

# Nature-based Solutions Policy Briefs

## Nature-based Solutions, Market Resilience, and Food Sovereignty

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*As evidenced in the UNDP LAC portfolio, NbS offer the potential to enhance the resilience of market systems while also achieving environmental goals.*

*NbS can strengthen local market system resilience to benefit the economy, vulnerable households, and the environment, and ensure that the region is better prepared for future shocks and stresses*

**The importance of market system resilience:** The Covid-19 pandemic has revealed the vulnerability of market systems throughout the world, including throughout Latin America and the Caribbean (LAC), as clearly shown by the regional economic contraction of 7% in 2020.<sup>1</sup> Economic shutdowns caused supply chain disruptions, impacting people's access to goods and services as well as the purchasing power of consumers. While the pandemic has revealed the vulnerability of market systems, climate change also threatens the resilience of market systems, particularly food systems which can be highly impacted by climate change. Climate change directly affects agricultural output through increased temperatures, drought and rainfall variability, and pests and diseases, leading to reduced yields, higher variability in production, and impacts on food quality.<sup>2</sup> Extreme events can also disrupt supply chains, as it may not be possible to get products to market. These disruptions are particularly acute for international markets and market systems that are reliant on complex supply chain dynamics, in which disruptions in one location can reverberate up and down supply chains.<sup>3</sup>

These crises have profound implications for economic growth, gender equity, and poverty reduction in the region, and demonstrate the importance of investing in the resilience of market systems. These crises leave those who are already marginalized and on the brink of poverty in an even more vulnerable position, and place increasing pressure on already stretched public resources.

As evidenced in the UNDP LAC project portfolio, Nature-based Solutions (NbS) offer the potential to enhance the resilience of market systems while also achieving environmental goals. NbS consist of activities that can be implemented for climate change adaptation and mitigation while also restoring ecosystems, conserving biodiversity, and enabling sustainable

1. IMF. 2021. World Economic Outlook: Managing Divergent Recoveries. <https://www.imf.org/en/Publications/WEO/Issues/2021/03/23/world-economic-outlook-april-2021>

2. Kuhl L. 2018. Potential contributions of market-systems development initiatives for building climate resilience. World Development, 108, 131-144. doi.org/10.1016/j.worlddev.2018.02.036

3. Dolgui A and Ivanov D. 2021. Ripple effect and supply chain disruption management: new trends and research directions. International Journal of Production Research 59(1): 102-109. doi.org/10.1080/00207543.2021.1840148





Traders sort produce for sale at regional markets

photo credit: Laura Kuhl

livelihoods.<sup>4</sup> NbS can enhance market systems by increasing agricultural productivity, connecting local producers to specialty markets for sustainably produced goods, and enhancing the resilience of the ecosystem services that markets rely on, such as water cycle regulation, local climate stabilization, and soil fertility. Resilience can be defined as “the capacity of a system to absorb disturbance and reorganize while undergoing change so as to still retain essentially the same function, structure, identity, and feedbacks.”<sup>5</sup>

A market system includes the network of buyers, sellers, and other actors involved in the commercialization and trade of a product. In addition to the participants, market systems include the regulations, policies, and interactions that allow commercialization and trade to occur.<sup>6</sup> Recognizing the importance of market systems for development, development initiatives, including those promoting biodiversity conservation and climate mitigation and adaptation, increasingly use market approaches. A market systems approach focuses on strengthening value chains and identifying market opportunities to connect the poor to markets to encourage poverty reduction and economic growth.<sup>7</sup>

While there are millions of subsistence farmers throughout the region, the vast majority of households depend on markets at least in part for their food needs.<sup>8</sup> Agricultural market systems directly impact the lives of the rural poor engaged in agricultural production, as well as urban populations dependent on agricultural production for food supply. Agriculture represents a key pathway out of poverty for millions of smallholder farmers, and growth in the agricultural sector plays a prominent role in the development agenda for many countries. At the same time, agricultural systems can be highly resource-intensive and unsustainable, in addition to being climate-sensitive. Managing the development of the agricultural system to ensure that both development and environmental objectives can be met is critical to market resilience.

