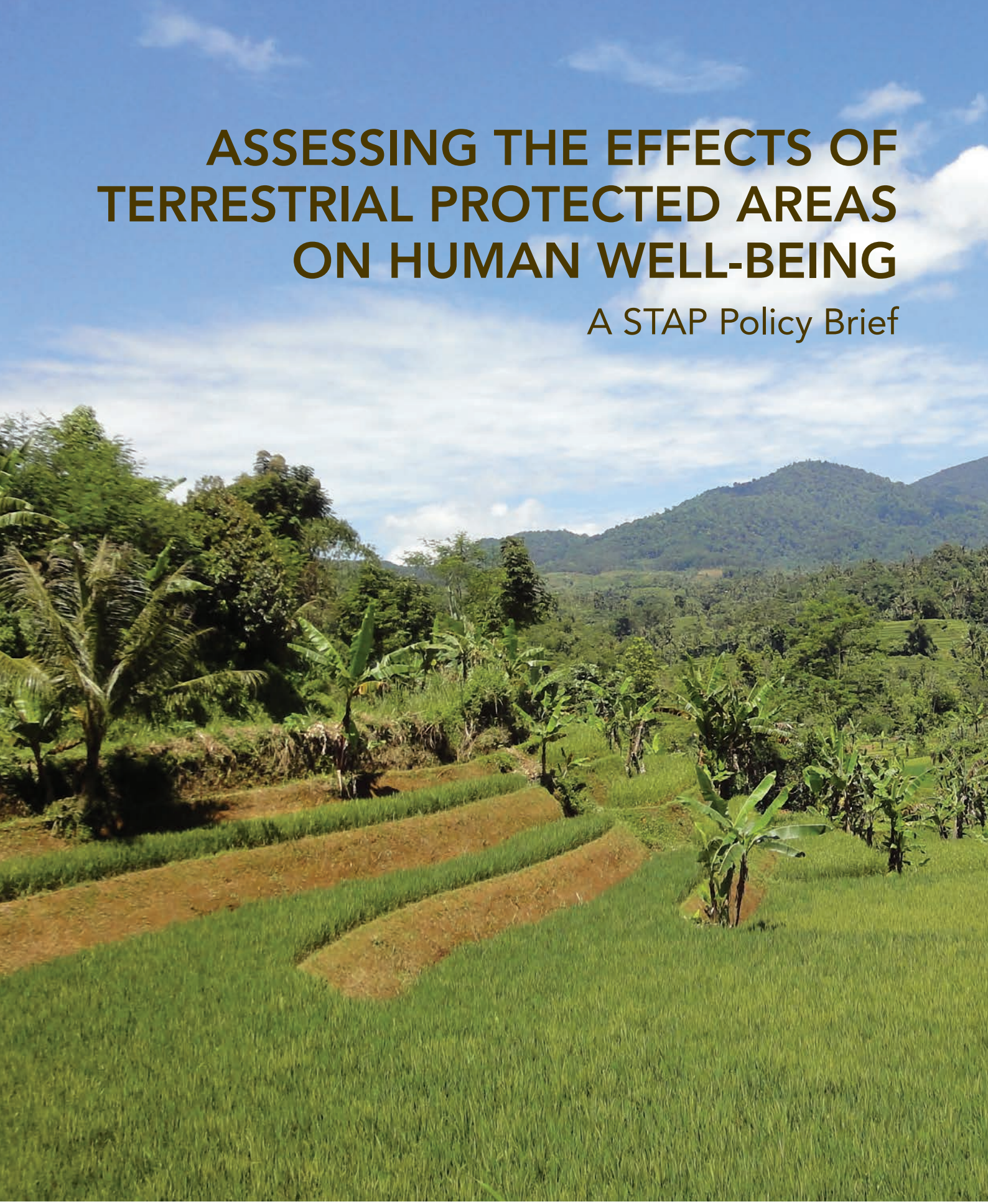
ASSESSING THE EFFECTS OF TERRESTRIAL PROTECTED AREAS ON HUMAN WELL-BEING

A STAP Policy Brief



Scientific and Technical Advisory Panel

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The establishment of protected areas (PAs) has been among the most common types of intervention since the beginning of the conservation movement, and one of the most successful for the purpose of conserving biodiversity. Indeed, the creation of PAs over the past century has been one of the great success stories of this movement.

