

Table 1. PICOs in relation to number of studies.

Database	PICOs	Number of studies
Scopus	country	268833
Scopus	country, equity outcome terms	22394
Scopus	country, intervention, equity terms	745
Scopus	country, intervention, equity outcomes, people term	627
Web of Science	country	205088
Web of Science	country, equity outcome terms	15555
Web of Science	country, intervention, equity terms	507
Web of Science	country, intervention, equity outcomes, people term	436
	subtotal	1063
	duplicates	429
	Total papers for screening	634

436	country, intervention, equity outcomes, people term	Web of Scie Angola OR Botswana OR Eswatini OR Swaziland OR Lesotho OR Madagascar OR Malawi OR Mozambique OR Namibia OR "South Africa" OR Zambia OR Zimbabwe OR Rhodesia OR SADC OR "Sub-Saharan Africa" OR "Southern Africa"	peace OR justice* OR equit* OR (distribut* NEAR/1 (benefit* OR burden* OR cost OR costs OR disbenefit* OR intergenerational)) OR fair OR fairness OR gender* OR trade-off* OR synerg* OR (sharing* NEAR/1 (benefit* OR burden* OR cost OR costs OR disbenefit* OR intergenerational)) OR transparency OR (participat* NEAR/1 ("decision-making")) OR (rights NEAR/0 (statutory OR customary)) OR "traditional knowledge" OR "cultural identit*" OR inequit* OR "cost-effective*"I	"ecosystem approach*"OR "ecosystem-based" OR "nature-based" OR (natur* NEAR/1 (solution* OR approach* OR reserve)) OR "community-based natural resource management" OR REDD* OR "community forest*" OR "protected area*" OR "conservancy" OR "payment for ecosystem service*" OR "PES" OR (agriculture NEAR/1 (conservation OR sustainable OR ecolog*)) OR "re-vegetat*" OR revegetat* OR reforest* OR "agro-forest*" OR agroforest* OR silvopast* OR silviculture OR afforest* OR "cover crops" OR "reduced emissions from deforestation" OR "reduced emissions from degradation" OR "rehabilit* NEAR/1 (ecosystem* OR natur* OR vegetation OR wetland* OR river* OR stream* OR aquifer* OR forest* OR woodland* OR grassland* OR savanna* OR mangrove* OR rangeland* OR marsh* OR peatland* OR marshland* OR shrub* OR "green infrastructure" OR "blue infrastructure" OR "ecological infrastructure" OR "natur* infrastructure" OR "ecosystem service*" OR riparian OR "ecological reserve" OR "ecological flow" OR "environmental reserve" or "environmental flow" OR "fire" OR watershed* OR mountain* OR catchment* OR "sub-catchment*" OR "subcatchment*" OR plateau OR highlands OR land OR landscape)) OR(protect* NEAR/1 (ecosystem* OR natur* OR vegetation OR wetland* OR river* OR stream* OR aquifer* OR forest* OR woodland* OR grassland* OR savanna* OR mangrove* OR rangeland* OR marsh* OR peatland* OR marshland* OR shrub* OR "green infrastructure" OR "blue infrastructure" OR "ecological infrastructure" OR "natur* infrastructure" OR "ecosystem service*" OR riparian OR "ecological reserve" OR "ecological flow" OR "environmental reserve" or "environmental flow" OR "fire" OR watershed* OR mountain* OR catchment* OR "sub-catchment*" OR "subcatchment*" OR plateau OR highlands OR land OR landscape)) OR(regulat* NEAR/1 (ecosystem* OR natur* OR vegetation OR wetland* OR river* OR stream* OR aquifer* OR forest* OR woodland* OR grassland* OR savanna* OR mangrove* OR rangeland* OR marsh* OR peatland* OR marshland* OR shrub* OR "green infrastructure" OR "blue infrastructure" OR "ecological infrastructure" OR "natur* infrastructure" OR "ecosystem service*" OR riparian OR "ecological reserve" OR "ecological flow" OR "environmental reserve" or "environmental flow" OR "fire" OR watershed* OR mountain* OR catchment* OR "sub-catchment*" OR "subcatchment*" OR plateau OR highlands OR land OR landscape)) OR(conserv* NEAR/1 (ecosystem* OR natur* OR vegetation OR wetland* OR river* OR stream* OR aquifer* OR forest* OR woodland* OR grassland* OR savanna* OR mangrove* OR rangeland* OR marsh* OR peatland* OR marshland* OR shrub* OR "green infrastructure" OR "blue infrastructure" OR "ecological infrastructure" OR "natur* infrastructure" OR "ecosystem service*" OR riparian OR "ecological reserve" OR "ecological flow" OR "environmental reserve" or "environmental flow" OR "fire" OR watershed* OR mountain* OR catchment* OR "sub-catchment*" OR "subcatchment*" OR plateau OR highlands OR land OR landscape)) OR(create* NEAR/1 (ecosystem* OR natur* OR vegetation OR wetland* OR river* OR stream* OR aquifer* OR forest* OR woodland* OR grassland* OR savanna* OR mangrove* OR rangeland* OR marsh* OR peatland* OR marshland* OR shrub* OR "green infrastructure" OR "blue infrastructure" OR "ecological infrastructure" OR "natur* infrastructure" OR "ecosystem service*" OR riparian OR "ecological reserve" OR "ecological flow" OR "environmental reserve" or "environmental flow" OR "fire" OR watershed* OR mountain* OR catchment* OR "sub-catchment*" OR "subcatchment*" OR plateau OR highlands OR land OR landscape)) OR(artificial* NEAR/1 (ecosystem* OR natur* OR vegetation OR wetland* OR river* OR stream* OR aquifer* OR forest* OR woodland* OR grassland* OR savanna* OR mangrove* OR rangeland* OR marsh* OR peatland* OR marshland* OR shrub* OR "green infrastructure" OR "blue infrastructure" OR "ecological infrastructure" OR "natur* infrastructure" OR "ecosystem service*" OR riparian OR "ecological reserve" OR "ecological flow" OR "environmental reserve" or "environmental flow" OR "fire" OR watershed* OR mountain* OR catchment* OR "sub-catchment*" OR "subcatchment*" OR plateau OR highlands OR land OR landscape)) OR(clear* NEAR/1 (vegetation OR forest* OR woodland* OR rangeland* OR tree* OR grassland* OR savanna* OR watershed* OR mountain* OR catchment* OR "sub-catchment*" OR "subcatchment*" OR plateau OR highlands)) OR(thin* NEAR/1 (vegetation OR forest* OR woodland* OR rangeland* OR tree* OR grassland* OR savanna* OR watershed* OR mountain* OR catchment* OR "sub-catchment*" OR "subcatchment*" OR plateau OR highlands)) OR(clear* NEAR/1 (invasive OR alien OR bush)) OR(thin* NEAR/1 (invasive OR alien OR bush)) OR(manage* NEAR/1 (invasive OR alien OR bush))	societ* OR house* OR people OR (communit* NEAR/15(human OR livelihood* OR people OR rural OR local)) OR "human" OR smallholder* OR "small-holder*" OR farm* OR village* OR rural OR livelihood* OR stakeholder* OR settlement OR homestead OR actor* (TI=(Angola OR Botswa	
1063						Total
429						Duplicates
634						Final for title and abstract screening

Table 3. Inclusion and exclusion criteria

Inclusion	Exclusion
English-language research articles, including primary empirical studies, literature syntheses deriving findings from empirical or documented evidence, and modelling studies where models estimated the impacts of implemented NbS based on observed or documented data	Non-English research articles, conceptual papers, opinion pieces, editorials, commentaries, conference papers, grey literature, and modelling studies not based on observed or documented data from implemented NbS
Studies assessing the impacts of NbS implemented in the field, where implementation was ongoing or complete	Studies not assessing NbS implemented in the field, including hypothetical or purely theoretical interventions
All study designs and data types were eligible, including qualitative, quantitative and mixed-methods studies; a comparator was not required, provided reported outcomes were explicitly or implicitly linked to the NbS intervention	Studies in which reported outcomes could not be explicitly or implicitly linked to the NbS intervention
Rural terrestrial or freshwater NbS, including protection, sustainable management and restoration and their subtypes	Urban, coastal or marine NbS, including design-based NbS and any protection, sustainable management or restoration in urban, coastal or marine contexts
NbS addressing any type of societal challenge; studies were not required to focus explicitly on climate risk reduction	NA
Studies across southern African ecosystems and landscapes	Studies outside southern Africa
Studies reporting inequitable NbS outcomes, including negative social impacts and/or unequal benefit sharing between social groups	Studies reporting only positive NbS outcomes

Studies addressing the same NbS were retained where they contributed substantively distinct evidence, for example by examining different time periods, outcomes or analytical perspectives	Duplicate inclusion of the same primary study both as an individual study and within an included review
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Table 4. Extraction template

