

# **Towards Equity in Land Protection**

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## **Abstract**

Land protection supports vital ecosystem services but also poses important challenges for social equity. Three key concerns emerge from economic frameworks about land protection policies: potential lost local economic development, reinforcement of existing structural inequalities, and disparities in access to the benefits of protected land. This article reviews evidence for each concern and identifies research needs as well as potential improvements in policy that could better support equity goals. Pathways forward towards greater equity include specific mechanisms that can ensure local communities benefit from land protection, attention to issues of spatial impacts and timing, explicit prioritization of equity in land protection initiatives, and community-centered processes. Economists have and can continue to play a role in strengthening these dimensions of land protection policies.

## **Keywords**

Land protection, Land conservation, Equity, Inequality, Environmental justice, Environment and development, Land use, Land management

## **JEL codes**

Q01, Q15, Q23, Q24, Q26, Q28, **Q56, Q57**, R1, R52

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## **Introduction**

Land protection initiatives are a crucial component of global goals to maintain functioning ecosystem services as a foundation for resilient communities (UN General Assembly 2015). Valuable ecosystem services provided by open space lands include watershed protection, flood control, prevention of soil erosion, cooling, carbon sequestration, cultural heritage, pollination, recreation, and the opportunity to access or experience nature (Reid et al. 2005, Daily and Matson 2008, de Groot et al. 2010, Guerry et al. 2015, Costanza et al. 2017, Bratman et al. 2019). Governments and conservationists are seeking permanent protection for up to 30 percent of terrestrial and marine areas by 2030 and 50 percent in the long term (e.g. Dinerstein et al. 2019, Díaz et al. 2020). These efforts are backed by substantial funding opportunities. Finance for support of global biodiversity was recently estimated at \$78-91 billion per year (OECD 2020). In the U.S., the Great American Outdoors Act is supporting up to \$900 million annually for investments in land and water conservation (National Park Service 2020, Walls 2020) and the Department of Agriculture is spending more than \$6 billion per year through the current farm bill on programs including incentives to restore natural land cover and easements to preserve land from development (Economic Research Service 2019).

Economists have played a key role in establishing the values of ecosystem services and articulating why land protection policies are needed to support their provision (e.g. Salzman et al. 2001, Barbier et al. 2009, Polasky et al. 2015, Boyd et al. 2015, Costanza et al. 2017). Economists have also contributed to assessments of the efficacy of land protection policies and recommendations to improve policy design or targeting (e.g. Albers and Robinson 2007, Somanathan et al. 2009, Ferraro et al. 2011, Pfaff and Robalino 2012, Alix-Garcia et al. 2015, Hellerstein et al. 2017, Walls and Kuwayama 2019). As land protection policies continue to grow in budget and scope, economists also have an important opportunity and responsibility to analyze how they matter for social equity.

This article reviews three key concerns about how land protection policies may impact equity and assesses evidence for each, drawing on global literature as well as examples from the U.S. I propose areas for future research and pathways forward to potentially improve the equity of land protection policies. Opportunities to move towards greater equity include specific links between land protection and local community benefits, careful zoning and timing, prioritization of equity in policy initiatives, and processes that center community views and needs. These suggestions focus on specific changes to policy mechanisms or processes that could bring immediate gains. Clearly, broader societal transformations to reduce underlying disparities of

income, wealth, or social privilege are also needed to ensure more fundamental and lasting equity in land protection.

**1. Land protection and ecosystem services**

Land protection encompasses a broad set of policy initiatives, differing in the degree, goals, and scope of protection across a range of global settings. Figure 1 groups selected policies by the mechanisms that they use to influence landholder choices, as these may play a central role in the equity of each policy. Mechanisms for direct regulation include area-based conservation through parks and sanctuaries (e.g. Maxwell et al. 2020) and rules-based mechanisms, such as wetlands protection laws (e.g. Sims and Schuetz 2008) or forest codes (e.g. Assunção et al. 2017). Area-based conservation can be highly heterogenous in size and scope, ranging from landscape-scale initiatives with an array of strict protection and mixed-use (e.g. Blackman 2015)—to the protection of narrow strips of land for urban greenways along rivers or roads (e.g. Lindsey et al. 2004). In May of 2022, the World Database on Protected Areas reported more than 270,000 protected areas across 245 countries and territories with approximately 15 percent of global land area protected (UNEP-WCMC 2022).

**Figure 1. Mechanisms for land protection and examples**

<b><u>Direct regulation</u></b>	<b><u>Incentive-based</u></b>	<b><u>Community collective action</u></b>
Protected areas	Payments for eco services	
Forestry laws	Conservation easements	Community forests
Wetlands protection	Tradeable rights	Indigenous
Cultural heritage sites	Current use tax reductions	conservation areas

While direct regulation has been a dominant form of land protection, it has also been controversial because it is based on restrictions or prohibitions on use (e.g. Adams et al. 2004, Ferraro and Pressey 2015, Oldekop et al. 2016). In part due to this pushback, land protection initiatives have also emerged that induce greater voluntary provision of ecosystem services by changing the incentives of landholders. For example, payments for ecosystem services programs (“PES”) seek to compensate landowners with financial or in-kind contributions for avoiding the loss of natural land cover or restoring land uses and habitat that enhance service provision (e.g. Pattanayak et al. 2010, Alix-Garcia and Wolff 2014, Salzman et al. 2018,). Payments for ecosystem services have grown in popularity, with large national programs in place for at least five to ten years in Mexico, Costa Rica, China, Ecuador, Peru, Brazil, Vietnam and the U.S.

(Alix-Garcia et al. 2018). Conservation easements, which place long-term legal restrictions on the use of land, have also increased dramatically as a form of private protection, particularly in the U.S. (Parker and Thurman 2019).

Land may also be protected by changing the locus of decision-making to support collective action, usually by giving more control to local communities over resource rules and use (e.g. Andersson and Ostrom 2008). These community-based or joint forest management policies are important initiatives, as local communities have legal rights to more than 15% of the world's forests (Rights and Resources Initiative 2017). Decentralized decision-making rests on the idea that communities can use place-specific knowledge to make and implement more sustainable and effective management of local resources than would be imposed by central regulations (e.g. Somanathan et al. 2009, Chhatre and Agrawal 2009, Baland et al. 2010, Khanal 2013).

Although affecting choices through different mechanisms and in an array of very different institutional settings, land protection policies share a common goal: to shift land-use or land-cover patterns towards those that are socially valuable, but tend to be underprovided by dominant market structures. Left to themselves, land markets operating with few restrictions will tend to result in the allocation of land to the most profitable private uses, rather than the most beneficial social ones. This is the result of individual choices by landowners who compare the potential returns or “rents” to uses on each parcel, such as agriculture, pasture, forestry, natural land covers, or development to residential, commercial, or industrial uses (e.g. Chomitz and Gray 1996, Irwin and Geoghegan 2001, Irwin et al. 2009, Barbier et al. 2010, Alix-Garcia et al. 2015). These choices to allocate land to the highest-rent land use lead to familiar patterns, such as the concentric circles of land-use types around cities described by Von Thünen (e.g. Walker 2021), and familiar pressures, such as the rapid conversion of ecologically rich forests or sustainable agricultural systems to industrial agriculture or suburban and urban development (Barbier and Burgess 2001, Irwin and Bockstael 2004).

