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Principles for just and equitable nature-based solutions

SEI discussion brief
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IMAGE (ABOVE): The River Ndarugu, which runs through the semi-informal settlement of Kaptembwa, in Nakuru, Kenya, offers potential to serve as the basis of a nature-based solution to multiple social-economic and environmental issues faced by the community © SEI

Key messages

- **Nature-based solutions (NbS) are often framed as apolitical, and so social equity and justice issues are often overlooked in the design, governance and implementation of such measures. As a result, co-benefits can be over-emphasized, and trade-offs and unintended consequences can be overlooked.**
- **NbS should adopt the same principles that underpin just and equitable approaches to address climate, environment and development issues more widely. These are:**
  1. **Ensure that design, governance and implementation processes are inclusive and transparent.**
  2. **Tackle root causes of marginalization, inequality and injustice at all stages.**
  3. **Limit the creation of economic and non-economic losses, and avoid the unjust redistribution of risks and costs.**
  4. **Prioritize interventions for the most at-risk places and communities.**
  5. **Devise and use valuation and measurement tools that assess social and political change and consequences.**
- **A case study from a semi-informal settlement in Nakuru, Kenya, illustrates how such principles can be integrated into nascent processes that set the stage for NbS-oriented measures to address socio-economic and environmental issues at the community level.**

Background

Nature-based solutions (NbS) are a hot topic in climate, environment and development circles. As they rise in popularity, it is increasingly important to scrutinize the narratives around the concept, its framing in policy and agenda setting, as well as its operationalization or practical implementation (Barquet et al., 2021).

This brief is one in an SEI series critically exploring key issues on the topic. Here, we focus on the social equity and justice dimensions and implications of NbS-related design, governance and implementation, particularly in the context of climate change adaptation, resilience building, and disaster risk reduction – three interconnected domains in which NbS are gaining significant traction. Specifically, we highlight prevalent blind spots and pitfalls in terms of social equity and justice objectives and outcomes, and propose principles for just and equitable NbS planning and implementation.

Despite the recent proliferation of NbS studies, programmes and publications, the focus has largely been on the science, technology and innovation required to generate the solutions. Less attention has been given to the socio-political and human aspects,

DEFINING NATURE-BASED SOLUTIONS (NBS)

A resolution adopted by the United Nations Environment Assembly (UNEA) at the fifth session (2021-2022) frames NbS as "actions to protect, conserve, restore, sustainably use and manage natural or modified terrestrial, freshwater, coastal and marine ecosystems which address social, economic and environmental challenges effectively and adaptively, while simultaneously providing human well-being, ecosystem services, resilience and biodiversity benefits" (United Nations, 2022).

ABOUT THIS SERIES

The key levers of change for our seas and coasts revolve around the need for an integrated climate, biodiversity and development agenda. Nature-based solutions (NbS) are increasingly seen as an important piece of the puzzle for delivering multiple and sometimes contradictory goals. If these options are to succeed, assessments of these options must go beyond simplistic promises of this win-win discourse. What are the potential pitfalls of NbS? What questions must be asked and answered to overcome these issues? This brief focuses on the social equity and justice dimensions and implications of NbS-related design, governance and implementation.

such as the power relations behind NbS design and implementation, and the differential impacts on specific socio-economic groups (Cousins, 2021). NbS may intend to generate positive environmental and socio-economic outcomes, but the recognition that solutions may reproduce inequalities and injustices is seldom made explicit or explored in depth (Kabisch et al., 2016).

There has also been a tendency to present exemplary "best" practices, even in the absence of adequate empirical evidence, testing in diverse contexts, or monitoring over time (Kotsila et al., 2021; Odongo et al., 2022). Given the lack of common definitions and frameworks, NbS tools can be easily designed, adapted, or manipulated to serve distinct agendas and parties, rather than to promote the wider, common good. In addition, there has been a tendency to portray NbS in an overly positive, almost idealized light. This has given rise to a dominant narrative about the potential value of NbS that risks undermining due consideration of social equity and justice principles in both sustainable development and climate action agendas (Cousins, 2021; Kotsila et al., 2021).

In light of this, calls are growing to make NbS and their underpinning processes more equitable and just. In this brief we respond to this call by exploring different frameworks and approaches aimed at prioritizing equity and justice in NbS and other, similar approaches, such as ecosystem-based adaptation (EbA) and payment for ecosystem services (PES). From this, we derive a set of principles for just and equitable NbS. We then illustrate the discussion through a case study from Nakuru, Kenya, that examines ongoing efforts to come up with NbS that can address socio-economic and environmental issues faced by an urban informal settlement, and can integrate principles of equity and justice into underpinning processes from the start.

