Supplementary Table S1. Article-Level Classification of Psychological Foundations Across the 42 Included Studies

Study	Primary psychological foundation	Secondary psychological foundation	Constructs supporting primary classification	Constructs supporting secondary classification	Coding rationale
Alambeigi et al. (2025)	Moral responsibility, stewardship, and meaning	Risk, vulnerability, and uncertainty appraisal	Moral responsibility; conservation duty; empathy	Extinction concern; perceived ecological threat	Qualitative conservation accounts emphasize ethical responsibility together with concern about species loss.
Andersson et al. (2020)	Trust, trustworthiness, and reciprocal expectations	Social norms, relational accountability, and social comparison	Trustworthiness signals; confidence in cooperation	Reciprocity; leading by example; shared restraint	Voluntary leadership provides credible signals; reciprocated restraint is a related cooperation process.
Au & Ngai (2003)	Risk, vulnerability, and uncertainty appraisal	Learning, system understanding, and cognitive framing	Uncertain group size; social uncertainty	Equal-division heuristic; position effects	Experimental uncertainty is primary, while decision heuristics are inferred from observed allocation patterns.
Baerlein et al. (2015)	Perceived legitimacy and procedural fairness	Trust, trustworthiness, and reciprocal expectations	Rule legitimacy; perceived appropriateness of procedures	Solidarity; reciprocity; interpersonal trust (inferred)	Acceptance of local rules is central; cooperative confidence is a related qualitative interpretation.
Basurto et al. (2016)	Social norms, relational accountability, and social comparison	Moral responsibility, stewardship, and meaning	Social comparison; hypercompetition; antisocial responses	Prosociality; concern for others (interpretive)	Behavioral games reveal competing prosocial and antisocial tendencies; the secondary moral reading is interpretive.
Camargo & Haydu (2016)	Risk, vulnerability, and uncertainty appraisal	Learning, system understanding, and cognitive framing	Awareness of resource depletion; perceived vulnerability	Resource feedback; learning to calibrate restraint	The experiment makes resource depletion salient and tests feedback-guided adjustment of extraction.
de Mello Frighetto et al. (2025)	Perceived participation barriers, costs, and constraints	Moral responsibility, stewardship, and meaning	Time constraints; overload; emotional exhaustion	Meaningful volunteer work; guilt-related duty	Volunteer sustainability is constrained by burden and burnout, alongside commitment to meaningful service.
DeCaro et al. (2015)	Agency, autonomy, and psychological ownership	Perceived legitimacy and procedural fairness	Voting/voice; self-determination; autonomy	Procedural justice; perceived fairness	The experimental design examines autonomy-supportive choice together with the fairness of rule procedures.
DeCaro et al. (2021)	Perceived legitimacy and procedural fairness	Agency, autonomy, and psychological ownership	Procedural justice; equity; rule acceptance	Self-determination; autonomy; competence	The final classification distinguishes evaluations of process legitimacy from participants' perceived autonomy.

Study	Primary psychological foundation	Secondary psychological foundation	Constructs supporting primary classification	Constructs supporting secondary classification	Coding rationale
DeCaro et al. (2025)	Perceived legitimacy and procedural fairness	Agency, autonomy, and psychological ownership	Recognized authority; role legitimacy; institutional backing	Operational autonomy; shared decision-making authority	An institutional case links role authorization and responsibility to the scope of self-governance; psychological pathways are inferred.
Dipierri & Zikos (2020)	Trust, trustworthiness, and reciprocal expectations	Risk, vulnerability, and uncertainty appraisal	Trust-based coordination; conflict containment	Environmental variability and uncertainty	The field study links coordination to interpersonal trust under changing resource conditions.
Eriksson et al. (2021)	Social norms, relational accountability, and social comparison	Trust, trustworthiness, and reciprocal expectations	Cultural tolerance; cooperative norms; metanorms	Generalized trust; radius of trust	Cross-national results emphasize tolerance-based cooperative norms, with generalized trust an additional social condition.
Farahmand et al. (2025)	Learning, system understanding, and cognitive framing	Risk, vulnerability, and uncertainty appraisal	Confirmation bias; status quo bias; present bias; availability heuristic; loss aversion	Restoration-related risk appraisal (theorized)	Interviews with 148 farmers provide qualitative evidence of cognitive biases shaping discretionary irrigation decisions and perceptions of shared-water depletion. The proposed REPAIR interventions were not independently tested.
Geschwind & Graf Lambsdorff (2025)	Risk, vulnerability, and uncertainty appraisal	Social norms, relational accountability, and social comparison	Scarcity perceptions; attribution of scarcity	Negative reciprocity; perceived unkindness	Resource scarcity frames the experiment; retaliatory responses to perceived unkindness supply the associated social process.
Grillos et al. (2024)	Action efficacy, perceived capacity, and benefit salience	Agency, autonomy, and psychological ownership	Salience of collective benefits; expected group impact	Group rule-making; local initiative (inferred)	Collective incentives relate to rule formation and harvesting restraint; the agency pathway is inferred from institutional choice.
Gurney et al. (2016)	Social norms, relational accountability, and social comparison	Trust, trustworthiness, and reciprocal expectations	Subjective norms; perceived social expectations	Social trust; reciprocity	Direct measures of social expectations are central to participation; trust is an additional social predictor.
Jenny et al. (2007)	Perceived participation barriers, costs, and constraints	Perceived legitimacy and procedural fairness	Daily-life rule compatibility; perceived sanctioning costs	Distributive and informational justice	Rule-specific empirical predictors emphasize practical compatibility and fairness of governance arrangements.
Kaur (2026)	Agency, autonomy, and psychological ownership	Trust, trustworthiness, and reciprocal expectations	Collective psychological ownership; civic "ours-ness"	Trust in municipal follow-through; perceived credibility	Qualitative evidence centers felt public ownership, with municipal credibility as an additional enabling perception.