Crucially, market-driven private choices do not tend to result in patterns of land use that are socially best, particularly from an ecosystem services perspective. Land in natural wetlands, in forests, in meadows and prairies, and even in small strips or parcels of buffer vegetation, hedgerows, or urban gardens, provide tremendously valuable, life-sustaining ecosystem services (Reid et al. 2005, de Groot et al. 2010, Daily and Matson 2008, Guerry et al. 2015, Costanza et al. 2017, Bratman et al. 2019). Yet since most ecosystem service values accrue to other people beyond the individual landholder, they are not easily factored in to the individual choices that determine land use. Indeed, these positive externalities lead to a core market failure: private

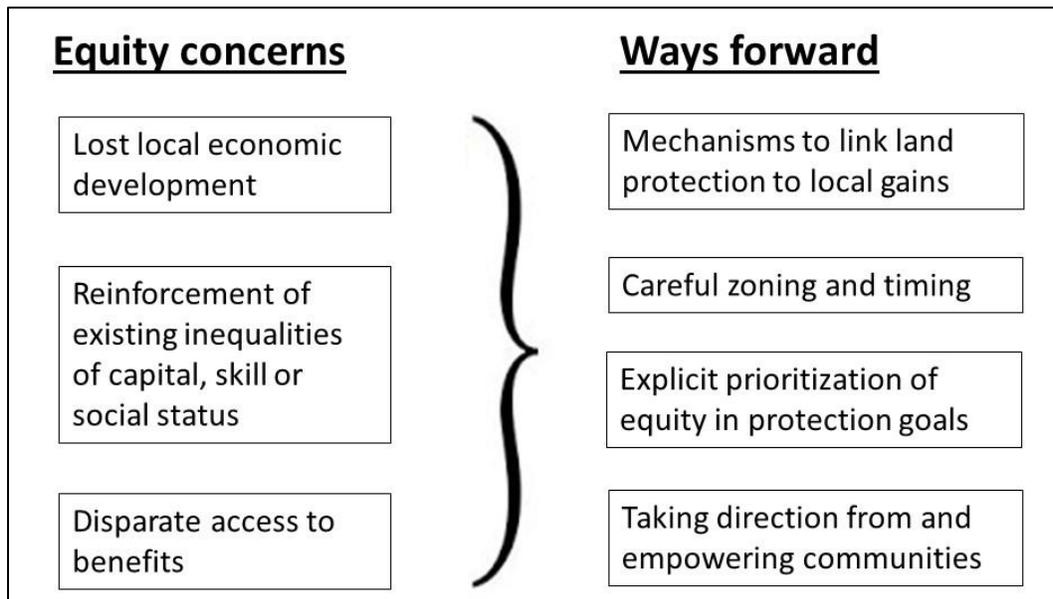
markets will tend to underprovide land-use types with crucial ecosystem service benefits. Despite their high social value, lands with important ecosystem service value will always be in short supply unless communities and policymakers engage intentionally in collective action, voluntary private provision, or effective public efforts.

## **2. Key equity concerns of land protection**

Although land protection policies are clearly needed to sustain functioning ecosystems, they have complex interactions with distribution and social equity. In general, land protection policies change the structure of private rents and social values, creating new winners and losers. From an equity perspective, this raises substantial concerns, particularly where land protection deepens existing disparities or further privileges the already privileged.

In particular, three major equity concerns emerge from economic frameworks. Land protection may result in: 1) lost local economic development or increased local poverty due to the costs of land protection; 2) economic development opportunities that differentially reinforce existing inequalities of capital, skill, or social hierarchies; and 3) patterns of access to the benefits of protected land that reflect and reinforce broader social disparities. As described below, there is substantial evidence from existing literature that each of these is a real concern, both domestically and globally. Additional research by economists could play an important role in understanding these dimensions, highlighting the conditions under which equity concerns are most likely, and recommending or testing changes in policy or process that may reduce disparities. Figure 2 previews the key concerns and pathways forward that are developed in the rest of this article.

**Figure 2. Equity concerns of land protection and potential avenues for improvement**



### **2.1 Lost local economic development or increased local poverty due to land protection**

The concern that land protection may harm local economic development and exacerbate local poverty stems from the inherently inequitable spatial distribution of benefits and costs of many land protection policies (Dixon and Pagiola 2001). The majority of the benefits of land protection are often regional or global. For example, payments for biodiversity conservation and biosphere reserves in Mexico support species that are nationally and internationally important (Koleff et al. 2018). Nepal’s community forests provide carbon sequestration that contributes to global climate goals (Chhatre and Agrawal 2009). In Thailand, forested areas in the north of the country protect watersheds that support the agricultural and urban areas of the central plains (Emphandhu and Chettamart 2003). Yet the costs of land protection—including in the cases above—are mainly local.

The most extreme potential local costs anywhere in the world are from direct displacement through forced resettlement: the livelihoods and social capital lost if communities are removed from protected areas or forced out by environmental regulations (e.g. Dowie 2005, Brockington and Igoe 2006, Curran et al. 2009, Krakoff 2018). However, even without direct displacement, land protection policies usually restrict local options for livelihoods or development by prohibiting or restricting certain uses or extractive activities. Land protection may potentially mean reduced subsistence agriculture, lost rents from higher profit land uses, lost rights to grazing, hunting and fishing, reductions in the collection of timber or non-timber forest

products, or slower growth of regional economies (e.g. Dixon and Sherman 1990, Lewis, Hunt and Plantinga 2002, 2003, Robalino et al. 2007, Robinson et al. 2008, Sims 2010). Depending on governance structures, land protection may also lead to losses of potential tax revenue for local communities due to less commercial or residential development (e.g. King and Anderson 2004, Vandergrift and Lahr 2011, Kalinin et al. forthcoming).

Although these concerns about high local costs are very real, land protection may instead help to encourage local growth or alleviate poverty by solving collective action problems or creating new economic opportunities. Benefits may include improved infrastructure such as road networks, increased ecosystem services such as water provision or timber and non-timber forest products, recreation-based employment opportunities, and amenity-driven growth (e.g. Dixon and Sherman 1990, Sims 2010, Ferraro and Hanauer 2014, Rasker et al. 2013).

A key empirical challenge in this literature is that land protection initiatives are often targeted to areas that are poorer and more isolated at baseline—for reasons of political economy or cost (e.g. Joppa and Pfaff 2009). Therefore, simple comparisons of poverty rates between areas with and without land protection are often confounded by these underlying differences (Andam et al. 2010, Ferraro et al. 2011). An increasing body of evidence, with substantial contributions from agricultural and resource economists, uses quasi-experimental methods (and occasionally true randomized controlled trials) to account for selection bias and seek to estimate impacts relative to the development trajectories likely to have occurred in the absence of land protection policies.

