John L Roberts

Scenarios for sustainable development[1]: Development v. disaster

Scenarios: a perspective

The theatrical origins of the word scenario (see Box 1) underscore the role of metaphor in using it as a conceptual aid in policy development and planning. Prediction is at the core of the scenario process. But, as had been said:

> 'predictions can be very difficult – especially about the future'.[2]

The scenario process commonly poses a question: If this trend were to continue, what would be the wider future implications? For example, if the population of our country continues to rise, putting increasing pressure on natural resources, what would be the social, economic and environmental implications for us all?

In a scenario, the picture of the future appears as a scene from a play. It is intended to illuminate the present and infer choices that might be made to secure a better future, or in some way to elude the worst consequences of it. A scenario is a loose elaboration of a game theory approach. It explores the expected outcomes of possible responses to current problems. It may be supported by numerical and formal logical analysis, but its principal function is to stimulate thought about broad policy options and the range of possible future circumstances for people and for nations. Scenarios help to paint a picture of tomorrow's world that can stimulate decision-makers today, who may not respond well to a dry diet of numerical models and the forecasts emerging from them. In recent years, scenarios have been used to promote debate about development policy and action to try to avert the risks of predicted social and environmental disaster. They are used variously as a tool in policy-making and planning, as indicated below in recent applications of the method.

In UNEP's 2007 flagship environmental policy assessment, *Global Environment Outlook 4* (GEO 4)[3], UNEP adopts a broad-based scenario approach for envisaging the planet's tomorrow. It offers four distinct policy frameworks. Each gives differing emphasis to the key drivers and the critical uncertainties which are thought to influence the interplay between the natural environment and the processes of economic and social development.

Markets First explores the implications of promoting a lead role for the private sector through international trade, with little or no emphasis on environmental policy and market regulation.

Policy First explores the pathway to the future in which governments at national, regional and international levels take a lead role, with less emphasis on the free play of market forces and greater emphasis on education, health and environmental protection.

Security First, the third UNEP scenario, offers a national rather than a regional or international perspective for policy, with a sharper focus on military intervention and expenditure, giving little attention to social and environmental values, and favouring the pursuit of the interests of select private-sector players.

Sustainability First, the final UNEP scenario explored in GEO 4, is again focused on largely national interests with little involvement by regional or international bodies. It does, however, give great emphasis to health, education and environmental values pursued at national and local levels.

The four UNEP scenarios are played out with support from a variety of computer-based models that explore inter-relationships between factors including population trends, GDP, health and education status, land use, pollution, climate change, consumption patterns, water use, marine eco-systems, and biodiversity. But the emphasis by UNEP is on the contrasting story lines spelt out in the unfolding prose narratives, which try to differentiate the particular implications of the control models for each of the geographical regions of the world.

The objective of the UNEP review is to illustrate the way in which choices made by decision-makers today can influence the patterns of life for the future, despite the common pattern of social and environmental states and trends inherited from the past.

None of the UNEP outcomes predicts a utopia, but each illuminates the risks, trade-offs, synergies and opportunities that may be expected from the choices we make today and their unfolding pattern of implications for our future. It is an heroic and complex attempt, detailed across 50 pages of tightly written text, to present, UNEP claims:

> 'what role society can play today in shaping and sustaining our common future'.
> (UNEP, 2007 p. 400)

Barrow[4] sees scenarios as one tool in the broader set of aids to assessment, prediction and forecasting, essential for the function of the formulation of policies, plans and programmes. It is a function, he warns, traceable to the origins of man, with past associations with sooth saying, witchcraft, magic and superstition. He recognises that we cannot see the future however hard we try, drawing attention to the varied and often surprising patterns of past evolution that defied prediction.

