Government Office for Science

Foresight

Migration and Global Environmental Change

MR9: Analysis of land area and population in the low-elevation coastal zone (LECZ)

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October 2011

This review has been commissioned as part of the UK Government's Foresight Project, Migration and Global Environmental Change. The views expressed do not represent the policy of any Government or organisation.

Contents

Final report

This report provides a description of the work that was undertaken in the context of the Foresight project for assessing population exposure to changes in sea levels in coastal regions. The report is divided into two parts.

The first part (Part A) describes the methods used for estimating the extent of the land area and the number of people located in the low-elevation coastal zone (LECZ)[1] for the base year 2000 and presents the results of this analysis. Part A is structured in three sections. The first section gives a short introduction into the topic of analysis of exposure of population and land area in coastal regions and describes the data and methods employed in the present study. The second section describes the methodological steps that were taken for producing the estimates for the different geographical divisions listed in the specifications document. The third section provides a description of the results.

The second part of this report (Part B) describes the methods used for developing the forecasts of coastal population for 2030 and 2060. It includes a brief introduction on previous work for assessing the development of coastal population, followed by a description of the methods employed in this study. Results for population in the LECZ and in the 1-in-100-year floodplain are presented for the Foresight scenarios A–D.

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[1] The contiguous area along the coast that is less than 10 m above sea level (McGranahan *et al*., 2007).

Part A: Exposure analysis

Introduction

Estimates of coastal land area and population situated below different elevation increments have been extensively employed in recent years for providing first-order assessments of population and land exposure to coastal flooding and submergence due to sea-level rise, at local, regional and global scales. Concerns about climate change-induced rises in sea levels, which will directly affect coastal population and resources, and the increasing availability of relevant population and elevation datasets, formerly a limitation for these types of studies, have been the main drivers of the large volume of work that has been carried out on this topic in recent years. Relevant studies include the work of Small and Nicholls (2003), McGranahan *et al*. (2007), Sterr (2008), Nicholls *et al*. (2008a), Wu *et al*. (2009), Dasgupta *et al*. (2009) and Crowell *et al*. (2010). Lichter *et al*. (2011) present a detailed review of previous work.

Most of the previous studies that have assessed population and land exposure to coastal flooding, at global and regional scales, have been based on geographic information system (GIS) analysis. This type of analysis commonly involves overlaying layers of spatial information (e.g. population, elevation) and assumes that all areas located below appropriate mean and/or extreme sea-level scenarios are exposed to flood and inundation hazards. Variations of this method include the ways in which hydrological connectivity with the sea are represented (Poulter and Halpin, 2008) or taking into account storm surge information (which is only represented at coarse spatial scales) (Dasgupta *et al*., 2011). At local scales, more detailed datasets are usually employed and often more sophisticated models (taking into account parameters such as flow paths, surface roughness) are considered in the analysis (Wu *et al*., 2009).

Nevertheless, despite the increasing data availability in recent years, exposure analyses at global and regional scales are still plagued by data limitations (Nicholls *et al*., 2008a; Vafeidis *et al*., 2008) as numerous issues related to data quality and accuracy exist (Lichter *et al*., 2011). A common problem encountered in most studies is the representation of the relief of the earth in existing elevation models, which often does not allow for an accurate delineation of the low-elevation coastal zone (LECZ). Other problems include misregistration between data layers, the representation of the coastline and uncertainties related to the spatial distribution of coastal population. These issues have not been addressed in much detail (Lichter *et al*., 2011) in previous assessments.

In the present study we have employed the best available global and regional datasets for estimating the area and population in the LECZ, which constitutes one of the most unambiguous and widely used (e.g. McGranahan *et al*., 2007; Lichter *et al*., 2011) definitions of the coastal zone. In many cases, the employed datasets have been corrected using spatial analysis methods and additional data available at a range of scales, as well as other types of information derived from a variety of

data sources. The methods used for correcting the data that were used in the present analysis are also described in the following sections.

Data and methods

The analysis of distribution of land area and population in the coastal zone was based on a series of relevant metrics that were produced for different geographical entities that were listed in the Foresight specifications document (UK Government Office for Science, 2011a). The development of these metrics was based on publicly available global-scale spatial datasets of population and elevation. Additional geographical data on administrative boundaries, coastlines and extent of urban areas were also used. Table 1 lists all the spatial datasets that were used in this study.

