Chapter I

Global trends and challenges to sustainable development post-2015

Summary

- The global community has made great strides in addressing poverty, but a mere continuation of current development strategies will not suffice to achieve sustainable development. Economic and social progress remains uneven, the global financial crisis has revealed the fragility of progress, and accelerating environmental degradation inflicts increasing costs on societies.
- There are a number of economic, social, technological, demographic and environmental megatrends underlying these challenges—a deeper globalization, persistent inequalities, demographic diversity and environmental degradation—to which a sustainable development agenda will have to respond.
- These trends influence and reinforce each other in myriad ways and pose enormous challenges. Urbanization is proceeding rapidly in developing countries, globalization and financialization are perpetuating inequalities, while exposing countries to greater risks of contagion from crises, and food and nutrition as well as energy security is threatened by competing demands on land and water, as well as environmental degradation.
- Most important, environmental degradation has reached critical levels. Business as usual is therefore not an option, and sustainable development will require transformative change at the local, national and global levels.

A more challenging context for global development

Significant progress has been made in the new millennium in achieving global development goals. Poverty was decreasing in all regions of the world, at least until the onset of the global financial crisis, underpinned by strong economic growth in developing countries and emerging economies. As a result, the first target of the Millennium Development Goals—halving the proportion of people living in extreme poverty globally—has already been met. Improvements in school enrolment rates and health outcomes demonstrate similar progress in the dimension of social development.

Rising inequalities, the food, fuel and financial crises, and the breaching of planetary boundaries have made clear that a mere continuation of current strategies will not suffice to achieve sustainable development after 2015

Nonetheless, a mere continuation of current strategies will not suffice to meet all the Millennium Development Goals by their 2015 deadline and to achieve sustainable development after 2015. In important areas, development is falling short and targets will be missed, including the reduction of hunger, vulnerable employment and maternal mortality, and improvements in the lives of slum dwellers, among others. Even where global goals have been reached, there are wide disparities between and within countries. Thanks in part to the remarkable growth rates in Asia, the region has made a large contribution to the achievement of global goals. Other regions, and particularly the least developed countries within them, have been less successful. Within countries, economic growth was frequently accompanied by rising income inequality, and the very poor and those discriminated against owing to their sex, age, ethnicity or disability have benefited least from overall progress (United Nations, 2011a). Income inequality is mirrored by very unequal social development and access to health services and education. Such intragenerational inequalities pose an equally important challenge to sustainable development, which is primarily associated with intergenerational equity.

The fragility of progress became apparent during the food, fuel and financial crises in 2008 and 2009. The global recession of 2009 was triggered by a global financial crisis engendered by the financial systems of developed countries, engulfing their financial and banking sectors. The resulting shock to economic activity passed through the global economy quickly, with international trade, investment and other financial flows collapsing. The recession and the slow subsequent recovery have increased unemployment worldwide and have slowed or partly reversed the decline in poverty. The fact that the global financial crisis coincided with a peak in food and energy prices aggravated its impacts in many countries. Food prices had risen rapidly since 2003, largely driven by rising energy prices and the increased production of biofuels, which became competitive owing to very high oil prices. Exacerbating factors such as extreme weather events in Australia, Ukraine and countries in other regions of the world, as well as increased speculative activity in commodity markets, highlight the intertwined risks between the three crises and the multidimensional nature of the challenges they posed (Headey, Malaiyandi and Fan, 2010).

Last, accelerating environmental degradation indicates that the world is facing a strong sustainability challenge; that is to say, there are limits to the substitutability of certain forms of natural capital, and thus to the extent to which technologies will be available to overcome environmental and planetary challenges in future (Ayres, 2007). As many forms of this natural capital are absolutely essential to human survival in the long run, its preservation is critical. A future global agenda has to address this strong sustainability challenge and facilitate transformative change at all levels—local, national and global.

Underlying global megatrends

These challenges to sustainable development are driven by broad underlying economic, social, technological, demographic and environmental megatrends. Megatrends are understood in this context as major shifts in economic, social and environmental conditions which change societies and substantially impact people at all levels.

Both the progress in development that has been achieved in recent decades and its uneven nature are tied intrinsically to changes in the global economy and globalization.

Many countries have benefited from access to global markets and the spread of knowledge and technology, but others remain marginalized. Tighter trade, investment and financial links have also increased interdependence between countries and led, particularly in combination with financialization, to greater risks of contagion in times of crisis. At the same time, economic growth has been accompanied by rising income inequalities in many countries.

In the years ahead, extremely diverse population dynamics have the potential to further exacerbate inequalities, both in developing and developed countries, and at the global level. With countries at different stages of the demographic transition, further population growth, urbanization and rapid ageing put major stresses on the national infrastructure and health and education systems. If necessary investments are not made, such demographic changes will also heighten the vulnerability of countries and populations to economic, social and environmental crises.

In addition to globalization, inequalities and major demographic changes, there is a fourth megatrend, accelerating environmental degradation, which introduces critical challenges for sustainable development. This megatrend is driven by unsustainable production and consumption patterns, and already impacts development at all levels. Extreme weather events contributed to the food crisis, and environmental problems often affect the poor disproportionally, since they are the least well equipped to deal with them. In the long run, a continuation of current trends and the breaching of planetary boundaries in particular would undermine all efforts to achieve sustainable development.

A more integrated, but multipolar and heterogeneous global economy

A deeper globalization

Globalization is not a new phenomenon. In the nineteenth century, the world economy underwent its first process of globalization, driven by technological progress in the form of lower transportation and communication costs. World trade expanded at close to 4 per cent annually on average throughout the century, much faster than in previous centuries (O'Rourke and Williamson, 2004). In addition, capital flows boomed and migration between continents occurred on a large scale. Today's globalization is therefore not entirely unprecedented in terms of trade levels, but it is qualitatively different. Beyond the mere expansion of trade and investment flows, underlying global production patterns have changed in recent decades, in particular since the turn of the millennium, driven by the rise of transnational corporations and global value chains. Instead of shallow integration, characterized by trade in goods and services between independent corporations and portfolio investments, this new phase of globalization has brought deep integration, organized by transnational corporations which link the production of goods and services in cross-border value adding networks (Gereffi, 2005).

Assembly-oriented export production in newly industrializing economies in East Asia marked the beginning of this geographical fragmentation of production. The movement of labour-intensive operations of manufactures production to low-wage locations upended the traditional international division of labour, creating opportunities for industrialization in developing countries. Successful insertion into global value chains contributed to rapid and sustained growth in numerous countries, accounting for much of the overall progress in the global fight against poverty.

Deepening globalization is characterized by tighter trade and investment links and geographically fragmented production processes organized by transnational corporations

The fragmentation of production was made possible by a favourable global political environment which gradually reduced barriers to trade and investment, and by major advances in transportation and in information and communication technology. The latter in particular is widely seen as the key general-purpose technology of the globalization age, driving technological progress in a wide range of sectors (Jovanovic and Rousseau, 2005). Those advances enabled corporations to manage complex global supply chains and was thus a precondition for the outsourcing and offshoring of production tasks, initially in manufacturing sectors such as apparel and simple electronics, but gradually in more and more sectors including, most recently, services and knowledge work (see, for example, Sturgeon and Florida, 2000, for the automotive industry; and Gereffi, 2005, for an overview).