Study	Primary psychological foundation	Secondary psychological foundation	Constructs supporting primary classification	Constructs supporting secondary classification	Coding rationale
Kaur et al. (2023)	Agency, autonomy, and psychological ownership	Moral responsibility, stewardship, and meaning	Collective psychological ownership; felt collective rights	Commitment to collective goals (interpretive)	Collective rights and ownership anchor the explanation; collective commitment is treated as an additional motivation.
Kinchy (2017)	Action efficacy, perceived capacity, and benefit salience	Risk, vulnerability, and uncertainty appraisal	Preparedness; empowerment; perceived usefulness	Pollution concern; uncertainty about future harm	Citizen science narratives emphasize capacity and preparedness alongside concern about pollution.
Leach & Sabatier (2005)	Perceived legitimacy and procedural fairness	Trust, trustworthiness, and reciprocal expectations	Procedural fairness; perceptions of collaboration process	Interpersonal trust; generalized social trust	Perceived process fairness and trust are both central to the collaborative policymaking analysis.
Li et al. (2026)	Trust, trustworthiness, and reciprocal expectations	Perceived legitimacy and procedural fairness	Dispositional, procedural, distributive, and interpersonal trust	Procedural/distributive acceptance of co-management arrangements	Trust is explicitly differentiated; process-related trust informs the accompanying legitimacy interpretation.
Liang et al. (2026)	Moral responsibility, stewardship, and meaning	Action efficacy, perceived capacity, and benefit salience	Biospheric values; care; public responsibility	Self-efficacy; perceived voice/influence	Civic environmental duty is prominent; limited efficacy and the pursuit of influence also enter participants' accounts.
Ma et al. (2023)	Action efficacy, perceived capacity, and benefit salience	Social norms, relational accountability, and social comparison	Perceived behavioral control; attitudes toward pollution control	Subjective norms; social expectations	The farmer survey models perceived capacity/evaluations alongside directly examined subjective norms.
Marrocoli et al. (2018)	Social norms, relational accountability, and social comparison	Risk, vulnerability, and uncertainty appraisal	Public self-monitoring; reputational accountability	Resource and social uncertainty	Monitoring/public visibility is the focal governance treatment; uncertainty informs the cooperation setting.
McCauley (2017)	Moral responsibility, stewardship, and meaning	Action efficacy, perceived capacity, and benefit salience	Environmental concern; connection to water; stewardship	Perceived usefulness of volunteer monitoring	Qualitative accounts emphasize caring for water and wanting monitoring to make a difference.
McKinnon et al. (2026)	Learning, system understanding, and cognitive framing	Social norms, relational accountability, and social comparison	Learning resource renewal; understanding partners	Conditional cooperation; partner-response expectations	Directly investigated learning deficits are focal; social contingencies form the additional behavioral context.
Ni et al. (2021)	Agency, autonomy, and psychological ownership	Action efficacy, perceived capacity, and benefit salience	Psychological ownership; watershed belonging	Self-efficacy; perceived capacity	The focal measure is ownership, with efficacy included as a distinct psychological predictor.

Study	Primary psychological foundation	Secondary psychological foundation	Constructs supporting primary classification	Constructs supporting secondary classification	Coding rationale
Partelow et al. (2021)	Perceived participation barriers, costs, and constraints	Perceived legitimacy and procedural fairness	Livelihood constraints; practical fit; perceived acceptability	Legitimacy of co-management rules in principle	Fishers' accounts distinguish a broadly acceptable governance idea from locally unworkable implementation.
Potiguar et al. (2025)	Social norms, relational accountability, and social comparison	Moral responsibility, stewardship, and meaning	Changed fishing norms; normative commitment to restraint	Shared ecological concern; stewardship	Community rules and social expectations organize cooperation; ecological responsibility is a complementary motivation.
Przepiorka & Diekmann (2020)	Social norms, relational accountability, and social comparison	Trust, trustworthiness, and reciprocal expectations	Social feedback; public reputation; approval/disapproval	Reliance on nonbinding promises (inferred)	The experiment centers feedback and reputational responses; confidence in others' promises is an ancillary interpretation.
Ritsema et al. (2015)	Agency, autonomy, and psychological ownership	Moral responsibility, stewardship, and meaning	Self-determination; perceived control; local voice	Community vision; cultural meaning	Local control dominates the qualitative analysis; attachment to a shared community vision adds a meaning-oriented process.
Rocha et al. (2020)	Risk, vulnerability, and uncertainty appraisal	Social norms, relational accountability, and social comparison	Threshold-risk perception; uncertainty; ambiguity	Social pressure; free-riding expectations	Experiments vary ecological thresholds; participants' responses also reflect peer-dependent cooperation.
Röttgers (2016)	Social norms, relational accountability, and social comparison	Perceived legitimacy and procedural fairness	Conditional cooperation; expectations of others	Rule acceptance under stronger enforcement (inferred)	Conditional responses to other herders dominate; rule acceptance is an associated, largely behavioral interpretation.
Sarker et al. (2014)	Agency, autonomy, and psychological ownership	Trust, trustworthiness, and reciprocal expectations	User autonomy; local control; self-organization	Trust; group cohesion	The institutional analysis emphasizes self-governing control, supported by trust and group cohesion.
Schafft & Brown (2000)	Trust, trustworthiness, and reciprocal expectations	Moral responsibility, stewardship, and meaning	Community trust; reciprocal expectations	Shared identity; collective development commitment (interpretive)	Social capital and community cohesion support governance; the secondary meaning/stewardship classification is interpretive.
Sheng & Ma (2023)	Social norms, relational accountability, and social comparison	Moral responsibility, stewardship, and meaning	Informal clan norms; reputation; shared expectations	Moral restraint; clan-based obligation	Village participation is explained through informal expectations and moral restraints associated with clan ties.
Theesfeld (2004)	Trust, trustworthiness, and reciprocal expectations	Perceived legitimacy and procedural fairness	Distrust; suspicion of authorities	Perceived corruption; rule acceptability	Distrust undermines collective action; perceived corruption also compromises acceptance of authority.