ID	Short_name	Original question	Q_Type	Categories for binary or closed_multiple	Section
Q_1	UID	UID	metadata	NA	bibliographic information
Q_2	title	Title	metadata	NA	bibliographic information
Q_3	authors	Author(s)	metadata	NA	bibliographic information
Q_4	year	Year	metadata	NA	bibliographic information
Q_5	ref_type	Reference Type	metadata	NA	bibliographic information
Q_6	journal	Journal	metadata	NA	bibliographic information
Q_7	doi	DOI	metadata	NA	bibliographic information
Q_8	lead_country	Lead author country	metadata	NA	bibliographic information
Q_9	senior_country	Last author country	metadata	NA	bibliographic information
Q_10	others_country	Other author countries	metadata	NA	bibliographic information
Q_11	assessment_type	What type of assessment is the study?	closed_multiple	Supp2_Table5	study design and approach
Q_12	data_type	What type of data are used to investigate social outcomes and equity outcomes?	closed_multiple	Quantitative; Qualitative; Mixed	study design and approach
Q_13	primary_secondary	Is this assessment of the direct effect of the nature-based intervention original?	closed_multiple	Yes; Partly, the authors rely on a mix of original and secondary analysis and data; No, the authors rely on an existing analysis or secondary data	study design and approach
Q_14	evidence_type	Developed from coding combinations of Q_11, 12, and 13	closed_multiple	Primary empirical with narrative review, document analysis and modelling; Narrative review and document analysis; Systematic review; Narrative review; Primary empirical with modelling; Primary empirical with document analysis; Document analysis; Modelling with observed data and document analysis; Primary empirical with narrative review and document analysis	study design and approach
Q_15	grouped_evidence	Developed from coding combinations of Q_33	closed_multiple	Primarily empirical; literature synthesis; modelling with observed	study design and approach
Q_16	nbs_group	Does the study focus on one broad type of NbS type or a combination of broad types of NbS (see broad NbS types below)?	closed_binary	Focal; Combination	NbS information
Q_17	nbs_type	What broad type of NbS intervention/s are considered in the study?	closed_multiple	Supp2_Table5	NbS information
Q_18	ecosystem_group	Do the NbS intervention/s target one or various types of ecosystems?	closed_binary	Focal; Combination	NbS information
Q_19	ecosystem_type	Within which broad type of ecosystem/s is the NbS intervention applied?	closed_multiple	Supp2_Table5	NbS information
Q_20	nbs_detail_closed	Provide more detail on the type of NbS intervention	closed_multiple	Supp2_Table5	NbS information
Q_21	nbs_detail_open	Describe the intervention in more detail	open	NA	NbS information
Q_22	societal_challenge	What broad scale societal challenge does the NbS intervention address as specified in the paper?	closed_multiple	Supp2_Table5	NbS information
Q_23	nbs_in_field	Has the NbS intervention been applied in the field?	closed_binary	Yes; No	NbS information
Q_24	nbs_date	When was the NbS intervention applied (project time period)?	open	NA	NbS information
Q_25	nbs_country	In which country has the NbS been applied in the field?	closed_multiple	Angola; Botswana; Eswatini; Lesotho; Madagascar; Malawi; Mozambique; Namibia; South Africa; Zambia; Zimbabwe	NbS information
Q_26	negative_outcomes	Does the study report negative social outcomes (i.e., social disbenefits or burdens) due to the NbS intervention?	closed_binary	Yes; No	Negative social outcomes
Q_27	negative_what	What aspects were negatively affected?	closed_multiple	Supp2_Table5	Negative social outcomes
Q_28	negative_who	Who experienced these negative impacts?	closed_multiple	Supp2_Table5	Negative social outcomes
Q_29	negative_detail	Describe the negative outcomes as specified in the study	open	NA	Negative social outcomes
Q_30	postive_outcomes	Does the study report positive social outcomes of NbS interventions?	closed_binary	Yes; No	Unequal benefit sharing
Q_31	positive_unequal	Does the study report unequal distribution of these positive social outcomes of NbS?	closed_binary	Yes; No	Unequal benefit sharing
Q_32	positive_what	What aspects were positively affected?	closed_multiple	Supp2_Table5	Unequal benefit sharing
Q_33	positive_who_more	Who gained/gained more benefits?	closed_multiple	Supp2_Table5	Unequal benefit sharing
Q_34	positive_who_less	Who received marginal or less benefits in comparison to those that gained more?	closed_multiple	Supp2_Table5	Unequal benefit sharing
Q_35	positive_detail	Describe the positive outcomes, and why these were not equitably distributed	open	NA	Unequal benefit sharing
Q_36	equity_incorporated	Does the study report that the NbS intervention attempted (whether successful or not) to incorporate any equity aspects i.e., based on its approach to design, planning and/or implementation (can be explicit or implicit)?	closed_binary	Yes; No	Equitable intentions
Q_37	equity_incorporated_	If yes, which equity aspects were the focus?	closed_multiple	Supp2_Table5	Equitable intentions
Q_38	vulnerable_included	Does the study report that there was/is a specific focus on the most vulnerable people and/or groups in relation to equity considerations and NbS design, planning and/or implementation?	closed_binary	Yes; No, also see Supp2_Table5	Equitable intentions
Q_39	community_based	Did the NbS intervention claim to use or described to use "participatory" or "community-based" approaches, including using co-(design, management or planning) or collaborative agreements as specified in the paper?	closed_binary	Yes; No, also see Supp2_Table5	Equitable intentions
Q_40	sec_detail	Does the study mention constraints (i.e., contextual factors) that hampered or potentially hampered the achievement of social equity in NbS? If so describe them.	open	NA	Constraints to social equity
Q_41	recommendations_de	Does the study provide recommendations for promoting the achievement of equity in NbS? If so describe them.	open	NA	Emerging Recommendations for enabling equity

Table 5. Codebook for close ended multi-category questions

ID	Short_name	Categories	Description
Q_11	assessment_type	Empirical	Studies that generate and analyse original data collected through field-based methods, such as interviews, surveys, observations or measurements, to assess the impacts of implemented or ongoing NbS.
Q_11	assessment_type	Narrative review	Studies that synthesise existing literature without reporting a systematic search strategy, databases searched, inclusion and exclusion criteria, or a formal review protocol.
Q_11	assessment_type	Document analysis	Studies that analyse selected documents or documentary sources (e.g., policy documents, reports, or archival records) to answer a specific research question, for example by examining meeting minutes to assess how local communities were included in decision making, or policy documents to understand who was affected by a NbS or why certain groups experienced negative outcomes.
Q_11	assessment_type	Systematic review	Studies that apply a structured and reproducible approach to identifying, screening and synthesising relevant literature, using predefined search strings, inclusion and exclusion criteria, and a systematic review process.
Q_11	assessment_type	Modelling	Studies that use modelling approaches using empirical, observed or documented data to estimate or analyse the impacts of implemented NbS, excluding models based solely on hypothetical or purely theoretical scenarios.
Q_17	nbs_type	Restoration	Active or passive interventions that involve returning degraded, damaged or destroyed ecosystems to a pre-disturbance natural state, including their structure or function. Also includes the restoration of natural (or wild) resources such as reintroduction or species, but excludes agrobiodiversity restoration which falls under sustainable management. ‘Restoration’ can be synonymous with reclamation, reforestation, rehabilitation, revegetation, and reconstruction (Roe et al., 2021; Seddon et al., 2021)
Q_17	nbs_type	Protection	Interventions involving a “clearly defined geographical area through legal or other effective means, to achieve the long-term conservation of nature with associated ecosystem services and cultural values”. This can involve land/site specific protection, including protected areas and their management, private land conservation measures, reserves, or conservancies, areas protected by Indigenous Peoples and local communities (e.g., sacred sites), or locally managed terrestrial areas with specific set-aside ‘conservation zones’. Can involve protecting a natural or created habitat (Dudley, 2008; Roe et al., 2021; Seddon et al., 2021)
Q_17	nbs_type	Sustainable management	These include interventions that make use of ecosystem functions and services (e.g., nutrient cycling, soil formation, water infiltration, pollination, natural pest control), including goods (e.g., for timber, for non-timber forest products or for producing other ecosystem goods and services) to maintain or enhance food, forestry or eco-tourism production and other related activities. Food production examples include agroforestry, conservation agriculture, permaculture activities, silvopasture, ecosystem-based fisheries and enhancing crop diversity using traditional crop varieties. Non-food production examples include forestry or forest management, and species management (e.g., for hunting, tourism, trade). Can involve managing natural or created habitat. Excludes industrial agriculture and timber or monoculture plantations which rely on chemical inputs and/or depletes biodiversity (Roe et al., 2021; Seddon et al., 2021).
Q_17	nbs_type	Design	Interventions that establish ecosystem-like characteristics to harness specific ecosystem like functions. These include creating a new habitat type in place where the habitat is has been severely modified such that it does not resemble its natural or even at least semi-natural ecological state (Holden et al., 2022). Created agroecosystems are excluded as these are included under the category of sustainable management. In many cases these interventions occur in and near cities (Roe et al., 2021; Seddon et al., 2021) so will likely be excluded due to inclusion/exclusion criteria.
Q_19	ecosystem_type	Natural and semi-natural ecosystems	Natural or semi-natural ecosystems (relatively self-sustaining or undisturbed) that are valued for biodiversity and the services they provide, such as savannas, grasslands, shrublands, wetlands or forests (Holden et al., 2022)
Q_19	ecosystem_type	Farming and cultural lands	Farming or cultural landscapes modified by humans for food and non-food production, recreation and other cultural uses, such as farmland (croplands and rangelands grazed by domestic herbivores) or recreational parks (Holden et al., 2022).
Q_19	ecosystem_type	Built and semi-built areas	Human-made or engineered areas or spaces existing in transformed environments or representing transformed environments, such as cities and human settlements (Holden et al., 2022).
Q_20	nbs_detail_closed	Agroforestry	The intentional integration of trees or shrubs into crop and/or pasture systems to enhance productivity, biodiversity and ecosystem services (Bettles et al., 2021).
Q_20	nbs_detail_closed	Conservation agriculture	A farming system based on three interlinked principles: minimal mechanical soil disturbance, permanent soil cover through biomass mulch, and crop diversification, typically implemented alongside complementary practices in integrated crop and production management (Kassam et al., 2018).
Q_20	nbs_detail_closed	Sustainable forest management	The management and use of forests in a way and at a rate that maintains their biodiversity, productivity, regeneration capacity and ecological functions, while contributing to human wellbeing and reducing deforestation and forest degradation (FAO 2019).
Q_20	nbs_detail_closed	Protected areas	Clearly defined geographical areas established through legal or other effective means and managed to achieve the long-term conservation of nature, together with associated ecosystem services and cultural values. This includes public, private, community, collaborative and transboundary governance arrangements (Dudley, 2008; Stolton et al., 2013).
Q_20	nbs_detail_closed	Restoration	Active or passive interventions aimed at assisting the recovery of degraded, damaged or destroyed ecosystems towards a natural or reference state in terms of structure, function and composition. This includes activities such as reforestation, rehabilitation and revegetation (Roe et al., 2021; Seddon et al., 2021).
Q_20	nbs_detail_closed	Sustainable natural resource management	The regulated use and management of natural resources through mechanisms such as quotas, access rules, agreements or designated use zones, with the aim of maintaining ecosystem function while supporting livelihoods (Roe et al., 2021; Xie et al., 2020).
Q_20	nbs_detail_closed	Sustainable rangeland management	The management of rangelands dominated by grasses, forbs or shrubs to support grazing and browsing, while maintaining ecosystem health, productivity and resilience through controlled use and adaptive management practices (Xie et al., 2020)
Q_20	nbs_detail_closed	Sustainable agriculture intensification	An approach to agricultural production that seeks to increase or maintain yields while reducing environmental impacts and enhancing ecosystem services, often through improved resource efficiency and ecological practices (Prettv et al., 2018).
Q_20	nbs_detail_closed	Sustainable fire management	The planned and controlled use of fire, including prescribed burning, to manage ecosystems in ways that reduce risk, maintain ecological processes and support biodiversity and livelihoods (Moritz et al., 2014).
Q_22	societal_challenge	Food security	A state that prevails when people have secure access to sufficient amounts of safe and nutritious food for normal growth, development, and an active and healthy life. This can include changes to productivity and thereby food supply. This can include direct measures of production (crop yield, fodder supply, livestock production) and indirect measures (soil fertility and moisture). Access to food and availability of resources for supporting food production and preparation. This can be under business as usual or linked to climate change (Grey & Sadoff, 2007; IUCN, 2020; Roe et al., 2021)
Q_22	societal_challenge	Water security	The reliable availability of an acceptable quantity and quality of water for health, livelihoods and production, coupled with an acceptable level of water-related risks. This can include changes to ground, soil and surface water storage, water quality, water supply for drinking and irrigation. This can be under business as usual or linked to climate change (Grey & Sadoff, 2007; IUCN, 2020; Roe et al., 2021).