Table 1: Spatial datasets employed in the present study

Dataset	Reference
LandScan™ (30 arc seconds; year 2008)	LandScan (2008)™ High Resolution global Population Data Set. Oak Ridge National Laboratory. http://www.ornl.gov/sci/landscan/(accessed 30 May 2011)
GRUMP (alpha) Population Grid (30 arc seconds; population year 2000) **GRUMP (alpha) Population Density Grid (30 arc seconds; year 2000)** **Land Area Grid (GRUMP) (30 arc seconds; year 2004)**	CIESIN – Center for International Earth Science Information Network (2004) Global Rural-Urban Mapping Project (GRUMP), Alpha Version [online]. Palisades, NY: Columbia University; International Food Policy Research Institute (IFPRI); The World Bank; and Centro Internacional de Agricultura Tropical (CIAT), Socioeconomic Data and Applications Center (SEDAC). URL: http://sedac.ciesin.columbia.edu/gpw (accessed 2 March 2011).
SRTM 90 m Digital Elevation Data (3 arc seconds)	CGIAR-CSI (Consultative Group for International Agriculture Research – Consortium for Spatial Information) Jarvis A., Reuter, H.I., Nelson, A. and Guevara, E. (2008). Hole-filled seamless SRTM data V4, International Centre for Tropical Agriculture (CIAT), available from

Dataset	Reference
	http://srtm.csi.cgiar.org (accessed 2 March 2011)
SRTM30 Enhanced Global Map (30 arc seconds)	ISciences (2003). SRTM30 Enhanced Global Map – Elevation/Slope/Aspect.
SRTM Global Digital Elevation Model (3 arc seconds) **GTOPO30 Global Digital Elevation Model (30 arc seconds)** **NUTS0 (national administrative boundaries), Cities, Rivers**	ESRI (2008). ESRI Data & Maps 9.3. Redlands, CA, USA
National Administrative Boundaries (Level 00) **Administrative Unit Boundaries (Level 01 to Level 04)**	GADM (Global Administrative Areas): http://www.gadm.org/(accessed March 2011)
National Boundaries (GPWv3) **Land Area Grid (GPWv3) (2,5 minutes; year 2005)**	CIESIN (Center for International Earth Science Information Network), Columbia University; and Centro Internacional de Agricultura Tropical (CIAT). 2005. Gridded Population of the World Version 3 (GPWv3): National Boundaries. Palisades, NY: Socioeconomic Data and Applications Center (SEDAC), Columbia University. Available at http://sedac.ciesin.columbia.edu/gpw (accessed 2 March 2011)
MODIS 500-m Map of Global	Schneider, A., Friedl, M.A. and Potere D. (2009). A new map of global urban extent from MODIS data. Environmental

Dataset	Reference
Urban Extent (15 arc seconds; year 2009)	Research Letters, volume 4, article 044003. Schneider, A., Friedl, M.A. and Potere D. (2010) Monitoring urban areas globally using MODIS 500m data: New methods and datasets based on urban ecoregions. Remote Sensing of Environment 114:1733–1746. Dataset is available at http://www.sage.wisc.edu/people/schneider/research/data.html (accessed June 2011)
DIVA Database 1-in-100-year storm surge heights	Vafeidis, A.T., Boot, G., Cox, J., Maatens, R., Mcfadden, L., Nicholls, R.J. and Tol, R.S.J. (2005). The DIVA Database Documentation. Technical report.

All data were imported within a GIS and were processed using spatial analysis methods. The LECZ extent was defined by taking into account hydrological connectivity (raster eight-sided) of the land to the sea. Population in the LECZ was calculated by overlaying the population data with the layer of the LECZ areas that was defined in the previous step. Global datasets (30 arc seconds resolution) were used for the regional-scale and national-scale analyses (Table 2). Specifically, the SRTM30 Enhanced Global Map (ISciences, 2003) was employed as the elevation base dataset; the GRUMP (alpha) Population Grid (CIESIN, 2004) was the base dataset for the analysis of the distribution of population; and the National Boundaries (GPWv3) dataset (CIESIN, 2005) was used for the definition of the national boundaries, at which results are reported. However, these data did not provide adequate coverage for the analysis of some of the geographical entities for which results were required, mostly because of limitations related to scale and resolution. Therefore results for the specific countries, deltas, cities; UK Overseas Territories (UKOTs) and small-island states with many low-lying islands (SILLS) that were listed in the specifications were produced using higher-resolution data (e.g. SRTM with 90-m resolution; see Table 2).

