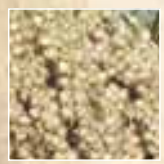
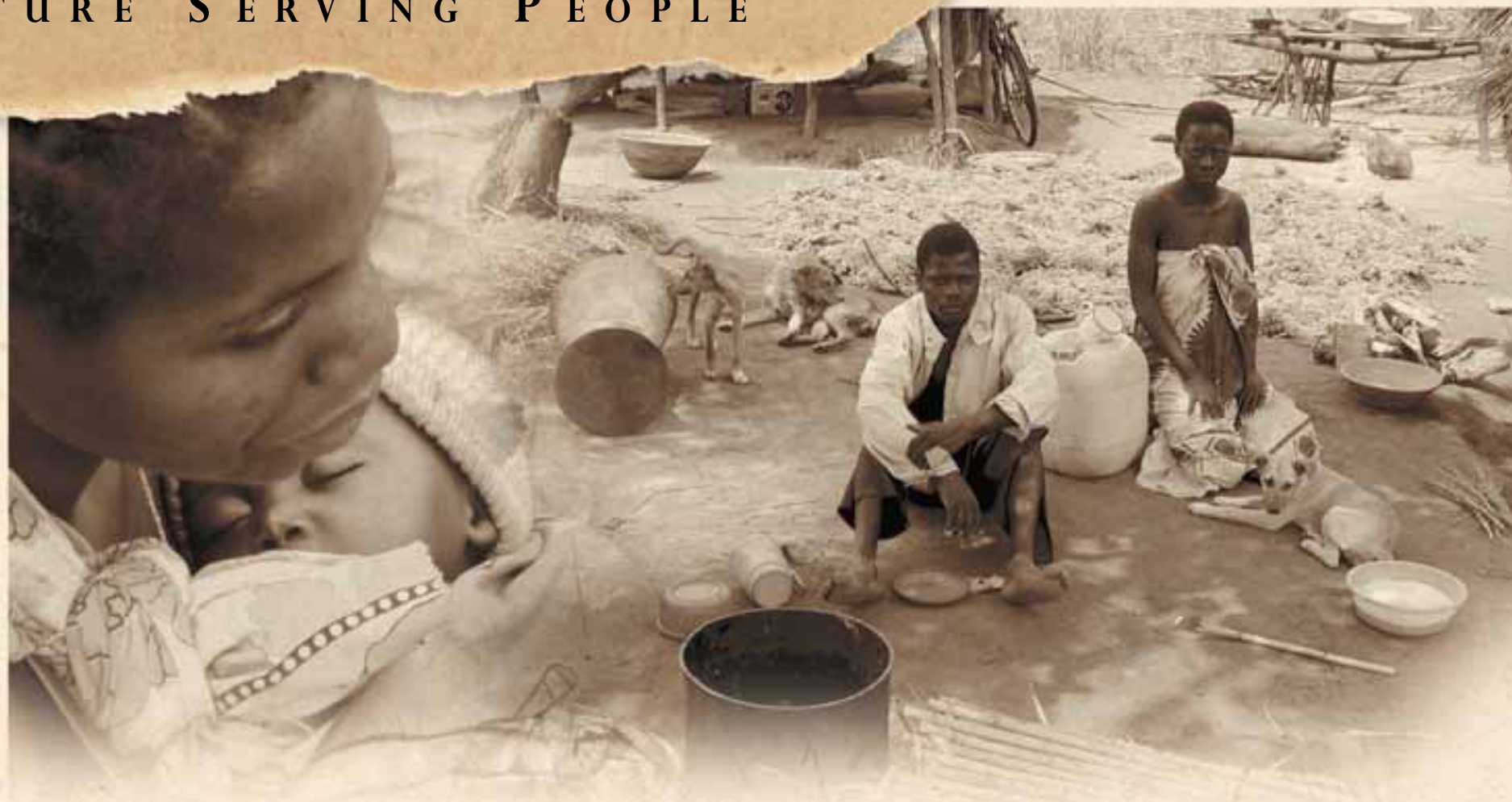
NATURE SERVING PEOPLE





A pilot assessment of southern African ecosystems

Millennium Ecosystem Assessment

STRENGTHENING CAPACITY TO MANAGE ECOSYSTEMS SUSTAINABLY FOR HUMAN WELL-BEING

The Millennium Ecosystem Assessment

The Millennium Ecosystem Assessment (MA) is an international effort to assess the capacity of ecosystems to support human well-being and life on earth. Several hundred leading social and natural scientists from all over the world are conducting the assessment, with the help of the public and decision-makers who use and manage ecosystem resources. The MA is funded by the World Bank, donor countries and private foundations, which are represented on the MA Board together with user groups and the United Nations.

What kind of information will the MA provide?

The MA will answer questions such as

- How can ecosystem-related management policies and actions best contribute to the alleviation of poverty?
- How does economic growth and globalisation affect ecosystems?
- How does population change affect ecosystems?
- What implications do changes in ecosystem services hold for future human well-being?

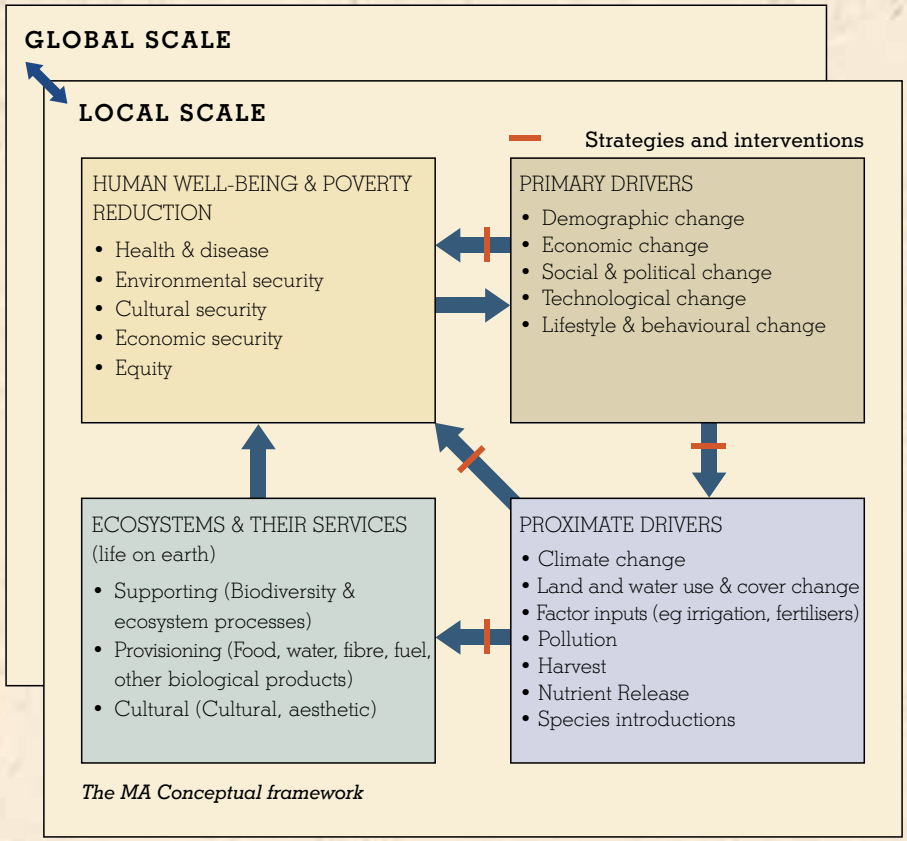
Who will use this information?

- **Governments** – to make better decisions about human development, ecosystems and poverty alleviation;
- **Firms** – to include environmental decisions in their business strategies and environmental management systems;
- **The public** – to become more aware of the impact of ecosystem changes on their well-being.

Ecosystem Services: The benefits that nature provides to humans and the rest of the living world. They consist of things like clean air and water, food, forest products and biodiversity.

Human well-being depends on ecosystem services

Humans are directly dependent on ecosystems for air, water, food and other basic needs. Underlying the provision of these 'ecosystem goods' are supporting ecosystem processes such as pollination and climate systems. The provision of ecosystem services may be affected by factors such as pollution and land cover change. Ultimately, these factors are themselves influenced by human well-being. Feedbacks occur both at the scale of an individual village and the entire globe. Interventions at key points can influence these feedbacks in positive ways.



