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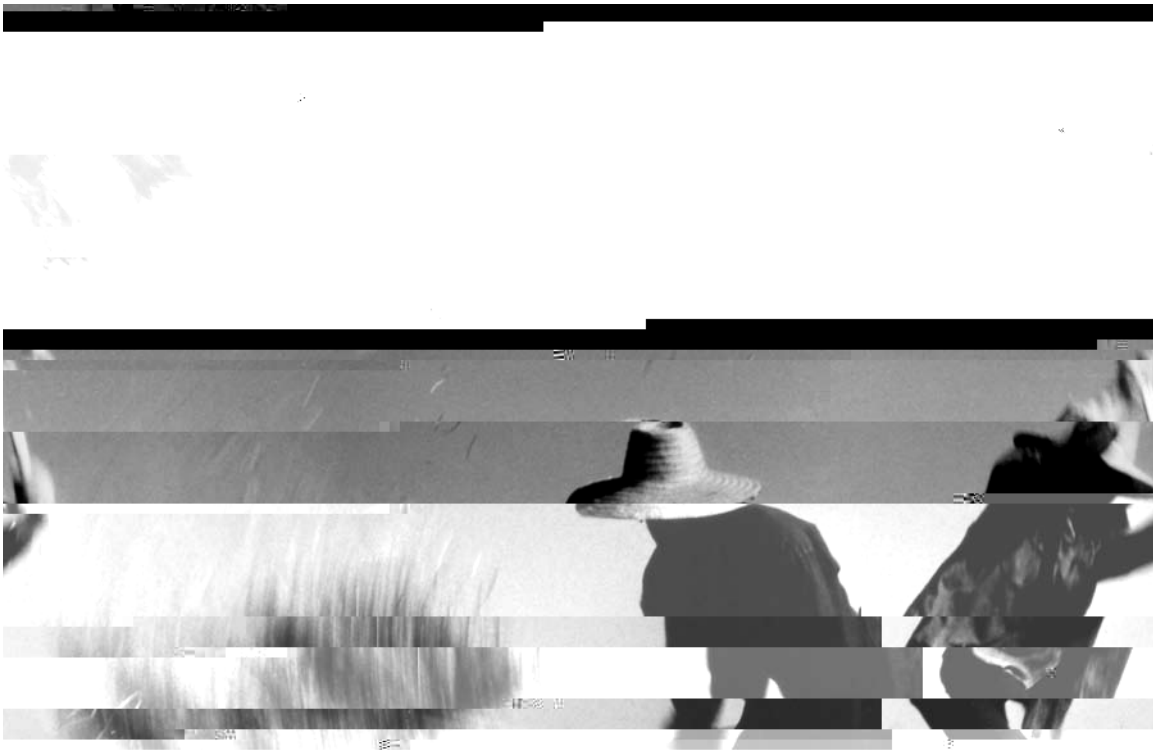

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Buitenlandse Zaken
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samenwerking

DGIS is the Development Agency
of the Ministry of Foreign Affairs
of the Netherlands

Editorial

The conservation community has tended to shy away from dealing with agricultural productivity. At best conservationists have offered vague words about how ecosystem functioning and biodiversity underpin food production and hopeful messages of new win-win solutions for both consumers and conservation; at worst they have indulged in 'anti-production' rhetoric, warning that we are set to repeat the mistakes of twentieth-century agriculture. Clearly mistakes have been, and are still being, made with poorly conceived policies and incentives driving the conversion of large areas of forest land, the indiscriminate use of pesticides and fertilizers and over-abstraction of rivers and aquifers. Nonetheless, increases in agricultural productivity have meant that globally the number of food-insecure people has fallen from 37 percent in 1970 to 17 percent, according to IFPRI. Indeed, without the dramatic increases in agricultural productivity that have been achieved over the past 50 years, we would now need an extra 300 million hectares – an area equivalent to 10 percent of the world's current forest cover – to feed the global population.

In the twenty-first century, conservation goals have to be tackled within the urgency of ensuring food security for a future global population of nine billion people. The puzzle to be solved by conservation is how this can be done whilst safeguarding ecosystems, forests and water resources.