However, there is an on-going debate concerning the net impact of protected areas on human well-being at the local and regional scales. Has it been positive or negative? Protecting areas from threats posed by human activities, by definition, inhibits some of these activities and therefore potentially has adverse effects on the well-being of individuals and communities. Such impacts may be balanced through the maintenance of valuable ecosystem services and the introduction of new livelihood options.

This policy brief reports on the results of an analysis of the scientific literature regarding the evidence of impacts on human well-being arising from the establishment and maintenance of terrestrial PAs (Pullin et al. 2014). Recommendations are also made for improved research design.

The Global Environment Facility (GEF) has successfully supported projects designed to establish and manage PAs, buffer zones and biological corridors over the past two decades. The approach described in this Policy Brief and associated STAP Advisory Document could be applied to the GEF portfolio to synthesise the empirical evidence of impacts of PAs on human well-being. Doing so could lead to the development of a streamlined methodology for PA projects in the GEF portfolio to be tested in GEF-6, with the goal of improving overall effectiveness and post-project sustainability of terrestrial protected areas.

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Policy and management implications and recommendations for future research design

The evidence base for the impacts of establishing and maintaining terrestrial protected areas (PAs) on human well-being provides a range of possibilities for informing decision-makers. However, it is insufficient to assist them in maximizing positive impacts of PAs on human well-being while also ensuring positive biodiversity outcomes. The diversity of existing studies and of their outcomes suggests that the impacts of PAs are highly context dependent. Nevertheless, the evidence base cannot yet be used adequately to predict impacts on well-being based on knowledge of the context of these impacts, or to identify circumstances/variables/effect modifiers that might lead to greater or lesser impacts.

Recommendations for future research design

Methodological detail. Studies should report sufficient details concerning the location of sample sites (particularly in relation to protected area boundaries), the degree of replication, the data collection tool, the method of sample selection, and times and duration of sampling.

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Baseline assessment. Where changes subsequent to the establishment of a protected area or a change in PA governance are investigated, adequate baselines should be assessed. However, this is difficult and requires planning prior to the intervention. Full before-after-control-intervention (BACI) study design is vital to account for confounding temporal and spatial factors.

