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Trends 2005

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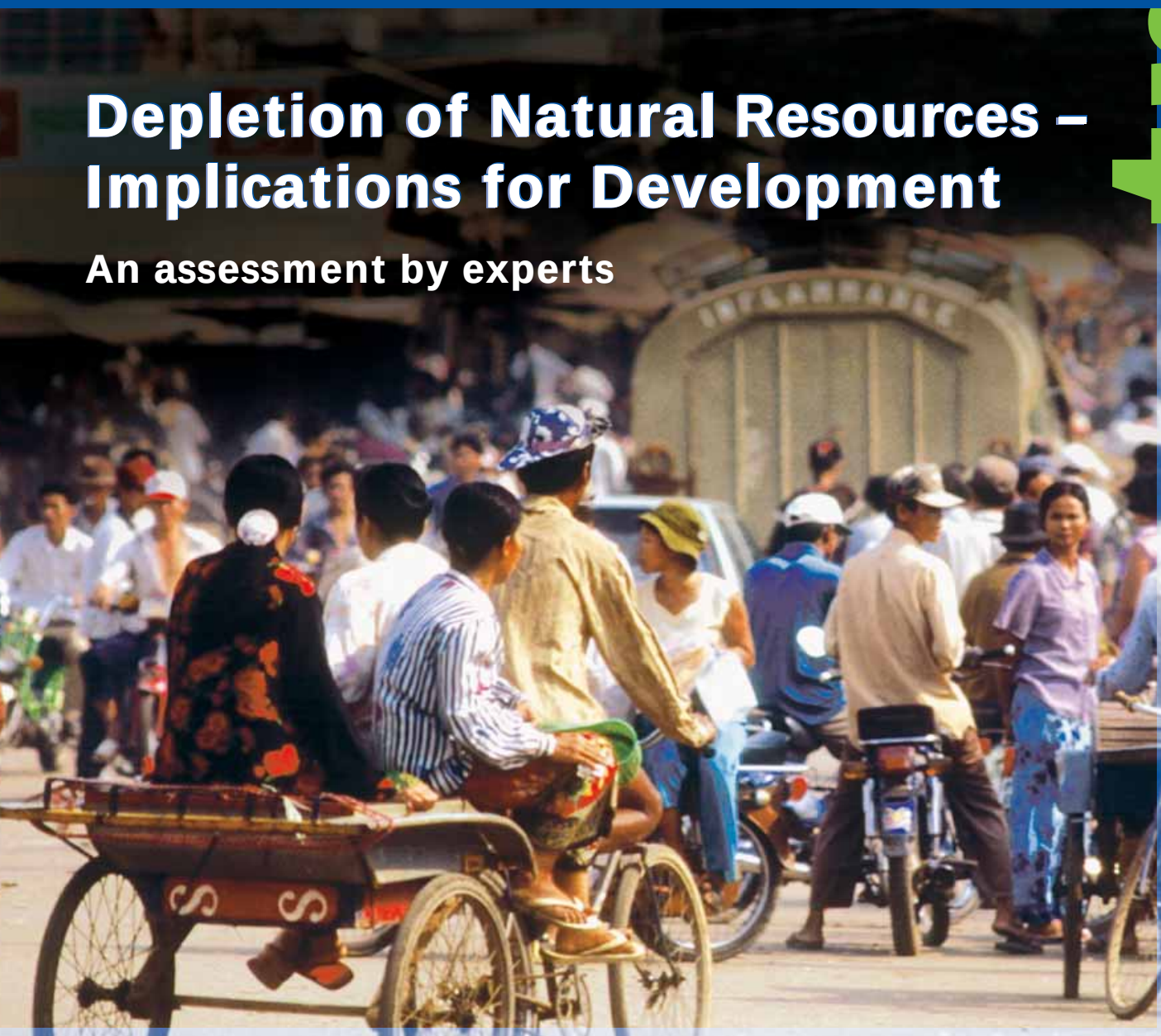
Depletion of Natural Resources – Implications for Development

An assessment by experts



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Carol J. Pierce Colfer, CIFOR
Hans Hurni, CDE
Bill Jackson, IUCN
John Nash, Worldbank
Jeffrey Sayer, WWF
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Tushaar Shah, IWMI

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Population growth increases the pressure on natural resources. Street scene in Phnom Penh, Cambodia. (Photo: FAO/19699/G. Bizzarri)

InfoResources Trends *compiles personal assessments of predicted changes by experts from the realms of politics and science, as well as from implementing agencies of NGOs around the world, and it makes these assessments accessible to a broader professional public.*
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Introduction

Rationale for a qualitative assessment

Changes in the condition of natural resources, and their long-term, usually negative impacts on society and economy have been pointed out clearly and alarmingly by several comprehensive studies, such as the Millennium Ecosystem Assessment. And yet these pessimistic assessments have not been able to bring on a breakthrough of policies or economic and institutional tools that promote efficient and sustainable management of natural resources.