As the current debate on reducing emissions from deforestation and degradation shows, the reality is that the fates of forest and agricultural land are inextricably linked. Pressure on both is growing, and in turn threatening loss of biodiversity and of the capacity of watersheds to support water security for people. The recent hikes in the price of oil seem to be part of a long-term trend rather than just temporary spikes, and the changing economics of how we satisfy our basic needs for food and warmth mean that production will spill over into marginal productive land where the conservation stakes are often higher.

This issue of **arbor** *ae* looks at some of these trends and what they mean for forests. The message seems to be clear – conservationists will need to pay more attention to agricultural productivity issues and work across the sectoral divide to develop sustainable, realistic strategies for the future.

Stewart Maginnis & Mark Smith
Stewart is Head of IUCN's Forest Conservation Programme and Mark is Head of IUCN's Water Programme

news in brief

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So rce: www.afrol.com, 8 August, 2008

Pollinators to get protection help:

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So rce: www.enn.com, 11 August, 2008

Forest handed back in A stralia:

1,800

So rce: www.planetark.com, 7 August, 2008

The high stakes

David Kaimowitz

The more profitable it is to raise cattle and grow crops in places that currently have forests, the more likely it is those forests will disappear. It's as simple as that.

For most of the last forty years, global food prices declined steadily. That was bad news for farmers but good news for forests. The returns to agriculture became so low that farming probably would have disappeared entirely from many tropical regions if it weren't for subsidies and the fact that many poor rural families had no other option.

Those days are gone. Emerging markets for biofuels and greatly improved diets in China, Brazil, and India have pushed up the demand for foodstuffs, while decades of neglect of agriculture and poor resource management have kept down supply. So food prices are going through the roof.

That makes it much more profitable to burn down forests to raise cattle and grow soybeans in the Amazon and put in oil palm plantations in Southeast Asia and Central America; and it may eventually lead to sugar cane, maize, and other crops expanding deep into the forest. High maize prices make it more expensive to use corn to produce chicken, eggs, milk, and beef, and may encourage producers to revert to extensive livestock systems that use large areas of pasture to feed cattle, instead of maize.

All this will make it much harder to conserve forests and will greatly raise the cost of any efforts to lower carbon emissions by reducing deforestation. And it will become increasingly difficult to defend large protected areas that don't have strong roots in local cultures and economies.

Theoretically, the new context could also open fresh opportunities to promote viable small farms with diversified, environmentally friendly production systems, particularly given the high prices of fuels and fertilizers. Small farms with perennial crops, woodlots, forest fallows, trees in crops and pastures, and limited agrochemical use can maintain much more biodiversity than most conservationists realize. However, to achieve that potential would require much more proactive and more equitable agricultural and rural development policies than we've seen so far in most developing countries.

To develop effective strategies for conserving biodiversity and other natural resources and improving rural livelihoods in the new context will require much more high-quality information and analysis than is currently available. Among the most problematic aspects of the declining interest in agriculture and rural issues in general in recent decades has been a marked reduction in data collection and research about rural areas and in the number of well trained and highly motivated people going into those fields. As a result, to some extent we are driving blind based largely on our conventional wisdom and recollections about how things worked in the past, and our thinking definitely has not caught up with the rapid pace of change.

Higher food and fuel prices combined with the cumulative effect of long-term trends in rural societies pose fundamentally new threats and opportunities for environmentalists. For the most part environmentalists don't understand these aspects very well and are ill-prepared to address them. The old approach of simply establishing more and larger parks will be costlier and less likely to succeed. The same applies to strategies driven by purely biological or ecological considerations. Prices matter more than ever – and the stakes are very high.

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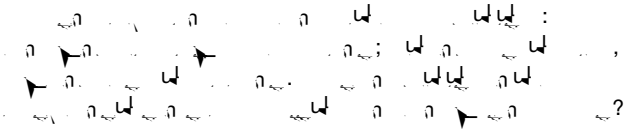
Biofuel ?