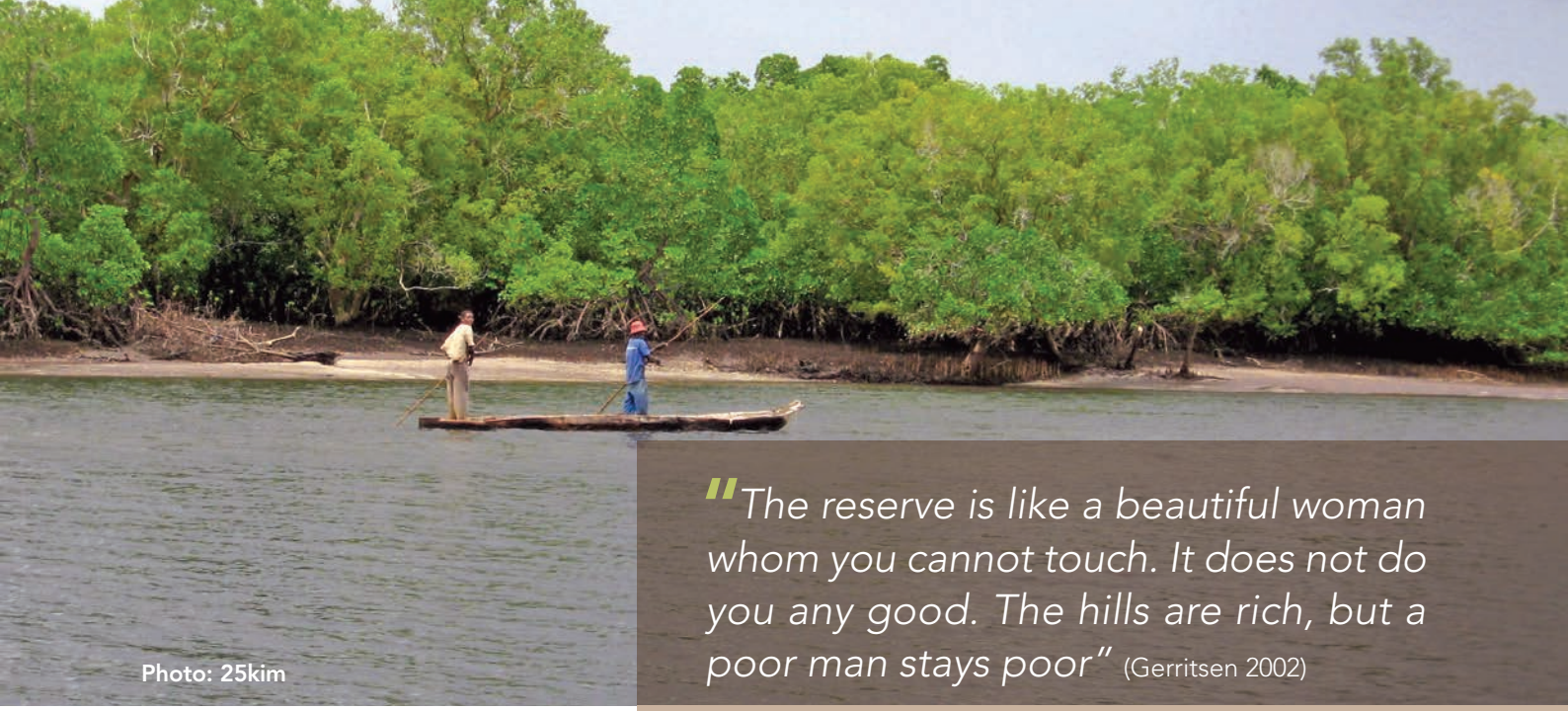
Matched controls. 'Control' or 'comparator' populations are necessary to enable conclusions to be drawn about impacts in the absence of the intervention. A reliable comparison requires that other variables describing the environment are held constant or matched between comparator and intervention populations, allowing only the intervention to change in an ideal situation.

Replication. When the study is designed, allocation of resources to pseudoreplication (improving precision) versus true replication (improving accuracy) should be considered carefully.

Statistics. In summarizing results and analyzing patterns, statistics should be used with great care. If possible, a statistician should be consulted during experimental design in order to optimize design for analysis. The use of models that account for changes in non-target variables across temporal and spatial scales is recommended. Tests for differences in confounders between intervention and comparator populations are also appropriate. Where information can be presented in summary statistics (e.g. mean/median and standard deviation/confidence intervals), this will aid future meta-analysis.

Overall, the diversity of outcome measures and the consequent difficulty of synthesis suggest a need to use standard indicators of human well-being that allow comparisons among studies and meaningful synthesis of evidence. This type of information would allow decision-makers and practitioners to improve their overall efforts to establish and manage protected areas.

The approach used in this study could be replicated to examine terrestrial PA projects in the GEF portfolio to determine whether or not similar recommendations could be made to enhance the evidence base and lead to improvements in overall project design in GEF-6.



