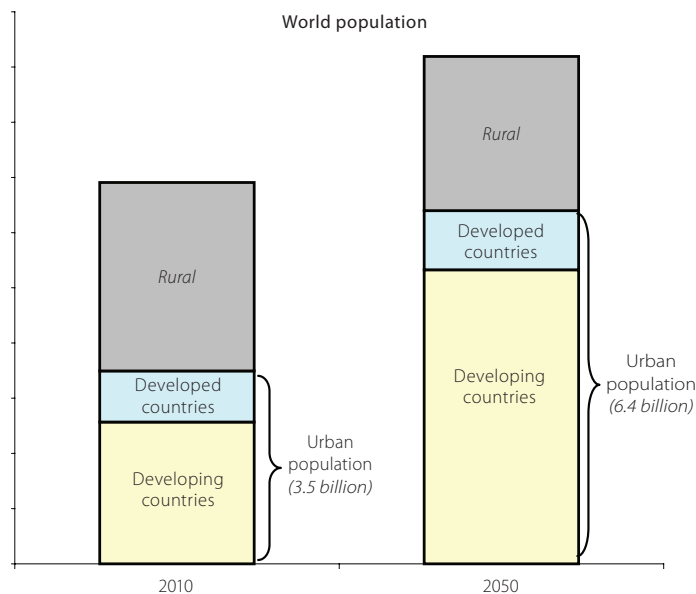




## The challenges of adapting to a warmer planet for urban growth and development

The United Nations estimates that more than half of the world's population lives in urban areas. It is expected that the proportion of city dwellers globally will have risen to three quarters by 2050, with almost all of the growth occurring in the developing world (see figure). The challenges resulting from such rapid urban growth are amplified by the risk of climate change, which in turn threatens to unravel the gains of development made to date.



Source: United Nations World Urbanization Prospects: The 2007 Revision Population Database.

### Climate change threatens urban growth...

Climate change poses a significant threat to urban environments. The most obvious is that of sea-level rise in coastal zones as the melting of ice sheets in the Arctic and Antarctic and the thermal expansion of oceans threatens 13 per cent of the world's urban population that live in low-elevation coastal zones. Indeed, these zones will contain 21 of the 33 cities that are projected to have a population of 8 million or more by 2015, and will include cities such as New York, London, Tokyo, Dhaka, Shanghai, Mumbai and Rio de Janeiro. At the same time, however, climate change will contribute to greater water scarcity. A greater incidence of flooding due to more intense precipitation and to sea-level rise in coastal zones will contaminate existing freshwater supplies.

In addition, the melting of mountain glaciers will decrease water resources in higher- and lower-altitude regions; the loss in volume of the glacier surface of Peru is already equivalent to about ten years of water supply for Lima, and has reduced by 12 per cent the water flow to the country's coastal region, home to 60 per cent of Peru's population.

In the more immediate term, climate change compounds all of the challenges that urbanized societies face. These challenges include health problems linked to air pollution and high-population density, transportation problems linked to inadequate infrastructure, and generally deficient access to and deficient provision of social services. In addition to adding new threats and intensifying existing ones, climate change is expected to multiply the challenges that vulnerable communities face by compounding interrelated threats.

Interconnected threats are likely to intensify with greater urbanization. Take, for example, the fact that unplanned urban settlements, in particular slum dwellings, often materialize in high-risk areas such as river banks and unstable hill slopes. While the dwellers in such slums may cope with occasional shocks, more frequent and more intense flooding due to climate change will push them further down the poverty ladder. Moreover, climate change will increase the pace of urbanization in many developing countries: as agricultural livelihoods are negatively affected by more variable and erratic weather, migration from rural areas will increase. These inflows will, in turn, increase the pressure on services provided in urban areas (water resources, infrastructure and urban ecosystems), thereby exacerbating the vulnerability of urban settlements to the direct impacts of climate change.

The vulnerability of urban societies is further exacerbated because they are often characterized by greater levels of inequality and social protection and informal support schemes are often weaker than in rural areas. This makes urban societies more vulnerable to shocks. Moreover, although the diversity of livelihoods is greater in urban settings and although urban populations do not typically depend directly on natural resources, incomes often depend on rural populations and small towns, either for the provision of primary commodities or for the purchase of processed goods and services. Climate change and urban environments are therefore intrinsically linked.

