consistency threshold is set to CR ≤ 0.10. Delphi item-level content validity index and scale-level content validity index (average) statistics are provided in Supplementary B2, B3 and B4. Abbreviations: AC: Accessibility; CI: Consistency index; CR: Consistency ratio; CV: Cultural value; DP: Development potential; EE: Economic benefit; ES: Ecological sustainability; HV: Historical value; RI: Random index; SI: Social impact

Supplementary C6. Examples of expert/public weight fusion and composite-score computation

Table S15. Experts' criteria weights

Criterion	HV	CV	AC	DP	SI	EE	ES
Weight	**0.320**	**0.134**	**0.045**	**0.080**	**0.115**	**0.055**	**0.251**

Note: Threshold for consistency ratio ≤ 0.10. Abbreviations: AC: Accessibility; CV: Cultural value; DP: Development potential; EE: Economic benefit; ES: Ecological sustainability; HV: Historical value; SI: Social impact

Table S16. Public criteria weights

Criterion	HV	CV	AC	DP	SI	EE	ES
Weight	**0.184**	**0.202**	**0.103**	**0.102**	**0.174**	**0.107**	**0.128**

Note: Calculation and consistency procedures are shown in Supplementary D1; weights for the public at the alternatives level are obtained via the rank–reciprocal method. Abbreviations: AC: Accessibility; CV: Cultural value; DP: Development potential; EE: Economic benefit; ES: Ecological sustainability; HV: Historical value; SI: Social impact

Table S17. Combined (group) criteria weights

Group/criterion	HV	CV	AC	DP	SI	EE	ES	Total
Experts	0.320	0.134	0.045	0.080	0.115	0.055	0.251	1.000
Public	0.184	0.202	0.103	0.102	0.174	0.107	0.128	1.000
Global (combined)	0.279	0.154	0.062	0.087	0.133	0.071	0.214	1.000

Abbreviations: AC: Accessibility; CV: Cultural value; DP: Development potential; EE: Economic benefit; ES: Ecological sustainability; HV: Historical value; SI: Social impact

Table S18. Experts' alternative-level weights

Criterion and site	Alternative			Weight
Historical value (HV)	HV1	HV2	HV3	
699 Cultural and Creative Park	1	1.570	0.249	0.1881
Zhangshulin Cultural Life Park	0.3333	1	0.215	0.1328
Jiangfang 1953 Cultural-Education Park	4.017	4.646	1	0.6791
Cultural value (CV)	CV1	CV2	CV3	
699 Cultural and Creative Park	1	1.684	0.308	0.2098
Zhangshulin Cultural Life Park	0.594	1	0.199	0.1282
Jiangfang 1953 Cultural-Education Park	3.249	5.018	1	0.6620
Accessibility (AC)	AC1	AC2	AC3	
699 Cultural and Creative Park	1	4.425	3.584	0.6630
Zhangshulin Cultural Life Park	0.226	1	0.712	0.1437
Jiangfang 1953 Cultural-Education Park	0.279	1.405	1	0.1933
Development potential (DP)	DP1	DP2	DP3	
699 Cultural and Creative Park	1	3.817	0.283	0.2452
Zhangshulin Cultural Life Park	0.2621	1	0.148	0.0814
Jiangfang 1953 Cultural-Education Park	3.536	6.764	1	0.6734
Social impact (SI)	SI1	SI2	SI3	
699 Cultural and Creative Park	1	3.891	0.266	0.2371
Zhangshulin Cultural Life Park	0.257	1	0.140	0.0780
Jiangfang 1953 Cultural-Education Park	3.765	7.143	1	0.6849
Economic benefit (EE)	EE1	EE2	EE3	
699 Cultural and Creative Park	1	6.494	2.364	0.6149
Zhangshulin Cultural Life Park	0.154	1	0.237	0.0829
Jiangfang 1953 Cultural-Education Park	0.423	4.228	1	0.3022
Ecological sustainability (ES)	ES1	ES2	ES3	
699 Cultural and Creative Park	1	0.178	0.338	0.0987
Zhangshulin Cultural Life Park	5.629	1	3.413	0.6618
Jiangfang 1953 Cultural-Education Park	2.961	0.293	1	0.2395

Table S19. Experts' alternative weights by criterion

Criterion (relative weight)	Alternative	Relative weight
Historical value (HV, 0.320)	699 Cultural and Creative Park	0.1881
	Zhangshulin Cultural Life Park	0.1328
	Jiangfang 1953 Cultural-Education Park	0.6791
Cultural value (CV, 0.134)	699 Cultural and Creative Park	0.2098
	Zhangshulin Cultural Life Park	0.1282
	Jiangfang 1953 Cultural-Education Park	0.6620
Accessibility (AC, 0.045)	699 Cultural and Creative Park	0.6630
	Zhangshulin Cultural Life Park	0.1437
	Jiangfang 1953 Cultural-Education Park	0.1933
Development potential (DP, 0.080)	699 Cultural and Creative Park	0.2452
	Zhangshulin Cultural Life Park	0.0814
	Jiangfang 1953 Cultural-Education Park	0.6734
Social impact (SI, 0.115)	699 Cultural and Creative Park	0.2371
	Zhangshulin Cultural Life Park	0.0780
	Jiangfang 1953 Cultural-Education Park	0.6849
Economic benefit (EE, 0.055)	699 Cultural and Creative Park	0.6149
	Zhangshulin Cultural Life Park	0.0829
	Jiangfang 1953 Cultural-Education Park	0.3022
Ecological sustainability (ES, 0.251)	699 Cultural and Creative Park	0.0987
	Zhangshulin Cultural Life Park	0.6618
	Jiangfang 1953 Cultural-Education Park	0.2395