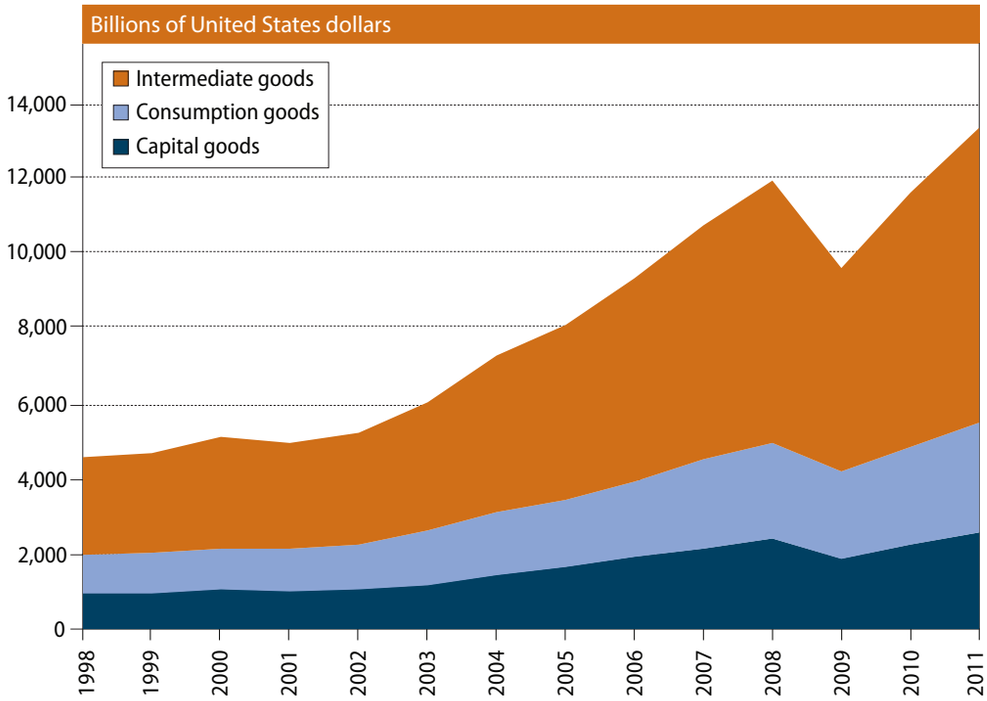
Information and communications technologies have also made the diffusion of information easier, and have facilitated better access by developing countries to the global knowledge pool. Because of the critical role of science and technology in addressing the social, economic and environmental challenges faced by countries, this wider diffusion is contributing to the progress of development in a wide range of areas. At the same time, innovative activity and technology development continue to be concentrated in a small number of advanced economies. Only very few countries such as Brazil, China and India, have entered this segment in recent decades, because core research and development activities are very rarely outsourced and remain overwhelmingly centred at corporate headquarters in developed countries (Castaldi and others, 2009).

The changes in global production are reflected in changing global trade patterns. Overall trade has grown at rates much faster than those of world domestic product, and not only did developing countries expand their share in world trade, but they were able to diversify and increasingly export manufactured products (United Nations, 2010a). However, these patterns are far from uniform—diversification is largely limited to developing and emerging economies in Asia, whereas traditional trade patterns based on commodity exports and imports of manufactures and capital goods prevail in Africa and, to a lesser extent, in Latin America. The rise of China in particular has contributed to this trend, both directly owing to China's large demand for commodities and the traditional sectoral patterns exhibited by rising South-South trade, and indirectly by contributing to high commodity prices, particularly for oil and minerals (Erten and Ocampo, 2012).

The disintegration of production, and its acceleration since the turn of the millennium, is visible also in a rapid increase of trade in intermediate goods (figure I.1). As a result, the income elasticity of trade has increased as lead firms react to changes in demand and pass shocks on to their downstream suppliers more quickly (Milberg and Winkler, 2010), thus further increasing interdependence in the global economy. However, since their collapse during the 2008 and 2009 crisis, trade flows have recovered but slowly, and trade expansion is likely to remain significantly slower than before the crisis, indicating a potential weakening of globalization of trade (United Nations, 2013).

Deep globalization is also characterized by increasing foreign direct investment (FDI) and financial flows of deep globalization. FDI flows grew as a number of countries offered conducive environments for investment and served the needs of corporations competing based on the transnationalization of production. Growth in FDI has outpaced even the rapid growth in world trade. Global FDI inflows reached $ 1.5 trillion in 2011, although they have yet to reach the pre-crisis peak of 2007 (United Nations Conference on Trade and Development, 2012b). Fifty-one per cent of total FDI was destined for

Figure I.1
World non-fuel merchandise exports by type of goods, 1998-2011



Source: United Nations Commodity Trade Statistics Database (UN Comtrade).

developing countries and transition economies, which have steadily and rapidly increased their share of overall FDI owing to their dynamic development. Yet, not all developing countries benefit from this trend. The least developed countries in particular remain marginalized, having attracted only $15 billion, or less than 1 per cent of global FDI.

Financial globalization and financialization

Globalization has progressed furthest, perhaps, in finance, where the liberalization of capital markets and short-term capital flows has been promoted since the 1980s, most prominently by the International Monetary Fund (IMF). The rationale was to enable global savings to be allocated to their most productive use, and thus to provide developing countries in particular with access to scarce savings. The actual outcome of financial liberalization was quite different, however. The increased volatility of capital flows, global macroeconomic imbalances, and multiple financial crises—typically followed by severe recessions, most recently on a global level—have highlighted both the large risks and the very uncertain gains of financial globalization for development.

Capital controls and restrictions to short-term capital flows were an essential part of the post-war Bretton Woods regime. With the Great Depression and the financial crisis that had preceded it in mind, policymakers agreed to restrict international capital mobility and thus prioritize trade and production over finance and give countries greater macroeconomic policy space. However, this essentially Keynesian vision was undermined by the ascendancy of financial interests in key developed countries, a broader move towards deregulation and liberalization, and growing trade links between countries, which made it more difficult to administer capital controls (Rodrik, 2011).

Capital market liberalization proceeded first in developed economies and then in developing countries, and international capital flows did increase significantly subsequently, from an average of below 5 per cent of global gross domestic product (GDP) between 1980 and 1999 to a peak of about 20 per cent in 2007. At the same time, short-term flows—portfolio and bank-related investments—have become a much more prominent part of total capital flows, particularly in the period between 2003 and 2007 (International Monetary Fund, 2012).

Financial globalization has led to rapidly increasing and more volatile international capital flows, macroeconomic imbalances and more frequent crises. And since the global financial crisis, cross-border financial flows have declined by more than 60 per cent

Developing countries that opened their capital accounts and relied more heavily on foreign finance did not promote growth and investment, however; in fact, they grew more slowly than their peers (Prasad, Rajan, and Subramanian, 2007). At the same time, the volatility of capital flows increased, their procyclical nature exacerbated macroeconomic instability, and financial crises became much more frequent. These crises generally follow a similar pattern. Capital inflows based on market optimism fuel credit bubbles, leading to increases in the values of real estate and the currency; but over-indebtedness soon undermines the capacity to repay. Once the bubble bursts, capital inflows stop and the ensuing credit crunch leads to economic contraction (Kindleberger and Aliber, 2011). The social costs of such crises are extremely high. Laeven and Valencia (2012) find that since the onset of the global financial crisis, the median output loss from systemic banking crises, which often coincide with currency crises, has amounted to 25 per cent of GDP.

Financial market liberalization has also increased macroeconomic instability, at both the national and the global levels. Capital flows are procyclical and thus exacerbate the business cycle. At the same time, they limit policymakers' ability to use macroeconomic policies to smooth out the business cycle (Ocampo, Spiegel and Stiglitz, 2006). Consequently, many countries have built up their international reserves to protect themselves against the risks associated with volatile capital flows. The massive increase in reserves held by developing and emerging countries—which amounted to $7 trillion in 2011 (United Nations, 2012a)—leads to global macroeconomic imbalances however.

Tightly related to capital market liberalization is the process of financialization. Broadly described, financialization entails the increasing role of financial motives, actors, markets and institutions in the economy, as evidenced in the increase in profits of financial institutions relative to non-financial corporations and the overall increase in rentiers' share of national income (Epstein, 2005). In the 1970s, starting in the United States of America followed by other advanced economies, financialization was driven by financial interests that sought profitable investments in the context of slowing economies. It led to changes in corporate behaviour in line with principles of shareholder value and shorter time horizons of corporations in their investment decisions, changes in financial markets which facilitated increased indebtedness and asset-price bubbles, and changes made in economic policy, not least of all to facilitate financial globalization (Palley, 2007).

More recently, and in parallel to the recent slowdown in trade globalization, the global crisis may have ushered in an era of weakening financial globalization. In fact, cross-border financial flows have declined by more than 60 per cent from their peak in 2007 (Lund and others, 2013). Financial regulation is being strengthened worldwide, both in major developed and emerging economies and at the international level, and major advocates of financial globalization have modified their position. Most prominently, IMF adopted a new institutional view on capital controls, highlighting the risks associated with rapid capital inflows and outflows, and embracing capital flow management measures under specific circumstances (International Monetary Fund, 2012).

