Towards safeguarding biodiversity and human development

POLICY BRIEF

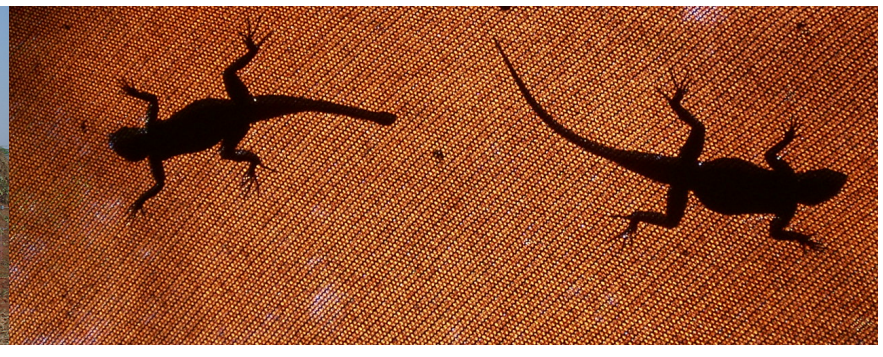
Policy experiences from seven developing countries

This policy brief explores strategies adopted by a selected number of developing countries to combat environmental degradation and poverty. It categorises policies in these developing countries according to their relationships to biodiversity conservation and poverty alleviation. The EC-funded project LUPIS performs impact assessment of these policies on sustainable development in seven countries in Asia, Africa and Latin America. Impact assessment tools are urgently needed to support the adequate implementation of land use policies. We identify policies that have combined both poverty alleviation and biodiversity conservation, and that can mutually strengthen each other in the long run, thereby offering an opportunity for sustainable development.

Our wealth depends on the health of our natural resources

It is widely acknowledged that there needs to be increased collaboration between biodiversity conservation and poverty alleviation. Too often economic growth is associated with biodiversity loss, while on the other hand also economic decline can lead to biodiversity loss. Agriculture remains the principal livelihood of the rural poor and at the same time accounts for the largest land use in developing countries. Due to population growth and agricultural expansion and sedentarisation, conversion of forest land to agricultural land has resulted in a continuous degradation of the natural resources. This has caused an enormous threat to ecosystems and thus biodiversity. Degradation of soil and vegetative resources has in turn negative effects on agricultural productivity since natural ecosystems regulate water, prevent soil erosion, and support pollination of crops.

Humankind benefits from a multitude of resources and processes that are supplied by natural ecosystems. The provision of food, clothing, housing and medical care is directly related to the availability of natural resources in the ecosystems. The rural poor depend heavily on such goods and services on a daily basis for subsistence or cash income.