International Cooperation must position itself within this area of tension and identify future priorities of development policy.

In an e-mail survey, eight international experts (see list at the end of this text) have

- assessed the future development of the natural resources and the poverty situation in a developing country within the next 20 years
- discussed promising measures in International Cooperation for promoting sustainable development at the local, national and international levels.

The resulting integrated view of development trends is intended to foster an understanding of long-term challenges and needs for strategic action, and thereby contribute to the positioning process of International Cooperation.

The approach

The entry point for the present assessment is an imaginary country called "Imagineland", which stands for the world's least developed countries (LDC). This reference framework helps to reveal general tendencies in development and prevent the discussion from focusing too closely on regional and context-specific particularities. We are aware that this approach bears the risk of neglecting important factors which, in many cases, may be determining for the development pathways of individual countries.

Imagineland

Imagineland is a developing country. Internal social conflicts occur here and there, mostly between migrants and indigenous farmers, as well as in cities. The gross domestic product (GDP) is dominated by mineral exports, the textile industry, and agricultural exports. Politically, Imagineland has a weak democratic system. Decentralisation processes have started only a few years ago, and corruption has remained an important factor.

The rural areas of Imagineland are characterised by high population growth. About 28% of the rural population live on less than 1 USD a day. Traditional subsistence farming prevails, but increasingly faces competition with cash crop and commodities production. The region is rich in biodiversity. There has been a considerable amount of forest conversion for agricultural purposes. There is also some traditional shifting cultivation. More and more water conflicts are emerging.

Following the electrification of several rural urban centres, some agro-business industries have established processing units in these centres. There is an increase in rural-urban migration, mainly among young men.

Representativeness of the scenarios?

"The socio-economic variables of a country over twenty years are complex and difficult to predict. The scenarios presented above are all reasonable and do reflect many of the real problems of the developing world …"

Bill Jackson, IUCN

"Seems quite representative, especially of Sub-Saharan Africa. Somewhat less representative of South Asia where population pressure on land is higher, per capita incomes lower, and income inequality is lower too. I think South Asia is also facing greater environmental problems, especially pressure on forests, land and water resources."

Tushaar Shah, IWMI

Please refer to the key statistical data of Imagineland in the Annex III

Trends until 2025

"Researchers have recently been testing the veracity of the Environmental Kuznets Curve. The underlying hypothesis is that in early stages of economic growth, natural resources and environmental quality come under intense pressure because a large majority of a country's population tries to make a living through intensive use of nature. At later stages of economic development, however, strong popular demand emerges for environmental amenity and natural resources protection … In view of this, it seems appropriate to believe that most regions of the developing world would face intense pressure on their natural resources and environment over the coming decades."
Tushaar Shah, IWMI

"I am becoming rather pessimistic and feel that the 'systems' in countries such as this are becoming more and more fragile and subject to being badly derailed by external forces – SARS or something similar; major conflict, fundamentalism, resource crises, etc. seem inevitable to me."
Jeffrey Sayer, WWF

Given that the overall conditions in Imagineland will not undergo any radical changes within the coming 20 years, high population growth and the population's strong dependency on agriculture (60%) will be the decisive factors influencing the country's development with regard to natural resources and the poverty situation.
Against this background, the pace and character of industrial and urban development will play a critical role. Rapid industrial growth will raise pressure on the environment particularly in urban and peri-urban areas, while agricultural pressure on natural resources will not cease to increase before the country succeeds in generating sufficient off-farm income opportunities.

Depletion of natural Resources will continue
An average of 23% of Imagineland's soils are degraded to the extent that their productivity is limited. The country's forested area is decreasing by 1% every year. During the dry seasons there are water shortages, and 100 high plant species are threatened.