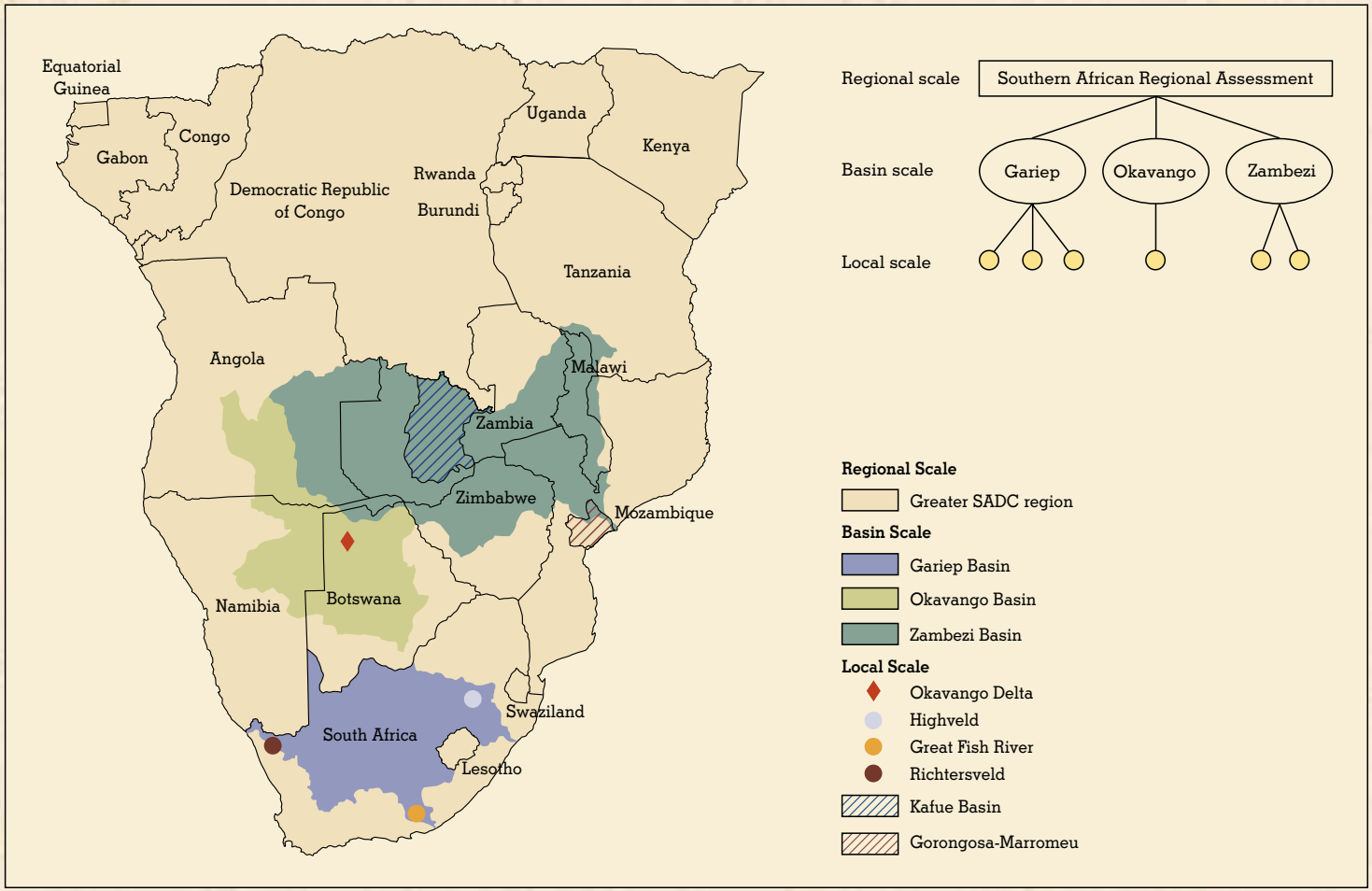
The MA Conceptual framework

SA*f*MA: The southern African Contribution to the MA

The southern African sub-global assessment (SA*f*MA) is linked to the global MA, and aims to assess the services provided by ecosystems in southern Africa and their impacts on the lives of the region's people. The assessment will explore how local, informal management systems and conventional, formal management systems can be combined to manage ecosystems in ways that ensure the continued provision of ecosystem services in the region. Much of the local level data will be collected using participatory research approaches, and tapping into the knowledge and memories of local resource users will be an important strategy. Regional stakeholders are represented on the SA*f*MA Advisory Committee, which directs the work of the SA*f*MA team.

Multi-scale approach

SA*f*MA is being carried out at a number of spatial scales. Since a multi-scale assessment has never been conducted in the region, SA*f*MA has adopted an experimental approach whereby each study is testing a different assessment method. An important objective of the pilot assessment was to test mechanisms for integrating the results from different scales. SA*f*MA is playing a leading role in the MA in this respect.

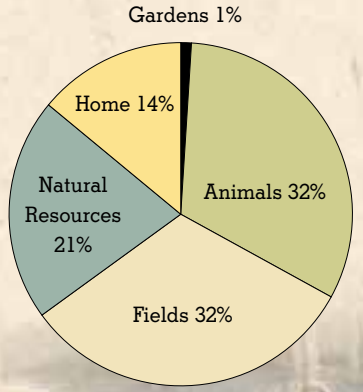


Ecosystem Services & Human Well-being

People rely on ecosystems to fulfil their most basic needs: air, water and food. All fuel, fibre and construction material are also ultimately derived from ecosystems. The dependence of people on ecosystems is often more apparent in rural communities whose lives are directly affected by the availability of resources such as food plants and firewood. Urban communities and wealthier groups in society may be partly buffered from changes in ecosystem services, for example by water treatment plants performing the water cleaning services that healthy rivers provide.

Ecosystem services and the livelihoods of rural communities in Zimbabwe

Direct services provided by ecosystems make up one-fifth of the total value of rural economies in the Zambezi Valley of Zimbabwe. The value of contributions from all ecosystem services greatly exceeds this percentage because the contributions of fields, animals and gardens are all derived from ecosystem services.



Sorghum, fish, reeds, baskets, thatching grass, fibre, poles and firewood. This rural scene highlights the importance of natural resources to household well-being in southern Africa.

Ecosystem services in an ordinary rural life

Every morning Lettie Mathebula wakes up at 5 am to prepare the morning porridge for her family of five. She cooks on an open fire using fire wood that she collects twice a week. She uses 8 - 9 kg per day. If she had to buy it, the cost would be over R 1000 per year. She is concerned about dwindling supplies, as she must now walk further to find suitable wood. She knows that she would struggle to afford electricity or paraffin, or to purchase wood from a vendor.

Most of the family's meals consist of maize porridge and *morogo* (wild spinach) and cultivated vegetables such as tomatoes, groundnuts, beans and cabbage. They rarely have meat. During summer they eat *morogo* twice a day, consuming approximately 58 kg over the year, with an annual market value of R1 900.

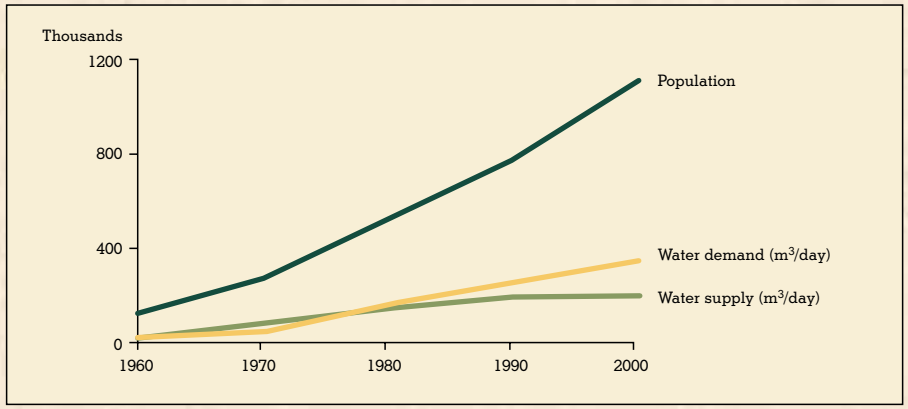
During the day she collects *Commiphora* bark medicine for her son who has a stomachache. She regularly self-medicates with some of the more popular herbal medicines. Mrs Mathebula also makes reed mats to earn extra income. She sells 2 - 3 mats a month and earns R50 – R100 per mat depending on the size and decoration.