Study	Primary psychological foundation	Secondary psychological foundation	Constructs supporting primary classification	Constructs supporting secondary classification	Coding rationale
Travers et al. (2011)	Agency, autonomy, and psychological ownership	Social norms, relational accountability, and social comparison	Self-organization; group decision-making; internal reward choice	Mutual monitoring; reputational accountability	Experimental treatments vary collective decision authority; monitoring and peer accountability are behaviorally inferred.
Velez et al. (2009)	Social norms, relational accountability, and social comparison	Moral responsibility, stewardship, and meaning	Conditional cooperation; conformity; social expectations	Altruism; other-regarding preferences	CPR decisions respond to expectations of others; altruism adds an other-regarding motivation.
Vollan et al. (2013)	Social norms, relational accountability, and social comparison	Moral responsibility, stewardship, and meaning	Ecological norms; norm–rule compatibility	Moral obligation to protect the environment	Ecological norms help explain responses to rules; internalized stewardship is a related interpretation.
Yoder (2019)	Social norms, relational accountability, and social comparison	Perceived legitimacy and procedural fairness	Shared accountability; monitoring visibility; peer comparison	Social acceptability of agreed practices; joint rule compliance	Collective responsibility and peer-visible outcomes organize the case; acceptance of shared practices supplies a secondary process.

Note. Each study was assigned one primary psychological foundation, representing its central explanatory emphasis, and one secondary foundation, representing the most salient additional psychological process identified in the study. Article-specific constructs and coding rationales are provided to make these classifications transparent; secondary assignments do not necessarily indicate independently measured or tested mechanisms. Foundation labels correspond to Tables 3 and 4 of the manuscript, with detailed coding definitions provided in Appendix A.

Supplementary Table S2. Illustrative Evidence Linking Institutional Arrangements and Psychological Foundations of Voluntary Engagement

Institutional arrangement (Table 6)	Supporting study / design	Empirical finding	Associated psychological foundation	Psychological evidence and inferential limit
Participatory rule-making and recognized self-governance authority	DeCaro et al. (2015) *Laboratory CPR experiment*	Voting on resource-use rules increased reported procedural justice/self-determination; voting combined with enforcement improved cooperation that persisted after enforcement ended.	Agency, autonomy, and psychological ownership	Directly measured: Psychological responses were surveyed alongside experimental behavior. A specific psychological mediation pathway was not established.
Participatory rule-making and recognized self-governance authority	Kaur et al. (2023) *Cross-sectional forest-group analysis and framed field game*	Groups with recognized collective forest land rights showed more cooperation and higher reported communal trust.	Agency, autonomy, and psychological ownership	Theory-informed for ownership: Psychological ownership is proposed rather than directly measured. Communal trust was measured; rights status was not randomly assigned.
Facilitative leadership, structured communication, and relational coordination	DeCaro et al. (2021) *Laboratory CPR experiment*	Communication coincided with self-governance formation and improvements in cooperation, psychological need satisfaction and trust; democratic groups reported stronger acceptance and motivation.	Perceived legitimacy and procedural fairness	Directly measured: Trust, need satisfaction and institutional acceptance were assessed. Democratic governance varied across emergent groups; the entire mediation chain was not tested.
Facilitative leadership, structured communication, and relational coordination	Andersson et al. (2020) *Lab-in-the-field experiment; observed group-round variation*	Unselfish voluntary leadership was associated with stronger agreement on self-governance rules; interpersonal trust and reciprocal behavior were also observer-coded.	Trust, trustworthiness, and reciprocal expectations	Directly observed: Trained observers coded interpersonal trust and interaction. Leadership itself was not randomly assigned; causal mediation through trust was not established.
Resource-condition monitoring, feedback, and social learning	Camargo and Haydu (2016) *Laboratory CPR experiment*	Resource-condition displays and written feedback reduced extraction; participants also communicated resource-preservation instructions.	Learning, system understanding, and cognitive framing	Behaviorally inferred: Extraction and instructions were observed, but a psychological learning pathway was not independently measured or tested.
Resource-condition monitoring, feedback, and social learning	Rocha et al. (2020) *Framed field experiment with fishers*	Threshold, risk and uncertainty conditions altered extraction; risk treatments reduced fishing effort, and group agreements were associated with restraint.	Risk, vulnerability, and uncertainty appraisal	Mixed direct and inferred: Risk/ambiguity attitudes were elicited and institutional conditions varied, but subjective appraisal was not established as the causal mediator of restraint.