- Pressure on the natural resources will increase due to expansion and intensification of agriculture, among others also for reasons of commercialisation and increase of global trade.
- The impact of climate change is assessed differently by the various experts. The consequences they predict include more frequent occurrence of extreme events, increasing intrusion of invasive plant species, and decreasing soil fertility. All experts are of the opinion that the adaptation of people and their agricultural systems to climate change requires competences and mechanisms similar to those necessary for adaptation to other degradation processes.
- Improved institutional settings, such as guaranteed land use rights for women and men or local water and forest user associations, can contribute to sustainable resource management.

Poverty will remain widespread
28% of Imagineland's population live on less than 1 USD per day. Their share is even higher at 35% in rural areas. 8% of the rural population are landless.

- Commercialisation of agriculture and development of the industrial and service sectors can contribute to poverty alleviation, provided that the overall conditions are favourable.
- The spreading of diseases like AIDS and malaria, along with a generally bad condition of health care and sanitation infrastructures, have a negative influence on the poverty situation.
- Persisting corruption equally undermines positive efforts.
- External factors, such as economic policies of the industrialised countries, dependence on oil prices, climate change, and natural disasters were mentioned as influences that aggravate poverty and can hardly be controlled by the country itself.

Little attention in the discussion was paid to Imagineland's dependence on price fluctuations in agricultural trade and its influence on the poverty situation.

Regional differences within the country

Processes leading to overuse of natural resources differ within the country. Resource policies need to take account of this fact and develop specific strategies for the different regions.

The experts anticipate that up to 2025 development efforts will be constrained not by the condition of any single resource but rather by that of a combination of different resources varying from region to region.

It is assumed that ecosystem services will be threatened throughout the country, leading to a decrease in agricultural productivity.

The experts therefore expect a general increase in conflicts over natural resources, particularly if resource shortages lead to marginalisation of certain population groups.

"Conflict over natural resources may increase and significantly endanger development efforts in contexts where increased competition over natural resources spills over into the political sphere and leads to political violence."
Joachim von Braun, IFPRI

Region	Degradation of NR (rank gravity)	Poverty status (rank gravity)	Most critical socio-economic and ecological processes; most seriously affected resource
High-potential areas: flat areas with fertile soils used for intensive commercial agriculture	Assessments diverge, ranging from least severe (3 experts) to most severe (2 experts)	Mainly assessed as least severe	Commercial agriculture with new and modern crops implies the use of fertilisers and pesticides, thus posing a threat to water quality and soil fertility. Biodiversity will decrease. Groundwater reserves will be in severe danger of exhaustion. The demand for energy and land will increase pressure on the forests. Increased productivity will not only generate income but also incur social and economic costs. Immigration of workers from rural areas can lead to the emergence of slums. Conflicts over water and land use rights may emerge.
Medium-potential areas hilly areas used for small-scale farming	Severe	Moderately severe to severe	Subsistence farming will continue to increase pressure on the forests. Intensification of agriculture will aggravate soil degradation and erosion. Poverty will remain a serious issue, and the creation of off-farm income opportunities become increasingly urgent. Secure land use rights will also remain a critical element.
Low-potential areas: semi-arid to arid areas used for shifting cultivation	Moderately severe to severe	Severe to most severe	The scarce resource base in these areas will render impossible any significant intensification of land use. As a result, agricultural land will be further expanded. Land degradation and pressure on the forests will become more severe. Increasing poverty will affect people's health, leading to manpower shortages and, eventually, a decrease in productivity. Population pressure and insufficient income opportunities will lead to out-migration.
Peri-urban and urban areas:	Assessments diverge, ranging from moderately severe to most severe	Moderately severe to severe	In-migration and industrial development will result in overuse and pollution of water resources. Intensive agriculture will put soils at risk. The growing urban population's need for energy (charcoal, biofuel) will increase pressure on natural resources in rural areas. Poverty will be less pronounced here than in rural areas, provided that the impacts of in-migration are cushioned by economic development.

Major changes	Probability
Genetically modified crops	Probable
Vaccination of AIDS/HIV becomes effective	
The democratic, decentralised government structure becomes fully operational	
Water services are privatised for urban and rural areas	
Oil prices increase by a factor of 5	
Prices of basic food commodities increase dramatically	
Institutional stability guarantees equitable access to land including land titling for women	
New markets for ecosystem services are established	
The polluter-pays principle is enforced	
Agricultural trade is completely liberalised	low probability

The probability of major changes in Imagineland until 2025: Assessment by experts.
The order is statistically not significant.

Anticipating megacrises

More and more events give rise to assumptions that future "megacrises" will substantially influence development options. Risks differ from region to region.