Conceptual approaches to equity and justice in NbS

In this section we discuss existing frameworks to illustrate the different ways in which equity and justice have been approached in conceptualizing NbS. These frameworks emerge from different disciplines, and, as a result, they are quite distinct from one another. Nevertheless, they have high degrees of convergence in terms of considering equity and justice in NbS.

A framework of elements for successful NbS

Taking an interdisciplinary and multi-stakeholder view of the value and promise of NbS, Nesshöver et al. (2017) put forward a framework of five key elements that, if addressed, can enable sustainable, effective and equitable development and implementation. The framework builds on an underlying principle that "successful" NbS require balancing social, economic and ecological goals (see Table 1).

A framework to make "justness" a focal point of NbS

"Just" NbS have been defined as "harnessing the power of nature and people to transform the social, political, and economic drivers of socio-spatial inequality and environmental degradation into opportunities to create progressive, cohesive, antiracist, and social-ecologically sustainable communities" (Cousins 2021, p.6). Achievement of just NbS requires explicit recognition of the ways in which access to and control over resources (particularly the land and spaces used for NbS) determine economic, environmental, and social outcomes.

In a recent review, Cousins (2021) finds social and environmental justice remains a peripheral focus and goal in NbS research and action. Using expanded notions of justice, Cousins (2021) seeks to put justice and inequality at the core of urban NbS through three focus areas: i) race and class, ii) transformative co-production, iii) value articulations (see Table 2).

Table 1. Five elements for delivering sustainable, effective and equitable NbS, based on Nesshöver et al. (2017).

Element	Equity and justice touchpoints
Acknowledge and account for uncertainty and complexity.	Implementation implies the achievement of multiple objectives: ecological functionality, economic feasibility, and social and cultural acceptability. Approaches to problems and solutions should be deliberated and adapted as needed, with opportunities for broad stakeholder participation and the incorporation of "local" knowledge. Navigating uncertainty and complexity in planning and implementation is necessary for achieving environmental justice through NbS.
Ensure the meaningful involvement of multiple stakeholders.	The involvement of multiple stakeholders in planning processes brings multiple benefits so long as participation throughout the employed processes is meaningful and empowering. Such involvement is key for improving planning, increasing understanding, generating support, legitimizing processes, facilitating learning and knowledge sharing, sparking social and technical innovation, and generating ownership and subsequent stewardship of plans.
Utilize transdisciplinary knowledge and methods.	NbS require new levels of interdisciplinary thinking and knowledge production, beyond those typically employed in ecosystem service design or restoration projects. It is important to facilitate the two-way flow of knowledge, not just from science to practice but in the reverse, from practice to science to improve design and implementation.
Develop a common understanding of concepts, solutions and trade-offs.	NbS should be based on a common understanding of available options, their costs and benefits, and the socioecological impacts, both positive and negative, of choices. Win-win options are idealistic; trade-offs and conflicts are inevitable. NbS have the potential to transform the ecosystem management paradigm by replacing objectives focused exclusively on increasing efficiency with strategies that aim to secure resilience and the multifunctionality of nature, ecosystems and land.
Integrate monitoring and evaluation, ensuring mutual learning across scales.	Equity and justice metrics – often hard to measure – risk being neglected in favour of environmental indicators. It is important to acknowledge and account for the long-term nature of social outcomes of NbS. How can social outcomes be effectively measured, monitored and evaluated?

Table 2. Three focus areas for pursuing justice in urban NbS implementation, based on Cousins (2021).

Focus area	Key points for just NbS
Race and class	Social-spatial inequalities shape vulnerability and exposure to risks, including those from climate change. Urban greening and gentrification can lead to displacement and deepen social and racial stratification in the city.
Transformative co-production	Knowledge co-production is required for effectively translating science into policy and implementing actions. Communal green spaces in urban areas should strive to achieve cultural and biological diversity.
Value articulations	There are competing measurement and valuation approaches for NbS in terms of economic, environmental, social and cultural benefits. These link to tools such as insurance, social protection and social services.

Table 3. Interdependent dimensions of social equity (McDermott et al., 2013).

Dimension	Description
Procedure	Decision-making is inclusive.
Distribution	Costs and benefits are fairly distributed.
Recognition	Stakeholders' knowledge, norms and values are integrated into processes and plans.
Context	Conditions allow stakeholders to participate, gain recognition, avoid or reduce potential losses, and gain and reap benefits.