Note: This table aims for site selection for the adaptive reuse of Nanchang's industrial heritage

Table S20. Experts' overall scores

Site	Composite score	Rank
699 Cultural and Creative Park	0.2435	2
Zhangshulin Cultural Life Park	0.2309	3
Jiangfang 1953 Cultural-Education Park	0.5256	1

Table S21. Public ranking and reciprocal weights table

Respondent	Criterion	Weight		
		699	ZSL	JF 1953
R-01	HV	0.272776869	0.181669394	0.545553737
	CV	0.272776869	0.181669394	0.545553737
	AC	0.545553737	0.181669394	0.272776869
	DP	0.272776869	0.181669394	0.545553737
	SI	0.272776869	0.181669394	0.545553737
	EE	0.545553737	0.181669394	0.272776869
	ES	0.181669394	0.545553737	0.272776869
R-03	HV	0.272776869	0.181669394	0.545553737
	CV	0.272776869	0.181669394	0.545553737
	AC	0.545553737	0.181669394	0.272776869
	DP	0.272776869	0.181669394	0.545553737
	SI	0.272776869	0.181669394	0.545553737
	EE	0.545553737	0.181669394	0.272776869
	ES	0.272776869	0.181669394	0.545553737
B-03	HV	0.272776869	0.181669394	0.545553737
	CV	0.272776869	0.181669394	0.545553737
	AC	0.545553737	0.181669394	0.272776869
	DP	0.272776869	0.181669394	0.545553737
	SI	0.545553737	0.181669394	0.272776869
	EE	0.545553737	0.181669394	0.272776869
	ES	0.181669394	0.545553737	0.272776869
M-01	HV	0.272776869	0.181669394	0.545553737
	CV	0.272776869	0.181669394	0.545553737
	AC	0.545553737	0.181669394	0.272776869
	DP	0.272776869	0.181669394	0.545553737
	SI	0.545553737	0.181669394	0.272776869
	EE	0.545553737	0.181669394	0.272776869
	ES	0.181669394	0.545553737	0.272776869
T-01	HV	0.272776869	0.181669394	0.545553737
	CV	0.272776869	0.181669394	0.545553737
	AC	0.545553737	0.181669394	0.272776869
	DP	0.272776869	0.181669394	0.545553737
	SI	0.545553737	0.181669394	0.272776869
	EE	0.545553737	0.181669394	0.272776869
	ES	0.181669394	0.545553737	0.272776869

(*Cont'd...*)

Table S21. (*Continued*)

Respondent	Criterion	Weight		
		699	ZSL	JF 1953
T-02	HV	0.272776869	0.181669394	0.545553737
	CV	0.272776869	0.181669394	0.545553737
	AC	0.272776869	0.181669394	0.545553737
	DP	0.545553737	0.181669394	0.272776869
	SI	0.545553737	0.181669394	0.272776869
	EE	0.545553737	0.181669394	0.272776869
	ES	0.181669394	0.545553737	0.272776869

Abbreviations: 699: Nanchang 699 Cultural and Creative Park; AC: Accessibility; CV: Cultural value; DP: Development potential; EE: Economic benefit; ES: Ecological sustainability; HV: Historical value; JF 1953: Jiangfang 1953; SI: Social impact; ZSL: Zhangsulin Cultural Life Park

Table S22. Public scheme-level weights

Criterion	Relative weight	Alternative level	Relative weight
Historical value (HV)	0.184	699 Cultural and Creative Park	0.2728
		Zhangshulin Cultural Life Park	0.1817
		Jiangfang 1953 Cultural-Education	0.5456
Cultural value (CV)	0.201	699 Cultural and Creative Park	0.2728
		Zhangshulin Cultural Life Park	0.1817
		Jiangfang 1953 Cultural-Education	0.5456
Accessibility (AC)	0.103	699 Cultural and Creative Park	0.5001
		Zhangshulin Cultural Life Park	0.1817
		Jiangfang 1953 Cultural-Education	0.3182
Development potential (DP)	0.102	699 Cultural and Creative Park	0.3182
		Zhangshulin Cultural Life Park	0.1817
		Jiangfang 1953 Cultural-Education	0.5001
Social impact (SI)	0.174	699 Cultural and Creative Park	0.4546
		Zhangshulin Cultural Life Park	0.1817
		Jiangfang 1953 Cultural-Education	0.3637
Economic benefit (EE)	0.107	699 Cultural and Creative Park	0.5456
		Zhangshulin Cultural Life Park	0.1817
		Jiangfang 1953 Cultural-Education	0.2728
Ecological sustainability (ES)	0.129	699 Cultural and Creative Park	0.1969
		Zhangshulin Cultural Life Park	0.4849
		Jiangfang 1953 Cultural-Education	0.3182