A megacrisis could be caused by political tensions erupting in extensive conflicts (keywords: September 11; tensions in the region of Afghanistan, Pakistan and India; China as a new power). The cause could also lie in a global economic crisis (economic stagnation, public debt, possible monetary breakdown, shortage of oil reserves). Finally, a megacrisis could also be brought on by dramatic impacts of environmental processes such as climate change in certain regions. The impact of such megacrises is often underestimated in scenarios of future developments.

Othmar Schwank, INFRAS

Major changes

Within the next 20 years, major global changes are expected to influence development also in Imagineland. The probability of these changes as well as their impacts are assessed differently by the various experts. Nonetheless, a majority of them gave similar assessments with regard to the following issues.

- *Genetically modified crops will come into widespread use*
  The consequences for poverty are largely seen as positive, while the impact on natural resources is assessed more or less critically. Better-off farmers will be able to enhance their income thanks to increased yields and fewer losses due to disease. Negative impacts on the poorest are expected only in the event that new technologies would cause difficulties in accessing traditional seed.

- *Vaccination of AIDS/HIV will become effective*
  Health among the poor will be improved, and knowledge about resource use among the local population and in rural institutions will not be lost. On the other hand, lower mortality may temporarily increase pressure on resources.

- *New markets for ecosystem services will become established only in some isolated places*
  Where markets for environmental services do emerge, they will have a positive impact both on the poverty situation and on the natural resources. However, it will be difficult to integrate poor or landless farmers into the system. Moreover, positive effects of these markets will only develop if the government provides clear and transparent regulations, particularly with regard to the flow of financial means.

- *Enforcement of the polluter-pays principle is unlikely*
  Enforcement of the polluter-pays principle is expected to have a positive effect on the natural resources and particularly on the environmental quality and the health situation in cities and downstream areas. In rural areas, enforcement will be particularly difficult due to the decentral nature of the causes of pollution. However, enforcement of the polluter-pays principle is generally assessed as unlikely. Political definition of norms would be a first precondition.

- *Agricultural trade will not be completely liberalised*
  The poor will only benefit from the chances offered by new markets if the state creates the necessary overall conditions. Intensification of agricultural production for export will have a mainly negative influence on the natural resources unless it concentrates on sustainable cultivation of high-quality products.

Development Pathways

The potential

According to the experts, Imagineland does have a potential for guiding its future towards a more sustainable and pro-poor development.

- The process of democratisation and decentralisation that has started some years ago can help to strengthen the accountability of the national and local administrations, and thereby lead to political stabilisation in the long term. Political stability, in turn, is a precondition and a stimulus for reforms, investments in sustainable resource management, and commercialisation of agriculture. Corruption needs to be combated.
- Further development of the agro-business industry and access to new markets for agricultural products are good entry points for creating new off-farm income opportunities.
- The knowledge and the adaptability of local farmers are assets that should not be underestimated. Several of the experts put particular emphasis on this aspect. However, it is important that the political, social and economic conditions provide an environment enabling the population and particularly the poor to become active again.

"Subsistence farmers must be given incentives and capabilities to move to more profitable commercial farming, and agroindustry must have a good environment for private investment in rural areas. This would require a combination of appropriate policies (open trade regime, clear property rights in land and water resources, relatively low taxation of business) and public investments in rural areas (infrastructure, research, extension)."
John Nash, Worldbank

The national level: Strengthening government accountability

The national government plays a central role as a mediator between the local and the international levels. At the same time, as a stakeholder it determines the scope of action for local administrations and participates in international policy-making.

Good governance, improved state accountability, democratisation processes, and land reforms are unanimously regarded as necessary preconditions for sustainable resource management. Good national governance must also have an impact at the local level by strengthening local accountability. One example particularly mentioned is the water sector, where adapted legislation must integrate all stakeholders and enable water users to form associations.