Institutional arrangement (Table 6)	Supporting study / design	Empirical finding	Associated psychological foundation	Psychological evidence and inferential limit
Capacity support, incentives, and benefit–burden alignment	Grillos et al. (2024) *Randomized lab-in-the-field collective-action experiment*	Collective conservation payments increased coordination and endogenous rule creation; observed institutional creation accompanied lower harvesting.	Action efficacy, perceived capacity, and benefit salience	Behaviorally inferred: Payments and institutional/harvesting outcomes were observed; perceived benefits and motivation were not separately assessed as psychological mediators.
Capacity support, incentives, and benefit–burden alignment	Ma et al. (2023) *Cross-sectional farmer survey; structural equation modeling*	Perceived government and organizational conditions were associated with perceived behavioral control, intention and self-reported pollution-control participation.	Action efficacy, perceived capacity, and benefit salience	Directly measured: Perceived behavioral control and related constructs were surveyed. Cross-sectional associations do not establish causal effects of governance support.
Behavioral monitoring, sanctions, and accountability	Przepiorka and Diekmann (2020) *Laboratory CPR experiments*	Public social feedback increased sustainable cooperation whereas private feedback did not; initial gains from nonbinding promises diminished over time.	Social norms, relational accountability, and social comparison	Behaviorally inferred: Feedback visibility and investment were experimentally observed; reputational motives, shame and guilt were not independently measured.
Behavioral monitoring, sanctions, and accountability	Yoder (2019) *Qualitative case study, interviews and environmental performance records*	A shared pollution cap, reporting and flexible management practices coincided with sustained collective compliance; interviews described peer accountability and shared livelihood concerns.	Social norms, relational accountability, and social comparison	Qualitatively interpreted: Interviews and performance records support accountability as a plausible process; there is no isolated psychological or causal mediation test.
Rule congruence and practical fit	Jenny et al. (2007) *Household interviews and cross-sectional quantitative analysis*	Perceived compatibility with daily routines, sanctioning costs and fairness were associated with compliance; relevant predictors differed across rules.	Perceived participation barriers, costs, and constraints	Directly measured: Rule compatibility, perceived sanctioning costs and justice perceptions were assessed; cross-sectional associations cannot establish causal mediation.
Rule congruence and practical fit	Partelow et al. (2021) *Qualitative interviews and perception-code network analysis*	Fishers described an acceptable co-management concept but reported livelihood and implementation mismatches that constrained practical participation.	Perceived participation barriers, costs, and constraints	Qualitatively evidenced: Participant perceptions and institutional conditions were analyzed; no causal effect of rule congruence on participation was tested.

Note. The table presents 12 illustrative studies drawn from the original 42-study review corpus, organized under the six institutional-arrangement categories reported in Table 6. The associated psychological foundation may correspond to either the primary or secondary foundation assigned to that study in Supplementary Table S1. It is an illustrative evidence map, not a comprehensive appraisal or frequency count. "Directly measured" refers to explicitly assessed psychological constructs, "directly observed" to coded interpersonal behavior, "behaviorally inferred" to psychological interpretations of observed choices, "qualitatively evidenced" to interview/case accounts, and "theory-informed" to an untested psychological explanation. These types are not a universal ranking of study quality. Experimental effects on behavior do not, by themselves, demonstrate psychological mediation; the framework's full institutional–psychological–behavioral pathway remains to be tested.

Supplementary Section S1. Focused Scopus Search-Sensitivity Assessment

This section documents a post hoc Scopus search-sensitivity assessment of the original 42-study review. It reports the expanded retrieval, preliminary relevance filtering, focused examination of 50 sampled records, and a closer eligibility and conceptual assessment of seven candidates. The exercise was not a complete eligibility screening of the expanded retrieval pool.

Search purpose and strategy. To test whether construct-specific searching retrieved relevant evidence beyond the original broad psychological terms, the Scopus search conducted on 18 October 2026 retained the original governance-context block (including self-governance, polycentric governance, commons, environmental governance, and public-service/citizen co-production; full syntax in manuscript Appendix C), TITLE-ABS-KEY fields, and English-language journal article/review limits. The psychological terms "psycholog*" OR "psychosocial" were expanded with trust*, reciproc*, legitim*, "procedural justice", autonom*, efficac*, motivat*, "social norm*", and "psychological ownership" (combined using OR). Retrieval covered 2000–2026, wider than the original April 30, 2026 eligibility cutoff. Records were compared using Scopus identifiers, then preliminarily filtered and sampled as summarized below.

Table S3. Expanded Search, Preliminary Filtering, and Focused Assessment

Search and assessment stage	Records (n)
Original Scopus records under the 30 April 2026 publication cutoff	243
Expanded Scopus retrieval, 18 October 2026	2,861
Additional records relative to the original 243-record baseline	2,618
Four-signal filter: passed preliminary relevance threshold	440
Four-signal filter: did not pass preliminary threshold	2,178
Group A: purposively selected from filter-passing records	10
Group B: randomly selected from remaining filter-passing records	15
Group C: randomly selected from filter-nonpassing records	25
Total individually examined in the focused sample	50
Advanced for closer eligibility and conceptual assessment	7
Not advanced to closer conceptual assessment	43
Of seven candidates: met original eligibility criteria	3
Of seven candidates: borderline eligibility	4
Filter-passing records not individually assessed (440 − 25)	415

Note. The original search was executed with publication eligibility ending 30 April 2026; the expanded search covered publication years 2000–2026. The 2,618 additional records were calculated relative to the original 243-record Scopus baseline. The expanded-only pool includes records potentially falling outside the original publication window; individual date eligibility was not determined for the full expanded pool.