Convergence, but greater vulnerability and heterogeneity in the global economy

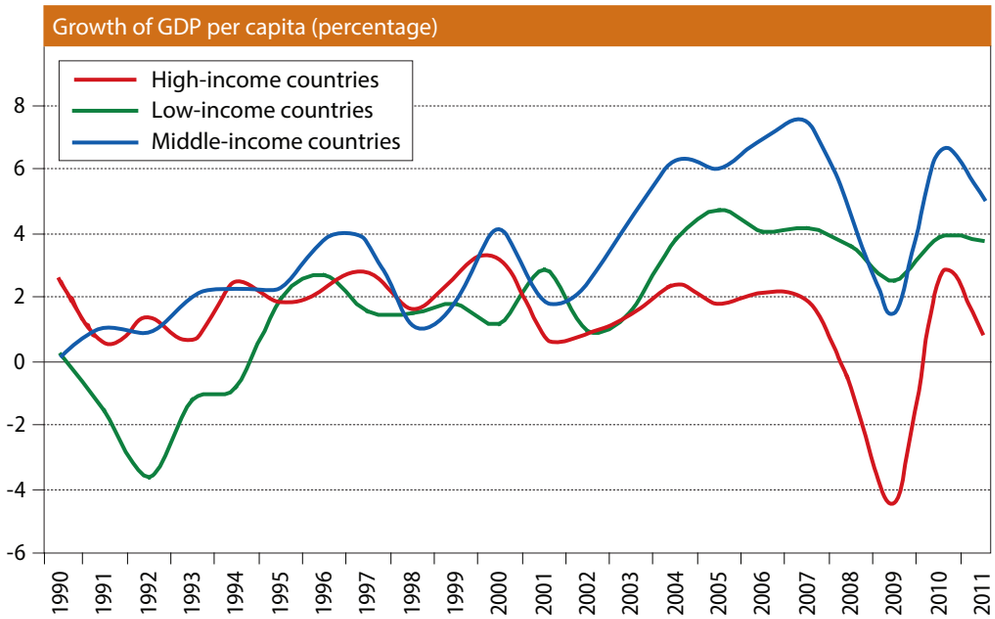
Overall, globalization has provided opportunities for emerging economies and developing countries, and in recent years their growth rates have been consistently higher than growth rates in the developed world. There are two critical caveats with respect to this broad trend of convergence, however. It has not made developing countries immune to cyclical shocks: indeed, globalization has increased countries' vulnerabilities; and it is far from uniform, with some developing countries not only excluded from this convergence process but falling further behind. Average per capita growth also hides increasing inequalities within countries, which are also partly related to globalization. A significant part of the global population therefore does not benefit from convergence (Dervis, 2012).

Deepening globalization has facilitated growth in developing and emerging economies, but has also made national economies more vulnerable to external shocks

Since the 1990s, per capita incomes in emerging economies have grown consistently faster than in the developed world. Since the turn of the millennium, growth in developing countries has accelerated as well, leading an overall trend of convergence in the global economy (figure I.2). Convergence is partly driven by globalization, which has facilitated access to technology and know-how through tighter trade and investment links and thus higher productivity growth in manufacturing. In fact, manufacturing sectors have experienced an unconditional convergence in labour productivity, that is to say, a convergence independent of geography or policies (Rodrik, 2012). Since this does not hold for other sectors of the economy, structural transformation—a decreasing reliance on the primary sector and a shift of resources to higher value adding manufacturing and modern services activities—will remain a necessary condition of sustained economic growth.

As a result of rapid growth in developing and emerging economies, the world economy is becoming more multipolar, which inevitably leads to the creation of a world that is more multipolar politically. These changes will have to be accommodated within a global

Figure I.2
Annual growth of GDP per capita, high-, low- and middle-income countries, 1990-2011



Source: World Bank World Development Indicators.

governance regime. The expansion of global trade associated with the fragmentation of production also adds to global carbon dioxide (CO_2) emissions, with the transport sector a significant source of those emissions. On average, internationally traded goods generate emissions that are 50 per cent higher than those generated by locally traded goods (United Nations, 2013). Relatedly, the vast expansion of global consumption and of changing consumption patterns in emerging economies will add to the strong environmental sustainability challenge driven originally by unsustainable consumption patterns in developed countries (see further below). Economically, continued growth in emerging economies in particular can be an engine of growth for the world economy and provides opportunities for other developing countries, but the gravity shift to China and India, the major drivers of this process, will also change the nature of end markets and is likely to pose new challenges for economic development.

Deepening globalization has also increased the cyclical interdependence of national economies. Owing to tighter links, they are more vulnerable to external shocks, and crises like the 2008-2009 global financial crisis spread quickly. Global value chains are partly responsible for this, as demand shocks in one region are passed on much more quickly through tightly integrated global value chains (see, for example, Cattaneo, Gereffi and Staritz, 2010). Reductions in consumer demand in end markets are transmitted in real time to producers, often with large and immediate effects on employment in exporting countries (Keane, 2012).

Perhaps even more important is the fact that financial globalization has increased countries' vulnerability to financial crises, as evidenced by the frequency of financial crises in recent years and the contagion effects arising from such crises. Many countries have taken the lessons learned from the crisis to heart—most notably developed economies such as the United States—and have taken steps to strengthen financial regulation. Interdependence in the global economy, however, also implies that the externalities of national economic policies are increasing and thus require better management and coordination at the global level. Again, notable first steps in this regard have been taken since the crisis, for example, through the establishment of the Financial Stability Board, and through the issuance of new rules by the Basel Committee on Banking Supervision.

There are concerns not only about external shocks, but also about heterogeneity in growth experiences, i.e., about the fact that progress is not uniform. Growth in many countries is not sufficient to enable them to be part of the overall convergence process, or they remain dependent on low value adding resource exports for growth. Yet, development strategies based on industrialization and structural transformation following the example of East Asia have become more challenging as rents for simple manufacturing and assembly procedures within global value chains have eroded and as prices for manufacturing goods typically exported by low-income countries have fallen more rapidly with the entry of China into global markets (Kaplinsky, 2006). In future, shifting end markets will also lead to shifting patterns of global import demand, with a heavier emphasis on demand for commodities and raw materials as well as unprocessed goods, likely rendering upgrading strategies within value chains more difficult (Kaplinsky and Farooki, 2010).

The 2008-2009 crisis has also accelerated the consolidation of global value chains, which began as early as the 1990s in some sectors, but can now be observed across sectors (Cattaneo, Gereffi and Staritz, 2010). Many lead firms used the crisis to end relations with marginal suppliers, relying on globally operating suppliers instead. This may preclude, or at least render significantly more difficult, the future entry of new firms, in particular those based in marginal countries, into global value chains. In combination

with continuing global macroeconomic imbalances and the related pressure on countries with current-account deficits to rebalance their external positions, as well as the slowdown in trade expansion already observed, these changes will render development strategies based on export-led growth, so successfully implemented in many of the best performing developing countries in recent decades, much more difficult in the years ahead.

Persistent inequalities

Income inequalities within many countries have been increasing, while global inequality, although it has receded slightly in recent years, remains extremely high

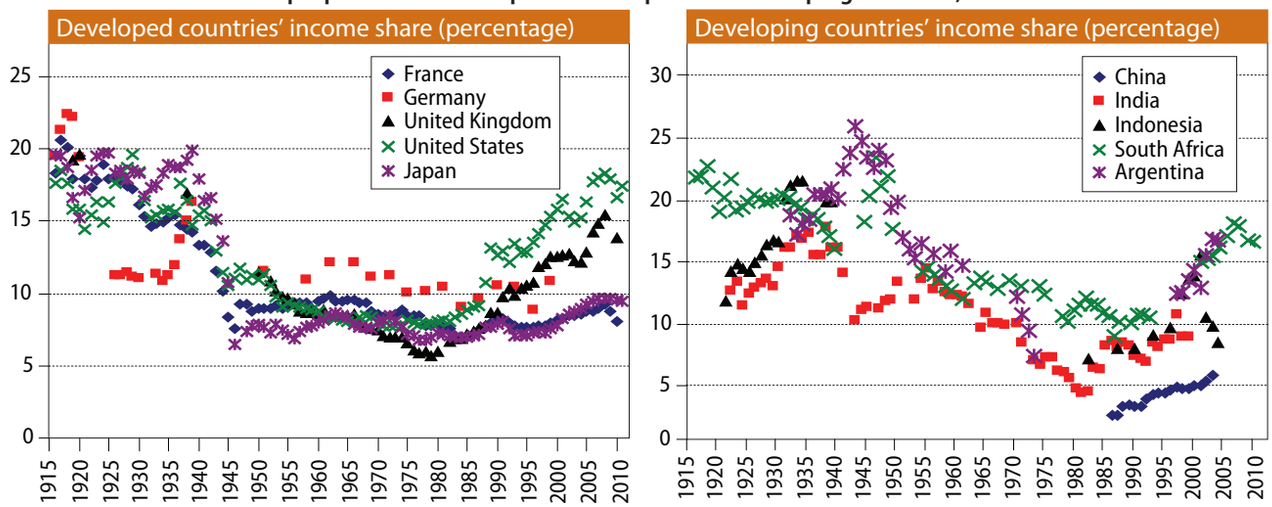
The heterogeneity among countries exists side by side with persistent inequalities, of which income inequality is only one, if the most visible, dimension. While global income inequality has receded slightly in recent years, inequalities within many countries have been rising. These trends are complex and driven by many, often structural and country-specific factors, and they are tightly linked to social, environmental and political inequalities. Nonetheless, globalization has important direct and indirect impacts on inequality. Left unaddressed, these inequalities threaten sustainable development prospects in multiple ways.