Further measures cited are:

- Granting of land use rights to women and men as an incentive for sustainable land use
- Decentralisation of resource management policies and tasks
- Enabling a diversity of institutional forms that are more appropriate for integrating all parts of the population, particularly women and marginalised groups
- Support for the creation of income opportunities outside the agricultural sector
- Furtherance of public-private research partnerships and the development of modern agricultural technologies

The experts have identified opportunities for an effective contribution of International Cooperation at the national level particularly in the following areas:

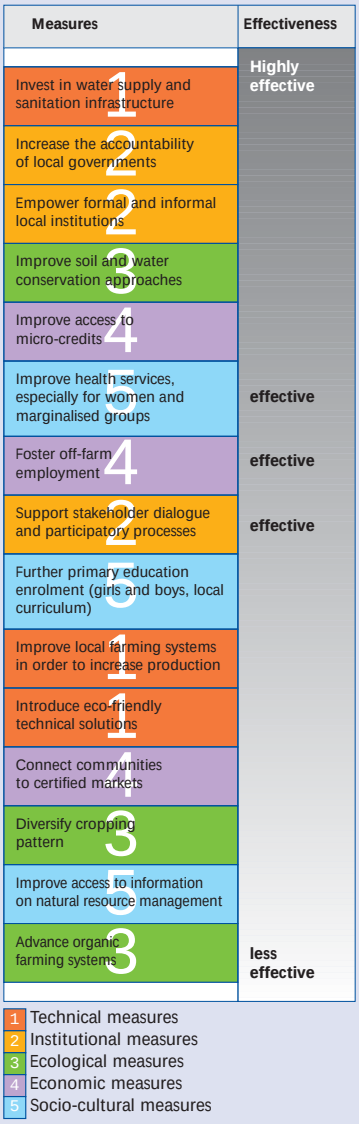
- Capacity building through research partnerships between the South and the North, management training, and financial support for research institutions

"During the past 5 decades, many newly independent countries of the world faced an institutional void at the local level. With the spread of modern ideas about freedom and democracy, the traditional local authority structures were razed down. However, nowhere are these replaced fully by new, democratic institutions of local governance. Rural areas in many parts of the developing world are thus completely ungoverned. For poverty reduction as well as for sustainable resource use, filling this 'Governance Gap' is crucial."
Tushaar Shah, IWMI

"Experimentation with institutional forms that are more hospitable to women and 'marginalized' groups; changes in bureaucratic culture to become more responsive to feedback and flexible rather than so directive."
Carol Colfer, CIFOR

"PRSPs are one important mechanism at the national level for development planning to reduce poverty and generate sustained and pro-poor economic growth. However, natural resource management issues and the agricultural sector are often neglected in PRSPs. That may mean that key aspects of poverty are by-passed."
Joachim von Braun, IFPRI

"There is a real danger that PRSPs are just another instrument to subordinate countries in the South and force them to do what the international communities want them to do. While well-intended, PRSPs are just taken as another obligation, similar to the Structural Adjustment Programmes of the 1980s."
Hans Hurni, CDE



Effectiveness of local-level measures in International Cooperation as assessed by the experts. The order is statistically not significant.

- Support for national and local institutions through capacity building enabling them to develop creative and coherent strategies and solutions that are adapted to the given local and regional conditions
- Strengthening of civil society in accordance with Rio Principle 10, which states the objective of granting civil society access to environmental information and legislation as a basis for well-informed participation in related decision-making processes.

PRSPs could possibly play a coordinating role
The challenges expected within the next 20 years require cross-sectoral cooperation among different branches of the administration. The experts are somewhat reserved with regard to whether national Poverty Reduction Strategy Papers (PRSPs) can be expanded into central and coherent planning instruments.

PRSPs can assume a cross-sectoral coordinating and planning function, provided that certain conditions are met:
- PRSPs must always be the result of a participatory process involving civil society representatives, decision-makers from the various sectors, and researchers. This is the only way to achieving consensus and ownership for all stakeholders, which in turn is a crucial precondition for successful implementation. Participatory processes take time and require capacity building at all levels.
- PRSPs must not be reduced to the economic aspects of development but must also integrate concerns of sustainable resource management and social equity.
- PRSPs must be understood as documents binding governments to assume responsibility towards their own population, and not as yet another commitment towards the international community.

The local level:
Support of institutional development is most effective
Which local measures in International Cooperation are most effective to promote sustainable resource management in Imagineland? Assessments of this question were telling with regard to each expert's individual background and in part diverged rather markedly. Nonetheless, they revealed several rough tendencies.

Institutional measures
In analogy to the national level, experts unanimously stressed the importance of institutional measures also at the local level and assessed them as most effective. International Cooperation should support institutional measures, but not impose them. Implementation takes time.
Strengthening local governments' accountability to the population is seen as particularly crucial. Other concerns considered important include the empowerment of local institutions and the furtherance of dialogue among stakeholders. All these measures can have positive effects not only with regard to sustainable natural resource management, but in all other spheres of society as well.