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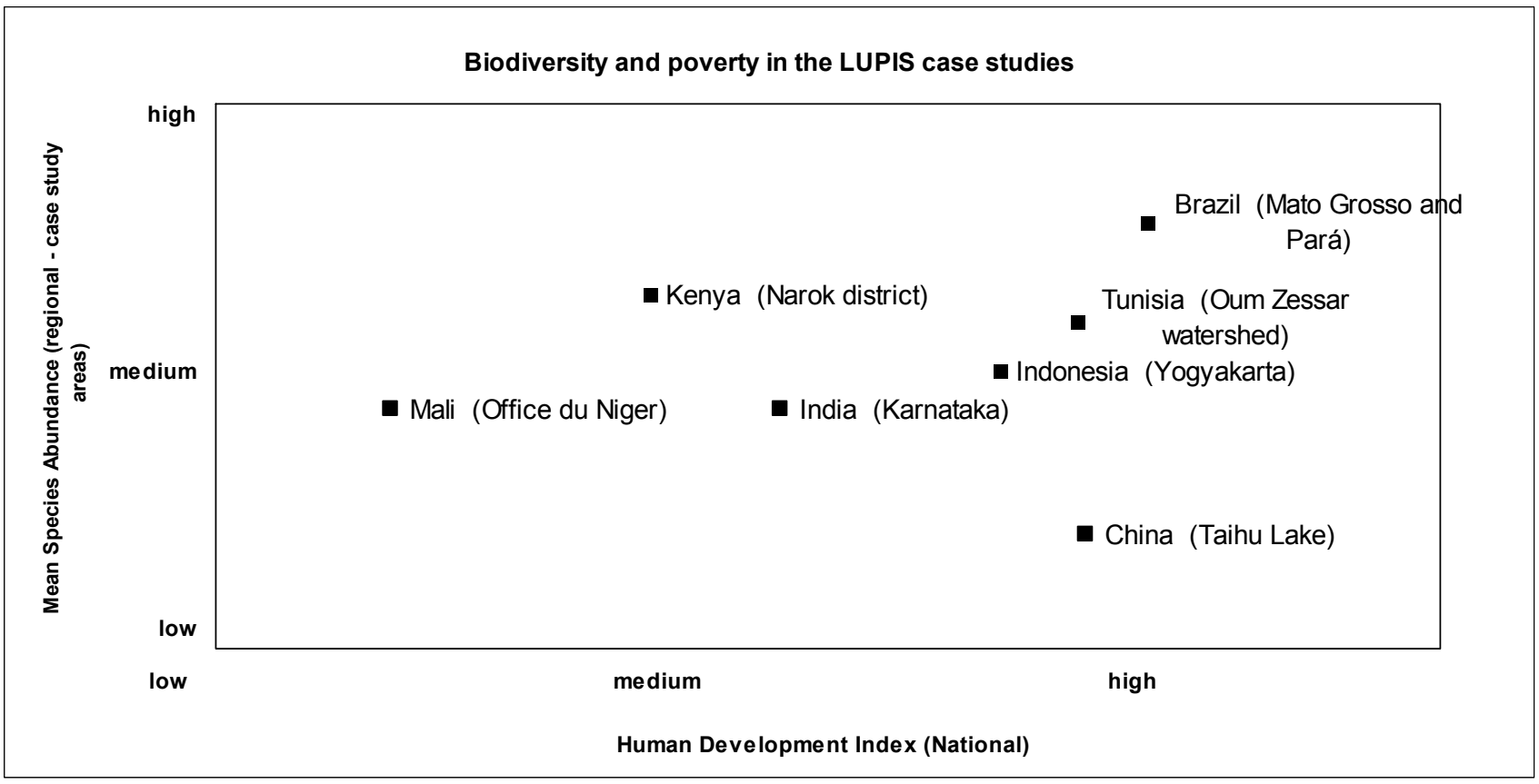
The poor are therefore most affected when environments are degraded and biodiversity is lost, as this diminishes the quality and quantity of goods and services available to them. The importance of biodiversity conservation to achieving poverty alleviation has been recognised in the Millennium Development Goals (MDG). However, the Millennium Ecosystem Assessment (MEA) found that most ecosystems are being degraded or used unsustainably, and that biodiversity is being lost at an unprecedented rate. It said that the costs and risks of this loss are set to increase and to fall disproportionately on the poor.

The EC-funded project 'Land Use Policies and Sustainable Development in Developing Countries' involves researchers from seven developing countries working with partners from four European countries. These seven developing countries differ greatly in their levels of poverty and biodiversity as is shown in Figure 1. Brazil has the best position since it has the highest Human Development Index and biodiversity (Mean Species Abundance). China has the same Human Development Index as Tunisia but a much lower biodiversity. Mali combines a relatively low biodiversity with the lowest Human Development Index. Next, we take a closer look at the issues in these countries and explore the extent to which both poverty alleviation and biodiversity conservation.

Figure 1: Biodiversity and poverty in the LUPIS case studies in 2000



MSA: Mean Species Abundance is an indicator for biodiversity, and refers to the mean abundance of original species relative to their abundance in undisturbed ecosystems; a MSA of 1.0 indicates an undisturbed natural ecosystem, while 0.0 represents a completely transformed/destroyed ecosystem without any wild species left. MSA presented in this figure is at regional level that is the level at the case study areas. Sources: Reidsma et al. (2009); Alkemade et al. (2009).
HDI: Human Development Index is an index used to rank countries by level of "human development" that is based on the life expectancy at birth, knowledge and education levels, and the standard of living.

Case Study

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Tunisia

The Province of Médenine and Oum Zessar watershed are characterised by the aridity of the climate, and the fragility of the plant communities. Due to increased human needs and agricultural development, the pressure on natural resources and particularly on land resources has become higher. This leads to land degradation and a significant decrease in crop yield. The sedentarisation of pastoralism and the accelerated land privatisation, as well as governmental subsidies for irrigated agriculture, have caused land fragmentation and increased pressure on the land.

Policies that are related to land use in the study area are Water and Soil Conservation (WSC) measures and water saving. The major objectives of the WSC measures are to recover arable land, to maintain soil fertility, to reduce flood and drought, and to increase incomes of the rural poor in the marginal areas. The National Programme of Water Saving aims to improve the efficiency of the irrigation system, to attach a better economic value to water and to balance water demand and available water resources.

Kenya

Agriculture is the largest productive sector and the most important economic activity for the majority of the Kenyan population, especially for the rural poor. However, the agricultural sector has performed poorly over the past two decades. This is attributed to land degradation and desertification as a result of changes in land use. Narok District is such an area that suffers from these problems, i.e. loss of land cover, soil erosion, lack of enough and good quality water both for human and livestock consumption, etc.