The definition of boundaries for the deltas and cities was based on the combination of a variety of different sources of information such as large-scale digital maps, satellite images, written descriptions found in existing literature, images from Google Earth, photos from Panoramio (included in Google Earth), and spatial datasets on population density. Therefore, boundaries for these geographical entities were partially digitised manually, based on the above-mentioned sources. It is important to note that the boundaries of the deltas that were defined in this study are not meant to provide precise definitions of the extent of these features but rather to represent them in the best possible way for providing accurate results in the context of our analysis. The primary aim of this decision was to avoid excluding from the assessment population located adjacent to the boundaries of the geographic entity. For example, in some cases, boundaries for deltas were chosen

to be more extensive than other map sources suggest, to ensure that no population was excluded because of misregistration problems between the different datasets.

Particular emphasis was given to the definition of population and land area in SILLS and UKOTs. Because of the small size of some islands and the coarse resolution of the datasets, manual editing was employed to improve the registration of different datasets. Furthermore, additional data sources, such as *The World Factbook 2009* (CIA, 2009), were used to manually correct for potential errors in the location of people or in the elevation values of the datasets. The decision to refine the estimates of population and area in the LECZ for SILLS and UKOTs was based on the discrepancies observed while comparing the calculated total population per island with the values of the *The World Factbook 2009*. More than half of the islands had a deviation of 10% or higher. For this reason we employed in the analysis the population dataset from LandScan™ (2008), which appeared (based on visual inspection) to match more accurately the digital elevation model and coastline layers. Additionally, all coastal population located seaward of the coastlines (because of misregistration), was allocated to the population within the LECZ. For the SILLS and UKOTs, the derived estimates of land area extent were calculated by multiplying the numbers of pixels within the LECZ of every island or island group by the average area per pixel of the respective Land Area Grid.

Serious misregistration issues between spatial data layers also became evident during the estimation of population living within the 1-in-100-year floodplain. For example, in many cases the GRUMP dataset (CIESIN, 2004) located people in the sea. This population was calculated and added to the estimates of exposed population. Also, manual corrections were performed for administrative or country boundaries[2] that were wrongly depicted in existing datasets (e.g. through changes in country borders after the publication of the employed datasets). Table 2 provides an overview of all the geographical units at which results are reported, as well as information on the scale of analysis and the data employed for each step.

Finally, for the calculation of the people living in the 1-in-100-year floodplain we employed information on storm surge heights from the Dynamic and Interactive Vulnerability Assessment (DIVA) database (Vafeidis *et al*., 2005). Those heights were then displaced by the amount of sea-level rise assumed in the Foresight scenarios for 2030 and 2060 (10 cm and 21 cm, respectively; see UK Government Office for Science, 2011b) and all land below this elevation was considered to belong to the 1-in-100-year floodplain. It must be noted that although the same amount of sea-level rise is assumed for all scenarios, actual sea-level rise may vary considerably between scenarios beyond 2060.

Table 2: Overview of the scope of the analysis, the base data and the results produced (for year 2000)

[2] Morocco and Western Sahara; Serbia and Montenegro; France; Monaco.