Local know-how

Two of the experts were rather sceptical about the effectiveness of International Cooperation at the local level. However, they emphasised that local populations possess considerable knowledge of natural resource management, appropriate production techniques, and also economic possibilities. People are able to improve their situation to a considerable extent on their own initiative, provided that the legal and political overall conditions are improved. The objective must therefore be to create legal security, transparency, and enabling incentives. In this regard, International Cooperation can play a supporting role.

Targeted ecological and technical assistance

While a majority of the experts assessed ecological and technical measures as less effective, two of them regard targeted environmental and technical assistance as effective. However, these measures must not put additional pressure on the economic situation of the local population but rather be economically advantageous. The improvement of soil and water conservation represents an important area of intervention. In this regard, markets for ecosystem services are mentioned as possible incentives. While support of organic production, particularly for export, may succeed in generating a win-win situation, it can hardly be implemented at a large scale. The promotion of biomass fuels and renewable energy in general may prove to be an interesting new area for interventions.

The international level: Enhancing competence in delegations

Which measures should International Cooperation advocate with particular emphasis in the UN and other international bodies?

Enhancing competence in delegations from least developed countries (LDCs)

Delegations from LDCs are often not in a position to fully comprehend their national interests and articulate them vis-à-vis the international community. Experts therefore consider measures aiming to improve the capability of delegations to advocate their country's interests in international negotiations as particularly promising. Creative and sustainable forms of knowledge transfer and research can enable administration staff to better identify their country's difficulties, but also its potential. Special attention must be given to ensuring that the concerns of underprivileged population groups are taken into account; otherwise there is a risk that delegations will neglect accountability to their own population. Along with these capacity-building measures, the openness of industrial nations to the concerns of the LDCs must be enhanced.

Reducing contradictions between the WTO and the environmental conventions by developing social and ecological standards

Initiatives aiming to develop social and ecological standards can help to mitigate natural resource degradation and poverty in developing countries like Imagineland. If guided in the right direction, trade could even serve as a catalyst for sustainable development. However, success in this area will be difficult to achieve: the WTO and the envi-

"Ultimately, good international policies will require meaningful input from all interested parties, and that includes LDC delegations, whose input now is hampered by lack of receptivity on the part of the West/North, by language problems for the delegates themselves, by lack of confidence deriving from horrid colonial experiences, by lack of information on non-dominant groups in their own countries, etc."
Carol Colfer, CIFOR

ronmental conventions are based on fundamentally diverging principles, and governments have done little towards reconciling them. A possible contribution by International Cooperation could consist of supporting developing countries at the national level in cushioning the negative impacts of rapid market opening through appropriate measures.

No additional conventions

Closing thematic gaps in the existing environmental conventions through additional sectoral conventions – a water or a soil convention, for example – is considered the wrong approach. The experts argue that it would hardly have a short-term impact in the developing countries; this, in turn, could curb efforts. In addition, there is a current trend towards interpreting the existing conventions so broadly that they cover all natural resources. Efforts should therefore aim to advance implementation of the existing conventions. However, implementation should be carried out not for its own sake, but with a special emphasis on the demands and interests of each individual country.

The experts did not discuss the possibility or the chances of developing a new convention that would encompass all natural resources and thus solve the problems of the partly incoherent sectoral conventions.

Other measures that a majority of the experts assessed as promising:

- Assuring the funding for existing mechanisms
- Improving the coherence of environmental conventions and multilateral agreements
- Fostering implementation of conventions and multilateral agreements
- Fostering research on institutional innovation in order to mitigate natural resource degradation and advance poverty alleviation

Funding

Which sources of funding will contribute to financing sustainable management of natural resources in Imagineland?

The experts estimate national and international subsidies to contribute the largest portion of funding. International subsidies include so-called “debt-for-nature swaps”, where a country’s debts are cancelled provided that it invests the corresponding amount into natural resource conservation. Although this type of agreement is not very widespread so far, it is considered to have a certain potential for the future.

Compensation of ecosystem services will also play an important role, provided that governments define clear and transparent rules. While markets for certified products can produce positive results on a local scale, they will never play a significant role for the overall funding. Bilateral and multilateral cooperation will make financial contributions to sustainable natural resource management, however it will account for a smaller portion than subsidies.

Investments into natural resources will also be made by the local population, provided that appropriate incentives, such as clear land rights, are established. Finally, private companies are expected to increasingly assume responsibility and invest into sustainable natural resource management.