Q_22	societal_challenge	Energy security	An adequate, stable, and predictable energy supply. This can include changes in the availability and access to fuelwood, hydropower, cleaner or more efficient energy. If linked to climate change please also tick the appropriate climate change box. This can be under business as usual or linked to climate change (IPCC, 2014; Roe et al., 2021).
Q_22	societal_challenge	Human health	Availability and access to medicine and medical care, production of medicinal plants or other health products derived from the NbS, incidents of illness and disease or conditions that cause them (water-borne diseases, air pollution, poor nutrition). This can be under business as usual or linked to climate change (IUCN, 2020; Roe et al., 2021).
Q_22	societal_challenge	Climate change adaptation	The process of adjustment to actual or expected climate and its effects. In human systems, adaptation seeks to moderate or avoid harm or exploit beneficial opportunities (IPCC, 2014; IUCN, 2020; Roe et al., 2021).
Q_22	societal_challenge	Climate change mitigation	A human intervention to reduce the sources or enhance the sinks of greenhouse gases. In this case the focus is on the removal of greenhouse gas emissions from the atmosphere through soil or vegetation carbon sequestration and storage, or the prevention of sources of greenhouse gas emissions from vegetation removal or degradation and other land management practices (IPCC, 2014; IUCN, 2020).
Q_22	societal_challenge	Disaster risk reduction	Management to reduce exposure and vulnerability to disasters. This can be under business as usual or linked to climate change (IUCN, 2020; Roe et al., 2021).
Q_22	societal_challenge	Economic development	Availability of jobs, opportunities for income generation (e.g. from harvesting wild or cultivated goods or from ecotourism, PES schemes or carbon credits (IUCN, 2020; Roe et al., 2021).
Q_22	societal_challenge	Social development	Availability and access to other subsistence goods, access to education or infrastructure (IUCN, 2020; Roe et al., 2021).
Q_22	societal_challenge	Biodiversity loss	Loss of the number, abundance, composition, spatial distribution, and interactions of genotypes, populations, species, functional types and traits, and landscape units in a given system (Diaz et al., 2006; IUCN, 2020).
Q_22	societal_challenge	Environmental degradation	For intrinsic, utilitarian or non-utilitarian reasons (de Groot et al., 2010; IUCN, 2020).
Q_22	societal_challenge	Poverty	The lack of, or the inability to achieve, a socially acceptable standard of living. Here the NbS is framed around poverty reduction or alleviation or poverty status and vulnerability linked to inability to meet basic needs (Bellù & Liberati, 2005).
Q_22	societal_challenge	Sustainable livelihoods	A focus on livelihoods that can cope with and recover from the stresses and shocks and maintain or enhance its capabilities and assets both now and in the future without undermining the natural resource base (Chambers & Conway 1992; IUCN, 2020).
Q_27 + Q_32	negative / positive _what	Income, employment or assets	Earning, saving or raising money, reducing expenses, and access to paid work, including formal, informal and self-employment, as well as the availability of these opportunities and changes in material assets (Roe et al., 2021).
Q_27 + Q_32	negative / positive _what	Access to resources or rights	Formal or informal rights to access, use, control and transfer land, property and other natural resources, including the ease with which people are able to use, benefit from or make claims to land, resources or geographic areas (Friedman et al, 2018).
Q_27 + Q_32	negative / positive _what	Livelihoods	The capabilities, assets and activities required for a means of living, with a focus here on the non-financial factors that support livelihoods, such as land, non-timber forest products, subsistence plots and other means of living (Friedman et al, 2018).
Q_27 + Q_32	negative / positive _what	Social/social-ecological relations	Changes in relationships and interactions between people and nature, and among people in relation to nature and natural resource governance. This includes negative and positive experiences, such as conflict or cooperation over resources, human-wildlife interactions, crime, relations with authorities, and changes in connection to nature, cultural identity, social cohesion, stewardship and other relational values (Roe et al., 2021: IPBES, 2015).
Q_27 + Q_32	negative / positive _what	Social development	Changes in access to subsistence goods, services, education, infrastructure and other social conditions that support wellbeing and everyday life (Roe et al., 2021).
Q_27 + Q_32	negative / positive _what	Food security	Access to sufficient, safe and nutritious food that meets dietary needs for an active and healthy life. This includes changes in availability of food and feed from wild, managed or domesticated terrestrial and freshwater systems, as well as direct and indirect factors affecting food production, supply and preparation, such as crop yield, fodder availability, livestock production, soil fertility and soil moisture (IPBES, 2015: IPCC, 2014: Roe et al., 2021).
Q_27 + Q_32	negative / positive _what	Knowledge, learning or inspiration	Changes in environmental and natural resource management related knowledge, awareness and learning among children or adults, including understanding of the local natural environment. This also includes nature-based inspiration for learning, artistic expression, innovation and technological development (Bennett et al. 2020; IPBES, 2015).
Q_27 + Q_32	negative / positive _what	Human health	Changes in physical, mental and social wellbeing, including disease, illness and injury. This includes access to medicine and medical care, including medicinal plants, naturally derived materials, genes and genetic information, and other health-related products, as well as health outcomes associated with environmental or other conditions such as water-borne disease, air pollution and poor nutrition (Roe et al., 2021).
Q_27 + Q_32	negative / positive _what	Water provision or regulation	Access to reliable water of sufficient quantity and quality to meet health, livelihood and production needs, together with an acceptable level of water-related risk. This includes the provision and regulation of freshwater quantity, location and timing, including surface water, groundwater and soil water storage, as well as the regulation of water quality through ecosystem filtration and the retention or transformation of particles, pathogens, nutrients and chemicals. It also includes water supply for drinking, irrigation and other productive uses (Grey & Sadoff, 2007; Roe et al., 2021).
Q_27 + Q_32	negative / positive _what	Energy	Access to reliable and affordable energy that meets household and productive needs through an adequate, stable and predictable supply. This includes changes in the availability of and access to fuelwood, hydropower and biomass-based fuels such as biofuel crops and animal waste (IPCC, 2014; Roe et al., 2021).
Q_27 + Q_32	negative / positive _what	Climate or extremes regulation	Regulation of climate and climate-related hazards through greenhouse gas emission reduction, carbon sequestration and storage, and other biophysical processes affecting climate. This includes moderating extreme events and longer-term climatic stresses, such as heat, drought, flooding and rainfall variability, including by increasing the resilience of crops, ecosystems or livelihoods to their impacts (Roe et al., 2021: IPBES, 2015).
Q_28; Q_33 ; Q_34	negative / positive _who	Minorities and marginalised	Minority and marginalised groups and communities that experience social, political, economic or cultural exclusion and discrimination because of unequal power relationships. This can include women, racial, ethnic or sexual minorities, people with disabilities, and poor or low-income groups. Use this category where the paper refers broadly to marginalised or minority groups without further specification. Where a specific group is identified, this category can be selected alongside the relevant subgroup below.
Q_28; Q_33 ; Q_34	negative / positive _who	Women	Women, as identified or described in the paper.
Q_28; Q_33 ; Q_34	negative / positive _who	Men	Men, as identified or described in the paper.
Q_28; Q_33 ; Q_34	negative / positive _who	Elderly or infirm	Older adults or elderly people, as identified or described in the paper. Those include those older individuals who are physically weak or suffering from long-term illness.
Q_28; Q_33 ; Q_34	negative / positive _who	Youth	Young people or youth, as identified or described in the paper.
Q_28; Q_33 ; Q_34	negative / positive _who	Board or committee members	NbS intervention appointed board or committee members including individuals appointed, elected or otherwise selected to serve on boards or committees established to oversee the design, planning, implementation or financial management of the NbS intervention.
Q_28; Q_33 ; Q_34	negative / positive _who	Powerful individuals or groups	Individuals or groups of individuals in authority positions including those with greater formal or informal authority, influence or power in relation to the NbS or within the community, such as traditional leaders, government officials or other locally powerful actors.
Q_28; Q_33 ; Q_34	negative / positive _who	Poor individuals and households	Poor or low-income individuals and households, as identified or described in the paper.
Q_28; Q_33 ; Q_34	negative / positive _who	Elite or wealthier individuals or groups	Individuals, households, families or groups with greater wealth and thus greater status within the community or more broadly.

Q_28; Q_33 ; Q_34	negative / positive _who	Tourists	Individuals who access the site for nature-based recreation, leisure or ecotourism activities.
Q_28; Q_33 ; Q_34	negative / positive _who	Local community	The local community living in or near the NbS site where no more specific social differentiation is made. This category can also be used alongside more specific groups where the paper indicates that the local community as a whole was affected.
Q_28; Q_33 ; Q_34	negative / positive _who	National to subnational society	The broader public within the country in which the NbS is implemented, without further social differentiation. This includes subnational to national populations who may benefit from or be affected by the NbS, for example through contributions to the provincial or national economy, or employment opportunities that attract applicants from outside the local community.
Q_28; Q_33 ; Q_34	negative / positive _who	Wider including global society	The broader public beyond the immediate local community, including people at subnational, national and international scales, without further social differentiation. This includes cases where benefits or access extend to the wider public, for example through tourism, recreation or other forms of use.
Q_37	equity_incorporated_which_aspects	Distributional	Signifies the fairness of distribution of benefits and burdens between different groups, including current and future generations, of the outcomes of NbS actions (Bennett et al., 2020; Zafra-Calvo et al., 2017).
Q_37	equity_incorporated_which_aspects	Recognitional	The acknowledgement, respect and representation of the statutory and customary rights, cultures identities (values, visions and culture of a group of people – e.g., relating to nature, their religious beliefs), knowledge systems (e.g., resource-use practices and other practices employed by Indigenous or local people for managing natural resources) and livelihoods of local groups in NbS planning and management. To note: customary rights are established, traditional patterns of norms in a socio-cultural setting (e.g., local forms of authority, traditional spatial planning, local access and use-rights). They differ from (but can co-exist with) formal state law (statutory rights). (Bennett et al., 2020; Zafra-Calvo et al., 2017).
Q_37	equity_incorporated_which_aspects	Procedural	The inclusive and effective participation of all relevant actors and groups in rule and decision making for NbS policies and programs resulting in all social groups and individuals being satisfied with how decisions are taken. This also includes transparency and access to relevant information in appropriate forms, effective dispute-resolution processes (e.g., issues of relocation, compensation for losses), processes through which concerns can be raised, and access to consultative processes whereby potentially affected social groups can give consent or not and negotiate the conditions of consent (e.g., Free, Prior and Informed Consent). (Bennett et al., 2020; Zafra-Calvo et al., 2017).
Q_38	vulnerable_included	Yes	Select if the study makes mention that the equity aspects considered in NbS design, planning and/or implementation focus on those most vulnerable in the context of the NbS. This can include a generalised statement that there was a focus on those most vulnerable or more targeted statements, such as a focus on minorities or marginalised groups, poor, women, children in the context of including those most vulnerable.
Q_38	vulnerable_included	No	There is no mention in the study that the NbS attempted to focus on those most vulnerable. See above.
Q_39	community_based	Yes	Select yes if the paper describes or mentions that the NbS was or is "participatory" or "community-based" that it is used co-() anything in the design, planning and implementation?
Q_39	community_based	No	There is no mention of the above.