Adapted from Sheona Shackleton and Charlie Shackleton (Currently US$1=R10)

Photograph: Tim Lynam

Ecosystem services and urban communities in Zambia

The population and water demand in the capital, Lusaka, have been increasing at a rate of 3.7% per year. The increase in water supply has been significantly lower (1.5% per year), with almost no increase during the past decade. Consequently, only 60% of the water demand is currently met, with important consequences for the Zambian economy and human well-being in Lusaka.



Ecosystem services and commercial farming systems in South Africa

Commercial production systems overcome some of their direct dependence on ecosystem services by relying on high fertiliser inputs to substitute for soil nutrients. They remain dependent on ecosystem services such as the provision of a soil substrate in which crops can take root, and the provision of water through rainfall or irrigation.

Commercial farming results in a number of important environmental consequences, which impact on the commercial farming sector as well as on other sectors of society. Some of the most important impacts are topsoil loss and land cover conversion (see satellite image).

Investigating the relationship between ecosystem services and human well-being

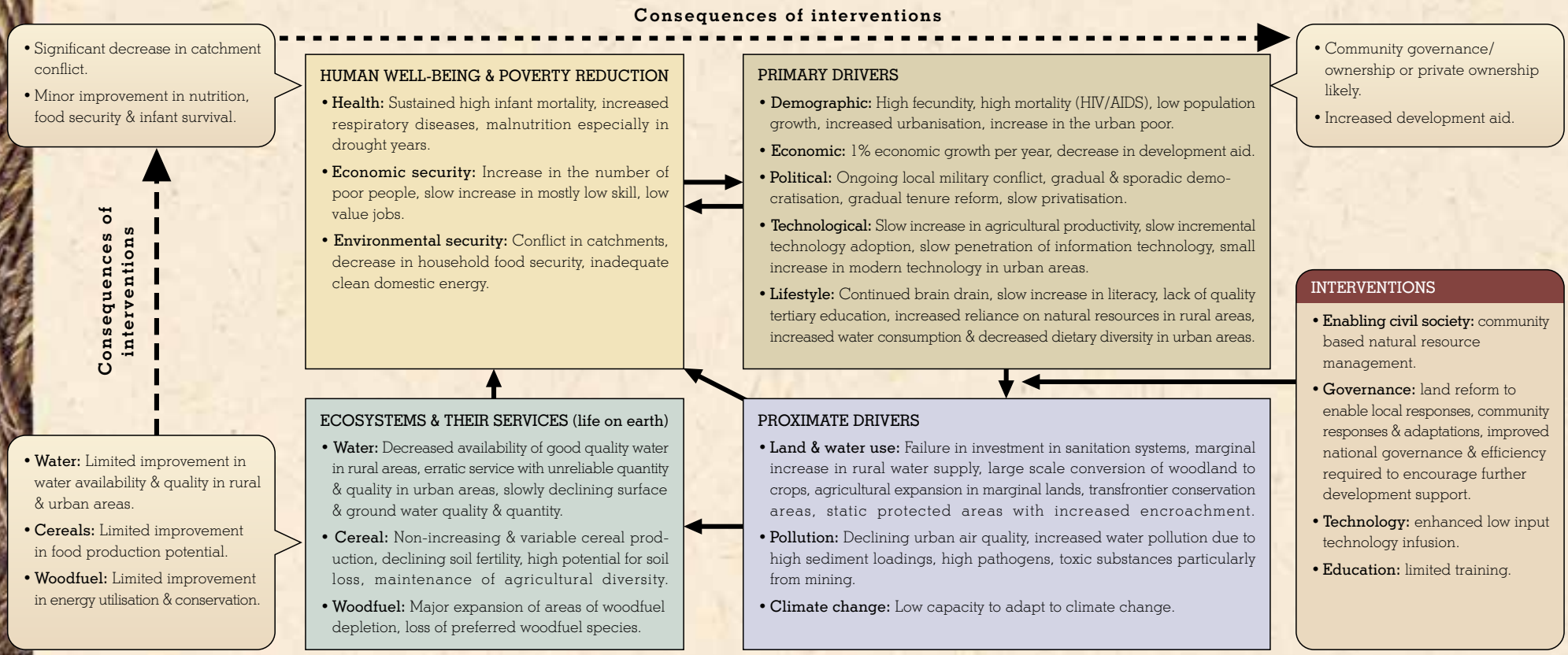
Ecosystem changes and human responses are difficult to predict. Changes in the provision of ecosystem services affect some groups of people more than others. Certain groups of people are better able to adapt to changes in ecosystem services than others. The way in which we respond to ecosystem change and the decisions we make affect the well-being of current as well as future generations. Managing the many and varied responses that occur at the local scale is particularly challenging for policy-makers. What risks do our choices hold for the different groups in society? Can we identify those groups that are least able to adapt in ways that improve their quality of life?

To make matters even more complex, what happens in one location may have knock-on effects elsewhere.

Ecologists and social scientists are increasingly aware that systems under stress may show very little change for a long period, and then suddenly and unpredictably experience massive, often irreversible changes. How can we know when social or ecological systems are on the verge of calamitous change? How can society buffer itself against radical changes?

Patchwork Africa Scenario

In this story, current trends in the SADC region persist. Low economic growth rates and declining foreign investment lead to the increased marginalisation of Africa. While democracy and good governance take hold in some countries, governance in others remains ineffective. Localised military conflicts continue to take place. Improvements in agricultural productivity are not sufficient to meet the needs of the growing population, so large-scale conversion of woodlands to crops, and the expansion of agriculture into marginal lands take place. Protected areas are encroached and **ecosystem services** affected by increased soil erosion and declining water quality. Many people migrate to cities, where they remain impoverished. Most governments are unable to ensure **human well-being** through the provision of reliable, safe water or the enforcement of urban air quality standards. Environmental security is jeopardized, setting the stage for local, regional and international tension. **Interventions** that address environmental problems are centred on enabling civil society at the local scale, for example, through infusion of low-input technology and community-based natural resource management initiatives.