Globally, agricultural productivity has increased dramatically over the last fifty years. Despite a doubling of the world's population, per capita food production has increased by 30 percent since 1960. These gains have been driven by improved technologies – pesticides, fertilisers, irrigation and improved varieties. 'Green revolutions' in the productivity of small grains (wheat, maize, rice) were seen in Europe and the US in the 1950s, and in Asia in the 1970s, while yields in Latin America have increased more steadily. Sub-Saharan Africa is the only region not to have seen a sufficient productivity increase – here per capita food availability has decreased. There are a multitude of reasons for this, underinvestment in agriculture being an important one.

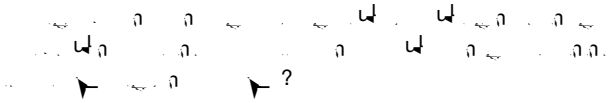
Today, our ability to feed the world's growing population may be jeopardized not only by threats to the natural resource base (chiefly from overgrazing, unsustainable land management, and deforestation), but also two important trends. The first of these is the dramatic increase in the global consumption of meat and other animal products. Economic growth in countries such as India and China are bringing dietary changes, as more people can afford to eat meat. The dairy industry is also booming in these countries – in fact India is now the biggest dairy producer in the world. This trend towards increased animal production requires more grains and therefore more agricultural land; as an illustration, producing one kilogram of beef requires eight kilograms of wheat. This trend is not one that can easily be 'managed' and if it continues as predicted, global 'feed security' may become a serious problem. It is also putting the squeeze on food security as competition for good agricultural land hots up. However, when the most sophisticated agriculture is used on the best land, that problem may be overcome.

The second trend that is undermining global food security is the current boom in biofuel production. Driven largely by the rising oil prices, the rapid expansion of biofuel crop production is in turn partly responsible for the increase in food prices as land-use switches from food to fuel. Government policies in the US and Europe are also behind these trends, as they set required quota or provide subsidies for biofuel use. The highest value use of maize is now as an ethanol feedstock, not as food or livestock feed. This is pushing up the price of these crop commodities, with widespread ramifications for consumers around the world. It needs to be borne in mind that, as with livestock production, biofuel production is a relatively inefficient use of land and wasteful conversion of solar energy. In the Netherlands, for example, meeting the EU target of 5.7 percent biofuel use in transportation would require 1.4 million hectares of rapeseed – that same amount of oil could cover the energy costs of 100 million Dutch people's daily food consumption.

If we look at the output value per unit production area of various agricultural products, fuel represents the least valuable use of land. I have drawn up a ranking to illustrate the range in per-hectare value of agricultural products. Thus, in order of the most valuable use of land, the products line up as follows: pharmaceuticals, fragrances, flavours, flowers, fruits, vegetables, food crops, fodder, fibres and fuel. From this listing, it can be seen that commercial farmers looking to maximize the economic productivity of their land would be better switching to high-value, land-intensive pharmaceutical crops rather than biofuel crops. This would also ease the pressure on food crop production – with obvious benefits for global food



Good practice in agriculture can contribute, directly or indirectly, to the health and conservation of forests by, for example, producing more food with less land and therefore relieving pressure from land conversion, establishing wildlife habitats, using minimum tillage, using more water-efficient crops and maximizing on-farm recycling of nutrients. But these benefits can be extended to other ecosystems other than forests too, such as wetlands and urban ecosystems.



Biofuel production is not the only reason food prices have been increasing in some regions. In 2007-2008, only

Converging demand, converging markets

The converging global demand for land to produce food, fuel and fibre will likely lead to a large-scale land grab, and forest lands are likely targets. Indeed, forests will increasingly be converted to industrial agricultural use to meet these burgeoning demands. Using conservative estimates, future demand for land will equal at least 515 million hectares: 200 million hectares for agriculture, 290 for bioenergy production (including fuelwood), and 25 for industrial tree plantations. This is far more than is available. After accounting for built areas, cultivated lands, forests, non-vegetated areas, parks, mountains and grasslands for meat production, there are only between 250 and 300 million hectares of land available for producing biomass. The additional 200 million hectares required to meet future demand can only come from forests (see http://cofi.org/library_and_resources/annual_convention/2008/pdf/Don%20Roberts%20-%20CIBC%20World%20Markets.pdf).

The global expansion of biofuels is driven by increased concerns about environmental,

Although the capital costs are still higher for processing wood, the variable costs may be lower, thus making wood a competitive feedstock.

What does this mean for forests?