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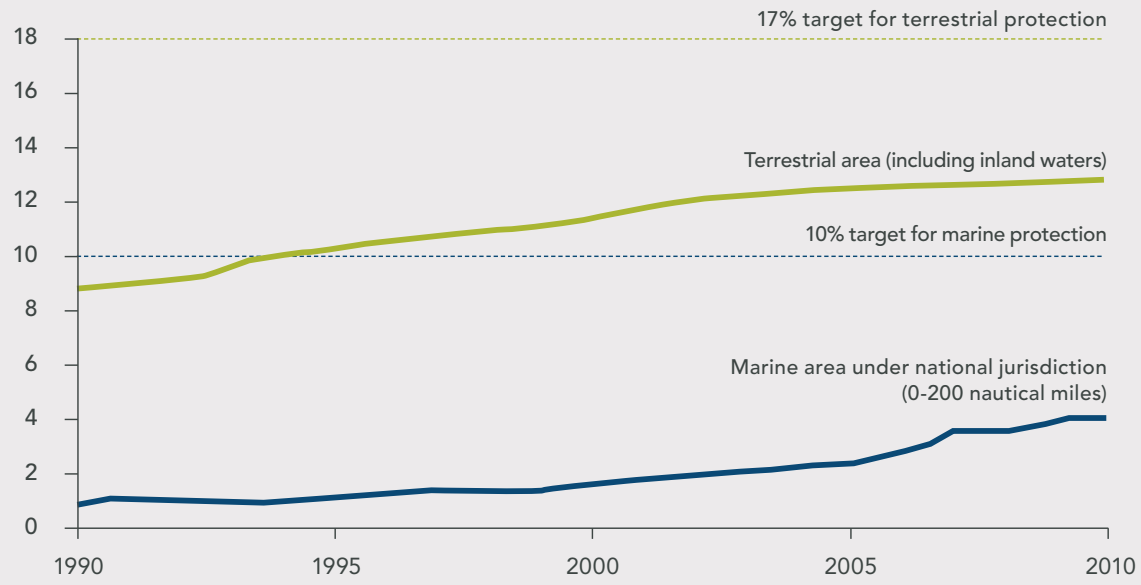
"The reserve is like a beautiful woman whom you cannot touch. It does not do you any good. The hills are rich, but a poor man stays poor" (Gerritsen 2002)

The challenge of ensuring human well-being in and around terrestrial protected areas

The concept and practice of protecting areas for the purposes of conservation has been at the heart of conservation policy since its inception in the 19th century. The idea that intervening to protect areas from human activity is an effective way to conserve species and habitats – and prevent habitat loss and species extinction – is arguably as pervasive today as it was when the first PAs were established (MEA 2005). The central place of PAs in the conservation movement is reflected in the increase in both the number of PAs and the area of land and sea placed under protection. The proportion of total area of land under some form of protection has now reached nearly 13% (Jenkins and Joppa 2009, Bertzky et al., 2012).

FIGURE 1. GROWTH IN TERRESTRIAL PROTECTED AREAS, 1990 - 2010



Growth in the percentage of protected terrestrial and marine areas, 1990-2010. The dashedlines show the 17% (green) and 10% (blue) target for terrestrial and marine areas, respectively. Lags in national reporting are likely to be responsible for the slower increase in recent years, as it takes time for new protected areas to be included in the World Database on Protected Areas (WDPA). Source: Bertzky et al. 2012.

There are many historical records to suggest that only a few PAs were uninhabited wildernesses before they were designated as protected areas, and that in some cases forced eviction followed this designation (Brockington et al. 2006). That scenario has continued in some countries with, in some cases, multinational corporations or even international conservation non-governmental organisations (NGOs) responsible for evictions (Dowie 2009). The problem of the negative impacts of PAs on human well-being gained official recognition in the Convention on Biological Diversity (CBD) arising from the Rio Summit in 1992. The principle that PAs should do no harm to local people was affirmed at the World Parks Congress in 2003, during which the Durban Accord was proclaimed (see **Box 1**).

In some instances, PAs may improve human well-being and help to alleviate poverty (Turner et al. 2012). By preventing conversion of natural habitats, they may improve the provision of some valued ecosystem services to some users. For example, downstream farmers may benefit from conservation of forested watersheds (Kramer et al. 1995). PAs may also directly introduce new livelihood options into a region through the expansion of tourism or research. Moreover, improvements to infrastructure resulting from the creation of a PA may indirectly result in economic development.

The Convention on Biological Diversity (CBD) Aichi targets set a goal of 17% of terrestrial and inland water areas to be covered by well-managed PAs and other effective area-based conservation measures by 2020 (http://www.cbd.int/sp/targets/). Therefore, future policy decisions to support and manage PAs should be informed by the best available evidence on their impacts on human well-being.