The Americas are home to a quarter of the planet’s agricultural land and are the world’s largest net exporter of agricultural products.<sup>9,10</sup> Across LAC, however, food systems have vastly different needs and markets are quite diverse. Despite significant export markets, over one third of regional food retail is met by traditional markets,<sup>11</sup> demonstrating the importance of local market system resilience. Island nations face very different market conditions compared to large nations, such as difficulty with supply availability and price

4. UN Global Compact. 2021. Nature-Based Solutions to Address Climate Change. <https://www.unglobalcompact.org/take-action/events/climate-action-summit-2019/nature-based-solutions>.

5. Walker B, Holling CS, Carpenter SR, and Kinzig A. 2004. Resilience, adaptability and transformability in social-ecological systems. *Ecology and Society* 9(2): 5. <http://www.ecologyandsociety.org/vol9/iss2/art5/>

6. McConnell CR and Brue SL. 2005. *Economics: Principles, Problems, and Policies*. McGraw-Hill/Irwin. <https://books.google.com/books?id=Gz-5QCLLaEC>

7. Kuhl L. 2018. Potential contributions of market-systems development initiatives for building climate resilience. *World Development*, 108, 131-144. [doi.org/10.1016/j.worlddev.2018.02.036](https://doi.org/10.1016/j.worlddev.2018.02.036)

8. OECD and FAO. 2019. Chapter 2: Latin American Agriculture: Prospects and Challenges in OECD-FAO Agricultural Outlook 2019-2028. [http://www.fao.org/3/CA4076EN/CA4076EN\\_Chapter2\\_Latin\\_American\\_Agriculture.pdf](http://www.fao.org/3/CA4076EN/CA4076EN_Chapter2_Latin_American_Agriculture.pdf)

9. FAO. 2020. Land use in agriculture by the numbers. <http://www.fao.org/sustainability/news/detail/en/c/1274219>

10. IICA. 2021. Agriculture in the Americas will play a key role in post-pandemic global recovery due to its production potential. <https://www.iica.int/en/press/news/agriculture-americas-will-play-key-role-post-pandemic-global-recovery-due-its-production>

11. WWF. 2017. *The Global Food System: An Analysis*. <https://www.metabolic.nl/publications/global-food-system-an-analysis-pdf/>



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*Market systems also need to be sustainable and support the resilience of the environments that they rely on. NbS have the potential to contribute to strengthening the resilience of market systems in numerous ways.*

rather than stock.<sup>12</sup> Rural market systems are different from urban systems; they are more closely linked to smallholder providers, and more removed from international markets. This diversity means that building market system resilience will require a variety of context-specific strategies to meet the unique needs of different places.

**Nature-based Solutions and opportunities to build local, sustainable market system resilience:** Despite the challenges that the pandemic has created for market systems, some markets remained resilient to the impacts of economic lockdowns, and in some cases new markets have even emerged, providing essential goods and services to local communities and critical income-generating opportunities. Many of these successes have drawn on NbS because of the increased resilience that NbS provide to markets. Learning from the vulnerabilities the pandemic revealed, as well as building on models of success, will be critical to ensure that market system resilience is built in ways that are inclusive, sustainable, and meet local needs.

To be truly resilient, market systems cannot focus only on economic resilience, but also need to be sustainable and support the resilience of the environments that they rely on, especially in the face of climate change. Key principles for building system resilience, including to climate-related shocks, include: a) maintaining diversity (variation in the system) and redundancy (overlap in the system), b) managing connectivity (interactions among actors and components in the system), and c) managing slow variables and feedbacks related to climate change.<sup>13</sup> Diversity helps to spread risk, reducing the chances that the entire system will be affected by a shock or stress, while redundancy ensures that the system does not collapse if one component fails. Connectivity allows for greater sharing of resources and information across actors and components, which is critical for adaptive capacity and learning. Management of slow variables acknowledges the potential tensions between short-term profitability and long-term sustainability. As climate change increases the vulnerability of the agricultural systems that food markets and producers rely on, ensuring that market systems are resilient is increasingly important.