Note: This table aims for site selection for the regeneration of Nanchang's industrial heritage

Supplementary C7. Formula

$$CI = \frac{\lambda_{max} - n}{n - 1} \tag{S1}$$

$$CR = \frac{CI}{RI} \tag{S2}$$

$$A_{ij}^{E} = (\prod_{k=1}^{m} A_{ij}^{(k)})^{1/m}, \quad m = 9 \tag{S3}$$

$$\mathbf{w}^{P} = \frac{1}{m}\sum_{K=1}^{m} w^{(K)}, \quad m = 12 \tag{S4}$$

$$S'_{i} = \sum_{c} w'_{c}\ s_{c,i} \tag{S5}$$

$$w = \alpha \mathbf{w}^{E} + (1-\alpha)\mathbf{w}^{P} \tag{S6}$$

$$\boldsymbol{W}_{c} = \alpha \mathrm{W}_{c}^{\mathrm{E}} + (1-)\mathrm{W}_{c}^{\mathrm{P}} \tag{S7}$$

$$S_{i} = \sum_{\{\mathrm{HV,\ CV,\ AC,\ DP,\ SI,\ EE,\ ES}\}} w_{c} w_{c,i} \tag{S8}$$

$$w'_{c} = \frac{f\ w_{c}}{1+(f-)w_{c}}, 1\ w_{j} = \frac{w_{j}}{+(f-)w_{c}}(j \neq c) \tag{S9}$$

Supplementary D1. Analytic hierarchy process computation pseudocode and parameter notes

Table S23. Expert questionnaire structure and item counts (analytic hierarchy process pairwise comparisons)

Level	Objects compared	Matrix size	No. of items to fill (upper triangle)	Consistency threshold
Criteria level	Seven primary criteria (HV, CV, AC, DP, SI, EE, ES)	7 × 7	C(7,2) = 21	CR ≤ 0.10 (n = 7, RI = 1.36)
Alternative level	Under each criterion, compare three candidate sites (699, ZSL, JF 1953)	One 3 × 3 per criterion (seven total)	Per matrix C(3,2) = 3; total 7 × 3 = 21	CR ≤ 0.10 (n = 3, RI = 0.52)

Notes: Saaty 1–9 scale is used throughout; "items to fill" counts independent upper-triangle entries; matrices are positive reciprocal. Abbreviations: 699: Nanchang 699 Cultural and Creative Park; AC: Accessibility; CR: Consistency ratio; CV: Cultural value; DP: Development potential; EE: Economic benefit; ES: Ecological sustainability; HV: Historical value; JF 1953: Jiangfang 1953; RI: Random index; SI: Social impact; ZSL: Zhangsulin Cultural Life Park

Supplementary D1. Consistency control

See **Section 4.2.** Worked example and RI table are in **Supplementary C3**.

Supplementary D2. Detailed one-at-a-time sensitivity tables

Table S24. New weight vectors

Criteria	Perturbations			
	−10%	−5%	5%	10%
Perturbing HV				
HV	0.2583	0.2688	0.2889	0.2986
CV	0.1584	0.1562	0.1519	0.1498
AC	0.0638	0.0629	0.0611	0.0603
DP	0.0895	0.0882	0.0858	0.0846
SI	0.1368	0.1349	0.1312	0.1294
EE	0.0730	0.0720	0.0700	0.0691
ES	0.2201	0.2170	0.2111	0.2082

(*Cont'd...*)

Table S24. (*Continued*)

Criteria	Perturbations			
	−10%	−5%	5%	10%
Perturbing CV				
HV	0.2834	0.2812	0.2769	0.2748
CV	0.1408	0.1474	0.1605	0.1668
AC	0.0630	0.0625	0.0615	0.0611
DP	0.0884	0.0877	0.0863	0.0857
SI	0.1351	0.1340	0.1320	0.1310
EE	0.0721	0.0716	0.0705	0.0699
ES	0.2173	0.2157	0.2124	0.2108
Perturbing AC				
HV	0.2807	0.2799	0.2781	0.2773
CV	0.1550	0.1545	0.1535	0.1531
AC	0.0561	0.0591	0.0649	0.0678
DP	0.0875	0.0873	0.0867	0.0865
SI	0.1338	0.1334	0.1326	0.1322
EE	0.0714	0.0712	0.0708	0.0706
ES	0.2153	0.2147	0.2133	0.2127
Perturbing DP				
HV	0.2814	0.2802	0.2778	0.2766
CV	0.1554	0.1547	0.1533	0.1527
AC	0.0625	0.0623	0.0617	0.0615
DP	0.0790	0.0830	0.0910	0.0949
SI	0.1342	0.1336	0.1324	0.1319
EE	0.0716	0.0713	0.0707	0.0704
ES	0.2159	0.2149	0.2131	0.2122
Perturbing SI				
HV	0.2828	0.2809	0.2772	0.2753
CV	0.1561	0.1550	0.1530	0.1520
AC	0.0628	0.0624	0.0616	0.0612
DP	0.0882	0.0876	0.0864	0.0859
SI	0.1213	0.1272	0.1387	0.1444
EE	0.0720	0.0715	0.0705	0.0701
ES	0.2169	0.2154	0.2126	0.2112