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Table 6. Past research reviews of relevance

Citation	Publication date	Title	NBS type	Aim	Question	Sub-questions	Objectives	Main findings	Key research gaps identified	Time period of re	Country focus
1 Aguilar-Gómez et al	2020	Differentiated payments for environmental services: A review of the literature	payment for ecosystem services	1. Discuss studies of PES schemes around the world in articles published from 2000 to 2016 to highlight the essential elements that should be considered in DPES schemes. 2. Explore the tendencies of DPES regarding sector, aspects and scale.	N/A	N/A	N/A	1. It is necessary to consider the contextual heterogeneity of socio-ecological systems as well as the social participation and acceptability in the design and implementation of DPES, and the challenges and opportunities that may face organizations choosing DPES over PES programs. 2. Despite the high transaction costs of implementing a new DPES scheme, for those institutions that are already running a PES scheme, such costs may not be as high as for those starting from “zero”. 3. DPES may allocate fair and equitable payments for beneficiaries and assign payments based on the production and provision of ES, contributing to the conservation status of the heterogeneous socio-ecological systems. 4. Due to the worldwide diversity of the social, economic and environmental aspects, the sector (e.g. agricultural or forestry) and the scale of PES, considering during the design and implementation of DPES its key essential elements (e.g. identified in this paper) contributes to achieve its efficiency.	Further research on DPES schemes should focus on identifying and assessing DPES already implemented, and on defining the approach, criteria and how to carry out the differentiation of payments in the design of such schemes, considering the contextual heterogeneity of socio-ecological systems.	2000 to 2016	None
2 Althor et al	2016	Does the social equitability of community and incentive based conservation interventions in non-OECD countries, affect human wellbeing? A systematic review protocol	community and incentive based conservation interventions	Characterise existing studies in order to understand when, where, and how CIBC interventions have included social equity in project participation or outcomes, and examine what (if any) effect this had on human wellbeing outcomes.	Does the social equitability of community and incentive based conservation interventions in non-OECD countries, affect human wellbeing?	1. How is social equity considered within participatory processes of community and incentive based conservation interventions? 2. Are outcomes of community and incentive based conservation intervention outcomes socially equitable? 3. Which types of community and incentive based conservation interventions account for (participation or outcome) social equity? 4. Within community and incentive based conservation interventions, what is the strength and robustness of evidence within studies, which document the effects of socially equitable participation or outcomes on human wellbeing?	1. Synthesize available evidence for the effect that incorporating social equity into project participation and outcomes has on human wellbeing, in CIBC interventions. 2. Assess the effects of socially equitable stakeholder participation, and socially equitable outcomes on human wellbeing (to achieve this, we will conduct a systematic review by utilising and updating data from an existing evidence map).	No findings; this is only a protocol - no paper was realised.	Literature from McKinnon et al.2016, and new literature search from 2014 - 2016	Non-OECD countries	
3 Anderson et al	2021	A review of public acceptance of nature-based solutions: The 'why', 'when', and 'how' of success for disaster risk reduction measures	nature-based solutions	Determine factors that may contribute to or detract from public acceptance of NbS is crucial given the identified research gaps and increasing investment in NbS projects.	When and why is public acceptance of NbS important and do NbS diverge from grey measures in this regard?	1. What are the factors that influence public acceptance of NbS and do NbS diverge from grey measures in this regard? 2. How can we build public acceptance of NbS by leveraging the identified factors?	N/A	1. Along with effectiveness and co-benefits, we identified a number of factors that can influence public perceptions and be leveraged by practitioners and researchers to encourage greater acceptance. Generic education campaigns are a popular recommendation for increasing awareness of benefits. However, it has become increasingly obvious that the presentation of scientific evidence alone can have a very weak influence on public attitudes and behaviour. 2. Public perceptions determine acceptance, which is crucial for the success and continued uptake of NbS. 3. In line with key NbS literature, we find that NbS involve distinct social interactions across project phases compared to traditional grey infrastructure measures for reducing risk. Moreover, the long-term success of NbS consistently relies on a broader range of public acceptance outcomes. 4. Given their reliance on public acceptance, a number of interconnected factors related to the measure itself, the individual, and the societal context are crucial for the success of NbS. These factors are highly contextual in their strength of influence, but broad in their potential applicability and therefore worthy of systematic consideration.	1. The presentation of scientific evidence alone can have a very weak influence on public attitudes and behaviour. Further research into alternative approaches to leveraging these factors for acceptance is needed. 2. Efforts towards establishing principles and standards for NbS should be accompanied by more research into interactions among individuals, societies and NbS for risk reduction.	1990 and up to May 15, 2019	None
4 Berrang-Ford et al	2021	A systematic global stocktake of evidence on human adaptation to climate change	human adaptation-related responses to climate change	Capture solution-oriented evidence of human responses to climate change.	How are humans adapting/responding to climate change?	1. What climate hazards are driving responses? 2. Who is responding? 3. What types of responses are documented? 4. How do responses intersect with the Sustainable Development Goals? 5. What is the extent of the responses? 6. Is there evidence that responses are reducing risk?	Systematically assess the global academic literature to characterize human adaptation-related responses to climate change	1. There is growing literature reporting on human efforts to respond to climate change, but negligible evidence of risk reduction. 2. Human responses to climate change were largely local and incremental. 3. The overall extent of global adaptation across regions and sectors is low.	Inadequate research regarding whether adaptation responses are actually reducing current/future risk.	2013 and 2019	None
5 Bottrill et al	2014	What are the impacts of nature conservation interventions on human wellbeing: a systematic map protocol	conservation	Scope and identify studies that document and/or measure the impacts of nature conservation interventions on human wellbeing at local to regional scales. The emphasis will be on direct effects to discrete populations, beneficiaries or targeted stakeholders, with a focus on households, communities, or individuals in developing countries, as these populations are likely to be most dependent on nature and/or most sensitive to positive or negative impacts of conservation.	What are the impacts of nature conservation interventions on different domains of human wellbeing in developing countries?	1. What is the current state and distribution of evidence? 2. What types of impacts from conservation interventions on human wellbeing are measured? 3. What types of ecosystem services are explicitly associated with the impacts of conservation interventions on human wellbeing? 4. What populations are affected by conservation and/or focus of studies? 5. How does the evidence base align with major priorities and investments of implementing agencies?	1. Assess and characterize the current state and distribution of the existing evidence base on causal linkages between both positive and negative effects of nature conservation and human wellbeing. 2. assess which services are associated with different conservation interventions and the extent to which these studies explicitly link conservation of ecosystem services with effects on wellbeing.	N/A	N/A	>2013	Non-OECD countries
6 Bowler et al	2012	Does community forest management provide global environmental benefits and improve local welfare?	community forest management	Highlight the challenges of rigorous evidence assessment when applied to such interventions and suggest ways in which future projects could be conducted, in order to develop a much-needed, improved evidence base to underpin decisions on the form of future programs.	“Does community forest management supply global environmental and local welfare benefits in less-developed countries?”	N/A	N/A	1. There is evidence of CFM being associated with greater tree density and basal area but not with other indicators of global environmental benefits. 2. There was no data on local human welfare amenable to meta-analysis. 3. Poor study design, variable reporting of study methodology or context, and lack of common indicators make evidence synthesis difficult.	Need fundamental improvement in the quality of evidence of the effectiveness of CFM; new CFM projects should be set up with rigorous plans for monitoring of outcomes built into their design. The integration of robust evaluation principles into all CFM projects would also allow those involved in implementing the policy to learn from successes and failures, and ensure the potential of this approach to deliver much needed environmental benefits and poverty alleviation is realized. Funders should require an a priori, peer-reviewed protocol for the design and evaluation of CFM projects, and propose some general standards for monitoring and evaluation.		Less developed countries
7 Brookes et al	2006	Testing hypotheses for the success of different conservation strategies	conservation	N/A	N/A	N/A	To evaluate four hypotheses: 1. Greater levels of utilization generate support for, and compliance with, conservation initiatives. 2. Where conservation projects facilitate increased market integration, there is greater local support for resource management and conservation. 3. Decentralization: with greater local input in conservation decisions and greater community control over programs, the attitudes and behaviors of residents change in a positive way. 4. The more homogeneous a community, the more successful the project is in all aspects.	1. Permitted use of natural resources, market access, and greater community involvement in the conservation project are all important factors for a successful outcome. 2. Without better monitoring schemes in place, it is still impossible to provide a systematic evaluation of how different strategies are best suited to different conservation challenges.	1. Need to concentrate more funds and study into collecting relevant monitoring data. High priority should be given to longitudinal rather than cross-sectional studies in evaluating the success of any strategy because of the problem of endogeneity. 2. Also need multiple measures of success. Rigorously collected data that cover only one or two measures of success have limited analytical value because conservation and development projects almost inevitably have ecological, economic, and social consequences.	>2006	None