NbS can support market systems resilience by maintaining (or increasing) diversity and redundancy in agroecosystems, strengthening connections across actors in the market system and facilitating new connections, and incorporating climate considerations into agricultural decision-making, land management, and marketing. NbS have the potential to contribute to strengthening the resilience of market systems in numerous ways:

- 1. Increasing the productivity and diversity of the agricultural sector**
- 2. Connecting local producers to specialty markets for sustainably produced goods**
- 3. Enhancing the resilience of the ecosystem services upon which agriculture depends**

12. FAO. 2020. Food Systems and COVID-19 in Latin America and the Caribbean: A first look at impact, and country response. <http://www.fao.org/3/ca8677en/ca8677en.pdf>

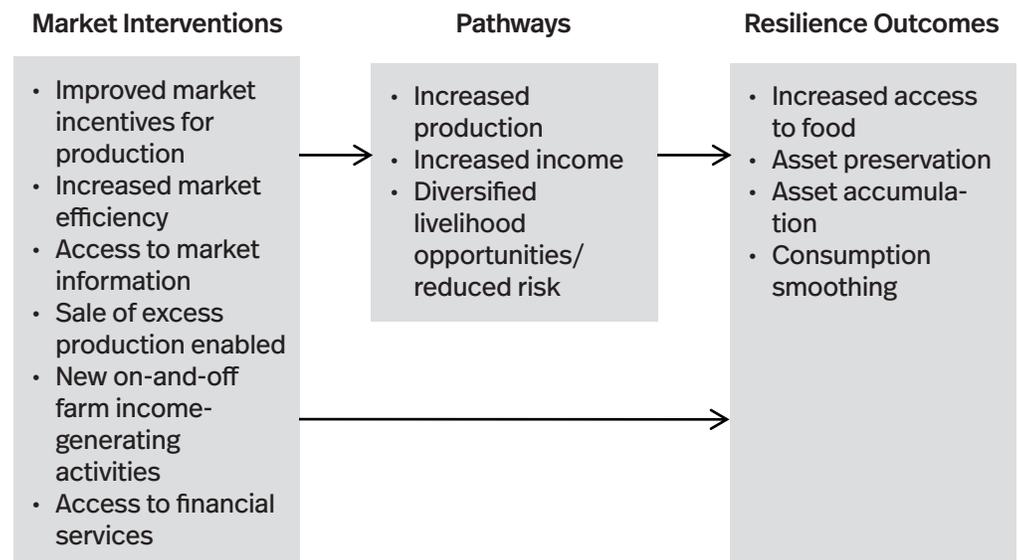
13. Biggs, R., Schlüter, M., Biggs, D., et al. 2012. Toward Principles for Enhancing the Resilience of Ecosystem Services. Annual Review of Environment and Resources, 37(1), 421-448. doi.org/10.1146/annurev-environ-051211-123836



*By using ecological and biodiversity conservation and restoration efforts as opportunities to provide producers with more reliable and diversified sources of income, NbS increase the resilience of producers. Many NbS also contribute to climate adaptation efforts, which can reduce smallholder, ecosystem, and community vulnerability to climate change on a broader scale.*

NbS can improve the resilience of the market system itself, while simultaneously improving producer resilience and the resilience of ecosystems. NbS can enhance the reliability of agricultural production and open up opportunities for new supply chains, through opportunities such as sustainable certification and productive landscape approaches. Increasing connectivity is a key principle for building resilience, and NbS that encourage sustainable production can allow vulnerable producers to enter market systems that they may previously been unable to access.

In addition to enhancing the resilience of the market systems themselves, interventions in market systems can increase the resilience of agriculture-producing households. Figure 1 illustrates potential pathways through which market systems interventions can contribute to household resilience.



**Figure 1: Pathways through which market systems interventions build resilience.** This diagram maps outcomes typically associated with market systems interventions and demonstrates pathways through which they, either directly or through the intervening variables identified, contribute to resilience outcomes for households. From Kuhl 2018.