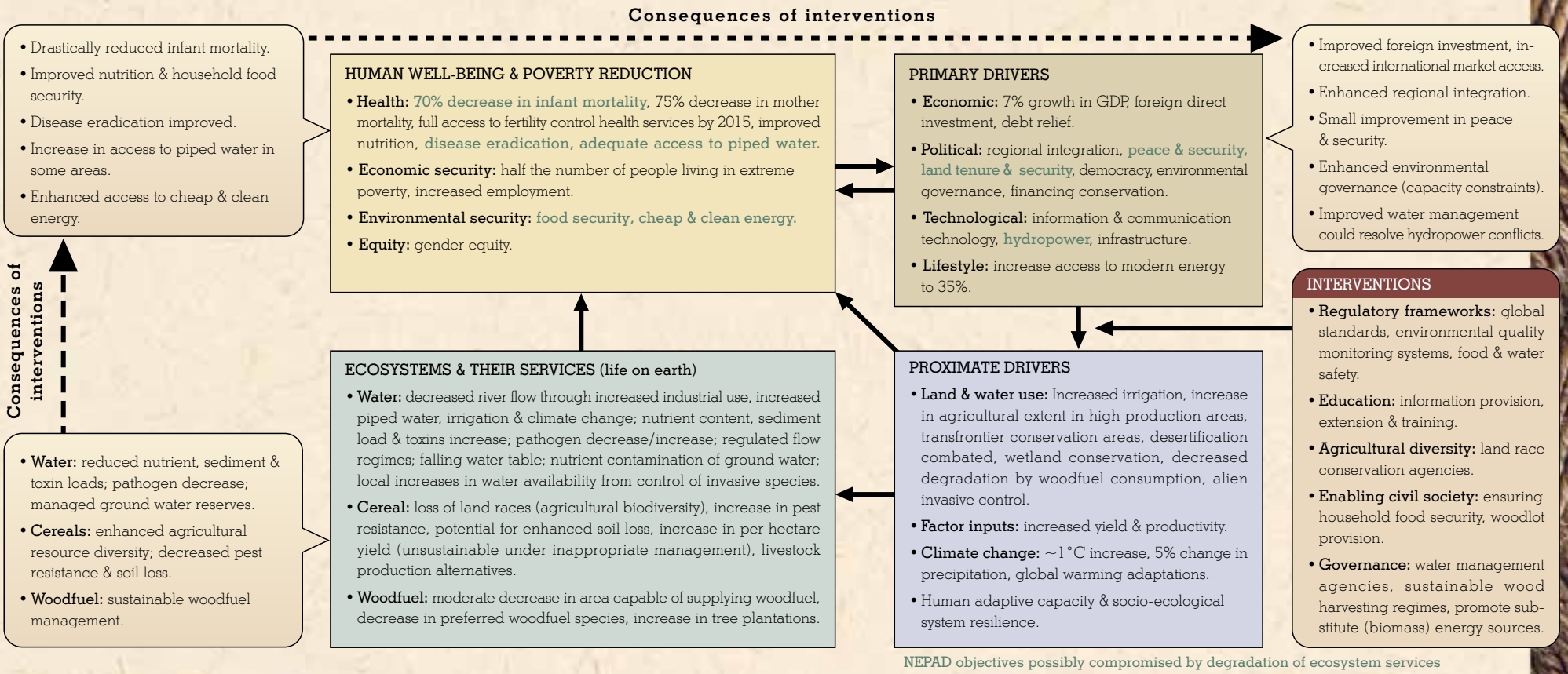


What are scenarios used for?

Managers and policy-makers base their decisions and policies on 'mental maps' of how the future will develop, but the future seldom unfolds in the way we expect. ***Scenarios*** *are a tool for helping decision-makers think about the future. They are credible and coherent alternative stories of how the world may develop. They are designed to challenge our assumptions, focus on key uncertainties, understand drivers and dynamics, and test our strategies and plans.*

NEPAD Scenario

African leaders commit themselves to improving **human well-being**. By promoting good governance and regional peace and security, the region is able to attract increased foreign investment. The developed world cancels some of the debt owed by African Nations. Improvements in infrastructure are accompanied by the modernisation of information and communications technologies. The energy needs of the increasingly wealthy and urbanised African population are largely met by hydropower, but in rural areas woodfuel remains an important energy source. Developments in the agricultural sector boost productivity and relieve pressure to cultivate new lands. Expanding agricultural, mining and manufacturing operations impact mainly on water and air quality. Competing water demands lead to conflict in the region. Fertiliser and pesticide runoff from farms contaminates rivers, increasing the cost of providing safe water and incubating water-borne diseases such as cholera. The expansion of farms based on single crop species make the region more vulnerable to pest invasions and drought. These negative impacts can be mitigated by **interventions**, such as enforcing environmental quality standards and establishing regional water management agencies.



How were the SAfMA pilot scenarios developed?

The SAfMA team developed the two pilot scenarios by mapping two different visions of southern Africa's future into the MA conceptual framework (see introductory pages). The NEPAD scenario was based on the widely promoted New Partnership for Africa's Development. The Patchwork scenario was developed by extrapolating existing trends and patterns.

Water

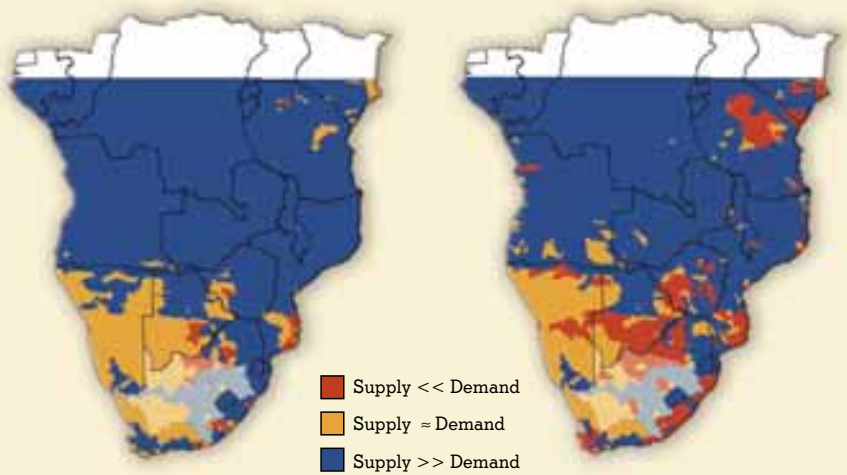
Vital for human survival, water is also crucial to the maintenance of ecosystem processes and the functions of many economic sectors, such as agriculture, industry, and tourism. The United Nations sets a minimum target of 1000m^3 per person per annum to satisfy human needs. Where water supply drops below this level, it can lead to problems with food production and economic development, unless the region is wealthy enough to apply technologies for water use, conservation or reuse. Growing human populations, increasing levels of household and industrial consumption, restrictive water policies, seasonal variability, and climate change are some of the factors that affect future water availability in the southern African region.

Why an assessment at multiple spatial scales?

A multiple-scale approach makes it possible to investigate processes at the scales at which they take place. For example, water availability may be most influenced by community adaptation at the local scale, national water policy at the basin scale, and climate at the regional scale. A multi-scale approach takes into account feedbacks between scales. For example, a local assessment of water supply in a downstream farming community would be incomplete without information on the activities in the upstream part of the basin. Larger-scale assessments provide context for local-scale studies and local assessments can ground-truth regional scale findings.

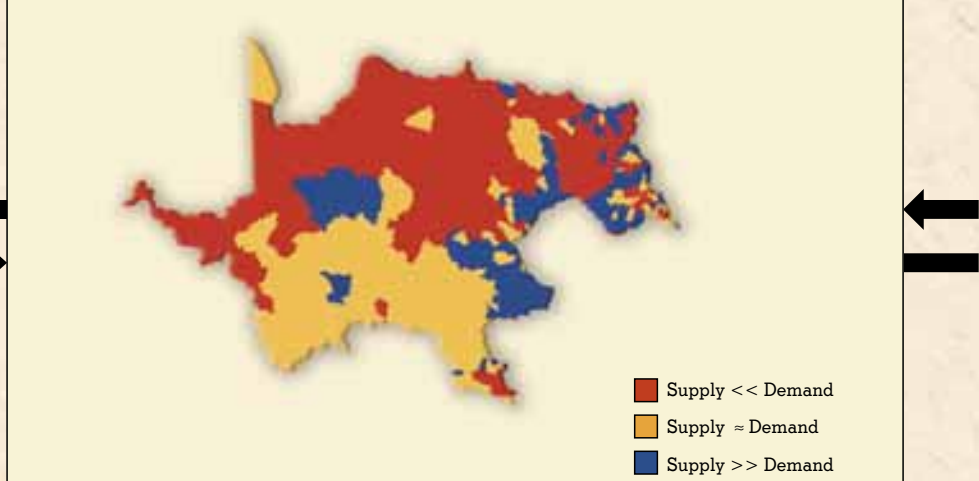
Global Millennium Assessment

Regional Scale



While countries north of 15°S have annual water supplies far in excess of demand, countries south of 15°S either already experience permanent water shortages or have just enough supplies to meet current demands. In some areas, water availability may appear adequate when averaged across the year, but when 'zooming in' to conditions in the driest month, severe shortages may be found (eg Rift Valley, Tanzania). Unless consumption patterns change, areas shown in yellow are likely to experience water shortages in future. The regional assessment is based on global datasets of runoff and population.

Basin Scale



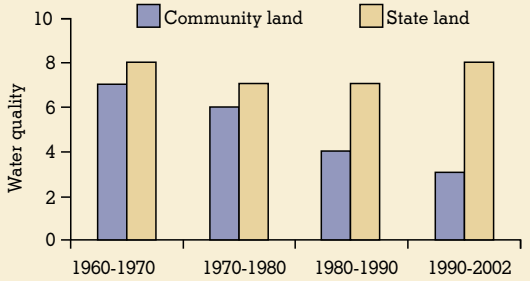
'Zooming in' at the Gariep Basin scale, one finds that most of the region experiences greater water shortages than predicted by the annual regional scale model. These results are surprising as one would have expected that, by including data on water transfers into the basin, there would be fewer water shortages than predicted by the regional model. These differences need further investigation, but may possibly lie with the data. The Gariep Basin assessment used national runoff and population data as opposed to the global datasets used at the regional scale.