Owing to the convergence of mean incomes of developing and developed economies, global income inequality has been falling in recent years, albeit to a very small degree, and from a very high level. In the wake of the great global divergence in incomes that started with the industrial revolution in the nineteenth century, location rather than socioeconomic status or class is still responsible for the overwhelming share of overall income inequality. More than two thirds of global inequality is explained by differences in income between countries, and only one third by the distribution patterns within countries (Milanovic, 2011a).

The more recent stabilization and slight narrowing of global income inequality largely reflect economic growth in China since the 1990s, and growth in India, other emerging economies and developing economies since the turn of the millennium (Milanovic, 2012). At the same time, income inequalities are increasing at the national level in most regions of the world (figure I.3; see also Vieira, 2012). While national income inequalities had for the most part decreased after the Second World War, this trend was reversed in the 1980s, when inequality started to rise sharply again, particularly in developed and emerging economies, with the largest gains going to the top 1 per cent of households. The extent of within-country inequalities, while growing in most countries, varies widely between them. In several countries in Latin America, the major exceptions to the overall trend, social programmes and improvements in labour productivity have played a major role in reducing income inequality since 2000. Distributional diversity, however, applies to the developed world as well as to developing countries, which suggests that in addition to global economic forces, institutional factors play an important role in explaining it (Palma, 2011).

Changes in the global economy—while not the only driver of trends in inequality—play an important role in the context of many of its underlying causes. In developed countries, the outsourcing and offshoring of jobs requiring mid-level skills—facilitated by changes in global production patterns and technological changes—have led to a hollowing out of labour markets from the middle and may be partly responsible for stagnating wages for low-skilled workers (Abel and Deitz, 2012). At the same time, financialization has increased executive compensation and wages at the very top of the income distribution (for the United States, see Piketty and Saez, 2003). A significant decline in the share of wages in the functional income distribution, reflecting lower bargaining power

Figure I.3
Income share of the top 1 per cent for a sample of developed and developing countries, 1915-2010



Source: World Top Incomes Database.

of immobile labour versus mobile capital, exacerbates these trends, as capital ownership is typically highly concentrated (United Nations Conference on Trade and Development, 2012a). For this reason, the collapse in stock prices during the global financial crisis led to a temporary fall in the share of the top percentile in total income in the United States. However, during the uneven recovery from 2009 to 2011, incomes in the top percentile bounced back and grew by 11.2 per cent, while the average incomes of the bottom 99 per cent of households fell by 0.4 per cent (Saez, 2013).

In developing countries, income inequality is often due to insufficient employment generation, if, for example, growth is based on commodity exports, as was the case in some regions in Africa. In East and South-East Asia, structural change from a primarily agricultural to a modern economy—as famously described by Kuznets—is an important driver of inequality. In addition, global economic developments such as financialization and rapidly rising capital flows, as well as a global policy agenda with very different priorities, had long constrained national policymakers in their use of macroeconomic, tax and redistributive, labour-market and other policies to directly tackle inequalities (United Nations Conference on Trade and Development, 2012a).

Rising inequalities undermine prospects for sustained growth and sustainable development by threatening economic and social stability and by constraining the life choices of individuals

Not only are rising income inequalities at the national level undesirable in their own right, but they may also undermine prospects for sustained growth and broader sustainable development. Empirically, higher levels of inequality are associated with a shorter duration of growth spells. Many developing countries have been able to initiate and sustain high growth for several years, but sustaining steady growth over a longer period has proved to be much more challenging. Such longer growth spells are robustly associated with more equality in income distribution (Berg and Ostry, 2011). Potential reasons for this are inequality's negative impact on the composition of aggregate demand, investments in social services and education, and sociopolitical and economic stability.

In terms of social development, large inequalities constrain life choices for individuals and perpetuate unequal economic and social opportunities, i.e., inequality of outcome translates into inequality of opportunity. Several studies have emphasized that increasing inequalities are detrimental to child development. Beyond the psychosocial

and cognitive consequences for children (Hoff and Pandey, 2004), persistent inequalities increase the chances of lower development outcomes in health, including under-nutrition and stunting, and in education, including in school enrolment and learning outcomes. These inequalities may solidify over time, as the political influence of wealthier groups increases, leading to institutional arrangements that favour their interests (World Bank, 2005). Such economic and social inequalities are strongly intertwined with and often exacerbated by horizontal inequalities, i.e., inequalities based on disability, gender, ethnicity, caste or other hereditary characteristics. Conversely, in more equal societies, better social outcomes can be expected: people are more likely to live longer and to achieve higher grades at school, and less likely to suffer from obesity and violence (Pickett and Wilkinson, 2009). For instance, there is evidence that the proportion of the population with obesity is higher in developed countries with higher income inequality (Pickett and others, 2005).

Last, income inequality can threaten economic stability (see, for example, Rajan, 2010; and Stiglitz, 2012). In the United States, stagnating real wages for the middle class lowered the purchasing power of households. Low interest rate policies were introduced to spur consumption, which contributed to the mounting of household debt beyond sustainable levels (Rajan, 2010). The increase in debt in turn generated profitable activities in the financial sector, widening wealth and income gaps, while contributing to asset-price bubbles and ultimately to the financial crisis.

Demographic changes

The global population reached 7 billion in 2011 and will continue to grow, albeit at a decelerating rate, to reach a projected 9 billion in 2050 (United Nations, Department of Economic and Social Affairs, Population Division, 2011). Beyond aggregate global population growth, demographic development is characterized by heterogeneity, as countries are at different stages of their demographic transition. While global population growth is slowing, it is still high in some developing countries, and while the world population as a whole is ageing rapidly, some countries are witnessing an increase in the proportion of youth in their overall population. Such diversity, combined with persistent inequalities, in turn creates migratory pressures both within countries and internationally. These demographic trends pose major challenges for future development strategies at all levels: local development will be shaped by further urbanization, national development strategies will have to adapt to evolving demographic structures, and migratory pressures will have to be addressed at the global level.

Population dynamics are driven by fertility rates and mortality rates—changes in which are often described as jointly constituting the demographic transition—and migration patterns. Historical patterns in developed countries suggest a demographic transition from an initial state of high fertility and high mortality to a state of low fertility and low mortality, where mortality typically declines first followed at a later stage by a more abrupt decline in fertility. At the global level, fertility rates have long been falling from their peak and the global fertility rate currently stands at 2.52 children per woman. It is expected to fall further, to 2.17 children per woman, in 2045-2050. However, these averages mask great heterogeneity between countries. Fertility is below replacement level in countries that account for almost half of the global population, namely, most developed countries, but also China. It has fallen rapidly in many developing countries as well, whereas it remains at 4.41 for least developed countries, and is projected to stay significantly above

replacement level in coming decades (ibid.). The empowerment of women, better access to birth control and the postponement of marriage are immediate drivers of fertility declines, but fertility rates are also dependent on economic development, mortality declines and improvements in education levels.