Through interventions that strengthen the market system, particularly NbS that also strengthen ecosystems, households can increase production and incomes and diversify their livelihoods. This can increase access to food, allow households to preserve and increase assets, and smooth consumption, reducing their vulnerability to climate-related (and other) shocks and stresses. By using ecological and biodiversity conservation and restoration efforts as opportunities to provide producers with more reliable and diversified sources of income, NbS increase the resilience of producers. Many NbS also contribute to climate adaptation efforts, for example by promoting drought-resistant crops and enhancing water retention in ecosystems, which can reduce smallholder, ecosystem, and community vulnerability to climate change on a broader scale.





Coffee production in Central America  
photo credit: Laura Kuhl

**Evidence of investments in Nature-based Solutions that build market resilience:** UNDP’s portfolio of projects throughout LAC illustrates the role of NbS in building markets more resilient to climate change and economic shocks.

The *Climate Change Resilient Productive Landscapes and Socio-economic Networks Advanced in Guatemala* project (2015-2018)<sup>14</sup> established eight commercial networks for 2,491 smallholder producers of honey, cocoa, peas, and maxán leaf. As part of the project, some of the participants have certified their pea products as Good Agricultural Practices (GAP) products, which can help increase income (due to premiums for certified products) as well as access to national and international markets. For cocoa producers, the project focused on commodity production and marketing supported those looking to enter local markets. Across participating households, the project increased average annual income over 17% (\$34.05 USD) through a combination of payment for ecosystem services, increased income for more diverse and certified products, and successful marketing efforts.

Product certification increased market access for smallholders participating in Colombia’s *Payment for Ecosystem Services (PES) and Biodiversity Conservation in the Coffee Sector* project (2010-2014).<sup>15</sup> In exchange for encouraging biodiversity through more sustainable coffee cultivation, farmers were able to certify their coffee and earn additional income for premium product – up to 29% higher income, on top of additional income from PES for carbon sequestration, for an average 8% increase in annual income. The additional income from product certification and PES can help reduce smallholder vulnerability to future shocks. Additionally, improvements to environmental quality can lead to higher crop yields through increased biodiversity and pollination, reduced pollution, and restored soil, water, and forest ecosystems as illustrated in Figure 1.

Finally, the *Sustainable Development of the Ecuadorian Amazon: Integrated Management of Multiple Use Landscapes and High Values Conservation Forests* project (2017- 2022)<sup>16</sup> encourages sustainable production through access to markets and credit for participants in high conservation value landscapes. NbS project staff are working on an initiative to define and trace sustainable and deforestation-free cocoa production to help Amazonian producers enter the European cocoa market, with similar initiatives for livestock and coffee. Evaluators found that sustainable certification increased the volume of products sold three-fold on foreign markets. These connections have been especially important during the Covid-19 crisis, as staff worked to develop strategic alliances with private companies to set fair prices for products that would help producers continue to earn their livelihoods. The project is further working to build a more resilient supply chain by developing an online marketplace to connect local producers directly with buyers and sellers, to maintain commercial relationships for participants.

14. Funded by Kyoto Adaptation Fund (KAF)

15. Funded by the Global Environment Facility (GEF)

16. Funded by the GEF



*UNDP project experience demonstrates that NbS can support food sovereignty goals through measures to strengthen local market systems in addition to measures that explicitly focus on food sovereignty. Sources of local food sovereignty such as family and community gardens provide access to sustenance through external shortages or periods of low income due to low yields of crops produced for market.*

**Policy Recommendations:** Strengthening market systems should be a core goal of pandemic recovery, as these investments have the potential to support people in both urban and rural areas, especially women, and to contribute to multiple economic and environmental goals at the same time. NbS are an effective approach to strengthening market systems that benefits smallholder producers, ecosystems, and communities. Investments in NbS that strengthen market systems help achieve national and international economic and environmental goals while building resilience.

*The importance of local market systems and food sovereignty for market system resilience:* One lesson that emerged from the pandemic is the importance of strengthening not just market systems overall, but local market systems in particular. The shorter supply chains in local markets can be less vulnerable, particularly to global shocks. Too often, market systems initiatives have targeted production for international markets without sufficient attention to the opportunities to strengthen local markets in ways that sustainably meet the needs of local communities. During moments of disruption, local markets provide a key lifeline for communities by connecting producers and consumers with essential goods and services. Local markets are especially important for the most vulnerable who are less likely to be connected to national or international markets. Local markets ensure that economic benefits accrue directly to those in the community and have been widely shown to be critical to ensuring inclusive growth and reducing inequality. When local markets are strengthened, resources recirculate through the economy, creating positive feedbacks.