How does a multi-scale assessment meet the needs of different users?

A regional scale assessment does not directly meet the needs of local communities, while local community assessments alone cannot meet the needs of regional bodies such as SADC. A multi-scale assessment helps ensure that the perspectives at any given scale are reflected in the conclusions at other scales. For example, a local community may have a very different perception of the costs and benefits of different ecosystem features to national-level decision-makers. In addition, a multi-scale assessment can highlight where overall beneficial impacts of policy change at a national scale hides 'winners' and 'losers' at local scales.

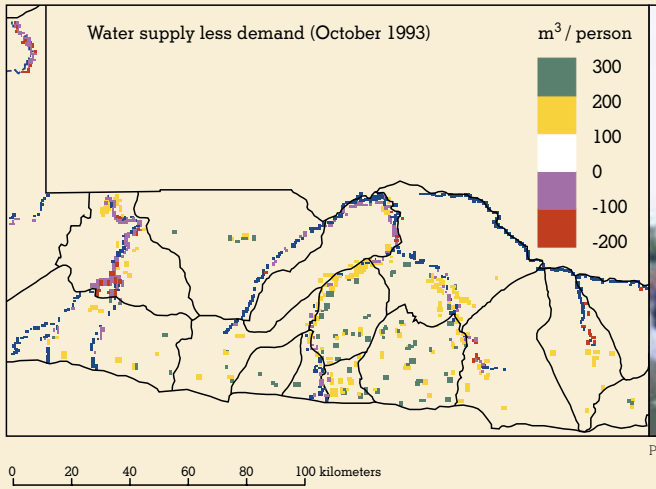
Water Quality in the Great Fish River Valley, South Africa

In the Great Fish River Valley, water quality varies with land ownership. The local community has experienced a decrease in the quality of water on community land, but believe that water quality on state land has remained constant. They represent their perceptions with piles of stones.



Local Community Scale

Eastern Zambezi Valley, Zimbabwe



When assessing small areas that appear to have uniform conditions at the regional scale, local areas of excess supply and demand appear. In the Eastern Zambezi Valley, patterns of water availability for October 1993 follow the major river systems, where most settlement occurs. As rainfall and recharge are lower in the north, areas here are generally under greater water stress. National conditions of governance and the economy influence water availability in the local region as they affect borehole development and dam construction.

Kafue Basin, Zambia

Photograph: C.G. Mucheleng'anga and A.R. Turton 2001

Socio-economic factors may influence access to water at a specific location. Although runoff is more than sufficient to meet demand in Lusaka, government lacks the funds to develop and maintain water supply infrastructure. Water companies using tank lorries supply wealthier residents. In peri-urban areas, water supply schemes are operated and maintained by charging users for the water. Households that cannot afford one of these schemes are forced to use contaminated water from hand-dug shallow wells.

Why do results differ between scales?

The regional-scale 'view' may differ from basin- or local-scale 'views' due to averaging over local differences. On average, everyone may have enough water, but some people within the specific area may have more than enough water, while others may experience water shortages. In other cases, local communities may have adapted in ways that overcome the shortages predicted at larger scales. For example, Windhoek, the capital of Namibia, manages to sustain industrial activities through a sophisticated water-recycling system. Shortages apparent at the local scale but not predicted at the regional scale may be due to localised high demand activities (such as irrigation systems in the lower Gariep Basin) not included in the larger scale models.

Woodfuel Energy

People need energy to cook their food, heat their homes and provide light. In southern Africa, more than half this energy is provided by wood or charcoal. People in rural areas are more dependent on woodfuel than people in urban areas, who have greater access to alternative energy sources such as electricity. Where alternative energy sources are unavailable or unaffordable, city-dwellers may also be heavily reliant on woodfuel energy (see box on Kafue Basin).

Woodfuel shortages occur in areas where there are large populations without access to alternative affordable energy sources. In such areas, food cannot be properly cooked and as it is too expensive to boil water or heat homes, waterborne diseases such as cholera spread and people become more susceptible to illness or malnutrition. Woodfuel scarcity impacts particularly on the rural poor, especially women and children, who must walk long distances searching for firewood, leaving less time for tending crops, cooking meals or attending school.

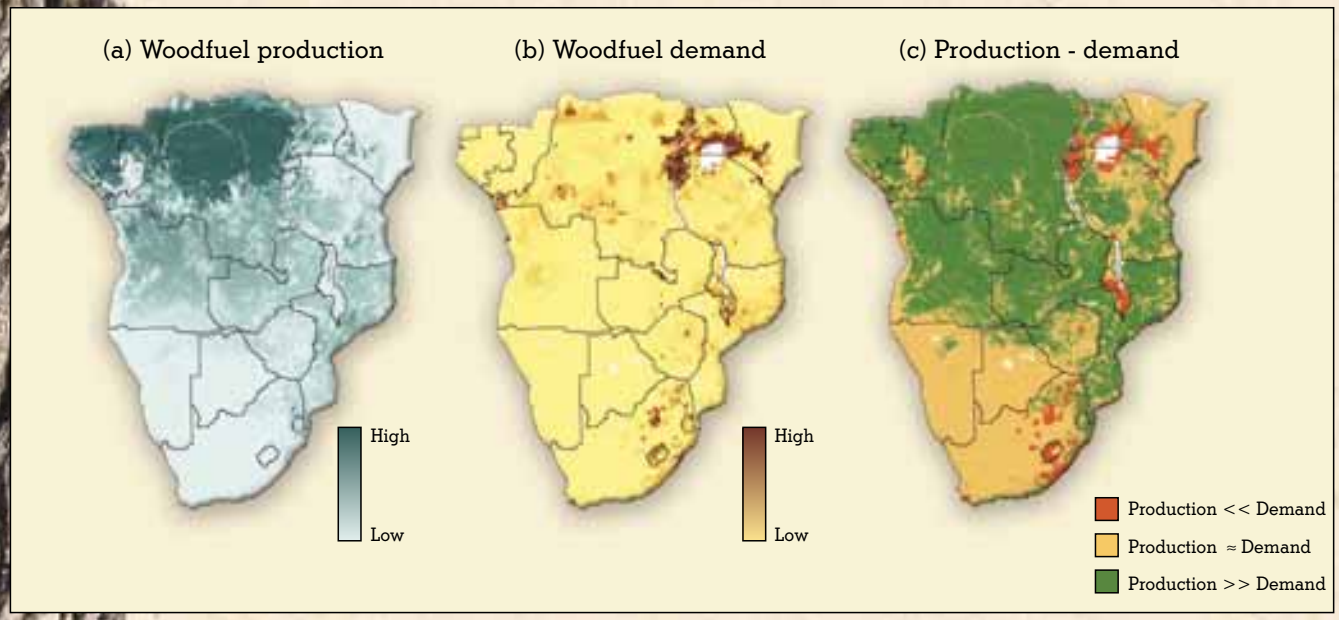


Figure 1. Woodfuel harvesting is sustainable when the rate of wood use is less than the rate of wood growth. The rate of wood growth (a) is mainly controlled by climatic factors. Woodfuel use (b) varies with climate and woodfuel availability. Where the rate of wood use is greater than wood growth (c), people cut into the woodfuel stock, resulting in deforestation. Deforestation is often associated with accelerated soil erosion, nutrient loss and a decline in biodiversity. Soil erosion and nutrient loss, in turn, impact on the agricultural potential of the area, and also affect water quality. All data are for 1995.

WOODFUEL ENERGY IN THE KAFUE BASIN OF ZAMBIA

Woodfuel (firewood and charcoal) accounts for 96% of household energy consumption in Zambia. In rural areas, the main energy source is firewood (95%), while in urban areas the major energy source is charcoal (85%). The wood to charcoal conversion efficiency in Zambia is 20% i.e. on average, each ton of charcoal is produced from 5 tons of wood.

In the more densely populated provinces, demand already outstrips supply. In Lusaka and the Copperbelt, charcoal is imported from areas outside the basin. The woodfuel deficit is likely to worsen as the population of Zambia increases.