A preliminary automated keyword-based filter examined titles and abstracts for four relevance signals: (1) governance context, (2) psychological or behavioral content, (3) empirical research, and (4) discretionary collective governance action. Records passed the filter only when all four signals were detected. Records with missing or ambiguous signals were classified as nonpassing rather than definitively ineligible. The filter results were used to define the sampling pools;

415 filter-passing records were not individually assessed for eligibility. This procedure served to prioritize records for further assessment, not to determine final study eligibility.

The 50-record focused sample combined 10 purposively selected high-relevance records (Group A), 15 randomly drawn records from the remaining filter-passing pool (Group B), and 25 randomly drawn from the nonpassing pool (Group C). Sampling records document random seed 20261024 and ordering by Scopus identifier. Five of the seven advanced candidates came from Group A, one from Group B, and one from Group C (Luo & Zhang, 2015). The latter indicates that the filter could miss relevant work; neither the sample nor its retained proportion estimates eligibility prevalence or the overall filter false-negative rate.

Table S4. Eligibility and Conceptual Assessment of Seven Additional Studies

Study / sample ID	Empirical basis	Psychological evidence	Meaningful discretionary governance	Eligibility assessment	Nine-theme implications / limitations
Angelsen & Naime (2024) A–S04	Framed field experiment with 720 forest users in Brazil, Indonesia, and Peru; extraction and peer-punishment choices observed.	Peer sanctions, reciprocity and cooperative types inferred from decisions, not direct psychometric mediation.	Participants choose resource extraction and costly peer sanctions—core self-governance actions.	Meets criteria	Social norms, relational accountability, and social comparison. Behaviorally evidenced; no unique new foundation.
Hidalgo et al. (2025) A–S03	Repeated CPR experiment with fishers from Chilean co-management communities; enforcement treatments and strategy types.	Conditional, unconditional and negative cooperation identified through observed game behavior.	Fishers choose extraction under enforcement conditions analogous to real co-management.	Meets criteria	Social norms, relational accountability, and social comparison. Behavioral type labels are not direct psychological measures.
Brown & van den Broek (2020) B–S11	Original Ugandan fieldwork using interviews, surveys, observation and operational outcomes of water-user management.	Norms against sanctioning, social division and retaliation interpreted from field accounts.	Water users and committees decide contributions, enforce sanctions and manage shared handpumps.	Meets criteria	Social norms, relational accountability, and social comparison. Qualitative interpretation of peer-enforcement processes.
Miao et al. (2015) A–S10	Farmer survey in Shaanxi with factor analysis and logistic regressions of collective irrigation participation.	Trust and reciprocity operationalized as distinct social-capital components; survey-based associations.	Farmers contribute fees or labor to collective irrigation systems under different management arrangements, but the extent of their discretion over collective governance decisions is not clearly established.	Borderline — governance discretion	Trust, trustworthiness, and reciprocal expectations; potentially social norms. Direct psychosocial indicators, observational associations.

Palmer et al. (2020) A–S09	Natural-experiment comparison plus framed forest commons game with 160 community members.	Intrinsic motivation inferred from cooperation in conservation game; no direct mediation test.	Real participatory sustainable-livelihood activities involve choice and decision-making, but link to core forest governance functions is indirect.	Borderline — plausible	Agency, autonomy, and psychological ownership (participation/empowerment). Interpretation of intrinsic motivation remains behavioral.
Xu et al. (2022) A–S05	Laboratory CPR fishery game in China with randomized fines/public disclosure and post-game debriefing.	Motivational crowding and conditional cooperation inferred from extraction patterns and responses.	Participants make discretionary commons extraction choices under imposed rules, but not in a real operating governance arrangement.	Borderline — plausible	Social norms, relational accountability, and social comparison; overlap with autonomy-related motivation. Experimental simulation limits field inference.
Luo & Zhang (2015) C–S40	Original interpretive Wukan case analysis constructed from a previously published detailed case report; no independent field collection reported.	Organizational identity, belonging, cohesion and deprivation interpreted from case narrative, not directly measured.	Villagers mobilize, organize, make collective decisions and undertake local self-governance.	Borderline — evidence provenance	Collective identity is distinct. Partial conceptual overlap with agency/ownership and moral responsibility/meaning; not an exact synonym for any named foundation.

Note. Eligibility follows the original review criteria: governance setting with meaningful discretionary action; psychological, psychosocial, or behavioral mechanism; link to institutional conditions or governance functions; original empirical evidence involving humans or observed behavior; and English-language journal publication by April 30, 2026. All seven articles meet the publication window. “Meets criteria” indicates a positive focused eligibility judgment; “Borderline” records residual interpretive uncertainty. None was incorporated into the original 42-study corpus solely on the basis of this post hoc sampled assessment.