With respect to protected areas, this literature indicates mixed results, with evidence for both net local economic losses and gains, depending on the context (Table 1). Several studies from a variety of global settings have found that protected areas contributed positively in net to poverty alleviation or local growth. In Thailand and Costa Rica for example, Andam et al. (2010) found that protected areas reduced poverty headcounts for sub-districts or census tracts near parks. Protected areas in Nepal (Yergeau et al. 2017, den Braber et al. 2018), Bolivia (Canavire-Bacarreza and Hanauer 2013), and Cambodia (Clements et al. 2014, 2020) also reduced poverty rates or improved local incomes for nearby households. Research on protected federal lands in the rural U.S. West (Rasker et al. 2013, Walls et al. 2020) found that these lands led to increased local per capita income or growth of employment opportunities while Sims et al. (2019) found that employment rates in New England towns and cities were boosted by new land protection. Using data from 34 developing countries, Naidoo et al. (2019) found that children living near protected areas with tourism were better off than comparable children far away from these areas,

and Kandel et al. (2022) finds overall positive impacts in a globally-focused meta-analysis of protected area impacts.

**Table 1: Protected area impacts on local communities– quasi-experimental evidence**

<b>Location of protected areas</b>	<b>Poverty alleviation or local economic development</b>	<b>Citation</b>
Costa Rica	+	Andam et al. 2010, Ferraro and Hanauer 2014, Robalino and Villalobos 2015
Thailand	+	Sims 2010, Andam et al. 2010
Zambia	+ / -	Richardson et al. 2012, Bandyopadhyay and Tembo 2010
Tanzania	+ / -	Baird and Leslie 2013
Bolivia	+	Canavire-Bacarreza and Hanauer 2013
U.S.	short run: - long run: + / neutral	Lewis et al. 2002, 2003, Rasker et al. 2013, Chen et al. 2016, Jakus and Akhundjanov 2018, Sims et al. 2019, Walls et al. 2020, Ferris and Frank 2021
Peru	+ / -	Miranda et al. 2016
Cambodia	+	Clements et al. 2014, 2016
Nepal	+ / -	den Braber et al. 2018, Yergeau, et al. 2017, Howlader and Ando 2020
Mexico	+ / -	Sims and Alix-Garcia 2017
Uganda	+ / -	Naughton-Treves et al. 2011, Tumusiime and Sjaastad 2014, Jagger et al. 2018
China	+ / -	Mullan et al. 2009, Duan and Wen 2017, Ma et al. 2019, Cheng, Sims and Yi 2022
Ethiopia	+	Estifanos et al. 2020
34 countries	+ / neutral	Naidoo et al. 2019
Meta analysis	+	Kandel et al. 2022

At the same time, multiple rigorous studies in this literature have found evidence for negative impacts or for a lack of positive local impacts from protected areas, particularly in the short run. For example, Ferris and Frank (2021) found short-term job losses in the timber industry due to the U.S. Northwest Forest Plan, which restricted logging in large areas previously open for public concessions, while Lewis, Hunt and Plantinga (2002) found no impacts of the plan on county level growth in the medium-term. Howlader and Ando (2020) find that protected areas in Nepal reduced household access to firewood, while Miranda et al. (2016) find no robust gains for poverty alleviation due to parks in the Peruvian Amazon. Sims and Alix-Garcia (2017) find that strictly protected areas in Mexico led to less poverty alleviation than in similar

comparison localities. Cheng, Sims and Yi (2022) found mixed results of China's protected areas, with positive effects on local poverty alleviation but possible negative impacts on employment. This is consistent with previous mixed results from studies of selected giant panda reserves (Duan and Wen 2017, Ma et al. 2019) and China's National Forest Protection Program (Mullan et al. 2009). In addition, the meta-analysis by Kandel et al. (2022) found that studies from African countries were less likely to show positive welfare impacts than those from Asia or South America.

This record of mixed evidence regarding the impacts of protected areas is perhaps not surprising, given that protected areas present both restrictions and opportunities. Payments for ecosystem services programs, on the other hand, have often been expected to contribute more positively to local economic development because they are voluntary and provide direct compensation for environmental stewardship (Pagiola et al. 2005, Engel et al. 2008, Jack et al. 2008, Alix-Garcia et al. 2015). PES should theoretically only induce households or communities to enroll if the expected benefits are higher than the costs of participating.

However, in reality, gains for local communities from PES are not guaranteed and may not be universal. Recipients may not understand the tradeoffs involved, the programs may not be fully voluntary, the payments may just cover participation costs, or PES may be beneficial for a community as a whole but have negative impacts on some members or on the social fabric of a community. There is less existing research about the socioeconomic impacts of payments for ecosystem services than for protected areas, but studies from a variety of locations generally support the idea that PES in practice has had small positive or neutral impacts for local communities (Table 2). Evidence for large positive gains, however, has been elusive, and some concerns have emerged.

A small number of studies on PES find statistically significant evidence for positive household impacts. For example, Alix-Garcia et al. (2015) found that in Mexico, early cohorts of the federal payments for hydrological services program resulted in reductions in locality poverty and gains in household wealth for poor households, as measured by ownership of durable goods and quality of home structures. Liu and Lan (2015, 2018) found positive impacts of China's Sloping Land Conversion program on household diversification of livelihoods as well as productivity. Adjogonon et al. (2021) found that a PES program in Burkina Faso that compensated households for maintenance of newly planted trees clearly improved food security; Clements et al. (2020) also found that some types of PES in Cambodia likely improved food security.

At the same time, the hope that PES would lead to very strong gains for local livelihoods often has not materialized. Several studies, including from later PES cohorts in Mexico, Costa Rica, Brazil, and the U.S. Conservation Reserve program, find no substantial effects on livelihoods, food security, or local growth (Table 2). A possible key reason for this is that in addition to the opportunity costs of PES, the participation and transaction costs of many programs have been higher than anticipated. Participation costs in PES include the time and vehicle costs of monitoring, as well as labor-intensive management practices such as building fire breaks, undertaking pest control, or installing and maintaining fencing. For example, in the case of Mexico’s PES, Alix-Garcia et al. (2015) estimated that the value of additional labor devoted to forest management activities was equivalent to 84% of the average payments for communal properties.