Frameworks to generate multidimensional social equity through NbS

There are a growing number of calls for adopting a multidimensional view of social equity in the context of payment for ecosystem services (PES), an economic-centered example of NbS (McDermott et al., 2013; Pascual et al., 2014). The framework proposed by McDermott et al. (2013) builds on decades of research on gender equality, social equity and human rights-based approaches. It consists of four dimensions (see Table 3). This framework also underpins justice approaches in practice and implementation, such as the seven social principles for ecosystem-based adaptation as proposed and explored through urban contexts in the Global South (see Table 4) (Vidal Merino et al. 2021). Such multidimensional, social-equity approaches are also central to narratives that dominate in fields of environmental justice (Hughes & Hoffmann, 2020) and climate justice (Newell et al., 2021).

An added dimension in more recent analyses is the matter of addressing intergenerational justice – that is, both mobilizing current generations of actors to protect the next generations from future harm caused by current actions, and including children and young

people in today's decision-making. This aspect of justice is critical for just and equitable NbS, given the time scales for benefits to materialize, and the risks posed by shorter-term cost-benefit assessments of various options (Odongo et al., 2022).

Principles for just and equitable NbS

Building on these frameworks, we put forward a set of principles for ensuring just and equitable NbS. Similar principle-based recommendations have been put forward for justice in other domains, such as in urban ecosystem-based adaptation (Vidal Merino et al., 2021), low-carbon energy transitions (Atteridge & Strambo, 2020) and climate resilience (Lager et al. 2021).

These principles are derived from the position that it is an inherently good approach to seek to develop solutions to address climate and disaster risk and, at the same time, to harmonize relationships within society and with nature. However, even approaches with good intentions can lead to unexpected trade-offs and thereby hinder real transformation. To enact transformations, NbS planners must acknowledge and define nature as a site of power, capable of producing uneven distributions of opportunities and risks (Pelling et al., 2015). We put forward five principles that should underpin processes for devising NbS:

1. **Ensure that design, governance and implementation processes are inclusive and transparent.** These processes should promote solutions based on shared social values and collective actions.

2. **Tackle root causes of marginalization, inequality and injustice at all stages.** Design, govern and implement NbS in ways that directly address the political and socio-economic relationships and power dynamics that can produce and reproduce marginalization, inequality and injustice.

3. **Limit the creation of economic and non-economic losses, and avoid the unjust redistribution of risks and costs.** Recognize that redistribution can take many forms: it may be geographic (i.e., transferring risk from one place to another) as is the case with upstream/downstream interventions; jurisdictional (i.e., transferring burdens/ costs from one sector to another); social (i.e., reducing risk for some portions of society at the expense of others) as can be the case with urban measures; or temporal and generational (i.e., addressing current risks but increasing or failing to account for future risks).

4. **Prioritize interventions for the most at-risk places and communities.** These include marginalized, informal urban populations and rural populations with strong connections to nature (e.g., through livelihoods, culture, heritage, and natural resource use) that stand to suffer significant climate and disaster losses, both economic (e.g., from land lost due to sea-level rise and climate-related impacts on livelihoods) and non-economic (e.g., from cultural heritage losses, health and well-being impacts, and increased socio-political insecurity).

5. **Devise and use valuation and measurement tools that assess social and political change and consequences.** Counterbalance the traditionally strong economic focus on valuation and measurement in NbS design, governance and implementation with measures and evaluation of shifts in social vulnerability, equality, knowledge, power, empowerment and political capabilities.

Table 4. Social principles for ecosystem-based adaptation (Vidal Merino et al. 2021).

Principle	Description
Participation and inclusion	Actively engage local stakeholders, especially historically marginalized groups, in the design and implementation of interventions. Work towards ensuring transparent, accountable, equitable and culturally appropriate adaptation outcomes.
Capacity building	Enhance the strengths, capacities and resources available to communities to adapt to climate change. Support EbA efforts through learning networks, communities of practice, and knowledge co-production.
Fairness and equitability	Promote equitable access to benefits and address specific needs of marginalized and at-risk groups.
Gender consideration	Consider differentiated roles and responsibilities based on sexual orientation and gender identity. Acknowledge power dynamics and inequitable impacts of climate change on specific socio-economic groups.
Livelihood improvement	Ensure income security, safe working conditions and fair distribution of resources and capitals – human, social, natural, physical and financial. Align with sustainable development goals, such as poverty eradication and inequality reduction.
Appropriateness of scale	Secure the sustainability of ecosystem-based adaptation interventions by operating at appropriate spatial, temporal and governance scales. Scale up policies, scale out implementation, and scale deep relationships and roots with communities.
Integration of indigenous and local knowledge	Consider indigenous and local knowledge alongside scientific knowledge for design and implementation of interventions. Operate with principles of free, prior and informed consent when engaging with different groups to ensure appropriate outcomes.