The best option to arrest woodfuel depletion under Zambian conditions would be to provide an alternative domestic energy source such as hydroelectric power. In a country where two thirds of the population live on less than US$1 per day, there are enormous challenges to providing alternative energy sources that are affordable.

Province	Population density 2000 (persons/km^2)	Wood Balance (million t/yr)	
		2001	2016
Northwestern	4.9	6.178	5.326
Central	10.7	0.467	-0.718
Southern	15.3	-0.481	-1.815
Lusaka	65.4	-2.237	-3.355
Copperbelt	52.9	-3.711	-7.874

Estimates of wood supply and demand balance for the provinces in the Kafue basin. In provinces with population densities greater than the national average of 13.7 persons/km^2, the demand for wood has already outstripped supply.

Charcoal seller on the way to market in Zambia.

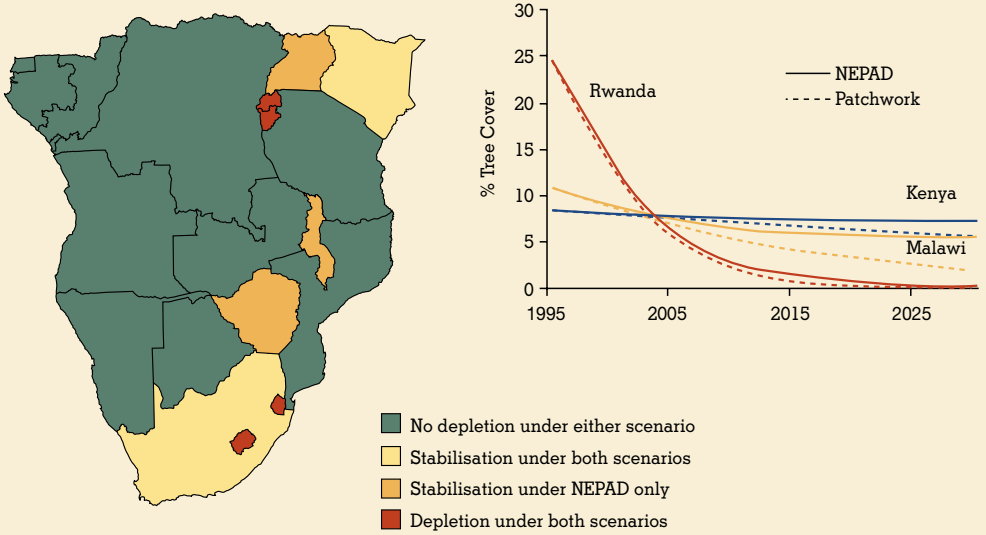
Looking to the Future

Woodfuel is likely to remain an important energy source in Africa in the coming decades. Woodland depletion under the **Patchwork** and **NEPAD** scenarios was examined assuming identical population growth, but higher urbanisation rates and greater use of alternative energy sources under the NEPAD scenario.

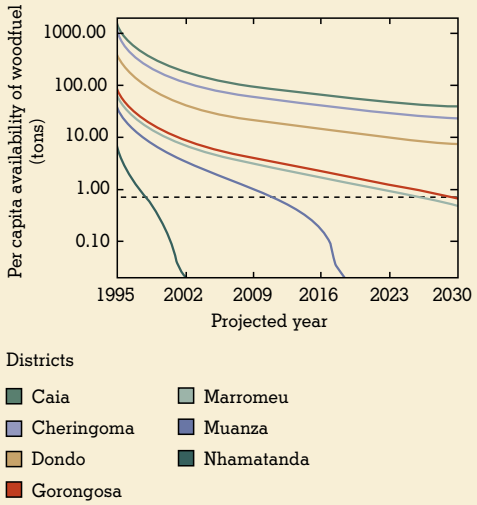
Countries with either a large woodfuel stock (e.g. DRC) or a small population (e.g. Namibia) show no woodfuel depletion under either scenario (Fig. 2). National level analyses may however hide problems at local level (see box on Sofala Province, Mozambique). Burundi and Rwanda show a drastic decline in tree cover under both scenarios, dropping below 1% by 2005 and 2010 respectively. Kenya and South Africa show a continued decline and then stabilisation under both scenarios. In the case of Malawi, Zimbabwe and Swaziland, there are marked differences in woodfuel depletion under the two scenarios, suggesting that woodfuel depletion in these countries will be very sensitive to future rates of wood use.

The future of energy provision in Africa may be influenced by global energy policy. The use of biomass for energy generation is a possible measure for stabilising global carbon dioxide (CO_2) emissions. Will southern Africa 'leapfrog' into such an alternative energy future?

Figure 2. Scenarios of woodfuel depletion

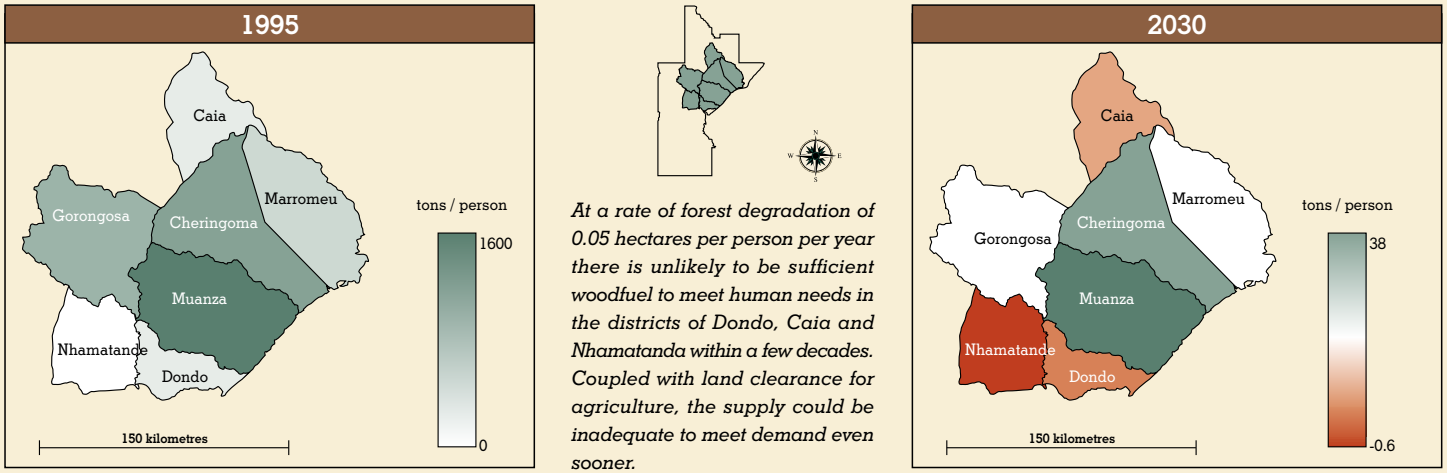


The rapid decline in per capita available woodfuel is shown in this figure. The horizontal dashed line indicates minimum per capita needs. Nhamatanda and Dondo are deficient by 1999 and 2012 respectively. Caia is predicted to be deficit by 2029.



PROJECTIONS OF WOODFUEL USE IN THE NORTHERN SOFALA PROVINCE, MOZAMBIQUE

When people use forest or woodland resources for household use or income generation they may slowly degrade the quality of that woodland. As woodfuel in the rural areas becomes scarcer, the pressure will mount on the existing reserve areas. What policies will most likely ensure a sustainable supply of woodfuel to both the urban and rural sectors whilst not undermining the provision of other ecosystem services such as conservation or the provision of water?



At a rate of forest degradation of 0.05 hectares per person per year there is unlikely to be sufficient woodfuel to meet human needs in the districts of Dondo, Caia and Nhamatanda within a few decades. Coupled with land clearance for agriculture, the supply could be inadequate to meet demand even sooner.

Staple Cereal Crops

Carbohydrates are an irreplaceable part of the human diet. The average person requires 2000 calories per day, mainly as starch. The main sources for the people of southern Africa are maize, millet and sorghum. Maize is the preferred crop in areas with an average rainfall greater than about 650 mm per year, and millet and sorghum dominate in more drought-prone areas. There are some local exceptions to the dominance of these crops. Wheat is a growing part of the diet of urban people, along with potatoes. In tropical areas, especially where the soil is acid, cassava is an important starch crop. In the Lake Victoria basin, banana is the staple crop.