Interpretation: three candidates met the original criteria and four remained borderline. For the three positive candidates, an illustrative primary-theme-only augmentation would add three studies to social norms/relational accountability, increasing its primary count from 11 of 42 studies (26.2%) to 14 of 45 studies (31.1%). This scenario would not reproduce the dual-code frequencies reported in Table 4. Identity and belonging in Luo and Zhang (2015) potentially span several existing themes but are not interchangeable with any single named foundation. Because the broader retrieval was not exhaustively assessed, these findings do not establish completeness of the original corpus or stability of thematic frequencies.

Table S5. Fifty-Record Focused Assessment Log

Group A comprises 10 purposively selected records passing the preliminary filter; Group B comprises 15 randomly selected passing records; Group C comprises 25 randomly selected nonpassing records. Study identifiers correspond to those used in Tables S3–S4, where applicable. Full citations are provided below.

Sample group / ID	Full article citation	Conceptual assessment stage
A–S01	Miura, H., Lee, T., & Kim, E. (2025). Citizen Participation and Political Efficacy at the Grassroots Level: The Case of Residents' Self-Governance Associations in Seoul, South Korea. Voluntas, 36(2), 204–216. https://doi.org/10.1007/s11266-024-00708-w	Not advanced
A–S02	Jedd, T., Sixt, G. N., Schutz, A., & Burbach, M. (2025). Legitimacy in polycentric groundwater governance: Framework conditions identified in Nebraska's Natural Resource Districts. Environmental Policy and Governance, 35(2), 187–200. https://doi.org/10.1002/eet.2132	Not advanced
A–S03	Hidalgo, C., Gelcich, S., Guzmán, R. A., Rivera-Hechem, M. I., & Rodriguez-Sickert, C. (2025). Shifting strategies: exploring cooperation dynamics in fisheries co-management. Ecology and Society, 30(4), Article 22. https://doi.org/10.5751/ES-16615-300422	Advanced
A–S04	Angelsen, A., & Naime, J. (2024). The mixed impacts of peer punishments on common-pool resources: Multi-country experimental evidence. World Development, 181, Article 106686. https://doi.org/10.1016/j.worlddev.2024.106686	Advanced
A–S05	Xu, C., Qin, B., & Rawlings, D. (2022). Motivational crowding effects of monetary and nonmonetary incentives: Evidence from a common pool resources experiment in China. Ecological Economics, 202, Article 107597. https://doi.org/10.1016/j.ecolecon.2022.107597	Advanced
A–S06	Gómez-Andújar, N. X., Gerkey, D., Conway, F., & Watson, J. R. (2022). Social cohesion and self-governance arrangements among small-scale fisheries in Puerto Rico. Frontiers in Marine Science, 9, Article 966309. https://doi.org/10.3389/fmars.2022.966309	Not advanced
A–S07	Skarlatidou, A., Haklay, M., Hoyte, S., van Oudheusden, M., & Bishop, I. J. (2024). How can bottom-up citizen science restore public trust in environmental governance and sciences? Recommendations from three case studies. Environmental Science & Policy, 160, Article 103854. https://doi.org/10.1016/j.envsci.2024.103854	Not advanced
A–S08	Baldivieso Soruco, C. R., De Silva, S., Gleich, P., Yan, Y., Dubois, M., Sieber, S., & Bonatti, M. (2024). Realizing collective action in agency-constrained contexts: the case of the Community Fish Refuges in Cambodia. Frontiers in Environmental Science, 12, Article 1417971. https://doi.org/10.3389/fenvs.2024.1417971	Not advanced
A–S09	Palmer, C., Souza, G. I., Laray, E., Viana, V., & Hall, A. (2020). Participatory policies and intrinsic motivation to conserve forest commons. Nature Sustainability, 3(8), 620–627. https://doi.org/10.1038/s41893-020-0531-8	Advanced
A–S10	Miao, S., Heijman, W., Zhu, X., & Lu, Q. (2015). Social capital influences farmer participation in collective irrigation management in Shaanxi Province, China. China Agricultural Economic Review, 7(3), 448–466. https://doi.org/10.1108/CAER-05-2014-0044	Advanced
B–S11	Brown, J., & van den Broek, M. (2020). Crime and punishment: The challenges of free-riding and peer sanctioning in the rural water sector – Lessons from an innovation in Uganda. Geoforum, 112, 41–51. https://doi.org/10.1016/j.geoforum.2020.03.013	Advanced
B–S12	Xie, L., Shao, M., & Deng, G. (2026). Licensed Commoning and the Authoritarian Commons: Governing Participation in China's Community Gardens. Environmental Policy and Governance, 36(4), 782–797. https://doi.org/10.1002/eet.70079	Not advanced