Scale/region	Metrics	Base data
Global	Coastal area extent for elevation increments 1–10 m, per country	– SRTM30 Enhanced Global Map, ISciences (30 arc seconds) – National Boundaries (GPWv3), CIESIN (2005) – Land Area Grid (GRUMP), CIESIN (30 arc seconds)
Global	Coastal population for elevation increments 1–10 m per country	– SRTM30 Enhanced Global Map, ISciences (30 arc seconds) – National Boundaries (GPWv3), CIESIN (2005) – GRUMP (alpha) Population Grid, CIESIN (30 arc seconds; population year 2000)
Global	Coastal population below 10 m (LECZ) separated into urban/rural per country	– SRTM30 Enhanced Global Map, ISciences (30 arc seconds) – National Boundaries (GPWv3), CIESIN (2005) – GRUMP (alpha) Population Grid, CIESIN (resampled from 30 to 15 arc seconds; population year 2000) – MODIS 500-m Map of Global Urban Extent (15 arc seconds; year 2009)
Global	Coastal population within the 1-in-100-year floodplain, per country (for present sea level; present + 10 cm; and present + 21 cm)	– SRTM30 Enhanced Global Map, ISciences (30 arc seconds; year 2003) – GRUMP (alpha) Population Grid, CIESIN (30 arc seconds; population year 2000) – National Administrative Boundaries (Level 01), GADM (2008) – DIVA 1-in-100-year Storm Surge Heights
Regional/Continental (e.g. Africa, Europe, Middle East, Southeast Asia,	Coastal area extent for elevation increments 1–10 m per continent and	– SRTM30 Enhanced Global Map, ISciences (30 arc seconds; year 2003) – National Boundaries (GPWv3), CIESIN (2005)

Scale/region	Metrics	Base data
Caribbean)	subregion	– Land Area Grid (GRUMP), CIESIN (30 arc seconds; year 2004)
Regional/Continental (e.g. Africa, Europe, Middle East, Southeast Asia, Caribbean)	Coastal population for elevation increments 1–10 m per continent and subregions	– SRTM30 Enhanced Global Map, ISciences (30 arc seconds; year 2003) – National Boundaries (GPWv3), CIESIN (2005) – GRUMP (alpha) Population Grid, CIESIN (30 arc seconds; population year 2000)
Regional/ continental (e.g. Africa, Europe, Middle East, Southeast Asia, Caribbean, Mediterranean)	Coastal population and area below 10 m (LECZ) for listed countries	– National Administrative Boundaries (Level 00), GADM (2008) – SRTM 90 m Digital Elevation Data, CGIAR (3 arc seconds); SRTM Global Digital Elevation Model, ESRI (3 arc seconds) – GRUMP (alpha) Population Grid, CIESIN (resampled from 30 to 3 arc seconds; population year 2000) – LandScan™ (30 arc seconds; population year 2008) – Land Area Grid (GRUMP), CIESIN (30 arc seconds, resampled; year 2004)
Cities (e.g. Dhaka, Shanghai, Cairo, Kolkata, Hanoi, Port Harcourt)	Coastal population and area in the LECZ for listed cities	– Kolkata: administrative boundary of Kolkata Municipal Area (KMA) manually digitised – Cairo: Administrative Unit Boundaries (Level 01), GADM (2008) –– Port Harcourt, Hanoi, Shanghai: Administrative Unit Boundaries (Level 02; aggregated), GADM (2008) - Dhaka: Administrative Unit Boundaries (Level 04; aggregated), GADM (2008) - SRTM 90 m Digital Elevation Data, CGIAR (3 arc seconds; year 2008); SRTM Global Digital Elevation Model (3 arc seconds) - GRUMP (alpha) Population Grid,

Scale/region	Metrics	Base data
		CIESIN (resampled from 30 to 3 arc seconds; population year 2000) - Land Area Grid (GRUMP), CIESIN (30 arc seconds, resampled; year 2004)
Deltas	Coastal population and area in the LECZ for listed delta regions	– Manually digitised delta masks – SRTM 90 m Digital Elevation Data, CGIAR (3 arc seconds; year 2008) – GRUMP (alpha) Population Grid, CIESIN (resampled from 30 to 3 arc seconds; population year 2000) – Land Area Grid (GRUMP), CIESIN (30 arc seconds, resampled; year 2004)
SILLS and UKOTs	Coastal population and area in the LECZ for listed islands or island groups	- National Administrative Boundaries (Level 00), GADM (2008) – SRTM Global Digital Elevation Model, ESRI (3 arc seconds); GTOPO30 Global Digital Elevation Model, ESRI (30 arc seconds) – Land Area Grid (GRUMP), CIESIN (30 arc seconds) – LandScan™ (30 arc seconds, resampled; population year 2008)
Greenland	Coastal population and area extent for elevation increments 1–10 m	– National Administrative Boundaries (Level 01), GADM (2008) - GTOPO30 Global Digital Elevation Model (30 arc seconds; year 2005) – GRUMP (alpha) Population Grid, CIESIN (30 arc seconds; population year 2000) – Land Area Grid (GPWv3), CIESIN (2.5 minutes, resampled to 30 arc seconds; year 2005)
Netherlands	Coastal area extent for elevation increments 1–	– NUTS0 (national administrative boundaries), ESRI (2008) – SRTM30 Enhanced Global Map, ISciences (30 arc seconds; year