(*Cont'd...*)

Table S24. (*Continued*)

Criteria	Perturbations			
	−10%	−5%	5%	10%
Perturbing EE				
HV	0.2810	0.2800	0.2780	0.2770
CV	0.1551	0.1545	0.1535	0.1529
AC	0.0624	0.0622	0.0618	0.0616
DP	0.0876	0.0873	0.0867	0.0864
SI	0.1340	0.1335	0.1325	0.1321
EE	0.0644	0.0677	0.0743	0.0775
ES	0.2155	0.2148	0.2132	0.2125
Perturbing ES				
HV	0.2851	0.2820	0.2760	0.2732
CV	0.1574	0.1557	0.1524	0.1508
AC	0.0634	0.0627	0.0613	0.0607
DP	0.0889	0.0879	0.0861	0.0852
SI	0.1359	0.1344	0.1316	0.1302
EE	0.0726	0.0718	0.0702	0.0695
ES	0.1968	0.2055	0.2223	0.2305

Abbreviations: AC: Accessibility; CV: Cultural value; DP: Development potential; EE: Economic benefit; ES: Ecological sustainability; HV: Historical value; SI: Social impact

Supplementary D3. Specifications and formulas for significance tests

Table S25. Descriptive statistics of expert and public weights (seven criteria)

Metric	HV	CV	AC	DP	SI	EE	ES
Expert mean	0.3178	0.1328	0.0486	0.0820	0.1160	0.0572	0.2490
Public mean	0.1934	0.1947	0.1045	0.1058	0.1664	0.1151	0.1200
Expert SD	0.0526	0.0150	0.0132	0.0181	0.0213	0.0136	0.0404
Public SD	0.0888	0.0744	0.0589	0.0508	0.0684	0.0875	0.0239
Standard error	0.0311	0.0221	0.0176	0.0159	0.0210	0.0257	0.0151
t-value	4.0034	−2.8057	−3.1863	−1.5034	−2.4038	−2.2539	8.5288
p-value	0.0008	0.0157	0.0075	0.1542	0.0310	0.0442	0.0000
Pooled SD	0.0757	0.0575	0.0456	0.0404	0.0538	0.0672	0.0319
Cohen's *d*	1.6424	−1.0772	−1.2266	−0.5902	−0.9368	−0.8613	4.0437

Abbreviations: AC: Accessibility; CV: Cultural value; DP: Development potential; EE: Economic benefit; ES: Ecological sustainability; HV: Historical value; SD: Standard deviation; SI: Social impact

Table S26. Comparative statistics of expert and public weights (seven criteria)

Criterion	Expert mean	Public mean	Expert SD	Public SD
HV	0.3180	0.1930	0.0526	0.0888
CV	0.1330	0.1950	0.0150	0.0744
AC	0.0486	0.1045	0.0132	0.0589
DP	0.0820	0.1058	0.0181	0.0508
SI	0.1160	0.1660	0.0213	0.0684
EE	0.0572	0.1150	0.0136	0.0875
ES	0.2490	0.1200	0.0404	0.0239

Abbreviations: AC: Accessibility; CV: Cultural value; DP: Development potential; EE: Economic benefit; ES: Ecological sustainability; HV: Historical value; SD: Standard deviation; SI: Social impact