**Table 2: Payments for ecosystem services, community-based forestry impacts on local communities– quasi-experimental evidence**

<b>Location of policy</b>	<b>Poverty alleviation or local economic development</b>	<b>Citation</b>
<u>Payments for ecosystem services</u>		
U.S.	neutral	Sullivan et al. 2004
China	+ / neutral	Liu and Lan 2018, 2015, Uchida et al. 2009, 2007
Costa Rica	neutral / -	Arriagada et al. 2015, Villalobos et al. 2022
Mexico	+ / neutral	Alix-Garcia et al. 2015, 2018, 2019, Jones et al. 2018
Vietnam	+ / neutral	Phan et al. 2018
Uganda	neutral	Jayachandran et al. 2017
Burkina Faso	+	Adjognon et al. 2019
Cambodia	+	Clements et al. 2020
Brazil	neutral	Alves-Pinto et al. 2018
Malawi	+ / -	Jack and Cardona-Santos 2017
Meta-analysis	small +	Liu and Kontoleon 2018
<u>Community-based forestry management</u>		
Nepal	+	Oldekop et al. 2019, Paudel 2018
Indonesia	+	Santika et al. 2019
Madagascar	+	Rasolofoson et al. 2017
Guatemala	+	Bocci et al. 2018
Namibia	+ / -	Meyer and Börner 2022
Multiple countries	+	Hajjar et al. 2021

The distributional impacts of PES may also depend strongly on local land ownership patterns. For example, PES programs may result in shifting labor allocation within households (e.g. Jack and Cardona-Santos 2017) or may lower the demand for agricultural labor, reducing incomes of non-landholding households. Villalobos et al. (2022) found that Costa Rica's PES may have increased poverty in places where land is owned mainly by wealthier households, consistent with a situation where landholding households benefitted from the program payments but landless laborers lost agricultural job opportunities.

An additional reason why the socioeconomic gains due to PES may be small is due to the inherent tension between program goals of increasing the land area enrolled versus supporting meaningful gains for those participants who are enrolled (e.g. Pagiola et al. 2005, Kirwan et al. 2005, Zilberman et al. 2008, Alix-Garcia et al. 2015, 2019). Policymakers seeking to protect as much land as possible on a limited budget should set PES payments just high enough to induce participation (e.g. Alix-Garcia, Sims and Phaneuf 2019). However, lower payments mean less surplus for landowners and thus less potential for PES to substantially reduce poverty or improve local economic development (e.g. Zilberman et al. 2008, Alix-Garcia et al. 2015). Greater budgets and higher payments will likely be necessary to truly improve local livelihoods. However, this recommendation raises broader questions about whether other social programs would be more effective or efficient in combatting poverty directly than PES. Little research to date has been able to explore the long-term social impacts of PES versus other social support programs in order to inform this debate.

Concerns have also been raised that the introduction of additional external funds to communities through PES programs may be disruptive to local norms or traditions of voluntary contributions (e.g. Bowles 2008, Muradian 2013, Pascual et al. 2014). For example, Ravikumar et al. (2023) finds that Peru's PES funding structure—which required program recipients to establish new local business structures—did not promote opportunities that were well-matched with local skills and may have undermined traditions of shared labor. In contrast, researchers in Mexico found that PES did not decrease contributions of labor to shared community activities and increased social capital (Alix-Garcia et al. 2018). Vorlaufer et al. (forthcoming) also found that in Uganda, PES did not lead to lasting shifts in resource sharing practices, and may have induced stronger long-term norms for resource sharing. Given the importance of understanding the deeper social impacts of PES, there is considerable scope for future collaboration between researchers using both qualitative and quantitative methods to further investigate potential context-specific channels of social change driven by land protection initiatives.

In addition to the impacts of protected areas and PES, a growing body of research also explores the local economic impacts of other land protection initiatives. Several studies have shown that community-based forest management interventions can result in positive gains for local livelihoods or for economic development. In Nepal, Paudel et al. (2018) found that households with access to community forests had greater food consumption, while Oldekop et al. (2019) found greater reductions in poverty for localities with more land devolved to community forests, compared to matched control areas. Santika et al. (2019) found livelihood gains from community forestry initiatives in Indonesia compared to matched controls, but substantial heterogeneity across interacting conservation zone types. Bocci et al. (2018) found that community-managed forest concessions in Guatemala were generally positive for rural livelihoods, and Rasolofson et al. (2017) found small positive impacts of community forests on household consumption expenditures in Madagascar. Community-based conservation in Namibia supported increased livelihoods but also increased human-wildlife conflicts and may have reduced food security (Meyer and Börner 2022).

Evidence on other land protection policies such as certification and land tenure initiatives is also emerging. Miteva et al. (2015) found that forest certification in Indonesia reduced firewood dependence and improved health outcomes. A review of forest-focused sustainable supply chain initiatives in Brazil finds that they have increased farm incomes (Garrett et al. 2021). Recent work also indicates that land tenure interventions may improve human well-being outcomes in some cases (Tseng et al. 2021), although they may not necessarily have positive impacts for ecosystem services unless coordinated with other protection efforts (e.g. Probst et al. 2020).

Despite substantial progress in understanding the livelihood impacts of land protection across multiple mechanisms, there is considerable room for additional research. In particular, there are only a small number of rigorous, quasi-experimental evaluations of the socioeconomic impacts of initiatives such as indigenous protected areas (e.g. BenYishay et al. 2017), regulatory requirements such as Brazil's forest code (e.g. Assunção and Rocha 2019), efforts to link credit provision to compliance (e.g. Assunção et al. 2019), or global restoration initiatives (Strassburg et al. 2020). In particular, if past efforts are a guide, current massive efforts to restore forests and biodiversity may require labor and land resources that impose substantial burdens on the global poor unless compensation mechanisms are dramatically increased (Brancalion et al. 2019, Erbaugh et al. 2020). There is also substantial room for new synthesis work that compares the findings from multiple studies using meta-analysis or theory-driven comparisons based on compilations of literature (e.g. Ferraro et al. 2011, Pfaff and Robalino 2012, Hajjar et al. 2021). To inform equity dimensions, this work can continue to investigate systematic predictors of local

costs or benefits for all types of land protection as well as the dimensions of tradeoffs between greater ecosystem services and gains for local livelihoods that have been found in specific studies (e.g. Alix-Garcia et al. 2015, Pfaff et al. 2015).

## **2.2 Reinforcement of existing inequalities of capital, skill or social status**

A second key equity concern is driven by the types of opportunities for new development that land protection provides. As described above, there are many documented cases in which land protection has helped to sustain or increase local economic activities. These tend to be activities that required collective action, and therefore benefit from government intervention, support of community governance, or legal easements that facilitate access to lands. In particular, land protection frequently supports new economic activity based on recreation or tourism (Dixon and Sherman 1990, Wu and Plantinga 2003, Rasker et al. 2013, Koontz et al. 2017). Land protection may also help to maintain businesses that rely on the sustainable harvest of natural products including timber and non-timber forest products, or may provide access to these resources in times of economic distress (Vasquez and Sunderland 2020, Ferraro and Simorangkir 2020, Murray et al. 2021). However, these possibilities also raise concerns that the type of development opportunities created by land protection may especially reinforce existing inequalities of capital or skill. Many of the types of economic activity that are compatible with land protection require substantial start-up costs or prior knowledge: e.g. capital for lodging, restaurants, or guide services; language, marketing and accounting skills to effectively compete in and benefit from recreation economies or eco-tourism. Literature on the political economy of environmental regulation generally supports the notion that regulations tend to create high fixed costs of compliance, which may favor larger scale, well-capitalized business operations (Heyes 2009).