Scale/region	Metrics	Base data
	10 m	2003) – Land Area Grid (GRUMP), CIESIN (30 arc seconds; year 2004)

Results

The results of the analysis are presented in maps and tables, at different levels of aggregation, according to the scheme described in the specifications document. In addition, following a request from the Foresight (Migration and Global Environmental Change) project office (UK Government Office for Science), detailed results for the Mediterranean region (per country and administrative unit) have also been included and the number of people living within the 1-in-100-year floodplain has been estimated (per country). Preliminary evaluation of the results shows good agreement with previous studies (e.g. McGranahan *et al*., 2007), with only minor deviations of the order of less than 1%.

We must note that although in the present analysis we have employed the best available datasets, results in some areas may be affected by data-related uncertainties or inaccuracies. Uncertainties and accuracy issues constitute an inherent characteristic of global datasets and can result from various factors such as data collection practices and techniques, local conditions accessibility and others (Hinkel *et al*., 2010). These issues are discussed in detail by Rodriguez *et al*. (2005) and, in the context of the present type of analysis, by Lichter *et al*. (2011).

Area and population in LECZ per continent and region

Table 3 presents the land area extent and population in the LECZ, per continent. Asia is the most exposed continent both in terms of population and land area. North America appears to have large areas in the LECZ; however, the number of people is significantly lower than in most other continents. Table 4 presents the figures of land area and population in the LECZ, for the subregions indicated in the specifications document. Southeast Asia is the most exposed region.

Table 3: Extent of LECZ and population within LECZs per continent in 2000[3]

Continent	LECZs (km²)	Population

[3] Base data: SRTM30 Enhanced Global Map (30 arc seconds); GRUMP (alpha) Population Grid (30 arc seconds; population year 2000); National Boundaries (GPWv3); Land Area Grid (GPWv3) (2.5 minutes; year 2005).

Continent	LECZs (km²)	Population
Europe[4]	481,695	52,232,216
Africa	193,658	54,167,364
Asia[5]	854,318	462,190,853
North America[6]	700,541	34,921,292
South America	263,000	21,908,581
Australia/Oceania	143,412	3,333,664
World	**2,493,211**	**628,753,970**

Table 4: Extent of LECZs and population within LECZs for selected regions in 2000[7]

Region	LECZs (km²)	Population
Central America	25,186	1,153,101
Caribbean	42,336	3,565,580

[4] Aggregation of countries differs from Part B as follows: “Europe” was defined to include Cyprus and Turkey in Part A; in Part B of this report, both countries have been assigned to Western Asia, following the UN regional categories.

[5] Aggregation of countries differs from Part B as follows: “Asia” includes Taiwan in Part A; in Part B of this report, “Asia” includes Cyprus and Turkey, while Taiwan had to be excluded from the projections (no UN population projections available for Taiwan).

[6] Aggregation of countries differs from Part B as follows: In Part A of this report, “North America” includes figures for Central America and the Caribbean as well, while in Part B “North America is is defined according to the UN classification (Canada, United States of America, Greenland, Bermuda, and Saint Pierre and Miquelon).

[7] Base data: SRTM30 Enhanced Global Map (30 arc seconds); GRUMP (alpha) Population Grid (30 arc seconds; population year 2000); National Boundaries (GPWv3); Land Area Grid (GPWv3) (2.5 minutes; year 2005).

