Prototype Global Sustainable Development Report

Brief 4
Visions, scenarios and future pathways

No one knows which path the world will take in the next 40 years. People across the world also have different views or "visions" of what kind of world they would like to see for themselves, their children and children in the future. In 2012, Rio+20 (UNCSD) agreed on elements of a common vision for sustainable development, and the Open-Working Group on the Sustainable Development Goals aims to add more details to this vision. People also prefer different future pathways toward achievement of the common vision. Scenarios are plausible and internally consistent pictures of the future. They are useful tools – often making use of quantitative models - to systematically explore the feasibility of the vision and of proposed future pathways towards its achievement. They provide information on the needed "means of implementation" and can be useful in monitoring progress.

Future scenarios

The Prototype Global Sustainable Development Report draws lessons from a variety of scenarios produced by leading global modelling teams. It contrasts two alternative types of scenarios: (i) *dynamics-as-usual scenarios*, assuming a world with economic growth as the main goal for the coming decades and continuing the historical path of incremental improvements in reaction to perceived crises, in line with historical patterns and trends; and (ii) *sustainable development scenarios*, in which the world follows an integrated approach to economic, social and environmental goals, in order to deliver a decent quality of life for all people on a "healthy" planet. The dynamics-as-usual scenario is often perceived by the public as future "projection" or "prediction", even though this is not the case by design.

Dynamics-as-usual world

Dynamics-as-usual is a "growth first"-scenario. In line with current trends, economic growth remains the top policy priority in most countries, but an increasing number of social and environmental issues are increasingly taken seriously and are being addressed.

By 2050, gross world product quadruples to US$300 trillion, with BRICS alone accounting for 40% of the world economy in 2050. Income convergence across countries continues rapidly, reaching ranges between emerging and developed countries similar to ranges among developed countries today. Average GDP per capita is expected to triple to US$33,000 in 2050, a level similar to OECD countries today – for OECD countries, GDP per capita is expected to double to US$69,000. GDP per capita in BRICS would quintuple to US$37,000 in 2050. However, some of the most vulnerable and poorest economies remain marginalized and in deep poverty.

In 2050, the world could count 3 billion poor, 250 million hungry, 240 million people without access to water, 1.4 billion without access to sanitation and 1.8 billion without access to modern energy services.

With economic growth as the key goal, energy and water will be in big demand, exerting substantial environmental pressures in the absence of significant improvements in eco-efficiency and without coordinated efforts to change consumption patterns. Water demand is expected to increase by 55% and energy use by 80% by 2050, with 85% of the global primary energy used coming from fossil fuels, 10% from modern renewable fuels, and 5% from nuclear energy.

Agricultural land area is expected to increase until 2030, putting pressure on other uses of land, and might decline thereafter, in line with declining population growth and agricultural yield improvements. Deforestation rates would likely continue to decline, especially after 2030, but most primary forests might be destroyed by 2050. Biodiversity is expected to decline by at least 10%, with the highest losses in Asia, Europe, and Southern Africa, and pressure from invasive alien species will increase.

Limited efforts are made on climate change. GHG emissions are expected to increase from 48 to 83 $GtCO_2$-equivalent from 2010 to 2050, eventually leading to a 3-6^{o}C warming.

Urban air quality will continue to deteriorate globally, with concentrations in many cities far exceeding acceptable health standards. Premature deaths from exposure to particulate matter might double to 3.6 million per year, SO_2 emissions increase by 90% and NOx emissions by 50%. Yet, there would be fewer premature deaths from indoor air pollution after 2020.

Sustainable development world

In the sustainable development scenario, economic growth would no-longer be the primary goal. Yet, as a result of pursuing other sustainable development objectives, global income convergence is expected, including through catch-up development of African countries by mid-century. As a result, GDP per capita might be more than US$10,000 (in PPP terms) in all regions by 2050.

Additional efforts are made to ensure the provision of high quality public services for all. Under some of these scenarios,

poverty and hunger will be eradicated by 2050, with improved water sources, basic sanitation, electricity and modern cooking fuels accessible to all.

Water use might increase by only 16% due to accelerated increases in water efficiency and conservation. Primary energy use could remain below 70GJ per capita, and the use of renewables could triple from 2010 to 2050. One co-benefit of environmental policies could be higher energy security, due to limited energy trade, increased diversity and resilience of energy supply by 2050

Deforestation and land degradation will be slowed and later reversed. The extinction of threatened species will be prevented and the situation of those in steepest decline by 2020 improved.