While mortality is declining throughout the world, fertility rates remain high for some countries, notably least developed countries, and as a result, future population growth will be extremely concentrated geographically

Owing to improvements in nutrition and public health and social development more broadly, mortality is declining throughout the world. Life expectancy at birth is currently at 67.9 years, and is expected to increase to 75.6 years by 2045-2050, based on increases in all regions and development groups. Even though mortality trends have been more uniform, there is regional diversity nonetheless, with the impact of HIV/AIDS on life expectancy in sub-Saharan Africa particularly visible.

Migration is the third driver of population dynamics. Net migration from less developed to more developed regions has been increasing steadily from 1960 onward. Between 2000 and 2010, developed regions attracted 3.4 million migrants annually on average. While these flows dominate global migration patterns, migration between developing countries is also significant, and several of them have attracted migrants in large numbers, for example, as guest workers (in the Middle East) and as refugees (in Africa). Looking forward, migration patterns are more difficult to predict, as they are influenced by a complex interplay of economic, social, demographic, environmental and political factors; but overall migration from less to more developed regions is projected to continue, albeit at a slower pace, in the decades ahead (United Nations, Department of Economic and Social Affairs, Population Division, 2011).

These demographic drivers lead to four major global population trends: the world population will continue to grow; it will grow at a much slower pace than previously; it will become older; and it will be increasingly urban (Cohen, 2010). These global trends mask large underlying heterogeneity between countries, and they pose important challenges to sustainable development, both globally and in specific regions and countries. With regard to population growth, it reached its peak between 1965 and 1970, and has decelerated ever since. This trend will continue, and by 2050 population in developed countries is expected to almost stagnate, and population growth in developing countries other than least developed countries will be 0.50 per cent annually, while the population of the least developed countries will grow at the rate of 1.42 per cent annually, significantly below today's rate, but still high enough to enable populations to double every 49 years (United Nations, Department of Economic and Social Affairs, Population Division, 2011; see also figure I.4).

This diversity implies that future increases in world population will be highly concentrated geographically. Only eight countries—the Democratic Republic of the Congo, Ethiopia, India, Nigeria, Pakistan, the Philippines, the United Republic of Tanzania, and the United States—will account for half of the projected global population increase. More worrisome is the fact that rapid population growth continues in countries that are the least well equipped to provide the necessary investments to deal with larger populations. Populations are expected to more than double in the least developed countries between now and 2050, and short of major development progress in these countries, this is likely to challenge their sustainable development prospects in a number of ways. A vicious circle of poverty, lack of education, ill health, high fertility and high infant mortality can perpetuate inequalities. Breaking it will require further investments in health and education systems, as well as better access to reproductive health services and the protection of women's reproductive rights. At the same time, these investments have to be complemented

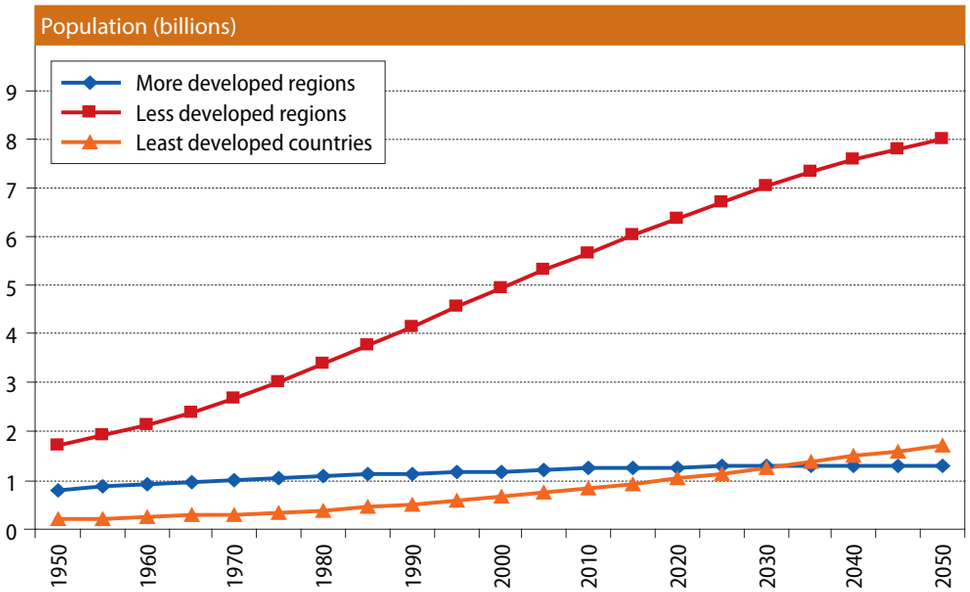
by expanding productive employment opportunities, as a growing number of young people enter labour markets. Last, population growth, in particular in combination with climate change, can add to local environmental stresses and resource and land scarcity.

Owing to the decline in fertility and mortality rates, the global population will also become older at an accelerating pace (Lutz, Sanderson and Scherbov, 2008). The share of persons aged 60 years or over will increase to 22 per cent in 2050 globally, up from 11.2 per cent in 2011 and from only 8 per cent in 1950. However, countries are at very different stages in their demographic transition. Population ageing is most advanced in developed countries, leading to sharp increases in dependency ratios and putting a strain on those countries' health and pension systems. Developing countries are younger on average, but their populations are growing older as well. Critically, the ageing process is projected to occur at a much higher speed than was the case in developed countries, while family structures undergo major changes and family support systems consequently play a smaller role. If basic pension systems are lacking, a growing share of older persons will therefore be at risk of falling into poverty.

Population ageing will lead to sharp increases in dependency ratios, while global disparities in population dynamics and persistent income disparities will increase migratory pressures at the global level

On the other hand, because of their continuously high fertility rates, the least developed countries will continue to see the number of youth and adolescents rising. A growing share of young people presents opportunities for reaping a demographic dividend, if a demographic transition occurs and fertility rates and dependency ratios fall, which, at this point, is projected to happen in least developed countries in Asia (United Nations Population Fund, 2011). However, this dividend will pay out only if those economies can create employment opportunities, which will be a major challenge for least developed countries in the decades ahead. Such disparities in international population dynamics, in combination with existing income disparities, are also contributing to continued migratory pressures at the global level. If addressed in a coherent manner, migration can be beneficial for both countries of origin and countries of destination, by alleviating—although by no means eliminating—problems arising from demographic trends, and contributing to

Figure I.4
Projected population by development region, medium variant, 1950-2050



Source: United Nations, Department of Economic and Social Affairs, Population Division (2011).

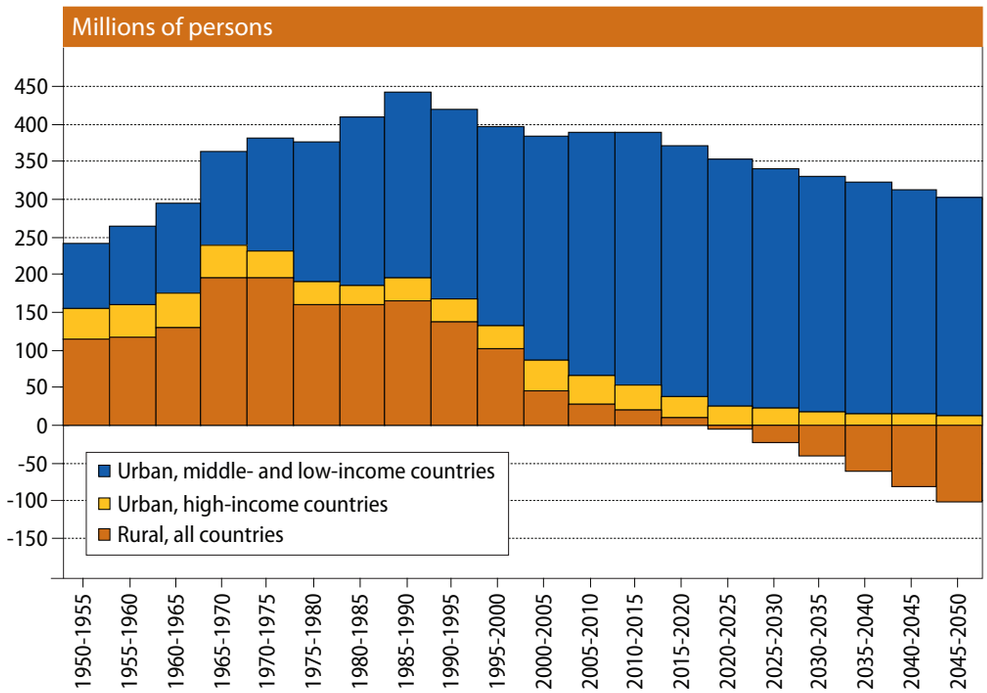
transfers of knowledge and resources. Yet, at this point, there are no adequate mechanisms at the global level for addressing these concerns.