8	Brookes et al	2012	How national context, project design, and local community characteristics influence success in community-based conservation projects	community-based conservation	1. Evaluate CBC success in four outcomes (attitudinal, behavioral, ecological, economic) by testing hypotheses about how features of the national context (H-NC), project design (H-PD), and community-level characteristics (H-CC) affect measures of success. 2. Explore evidence for synergies between pairs of outcomes.	N/A	N/A	To assess the following hypotheses: 1. National political context: Success when projects are implemented in countries where there is greater transparency and stability in governance (Governance) or where the populace has a voice in politics and enjoys common civil liberties (Rights). 2. National socioeconomic context: Success when projects are implemented in countries with a higher level of development progress (HDI. or greater economic equality (Gini). 3. Grassroots: Success when there is more emphasis on local participation in the initiation, establishment, and daily management of a project (Participation), or when the project engages positively with traditional organizations and cultural beliefs, practices, and traditions (Engagement). 4. Access to and utilization of resources: Success when projects avoid placing natural resources off limits (Protectionism) or emphasize greater levels of utilization (Resource use). 5. Project benefits: Success when projects provide clear and well-directed economic benefits (Provision benefits); also where projects ensure benefits are shared equitably and prevent elite capture (Equity). 6. Human and social capital: Success when projects invest in human capital through capacity building (PD-Capacity) or environmental education (PD-Environmental education). or	1. More successes than failures across all outcomes and more evidence for synergies than trade-offs between pairs of outcomes. 2. Project design, particularly capacity-building in local communities, is associated with success across all outcomes. In addition, some characteristics of the local community in which projects are conducted, such as tenure regimes and supportive cultural beliefs and institutions, are important for project success. 3. There is little evidence that national context systematically influences project outcomes. 4. There is evidence of synergies between pairs of outcomes, particularly between ecological and economic success. 5. Design features that include emphasis on community participation, capacity building, and equitable distribution of economic benefits, are very important and suggest that projects that balance economic incentives, community empowerment, and secure rights can succeed. 6. Hypotheses 1, 3 and 4 -were supported to some degree, indicating the importance of: (1. building local institutional capacity and training and skills development , (2. equitable benefit distribution including avoidance of elite capture; (i2. engagement with local institutions and cultural beliefs and traditions; (4. the provision of social capital and other intangible social benefits; and (5. participation in rule making and daily management. 7. Projects running for a longer period are more likely to have economic success than more recent projects.	The amount and rigor of outcome monitoring across the domains remains low, need more systematic evaluation of important outcomes.	52 papers that were identified through prior systematic reviews conducted by Brooks et al.and Waylen et al. (2). This sample was expanded with a primary literature search with a date range of 2007 [when the search conducted by Waylen et al. (2) ended] to August 2009	
9	Brookes et al	2013	Assessing community-based conservation projects: A systematic review and multilevel analysis of attitudinal, behavioral, ecological, and economic outcomes	community-based conservation	Assess the effect of non-local factors on conservation projects in addition to the goal of increasing the sample size from previous reviews for a more robust statistical analysis.	Is community-based conservation an effective conservation tool?	1. Which aspects, if any, of national socio-economic and political contexts affect the outcomes of local-level CBC projects? 2. Which aspects, if any, of project design and community characteristics affect the outcome of CBC projects? 3. to determine how well our coding matches the intent of the authors of the articles from which we extracted our data.	N/A	1. Further evidence that CBC can be an effective conservation tool, particularly when studies are well designed and initiated in favorable local contexts. 2. find little support for the prediction that the measured national-level variables would be associated with CBC project outcomes. 3. The multivariate results provide strong indication that well-designed projects may be able to overcome challenges imposed by national contexts (e.g. low human development, or rampant corruption) as well as local contexts (e.g. ineffective institutions or unsupportive cultural traditions). 4. Our results indicate that CBC can be an effective tool as we found that there were more instances of success than failure for all four outcome measures and that this was especially true for ecological outcomes. However, we note that the number of failures is still large and the presence of a number of "limited success" results suggests that one should not be too optimistic about the likelihood of CBC success in all cases;	1. we would like to emphasize the need for more thorough and systematic monitoring of CBC projects; 2.We also emphasize the importance of including multiple measures of success. Rigorously collected data that address only one or two measures of success have limited analytical value because CBC projects almost inevitably have ecological, economic, and social consequences. Without measures of success that span these distinct dimensions, the overall effectiveness of CBC will be difficult to determine. 3. The third issue, which relates to the limited amount of outcome monitoring and quality of reporting, is the issue of what is monitored and reported for outcome variables. For each outcome, a multitude of indicators could be monitored that might provide conflicting information, Primary researchers and evaluation teams need to be clear about the specific problem that the project is designed to address and the goals of the project in each of the four outcome areas. 4.The fourth issue relates to which predictor variables are measured. The CBC literature is dominated by case studies that do not follow standardized guidelines for the type, quality, and amount of data that are collected. Further, while standardization will help with problems of what is reported, it will be of less help in improving study designs. 5. little evidence for systematic effects of national level variables on project outcomes when other factors are also considered. However, this finding may be influenced by the variables chosen to represent effects at this level, or the possibility that national level variables interact with, or mediate, other influences with less direct effect. Furthermore, an institutional perspective suggests that there is no easy dichotomy between 'local' and 'national'. Depending on	2000-2016	Developing countries; The project could not be exclusively located within a most-developed country as determined by 2009 gross national income (GNI1. per capita data provided by the World Bank.
13	Chausson et al	2020	Mapping the effectiveness of nature-based solutions for climate change adaptation	nature-based solutions	Consolidate the large dispersed evidence-base on the effectiveness of NBS for addressing climatic impacts.	What is the state of the scientific evidence base on the effectiveness of nature-based solutions for addressing the adverse impacts of climate change and hydrometeorological hazards?	1. Are there critical knowledge gaps and biases in the evidence? 2. What are reported synergies and/or trade-offs between reducing climate impacts and broader social, and environmental impacts of the intervention, as well as GHG mitigation?	1. Identify existing evidence of the effectiveness of Nbs for addressing different climate impacts on people and economic sectors, and catalogue evidence with respect to geography, country income group, climate impact addressed, ecosystem type, and type of intervention. 2. Elucidate the synergies and/or trade-offs between climate impact reduction and greenhouse gas (GHG) mitigation, ecological, and social outcomes. 3. highlight knowledge-gaps to stimulate further research, especially on the extent to which geographical regions, ecosystems, intervention types and climate impacts are understudied.	1. Few interventions were explicitly identified as Nbs by the literature. 2. Broad evidence base but biased towards: establishment of created ecosystems and restoration of natural and semi-natural ecosystems. Fewer focused on protecting ecosystems as an intervention. 3. Most studies reported positive findings and effectiveness in reducing climate impacts, thus improving adaptive capacity in natural or semi-natural ecosystems. 4. Interventions in non-natural systems had trade-offs but overall more synergies than trade-offs between addressing climate impacts and broader benefits. 5. Dearth of literature in Africa, especially in central Africa, North-eastern Africa and Southern Africa. 6. 79% of articles from Global North, 15% of articles from LMICs and LICs combined. 7. Literature largely from high income countries, with very little from LMICs and LICs (see Fig. 2 - b). 8. No specific mention of global vs local/equitable benefits; but the authors did state that some of the reviewed few papers reported GHG impacts (a global impact) but there was no explicit discussion of this.	2. Few studies reported on more than one or two different climate impacts, or broader social, economic and ecological outcomes → thus there is a need for more integrated assessment. 3. Few studies reported trade-offs and/or synergies with GHG mitigation. 4. Few studies directly compared Nbs outcomes with alternative interventions and those that did showed varied results of Nbs mostly evaluated through economic lens thus potentially missing non-economic advantages/trade-offs.	>2018	
14	Cheng et al	2019	A systematic map of evidence on the contribution of forests to poverty alleviation	forest-related activities	Address the gap in understanding of the pathways and mechanisms by which forests can help the chronically poor become less poor, by consolidating the existing evidence on forest-poverty linkages, synthesizing data on impacts for a specific linkage, and disseminating data and products to key decision makers in the forest sector.	1. What evidence exists for the role of forests in contributing to poverty alleviation? 2. What are some critical gaps in the available evidence?	1. What is the distribution of the evidence base in terms of overall quantity of articles, study design types, interventions examined, outcomes measured, governance regimes, ecoregions, and geographical locations? 2. What types of forest-based programs have been studied and how much evidence is there from different types of research? 3. What indicators are commonly used as measures of poverty in this area of research? 4. What are the major gaps in the evidence base that represent research priorities?	Identify, map and describe the global evidence on the effects of forest related activities on poverty outcomes, with special interest in welfare outcomes associated with changes in forest management (including governance structures) and markets for forest products and services.	1. The most studied areas are South Asia, East Asia, Southeast Asia, South America, and East Africa, while Europe, North America and West Africa had relatively few articles. 2. The productivity, rights, and markets strategies from the PRIME framework are the most studied, Comparatively, few articles examined activities aimed at enhancing capitals, utilizing and harnessing market forces, and protecting and augmenting non-monetary benefits. 3. Interventions that were most commonly studied within a single article were: forest management and governance, forest management, governance, and empowerment, and empowerment and governance. 4. There was an overall lack of impact evaluations employing a credible control. 5. Much of the potentially relevant research that was recovered in searching did not utilize any type of comparator; and the	1. Gap in research on impacts of rights-based activities within forest ecosystems on all dimensions of poverty. While there have been some systematic reviews examining the links between rights-based actions and poverty, current evidence in this area now merits synthesis to investigate causal mechanisms and critical contexts for achieving impact. 2. A lack of evidence around the impacts of strengthening institutions to manage and deliver ecosystem services and identify and value their non-monetary benefits. 3. Further empirical evaluation is needed to document the relationship between particular strategies to alleviate and reduce	2014 -2016	None
15	Cheng et al	2020	Strengthen causal models for better conservation outcomes for human wellbeing	conservation	Address the knowledge gap on how causal models are actually used in practice and research in conservation, and on the linkages between conservation and human wellbeing outcomes.	N/A	N/A	1. Outline criteria for credible causal models. 2. Systematically evaluate their use in a broad base of literature on links between nature-based conservation actions and human wellbeing impacts.	1. The majority of the evidence base does not document the underlying mechanisms about how the studied conservation intervention is predicted to affect human wellbeing outcomes. 2. The analysis identified few documented models within a large, recent, and relevant evidence base 2. documented credible causal models tended to be presented graphically, occasionally complemented by narrative descriptions. 3. The methodologies employed to test for causality were quite varied, and articles often did not employ robust methodologies.	Lack of Consistent—and standardized—use of causal models regarding understanding of how conservation impacts social-ecological systems.	>2020	Non-OECD countries