The literature that explores how land protection in particular has affected inequality, capitalization, or the scale of businesses is limited, but there are enough examples of supporting evidence to indicate this is an area of concern. For example, Sims (2010) finds that protected areas in Thailand increased local level inequality even though they reduced poverty overall. This is consistent with a situation where more of the gains from tourism went to households that were already better off. In Costa Rica, Robalino and Villalobos (2015) found that wages increased for workers who found park-related employment, and particularly in locations close to park entrances. However, they did not find gains for agricultural wages in the area, suggesting that protection-based economies did not lead to broader gains for workers overall. Considering the case of federal protection in the U.S. West, Rasker et al. (2013) found that economic gains were driven primarily by an increase in non-labor income in the affected counties. This is suggestive

of amenity-driven growth fueled by relocating retirees with money to spend; again, a trend that may increase local inequality. Walls et al. (2020) found that new National Monuments in the West drove job gains due to growth in hotels and lodging services, business services, and finance, investment and real estate services, all sectors that are likely to be capital and skills intensive.

An additional concern is that while the initial gains from tourism created by land protection may be broad, competition over time may substantially dissipate those gains or lead to consolidation that favors a few well-resourced businesses. For example, Quadri-Barba et al. (2020) found that cultural heritage sites in Mexico may have decreased local poverty initially but not in the longer term. Khanal (2011) found that inequality across income groups increased among forest users after community forestry was implemented in 30 community forests in Nepal. Tumusiime and Sjaastad (2014) found that in Uganda, overall benefits from a national park were positive, but also increased local economic inequality because the main economic gains were not widely distributed. Although there are substantial concerns that land protection may reinforce existing inequalities of capital or skill, this does not necessarily have to be the case, and indeed, some research also suggests that land protection has the potential to reduce existing inequalities. In Nepal, den Braber et al. (2018) found that compared to similar matched locations, conservation areas established earlier in time may have reduced inequality (although later ones did not). Phan et al. (2018) found significant reductions in income inequality due to PES for forests in Vietnam. Additional future work is needed in this area, particularly to understand the conditions under which economic opportunities created by land protection can support equitable distribution of the gains.

In addition to privileging development that requires access to capital or skills, land protection may amplify existing inequalities driven by social hierarchies, particularly by reinforcing patterns of spatial sorting and economic segregation driven by property wealth or historically discriminatory processes. Substantial literature from the U.S. establishes that land protection policies change the values of nearby land, both by creating supply constraints and by boosting amenity values (Wu and Plantinga 2003, McConnell and Walls 2005, Wu and Cho 2007, Anderson and West 2006, Irwin et al. 2014, Zipp et al. 2017). For example, Heintzelman (2010) and Lang (2018) both showed that the approval of dedicated open space funding by local voters substantially raised property values in subsequent years. The potential distributional impacts of such property value gains depend on existing patterns of ownership as well as how property tax burdens or land acquisition patterns change in response to higher values. Higher values created by land protection are likely to reinforce the wealth of those who already own property, while potentially displacing renters or lower income households who cannot afford to

pay increased annual tax bills or who fall into debt and need to sell their land. Kalinin et al. (forthcoming) finds that changes in land protection across the New England region do not have substantial impacts on municipal level tax rates overall, but may have raised taxes in lower-income municipalities, highlighting the potential for unequal impacts on local tax burdens. Lang et al. (2022) analyzed the distribution of capitalized benefits in home values from land protection in Massachusetts and found disproportionate benefits for wealthier and white households, again consistent with problematic reinforcement of existing inequalities.

Changes in land values due to policy changes are also likely to lead to sorting patterns that may reinforce inequality and social segregation. Researchers have previously documented substantial sorting patterns based on proximity to environmental harms as one of the crucial mechanisms underpinning environmental injustices (e.g. Pastor et al. 2001, Banzhaf, Ma and Timmins 2019, Melstrom and Mohammadi 2022). Globally, payments for ecosystem services programs or restoration initiatives may also raise the value of eligible lands, creating new incentives to acquire those lands (McAfee 2012), while protected areas may raise the value of nearby lands for eco-tourism businesses (Green and Adams 2015). These situations may similarly result in displacement of long-standing community members. Concerns about displacement due to land protection, particularly of lower-income households, renters, or the landless poor, have been raised in literatures on “green gentrification” (e.g. Anguelovski et al. 2019, Rigolon and Nemeth 2020, Black and Richards 2020), and “land grabbing” (e.g. Fairhead et al. 2012, Holmes 2014).

However, only a limited number of economic studies have examined whether land protection policies specifically have resulted in spatial sorting. A study by Chen et al. (2016) found that the U.S. Northwest Forest plan led to positive long-term growth in median incomes for small communities due to the positive amenity effects of the protection. Subsequently though, Chen et al. (2021) showed that these recreation-based amenities created spatial inequality by differentially attracting higher skilled workers to the amenity-rich localities. There is clearly scope for additional empirical economics research to help further understand the magnitudes and dimensions of equity concerns related to capitalization and sorting, both in urban and rural contexts.

### **2.3 Patterns of access to benefits that reflect and reinforce social disparities**

Finally, a third equity concern is that patterns of land protection may create unequal access to the benefits of nature because they mirror overall patterns of social inequality. The focus on environmental justice within economics has frequently been centered around environmental harms (e.g. Banzhaf, Ma and Timmins 2019). However, awareness is growing

that environmental justice requires not just reductions in harm, but support for the conditions that enable thriving, healthy communities, including access to ecosystem services and open space (e.g. Benner and Pastor 2015, Lado 2019, Askew and Walls 2019, Schell et al. 2020). Indeed, access to parks and open space are issues that have been raised from the beginning by environmental justice scholars and have also been part of local organizing efforts within disadvantaged communities for decades (e.g. Taylor 2000, Agyeman et al. 2003). Access to open space is often a concern in heavily developed urban areas, but can also be surprisingly difficult in more rural areas, particularly where private lands that were historically used by local communities are developed or posted by new private owners to prohibit public access.