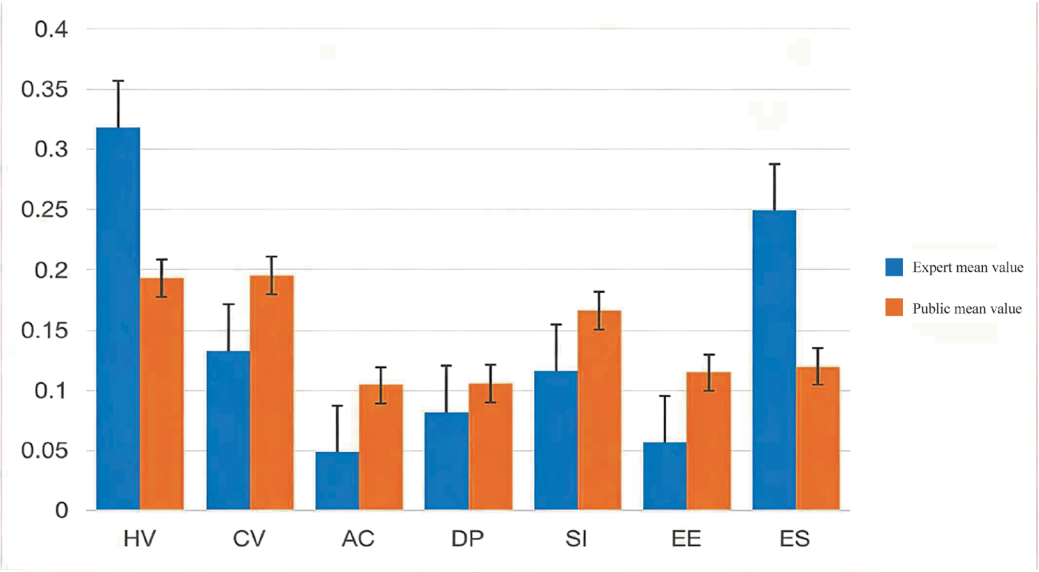


Figure S3. Comparison of expert and public mean weights (seven criteria)
Abbreviations: AC: Accessibility; CV: Cultural value; DP: Development potential; EE: Economic benefit; ES: Ecological sustainability; HV: Historical value; SI: Social impact. Source: Diagram by the authors

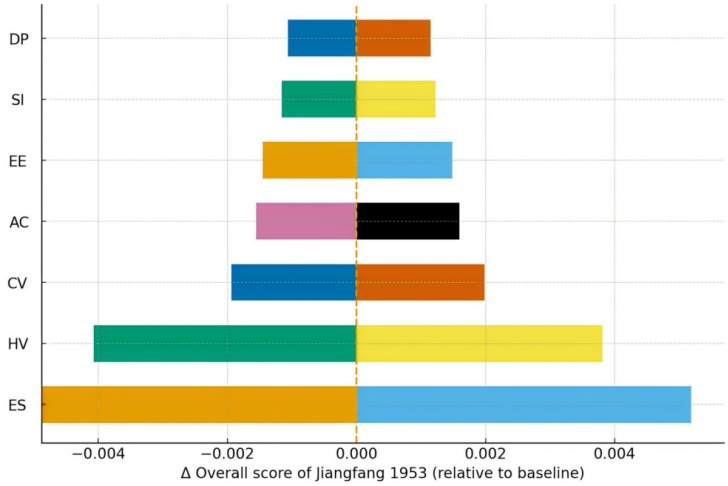


Figure S4. Tornado chart for the sensitivity of Jiangfang 1953 overall score to ±10% criterion-weight shocks.
Abbreviations: AC: Accessibility; CV: Cultural value; DP: Development potential; EE: Economic benefit; ES: Ecological sustainability; HV: Historical value; SI: Social impact. Source: Diagram by the authors

Supplementary D4. Result verification and robustness details

Table S27. Intercept-free variance inflation factor (VIF) diagnostics by criterion

Criterion	R^2 (no intercept)	Tolerance ($1 - R^2$)	VIF = 1, ($1 - R^2$)
HV	0.3109	0.689100	1.451168
CV	0.4709	0.529100	1.890002
AC	0.3212	0.678800	1.473188
DP	0.2971	0.702900	1.422677
SI	0.2488	0.751200	1.331203
EE	0.2551	0.744900	1.342462
ES	0.3109	0.689100	1.451168

Abbreviations: AC: Accessibility; CV: Cultural value; DP: Development potential; EE: Economic benefit; ES: Ecological sustainability; HV: Historical value; SI: Social impact

Supplementary D5. Pearson correlations and Holm–Bonferroni multiple correction

Table S28. Pearson correlation matrix among the weights of the seven criteria

Criterion	HV	CV	AC	DP	SI	EE	ES
HV	1	−0.0676	−0.7262	−0.4546	−0.4996	−0.5670	0.5008
CV	−0.0676	1	−0.2297	−0.0525	−0.0904	−0.1561	−0.3827
AC	−0.7262	−0.2297	1	0.4266	0.4065	0.5137	−0.6322
DP	−0.4546	−0.0525	0.4266	1	0.0917	−0.0422	−0.2570
SI	−0.4996	−0.0904	0.4065	0.0917	1	−0.0510	−0.3787
EE	−0.5670	−0.1561	0.5137	−0.0422	−0.0510	1	−0.4124
ES	0.5008	−0.3827	−0.6322	−0.2570	−0.3787	−0.4124	1

Abbreviations: AC: Accessibility; CV: Cultural value; DP: Development potential; EE: Economic benefit; ES: Ecological sustainability; HV: Historical value; SI: Social impact