Sample group / ID	Full article citation	Conceptual assessment stage
B–S13	Ruseva, T. B. (2023). The governance of forest carbon in a subnational climate mitigation system: insights from a network of action situations approach. Sustainability Science, 18(1), 59–78. https://doi.org/10.1007/s11625-022-01262-4	Not advanced
B–S14	Leonardo, H. D. S. C., Esteves, A. M., & Disterheft, A. (2025). Care as Resistance on Behalf of the Commons: Feminist Political Ecologies and Anti-Extractivism in Covas do Barroso, Portugal. Capitalism Nature Socialism, 36(4), 52–72. https://doi.org/10.1080/10455752.2025.2572349	Not advanced
B–S15	Wallington, T., Lawrence, G., & Loechel, B. (2008). Reflections on the legitimacy of regional environmental governance: Lessons from Australia's experiment in natural resource management. Journal of Environmental Policy & Planning, 10(1), 1–30. https://doi.org/10.1080/15239080701652763	Not advanced
B–S16	Urcuqui-Bustamante, A. M., Selfa, T. L., Hirsch, P., & Ashcraft, C. M. (2021). Uncovering stakeholder participation in payment for hydrological services (PHS) program decision making in Mexico and Colombia. Sustainability, 13(15), Article 8562. https://doi.org/10.3390/su13158562	Not advanced
B–S17	Eslamizadeh, S., Ghorbani, A., Künneke, R., & Weijnen, M. (2020). Can industries be parties in collective action? Community energy in an Iranian industrial zone. Energy Research & Social Science, 70, Article 101763. https://doi.org/10.1016/j.erss.2020.101763	Not advanced
B–S18	Janikowska, O., Generowicz-Caba, N., & Kulczycka, J. (2026). Deliberative–Polycentric Governance for the Energy Transition Trilemma: The Case of Heat Pumps. Energies, 19(10), Article 2404. https://doi.org/10.3390/en19102404	Not advanced
B–S19	Hunter, C. E., Lauer, M., Levine, A., Holbrook, S., & Rassweiler, A. (2018). Maneuvering towards adaptive co-management in a coral reef fishery. Marine Policy, 98, 77–84. https://doi.org/10.1016/j.marpol.2018.09.016	Not advanced
B–S20	Zechner, M. (2023). No Commons Without Micropolitics. Learning with Feminist and Municipalist Movements in Spain. International Journal of the Commons, 17(1), 447–461. https://doi.org/10.5334/ijc.1232	Not advanced
B–S21	Xiu, R., Le, J., Zhang, D., Lu, Q., Xiang, T., & Liao, X. (2025). NAAFL: A Non-Authoritative Anarchic Federated Learning for Defending Against Malicious Attacks. IEEE Transactions on Sustainable Computing, 10(6), 1202–1215. https://doi.org/10.1109/TSUSC.2025.3605384	Not advanced
B–S22	Durocher-Granger, L., Fiorito, S., Mudenda, S. K., Chiboola, M. M., Kansiime, M. K., Ludwig, D., & Leeuwis, C. (2023). Investigating the feasibility of developing a collective action for biological control of fall armyworm among smallholder farmers in rural communities of Zambia. CABI Agriculture and Bioscience, 4(1), Article 14. https://doi.org/10.1186/s43170-023-00154-6	Not advanced
B–S23	Naveed, S., & Azhar, A. (2022). Structure, governance and challenges of networks in the public sector: the case of the power network in Pakistan. International Journal of Public Sector Management, 35(1), 16–33. https://doi.org/10.1108/IJPSM-12-2020-0343	Not advanced
B–S24	Kellner, E., Oberlack, C., & Gerber, J.-D. (2019). Polycentric governance compensates for incoherence of resource regimes: The case of water uses under climate change in Oberhasli, Switzerland. Environmental Science & Policy, 100, 126–135. https://doi.org/10.1016/j.envsci.2019.06.008	Not advanced
B–S25	Vega-Baudrit, J. R., Corrales, Y., Merazzo, K. J., Bahloul, B., Castillo-Henríquez, L., & León, H. (2026). Diagnosing the governance gap: Technically informed public perception and institutional trust in microplastic regulation in Costa Rica. Marine Policy, 184, Article 106953. https://doi.org/10.1016/j.marpol.2025.106953	Not advanced
C–S26	Moran, D. (2019). A framework for improved one health governance and policy making for antimicrobial use. BMJ Global Health, 4(5), Article e001807. https://doi.org/10.1136/bmjgh-2019-001807	Not advanced