In modern times, Barrow sees forecasting tools, such as scenarios, in use in endeavours as distinct as actuarial practice, military strategic planning, scientific, mathematical and macro-economic modelling and environmental simulations. Barrow draws attention to the gap between what can be assessed from numbers and from game theory, for example, and the subjective pictures of the future that may be derived from expert judgement. He cites as another related tool, the expert consultative process involved in the Delphi technique, which was adopted by the RAND Corporation in forecasting possible outcomes of evolving international relations during the Cold War. The Delphi technique has been sub-

sequently adapted for use in exploring possible futures in health, education, and in environmental systems, and may be found as part of strategic environmental assessment, and in environmental impact assessment.

Barrow concludes that forecasting of future scenarios, however scrupulously conducted with expert advice and a firm numerical basis, '*is seldom accurate and gap free*'. He asserts that, ideally, tools and strategy should be flexible and adaptive. Otherwise the assessments can give a false sense of security. In forecasting, he says, '*The unexpected must be expected*'.

Khor[5], focusing on globalisation, explores through a series of loosely presented scenarios its possible implications for international economic development, finance, governance, trade, competition and development strategy. His principal concern is that in scenarios of the implications of globalisation, the implications for natural resources in developing countries have been neglected. However, he is also concerned that the evidence base is weak for linking environmental damage to economic loss and for demonstrating that environmental protection and eco-friendly technology and practices are themselves economically efficient ways of pursuing development. He sees the strengthening of this evidence base as an essential prerequisite for using the sustainable and human development paradigm as a basis for refining both macroeconomic policies, and the appropriate relationship to establish between the state, markets, people and relevant development styles and models. Thus Khor's position challenges the existence of the very evidence on which the UNEP scenarios appear to be founded.

By contrast Hanley[6], in his exploration of environmental risk, is concerned to match with economic analysis the process of scenario-building adopted by natural scientists in environmental risk analysis. Without this process of examining the costs and benefits of environmental risk reduction, he considers we are in danger, in public decision-making, of throwing out the baby with the bath water. He explores this field using probability analysis, game theory and a variety of approaches to economic evaluation of risk, perception of risk and human behaviour in the face of risk. Scenario-building would greatly benefit from incorporating such concepts into the narrative and the economic and behavioural analysis which should underpin it.

Lomborg[7] presents a sceptic's review of the future implications of global warming and current choices. He challenges the disaster scenarios painted by the Worldwatch Institute, UNDP and others in this field and their claim that global warming is one of the most serious problems facing the world today. Drawing on analyses by Nordhaus and Boyer[8] he addresses the opportunity costs of diverting scarce resources to reducing global warming, in terms of sacrificing the gains from not investing in basic levels of development in education, public health and infrastructure in the poorest countries of the world. Scenarios often present choices in the narrative which lack both an adequate evidence base and appropriate economic analysis to draw out the full implications of the pursuit of one pathway for development rather than another.

The student exercise in scenario development below is offered within this broader context of the basis for decision-making in natural resource analysis.

A class room exercise in using the scenario approach

Objective: Two groups (A & B) are set to explore and identify the critical factors affecting sustainable development at country level and to propose action to achieve defined objectives: Group A's task is to put the country Goodland on a pathway for sustainable development; Group B's task is to put the country Goodland on a pathway to unsustainable development towards that of the failed state of Badland.

Method: The class will be divided into two groups A and B. Both groups will have the current Goodland country profile information (see Annex). Group B will have, in addition, the country profile for Badland.

The two Groups will work separately. Each will identify a co-ordinator and rapporteur to assist their work as a team. The time limits for the review process will be set (for example, the exercise may be introduced on one day with a preliminary discussion session and a report back on another day).

The principal lessons learnt about policy choices in this exercise and the methods adopted for scenario development can be followed through during subsequent sessions of the course.

Group A will have the role of an international group of development experts with the objective of promoting sustainable development in Goodland for the benefit of the public and private sectors and the future of the people. They will examine the country profile, define, in a report, the critical issues, the key development and investment policies and their targets. They will take into account the Key Questions for Review (see Box 2), and use the Policy Development Framework (see Box 3) for recording their decisions and proposed action. They will identify the indicators they will use to track performance and the projections of expected results, taking note of conditional and constraining factors.