There is a growing body of evidence that documents how patterns of land protection tend to reflect and reinforce underlying patterns of structural inequality, with these disparities driven by mechanisms including underlying historic racist practices, the targeting of cheap land for protection (which tends to be far from population centers), funding criteria such as the requirement of matching contributions, or ongoing outright discrimination. Prior work demonstrates that lower income neighborhoods in the U.S. have less access to open space, as parks are fewer in number, smaller, and have fewer amenities (e.g. Jennings et al 2012, Trust for Public Land 2020, Chapman et al. 2021). In the New England region, Sims et al. (2022) found substantial disparities in access to nearby protected open space at the census tract level: communities with the lowest income or the highest proportions of people of color defined by quartiles had just half as much nearby protected land as those in the opposite quartiles. An analysis of 37 cities across the U.S. by Locke et al. (2021) showed that current patterns of urban tree canopy were linked to residential segregation patterns determined by historical redlining, with substantially less investment in trees for communities of color. A report by Rowland-Shea et al. (2020) found that the highest rates of loss of natural areas in recent decades in the U.S. coincided with communities that were lower income or had higher proportions of people of color, illustrating disparities in loss of existing open space. Despite this growing evidence of disparities in access to ecosystem benefits, there are still substantial gaps in understanding of these disparities at the national and global level and differences across regions and contexts.

Prior work has also highlighted the importance of social hierarchies and structures in determining the distribution of benefits from land protection within communities. Even land protection mechanisms such as payments for ecosystem services or community-based forest management that are intentionally designed to be pro-community may reinforce existing social structures in ways that can disempower marginalized community members. For example, Agarwal (2009) examines how community-based forest use rules may be related to the number of women on governance committees and discusses the complex intersectionality of gender and

social status in rule-making and enforcement. Bardhan and Dayton-Johnson (2002) also document how heterogeneity in wealth and social status frequently affect outcomes for cooperative irrigation systems. Alix-Garcia et al. (2015) found that gains in household assets attributable to Mexico's PES program went primarily to full-rights members of agrarian reform communities, a legacy of the one-to-one inheritance structures in that context. At the same time, Bocci and Mishra (2021) find that participation in community forest management in Guatemala effectively empowered previously disadvantaged women by increasing their household bargaining power. Sills and Jones (2018) emphasize the role of institutions in the success of land protection efforts, noting that the details of how policies are implemented and by who may generate substantial heterogeneity in outcomes. Again, there is considerable scope for additional research that seeks to understand how the benefits of land protection policies are distributed and how these patterns intersect with existing structural inequalities across and within communities.

### **3. Moving towards greater equity in land protection**

As outlined above, there are clearly reasons to be concerned about how land protection may result in outcomes that privilege the already privileged. At the same time, there are several potential ways to move forward by ensuring that policies and practices more actively seek to promote equitable outcomes. In particular, I identify four possible avenues for change (Figure 2): specific mechanisms that link land protection to local economic gains, careful zoning and timing, prioritization that explicitly includes equity goals, and taking direction from local communities.

#### **3.1 Specific mechanisms that link land protection to local economic gains**

Gains from land protection are possible but are also unlikely to materialize unless there are concrete, intentionally-designed governance and benefit sharing mechanisms that ensure a link between land protection and local livelihoods. These may include rules and institutional structures for local revenue sharing, local hiring, support of local infrastructure, or support for new small businesses.

Across the globe, many protected area systems do require some return of park revenues to local communities (Adams and Infield 2003, Dikgang and Muchapondwa 2017, Snyman and Bricker 2019). In Nepal, for instance, conservation area management committees with representation from an array of stakeholders have historically governed the distribution of funds based on park entrance fees, and may retain 100% in some conservation areas and 30-50% in buffer zones (Heinen and Shrestha 2006, Thakali et al. 2018). These funds are to be used for community development, such as improving drinking water, education, roads, or sanitation. Similarly, in Costa Rica, local advisory boards for parks can work to promote local benefits,

including local hiring. As documented by Basurto and Jiménez-Pérez (2013) these local hires often became crucial park guards, naturalists, and firefighters. U.S. Federal agencies also prioritize local hires in some areas (e.g. state residents are sought by the National Park Service for jobs in Alaska).<sup>1</sup> Multiple U.S. federal agencies also maintain roads, bridges, culverts, public restrooms and other infrastructure that support recreation economies,<sup>2</sup> as do other parks agencies globally. Seeking to foster more representative leadership, the NPS also supports employee resource groups that celebrate a diverse set of identities and values, can advise NPS leadership, and develop a future set of leaders (National Park Service 2022). In addition, several government agencies or programs globally provide compensation for crop or livestock damages that occur due to conservation-induced human-wildlife conflicts (e.g. Ravenelle and Nyhus 2017). Others provide payments in lieu of property taxes (“PILOT” payments) when land is acquired by state, provincial or federal owners. Although often underfunded, these payments are designed to compensate for the potential lost local tax revenue when land is owned publicly rather than privately (Kenyon et al. 2010, Hall 2013).

Part of the appeal of incentive-based land protection programs such as payments for ecosystem services has been the promise of a direct link between conservation and tangible local benefits. For example, surveys of the use of funds provided to communities under Mexico’s federal PES program indicated that funds were used for maintaining schools, communal meeting spaces, and for the purchase of communal vehicles for patrolling and other collective needs, in addition to for land management (Alix-Garcia et al. 2018). Peru’s PES program provided funds to communities that were intended to be used for starting businesses to provide alternate livelihoods to timber extraction (Börner et al. 2016), although concerns have been raised about the appropriateness of the match between allowed uses and true local needs (e.g. Ravikumar et al. 2023).

Some conservation efforts may be well-linked to local communities not because they seek to provide new revenue streams or jumpstart new business, but because they preserve the continuance of existing local livelihoods. For example, in Grand Lake Stream, Maine, public and private partners protected formerly private timberlands that had historically allowed public access through a combination of purchases and easements. These agreements facilitated continued access to lands that directly supported existing local businesses for guiding, hunting and fishing (Highstead Foundation 2019). The lands also provide an allowance of up to four

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<sup>1</sup> Local hires are allowed under the Alaska National Interest Lands Conservation Act of 1980 (ANILCA) (Public Law 96-487).

<sup>2</sup> Funding for the National Park Service will include 1.7 billion over five years for local infrastructure. “Bipartisan Infrastructure Law” <https://www.nps.gov/subjects/transportation/bipartisan-infrastructure-law.htm>; accessed July 2022.

cords of hardwood for every household, which is enough to cover a winter's worth of heating for many families, providing a direct and valuable local benefit of the protection.

At this point in time, many agencies and conservation organizations have decades of experience seeking to directly link land protection and livelihoods—a key tenet of the integrated conservation and development project literature (McShane and Wells 2004). Yet the frequent lack of direct, appropriate, and sustained links to local livelihoods has been identified as one of the key reasons for failure of many of these projects (Blom et al. 2010). Continuing research in this area may help to strengthen the case for more substantial and longer-term funding streams that can overcome some of the identified barriers, as well as care to ensure that funding is provided in a flexible and locally appropriate way. In addition, new research is needed to understand how increased information access and globalization are changing the opportunities and challenges of linking land conservation to local development.