Nature-based strategies to strengthen local markets include promotion of farmers markets, seed exchanges, and production of locally-appropriate food. Mechanisms to strengthen local food distribution systems, including credit and marketing support, are also needed. Additionally, it is important to ensure that policies promoting market systems do not inadvertently undermine local market resilience. For example, assessments of whether new market opportunities will incentivize producers to shift production from food for local consumption to either export production or out of food production entirely should be undertaken in advance of promotion of new market initiatives.

Food sovereignty has risen in prominence, particularly in Latin America, as an approach that prioritizes local food systems in contrast to internationally-focused production systems. Food sovereignty is the idea that local people have the right to healthy and culturally appropriate food produced through ecologically sound and sustainable methods, and to define their own food and agriculture systems.<sup>17</sup> Focusing on food sovereignty provides an alternative approach to thinking about market system resilience that emphasizes the values and priorities of local communities. This approach can still include international trade and markets, with production of multiple food sources creating redundancy in the system— one of the key principles

17. La Via Campesina. 2007. Declaration of Nyéléni. <https://viacampesina.org/en/declaration-of-nyeli/>



*A focus on local market resilience can most closely align priorities of market system resilience, household resilience, and food sovereignty. Strengthening local market system resilience through NbS that target small producers will benefit the economy, vulnerable households, and the environment, and ensure that the region is better prepared for future shocks and stresses.*

*Acknowledgements: The authors gratefully acknowledge that this publication was funded by UNDP.*

**FOR CITATION:** Kuhl L. and Boyle A. “Nature-based Solutions, Market Systems Resilience, and Food Sovereignty” Policy Brief. School of Public Policy and Urban Affairs, Northeastern University and United Nations Development Programme, April 2021

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for resilience discussed above – but the emphasis of food sovereignty is on the benefits for local communities. This focus on local food production is also likely to increase diversity in the food system, further strengthening local food system resilience.

UNDP project experience demonstrates that NbS can support food sovereignty goals through measures to strengthen local market systems in addition to measures that explicitly focus on food sovereignty. Sources of local food sovereignty such as family and community gardens or diversified crop production provide access to sustenance when there are external shortages or periods of low income due to low yields of crops produced for market. For example, the Guatemala project helped 328 households establish women-managed family gardens growing vegetables, animal feed, and medicinal plants to provide consistent access to nutritious food and improve household food security in the face of external shocks such as climate change, simultaneously reducing the impacts of climate change and strengthening resilience.

*Acknowledging tensions between market systems and local climate resilience:* While investments in NbS to enhance market system resilience should be prioritized in Covid-19 recovery planning, it is important to acknowledge that there are inherent tensions between interventions to strengthen large-scale market systems and build climate resilience at the household level. For the market system, achieving economies of scale is essential, so increasing production that enters the market is a priority. This is particularly important for international markets that require consistent supply of that meets specific quality standards. However, efforts to increase production may conflict with strategies to support smallholder livelihoods, which may focus instead on decentralized production, food sovereignty, and diversity to reduce risks.

While market systems can support smallholder producers, extra support is needed to ensure that the most vulnerable households can participate in markets.<sup>18</sup> Participation in markets is inherently risky, and the risk tolerance of the most vulnerable households is particularly low. The UNDP projects demonstrate the high levels of support that are required to engage vulnerable populations in market production, but the high rewards in terms of poverty reduction and sustainable development when these investments are made.

These potential tensions are most easily resolved by focusing on climate-resilient local markets, where the priorities of market system resilience, household resilience, and food sovereignty align most closely. Strengthening local market system resilience through NbS that target small producers will benefit the economy, vulnerable households, and the environment, and ensure that the region is better prepared for future shocks and stresses.

18. Kuhl L. 2020. Technology transfer and adoption for smallholder climate change adaptation: opportunities and challenges. *Climate and Development*, 12(4), 353-368. doi.org/10.1080/17565529.2019.1630349