Group B will have the role of advisers to an international mafia with the objective of undermining the capacity for sustainable development in Goodland and the promotion of the interests of the criminal businesses of their mafia sponsors. They will start with the Goodland country profile, but will also have comparative material from Badland. They will define, in a report, the critical issues, the key intervention policies, and the targets for moving the country from the current state of Goodland into that of the failed state of Badland. They will take into account the Key Questions for Review (see Box 2) and the Policy Development Framework (see Box 3). They will identify the indicators they will use to track performance and the projections of expected results, taking note of conditional and constraining factors.

Presentation and review of results

Both groups will make a presentation of their results. The class will then review the outcome, in terms of their identification of critical factors for sustainable development of a small island state, or for its decline.

One purpose of this review is to identify strengths and weaknesses in the analysis especial-

ly the gaps in analysis that emerge in the comparison between the policy proposals of the two groups.

For example, Group A may give little weight to investment and support for the factors in the state's survival that Group B selects as the targets to attack.

Group B may neglect the power of the national, regional and international multicultural factors which Group A identifies as essential for progress, and which can also resist and overcome the capacity of malign influences to undermine a state. (See endnotes which may be used to encourage wider discussion within the groups.)

Comment on the exercise

The exercise aims to provide for students an opportunity to discuss and explore:

- the use of MDGs and other indicator systems as tools in policy development;
- the concept of a scenario as an aid to forecasting long-term decision-making;
- the elements in policy and planning relevant to sustainable and unsustainable development;
- the assessment of target values, trends and the factors on which they may depend;
- choices in paradigms for policy development;
- underlying factors affecting country development status and trends; and
- national, regional and international factors in the support for change.

Box 1. What is a scenario?

A scenario is a concept used in policy review and planning in the public and private sectors, as a way for envisaging the future and its implications. It is usually based upon projections from current states and trends of social, economic and environmental circumstances. 'Scenario' is derived from an Italian word for the list of scenes in a play and the entrances and exits of the players.

A scenario may be the output from a series of computer simulations using clearly defined data and mathematical projections, as undertaken for the Club of Rome in the *The limits to Growth* (Meadows D.H. et al., 1972) and *Beyond the Limits* (Meadows D.H. and Meadows D.L., 1992). These scenarios reached a wide audience, provoked great controversy, and became iconic contributions to debates on development policy of those times.

In UNEP's *African Environment Outlook 1* (2002) and *2* (2006) and in the *Global Environment Outlook GEO 4* (2007), the use of scenarios formed a substantial element in the presentation of the future regional and global environmental prospects in the face of a set of broad policy options. The UNEP scenarios, however, were less the product of evidence-based analysis and computer simulation of official data, than in the work of the Club of Rome. The principal aim of UNEP was to alert policy-makers and planners to current trends and to policy options to give greater attention to the impact of development policy on environmental degradation.

The Global Scenario Group has produced a series of scenarios on the issue of planetary sustainability (*1997: Branch points: Global Scenarios and Human Choice; 1998: Bending the*

Curve: Toward Sustainability; 2002: Great Transitions: the Promise and Lure of the Times Ahead). The worst-case scenario in these reviews is a planet with impoverished people, cultures and nature; the best case is the Great Transition towards a future of enriched lives, human solidarity and environmental sustainability. Many of these types of scenario tend to lack a rigorous economics framework and estimates of the costs and benefits of achieving the transition to produce new outcomes.

The Meadows's projections for sustainable development in 1992 included proposals for developing fresh tools for restructuring, including: 'visioning; networking; truth-telling; learning; and loving (sic)'. They concluded then with the warning '... no time to waste. There is just exactly enough energy, enough real material, enough money, enough environmental resilience, and enough human virtue to bring about the revolution to a better world'. Thus, the use of such scenarios goes beyond economic planning and politics into the field of ethics and concepts of the good life.