In this case study, two policies that are related to land use in Narok District are assessed – land privatisation policy and Wildlife and tourism policy. The land privatisation policy has changed the land tenure system to private ownership. It divides the group ranches into individual units. The resultant small plots cannot provide an adequate source of subsistence and may lead to agricultural expansion. Agricultural land has expanded into areas previously used for grazing and as wildlife dispersal zones. Moreover, the subdivision of group ranches limits the free movement of wildlife and may increase the conflict between human and wildlife over for example water resources.

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Case Study

India

Agriculture is the single largest source of employment in India. A high economic growth rate has led to increasing demand for agricultural land for non-agricultural purposes. The pressure of population growth along with the drivers of policies, trade and technology has led to agricultural intensification. Karnataka is one of the four southern states in India characterised by high rates of economic growth while facing agrarian distress resulting in farmer suicides.

Causes of agrarian distress are various but are largely due to land degradation, depletion of ground water levels, stagnating crop yields and fluctuating terms of trade.

To tackle this problem, the Karnataka State Policy of Organic Farming (KSPOF) has been implemented among other measures. Moving towards organic farming requires fewer financial and external inputs and places more reliance on natural and human resources. The KSPOF involved selecting one village per taluk[1] based on certain criteria for implementing various activities to augment natural input use and subsequently facilitating marketing of these organic products.

[1] A taluk is an administrative division in India. A taluk consists of a city or town that serves as its headquarters, possibly additional towns, and a number of villages.

China

Taihu Lake is the third largest fresh water lake in China. It is not only a tourist destination but also an important source of drinking water and is known for its productive fishing industry. Moreover, it also provides services such as irrigation and transportation. However, with the rapid economic development and the lack of proper environmental measures, Taihu Lake is seriously polluted. Industry, domestic sewage and agricultural production are the major sources of increasing nutrient levels in the water that leads to eutrophication.

In this case study, four policy options have been selected that (i) have potential to reduce water pollution, (ii) have impact on sustainable development at large, (iii) have been adopted already by farmers and implementation is therefore plausible. The first policy option considers the conversion from arable land to trees in areas close to rivers and the lake. The second policy option refers to the stimulation of site-specific nutrient management. The third policy option relevant for arable farming is the stimulation of mechanical transplanting of rice. The fourth policy option relevant to the livestock sector is the stimulation of the use of biogas digesters.

Case Study

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Mali

The Office du Niger is a major source of rice production and supplies more than 50% of its national rice demand, which has a strong impact on national food security. Due to population and economic growth, in order to meet the demand for rice in Mali and West Africa, the government of Mali decided to expand land for rice production. This has led to an increasing conversion rate of some forest land and pasture land into agricultural land. The decreasing of forest land has caused wood scarcity, and the decreasing of pasture land has threatened the livestock production. On the other hand, the destruction of forest and pasture lands leads to land degradation and has negative impacts on climate. Another related problem is that the leasing of thousands of hectares to foreign companies by the government is more likely to threaten land and water use rights of the local population.

Policies that are assessed in this case study are the Office du Niger Master Plan and privatisation policy. The Office du Niger Master Plan aims to meet the increasing demand for rice by expanding paddy fields into the forest and pasture lands. The privatisation policy encourages the involvement of the private sector that wishes to invest in processing facilities and in crop diversification.

Indonesia

Yogyakarta Special Province (DIY) is one of the fast growing provinces in Indonesia and has high potentials in natural and human resources. However, DIY is located in an area prone to natural hazards such as volcano eruptions, landslides, floods and droughts. Besides, rapid population and economic growth in DIY leads to conversion of forest and agricultural land use to non- agricultural land use, which has negative impacts on the environment.

Policies that are assessed in this case study are Forestry Law at the national level, the spatial planning act at the provincial level, and the conservation of paddy fields. The Forestry Law aims at reforestation, sustainable forest management and preventing illegal land conversion. The regional spatial planning aims at sustainable land use to minimise land degradation. The regional long-term Act of development planning aims at preventing the conversion of agricultural land use to non-agricultural land use. The conservation of paddy field aims at increasing food self-sufficiency and the welfare of farmers.

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Case Study

Brazil

The Amazon rainforest is highly threatened by deforestation, causing genetic erosion and a great amount of greenhouse gas emissions. The states of Mato Grosso and Pará in Brazil are facing a conflict between agricultural expansion (largely due to an increase in the international demand for commodities) and conservation of the Amazon rainforests that is important for biodiversity and carbon storage. The paving of highway BR-163 accelerates migration to remote areas and increases the clearing of the forest.