## ... and development

Although some regions may experience benefits from climate warming in terms of declining mortality rates and increasing crop yields as long as increases in global temperatures do not greatly exceed 2°C, the proliferation of threats brought about by temperatures rising above that could quickly heighten vulnerabilities and redress development achievements with greater severity than expected. In this sense, global warming will primarily affect water resources, agriculture and food security, natural resource management and biodiversity, and human health. These impacts will have a significant effect on agricultural trade, economic growth and the achievement of development goals. Many developing countries are already experiencing a major deficit in food production: as soil moisture declines and as the risk of water stress and drought increases, the situation will worsen owing to declining crop yields.

Countries and communities with poor health care, lack of infrastructure, weakly diversified economies, missing institutions and soft governance structures may be particularly exposed not just to potentially catastrophic large-scale events resulting from climate change, but also to a more permanent state of economic stress. These stresses increase the risks of food and income insecurity, further exposing inadequate levels of health care, sanitation, shelter and social infrastructures. About 600 million people, who could become victims of malnutrition by 2080 as a result of climate change, will be living in what are already the most vulnerable areas.

Although the threats will primarily affect the most vulnerable countries, climate change also threatens to redress the hard-gained achievements in the rest of the developing countries. While the scale of the damage often exceeds the amount of resources available for protection, the constraints on their capacities to mobilize sufficient resources remain binding for many developing countries, thus preventing them from investing in more long-term and effective responses.

## Long-term investment, urban planning and capacity building

Long-term investment that addresses the factors underlying the vulnerabilities associated with rapid urbanization is needed. Its urgency is acute considering that 30–50 per cent of the entire population of cities in developing countries live in settlements that have been developed in environmentally fragile areas, vulnerable to flooding or other adverse climate conditions, and where the quality of housing is poor and basic services are lacking. Climate change is expected to increase such vulnerability in many cities around the world, as it is expected to increase the incidence and the intensity of hydro-meteorological disasters, such as windstorms, droughts and floods.

National and local policies to identify and influence development in these areas are therefore essential, as is the allocation of alternative areas for urban development in order to anticipate and shape the vision for the city and to provide sustainable expansion of land for affordable housing. Moreover, sustainable, climate-conscious urban development policies will require inter alia:

- Adequate urban governance structures at various levels as well as clear visions for city development and planning that is guided by stakeholders and that is supported by sufficient public investment to prevent informal settlements in vulnerable areas.
- Policy action to prevent disasters by increasing resilience of those at risk. Such action would be embedded in a sustainable development-oriented approach through which adaptation to climate change rests on preparedness, a long-term view and awareness-raising activities, as opposed to the focus on emergency measures for relief that often dominates existing policy-making.
- A focus on investing in climate-proof infrastructure, land-use planning and regulatory measures, with a particular emphasis on vulnerable dwellings and high-risk areas. For example, in many developing countries sewerage and drainage systems need to be built to reduce the risk resulting from more intense precipitation, while a diversified economy can provide for more sustainable livelihoods.

For such policies to be effective, they will require the involvement of all stakeholders in tackling, for instance, urban legislation that withholds tenure and thus obstructs the consolidation of buildings and expansion of areas with shanty towns. A case in point is the city of Manizales in Colombia, where local authorities, universities, NGOs and communities have worked together since the 1990s to improve the living standards of the poor and to protect and regenerate fragile ecological areas. More specifically, households have been moved away from areas at risk from floods and landslides and have been rehoused nearby, while most of the former housing sites were converted into eco-parks with strong environmental-education components, along the lines of the approach suggested above. ■

*Prepared by:*

Alex Julca and Oliver Paddison

For further information please contact:

**Rob Vos**, *Director*, Development Policy and Analysis Division  
Department of Economic and Social Affairs, Rm. DC2-2020  
United Nations, New York, NY 10017, U.S.A.

Tel: +1 212 963-4838 • Fax: +1 212 963-1061

e-mail: vos@un.org • website: <http://www.un.org/esa/policy>