Box 2. Key questions for review

Group A: The pathway to sustainable development

What are the critical factors that can determine Goodland's progress towards sustainable development?

What are the economic and environmental factors that make the small island state of Goodland vulnerable? How can you promote resilience against these threats?

What are your targets for sustainable development for Goodland and what capacity development and other resources are required for achieving them?

How far does the scope and content of the UN MDGs framework provide a sufficient basis for policy and planning for sustainable development in Goodland? What other factors do you need to take into account?[9]

Who are the key players to be involved in the promotion of sustainable development in Goodland and how will you secure their effective involvement?

What are your policy priorities for securing improvements in sustainable development?

Group B: The pathway to a failed state

What are the critical factors that can undermine the capacity of Goodland for sustainable development and put it on a pathway for decline towards a failed state such as Badland?

What are the economic and environmental factors that can make the small island state of Goodland vulnerable? How can you undermine resilience against these threats?

What are your targets for unsustainable development for Goodland and what development capacities and other resources are needed for achieving them?

How far does the scope and content of the UN MDGs framework provide a sufficient basis for policy and planning for unsustainable development in Goodland? What other factors do you need to take into account?[10]

Who are the key players to be involved in the promotion of unsustainable development in Goodland and how will you secure their effective involvement?

What are your policy priorities for undermining sustainable development in Goodland and putting it on a pathway towards the failed State of Badland?

Box 3. Policy development framework

Country .....
Policy Goal .....
Advisory Group Members .....

Critical issues	Development policies	Interventions/ Investments	Performance indicators	Expected results and targets	Constraints and assumptions

Annex: Supporting material

Groups A and B
Global Bank Goodland country brief

Development history

Goodland gained independence in 1964, after centuries of colonisation by the Dutch (1598), the French (1710), and the British (1810). It has a highly diverse population. Descendants of indentured workers from India, who were brought to work in the sugar-cane fields after the abolition of slavery in 1835, make up about 60 per cent of the population. The rest of the population includes Africans, Creoles, Chinese and Europeans.

Goodland is a development success story. At independence in 1968, the country was poor, with per capita income of about US$260. Today, it is an upper middle-income country, with a 2008 per capita income of US$5,260. In no small measure, this success is attributable to trade preferences in sugar (under the EU sugar protocol) and textiles and clothing (under MFA and later AGOA). But the country's ability to profit from these opportunities testifies to institutional strengths – stable democracy and rule of law; ethnic tolerance; macro-economic stability; equitable social progress; and reliance on private incentives. The country has had a good record in public health and basic education but has been slow to develop effective responses to its now more complex educational, human development and health issues.

Economy

In 2008, GDP growth is projected to accelerate to 3.2 per cent from 2.3 per cent in 2004 as the economy continues to adjust to the erosion of sugar and textiles preferences. Though still respectable by the standards of the region, growth has clearly slowed from the miracle years, with weaker investment and rising unemployment. Goodland is highly vulnerable to changes now taking place in the world trade regime, and the slowdown appears to be an adjustment occurring in anticipation. On one estimate, the ending of MFA in January 2005 and the phasing out of sugar preferences by 2008 could cost Goodland as much as 8–9 per cent of GDP, 20 per cent of exports, and 40 per cent of government revenue. But while these developments add some urgency, Goodland's very success in raising wages and living standards would in any case be undermining competitiveness in labour-intensive sectors such as sugar and mass produced garments.

The challenge which Goodland now faces has not come as a surprise. Over the past decade, the groundwork has been laid to move the economy toward more knowledge and skill intensive activities and higher value added financial and business services. Successive governments have been implementing Goodland's vision for its future, restructuring and downsizing sugar and textiles, putting in place enabling legislation for offshore financial services, and drawing FDI into the IT sector with a state-of-the-art, fiber optic-wired Cyber Tower. Major investments have been undertaken in education, transport, and environmental infrastructure. While the July 2005 election brought a change in government, no fundamental shift in Goodland's development strategy is anticipated.