### **3.2 Careful zoning and timing**

A second key theme that has emerged across different places and cases is that zoning and timing matter for the success of land protection. Flexibility in zoning means seeking to creating a spatial balance between areas with strict prohibitions and those that allow for sustainable harvests, limited extraction or managed development. Economists have demonstrated that multiple possible uses of land mean that optimal management strategies require spatial planning (e.g. Albers and Grinspoon 1997, Albers and Robinson 2007). Albers and Robinson (2007) demonstrate how a combination of a strictly protected inner core area and a buffer zone forming a ring around that area leads to the highest level of net benefits in a protected area situation where surrounding communities rely on forest extraction. Indeed, multiple use, defined as a mandate to ensure that public lands allow uses and development of land resources that meet the needs of multiple people, is a founding concept of public lands in the U.S. (Pressey et al. 2015). The balancing of multiple needs has been applied globally as well, particularly in work to develop biosphere reserves, which are intentionally zoned to accommodate a mix of core areas with strict protection, areas that allow for tourism and recreation, and areas that allow for human settlements and sustainable use (Brunkhorst 2001), and through other landscape approaches to conservation (Sayer et al. 2013).

Several empirical analyses have found support for the idea that differentiated zoning may be important to ensuring local gains from land protection. Blackman (2015) found that the Maya Biosphere reserve in Guatemala generated more avoided deforestation in the multiple-use zone than in the strictly protected areas, while Bocci et al. (2018) found that limited forest concessions were a key mechanism for livelihood support. Ferraro et al. (2013) found that strictly protected

areas are not necessarily the most effective at protecting forests because governments may simply avoid designating them in high-risk areas in order to avoid social conflict, while Sims and Alix-Garcia (2017) found that biosphere reserves in Mexico were the type of protected area most able to achieve avoided deforestation while maintaining local livelihoods. The prevalence of buffer zones supporting community-use and control around most conservation areas in Nepal may be part of the reason why protected areas there have contributed to meaningful poverty reduction (den Braber et al. 2018).

It is important to recognize, however, that while spatial zoning may be beneficial in balancing multiple needs and priorities, it is also a tool that has been used in exclusionary ways to control or subjugate populations, particularly those with traditional but not formal land rights or with contested claims. Vandergeest (1996, 2003) argues that the process of defining and mapping forest zones in Thailand was a key basis for controlling and racializing ethnic minorities by the Thai government. Krakoff (2018) argues that U.S. conservation designations served to dispossess Native Americans of key territories and that ongoing processes of protected area designation could continue to undermine Native American sovereignty. García and Baltodano (2005) highlight longstanding conflicts over public access to beaches in California and the exclusionary control of access points and amenities as a problematic example of spatial management.

In addition to careful attention to the spatial management aspects of land protection, a focus on the timing of protection initiatives has emerged as one way to mitigate potential displacement or gentrification impacts. In cases where land protection initiatives are expected to increase land or property values, conservation actors have a chance to anticipate these potential impacts and ensure that safeguards are in place prior to protection. Clarifying land rights and tenure security can allow local communities to participate in programs such as PES and may reduce the risk of land grabbing (Chhatre et al. 2012). In Mexico, for example, most communities had already been through a process of formal land titling and recognition (PROCEDE) prior to the establishment of the payments for ecosystem services program; in contrast, PES has not been a viable option in many countries because of the lack of formal land rights for communities, despite these communities having demonstrated long-standing effective stewardship of natural resources.

Timing is also crucially important for efforts to support access to affordable housing near protected land where this is a concern. If property values are expected to rise as a result of new or improved parks, efforts to support access to affordable housing have the best chance to succeed if planned early and with coordination between organizations or government agencies

(Rigolon et al. 2020). Community organizations supporting affordable housing are likely to have more opportunities for purchases of property or for passage of inclusionary zoning proposals before prices rise. Yet these will only be possible if there is early outreach and dialog between organizations promoting affordable housing and land protection—or if more organizations adopt dual missions seeking to achieve both goals. Community land trusts have emerged as one possible structure to reduce gentrification through resale restrictions and asset ownership that is controlled through local governance (e.g. Moore and McKee 2012, Choi et al. 2018, Veronesi et al. 2022). Economists have opportunities to engage with and contribute to the empirical research on these emerging partnerships.

### **3.3 Explicit prioritization of equity goals in land protection initiatives**

To date, most land protection efforts have been driven by and focused on ecological priorities (e.g. Pimm et al. 2018, Wilson 2016, Anderson et al. 2014). Although there has been substantial concern and attention paid to how land protection affects communities, these issues are still often framed as secondary to the core purpose of conservation. Yet if access to the benefits of nature is viewed as condition for thriving human communities, then from an equity perspective, land protection efforts should explicitly seek to provide equal access both through improved outcomes and underlying processes (Agyeman 2003, Estrella-Luna 2010, Lado 2019, Askew and Walls 2019, Ruano-Chamorro et al. 2022).

Although this issue has been understudied in the conservation prioritization literature, many public conservation funding opportunities do in fact already explicitly prioritize disadvantaged communities. In Mexico, the National Forestry Commission (CONAFOR) gives additional weight to PES applications from areas with a high proportion of economically marginalized people and from indigenous communities (Sims et al. 2014, Alix-Garcia et al. 2015). These rules are the result of a process intentionally designed to give voice to multiple stakeholders through annual review by a council including representatives from government agencies and civil society (Sims et al. 2014). In the U.S., individual states may give extra weight to applications for Land and Water Conservation Fund dollars that improve access for environmental justice populations.<sup>3</sup> States may also establish their own program goals, such as New Mexico’s focus on providing outdoor recreation opportunities to a more diverse population through its “Outdoor Equity Grant Program” (Askew and Walls 2019). Federal policy shifts

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<sup>3</sup> For example, the scoring criteria for Massachusetts applications includes additional points for projects that are near to census blocks with each of three environmental justice criteria as defined by the state. “Grant Opportunity Summary for FY 22”, October 2021, Land and Water Conservation Grant Program, Executive Office of Energy and Environmental Affairs, State of MA; <https://www.mass.gov/doc/grant-application-package-bid-env-22-dcs-10/download>.

towards greater prioritization of equity goals in land conservation in the U.S. are also growing. The Biden-Harris Administration's "America the Beautiful" initiative explicitly lists collaborative and inclusive processes and conservation "for the benefit of all people" as primary goals (U.S. Department of the Interior, 2022). In parallel, the "Justice 40" is an effort to ensure that at least forty percent of the overall benefits from Federal investments including in infrastructure, climate, clean energy, agriculture, and conservation are delivered to disadvantaged communities (Young et al. 2021, U.S. Department of Agriculture 2022). International calls for area-based conservation are also increasingly incorporating ideas of justice and equity (Zafra-Calvo et al. 2019, Maxwell et al. 2020, Ruano-Chamorro et al. 2022). In addition, there is growing awareness of and information about both local and global environmental justice struggles generally (Temper et al. 2015, White House Council on Environmental Quality 2022).