Case study: Fostering equity and justice in processes to generate potential NbS options for the semi-informal settlement of Kaptembwa in Nakuru, Kenya

Background

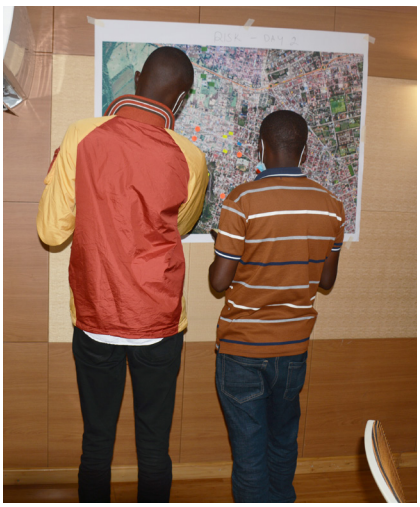
This case study provides an example of ongoing efforts to integrate principles that foster equity and justice into nascent efforts to generate concepts and designs for measures premised on nature-based solutions (NbS) to address environmental and societal concerns in Kaptembwa, a growing, semi-informal settlement in Nakuru, Kenya. Since 2018, SEI has worked on environmental governance issues with residents and other stakeholders. One goal is to identify the potential of existing, common outdoor spaces to be upgraded to provide multiple societal benefits. SEI's work is expected to lead to increased awareness about NbS-related measures to respond to local challenges, and about the roles that each stakeholder plays in co-designing such solutions. As part of the project, SEI will create a roadmap for supporting Nakuru health and well-being, including agreed-upon actions related to NbS-oriented planning in semi-informal and informal settlements.

Issues of concern in Kaptembwa

Residents in the area face many challenges: flooding; air, water and noise pollution; poor water quality; insufficient water quantity; a lack of adequate sanitation, sewerage and waste management services; and the absence of nearby green spaces for residents – all of which are likely to be intensified by the growth that is forecast for the area. Furthermore, SEI's surveys of residents indicated low levels of well-being and relatively high levels of stress, especially among women. Kaptembwa has few green spaces, especially within walking distance for daily use; while some outdoor areas are grassy during certain seasons, there is a low level of vegetation and biodiversity in general, with some stretches considered to be "brown space ". One popular area is the site of both a power line and an oil pipeline. As a result, Kaptembwa residents spend less time in green spaces than residents of Nakuru's Central Business District, which has better access to green areas . Inequalities in access to these areas have been correlated with inequalities in well-being across Nakuru (Tuhkanen et al., 2022).

The potential for NbS to improve life in Kaptembwa

SEI's work in the area has focused on the theme of common outdoor spaces, using participatory work involving Kaptembwa residents, Nakuru city authorities and other stakeholders. SEI's urban heat-island modelling indicated the potential to mitigate multiple



Resident workshop, Kaptembwa © SEI

environmental and social well-being-related issues by using NbS -oriented measures to create more green space and to improve common areas near the River Ndarugu, which runs through Kaptembwa. In a participatory mapping workshop, residents confirmed the identified local problems, and also identified flooding and personal safety as additional key concerns. Although extreme temperatures were not seen as a current issue for most of the residents, there was agreement that could become an issue in the future; the types of housing materials used in the area mean that temperatures become very high indoors. Kaptembwa has several common outdoor spaces that are informally used for different functions, including for social and political gatherings, recreation, and relaxing, but these spaces do not fulfil any of these functions to a high level. The River Ndarugu has low water quality, and suffers from litter and erosion along its riverbanks there. Despite its poor water quality, the river is also used as a source of water for cooking and washing.

In the workshop, residents recognized the potential for some of Kaptembwa's common outdoor spaces to be used and change in ways to help with issues that had been identified: stormwater management, flood mitigation, and rainwater harvesting. However, to provide value for the area, residents felt that the areas could also be designed to also provide other services: improved sewerage and water supply and recreational opportunities.