Despite the steps which have been taken, many challenges remain. Education must be further expanded to bring human capital up to the best practice standards of Singapore or Korea. Stronger university-business ties are needed along with a more entrepreneurial, innovative culture. In light of limited R & D capacity, substantially more FDI must be attracted to gain access to cutting-edge technology and marketing skills. And finally, greater public sector efficiency is needed if the ambitious public investment programme is not to drive fiscal deficits and debt to unsustainable levels. The mid-1990s long-term perspective study, *Vision 2020*, set a goal of sustaining growth in the range of 5–7.5 per cent. Provided such challenges can be overcome, this goal can become a reality. Reform of financial management and financial services is increasing the tax revenue yield, decreasing tax evasion, improving probity in government and promoting civil service reform and results based resource allocation.

Politics

Goodland is a multiparty parliamentary democracy. A general election in July 2005 resulted in the victory of the left-of-centre multi party alliance. Sir V. Goodman is President of the Republic; Mr. A. Fineman, leader of the Labour Party, is Prime Minister.

Development picture/donor co-ordination

Reflecting Goodland's past success and improved access to capital markets, official donor assistance has declined in volume and has become more selective. There is a de facto satisfactory division of labour among donors (e.g. EU, BFDB, UNDP).

The Global Bank Group's role

Global Bank's role in Goodland is evolving, reflecting the country's past success in gain-

ing access to capital markets. Because of its relatively high income, Goodland is one of only a few countries in its region eligible for IBRD loans (most others borrow from the International Development Association, the Global Bank's soft-lending arm for the poorest countries). The Global Bank currently has one active project totalling $12.4 million in the sewerage and sanitation sector. The Bank is currently preparing its new Country Partnership Strategy to frame its support over the coming years.

The Bank also supports the Government of Goodland through analytical and advisory assistance. The Bank has carried out a Country Procurement Assessment Review, a Public Expenditure Review to assess the sustainability of the New Economic Agenda, a Transport Action Plan, and a report on modernisation of the pension system. The Bank has also been supporting the government with a Medium Term Economic Framework (MTEF), a Labour Market Study, and Investment Climate Assessment. A Country Economic Memorandum is underway.

The International Finance Corporation (IFC) has made no new investments since 1996, and the portfolio has steadily decreased as investments have been repaid and/or exited. IFC has an equity investment of $US9 million in a collective investment vehicle. In March 2006, the IFC organised a multi-sector promotion mission, and is positioning itself to play a more active role in supporting South–South investment opportunities as well as private sector involvement in the following sectors: tourism, textile, agri-business, and information and communications technology. IFC is also considering a request from the Joint Economic Council to assist in the establishment of a Credit Bureau to facilitate access to finance for SMEs.

While the Multilateral Investment Guarantee Agency (MIGA) has not insured any projects in Goodland, it has issued four contracts of guarantee to Goodland investors in support of their investment in an agribusiness project in Mistyland. The agency's outstanding gross exposure for this project is US$52.2 million. In the past, Goodland investors have benefited substantially from MIGA coverage of their projects in the region. Goodland is also one of 11 regional countries participating in MIGA's Enterprise Benchmarking Program (EBP), which gauges a country's ability to compete with other potential sites and locations for foreign investment. Goodland is not an active participant in GBI programs, but discussions are underway to help position the country as a global knowledge hub.

The prospects for sustainable development in Goodland are fair. Further progress will depend upon national, regional and international commitment to the conservation of the country's outstanding natural resources. This will require better management of the use of land, keeping tourist development within the carrying capacity of the country and effective solutions to a number of critical stages of further development. These include eliminating the remaining pockets of poverty, malnutrition, alcohol and drug abuse and petty crime.