Table S29. Conditional weights and composite scores of the three sites

Criterion	Base weight	699 conditional weight	699 contribution	ZSL conditional weight	ZSL contribution	JF 1953 conditional weight	JF 1953 contribution	Row sum of conditional weights	Leading option
HV	0.2790	0.2135	0.0596	0.1474	0.0411	0.6390	0.1783	1	JF 1953
CV	0.1540	0.2286	0.0352	0.1443	0.0222	0.6271	0.0966	1	JF 1953
AC	0.0620	0.6141	0.0381	0.1551	0.0096	0.2308	0.0143	1	699
DP	0.0870	0.2672	0.0232	0.1115	0.0097	0.6213	0.0541	1	JF 1953
SI	0.1330	0.3025	0.0402	0.1090	0.0145	0.5885	0.0783	1	JF 1953
EE	0.0710	0.5942	0.0422	0.1125	0.0080	0.2934	0.0208	1	699
ES	0.2140	0.1282	0.0274	0.6086	0.1302	0.2632	0.0563	1	ZSL
Totals (baseline composite score)		0.2659		0.2354		0.4986			

Abbreviations: 699: Nanchang 699 Cultural and Creative Park; AC: Accessibility; CR: Consistency ratio; CV: Cultural value; DP: Development potential; EE: Economic benefit; ES: Ecological sustainability; HV: Historical value; JF 1953: Jiangfang 1953; RI: Random index; SI: Social impact; ZSL: Zhangsulin Cultural Life Park

Table S30. Sensitivity analysis results under ±10% criterion-weight perturbations (seven criteria)

Sites	Perturbations			
	−10%	-5%	5%	10%
Perturbing HV				
699 (new)	0.267448	0.266685	0.265222	0.264520
ZSL (new)	0.237935	0.236654	0.234200	0.233023
JF 1953 (new)	0.494618	0.496661	0.500579	0.502458
699 Δ (change)	0.001505	0.000742	−0.000721	−0.001423
ZSL Δ (change)	0.002525	0.001244	−0.001210	−0.002388
JF 1953 Δ (change)	−0.004029	−0.001986	0.001931	0.003811
Perturbing CV				
699 (new)	0.266526	0.266232	0.265658	0.265377
ZSL (new)	0.236835	0.236117	0.234714	0.234028
JF 1953 (new)	0.496639	0.497651	0.499628	0.500595
699 Δ (change)	0.000583	0.000289	−0.000285	−0.000566
ZSL Δ (change)	0.001425	0.000707	−0.000696	−0.001382
JF 1953 Δ (change)	−0.002008	−0.000996	0.000981	0.001948
Perturbing AC				
699 (new)	0.263771	0.264860	0.267019	0.268088
ZSL (new)	0.235911	0.235660	0.235162	0.234915
JF 1953 (new)	0.500318	0.499480	0.497819	0.496997
699 Δ (change)	−0.002172	−0.001083	0.001076	0.002145
ZSL Δ (change)	0.000501	0.000250	−0.000248	−0.000495
JF 1953 Δ (change)	0.001671	0.000833	−0.000828	−0.001650
Perturbing DP				
699 (new)	0.265932	0.265938	0.265948	0.265953
ZSL (new)	0.236498	0.235951	0.234873	0.234341
JF 1953 (new)	0.497570	0.498111	0.499179	0.499705
699 Δ (change)	−0.000011	−0.000005	0.000005	0.000011
ZSL Δ (change)	0.001088	0.000541	−0.000537	−0.001069
JF 1953 Δ (change)	−0.001077	−0.000536	0.000531	0.001058
Perturbing SI				
699 (new)	0.265450	0.265698	0.266184	0.266422
ZSL (new)	0.237113	0.236256	0.234575	0.233751
JF 1953 (new)	0.497436	0.498046	0.499241	0.499826
699 Δ (change)	−0.000492	−0.000245	0.000241	0.000480
ZSL Δ (change)	0.001703	0.000846	−0.000835	−0.001659
JF 1953 Δ (change)	−0.001211	−0.000601	0.000593	0.001179

(*Cont'd...*)

Table S30. (*Continued*)

Sites	Perturbations			
	−10%	-5%	5%	10%
Perturbing EE				
699 (new)	0.263596	0.264774	0.267104	0.268257
ZSL (new)	0.236289	0.235848	0.234975	0.234543
JF 1953 (new)	0.500115	0.499379	0.497921	0.497200
699 Δ (change)	−0.002347	−0.001169	0.001161	0.002314
ZSL Δ (change)	0.000879	0.000438	−0.000435	−0.000867
JF 1953 Δ (change)	0.001468	0.000731	−0.000726	−0.001447
Perturbing ES				
699 (new)	0.268956	0.267433	0.264484	0.263056
ZSL (new)	0.227249	0.231373	0.239361	0.243230
JF 1953 (new)	0.503796	0.501194	0.496155	0.493714
699 Δ (change)	0.003013	0.001490	−0.001459	−0.002887
ZSL Δ (change)	−0.008162	−0.004037	0.003951	0.007820
JF 1953 Δ (change)	0.005149	0.002547	−0.002493	−0.004933

Abbreviations: 699: Nanchang 699 Cultural and Creative Park; AC: Accessibility; CR: Consistency ratio; CV: Cultural value; DP: Development potential; EE: Economic benefit; ES: Ecological sustainability; HV: Historical value; JF 1953: Jiangfang 1953; RI: Random index; SI: Social impact; ZSL: Zhangsulin Cultural Life Park