As noted above, the fourth major trend is increasing urbanization. Already, more than half of the world's population live in towns and cities, and most future population growth will occur in the urban areas of developing countries (figure I.5). In the least developed countries, the rate of growth in urban areas is 4 per cent per year, mostly driven by rural-urban migration in search of employment (United Nations Population Fund, 2011). Many of these migrants live in informal settlements and urban slums where they are exposed to environmental hazards and increased health risks. Climate change can further increase these risks, as many cities are in locations particularly exposed to its effects (Satterthwaite, 2009). On the other hand, urbanization offers opportunities to provide better access to services and employment at lower cost and with a lower environmental impact. While building the infrastructure that would allow those opportunities to be realized entails huge investment and planning needs, the reality of continued population growth will render such an undertaking critical to any sustainable development strategy.

Environmental degradation

While an unusually stable global environment has been the precondition for unprecedented human development over the last ten thousand years, this stability is now under threat from human activity. Most critically, energy consumption has skyrocketed owing to rapid population and economic growth, resulting in unprecedented concentrations of CO_2 in the atmosphere and anthropogenic climate change. If greenhouse gas emissions, global

Figure I.5
Urban and rural population growth, high-, low- and middle-income countries, 1950-1955 to 2045-2050



Source: Population Division, UN/DESA.

resource consumption and habitat transformation continue at or above current rates, a state shift in the Earth's biosphere is likely (Barnosky and others, 2012), irreversibly changing the environmental conditions so favourable to human development in recent millenniums.

The environmental impact of human activity and the strong sustainability challenge that it poses are tightly related to the megatrends identified above. To decompose their overall effects and shed more light on the many interlinkages, it is useful to draw on the ImPACT identity, which relates demographic, socioeconomic and technological changes to their environmental impact. More specifically, ImPACT specifies that the product of total population (P), world product per person or affluence (A), the intensity of use of GDP or consumption patterns (C) and the efficiency of producers determined by technology (T) together determine overall environmental impact (Im) (Waggoner and Ausubel, 2002).[1] These forces influence each other in important and multiple ways. Population dynamics impact on per capita income and vice versa, income levels affect consumption patterns and efficiency in production, and environmental changes in turn exert an impact on economies, to give just a few examples.

The stability of the global environment is under threat from human activity, owing largely to unsustainable consumption patterns that reflect extreme inequalities

Within this framework, the contribution of the megatrends to environmental degradation can be delineated. Population dynamics determine the overall number of persons whose material needs have to be met, both at the local and national levels, and at the global level. Diverse demographic trends present highly diverse challenges to sustainable development at the local and national levels. Globally, however, population growth is slowing. More important, population growth is concentrated in countries whose contribution to global environmental challenges is comparatively small.

Economic growth lies at the heart of the global development agenda, and the persistence of large unmet material needs implies that sustainable development requires further increases in income and affluence for many. At the same time, humanity's overall demand for natural resources already exceeds Earth's bio-capacity (WWF, 2012). Contributions to this excessive environmental footprint are extremely uneven, however: the global inequalities in incomes and wealth described above translate directly into starkly differing environmental impacts (see chap. II).

The impact of per capita income on the environment is mediated by the intensity of GDP use, which is a reflection of consumption patterns, and by the efficiency of production of goods, or technology. Consumption patterns and technological progress are sometimes called sustainability levers, as they can mitigate the environmental impact of income growth (Waggoner and Ausubel, 2002). Growth itself can be a driver of such technological progress, of structural change entailing movement away from material-intensive industries towards services, and of changes in consumer preferences. An environmental Kuznets curve hypothesis suggests that for these reasons, resource use would increase in the early stages of development, but fall in later stages (Rothman, 1998). However, there is no evidence of such an absolute decoupling of growth in resource use from economic growth at the global level, and only very limited evidence for relative decoupling, where resource use grows more slowly than the economy. Most importantly, global CO_2 emissions have grown as fast as or faster than global GDP since the turn of the millennium, as large emerging economics industrialize (see below and chap. II).

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1 The well-known Kaya identity—expressing total global CO_2 emissions as a product of total population, GDP per capita, energy consumption per gross world product, and global CO_2 emissions per global energy consumption—is the basis of a specific exercise in decomposing overall environmental impact—in this case global emissions—into contributing driving factors P, A, C and T.

Threats to global ecosystems

In a number of areas, damage to the global environment is reaching critical levels and threatens to lead to irreversible changes in global ecosystems. Rockstroem and others (2009) have identified interlinked planetary boundaries, and found that in some areas, including most prominently climate change, boundaries have already been exceeded. There is also strong evidence for tipping points to exist for ocean acidification, the phosphorous cycle, and stratospheric ozone depletion, while in other areas, the impacts of environmental degradation may be limited to local and regional ecosystems (Nordhaus and others, 2012). Overwhelmingly, these changes are driven by the reliance on fossil fuels to power economic growth, and by industrialized forms of agriculture, necessary to feed a growing and increasingly wealthy global population.

Damage to the global environment is reaching critical levels and threatens to lead to irreversible changes in global ecosystems. Most visibly in climate change, critical thresholds have already been exceeded

The overarching environmental challenge is anthropogenic climate change. The increased concentration of greenhouse gases in the atmosphere—most importantly, CO_2—is leading to a warming of the planet. The atmospheric CO_2 concentration has increased from 260-280 parts per million (ppm) in pre-industrial times to 391 ppm in September 2012, and global mean warming is already 0.8º C above pre-industrial levels (World Bank, 2012a). Projections of future global warming depend on assumptions regarding future development pathways and demographic, economic and technological developments, and thus vary widely, but further warming is predicted in all scenarios. The business-as-usual scenario produced by the Intergovernmental Panel on Climate Change (2007a) arrives at a best estimate of a 4° C increase of global average surface temperature in 2100 as compared with the period 1980-1999.

There is also a strong scientific consensus that global warming is induced by human behaviour, predominantly by fossil fuel use and, to a smaller extent, by changes in land use and deforestation. The extent of future global warming will therefore primarily depend on successfully using the sustainability levers by reducing the energy intensity of GDP growth and the carbon intensity of energy, assuming that GDP per capita and population continue to grow. However, current trends are not favourable. While the carbon intensity of global growth decreased and thus slowed down the overall growth in CO_2 emissions up until 2000, emission growth has accelerated in the new millennium because of a reduction—and, partly, even a cessation—in the long-term decreasing trends of carbon intensity of energy and energy intensity of GDP, largely owing to the high energy requirements of intensive growth in developing and emerging economies (Raupach and others, 2007).

This challenge, in its starkness and immediacy, clearly requires a global response. Rockstroem and others (2009) propose a CO_2 concentration boundary in the atmosphere of 350 ppm, which has already been breached. Yet, reaching agreement on this global response entails addressing difficult equity questions, as contributions to global emissions have varied widely historically and continue to do so. While developed countries are responsible for almost 60 per cent of cumulative emissions and therefore bear the brunt of the blame historically, they now contribute little to emissions growth, which is driven by China, India and other developing countries (Raupach and others, 2007). In fact, China is now the single largest contributor to global CO_2 emissions, having emitted 9.7 billion tons in 2011, representing 29 per cent of all emissions (Olivier, Janssens-Maenhout and Peters, 2012). At the same time, the stabilization of emissions in developed countries can be explained in part by growing imports of emissions-intensive products from developing countries. If these emissions transfers are taken into account, developed countries have not been able to stabilize their contribution to global emissions (figure I.6). The picture is