Unfinished business

Further advances are needed in technical and social research and development (R&D), food security and safety, and better exploitation of renewable energy resources, especially solar power. Re-orientation of the health sector is needed to give more emphasis on health

promotion and the health of the increasingly large population of older people. Reform is necessary to improve the effectiveness and management of medical services and bring them more in line with the principal problems of the country, notably non-communicable disease and mental ill-health.

Other issues yet to be tackled include overcrowding, relief of traffic congestion, land pollution and degradation. This in turn will require further improvements in public education, the standards of public and professional life, and greater probity and accountability in national and local government.

Group B
Extracts from the Global Bank assessment of Badland 2008

Development history

For nearly two decades, Badland has struggled to emerge from a cycle of internal conflicts that have devastated its economy and inflicted severe hardship on its population. Badland is one of the poorest countries in the world and one of the most disadvantaged, as social, economic and environmental indicators reveal:

- GDP per capita of US$361 (2008);
- 146th on the human development index;
- 65 per cent of the population lives under the poverty line;
- life expectancy is 53 years;
- half the population does not have access to clean drinking water;
- half the population is illiterate;
- highest incidence of HIV/AIDS in the region; and
- 97 per cent deforestation.

Despite a remarkable history as the first and only slave colony to gain national independence, Badland's path to development and democracy has been hampered by political instability. After growing at an average annual rate of 2.3 per cent in real terms in the 1970s, real per capita GDP fell an average of 2.4 per cent per year in the 1980s and continued to decline in the 1990s at an average annual rate of 2.6 per cent. A population growth rate of 3.2 per cent a year adds 64,000 a year to the current 2 million population. The early 1990s were marked by a military coup against the president, Jean Paul Le Bruin, and a subsequent international embargo that sought to restore constitutional rule. During this period, industrial activity and exports virtually ceased, tax collection and expenditure control systems collapsed, and maintenance of economic and social infrastructure was all but abandoned.

Global Bank's role

To support a process of national reconciliation and ensure a rapid response to the country's development needs, the Bank identifies four priority areas for action:

1 improving political governance and promoting national dialogue;
2 strengthening economic governance and promoting institutional development;
3 promoting economic recovery; and
4 improving access to basic services.

From 1956 through the mid 1980s, some US$260 million was disbursed for infrastructure projects, rural and urban development, agriculture, forestry and education. From 1987 to 1991, IDA disbursed some US$142 million for projects to support fiscal and trade reforms and projects for basic health services. Results of this investment were poor, arising from mismanagement and lack of transparency and accountability in disbursement of funds. IDA projects, suspended in 1991, were resumed when constitutional order was restored in 1994. From December 1994 to September 1997, IDA disbursed about US$100 million to finance an economic recovery programme, emergency employment creation, road rehabilitation and maintenance, and a forest and parks protection technical assistance project. IDA disbursements to Badland peaked at US$56 million in 1997. From 1997 to August 2000, with no fully constituted Parliament to ratify new credits, IDA disbursements steadily declined, with less than $9 million disbursed in 2000. In September 2001, BADLAND fell into non-accrual with the Global Bank.

Unfinished business

The prospects for sustainable development in Badlands remain bleak, with increasing levels of poverty, crime and degradation of the environment and natural resources. These factors and rampant infectious disease make this small overcrowded island, once of outstanding scenic beauty, unattractive for tourists except those bent on crime, money laundering, human trafficking, drugs and other nefarious activities.

MDG tables

1 Goodland

	1990	2000	2008	Target
Goal 1: Eradicate extreme poverty and hunger.				
MDG Target: halve 1990 level by 2015				
% Population at less than $1 a day PPP	10	7	6	
% Population undernourished	NA	15	12	
Goal 2: Achieve universal primary education.				
MDG Target: 100% by 2015				
% literate females 15–24 yrs	60	65	75	
% literate males 15–24 yrs	75	85	95	
Primary school completion rate (% of relevant age group)	NA	75	85	
Primary school enrolment rate %	80	85	92	
Goal 3: Promote gender equality and empower women.				
% parliamentary seats held by women	7	6	8	
MDG Target: reach 50% by 2015				
Ratio female to male primary enrolment	NA	101	120	
MDG Target: ratio to 100 by 2005				
% women of total employment in non-agricultural sector	20	25	30	
MDG Target: reach 50% by 2015				