Region	LECZs (km²)	Population
Middle East	123,572	37,604,210
Southeast Asia	383,834	133,320,375

Area and population in LECZ per country

Table 5 presents the results of the global analysis of population and land area in the LECZ per country. Refined results for the countries listed in the specifications document can be found in the following sections. Examples of the extent of the LECZ for north-west Europe and of the spatial distribution of population are provided in Figure 1. Values for non-coastal countries (landlocked) in Table 5 are 0. As a result of the resolution/scale of this analysis, some issues with small coastal countries exist. For example Micronesia appears to have no coastal population whereas for Pitcairn and Saint Helena, the LECZ and the coastal population in the LECZ could not be calculated. For this reason, UKOTs and SILLS were analysed using datasets with a higher spatial resolution, where possible (these results are reported in the section 'Area and Population in the LECZ for SILLS and UKOTs').

Results show that the countries with the highest population in the LECZ include China, India, Bangladesh and Indonesia. Russia, Canada, China and Indonesia have the largest area below 10 m of elevation. However, in the cases of Russia and Canada this land is located in the northern parts of the country, which are sparsely populated.

Table 5: Extent of LECZ and population within LECZ per country in 2000[8]

Country	Coastal/landlocked	LECZs (km²)	Exposed population
Afghanistan	l	0	0
Albania	c	1,696	313,830
Algeria	c	1,437	739,375

[8] Base data: SRTM30 Enhanced Global Map (30 arc seconds); GRUMP (alpha) Population Grid (30 arc seconds; population year 2000); National Boundaries (GPWv3); Land Area Grid (GPWv3) (2.5 minutes; year 2005).

Country	Coastal/landlocked	LECZs (km²)	Exposed population
American Samoa	c	24	7,272
Andorra	l	0	0
Angola	c	3,463	312,236
Anguilla	c	36	4,545
Antigua and Barbuda	c	168	17,611
Argentina	c	52,026	3,807,370
Armenia	l	0	0
Aruba	c	53	30,596
Australia	c	119,211	2,196,520
Austria	l	0	0
Azerbaijan	l	0	0
Bahamas	c	12,211	267,118
Bahrain	c	325	485,263
Bangladesh	c	54,679	63,122,300
Barbados	c	27	16,298
Belarus	l	0	0
Belgium	c	4,279	2,271,170
Belize	c	3,486	97,238
Benin	c	2,026	1,415,800
Bermuda	c	29	29,381
Bhutan	l	0	0

Country	Coastal/landlocked	LECZs (km²)	Exposed population
Bolivia	l	0	0
Bosnia-Herzegovina	c	11	753
Botswana	l	0	0
Brazil	c	121,668	11,552,800
British Virgin Islands	c	92	8,889
Brunei Darussalam	c	193	19,086
Bulgaria	c	472	127,075
Burkina Faso	l	0	0
Burundi	l	0	0
Cambodia	c	13,493	3,196,470
Cameroon	c	995	521,099
Canada	c	249,491	1,192,880
Cape Verde	c	425	55,040
Cayman Islands	c	248	36,201
Central African Republic	l	0	0
Chad	l	0	0
Chile	c	16,635	267,603
China	c	181,909	143,989,000
Colombia	c	15,691	1,408,730
Commonwealth of Dominica	c	46	6,033

Country	Coastal/landlocked	LECZs (km²)	Exposed population
Comoros	c	133	51,962
Congo	c	271	94,809
Congo, Democratic Republic	c	715	35,224
Cook Islands	c	561	7,122
Costa Rica	c	2,021	97,204
Croatia	c	853	112,354
Cuba	c	22,914	1,164,490
Cyprus	c	431	82,498
Czech Republic	l	0	0
Denmark	c	10,867	1,455,450
Djibouti	c	318	204,552
Dominican Republic	c	2,104	287,900
East Timor	c	454	20,008
Ecuador	c	7,652	1,702,070
Egypt	c	23,676	25,461,200
El Salvador	c	1,100	200,817
Equatorial Guinea	c	155	11,379
Eritrea	c	2,952	51,335
Estonia	c	2,199	121,953
Ethiopia	l	0	0