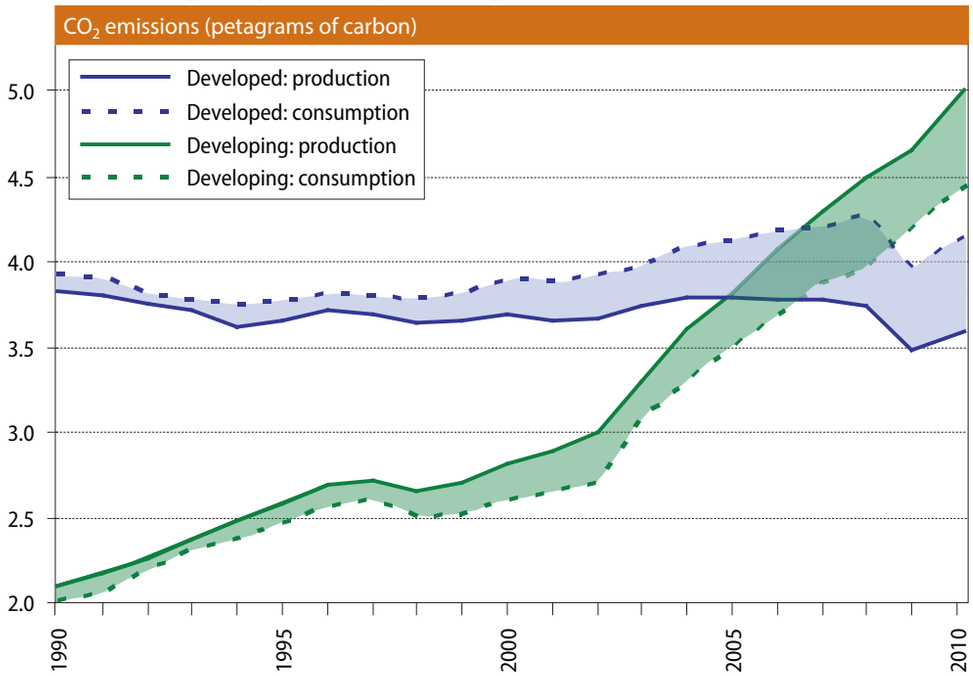
further complicated by stark differences in per capita emissions. While per capita emissions in the United States are about five times the global average, per capita emissions in least developed countries are a mere tenth of the global average (Raupach and others, 2007).

Climate change poses numerous and stark challenges for sustainable development, and its effects will be felt in all regions of the globe, although the intensity of exposure will vary. Degree of vulnerability will vary even more, with developing countries and the poor, which have contributed the least to global warming, likely to suffer the most. Coastal communities, notably in small islands and megadeltas, mountain settlements and urban communities in megacities of developing countries are particularly vulnerable (Intergovernmental Panel on Climate Change, 2012a). Agriculture will also be negatively impacted by the increasing frequency of extreme weather events such as heatwaves and droughts, and the intensification of the water cycle, further intensifying aridity of already dry zones and thus reducing the amount of arable land. Growing average temperatures and changes in precipitation trends are already having a significant negative impact on yields of global maize and wheat crops (Lobell, Schlenker and Costa-Roberts, 2011).

Arguably even more important in the functioning of the Earth system, albeit less visibly, are the world's oceans. They, too, are dramatically affected by increased CO_2 emissions, which lead, through the effects of warming and thermal expansion, to a rise in sea levels, as well as to ocean acidification. The latter would, if current trends continued, halt or even reverse coral reef growth, undermining marine ecosystems, and, in combination with sea-level rises, would endanger coastal regions worldwide (World Bank, 2012a).

Climate change is also exacerbating biodiversity loss. Biodiversity is critical for the resilience of ecosystems and thus important for the provision of often-irreplaceable ecosystem services, encompassing, inter alia, food, water and cultural services (Steffen and

Figure I.6
CO_2 emissions of developed and developing countries, as allocated to production and consumption (production plus net exports), 1990-2010



Source: Peters and others (2012).

others, 2011). While current losses in biodiversity are mostly caused by habitat destruction, climate change could soon become an even bigger threat to the survival of species and is expected to accelerate the overall trend in biodiversity loss (Bellard and others, 2012). Causal chains are complex and multiple, and include the increase in average temperatures and changes in precipitation patterns, the higher frequency of extreme weather events such as droughts and flooding, ocean acidification and further land-use changes.

The expansion and modernization of agriculture are largely responsible for interference with the planetary nitrogen and phosphorus cycle, and contribute to global land-use change. Fertilizer use, a major driver of the green revolution in agriculture, has increased by 700 per cent since 1960 (Foley and others, 2005). Fertilizer production involves the conversion of nitrogen from the atmosphere into reactive forms through which it becomes usable nutrient for plants. This has allowed for the remarkable expansion of agriculture, but at the same time it has led to the widespread dispersion and accumulation of reactive nitrogen in the environment. The same is true for phosphorus, which is mined from rock and also used in fertilizers. The excess concentration of nitrogen and phosphorus degrades water quality and threatens biodiversity and thus the resilience of marine ecosystems. Increasing nitrogen concentrations also contribute to acidification of rivers and streams, to stratospheric ozone depletion and to climate change (Galloway and others, 2003). Land-use change, which is driven not only by agriculture but also by the expansion of urban areas, further contributes to change in the global and regional climates and to biodiversity loss.

Once certain thresholds have been crossed, there are substantial risks of large-scale non-linear impacts, which could irreversibly alter the state of the planet's biosphere

Most worrisome are the substantial risks of large-scale non-linear impacts of climate change and the breaching of other planetary boundaries. Once certain environmental thresholds are crossed, biological changes might interact in multiple ways, through feedback mechanisms which are not yet fully understood, and move the planet's biosphere irreversibly into a different state. Such state shifts have occurred multiple times in the Earth's history, most recently about thirteen thousand to eleven thousand years ago, when the planet transitioned from its last glacial into the present interglacial condition, or the Holocene, characterized by exceptionally benign conditions for human development. Planetary state shifts are irreversible, and cause dramatic changes in the global, regional and local assemblage of species (Barnosky and others, 2012). Some of the better-understood potential feedback mechanisms encompass a rapid loss in rainforest coverage and dieback, of the Amazon rainforest in particular; disruptions in the ocean ecosystem; abrupt loss of Arctic summer sea-ice; irreversible meltdown of the Greenland ice sheet; disintegration of the west Antarctic ice sheet; and melting of permafrost in the northern hemisphere (Lenton and Ciscar, 2012).

A strong sustainability challenge?

Climate change also puts pressure on natural resources that are essential for sustaining human civilization. In the past, resource scarcity was often presented as a critical challenge, but for much of the twentieth century, resource prices actually fell. The combination of rapid economic expansion, continued population growth and a changing climate raises the spectre of resource scarcities. In the medium and long term, it may lead to a strong sustainability challenge. There is significant scope for substitution in many areas, yet certain forms of natural capital including the ecological services they provide cannot be replaced by man-made capital. Their exploitation has thus to be limited so as to preserve the overall capacity of ecosystems to provide those services (Ayres, 2007).

Land, water and energy in particular are critical resources for humanity, and their availability and use are tightly interconnected, with multiple feedback channels between them. All of them have strong links to agriculture and food production. Large unmet needs at the global level require and will inevitably lead to a further expansion in their use and exploitation. Combined with the additional impact of climate change, this expansion may very well lead to much tighter supplies, and thus to price volatilities and sustained price increases. If scarcities arise and if limits to substitutability are reached, distributional conflicts will have to be addressed at the national and global levels, as well as with respect to purposes of use.

Economic growth and changes in consumption and urbanization patterns are the main drivers of rising global resource demand, which— in combination with climate change—could lead to increasing pressure on arable land and water supplies

The common drivers of resource use are population growth and economic expansion and the associated lifestyle changes. The global population will continue to expand, but population growth will take place largely in the poorest countries, adding comparatively small additional pressure at the global level. Resource use is strongly correlated with income, however. Currently, per capita material and energy use in developed countries is higher than in developing countries by a factor of 5-10. Population density also appears to be a significant determinant, with densely populated areas needing fewer material resources to achieve the same standard of living (Krausmann and others, 2009). For these reasons, the major drivers of global resource demand in the decades ahead will be economic growth and changes in consumption and urbanization patterns.

Competing demands for land stem from increasing global demand for food and feed, for livestock in particular, increasing biofuel production, and the expansion of cities, and from the need to protect forests so as to meet the demand for fibre, as well as the need for carbon sequestration (Evans, 2010). Climate change may further reduce the amount of arable land, particularly in low-lying regions susceptible to flooding (World Bank, 2012a). Increasing pressure on land is already occurring worldwide, as evidenced by the dramatic increase in land deals. The Global Commercial Pressures on Land Research Project estimates that 203 million hectares of farmland worldwide have been sold or leased since 2001, with the pace of acquisitions accelerating markedly since 2008. Africa is the biggest target for these land deals, accounting for reported sales of 134 million hectares. (Anseeuw and others, 2012; see also chapter IV).