18	Dick et al	2020	How are nature-based solutions contributing to priority societal challenges surrounding human wellbeing in the United Kingdom: a systematic map	nature-based solutions	N/A	What evidence is there for nature based solutions and their impacts on human wellbeing for societal challenges related to cost-efficacy, governance in planning, environmental justice, and the acoustic environment?	1. What evidence is there for specific economic cost–benefit analyses of individual NBS actions? 2. What evidence is there concerning the role of NBS actions in addressing environmental justice and socio-economic inequalities? 3. What evidence is there that governance issues are being highlighted with regard to implementing NBS actions? 4. What is the evidence for NBS actions focused on the acoustic environment (soundscape)? 5. Generic questions for collection from evidence-search: 1. What is the current state and distribution of evidence? 2. What habitat types are being covered? 3. What aspects of human wellbeing are associated positively and negatively with NBS actions? 4. How much evidence is there for really long-term impacts—what is actual length	Identify and codify studies that investigate the impacts of NBS on Human Wellness Benefits with regard to the particular societal challenges: (NBS cost-efficacy, governance in planning, environmental justice, and acoustic environment i.e. soundscape.	1. Most of the evidence reviewed referred to natural, blue or green infrastructure in the urban environment and focused on economic, material and health aspects of HWB. 2. Very few studies robustly reported the role of NBS actions or interventions on HWB compared with non-NBS actions or interventions. 3. the evidence base is growing on NBS-HWB linkages, but significant biases persist in the existing literature; urban environment and restoration studies focused on conservation aspects, with only a few studies investigating the full suite of advantages to HWB that can be delivered from NBS actions and interventions. 4. The soundscape was the least studied of the societal challenges identified as being of key importance by policy makers, with cost-efficiency the most reported.	1. There is a need for long-term, transdisciplinary studies that focus on comparisons between NBS and non-NBS alternatives, covering all four key societal challenges identified	>August 2019	OECD countries only
19	Doswald et al	2014	Effectiveness of ecosystem-based approaches for adaptation: review of the evidence-base	ecosystem-based adaptation	Give a methodical overview of the state of the evidence-base for EbA as effective interventions to enable people to adapt to climate change, climate variability and climatic shocks.	What evidence exists regarding the ability of EbA to help people adapt to the impacts of climate change?	What are the critical knowledge gaps in the evidence?	Identifying the scientific literature that makes explicit links between human adaptation and climate change, variability, extremes or other natural hazards that could be linked to climate.	1. Measures of the effectiveness of EbA-relevant interventions recorded in the articles showed positive results, although discussion of thresholds, limits and timescales related to these interventions was limited. 2. Social, environmental and economic benefits of EbA interventions were in evidence in most articles, and though costs were discussed, this was limited in extent. 3. the literature on EbA-relevant interventions addressing climatic variability, change, and linked extremes and natural hazards, contains some information that will support making the case for EbA.	1. the evidence-base is currently lacking information on the implementation of EbA-relevant interventions in certain ecosystems. These include the grassland/savanna, mountain and marine biomes. 2. There is a lack of quantitative (and consistent/comparable) measures of the success of EbA-relevant practices (and detail on the associated timescales, thresholds, and physical, ecological and socio-economic conditions for success/failure). 3. Gap in comparative articles between EbA and other adaptation notions, and the lack of distinction between different adaptation notions.	>2012	None
20	Friedman et al	2018	How just and just how? A systematic review of social equity in conservation research	conservation	Understand how equity has been defined and examined through a systematic review of the literature and to better equip conservation scholars and practitioners seeking to define, study, or address equity issues in conservation.	In what contexts has equity research been conducted and by whom?	1. How is the notion of equity conceptualized and measured in conservation research? 2. How might the conceptualizations and assessment mechanisms affect the study conclusions about equity?	1. Uncover the challenges associated with defining and studying a multi-faceted concept such as equity and apply it to conservation. 2. Show strengths and gaps in the rapidly burgeoning research on equity in conservation 3. Foster a better understanding of how it can be applied successfully in practice.	1. Majority of relevant studies were undertaken in the last nine years. 2. Asia, Sub-Saharan Africa, and Latin America and the Caribbean most studied areas - 'global south', countries considered to have lower levels of governance, indicating a bias towards cases that are more likely to expose injustices and inequities, and therefore have negative equity outcomes. 3. Forest ecosystems comprised the largest proportion of study systems, with the second and third most prominent being coastal and marine ecosystems and grasslands. 4. Disciplinary background of the authors influences how conservation and equity is perceived, framed, and which variables are assessed. 5. Challenges arise from the case specificity of equity and what dimensions authors choose to examine. 6. There is over-reliance on the monetary and other tangible variables used to assess distributional equity.	1. Framing of equity within conservation research would benefit from greater transparency of study motivation, more explicit definition of how equity is used within the study context, and consideration for how best to assess it. 2. empirical conservation literature should more deeply engage with different notions of equity when studying, planning, and implementing actions to address potential trade-offs among equity and conservation objectives and beneficiaries.	>October 2016	None
22	Hajjar et al	2016	The data not collected on community forestry	community forestry	1. Assess whether published studies demonstrate that community-managed forests lead to improvements or declines in environmental and livelihood outcomes. 2. Analyze how these outcomes vary across a range of biophysical, institutional, and socioeconomic contexts.	What are the biophysical, institutional, and socioeconomic contextual factors associated with improvements in livelihood and environmental outcomes in forests managed by communities?	N/A	Integrate and summarize empirical research on environmental and livelihood outcomes in community-managed forests, and the biophysical, institutional, and socioeconomic contextual factors associated with those outcomes.	1. Significant gaps in understanding of the role of population dynamics, market forces, and biophysical factors as drivers of environmental and livelihood outcomes of community forestry. 2. Livelihood outcomes have been assessed primarily with qualitative methods. Although existing qualitative studies provide useful insights into the kinds of socioeconomic impacts community forestry can have, there is an urgent need to complement these studies with non-perception-based measures to make comparative assessments of intervention outcomes across sites and help establish baselines for longitudinal studies. 3. The CFM literature was heavily biased toward cases in South Asia (predominantly in India and Nepal) and thus was likely not representative of the range of experiences and outcomes in other regions. 4. While the majority of cases reported positive environmental and income-related outcomes, forest access and resource rights were often negatively affected by policies to formalize CFM, countering one of CFM's principal goals. Positive outcomes across all three dimensions were rare. 5. Biophysical conditions, de facto tenure rights, national context, user-group characteristics and intervention types are key predictors of joint positive outcomes. 6. Often either rights are traded off for environmental improvements or distributional asymmetries within communities may result in income gains for some but rights losses for others. 7. Specific contexts need to be considered in designing community forestry interventions; decision makers should consider biophysical conditions, community institutional arrangements and user-group characteristics either as predictors of the ability of CFM to deliver on multiple objectives when prioritizing site selections for new CFM interventions, or as indicators of those communities that may require more assistance to overcome unfavourable starting conditions. 8. Where rights were increased, forest condition and income were generally either maintained or enhanced: of the cases that reported increases in rights, 75% saw improvements in or maintenance of forest condition, and all saw improvements or no declines in income. 9. CFM interventions alone have resulted in many of the positive and negative effects on community social-ecological resilience.	1. Gap in understanding population dynamics and individual and collective livelihood outcomes. 2. Lack of robust quantitative, comparable studies. 3. Bias towards South Asian forests thus indicating gap on community forestry in other regions.	>2016	Latin America, the Caribbean, Africa, and Asia and the Pacific
23	Hajjar et al	2020	A global analysis of the social and environmental outcomes of community forests	Community forest management	Assess the frequency of joint positive outcomes and trade-offs of community forest management and how different outcome combinations are influenced by various socioeconomic and biophysical factors.	What are the biophysical, institutional, and socioeconomic contextual factors associated with improvements in livelihood and environmental outcomes in forests managed by communities?	N/A	Integrate and summarize empirical research on environmental and livelihood outcomes in community-managed forests, and the biophysical, institutional, and socioeconomic contextual factors associated with those outcomes.	1. While the majority of cases reported positive environmental and income-related outcomes, forest access and resource rights were often negatively affected by policies to formalize CFM, countering one of CFM's principal goals. Positive outcomes across all three dimensions were rare. 2. Biophysical conditions, de facto tenure rights, national context, user-group characteristics and intervention types are key predictors of joint positive outcomes. 3. Often either rights are traded off for environmental improvements or distributional asymmetries within communities may result in income gains for some but rights losses for others. 4. Specific contexts need to be considered in designing community forestry interventions; decision makers should consider biophysical conditions, community institutional arrangements and user-group characteristics either as predictors of the ability of CFM to deliver on multiple objectives when prioritizing site selections for new CFM interventions, or as indicators of those communities that may require more assistance to overcome unfavourable starting conditions. 5. Where rights were increased, forest condition and income were generally either maintained or enhanced: of the cases that reported increases in rights, 75% saw improvements in or maintenance of forest condition, and all saw improvements or no declines in income. 6. CFM interventions alone have resulted in many of the positive and negative effects on community social-ecological resilience.	Need a better understanding of how CFM performs in relation to other policy instruments such as protected areas or industrial logging concessions.	>2014	Latin America, Africa and Asia-Pacific regions
24	Hajjar et al	2021	The impacts of REDD+ on the social-ecological resilience of community forests	REDD+; community forest management	Explore how REDD+ may be contributing to, or detracting from, the resilience of community forestry.	Are REDD+ interventions in community forests enhancing or detracting from communities' abilities to practice adaptive management and governance?	N/A	N/A	1. CFM interventions alone have resulted in many of the positive and negative effects on community social-ecological resilience. 2. REDD+ is bolstering some aspects of adaptive capacity while further limiting others. 3. REDD+ has further limited communities' ability to manage for uncertainty through restrictions on local forest practices.	Future research should:	>March 2018	None
25	Hanson et al	2020	Working on the boundaries—How do science use and interpret the nature-based solution concept?	nature-based solutions	Analyze how the NBS concept is used and interpreted in peer-reviewed scientific publications using the theoretical perspective of boundary objects, and discuss the future role of NBS in green space governance.	How does science frame, use and interpret the Nbs concept?	How is the NBS concept working on the boundaries of scientific disciplines?	N/A	1. There is a time lag between the launching of a new concept and the scientific process of implementing it into scientific practice. 2. There is a clear bias in the uptake and use towards the environmental research community and the European urban context and older concept of ecosystem services and green infrastructure 3. The implementation of the core ideas of Nbs – co-benefits and stakeholder involvement – into empirical research is weak.	1. Need research on the NBS policy sphere at the international level, exploring how key NBS-organisations interact and negotiate in relation to the development of green, and NBS concepts. 2. The study of the implementation of the NBS concept in practice, including national and municipal organisations, as well as local-level implementation, is needed.	>2018, but earliest publication was 2014, and most were after 2017	Africa, Asia, Australia, Europe, North- and South America, NA
26	James et al	2021	Conservation and natural resource management: where are all the women?	conservation; natural resource management	1. Examine the existing research on the link between considering women and conservation/natural resource management outcomes. 2. Identify the barriers and opportunities that women face in engaging in conservation and natural resource management. 3. Use this analysis to determine research and information gaps and propose a set of recommendations to enable meaningful inclusion of women in conservation and management.	What are the barriers, opportunities and outcomes of women's engagement in conservation and related fields?	N/A	N/A	1. Existing societal norms affect women in conservation. 2. Women interact with, use, understand and value the environment differently than men. 3. Women lack resources and/or capability to engage in conservation. 4. Women need to be substantively and meaningfully included in conservation. 5. Inclusion of women needs to be addressed within conservation institutions.	There is a gap in understanding women's aspirations and agency within conservation and natural resource management, and what women's leadership and empowerment means in the context of conservation. We need to apply theoretical frameworks from social sciences to understand gender inequity, power and patriarchy, and interplay of social and cultural norms.	1 January 2000–31 January 2020	None
27	Jones et al	2020	Participation in payments for ecosystem services programs in the Global South: A systematic review	payment for ecosystem services	1. Assess the use of behavioral theories (if any) that motivate studies of PES participation. 2. Identify the types of motivations and household or community characteristics associated with PES participation. 3. Explore the relationships between these motivations and factors and PES participation decisions.	N/A	N/A	N/A	1. Financial and non-financial motivators, including pro-social, pro-environmental, and risk reduction, positively influence willingness to participate. The decision to participate in PES programs is based on a household's or community's willingness to participate, which is determined by both financial and non-financial motivations (pro-social, pro-environmental, and risk reduction), and ability to participate, which is influenced by pre-program capital assets. 2. Most studies consider the role of at least one capital asset in determining ability to participate in PES programs. In general, participants in PES programs have more capital assets than non-participants. 3. Who is able to participate in PES programs in the Global South remains restricted to those households and communities with higher levels of capital assets pre-program, limiting poverty alleviation outcomes and affecting equity.	1. Future participation studies should pay attention to how and when non-financial motivators are measured. 2. Future studies should investigate the links between participation variables and the effectiveness of these programs. Incorporating knowledge on how multiple factors and motivations drive participation and behavior change can lead to PES 2.0 that incorporates a more robust theory of how PES mechanisms work in the design of programs and evaluation of program effectiveness.	>2018	Global South