Coordinated efforts are considered to curb GHG emissions in order to keep GHG concentrations below 350-450 ppmv CO_2-equivalent by 2100 and limiting the global average temperature change to 2°C through the whole range of possible policies, technologies and regulations.

Great improvements could be achieved in terms of reducing air pollution. It should be possible by 2050 to reduce NOx, SO_2 and black carbon emissions by 25% compared to the baseline. Reduced air pollution could reduce the number of premature deaths globally by 50% by 2030.

Common elements

In both scenarios, universal primary education is an achievable goal, chemicals pollution is not eliminated, and surface and ground water quality continue to worsen.

Investment needs

Global cooperation is needed to accelerate technology transfer and diffusion, to direct wisely the one trillion US dollars that are spent on research and development every year and to meet the global investment requirements. Sustainable development scenarios based on modelling provide information on investment and technology needs to achieve the chosen goals. However, since their scope and assumptions vary significantly, the results also range widely. In view of the trade-offs and synergies involved across different sectors, it does not make sense to add up the costs of achieving individual goals.

All the analyses of investment requirements and financing needs for sustainable development in the coming decades based on scenarios conclude that financial needs are significant, of the order of the several trillions per year. The Figure below indicates total investment needs in a different colour than the incremental needs beyond a baseline in order to achieve a certain goal.

Lessons learned

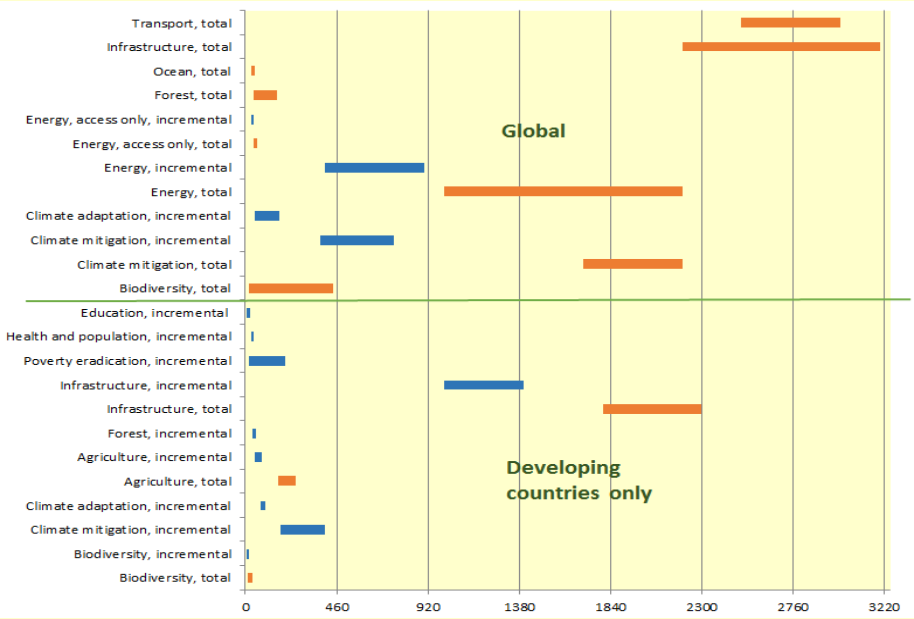
There is no agreement on the role of science in policy making. Yet, scenario models reflect specific worldviews that have greatly shaped the worldviews of decision-makers. Hence, policy recommendations made by analysts need to make special efforts to make underlying assumptions clear to decision-makers.

To date, no scenario exists that would consider the full range of sustainable development goals suggested by science or by politics. And the broader the set, the more unresolved trade-offs and synergies remain. This is a serious challenge and will require significant resources to resolve. More resources are needed for integrated assessment processes and model development tailored to broad, new problems.

More information

For further information, see the Prototype Report's website: http://sustainabledevelopment.un.org/globalsdreport

Investment requirements for various sectors (billion USD)



Legend: blue bar stands for incremental needs and orange bar stands for total needs.
Sources: UN DESA (2013), Financial needs for sustainable development, Division for Sustainable Development's inputs to the UN Task Team on post-2015 agenda; UNTT Working Group on Sustainable Development Financing (2013), Financing for sustainable development: Review of global investment requirement estimates.