Price increases in wood feedstocks should stimulate increased production and, as

The links between forests and household access to food supplies are numerous, and include the indirect environmental impacts of forests on the capacity of land to produce food. More directly, forests and forest trees are the source of a variety of foods that supplement and complement what is obtained from agriculture, and of a wide range of medicines and other products that contribute to health and hygiene. Forest products not only fill seasonal and cyclical gaps in food availability, they also act as a safety net in times of shortages due to drought, floods, illness, or other emergency situations. Access to wood fuels affects the availability of cooked food. Sale of forest foods and other forest products can contribute to the income of households that are nutritionally at risk, enhancing their ability to purchase food and inputs into their food production systems.

As populations have grown and agriculture has spread into forest areas, forest foods and other forest products have increasingly come from tree stocks and tree-dominated habitats that coexist with agriculture, as well as from closed forests. Forest fallow, farm bush, the trees that farmers maintain or establish on their land, and tree resources on other land have widely become major sources of forest foods, fuels and income.

Although research in the field of ecosystems and food security for the rural poor is limited, the case appears strong for conservation organizations to work on these linkages. But these can be quite complex. While forest foods and income are known to be widely important in helping the poor 'cope' with poverty (*poverty alleviation*), they are perhaps less likely to provide a pathway out of poverty and chronic long term shortages of food (*poverty reduction*). We therefore need to guard against promoting dependence on such low-value sources of food and income where they can become a *poverty trap* for those involved. Interventions need to be designed to complement and not undermine the capability of households to meet some of their needs through their own production and income.

Understanding the local context is critical. Initiatives to increase the productivity and usefulness of wild food resources need to be closely focused on meeting the actual nutritional and health needs of user populations, and on changes in these needs. In many situations use of forest foods continues to be important and sometimes increasing. Where use of forest foods is declining, this may reflect availability of better alternatives, cultural changes, resource depletion, erosion of traditional knowledge, or reduced availability of labour and other entitlements to use such resources.

Access is as important as availability, and access by the poor to resources that can yield forest foods and income is still widely constrained by weak and ineffective political and institutional arrangements in support of local control and management of forests. Thus, a comprehensive engagement in this issue would require addressing these constraints.

There is much scope and urgent need for more research into the linkages between ecosystems and food security in order to influence more sustainable policies and practices. This research is likely to be most effective if it is designed as part of an overall livelihood strategy to improve the wellbeing of rural poor households.

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Mike is an independent consultant and this article is based on a paper he prepared earlier this year for IUCN: 'Managing Ecosystems to Enhance the Food Security of the Rural Poor: A Situational Analysis prepared for

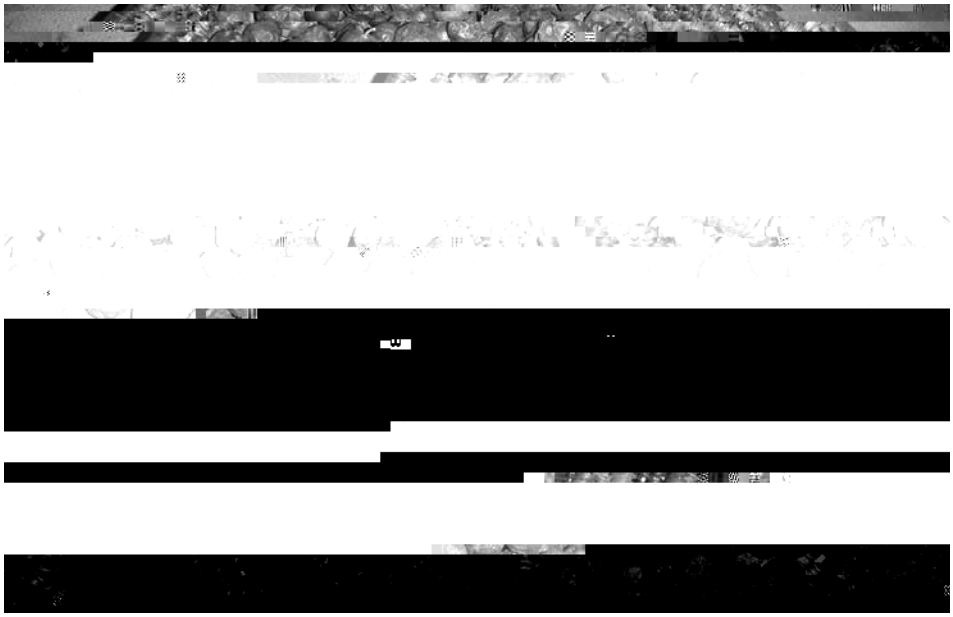
What is the 'bushmeat crisis'?