Goal 4: Reduce child mortality.			
MDG Target: reduce 1990 mortality by 2/3 by 2015			
Infant mortality rate (deaths in 1st yr per 1000 live births)	20	18	13
Under five mortality rate (deaths under five years per 1000 live births)	23	21	18
Goal 5: Improve maternal health.			
MDG Target: reduce 1990 maternal mortality by 3/4 by 2015			
Maternal mortality rate (maternal deaths per 100,000 live births)	32	25	20
Goal 6: Combat HIV/AIDS, malaria, etc.			
MDG Target: by 2015 reverse increase since 1990			
Prevalence of HIV (% population 15–45 yrs)	NA	1.5	1.8
Incidence TB cases per 100,000 population per year	69	65	64
Incidence of malaria per 100,000 population per year	10	5	1
Goal 7: Ensure environmental sustainability.			
% land area with forest cover:	20	15	NA
MDG Target: reverse loss			
% land area protected: Target: sustain or increase per cent	1	3	4
CO_2 emissions per head of population (metric tonnes)	1	NA	3
MDG Target: halt and reverse increase			
% Population with safe water	85	90	91
MDG Target: by 2015 halve 1990 per cent without safe water			
% Population with safe sanitation	NA	70	90
MDG Target: by 2015 halve 1990 without safe sanitation			
Goal 8: Develop a global partnership for development.			
Aid per head of population (US$)	85	78	26
MDG Target: by 2015 reduce 1990 levels			
Debt service % of exports	7	5	4
MDG Target: by 2015 reduce 1990 levels			
Internet users % total population	NA	2	10
MDG Target: by 2015 increase 1990 levels			
Mobile and mainline telephone subscribers % total population	5	NA	86
MDG Target: by 2015 increase 1990 levels			
Other data			
GDP per capita at PPP $	2,300	4,200	10,800
Population (millions)	1.1	1.2	1.3
Land per head of population (hectare per capita)	18	16	15
Eco footprint (global equivalent no. earth planets at current rate of use of resources)	NA	2.3	2.4
Adult literacy rate % total population 15 yrs and above	79	85	87
HDI rank (GDP, education, expectation of life)	65	60	56
HPI rank (Life satisfaction x expectation of life/ ecological footprint)	50	55	65
Expectation of life at birth (yrs)	65	70	73

NA = data not available

2 Badland

	1990	2000	2008	Target
Goal 1: Eradicate extreme poverty and hunger.				
MDG Target: halve 1990 level by 2015				
% Population at less than $1 a day PPP	30	45	65	
% Population undernourished	65	59	70	
Goal 2: Achieve universal primary education.				
MDG Target: 100% by 2015				
% literate females 15–24 yrs	45	48	48	
% literate males 15–24 yrs	47	47	52	
Primary school completion rate (% of relevant age group)	28	25	20	
Primary school enrolment rate %	35	32	25	
Goal 3: Promote gender equality and empower women.				
% parliamentary seats held by women	4	3	3	
MDG Target: reach 50% by 2015				
Ratio female to male primary enrolment	NA	NA	NA	
MDG Target: ratio to 100 by 2005				
% women of total employment in non-agricultural sector	40	NA	NA	
MDG Target: reach 50% by 2015				
Goal 4: Reduce child mortality.				
MDG Target: reduce 1990 mortality by 2/3 by 2015				
Infant mortality rate (deaths in 1st yr per 1000 live births)	102	94	99	
Under five mortality rate (deaths under five years per 1000 live births)	150	126	130	
Goal 5: Improve maternal health.				
MDG Target: reduce 1990 maternal mortality by 3/4 by 2015				
Maternal mortality rate (maternal deaths per 100,000 live births)	NA	NA	680	
Goal 6: Combat HIV/AIDS, malaria, etc.				
MDG Target: by 2015 reverse increase since 1990				
Prevalence of HIV (% population 15–45 yrs)	NA	NA	5	
Incidence TB cases per 100,000 population per year	470	350	360	
Incidence of malaria per 100,000 population per year	NA	NA	NA	
Goal 7: Ensure environmental sustainability.				
% land area with forest cover	7	4	3	
MDG Target: reverse loss				
% land area protected	NA	NA	0.3	
MDG Target: sustain or increase per cent				
CO_2 emissions per head of population (metric tonnes)	0.1	NA	0.3	
MDG Target: halt and reverse increase				
% Population with safe water	47	46	50	
MDG Target: by 2015 halve 1990 per cent without safe water				