Table S31. Holm–Bonferroni corrected significance tests for variable pairs

Pair	Raw *p*-value (p_\text{raw})	*i* (ascending rank)	Holm threshold	Corrected *p*-value (p_\text{Holm})	Significance
HV–AC	0.000193	1	0.00238	0.00406	Significant
AC–ES	0.002104	2	0.00250	0.00421	Significant
HV–EE	0.007356	3	0.00263	0.01397	Not significant
AC–EE	0.017231	4	0.00278	0.03102	Not significant
HV–ES	0.020748	5	0.00313	0.03527	Not significant
HV–SI	0.021120	6	0.00313	0.03379	Not significant
HV–DP	0.038435	7	0.00333	0.05765	Not significant
AC–DP	0.053811	8	0.00357	0.07533	Not significant
EE–ES	0.063179	9	0.00417	0.08213	Not significant
AC–SI	0.067485	10	0.00455	0.08098	Not significant
CV–ES	0.086853	11	0.00500	0.09554	Not significant
SI–ES	0.090476	12	0.00556	0.09048	Not significant
DP–ES	0.260783	13	0.00625	1.00000	Not significant
CV–AC	0.316573	14	0.00667	1.00000	Not significant
CV–EE	0.499243	15	0.00714	1.00000	Not significant
DP–SI	0.692776	16	0.00833	1.00000	Not significant
CV–SI	0.696894	17	0.00909	1.00000	Not significant
HV–CV	0.770781	18	0.01000	1.00000	Not significant
CV–DP	0.821311	19	0.01250	1.00000	Not significant

(Cont'd...)

Table S31. (*Continued*)

SI–EE	0.826369	20	0.02500	1.00000	Not significant
DP–EE	0.855768	21	0.05000	1.00000	Not significant

Note: Significance criterion: After correction, p-value < 0.05 is considered significant.
Abbreviations: 699: Nanchang 699 Cultural and Creative Park; AC: Accessibility; CR: Consistency ratio; CV: Cultural value; DP: Development potential; EE: Economic benefit; ES: Ecological sustainability; HV: Historical value; RI: Random index; SI: Social impact

Supplementary E1. Objective accessibility data and illustrations for the three sites



Figure S5. Accessibility map of 699 Cultural and Creative Park (approximately 799 m walking distance). Source: Baidu Maps, adapted by the authors

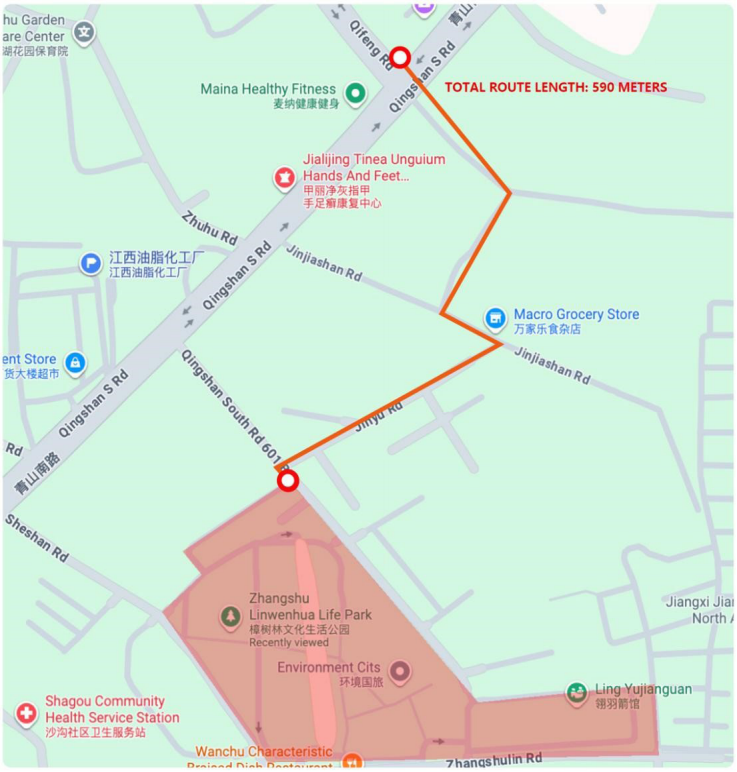
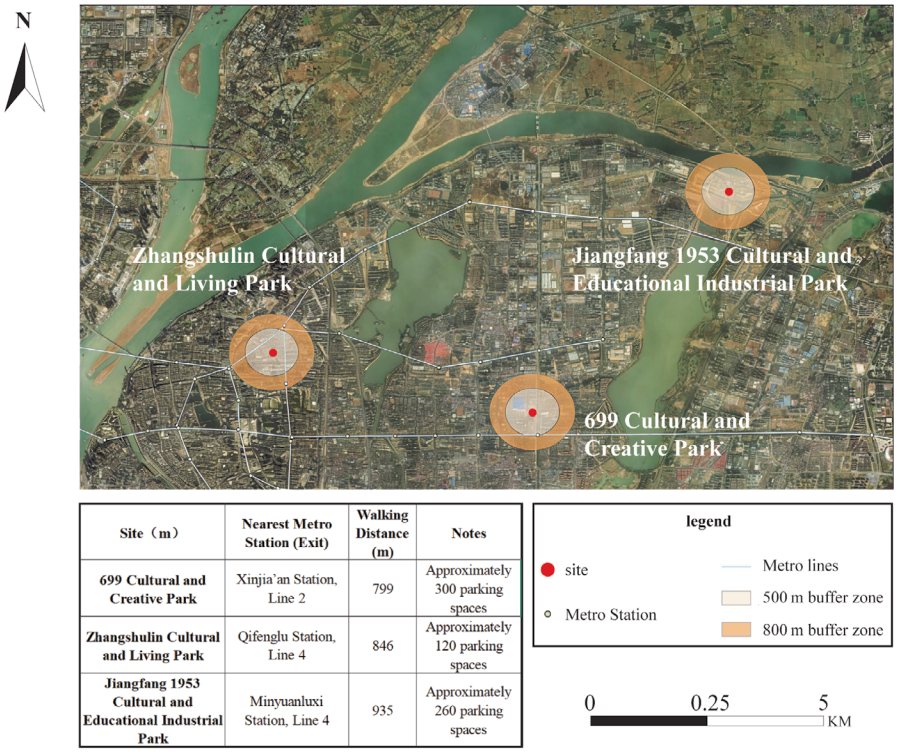