Concluding Comments

Imagineland does not exist. Yet, the problems that this fictitious country is struggling with are representative for many of our world's least developed countries. Although the experts' assessments of the situation of natural resources and poverty in Imagineland in 2025 showed marked differences in the details, they nonetheless did reveal basic tendencies and patterns that should be given more attention in future International Cooperation.

InfoResources regards the following insights from the appraisal as particularly important for the future:

- In 2025, development constraints will arise not from a single specific resource, but from increased pressure on the entire system. We can only emphasise that the current trend towards promoting integrated approaches to sustainable resource use points to the right direction. Important approaches in this regard include sustainable land management, the ecosystem approach, and forest landscape restoration.
- However, efforts towards more sustainability in resource management will not be sufficient for reducing pressure on the resources. Alongside these efforts, economic growth with labour-intensive value added and, accordingly, the creation of off-farm income opportunities must help to reduce the percentage of people dependent on subsistence farming.
- The need of reforming local institutions, strengthening government accountability and enhancing competence in international delegations has been clearly stated. The establishment of enabling incentives in a broad sense through good governance, clear land use rights, capacity building and others, will be crucial. This is where the experts have clearly located the greatest potential effectiveness of efforts in International Cooperation. It was rated higher than the support of technological innovation.
- Social and ecological standards within existing international economic treaties (e.g. WTO) are expected to have a greater effect with regard to promoting sustainable resource use and pro-poor development than additional sectoral treaties complementary to the environmental conventions could have. The opening of global trade is the driving force behind any further development. Therefore, this process itself must be shaped to support the poor and promote sustainable resource use. Environmental conventions can have nothing more than a corrective effect. A majority of the experts thus agreed that priorities must be set accordingly with regard to International Cooperation efforts.
- Finally, accountability must be improved at all levels. Ethical responsibility both of the national governments and administrations vis-à-vis their own people and of the international community and its institutions vis-à-vis the least developed countries is an important precondition for poverty alleviation and sustainable resource management. This is also apparent in the models for funding sustainable resource management that the experts suggested.

"Worldwide there are about 2.6 billion people engaged as subsistence farmers in the primary sector. This is probably the single most important factor relating to poverty and food security among rural populations, as these people will only be able to free themselves by sending most of their children off their farms. Once there are more people active in the other two sectors of the national economies, these will stimulate agriculture and enable the remaining farmers to sell an increasing portion of their farm products on the markets, and hence have more means to buy inputs and re-invest into their farms. Agriculture-based development of a country is a myth that was never true, not even in our countries, and it will not work in developing countries either."
Hans Hurni, CDE

"The role [of International Cooperation] will be limited compared to the influence of market forces. Helping to improve human capital (education and training) and institutional capital (learning and experimentation etc.) will be important. So Development assistance could provide management training etc. I do not think that technical assistance will be an important factor."
Jeffrey Sayer, WWF

List of experts

Experts	Focus	Institution
Joachim von Braun Director IFPRI; President Int. Academy of Agricultural Economists IAAE; Collaboration in German Action Plan 2015 for the attainment of the MDGs	Food security; Projections, e.g. Africa 2020; Poverty and globalisation	International Food Policy Research Institute (IFPRI), Washington DC
Carol J. Pierce Colfer Team leader of the CIFOR program on Local People, Devolution and Adaptive Collaborative Management of Forests	Social aspects, social processes, adaptive management, social forestry, equity and gender issues criteria to assess progress in meeting social objectives of community forestry	Centre for International Forestry Research (CIFOR), Bogor, Indonesia
Hans Hurni Director CDE; Director NCCR North-South; Chairman European Forum on Agricultural Research for Development EFARD; member International Assessment on Agricultural Science & Technology for Development IAASTD	Integrated and sustainable natural resource management	Centre for Environment and Development (CDE), University of Berne, Switzerland
Bill Jackson Director Global Programme, IUCN	Biodiversity; Rural development and conservation	IUCN International, Gland, Switzerland
John Nash Advisor for Commodities and Trade in the World Bank's Agriculture and Rural Development Department	Economic development, Commodity and weather risk management, Trade policy in Latin America, Africa, South Asia, and transition economies; Agricultural policy adjustment; Agricultural price policy; Capital mobility	Worldbank, Washington DC
Jeffrey Sayer Senior Associate of the World Wildlife Fund International's Forests for Life Program; was Founding Director General of the Center for International Forestry Research CIFOR	Sustainable forest management	World Wildlife Fund for Nature International (WWF), Forests for Life Programme, Gland, Switzerland
Othmar Schwank UNFCCC Expert (climate change); Leader of the Swiss State Secretariat for Economic Affairs Delegation for the "National Strategy Studies for CDM" in China and India; longterm SDC backstopping mandate for Climate Project in India	Energy, climate adaptation, Environment management	Infras Consulting, Zurich, Switzerland
Tushaar Shah Indian Respresentative of IWMI; Winner of "Outstanding Scientist of the Year" award of the CGIAR in 2003	Water governance, Water resource management, NRM research; Broad knowledge of the water situation in South Asia, China and East- and South Africa, Experience in partnership with private sector (IWMI-Tata project India)	International Water Management Institute (IWMI), Colombo, Sri Lanka