Historically, hunting pressure has contributed to the extinction or near-extinction of many species (Right whale, Great auk, Eskimo curlew, Passenger pigeon…). Recent research suggests that the current scale of hunting in tropical forests will lead to further extinction of many forest mammals, and that malnutrition is likely to increase

In almost all discussions of biodiversity and the importance of conserving it as a matter of enlightened self-interest, one thing is missing: agriculture. Indeed, agriculture is all too often seen as the enemy of biodiversity. Furthermore, very little attention has been paid to the diversity of agricultural ecosystems. In the past, agricultural biodiversity, including the very important diversity contained within the wild relatives of crop plants and livestock, has been considered almost exclusively as a source of traits that can be used to improve varieties and breeds. This remains true, but agricultural biodiversity can also deliver other benefits that are every bit as important.

Better nutrition through dietary diversity is perhaps the most obvious of these, but it is not the only one. Diverse farming systems are much less vulnerable to outside impacts

Drylands



Masego Madzwamuse, **Edmund Barrow** and **Caterina Wolfangel** of IUCN consider the untapped potential of drylands as productive landscapes.

Drylands cover over 40 percent of the Earth's surface and play a critical role in conserving biodiversity and feeding the world. Many of the world's national parks are found in drylands; in Kenya over 70 percent of the country's parks are in dryland areas. And, while drylands are often thought of as 'wastelands', they actually account for 43 percent of the world's cultivated areas – including inappropriate cultivation techniques that degrade the soil and, in the case of irrigation, leave the water table depleted and saline. At the same time, a disproportionately high percentage of the 2 million people who live in drylands are food insecure – and this is likely to get worse with climate change.

However, little attention has been paid to drylands by national governments or the international community. Outside assistance tends to be limited to short-term humanitarian relief during times of famine, or simplistic development solutions that ignore the harsh realities of dryland environments. We don't seem to have learned from the last half-a-century of flawed efforts to bring a 'green revolution' to drylands. The fact is that crop production will always be a limited opportunity for these areas, as rainfall is low, unpredictable and erratic and surface or groundwater is inadequate for irrigation. The Turkana pastoralists of Kenya know this well – they have some of the fastest maturing varieties of sorghum in the world, yet even for them, cultivation is opportunistic; livestock is their mainstay. Similarly, efforts to settle drylands peoples, for ease of service delivery and support, have been less than successful, and have contributed to further environmental degradation as people are concentrated in relatively small areas, way above the carrying capacity (for fuel, fodder, etc.) of the surrounding lands.

So what are the ingredients for success to develop these regions of this world? First, we need to respect and build on the immense knowledge of local people for drylands management. Understand why they have complex common property systems for land and resource (water, trees, pasture, salt) management that can cover large territories. Understand why they place more emphasis on livestock than on crops. Understand how they manage for the dry and drought times. Build on those systems and support them with 'modern and scientific knowledge' to improve productivity, and create market opportunities.

Opportunities for sustainable development in dryland areas do exist:

Many natural products come from drylands – and many of these are tree-based. These include gums and resins, vegetable oils, dyes and many medicinals. For instance, Sudan is the world's largest producer of Gum Arabic, and the arid lands of the Horn of Africa produce the highest quality frankincense and myrrh in the world. Developing these kinds of products will require a commitment to equitable benefit-sharing mechanisms, if they are to contribute to local livelihoods.

The world still needs milk and meat – and livestock in drylands are the most efficient converters of biomass for human use (milk, meat). Improvements in pastoralist livestock management should build on and support customary pastoralist land management and should be based on extensive systems that include grazers (cattle and sheep) and browsers (camels and goats).