Future research can play an important role in providing information that can help to assess current disparities in the distribution of benefits or that can be used to develop screening tools to identify potential priority characteristics or locations (e.g. Sims et al. 2022). Research can also illuminate how the explicit inclusion of social justice as a goal of land protection is likely to shift conservation priorities, processes, and outcomes. Economists in particular may play an important role in continuing to assess the potential relationships between conservation and livelihood goals (e.g. Ferraro et al. 2011, Alix-Garcia et al. 2015, Hajjar et al. 2021, Meyer and Borner 2022) and among valuable environmental benefits or services (Newbold and Siikamäki 2015, Keeler et al. 2019).

Prior research has demonstrated both opportunities for win-win scenarios when social goals are emphasized, as well as the reality of true tradeoffs driven by the current distributions of social disadvantage versus ecological benefits. For example, in the context of PES, prior work has demonstrated real difficulties in achieving both poverty alleviation and ecologically effective program targeting when land at the highest risk of loss is also owned by wealthier households (e.g. Zilberman et al. 2008, Alix-Garcia et al. 2015). Yet this work has also identified opportunities, such as targeting PES to communal landholders and specific geographic regions which have both high rates of loss and high social marginalization (Alix-Garcia et al. 2015). Potential synergies and tradeoffs can also be identified for targeting new protected areas (e.g. Ferraro et al. 2011). In the context of New England, Sims et al. (2022) demonstrates substantial differences in the rankings of undeveloped and unprotected lands according to their proximity to communities with high proportions of people of color versus traditional ecological prioritization criteria. While clear tradeoffs emerge between prioritizing access for diverse populations versus ecological resilience, there are potential synergies with protecting land of high value for clean drinking water. Economists can play an important role in outlining these types of tradeoffs or

synergies. They can also seek ways to incorporate equity as a standard part of analyses of conservation prioritization and spending programs, which have often been focused on efficiency or cost-effectiveness criteria. They can seek to present information on equity dimensions along with standard measures of benefits and costs, can be explicit about how the choice of a numéraire good in benefit-cost analysis may affect the ranking of policy choices, or can incorporate different sets of distributional weights in these analyses (Hammit 2021).

Researchers may also contribute to understanding the concrete mechanisms or institutional structures that can be effective in prioritizing equity as part of conservation. Environmental justice researchers strongly emphasize the importance of more equitable processes in efforts to redress disparities (Lado 2009, Estrella-Luna 2010, Askew and Walls 2019, Ruano-Chamorro et al. 2022, Keller et al. 2022). Some of the potential changes to process that may matter are advisory groups of stakeholders, increased resource sharing by NGOs and land trusts with less well-endowed organizations, integrating diversity, equity and inclusion goals into strategic plans of conservation agencies and organizations, lowering requirements for matching funds from municipalities, assistance to localities from regional planning authorities, and improved spatial mapping tools. These potential changes to process deserve support for implementation by economists where we can contribute, as well as additional systematic study.

### **3.4 Taking direction from and empowering communities**

Each of the above ways to potentially improve equity in land protection rests on the implicit assumption that these changes could shift policies towards outcomes and processes that benefit historically marginalized or disadvantaged populations. Yet to know what is truly benefitting people also ultimately requires opportunities to take direction from and empower these communities directly.

Engagement and listening are a first step towards understanding and redressing disparate access to the benefits of ecosystem services. Prior work illustrates that even when there is legal access to open space, marginalized populations may be excluded by experiences of racism, limited access points, congestion, or lack of transportation and leisure time (Taylor 2000, García and Baltodano 2005, Roberts and Rodriguez 2008, Erickson et al. 2009, Sister et al 2010, Finney 2014, Rodriguez-Gonzalez 2021). Better understanding of these barriers can lead to ways in which land-oriented organizations can change missions, form partnerships, or provide programming that better communicates with and involves historically excluded groups to create more inclusive access (e.g. Sister et al. 2010, Flores and Khun 2018, Rigolon 2019).

As many scholars and activists have emphasized, efforts to redress structural inequality and structural racism need to move from processes that ignore or simply inform communities to processes that collaborate with and defer to those communities (Gonzales 2018, Martinez-Alier 2014, Rigolon et al. 2019, 2022). In some settings, community land trusts, for example, offer one possibility through collective ownership structures, as long as their governance remains truly inclusive (DeFilippis et al. 2017). Similarly, increased devolution of control to already collectively managed common lands globally may be an important strategy for future land protection (Erbaugh et al. 2020). Rigolon et al. (2019, 2022) emphasize the importance of both procedural and interactional justice in park management: ensuring that planning processes are deliberately seeking inclusive feedback, that leadership staff and on the ground employees of parks reflect the ethnic, racial, and socioeconomic diversity of surrounding communities, and that community outreach and in-park recreation programs welcome and engage all community members, including long-time residents. Still, a key challenge moving forward is that communities—whether within the U.S. or globally—are not homogenous units but are themselves complex systems with internal dynamics and differences (e.g. Agrawal and Gibson 1999, Agarwal 2009, Tyagi and Das 2017, Estifanos et al. 2020).

Researchers can also do more to engage respectfully and thoughtfully, including through community-centered practices such as early listening sessions, groundwork, network mapping to understand context, presenting research goals transparently, and using reflexive approaches (Humphreys et al. 2021, Rodríguez-González and Torres-Garrido 2022; Rodríguez-González 2022). One challenge is that efforts to include marginalized voices must be balanced with the high burdens already faced by people in disadvantaged communities. Researchers can seek to ensure fair compensation for time devoted to these processes and that work products are returned to the community. In addition, the study of conservation itself has many ways to shift towards a more inclusive climate that may change the nature of the questions asked, who is doing the research, and the types of research that are valued (Cronin et al. 2021, Rudd et al. 2021).

## **Conclusion**

The maintenance of ecosystem services provided by lands in forests, wetlands, riparian corridors, grasslands, sustainable agricultural systems, urban parks, and other open spaces is a core societal goal. Land protection policies ranging in size and scope are crucial to ensure the future viability of ecosystem services. These policies generate both concerns and opportunities for social equity by changing the rents for different land uses and creating new winners and losers. Concerns about equity stem from situations where these changes reinforce disadvantages: by burdening local communities with the costs of land protection; by reinforcing underlying

inequality in capital, skills, or social status, or by deepening inequalities in access to the benefits of nature. This article has sought to provide evidence for each of these concerns and to propose concrete steps for change as new land protection policies are developed. Each of the issues and potential avenues for change that have been identified are also worthy of considerable additional investigation and future research by environmental and resource economists.

Each of the equity concerns identified here unfortunately shares roots in the fundamentally unequal distribution of income, wealth, and social power that haunts our present global society. Economists also have a clear role to play in analyzing and informing the redress of these broader structural inequalities. In addition, although economists have traditionally been more focused on outcomes than processes, equity concerns demand increasing attention to the processes of decision-making and power—including processes about which topics are studied and by whom. Although I have sought to identify some possible avenues for future research based on a broad review of the literature, additional concerns and proposals for change are likely to be identified by future outreach and listening to communities most directly engaged in and impacted by land protection.

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