BOX 1: THE DURBAN ACCORD (2003) ADVOCATES SUPPORT FOR PEOPLE LIVING IN AND NEAR PROTECTED AREAS

> We urge commitment to the integral relationship of people with protected areas, fully incorporating the rights, interests and aspirations of both women and men."

> We urge commitment to involve local communities, indigenous and mobile peoples in the creation, proclamation and management of protected areas."

> We urge commitment to ensuring that people who benefit from or are impacted by protected areas have the opportunity to participate in relevant decision-making on a fair and equitable basis in full respect of their human and social rights."

> We urge commitment to protected area management that strives to reduce, and in no way exacerbates, poverty."

> We urge commitment to protected area management that shares benefits with indigenous peoples and local communities."

> We urge commitment to value and use all knowledge systems on protected areas, both scientific and traditionally based."

Photo: sarfraz hayat

Examining the evidence base

To better understand the impacts of PAs on human well-being, the Global Environment Facility Scientific and Technical Advisory Panel (GEF STAP) commissioned a review of scientific literature to examine the evidence base, with a focus on several key themes and related questions:

Photo: UNDP in Europe and CIS

TABLE 1. KEY THEMES RELATED TO THE EFFECTS OF TERRESTRIAL PAS ON HUMAN WELL-BEING

Effects of the establishment of protected areas on human well-being	
Key themes	General question: *Did the Establishment of the PA…*
Livelihood strategies	• Generate or decrease specific production opportunities? • Influence migration generally, and the migration of particular social groups? • Differentially impact the most vulnerable groups in local communities?
Social capital	• Affect the development of social networks? • Positively or negatively affect education and capacity building? • Differentially affect more vulnerable groups in a positive or negative way?
Empowerment	• Empower or disempower local communities and any particular social groups? • Create or undermine organizations/institutional arrangements that represent the interests of communities and any particular social groups? • Develop activities aimed at improving livelihoods? • Positively or negatively affect existing activities?
Human rights	• Positively or negatively affect the rights of any local stakeholders?
Access to ecosystem goods and services and natural resources essential for well-being	• Positively or negatively affect access to ecosystem services and natural resources? • Affect access to culturally significant places? • Change self-sufficiency in food acquisition (e.g. local cultivating, hunting, raising animals or gathering) or access to medicinal plants? • Disproportionately affect particular sectors of society?

Researchers at the Centre for Evidence-Based Conservation at the University of Bangor, United Kingdom, undertook a systematic search for the evidence of impacts of PAs since 1992. Using an a *priori* protocol, they divided the review into two separate processes: a qualitative synthesis of people's views, observations and related documentary evidence, led by The Evidence for Policy and Practice Information and Co-ordinating Centre (EPPI-Centre) at the University of London; and a synthesis of quantitative evidence of impacts, including people's attitudes and views, led by Bangor University. A total of 18,895 articles were identified from searches and calls for information.

Following title screening, 3,370 articles remained. After abstract and full text screening, the qualitative evidence review mapped 306 relevant articles (Figure 2). Of these, 34 that were scored as high quality were synthesized in detail. The quantitative evidence review critically appraised 79 studies from 70 articles at full text.

The qualitative synthesis revealed a number of factors that contribute to tension as a result of the creation of PAs. It also highlighted factors that contribute to their successful implementation. These factors are summarized in Table 2.

FIGURE 2. GEOGRAPHICAL LOCATION OF 306 RELEVANT ARTICLES

Screening at full text as part of the qualitative review identified 306 reports of people's views about protected areas. The studies examined a total of 83 countries. The literature focuses largely on Africa and Asia, but also Europe and Latin America. Fewer studies were set in parks in Europe, Scandinavia, North America or Australasia. Reports were most often of studies conducted in India (30) and Nepal (28); followed by China (18), Tanzania (18), South Africa (17) and Uganda (17); then Kenya (13), Indonesia (11) and Botswana (10), with other countries appearing less and less often until 12 appear in only three reports, 18 in two and 31 in one.