Policies that are assessed in this case study are grouped into five categories:
(1) Conservation policies that consist of the creation and effective surveillance of conservation units and indigenous territories; (2) Agrarian regularisation that was once the main issue that undermines assigning responsibilities to stakeholders involved in illegal deforestation; (3) Agricultural policies that include funds for modernisation of agricultural machinery (*Programa Nacional de Agricultura Familiar*-The National Programme for Family Agriculture), Harvest Plan 2007/2008, and the renegotiation of rural debt; (4) Payment for environmental services that remunerates stakeholders for maintenance basic ecological service within their Agro-systems; (5) Deforestation Control and Prevention that are based on surveillance by governmental agencies.

Policy priorities

Policies that are assessed in all the LUPIS case studies may be categorised based on their focus towards achieving biodiversity conservation and poverty alleviation as shown in Table 1.

A priority for biodiversity indicates that the policy does not have any specific goals towards increasing income for those dependent upon the natural resources targeted in the policy. A priority for poverty indicates that the policy does not include a specific measurement to protect the natural resources upon which potential economic growth is based. The integrated policies include goals set for both the protection of natural resources as well as the economic development of those depending on them. Tunisia, India, and China focus on policies that take into account the relationships between poverty and conservation. Brazil assesses not only policies that either prioritise biodiversity conservation or poverty alleviation but also measures that combine both. Mali assesses policies focusing more on poverty alleviation while Indonesia assesses policies focusing more on biodiversity conservation.

Based on policies listed in Table 1, the focus of policies towards 2020 is summarised in the following:

1. In the Tunisian, the Chinese, and the Indian case studies, policies that are assessed take both poverty alleviation and biodiversity conservation into account, which might lead to a win-win situation;
2. In the Malian case study, policies that are assessed focus more on poverty alleviation, which might risk biodiversity in the future.

Policy priorities

Table 1: Policy priorities in the LUPIS case studies

Case studies	Priority of biodiversity conservation	Priority of poverty alleviation	Combining biodiversity conservation and poverty alleviation
Tunisia			• Water and Soil Conservation • Water saving
Kenya		• Land privatization	• Wildlife and tourism
India			• Organic farming policy (KSPOF)
China			• Policies addressing environmental pollution
Mali		• The Office du Niger Master Plan; • the privatisation policy	
Indonesia	• Forestry Law; • the regional spatial planning; • the conservation of paddy field		
Brazil	• Conservation policies; • Deforestation Control and Prevention	• Agrarian regularisation; • Agricultural policies (PRONAF)	• Payment for environmental services

3. In the Indonesian case study, policies that are assessed focus more on biodiversity conservation, which might risk rural viability;
4. The Kenyan case study assesses policies that are combined and policies that focus more on poverty alleviation. The Brazilian case study assesses policies that prioritise biodiversity conservation as well as policies that prioritise poverty alleviation.

The aim of this policy brief is to provide policy makers an overview of measures adopted to cope with biodiversity conservation and poverty alleviation. Two policy strategies that may have positive outcomes could be summarised based on the policies presented in Table 1:

1. Policies that financially support conservation practices in rural areas: This strategy is used in Tunisia where farmers are subsidised for their soil and water conservation strategies. In Brazil, conservation strategies are to create effective surveillance of conservation units and indigenous territories.
2. Policies that support livelihood diversification: In India the promotion of organic farming not only aims at reducing environmental pollution but also provides market access and food security to the farm households. China also financially supports conservation practices.

To summarise, policies with a long term future perspective enable situations where promotions of biodiversity conservation strategies also allow for poverty alleviation. Likewise, policies that promote poverty alleviation can provide opportunities for biodiversity conservation.

Depending on the actual implementation of the policies assessed in the case studies, possible outcomes might be diverse. For example, more focus on poverty alleviation might risk biodiversity conservation or vice versa. In the evaluation of these policies it is clear that a positive outcome for both biodiversity conservation and poverty alleviation is only foreseen in those policies that combine both targets. Policies with a clear preference of either biodiversity conservation or poverty alleviation risk a win-lose situation. Stakeholders that are involved in land management such as farmers and

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forest owners play a vital role in implementing sustainable practices in rural areas. Policies with conflicting interests may end up in a lose-lose situation.

The need for ex-ante impact assessment

The highly complex and diverse relationships between biodiversity conservation and poverty alleviation call for *ex-ante* policy impact assessment. It helps policy-makers to understand the intended and unintended impacts of the assessed policies on diverse stakeholders and institutions (including those not targeted by the policy). The LUPIS project develops integrated tools for impact assessment in seven developing countries. The project started on 1 February, 2007 and will run for a period of 50 months (31 March, 2011). It involves different stakeholders such as policy-makers and scientists and aims at improving science-policy interaction. The integrated and forward looking approach (that involves different stakeholders) adopted in the LUPIS project supported by appropriate data and modeling tools will be crucial to safeguard biological diversity and poverty alleviation in developing countries.

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