29	Lamb et al	2020	What are the social outcomes of climate policies? A systematic map and review of the ex-post literature	climate policy interventions	1. Identify the ex-post policy literature on climate change mitigation that examines social outcomes. 2. Extract a variety of evidence from each study, most importantly the social outcomes, including affected populations, and the type and valence of each outcome. 3. Synthesize from the ex-post policy literature, to inform and guide future policy, by examining social outcomes that resulted under varying policies and contexts. 4. Identify key cases where positive outcomes were achieved by design—or negative outcomes were avoided.	N/A	N/A	N/A	1. Three common mechanisms by which policies exacerbate inequalities: First, policy financing may be passed on to households in an untargeted manner, for instance, via increases in electricity prices under FITs and renewable procurement obligations. Second, the costs of policy compliance may fall on baskets of subsistence consumption that poorer households are particularly exposed to. This is often the case for taxes on fuels, or appliance and building standards. Third, policy benefits may accrue to wealthier households in particular, who can afford the capital investments required to gain access to a support measure, such as subsidies for solar PV systems. 2. There are multiple cases where negative equity outcomes are deliberately and successfully avoided via policy design. 3. many of the negative social outcomes we observe revolve around a lack of scope for citizen, community or public participation in decision making. Shifting public participation even further 'upstream', to deliberation over broader questions on the purpose and direction of policy, and shaping public values, will be necessary to advance even more ambitious measures that avoid rejection in their final implementation. 4. evidence that climate policies and efforts influence a wide range of social outcomes. In the ex-post literature, these outcomes tend towards negative (renewable deployment projects, feed-in-tariffs), positive (carbon and fuel taxes, direct procurement) and inconclusive effects (subsidies). Nevertheless, across all policy types, at a variety of scales and configurations, we find that it is possible to meet climate mitigation goals alongside improvements in livelihoods, affordability, equality, the provision of employment, and community cohesion. This requires integrated policies that directly address equity and procedural justice, supported by well-functioning institutions and financial alignment towards affordable low-carbon energy services.	1. There were only a small number of studies meeting key selection criteria: a focus on social outcomes within ex-post assessments. In screening the search results, we found hundreds of articles that either perform ex-ante policy assessments, or focus on pure economic criteria (e.g. policy costs). 2. More literature is required to better understand and explain mixed results in key outcomes such as income equality, employment and energy affordability. 3. the focus is on WEIRD countries, case studies, and populations: oriented to Western, Educated, Industrialized, Rich, and Democratic locations (Henrich et al 2010), thus excluding non-Western cultures that shape the beliefs and lives of more than half the world's population. 4. few studies go beyond analysing the social impacts of individual climate policies, towards groups of policies, or policy mixes. Further, our focus on climate policies with direct mitigation outcomes excludes important categories of social policy, namely public investment in transportation infrastructures and social housing. These also have indirect emissions outcomes and may be particularly salient for developing and middle-income countries. 5. Follow-up research exploring the question 'what are the climate outcomes of social policies?' would be a useful complement to this study.	>August 2019	None
30	Leah et al	2020	How climate change interacts with inequity to affect nutrition	NA	Inform the design and implementation of climate change-related policies and programs aimed at adaptation and mitigation so that they equitably address nutrition challenges.	How does climate change interact with inequity to affect nutrition?	N/A	1. Build on the conceptual work linking climate change to nutrition outcomes through the integration of three essential equity dimensions (fairness, justice, and inclusion). 2. The creation of our own climate change and nutrition "meta-framework". 3. Through mapping primary research in this area, aim to see how equity is considered, the depth in which is it conceptualized, and how research trends map to our meta-framework.	1. Have evidence of that distribution of inequity in the context of climate change, but find much less evidence exploring how and why this inequity persists. 2. The value of using qualitative or mixed methods in analyses. 3. The existing literature is highly skewed toward a consideration of only one of many possible pathways from climate change impacts to nutrition outcomes: from direct effects on agricultural productivity through to food insecurity and thence to reduced dietary intake and undernutrition. 4. Highlights the complexity and heterogeneity of the linkages between climate change and nutrition outcomes - need mixed-methods research.	1. Little evidence exploring how and why distribution of nutrition inequity in context of climate change persists; and paucity of evidence exploring the inclusion of vulnerable groups in decision making. 2. Gap in data that involves disaggregation of health and nutrition data for equity determinants such age, sex, ethnicity, education, wealth, disability, migration status, and geographic location, as well as qualitative data collection at the community level - need participatory methods. 3. Few articles address how climate change affects nutrition through underlying drivers other than food security such as care capacity and health services, water, and sanitation. 4. Dearth of literature that explores the whole gamut of	2007-2019	None
31	Lovell et al 2015	2015	Understanding how environmental enhancement and conservation activities may benefit health and wellbeing: a systematic review	physically active environmental enhancement or conservation activities	Investigate the health and wellbeing impacts of participation in environmental enhancement and conservation activities and to understand how these activities may be beneficial, to whom and in what circumstances or contexts.	N/A	N/A	Deepen understanding as to how participation in environmental enhancement and conservation activities may benefit health or wellbeing.	1. Qualitative evidence suggested that the environmental enhancement and conservation activities are valued and are thought, by participants, to contribute to better health and wellbeing. It is plausible that the activities are beneficial as they incorporate factors previously proven to be effective such as physical activity, increased social contact, improved self-esteem through contribution and achievement, and contact with nature. 2. Benefits were thought by those participating in the activities to be achieved through a number of key mechanisms; including time spent in quiet natural environments, achievement, enjoyment and social contact. The qualitative evidence suggested that some of the key pathways, such as social contact and undertaking constructive and valued activities, appeared to be valuable for those (where reporting allowed for assessment) experiencing social isolation and mental ill health. 3. Whilst there was little direct primary evidence within the included studies regarding these pathways and mechanisms, partly due to the lower order quantitative study designs, they were shown to be plausibly linked to health and wellbeing outcomes through the use of the supplementary evidence. 4. The benefits of the activities perceived by participants in the qualitative research were not reflected in the quantitative	Need more robust quantitative evidence that allows for an assessment of the effect of environmental enhancement and conservation activities on health and wellbeing outcomes.	>2012	None
34	Mckinnis et al	2016	What are the effects of nature conservation on human wellbeing? A systematic map of empirical evidence from developing countries	conservation	Shed light on areas of high and low occurrences of empirical research, existing biases in research efforts, and the robustness of current evaluation approaches.	What is the extent and occurrence of empirical evidence documenting nature conservation impacts on human wellbeing in developing countries?	1. What is the frequency and type of nature conservation interventions for which evidence are documented on human wellbeing outcomes? 2. What are the characteristics of documented evidence in terms of quantity, type of outcome measures, geographic location, and study design? Where do gaps exist in the evidence base that represent research priorities? 3. What are promising areas for further synthesis?	N/A	1. Well-studied relationships focus on established interventions, such as protected areas and community-based natural resource management, and economic and material aspects of wellbeing, such as income, employment and physical assets. 2. Linkages between interventions and outcomes with high occurrence of evidence include resource management interventions, such as fisheries and forestry, and economic and material outcomes. 3. Over 25 % of included articles examined linkages between protected areas and aspects of economic wellbeing. 4. Very few articles evaluated human health outcomes. 5. Robust study designs were limited, very few evaluating causal effects with quantitative design.	1. There is a lack of evidence for areas of interventions, such as education and species management, and measurement of important aspects of wellbeing, such as social relations between groups, that may be more difficult to quantify. 2. The robustness of the evidence base overall is low with few articles applying robust quantitative method - need more and better research. 3. Further empirical evaluation is needed to document the magnitude and direction of particular conservation-wellbeing linkages, in particular for relationships commonly assumed in conceptual models, institutional strategies or global policy goals. 4. Higher occurrence and more robust evidence on the contribution to sustainable development is required.	>April 2015	Non-OECD countries
35	Munroe et al	2012	Review of the evidence base for ecosystem-based approaches for adaptation to climate change	ecosystem-based adaptation	Give a methodical overview of the state of the evidence base for EbA effectiveness, and to identify the current knowledge gaps.	What is the state of the evidence base regarding the ability of ecosystem-based approaches for adaptation to climate change?	What are the critical knowledge gaps in the evidence?	N/A	N/A	N/A	>2012	
39	Pullin et al	2013	Human wellbeing impacts of terrestrial protected areas	protected areas	Synthesise the empirical evidence of positive, negative or neutral impacts of PAs on human wellbeing at the local to regional scales, with emphasis on local communities and contemplating as broad a definition of wellbeing as possible (see categories to be considered below).	What are the human wellbeing impacts of terrestrial protected areas?	1. How are costs and benefits distributed among and within local communities living inside and in the buffer zones of PAs (by socio-economic status, gender, age etc.)? 2. How do costs and benefits vary with governance, resource tenure arrangements, and site characteristics? 3. As the aim is to assess the human wellbeing impacts of PAs in their current form and capture lessons for future interventions, relevant evidence may be provided by studies that generate hypotheses about impact, as well as studies that test hypotheses about impact.	N/A	The evidence base provides a range of possibilities to inform but little evidence to support decision making on how to maximise positive impacts of PAs on human wellbeing. The diversity of studies and of outcomes measured, together with the diversity (or lack of clear signal) in the data suggests that impacts of PAs are highly context dependent. However, the evidence base is insufficient to provide any power with which to predict impacts on wellbeing from a knowledge of their context. It logically follows that there is an insufficient evidence base to identify circumstances/variables/effect modifiers that might lead to greater or lesser impact. At present, the available evidence base is failing to inform policy on the progress (or lack of it) being made; The nature of the research reported to date forms a diverse and fragmented body of evidence unsuitable for the purpose of informing policy formation on how to achieve win-win outcomes for biodiversity and human wellbeing.	Need to improve the quality of future research by: 1. Methodological detail: Studies must report sufficient details regarding the location of sample sites (in relation to the protected area boundaries in particular), the degree of replication, the data collection tool (e.g. quote questions posed to respondents in questionnaires), the method of sample selection (e.g. random or purposeful), and the times and duration of sampling. 2. Baseline assessment (BAC study design): Where changes following establishment or change in protected area governance are being investigated, adequate baselines must be assessed. 3. Matched controls: 'Control' or 'comparator' populations are vital to enable conclusions to be drawn about impacts in the absence of the intervention. A reliable comparison requires that as many other variables describing the environment are held constant or matched between comparator and intervention populations 4. Replication: Care must be taken to ensure that there is an appropriate trade-off between a study's accuracy and its precision. When combining many studies in a synthesis, more accurate results are preferable to more precise ones. 5. Statistics: Statistics, both in summarising results and analysing patterns, must be used with great care. A statistician should be consulted during experimental design in order to optimise	>2013	None