TABLE 2. SUMMARY OF SOME FINDINGS FROM THE QUALITATIVE SYNTHESIS OF EXPLANATIONS AND MEANINGS OF IMPACTS

Factors contributing to tension	
Lack of clarity	Inaccurate maps and poorly drafted legislation may cause regulations to be ineffective. Often there are discrepancies between state rules and local institutions.
Poor communication	Lack of communication between communities and authorities and among members of communities is typical.
Forced or Induced migration	Memories of forced or induced migration negatively influence subsequent community responses to authorities.
Lack of compensation	Inadequate or non-existent compensation is a widely held concern.
Incompatibility with local rules and customs	Externally imposed regulations may be incompatible with local rules and customs and often do not take into account cultural and social diversity. Respect for regulations is greater where they have been locally adapted and allow for income generation.
Subsistence activities	Failing to distinguish sustainable subsistence activities from those on a larger scale.
Factors contributing to successful implementation	
	Successful implementation can be achieved when the staff of PAs have prior experience working with local communities; clear guidelines; extensive training in community development, gender issues and a variety of participatory approaches; and when they meet with members of local communities informally and use existing kinship networks.

Studies reporting quantitative impacts provided evidence across a range of categories related to the effects of PAs. Of the 79 studies included in the quantitative analysis, 63 were categorized as having 'high' susceptibility to bias. Table 3 summarizes some key findings from the quantitative analysis.

TABLE 3. SOME KEY FINDINGS FROM THE QUANTITATIVE COMPONENT OF THE RESEARCH ANALYSIS

PROTECTED AREA EFFECTS	NO. OF STUDIES NOT HIGHLY SUSCEPTIBLE TO BIAS	SOME ILLUSTRATIVE FINDINGS
Ecosystem goods	2 out of 17	Nyahongo et al. (2009) found that meat and fish consumption increased with proximity to Serengeti National Park.
Livelihood strategies	8 out of 43	Lundgren (2009) found no significant differences in income growth or forestry/tourism sector employment as a result of protected area establishment in Sweden.
Access and restrictions	0 out of 6	All studies were highly susceptible to bias due to lack of methodological detail, non-random sample selection, spillover, questioning bias and uncontrolled cofounding variables.
Health and safety	1 out of 9	Korhonen et al. (2004) found highly variable infant mortality rates in and around Ramonafana National Park in Madagascar, with slightly higher levels outside than inside the PA.
Society and development	2 out of 13	Sheppard et al. (2010) found a greater number of infrastructural developments inside Wechiau Community Hippo Sanctuary in Ghana than outside it.
Attitudes	1 out of 24	Sarker and Røskaft (2011) found attitudes to PAs to be negatively associated with PA proximity.
Economic valuation studies	1 out of 10	Studies were too heterogeneous and open to bias to permit meaningful quantitative synthesis of valuations.

Photo: Paul VanDerWerf

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Toward an Improved Understanding of the Impacts of Protected Areas on Human well-being

The percentage of terrestrial protected areas is expected to increase in the future to meet internationally agreed targets. Therefore, it is critical for future efforts to design and manage protected areas to be carried out in a manner that not only enhances biodiversity, but also strives to improve the lives of people living in and around critical ecosystems.

The challenge is to improve our capacity to predict factors that will influence the balance of positive and negative impacts on livelihoods. By developing and using meaningful and measureable indicators of human well-being, researchers and practitioners will be able to draw upon a more robust qualitative and quantitative database to help ensure that the future establishment and management of protected areas is effective, equitable, and sustainable in the long term.

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For the full report on which this policy brief is based, see:

Pullin, A.S. et al. (2014). 'Assessing the Effects of Terrestrial Protected Areas on Human Well-being: A STAP Advisory Document'. Global Environment Facility, Washington, D.C.

ABOUT STAP

The Scientific and Technical Advisory Panel comprises seven expert advisors supported by a Secretariat, which are together responsible for connecting the Global Environment Facility to the most up to date, authoritative and globally representative science. The Global Environment Facility (GEF) unites 183 countries in partnership with international institutions, civil society organizations (CSOs), and the private sector to address global environmental issues while supporting national sustainable development initiatives. An independently operating financial organization, the GEF provides grants for projects related to biodiversity, climate change, international waters, land degradation, the ozone layer, and persistent organic pollutants.

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