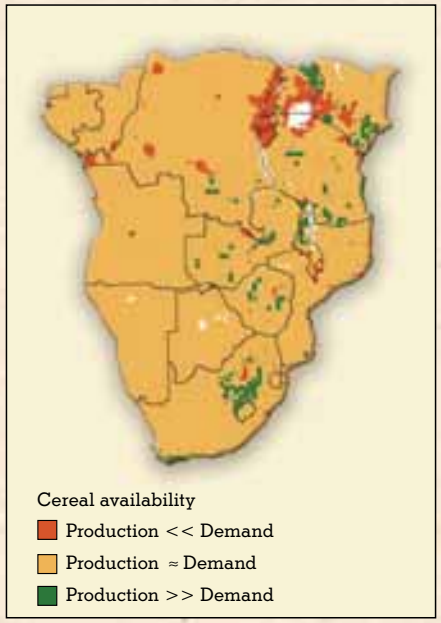


Figure 1. Although the region as a whole is approximately self-sufficient in staple crops (maize, sorghum and millet) in good years, the spatial pattern of food supply does not match demand, resulting in food shortages in certain areas.

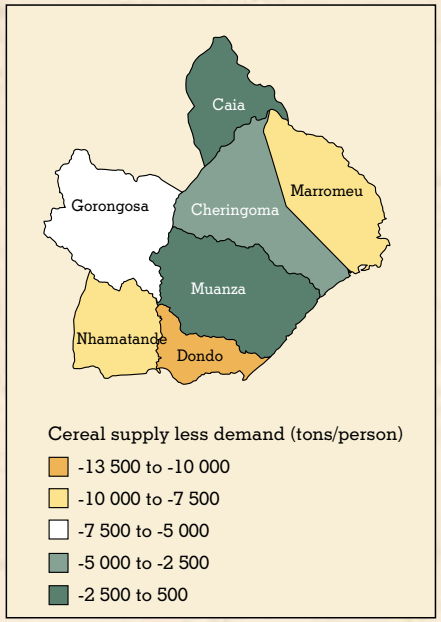


Figure 2. Most districts of northern Sofala Province were found to be cereal deficient in 2000. The deficits were slight and could be neutralised if extra sources of carbohydrate, such as sweet potatoes, were taken into account.

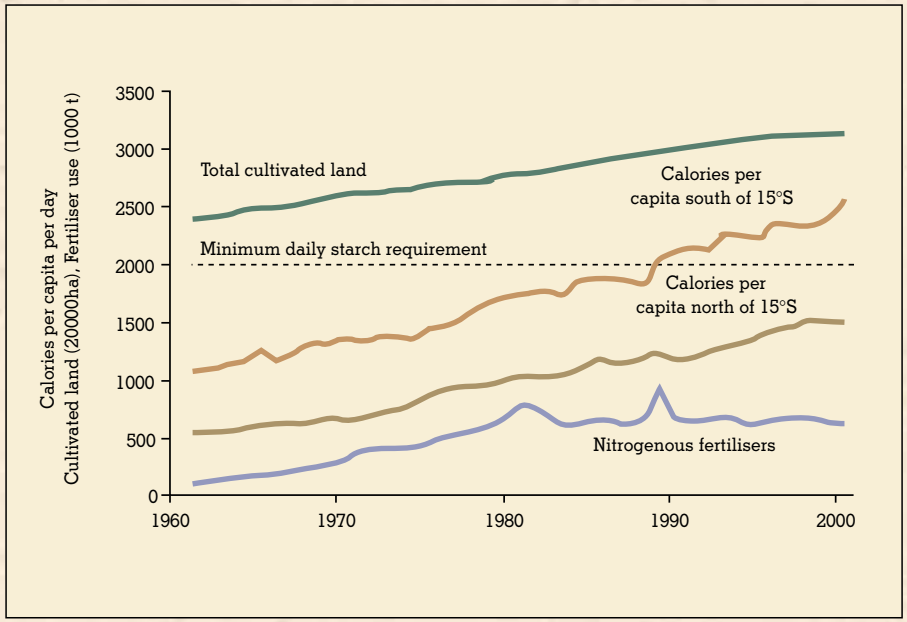


Figure 3. Although per capita supply of cereals has been increasing, production in much of the region remains below the minimum daily starch requirement. Increased production accompanied by a levelling off of fertiliser inputs indicates that soil nutrients are being depleted (FAO Statistics).

As a whole, the region is approximately self-sufficient in staple crops in good growing seasons, although in some places there is an annual shortfall (Fig 1 and Fig 2). Following periods of below-average rainfall, there is cereal shortage throughout the region. This is because severe, prolonged droughts are linked to the El Nino-Southern Oscillation climate phenomenon, which affects nearly the entire region simultaneously. The spatial pattern of food supply does not necessarily match food demand. Cereals are relatively bulky and expensive to transport. The infrastructure for doing so in often inadequate, leading to spoilage and wastage. The delays and costs are even greater when grains are transported across national borders. Within communities and nations there is unequal access to, and consumption of, staple foods by different social and economic groups.

The soils and climate of the region are adequate for cereal production far in excess of current or near future needs. Nevertheless, per capita staple crop production remains well below the minimum daily starch requirement in much of the region (Fig 3). This may be partly explained by a lack of agricultural support services (credit, extension, infrastructure) in many countries. The probability of higher temperatures, and the possibility of greater aridity over much of the region in future, could provide additional obstacles to the region becoming food self-sufficient.

The population of the region will continue to grow, despite the short-term slowing caused by AIDS mortality. As people urbanise and become more wealthy, their diet changes, typically including more wheat, potatoes and protein (including grain-fed chicken and meat). The demand for staple crops will become progressively greater than supply over much of the region in future, unless decisive action is taken. This action could involve tradeoffs with other ecosystem services, notably water quantity and quality, and biodiversity.

Trade-offs between local food sufficiency, water and biodiversity

The growing demand for food can be satisfied in one or more of three broad ways: expanding the area of cropland; increasing the production per hectare on existing cropland; or importing food from outside the region. The last option is not preferred because of concerns regarding food security, and is only possible under scenarios of increasing economic performance in the region, and/or increasing donor benevolence.

Increasing production per hectare

The average per hectare yields obtained in much of the region are up to ten times below the potential yields, using known agricultural technology, tested in the region. These practices include: crop rotations with nitrogen-fixing species, liming and fertilising the soil, mechanised ploughing and weed control, irrigation, pesticides and improved cultivars. Widespread application of these practices would postpone expansion of the planted area for many decades. They require an efficient infrastructure to supply the inputs to the farmer and transport the crops to the markets; effective agricultural extension and credit; and a market not undermined by donated or dumped agricultural produce. These preconditions are more likely under the **NEPAD** scenario.

Agricultural intensification is likely to produce greater economic disparities between modern and traditional farmers, loss of agricultural diversity and increasing reliance on specialised regions of crop production. If inappropriately applied, it will increase the salinity, sediment, pesticide and nutrient load of rivers and the contamination of groundwater. Agriculture cannot coexist spatially with large wildlife populations, and control of insect and bird pests could have negative impacts on non-target species. All of these negative consequences can be mitigated to a large degree by appropriate planning, training and regulation.

Expansion of cropland area

Expansion of the planted area is unavoidable if the per hectare productivity increases at less than 3% per year. Projection of historical trends suggests this is likely to be the case in the absence of intervention, for instance in the African Patchwork scenario.

Loss and fragmentation of habitat due to the expansion of agriculture is one of the main drivers of biodiversity loss, along with deforestation for timber and woodfuel, which often goes hand-in-hand with crop expansion. The fynbos, highland grasslands and montane forests of the region have already been radically transformed. The miombo woodlands and the lowland forests are at risk.