Stresses in water supplies arise from the increase in consumptive use and pollution of freshwater, for which agriculture is overwhelmingly responsible. The consumption of agricultural products accounts for 92 per cent of the global freshwater footprint, an indicator for humans' appropriation of freshwater resources (Hoekstra and Mekonnen, 2012). Different commodities and types of food in particular differ dramatically in their water intensity; therefore, going forward, changes in food consumption patterns will have a major impact on global water stress.

In addition, energy production is likely to become thirstier in coming years, as biofuels become a more prominent part of the energy mix. The International Energy Agency (2012) estimates that water consumption for energy production will increase by 85 per cent between now and 2035. Overall, global energy demand is projected to increase by about one third in this time period. While technological advances are unlocking previously inaccessible fossil fuels for extraction, their exploitation is at odds with global emissions reduction goals. In fact, only a third of proved reserves of fossil fuels can be consumed by 2050, if CO_2 concentration in the atmosphere is to be limited to 450 ppm (ibid.).

All three factors—land, water and energy—have a direct impact on agriculture and food production. Food prices have already increased and become more volatile

in recent years, partly driven by higher prices and tighter supplies of those factors. By 2050, global food production will have to further expand by 70 per cent, in order to feed a growing world population and simultaneously address existing malnutrition and hunger (Food and Agriculture Organization of the United Nations, 2011a). Competing demands for land, water and energy, and the impact of climate change, are exacerbating the scale of this challenge. At the same time, the expansion of food production has to be achieved in an environmentally sustainable way, so as not to contribute to further degradation of the environment. This will entail dramatic improvements in food production, processsing, and distribution (Godfray and others, 2010).

The implications of resource scarcities are manifold. Increasing prices and price volatility will not only heighten the vulnerability of poor and net food consuming households, but also raise issues of food and energy security for countries, and globally as well. Poor households are particularly vulnerable to rising food prices, at least in the short run, as they spend a much larger proportion of their total income on food. For this reason, they are also less well equipped to deal with price volatility and sudden price spikes, which, by possibly requiring them to sell assets, can exert permanent effects (Evans, 2010).

At the national level, higher food and energy prices dampen growth prospects for food-deficit countries and net energy importing countries. Globally, higher expenditure in resource-exporting countries is unlikely to compensate for the fall in aggregate demand in importing countries (Dobbs and others, 2011a). At the same time, tighter trade links and lower buffers associated with more integrated production patterns cause local or regional shocks triggered by resource scarcities to reverberate more quickly in other regions of the world. Lastly, the prospect of scarcity could also increase concerns about the security of supply of food, energy and water and lead to more "resource nationalism". The recent spike in cross-border land acquisition can be interpreted in this light, as can export restrictions on crops or mineral resources, which have increased in recent years (ibid.).

Huge investments will be necessary to increase the food and energy supply in an environmentally sustainable manner

To address these issues, huge investments will be necessary to increase supply in an environmentally sustainable manner. Securing long-term financing at an adequate scale to finance these investments will be a major challenge. Yet, expansions of supply, technological progress and efficiency gains at all levels may not be sufficient. In this case, distributional questions will inevitably arise. Access to resources is already extremely unequal, even in an age of relative plenty, as evidenced by the large number of people who go hungry or remain without access to modern forms of energy. With scarcity, distributional conflicts over access to natural resources will become much more pressing, both within and between countries (Evans, 2011).

Sustainable development in a more interdependent world

Achieving sustainable development post-2015 will entail progress in its four dimensions—inclusive economic development, inclusive social development, environmental sustainability and effective governance and peace and security (United Nations System Task Team on the Post-2015 UN Development Agenda, 2012). The megatrends discussed above raise multiple challenges which threaten our ability to achieve such progress in the decades ahead. They also reinforce each other in myriad ways, and therefore have to be addressed

in a broad and holistic manner, by achieving transformative change in production and consumption patterns, natural resource management, and mechanisms of governance.

Mutually reinforcing trends and challenges

Global socioeconomic, demographic and environmental megatrends have increased interdependence among countries, but without any commensurate strengthening of global governance. As a result, global macroeconomic imbalances, migratory pressures and environmental challenges are insufficiently addressed, and crises occur with increasing frequency. At the same time, countries with growing exposure and interlinkages become more vulnerable to such external shocks, and crises spread more quickly, threatening development progress.

Megatrends have increased interdependence among countries without any commensurate strengthening of global governance, while heterogeneity has increased both within and between countries

At the national and subnational levels, these tighter links have facilitated socioeconomic progress, but not everybody is benefiting to the same degree. Rather, inequalities both within and between countries persist. While growth has accelerated in many developing countries, often it has been non-inclusive, failing to create sufficient employment opportunities and exacerbating inequalities. The consolidation of value chains and the related deceleration of trade growth may render the implementation of export-based growth strategies even more difficult in the years ahead, at the same time as demographic developments make accelerated employment generation an imperative in countries with large youth cohorts. Population dynamics will also impose additional stresses on local governments and rapidly growing cities and national health and education systems. Rapid ageing in numerous countries, in particular, will require further investments in social protection systems. The persistence of inequalities, whether in incomes, or in access to services, decent jobs, land or technology, also hints at their entrenched structural causes. Discrimination and exclusion, based on gender, age, disability or ethnicity, have to be tackled directly in order that greater inclusiveness and transformative change may be achieved.

These challenges are exacerbated in multiple ways by accelerating environmental degradation. The poor are most vulnerable to environmental hazards and, owing to the unequal distribution of assets, will also suffer the most from resource scarcities. In terms of the medium and long run, threats to the stability of the global climate overshadow all other challenges, as they would fundamentally undermine the preconditions for human development.

Strategies for sustainable development

World Economic and Social Survey 2013 discusses the changes required in local, national and global policies to achieve sustainable development post-2015. The transformative change necessary to address the challenges set out above will be driven mainly by actors at the local and national levels. Coherence between local and national strategies will therefore remain critical. Policy decisions in one country have regional and often global repercussions, but currently such externalities—be they positive or negative—are not taken sufficiently into account in decision-making processes.

Coherence in national development strategies implies most fundamentally that socioeconomic development strategies aim to avoid further environmental distress. Developed countries in particular have to address unsustainable consumption and production patterns and their continuously rising environmental impact, while emerging and

developing economies need to pursue the goal of greening their catch-up growth. At the global level, the human development agenda and the goal of environmental protection have to be jointly pursued. Developed countries in particular would make moves towards sustainable production and consumption, while developing countries would offer greater cooperation in meeting climate and other global challenges. Such a global consensus on sustainable development will be based on solidarity, with human development and environmental protection as integrated and universal goals for all countries (chap. II).

Meanwhile, many specific measures will be designed and implemented at the local level and in towns and cities in particular (chap. III). Urbanization offers the opportunity to achieve socioeconomic progress in a more environmentally sustainable manner; but for that opportunity not to be wasted, enormous investments will be necessary.

Many of the major trends and challenges reinforce each other, as was starkly revealed by the 2008-2009 global food, fuel and financial crises. Therefore, policy coherence between areas is equally important. The availability and use of land, water, and energy, in particular, are tightly interconnected. They all impact on agriculture and food production, and that impact, in combination with the additional impact of climate change, will require a rethinking of food and nutrition security strategies (chap. IV). Achieving food security while minimizing the environmental impact will require increasing agricultural productivity, particularly in developing countries. At the same time, reductions in food waste and less resource-intensive diets could make a remarkable contribution to food and nutrition security.

A transformation of the energy system will be necessary to achieve near universal access to energy in an environmentally sustainable manner (chap. V). Current emissions trends of greenhouse gases will likely lead to further increases in global temperatures, with potentially catastrophic consequences. To avert further warming, major investments in energy efficiency are critical, while industrial policies and technological innovation, transfer and adaptation can support a low-carbon inclusive growth path to facilitate a global energy transformation that is compatible with economic and social inclusion in developing countries.

To achieve this energy transformation together with food and nutrition security, sustainability of cities and other development goals after 2015, large-scale investments will be needed. Such investments will require sufficient levels of supply of long-term financing, and they will have to be carried out both by public actors through increased public expenditure and by the private sector, which will depend critically on creating the right incentives for investments in sustainable development.