Figure S6. Accessibility map of Jiangfang 1953 Cultural Education Park (approximately 935 m walking distance). Source: Baidu Maps, adapted by the authors



Figure S7. Accessibility map of Zhangshulin Cultural Life Park (approximately 846 m walking distance). Source: Baidu Maps, adapted by the authors



Site（m）	Nearest Metro Station (Exit)	Walking Distance (m)	Notes
699 Cultural and Creative Park	Xinjia'an Station, Line 2	799	Approximately 300 parking spaces
Zhangshulin Cultural and Living Park	Qifenglu Station, Line 4	846	Approximately 120 parking spaces
Jiangfang 1953 Cultural and Educational Industrial Park	Minyuanluxi Station, Line 4	935	Approximately 260 parking spaces

Figure S8. Locations and metro accessibility of the three industrial-heritage reuse sites. Source: Baidu Maps, adapted by the authors

Table S32. Coordinates of the three sites and city center (China Geodetic Coordinate System 2000 projection)

ID	X	Y	Place
0	115.8921	28.6765	Bayi Square
1	115.9545	28.6820	699 Cultural and Creative Park
2	115.9048	28.6933	Zhangshulin Cultural Life Park
3	115.9921	28.7238	Jiangfang 1953 Cultural Education Industrial Park

References

Claver, J., García-Domínguez, A., & Sebastián, M. A. (2020). Multicriteria decision tool for sustainable reuse of industrial heritage into its urban and social environment: Case studies. *Sustainability*, *12*(18), Article 7430.

https://doi.org/10.3390/su12187430

Della Spina, L. (2020). Adaptive sustainable reuse for cultural heritage: A multiple criteria decision aiding approach supporting urban development processes. *Sustainability*, *12*(4), Article 1363.

https://doi.org/10.3390/su12041363

Gharaati, F., Mahdavinejad, M., Nadolny, A., & Bazazzadeh, H. (2023). Sustainable assessment of built heritage adaptive reuse practice: Iranian industrial heritage in the light of international charters. *The Historic Environment: Policy & Practice*, *14*(4), 498–532.

https://doi.org/10.1080/17567505.2023.2261328

Haroun, H.-A. A. F., Bakr, A. F., & Hasan, A. E.-S. (2019). Multi-criteria decision making for adaptive reuse of heritage buildings: Aziza Fahmy Palace, Alexandria, Egypt. *Alexandria Engineering Journal*, *58*(2), 467–478.

https://doi.org/10.1016/j.aej.2019.04.003

Lian, W., & Dimitrijević, B. (2025). Analytic hierarchy process-based industrial heritage value evaluation method and reuse research in Shaanxi Province—A case study of Shaanxi Steel Factory. *Sustainability*, *17*(9), Article 4125.

https://doi.org/10.3390/su17094125

Meng, F., Zhi, Y., & Pang, Y. (2023). Assessment of the adaptive reuse potentiality of industrial heritage based on improved entropy TOPSIS method from the perspective of urban regeneration. *Sustainability*, *15*(9), Article 7735.

https://doi.org/10.3390/su15097735

Meng, F., & Xiao, X. (2025). Spatiotemporal distribution and adaptive reuse results assessment of Beijing industrial heritage based on the sustainable renewal perspective. *Land*, *14*(2), Article 384.

https://doi.org/10.3390/land14020384