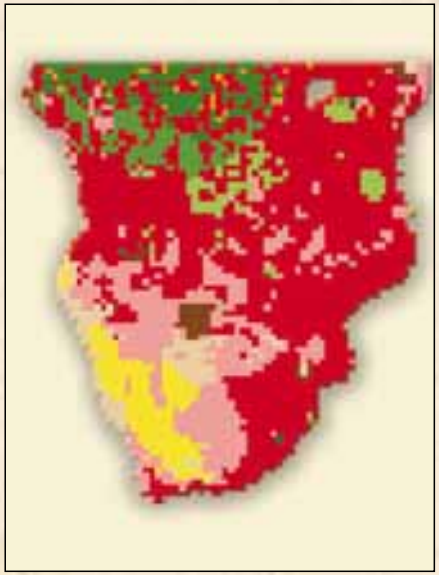


Figure 4. Red areas indicate agricultural land, including natural pastures used for cattle grazing, in 2030 as projected by the IMAGE model under a Patchwork-type scenario. Land transformation is particularly driven by the increased demand for meat that accompanies urbanisation and higher income levels.

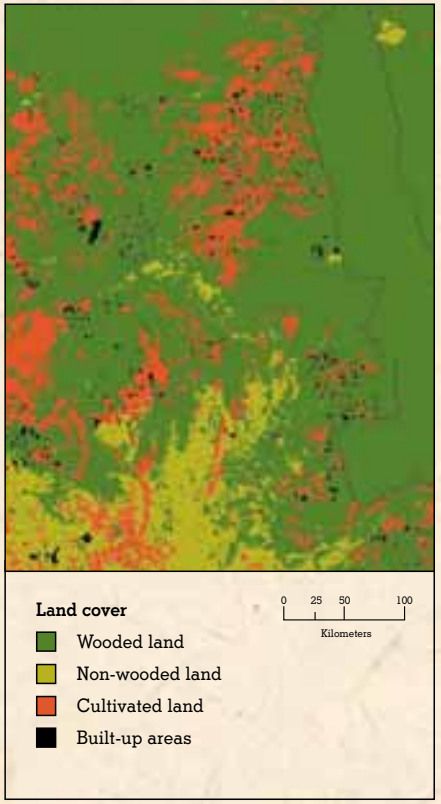


Figure 5. As pressure for agricultural land increases, protected areas start forming islands surrounded by transformed land. The boundary of the Kruger National Park in South Africa is clearly visible in this land cover map.

Responses & Trade Offs

People use the services of ecosystems to improve their well-being. The ability of ecosystems to continue to supply a range of services is in turn altered by human use. Humans adapt their management and sometimes even their use patterns to the changing ability of ecosystems to deliver services. This cycle of use, response and adaptation can result in improvements in both human well-being and in ecosystem health, or it can result in degradation of both. Under what conditions do managers and policy makers need to intervene? Can we identify circumstances under which the inherent capacity of human systems and ecosystems to adapt will be inadequate to deal with trends of change or disturbance events?

A key objective of the SA*f*MA process is to identify the limits of adaptation in specific ecosystems as well as the limits of adaptation in particularly vulnerable sectors of society. However, this in itself is not sufficient to guide our decision-making. Timing is also crucial. Managers and policy makers need to be alerted when best to intervene and which interventions will have the greatest benefit at least cost. There are situations in which these adaptations occur of their own accord, but in some circumstances external interventions are required to alter either the supply of a key ecosystem service or the demand for a service.

Pilot scenarios and response options

The pilot SA*f*MA scenarios yield four consistent classes of response. Most notable in the Patchwork Africa scenario is the dominance of automatic or endogenous responses. The adverse effects of ecosystem changes are mitigated only by limited managerial or policy interventions, such as the provision of information or the empowerment of affected groups of society.

In the NEPAD scenario, central government actions take the place of local adaption. Interventions such as the acceptance of standards for water quality, or the establishment of regulatory bodies for water management are feasible to mitigate the negative impacts of NEPAD developments.

In both scenarios the need for transparent and responsive governance is strongly highlighted. The weakness of governance systems in the Patchwork Africa scenario contributes significantly to the negative trends. The establishment of sound governance systems is an essential requirement for the success of NEPAD.

Photographs: Tim Lynam

Development of new infrastructure, such as the road shown above, is an important development tool. Roads are however, a double-edged sword, bringing as they do new opportunities for trade and employment but also new opportunities for the exploitation of ecosystem services such as timber for charcoal production. Without the ability to monitor and enforce regulations governing the use of ecosystem services new infrastructural developments could have net negative impacts on the ability of ecosystems to supply essential services to particularly vulnerable or productive sectors of society

Conclusions & summary

SA*f*MA set out to answer three questions in the pilot assessment and came to the following conclusions:

Do the techniques exist to conduct an assessment of ecosystem services at several scales?

Yes, although many of the techniques are still experimental. Although many groups have stressed the need for regional and multi-scale environmental assessments, there are virtually no examples of such assessments to act as guides. The pilot SA*f*MA has played a leading role in developing and testing ideas on how to conduct subglobal, multi-scale assessments. The fully-nested design of SA*f*MA (local sites within basins within the region) provided a powerful test of assessing ecosystem service condition, scenarios and responses.

Do the technical resources exist in southern Africa to conduct a full-scale Millennium Assessment?

Yes. In a period of four months, it was possible to do an assessment at a variety of scales for three important ecosystem services. A full Southern African assessment, taking place between August 2002 and December 2003, will be able to cover a further set of services. Sufficient information is available to perform a useful assessment. The capacity exists to model, map and analyse supply of services and demand for services. A competent, multi-national and interdisciplinary team has been developed to undertake the assessment, and funding has been secured.

Is there a need and demand for a regional ecosystem services assessment?

The Millennium Assessment process sets out to be user driven. At the global scale, a pilot assessment helped to build the understanding of the assessment process, and support for it among global stakeholders. The SA*f*MA pilot assessment is a tool to build stakeholder awareness and involvement within the southern African region. Based on the southern African pilot assessment, the SA*f*MA team is convinced that a full multi-scale assessment is needed in the region, and that such an assessment will produce useful information. What is your opinion? SA*f*MA would like your feedback on the usefulness of the type of information presented in this brochure - see the back cover for contact details.

Photograph: Tim Lynam

How can you get involved?

TIN ROOF STUDIOS

What information do you require as a land manager or policy maker to take environmentally sound decisions? Is the type of information presented in this brochure useful to you? What other kinds of information would be useful to you?

The SA*f*MA team encourages feedback from all potential users (policy-makers, land managers, private business, the public and fellow researchers) in order to make the full assessment as useful and relevant as possible. Contact the SAfMA coordinator or the local study in your area.

SA*f*MA Coordinator

Dr Constancia Musvoto
Institute of Environmental Studies,
University of Zimbabwe, Harare, Zimbabwe
cmusvoto@science.uz.ac.zw
Tel: +263 4 302603
Fax: +263 4 332853

Project leaders and contact details

- SADC Regional Scale: Dr Bob Scholes (CSIR Environmentek, Pretoria, South Africa)
  bscholes@csir.co.za, Tel: +27 12 8412045, Fax: +27 12 8412689
- Zambezi Basin: Dr Paul Desanker (IGBP/LUCC/START Miombo Network & Department of Environmental Science, University of Virginia, Charlottesville, USA)
  desanker@virginia.edu, Tel: +1 804 9243382, Fax: +1 804 9822137
- Okavango Basin: Prof Lars Ramberg (Harry Oppenheimer Okavango Research Centre, University of Botswana, Maun, Botswana)
  lramberg@orc.ub.bw, Tel: +267 661833, Fax: +267 661835
- Gariep Basin: Prof Albert van Jaarsveld (Centre for Environmental Studies, University of Pretoria, Pretoria, South Africa)
  asvjaarsveld@zoology.up.ac.za, Tel: +27 12 4204048, Fax: +27 12 4203210
- Kafue Basin: Dr George Kasali (National Institute for Scientific and Industrial Research, Lusaka, Zambia)
  nisiris@zamnet.zm, Tel: +260 1 283150, Fax: +260 1 283502
- Gorongosa-Marromeu: Dr Tim Lynam (Institute of Environmental Studies, University of Zimbabwe, Harare, Zimbabwe)
  tlynam@science.uz.ac.za, Tel: +263 4 302603, Fax: +263 4 332853
  Mozambique Office: C.P. 07, Beira, Mozambique
  linksmoz@teledata.mz, Tel & Fax: +258 3 325997, Cell: +258 82 498765
- Local Cross-Cutting Studies: Prof Christo Fabricius (Department of Environmental Science, Rhodes University, Grahamstown, South Africa)
  c.fabricius@ru.ac.za, Tel: +27 46 603 8614, Fax: +27 46 6225524

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