% Population with safe sanitation	24	NA	26
MDG Target: by 2015 halve 1990 per cent without safe sanitation			
Goal 8: Develop a global partnership for development.			
Aid per head of population ($)	24	26	60
MDG Target: by 2015 reduce 1990 level			
Debt service % of exports	9	NA	50
MDG Target: by 2015 reduce 1990 level			
Internet users % total population	NA	NA	7
MDG Target: by 2015 increase 1990 level			
Mobile and mainline telephone subscribers % total population	7	16	NA
MDG Target: by 2015 increase 1990 level			
Other data			
GDP per capita at PPP $	400	380	361
Population (millions)	1.8	2.0	2.1
Land per head of population (hectare per capita)	11	10	9.5
Eco footprint	NA	NA	3.1
Adult literacy rate % total population 15 yrs and above	NA	NA	50
HDI rank	130	140	146
HPI rank	NA	NA	120
Expectation of life at birth (yrs)	49	50	53

NA = data not available

Notes

1 Defined by the UN Bruntland Commission 1987 in *Our Common Future* (Oxford University Press) as 'development that meets the needs of the present without compromising the ability of future generations to meet their own needs'.
2 Attributed to Niels Bohr 1885–1962.
3 UNEP (2007) *Global Environment Outlook 4, Environment for Development*, UNEP, ISBN 978-92-807-2836-1
4 Barrow, C.J. (2006) *Environmental Management for Sustainable Development*, Routledge, ISBN 10: 0-415-36534-1
5 Khor, M. (2006) Globalization, Global Governance and the Dilemmas of Development; Chapter in Chang, H., *Rethinking development economics*, Anthem Press, ISBN 1 84331 1100.
6 Hanley, N. et al. (2001) *An Introduction to Environmental Economics*, Oxford, ISBN 13 978-0-19-877595-9
7 Lomborg, B. (2006) *The Skeptical Environmentalist, measuring the real state of the world.* Cambridge, ISBN 0 521 80447 7, Chapter 24, Global Warming.
8 Nordhaus, W. and Boyer, J. (2000) *Roll the DICE again; economic models of global warming*, Cambridge, Mass: MIT.
9 For example, Group A might be encouraged to consider: state and trends in demography, economic and human development status, protection against disasters and climate change, eco footprint, use of renewable energy, governance, competitiveness, logistical capacity, national, regional and international institutional, professional, and cultural support for information exchange, technical transfer, finance, education, political, economic and social communication, etc.

10 For example, Group B might be encouraged to consider state and trends in inter-state and civil conflict, crime, unemployment, corruption and abuse of power in police, military, courts, elections, and civil services; lack of safe standards and probity in commerce, construction industry; drug and alcohol abuse, prostitution, human trafficking; unwanted fertility, epidemic disease; unsafe water and sanitation, pharmaceutical supplies, black economy, piracy; lack of development of public health, education, medical treatment services, emergency response services, roads, communications, and energy; lack of controls on degradation of land and water resources; decline in protection against disasters and climate change, fraud in governance, and low levels of productivity, competitiveness, logistical capacity, etc.