40	Puri et al 2016	2016	Examining the evidence base for forest conservation interventions	forest conservation	1. Identify and illustrate the existing empirical evidence on environmental and human wellbeing from forest conservation intervention. 2. Inform key stakeholders, including funders, evaluators, and organisations across different regions and sectors, of the evidence on the characteristics of successful forest governance and conservation strategies that are effective, efficient and sustainable	N/A	N/A	1. Present an overview of what we know and do not know about the interventions implemented. 2. Enable practitioners and policymakers to explore the findings and quality of existing evidence in the forest conservation sector. 3. Identify key gaps where little or no evidence from impact evaluations and systematic reviews is available which can assist in informing research in the sector. 4. Facilitate evidence-informed decision making.	1. Most impact evaluation and systematic review evidence is directed at understanding the effects of protected areas, decentralised forest management and payment of ecosystem services. However, the evidence base for these interventions is geographically skewed, and focuses on a small number of outcome types. 2. systematic reviews mainly focus on decentralised forest management, protected areas and payment of ecosystem services. Only after 2010 were systematic reviews performed to measure evidence in this sector. Three out of eight systematic reviews estimate only environmental outcomes, with the remainder estimating the trade-offs between social and environmental outcomes. Only one systematic review measures decision making of the forest communities. 3. The outcomes that are most frequently measured are forest cover, forest degradation, and income and poverty reduction; biodiversity, knowledge and behaviour change are rarely examined. 4. Despite the considerable focus on synergies and trade-offs between environmental and social outcomes in conservation, few studies robustly examine these relationships. 5. Quasi-experimental methods can and should be considered for impact evaluations.	1. There is little or no high- quality evidence in areas that are otherwise significant for policy. These include evidence on the effect of forest-related climate change policies, trade laws and management, or education and awareness campaigns on environmental and social outcomes in forests. Similarly, there is a paucity of high-quality evidence on the impacts of forest conservation interventions on transparency and accountability, biodiversity, knowledge and behaviour change, supporting services and cultural services. 2. There is a need to invest in targeted evidence synthesis efforts to distil information in a format that can directly inform decision making.	1990 and 2015	LMICs
42	Roe et al	2014	Which components or attributes of biodiversity influence which dimensions of poverty?	biodiversity conservation	Provide some essential background in efforts to address this question from a research programme on Ecosystem Services and Poverty Alleviation: 'How do ecosystem services contribute to sustainable poverty alleviation?	Which components or attributes of biodiversity influence (positively or negatively) which dimensions of poverty?	1. What is the geographical focus of the evidence base? 2. What components of biodiversity have been addressed? 3. What dimensions of poverty have been addressed? 4. What methods were used to collect the evidence? 5. What can we say about the relative strength of the evidence given	Describe the current state of the evidence base – the degree to which it disaggregates “biodiversity” and “poverty”, its representativeness, the types of linkages that have been found, the methods that have been used to analyse them	1. Income is the dominant measure of poverty. However, over half the sources of evidence did measure more than one dimension of poverty. 2. Studies in forest systems ecosystems make up the majority. 3. The evidence base on biodiversity – poverty linkages is dominated by studies of the direct, consumptive, use of biodiversity by people. 4. Very few studies reported negative impacts on poverty, due to the decision to exclude health impacts of pathogens.	1. A large proportion of all or did not specify the aspect or dynamic of poverty they were measuring, should be considered in future research. 2. limited number of studies that had adopted experimental or quasi-experimental research designs.	>2013	Developing countries
43	Ruangpan et al	2020	Nature-based solutions for hydro-meteorological risk reduction: a state-of-the-art review of the research area	nature-based solutions for hydro-meteorological risk reduction	Provide a state-of-the-art review of publications on hydro-meteorological risk reduction 25 with NBS and to explore the patterns and trends of current research activities as well as to indicate some directions for future research based on the knowledge gaps.	N/A	N/A	1. Identify patterns and trends of NBS publications in scientific journals. 2. Assess the state-of-the-art in research concerning both small and large scale NBS. 3. Review the use of techniques, methods and tools for planning, selecting, evaluating and implementing NBS. 4. Review the socio-economic influence in the implementation of NBS as well as their main benefits and co-benefits. 5. Identify knowledge gaps and proposed future research prospects	1. NBS have not been equally applied to all hydro-meteorological risk reduction contexts. 2. Most of the literature to date is about NBS in urban areas whereas those contexts concerning river and coastal floods, droughts and landslides are the least addressed. 88% of all articles were concerned with runoff reduction or flood risk reduction in urban area. 3. 4.5% explicitly used the term “Nature-Based Solution” for hydro-meteorological risk reduction. This can be explained due to difference in terms used in different countries while the term NBS has been used only from 2008. However, the significant increase of published articles in recent years testifies how NBS is a rapidly growing research area. 4. investments in NBS will benefit society by providing cost-effective measures and adaptive strategies that protect their communities and achieve a range of co-benefits.	1. Clear gap between the amount of research on small scale NBS in urban areas and large scale NBS at the catchment (river basin), rural, and regional scale. Therefore, the research and frameworks that deal with the problem of reducing hydro-meteorological risk with upscaling NBS from urban scale to catchment (river basin) scale would be beneficial, and it would be also beneficial to understand both the natural processes of large scale NBS and how they change over time. 2. Furthermore, there are only few studies that combine NBS at both small- and large-scale and further research in this direction is highly desirable. 3. Need to improve and develop methods for assessing co-benefits (especially socio and ecological benefits i.e. aesthetics values, community livability, and human health), frameworks and methods for evaluating large-scale NBS and “hybrid	2007-2019	None
45	Sammi et al	2014	Effects of Payment for Environmental Services (PES) on Deforestation and Poverty in Low and Middle Income Countries: A Systematic Review	payment for ecosystem services	Assess the effects of PES programs on deforestation and welfare outcomes in low and middle income countries (LMICs), and whether the twin goals of improving both environmental and human welfare outcomes are at odds with each other.	Does PES reduce deforestation rates?	Does PES have a non-negative impact on local poverty levels?	1. Assess the evidence on the effects of PES interventions on conservation and poverty outcomes in LMICs. 2. Assess the extent to which effects on poverty in turn affect whether conservation benefits are realized. 3. Evaluate how institutional and social conditions (namely, inequality, institutional capacity, corruption, and democratic accountability) moderate the effects of PES programs.	1. The state of the evidence base for PES programming is extremely poor making it difficult to draw conclusions. 2. The evidence base on the effects of PES on welfare outcomes is very limited, with only two studies in two countries (China and Mozambique) included in the review. These studies find that PES improved participating households’ incomes. 3. Keeping in mind the weakness of the evidence base, the studies that focus solely on reducing deforestation suggest that PES programs have, on average, tended to reduce the annual rate of deforestation by 0.21 percentage points. 4. Available evidence shows that PES programs are less effective in poor areas and are less likely to attract participation of poor households than wealthier ones.	The resulting evidence base is weak both in terms of the number of eligible studies and the methodological weaknesses of the included studies. None of the studies are based on randomized experiments, and so the potential for hidden selection or confounding biases is the most concerning issue. Few of the studies create comparison groups that allow them to address spill-over and leakage of effects from program areas to non-program areas. None of the studies investigated forest conservation and welfare effects jointly, which made it difficult to assess how these two goals are related. Researchers should consider the recent work in development economics for guidance on executing field experiments that might provide more reliable evidence.	>2015	LMICs
46	Sammi et al	2015	Decentralised forest management for reducing deforestation and poverty in low- and middle-income countries	decentralised forest management	Move the debate around DFM beyond theoretical discussions and into better-informed, evidence-based discussion by examining the evidence on the effects of DFM programs on deforestation and welfare outcomes in low and middle income countries (LMICs), aiming also to assess whether these goals are at odds with each other.	How might these potential “win-win” outcomes from natural forest conservation in the tropics be realized?	How do different approaches to natural forest conservation relate to the pursuit of poverty reduction goals?	1. Assess the evidence on the effects of DFM programs on the conservation and poverty outcomes in LMICs. 2. Assess the extent to which these programs’ effects on poverty in turn affect whether conservation benefits are realized. 3. Evaluate how institutional and social conditions (namely, inequality, institutional capacity, corruption, and democratic accountability) moderate the effects of DFM programs.	1. Despite limitations in the evidence base, DFM does reduce deforestation rates. 2. Based on the evidence available, cannot draw the conclusion that an evidence-based case can be made for conservation and poverty-reduction goals being complementary in DFM programming.	The evidence base is limited both in terms of the number of eligible studies and the methodological quality of included studies; few are based on randomized experiments, few of the studies create comparison groups, and none of the studies investigated forest conservation and welfare effects jointly	>2013	LMICs
48	Snilstveit et al	2016	Land-use change and forestry programmes Evidence on the effects on greenhouse gas emissions and food security	AFOLU programmes	Identify, map and describe existing empirical evidence on the effects of land-use change and forestry programmes and policies on GHG emissions and human wellbeing outcomes.	N/A	N/A	1. Identify, appraise and summarise existing evidence from systematic reviews of the effect of land-use change and forestry programmes on GHG emissions and human welfare outcomes that can be used to inform policy in the AFOLU sector. 2. Identify existing evidence gaps where new primary studies and systematic reviews are needed to better inform climate change mitigation and development policies.	1. The distribution of evidence is relatively uneven when considering study characteristics according to intervention and geographical location. The interventions with the largest volumes of studies are protected areas (PAs), community and decentralised forest management (C/DFM), payment for environmental services (PES) and agricultural extension and training. 2. very few studies for dams and civil society interventions, and, land rights, information services, and technical and vocational training for farmers. 3. Over half of the identified studies were conducted in only 10 countries: Costa Rica, Brazil, China, Indonesia, Mexico, Uganda, Ethiopia, India, Bolivia and Malawi. Out of the 47 countries that are part of Reducing Emissions from Deforestation and Degradation (REDD/REDD+), we identified evaluations of forestry programmes in only 24. 4. the existing evidence base is too limited to guide decision makers on which interventions are likely to be most effective in reaching emissions reductions targets, while avoiding negative effects on food security and other human welfare outcomes. 5. few studies were designed to assess potential trade-offs between climate change mitigation and food security and poverty reduction.	1. No primary study directly addresses the question whether there are trade-offs or potential synergies between programme effects on environmental and human welfare outcomes, as measured by GHG emissions and food security addressing the directly by measuring programme effects on both of these outcomes. 2. There is almost no evidence of studies directly measuring either carbon storage and sequestration2 or GHG emissions; studies largely focused on indirect measures of GHG emissions such as forest cover. 3. Evidence mainly uses quasi-experimental study designs (223 of the 241 studies) such as propensity score matching, instrumental variables and difference-in-differences, thus lack of robust before/after. However, more recent studies are increasingly using more robust methods. 4. The need to generate a body of evidence as new initiatives are rolled out. New programmes, including those implemented under REDD+, should be accompanied by high-quality evaluations assessing potential trade-offs between climate change mitigation and human welfare outcomes. 5. To allow assessment of the potential for win-win solutions and identify potential trade-offs, studies need to measure effects on both GHG emissions and human welfare outcomes, including food security. When feasible, studies should include direct measurement of GHG emissions to test assumptions about	January 2000 - April 2016.	None

52	Vang Rasmussen et al	2021	Socio-economic outcomes of ecological infrastructure investments	ecological infrastructure	Examine the multitude of socio-economic outcomes arising from ecological infrastructure investments by identifying a range of outcome pathways at the scale at which the investments occur, and exploring the conditions under which these different outcomes are likely to play out.	N/A	N/A	Address the knowledge gap on the socio-economic outcomes of ecological infrastructure investments by synthesizing research that analyses how ecological infrastructure investments affect ten different socio-economic dimensions, such as income and food security in low- and middle-income countries.	1. Positive outcomes are primarily observed for income and natural capital, positive outcomes for other socio-economic dimensions are less frequently observed. 2. Mixed-method studies capture a significantly higher number of positive outcomes. 3. Participant involvement in project implementation facilitates many positive outcomes.	1. Few reviews synthesize knowledge on how investments in ecological infrastructure (or variants hereof: environmental infrastructure, soft infrastructure, natural infrastructure, green infrastructure, ecosystem-based adaptation, and nature-based solutions) affect human wellbeing in low- and middle-income countries. 2. Lack of quantitative and comparable measures of the success of ecosystem-based approaches for adaptation to climate change hinders the widespread use of ecosystem-based approaches being translated into practical policy advice; While there is considerable hope and expectation that ecological infrastructure investments can contribute to both environment and development goals (Adamowicz et al., 2019, Cumming et al., 2017). 3. The bulk of the researched cases fail to present actual evidence for this as they tend to be focused on short-term project employment, lacking evidence of the more long term effects. 4. Need to learn more about the variation in bundles of socio-economic outcomes that we have observed across geographic regions; policymakers and practitioners can respond to in terms of better mediating between different stakeholder interests and aspirations in the design and implementation of ecological infrastructure projects.	>2018	geographic focus on low or middle-income countries (c.f. World Bank, 2019) AND Dealt with rural or peri-urban areas (i.e. excluding cases dealing with low carbon cities)
57	Zheng et al	2019	Coordinating ecosystem service trade-offs to achieve win-win outcomes: A review of the approaches	ecosystem services	Summarize the current approaches to minimize ES trade-offs for win-wins, and to analyze the trade-offs among different ESs and their drivers.	N/A	N/A	N/A	1. Diversified approaches to coordinate ES trade-offs indicate that win-win outcomes are feasible. 2. ES trade-offs were found to be associated with complex social dynamics, stakeholder behaviors, decision making backgrounds, as well as geographic locations. 3. Thus, drivers of ES trade-offs must be identified within the appropriate scope of complex socio-economic dynamics and in specific local contexts.	5. there is a need for a) better integration of research methods Need more research to understand: the important roles of multiple stakeholders, spatial scales of management, and trade-off dynamics, as well as the associated implementation of diverse approaches, in coordinating ES trade-offs in different contexts.	2005 to 2018	None