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Key Statistical Data of Imagineland

General data

- Low income country
- Territory: 200,000 sq km
- Total population: 20 million; 60% aged between 15 and 64
- Population density: 100 inhabitants per sq km
- Urban population: 40% of total population; 3 million live in the capital city
- Employment by sector: agriculture – 60%; small-scale industry, mining, agro-industry and construction – 15%; services and administration – 25%
- Gross domestic product (GDP): USD 30 billion; GDP composition by sector: 35% agricultural, 25% industry, 40% services
- Democratic system, decentralisation process started a few years ago
- No open conflict
- The three Rio conventions have been ratified

Services and infrastructure

- Administration: rather strongly centralised administration in the capital and recently established administrative centres in district capitals
- Education: secondary school mainly in rural centres, two main universities
- Hospitals in district capitals, 1 primary health centre per 35,000 inhabitants, national public information campaign on HIV/AIDS
- Transportation: paved highways linking the main rural urban centres (5,000 km) and 30,000 km of unpaved rural roads
- Water and sanitation: 70% of population have access to improved water sources, 25% have access to sanitation

Energy

- Electricity production: 30 billion kWh; concentration in rural urban centres with 65% of the households connected; only few villages connected in rural areas
- Gas production: 60 million m^3, for domestic consumption
- Oil: no production; consumption of 40,000 barrels/day

Communication, information

- General information dissemination mostly through radio broadcasting; about 20% of the population owns a radio receiver and less than 1% owns a television
- Telephone: systems are still rudimentary, but expanding; about 500,000 main lines and 1 million mobile phones in use

Data on rural areas

Natural resources

- Subtropical, rainfall between 600 and 1500 mm, 2 rainy seasons, 5–7 dry months
- 30% of the area are mountainous and 40% hilly
- The main rivers have their sources in the hilly and mountainous areas; some of them dry up towards the end of the dry season
- Soils: few fertile volcanic soils, mainly tropical soils sensitive to human activities
- Forests: 20% of the area, out of which 40% are secondary forests, 10% plantations and 20% protected areas; deforestation rate of 1% between 1990 and 2000
- Arable land and permanent crops: 15% of the country; grasslands: 20%
- Land quality: 23% degraded by erosion, leaching and inadequate application of fertilizers, to the point that production is affected
- Moderate but increasing pollution; environmental sustainability index (ESI) of about 50, i.e. the worldwide average
- Water availability: 5,000 m^3/capita
- Biodiversity: 5% of territory is under protection, 100 higher plant species are threatened

Society

- Average population density in rural areas, about 60 inhabitants per sq km
- Demographic growth of 2%
- 35% of the households live on less than 1USD a day in rural areas, 28% countrywide
- Up to 8% of the farmers are landless
- Frequent causes of adult mortality are malaria and AIDS; infant mortality is about 50 deaths per 1000 live births
- 65% of the girls and 85% of the boys are enrolled in primary schools
- Female/male ratio in rural areas is 53/47

Farming systems

- Arable land per capita is about 0.15 ha (6–7 inhabitants per ha arable land and permanent crops)
- Intensive and frequently irrigated agriculture around urban centres and in the alluvial plain, cash crop production for export (about 20% of the arable land)
- Medium- and small-scale agriculture, mainly subsistence agriculture in the hilly regions (60% of the arable land)
- Shifting cultivation in the mountains
- Small-scale livestock farming for subsistence

Rural household economy

- Energy source: biomass (wood fuel), oil/petroleum (transportation, lighting)
- Cash crop commercialisation contributes to 50% of the rural incomes
- Remittances incomes from emigrants: 5%