Sample group / ID	Full article citation	Conceptual assessment stage
C–S27	Isufi, I. (2026). Self-diagnosis of psychiatric conditions as a threat to personal autonomy. Philosophical Psychology, 39(2), 437–460. https://doi.org/10.1080/09515089.2024.2411242	Not advanced
C–S28	Pong, H.-K., & Fong, C.-C. (2024). The Impact of Personal Satisfaction on the Environmental, Social, and Governance Practices of Chinese Accounting Managers. Sustainability, 16(14), Article 5839. https://doi.org/10.3390/su16145839	Not advanced
C–S29	Neuner, F. G. (2020). Public opinion and the legitimacy of global private environmental governance. Global Environmental Politics, 20(1), 60–81. https://doi.org/10.1162/glep_a_00539	Not advanced
C–S30	Overby, A. T., Dyckman, C. S., Ogletree, S., Fouch, N., Lauria, M., White, D. L., Baldwin, R. F., Amidon, K., & Crum, D. (2022). Evaluating Conservation Easement and Land Records Data in Rapidly Growing Counties in the United States and the Implications for Environmental Governance. Society & Natural Resources, 35(2), 167–184. https://doi.org/10.1080/08941920.2021.2008076	Not advanced
C–S31	Camilleri, M. (2025). Environmental Governance in Malta: A Trajectory and Reflections on Shaping Institutions for Policy Learning. Governance, 38(2), Article e70015. https://doi.org/10.1111/gove.70015	Not advanced
C–S32	Heim, J. B. (2026). Following the Bitis pet trade: a practice-based exploration across Africa and Europe. Socio-Ecological Practice Research, 8(1), 121–136. https://doi.org/10.1007/s42532-026-00246-3	Not advanced
C–S33	Brennan, A. M. (2026). Regulating the environmental impact of asteroid mining: Toward an independent international monitoring mechanism. Acta Astronautica, 244, 281–290. https://doi.org/10.1016/j.actaastro.2026.02.013	Not advanced
C–S34	Bala, M., & Roy, M. (2026). Insurgency and eco-bio-politics: indigenous resistance and environmental governance in postcolonial India. Small Wars and Insurgencies. https://doi.org/10.1080/09592318.2026.2678514	Not advanced
C–S35	Vang-Phu, T., & Giao, N. T. (2026). Vietnam's Air Pollution And Policy Gap. Kutafin Law Review, 13(2), 452–470. https://doi.org/10.17803/2713-0533.2026.2.36.452-470	Not advanced
C–S36	Dedering, T. (2009). Petitioning geneva: Transnational aspects of protest and resistance in south west africa/namibia after the first world war. Journal of Southern African Studies, 35(4), 785–801. https://doi.org/10.1080/03057070903313160	Not advanced
C–S37	Winter, S. L. (2011). Reimagining Democratic Theory For Social Individuals. Zygon, 46(1), 224–245. https://doi.org/10.1111/j.1467-9744.2010.01167.x	Not advanced
C–S38	Meijer, A. J. (2011). Networked coproduction of public services in virtual communities: From a government-centric to a community approach to public service support. Public Administration Review, 71(4), 598–607. https://doi.org/10.1111/j.1540-6210.2011.02391.x	Not advanced
C–S39	Zhou, Y. (2015). State power and environmental initiatives in China: Analyzing China's green building program through an ecological modernization perspective. Geoforum, 61, 1–12. https://doi.org/10.1016/j.geoforum.2015.02.002	Not advanced
C–S40	Luo, J., & Zhang, C. (2015). Seeking Self-Governance: From Grassroots Mobilization to Movement Mobilization: An Analysis of the Mobilization Path to Villagers' Autonomy Based on the Wukan Case. The China Nonprofit Review, 7(2), 329–344. https://doi.org/10.1163/18765149-12341298	Advanced
C–S41	van Tielhof, M. (2017). Regional planning in a decentralised state: How administrative practices contributed to consensus-building in sixteenth-century Holland. Environment and History, 23(3), 431–453. https://doi.org/10.3197/096734017X14979473873885	Not advanced
C–S42	Bruce, R. (2017). The trust/ distrust complex organizing social self-governance behavior. Emergence: Complexity and Organization, 19(3-4).	Not advanced
C–S43	Della Bosca, H., & Gillespie, J. (2019). The construction of 'local' interest in New South Wales environmental planning processes. Australian Geographer, 50(1), 49–68. https://doi.org/10.1080/00049182.2018.1469180	Not advanced

Sample group / ID	Full article citation	Conceptual assessment stage
C–S44	Belay, D. G., Abate, T. G., & Jensen, J. D. (2020). A Montero Auction Mechanism to Regulate Antimicrobial Consumption in Agriculture. American Journal of Agricultural Economics, 102(5), 1448–1467. https://doi.org/10.1002/ajae.12079	Not advanced
C–S45	Pedersen, A. B., Nielsen, H. Ø., & Daugbjerg, C. (2020). Environmental policy mixes and target group heterogeneity: analysing Danish farmers' responses to the pesticide taxes. Journal of Environmental Policy & Planning, 22(5), 608–619. https://doi.org/10.1080/1523908X.2020.1806047	Not advanced
C–S46	Majumder, S., Khaparde, S. A., Agalgaonkar, A. P., Kulkarni, S. V., & Perera, S. (2022). Graph Theory Based Voltage Sag Mitigation Cluster Formation Utilizing Dynamic Voltage Restorers in Radial Distribution Networks. IEEE Transactions on Power Delivery, 37(1), 18–28. https://doi.org/10.1109/TPWRD.2020.3047811	Not advanced
C–S47	Alcaraz, J. M., Tirado, F., & Gálvez, A. (2021). Dark times for cosmopolitanism? An ethical framework to address private agri-food governance and planetary stewardship. Business Ethics, Environment and Responsibility, 30(4), 697–715. https://doi.org/10.1111/beer.12362	Not advanced
C–S48	Yang, J., Shi, D., & Yang, W. (2022). Stringent environmental regulation and capital structure: The effect of NEPL on deleveraging the high polluting firms. International Review of Economics and Finance, 79, 643–656. https://doi.org/10.1016/j.iref.2022.02.020	Not advanced
C–S49	Jain, G., Shrivastava, A., Paul, J., & Batra, R. (2022). Blockchain for SME Clusters: An Ideation using the Framework of Ostrom Commons Governance. Information Systems Frontiers, 24(4), 1125–1143. https://doi.org/10.1007/s10796-022-10288-z	Not advanced
C–S50	Cui, G. (2024). How do environmental taxes affect the environmental investment of high-emission enterprises: Evidence from China. Journal of Environmental Management, 370, Article 122629. https://doi.org/10.1016/j.jenvman.2024.122629	Not advanced

Note. "Advanced" indicates one of the seven studies taken forward for the closer eligibility and conceptual assessment reported in Table S4. "Not advanced" indicates that the record was not selected for this further stage on the evidence available in the focused assessment; it does not mean the study was definitively excluded following full-text eligibility screening. The 43 records not advanced were not added to the original 42-study corpus.