Pastoralism is compatible with wildlife conservation. Dryland peoples should be better able to benefit from conservation through community conserved areas and tourism, and not have their best lands alienated in the name of conservation.

Governments need to start by reflecting the true value of drylands in economic data and national accounts, so that they are recognized as valued-lands not valueless lands.

An adapted version of this article was published on BBC website: http://news.bbc.co.uk/1/hi/sci/tech/7456973.stm

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The potential for conflict between forest conservation and agricultural productivity can be influenced greatly by new EU policies, such as reforms to the Common Agricultural Policy (CAP) or introduction of new targets for renewable energy. Yet the evidence available to policy-makers on the likely impacts of such policies is far from complete. To address this problem, over the last five years the EU has invested substantial funding in the development of a suite of computer-based models to support policy-making for different sectors and at different strategic levels and spatial scales.

One of the most innovative and ambitious of these initiatives is 'SENSOR' ('Tools for Environmental, Social and Economic Effects of Multifunctional Land Use in European Regions'), a four-year project, coordinated by the Leibniz Centre for Agricultural Landscape Research in Germany, which has brought together teams of researchers from 36 institutes in 15 European countries, as well as China, Brazil, Argentina and Uruguay. The aim is to develop 'Sustainability Impact Assessment Tools' ('SIAT') that support ex ante assessment of new policies on six land-use sectors: agriculture, forestry, nature conservation, transport infrastructure, energy and tourism.

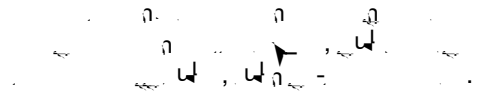
The SIAT model uses 'response functions' to quantify how the key variables that constitute a given policy option (e.g. direct income support to farmers), and other drivers (e.g. oil prices and demographic changes), might impact on land-use patterns in Europe over the next 20 years, and in turn how these impact on the values of 40 different sustainability indicators (e.g. employment, GDP, and nitrogen surplus). To help interpret these changes, the indicators have been weighted and aggregated to express impacts on nine 'Land Use Functions'. The current and future values for each indicatore igs/T1rs (e.d39s, tUse Functions'. administrative regions. As/rther step allows the sustainability risks of each policy option to be expressed in terms of the 'sustainability choice space' that is available within legal limits, scientific thresholds, and political targets, allowing policy-makers to choos, tUs best option, and back up tUsir choice with better evidence.

A prototype SIAT has now been developed and used to analyse impacts of options for CAP reform. Preliminary results suggest that liberalization (reduction in farm income support and in the level of protection of EU agricultural markets) would have a strong negative effect on agricultural production, incomes, and land prices. The effects would

Key recommendations, suggested by those consulted included:

- Empowering primary 'stakeholders' such as forest dwellers so that they can make their rights, knowledge and needs centre-stage;
- Improving financial flows to activities that support local needs as well as global public goods such as carbon storage; and
- Interacting effectively with other sectors such as water and agriculture, where the underlying causes of forest problems, and their solutions, are often lodged.

Daniela Gomes Pinto and Mario Monzoni of the Getulio Vargas Foundation, who helped to coordinate the extensive consultation process in Brazil, reported: "The Brazilians we consulted said a global forest partnership is needed to raise the overall profile of forests, to curb the drivers of deforestation, and to support those who wish to practice sustainable forest management. It must 538F0020]TJ0 -1.3dcdeement. (333 TDnate e,1g ip i3 Td overurb the drt



Last year the World Bank proposed the creation of a Global Partnership on Forests that would link local and global processes and promote the reflection of local stakeholders' needs and views in international decision-making. In a break from its traditional practice, the World Bank asked the International Institute for Environment and Development (IIED) to conduct an independent assessment of the new partnership idea.

In July, IIED published the result of this assessment – which gathered the views of more than 600 forest experts who had responded to IIED's survey or participated in focus groups in Brazil, China, Ghana, Guyana, India, Russia and Mozambique or in international meetings. As part of the assessment, IIED also reviewed more than 50 existing initiatives to identify the proposed partnership's potential partners and the gaps it could fill.

The general view that emerged is that such a partnership would be a welcome initiative but that the World Bank should take a back seat in the partnership's development, as one of a number of facilitators rather than as the central 'director'.