The community's vision

The results from the workshop put the environmental and health risks that residents face into the broader development context. Workshop participants created a vision statement for the community to offer residents "***clean, safe, and accessible outdoor spaces situated within a community with infrastructure and services…to improve and sustain their well-being".*** The work also highlighted the desire of local residents to achieve more than one aim. For example, to gain local resident support, common outdoor areas need to be used not just to expand access to green spaces, but also in ways that also support the potential economic developmen t of a community where many people live in poverty. Residents felt that the community included many vacant spaces that could be better utilized to serve the community.

These resident perspectives fed directly into SEI's visioning work with a broader group of stakeholders. These stakeholders were asked to plan specific common outdoor areas that could serve multiple functions, provide greater connectivity between areas , help with climate adaptation needs, and provide social and economic benefits. Due to the high unemployment in the area, common outdoor spaces were seen as potential sites not only for increased recreation and biodiversity, but also for income-generating activities, such as recycling, community gardening, fishing, seedling nurseries and small retail businesses. One idea from this exercise proposed that community groups (related to youth, women or people with disabilities, for example) could maintain the areas in exchange for donations from users of the site. Formal plans for a specific NbS have yet to be devised.

Planning challenges

However, due to the informal nature of many areas in the community, the potential for development is uncertain. This makes planning solutions of all kinds, including NbS, less than straightforward. For example, one must consider the complexity of NbS governance arrangements needed to deal with the many issues that come into play in planning – many of which are exacerbated by the nature of at-risk communities and informal settlements. These issues include the lack of formal planning and investment mechanisms, uncertain land rights, and co-location with other infrastructure such as pipelines, electricity towers, (illegal) dumpsites, and roads.

It should also be noted that there is a difference between designing outdoor spaces to accommodate multiple local needs and designing them solely for environmental benefits. Plans designed to serve multiple needs may require trade-offs between environmental,

social and economic goals. However, planning the solutions together with local actors, including the residents, is more likely to result in decisions that both support communities and are supported *by* communities over the longer term.

Conclusions

> *"As cities, communities, and organizations embrace NbS in their climate change adaptation planning, the process needs to create just and equitable outcomes instead of increasing socio-spatial inequality and intensifying vulnerability and exposure to environmental risks and hazards." (Cousins 2021, p.1)*

The meaningful integration of social equity and justice in the design, governance and implementation of NbS is a prerequisite for successful outcomes in policy and practice (Barquet et al., 2021). Proponents of NbS must account for social contexts, including gender norms, power dynamics, and the historical marginalization and discrimination of different groups. Further, geographic and cultural imbalances in NbS knowledge (i.e., a Western and Northern domination of mainstream science at the expense of long-held traditional and Indigenous knowledge) remain a barrier to just and equitable NbS.

Addressing such complex challenges requires a major shift in thinking and practical approaches to NbS. It also requires tackling broader issues, such as climate and development finance flows, uneven research capacities, and unjust political regimes that fail to protect human rights. Studies consistently point to the value of using proven approaches to enhance the prospects of integrating rights-based and socially just outcomes in environmental policies. Such approaches include broad stakeholder engagement, meaningful participation of all social groups, transparent decision-making processes, and accountability (e.g. Toxopeus et al., 2020).

There is still a paucity of information on how marginalized communities, rather than powerful actors, can benefit from NbS, both now and long into the future. Cousins (2021) asserts that an academic community addressing justice issues in NbS has not yet emerged; however, one could argue that it has surfaced in the broader contexts and framings of resilience, adaptation and disaster risk reduction (Paavola & Adger, 2006; Thomalla et al., 2018). Examples from practice and implementation of just and equitable NbS approaches are emerging (e.g., Vidal Merino et al., 2021), but important questions across NbS research, policy and practice remain largely unanswered. These include:

- What do NbS that are more just and equitable look like?
- Which communities and people need NbS most?
- What measures can be taken to ensure equitable access to NbS benefits?
- What costs or trade-offs are most commonly associated with NbS delivery?
- How can measures of socio-political transformations be brought into NbS valuations?
- What lessons can be learned from previous efforts to either protect nature or to sustainably utilize it?

Resident workshop, Kaptembwa © SEI

Policymakers and researchers should seek answers to these questions, but they need not wait to adhere to the principles put forward in this brief to make NbS more just and equitable. Key elements are making NbS design, governance and implementation inclusive and transparent; tackling marginalization, inequality and injustice; seeking to limit losses and to avoid the re-distribution of risks and negative impacts on the most at-risk people and communities; prioritizing the most at-risk places and communities; and generating ways to value and measure social and political changes. Ultimately, without just and equitable NbS, broader goals of adaptation, resilience and sustainable development risk being undermined by the unrealistic view of NbS as silver-bullet solutions.

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