Country	Coastal/landlocked	LECZs (km²)	Exposed population
Faroe Islands	c	102	2,860
Falkland Islands	c	1,468	340
Federated State of Micronesia	c	0	0
Fiji	c	1,512	133,323
Finland	c	4,083	236,413
France	c	13,433	2,949,660
French Guiana	c	1,883	25,635
French Polynesia	c	1,109	33,630
Gabon	c	2,508	110,427
Gambia	c	2,966	477,463
Georgia	c	1,631	318,760
Germany	c	22,600	4,585,850
Ghana	c	2,716	911,518
Gibraltar	c	5	18,946
Greece	c	7,114	1,052,030
Greenland[9]	c	22,577	25,247
Grenada	c	14	4,240
Guadeloupe	c	246	85,437

[9] *Variation in base data: GTOPO30 Global Digital Elevation Model (30 arc seconds; year 2005), GRUMP (alpha) Population Grid, CIESIN (30 arc seconds; population year 2000); National Administrative Boundaries (Level 00), GADM (2008); Land Area (GPWv3), CIESIN (resampled from 2.5 minutes to 30 arc seconds; year 2005)*

Country	Coastal/landlocked	LECZs (km²)	Exposed population
Guam	c	28	6,929
Guatemala	c	1,881	158,635
Guernsey	c	43	28,653
Guinea	c	4,577	613,967
Guinea-Bissau	c	6,868	337,046
Guyana	c	7,567	410,748
Haiti	c	1,026	457,677
Honduras	c	5,912	245,297
Hong Kong	c	141	1,253,580
Hungary	l	0	0
Iceland	c	4,087	34,780
India	c	82,262	63,925,500
Indonesia	c	172,092	39,255,200
Iran	c	26,708	1,490,010
Iraq	c	34,658	2,664,710
Ireland	c	2,795	338,629
Isle of Man	c	41	8,618
Israel	c	192	245,770
Italy	c	18,794	5,384,250
Ivory Coast	c	1,429	1,184,510
Jamaica	c	746	221,350

Country	Coastal/landlocked	LECZs (km²)	Exposed population
Japan	c	24,154	30,193,500
Jersey	c	15	11,651
Jordan	c	3	679
Kazakhstan	l	0	0
Kenya	c	2,544	256,141
Kiribati	c	1,051	82,080
Korea	c	4,572	2,988,700
Korea, Dem. People's Rep. of	c	4,880	2,407,460
Kuwait	c	1,283	400,784
Kyrgyz Republic	l	0	0
Lao People's Democratic Republic	l	0	0
Latvia	c	2,627	798,930
Lebanon	c	87	252,132
Lesotho	l	0	0
Liberia	c	1,097	604,649
Libyan Arab Jamahiriya	c	10,372	645,381
Liechtenstein	l	0	0
Lithuania	c	1,627	208,408
Luxembourg	l	0	0

Country	Coastal/landlocked	LECZs (km²)	Exposed population
Macao	c	4	68,960
Macedonia	l	0	0
Madagascar	c	15,883	858,667
Malawi	l	0	0
Malaysia	c	19,506	5,176,750
Maldives	c	189	290,799
Mali	l	0	0
Malta	c	41	24,172
Marshall Islands	c	218	51,056
Martinique	c	104	33,396
Mauritania	c	17,304	354,883
Mauritius	c	123	83,037
Mayotte	c	29	21,184
Mexico	c	93,369	5,615,320
Monaco	c	8	20,596
Mongolia	l	0	0
Montserrat	c	10	350
Morocco and Western Sahara	c	5,134	1,739,490
Mozambique	c	25,678	2,310,220
Myanmar	c	48,651	12,502,200

Country	Coastal/landlocked	LECZs (km²)	Exposed population
Namibia	c	3,113	116,888
Nauru	c	7	4,693
Nepal	l	0	0
Netherland Antilles	c	235	52,082
Netherlands[10]	c	24,870	11,551,400
New Caledonia	c	1,488	63,883
New Zealand	c	6,823	472,986
Nicaragua	c	7,502	117,478
Niger	l	0	0
Nigeria	c	14,973	7,355,540
Niue	c	10	101
Norfolk Island	c	0	0
Northern Mariana Islands	c	71	21,534
Norway	c	8,535	287,253
Occupied Palestinian Territory	c	21	72,214
Oman	c	4,184	363,637
Pakistan	c	22,835	4,556,230
Palau	c	76	6,505

[10] Variation in base data: NUTS0 (national administrative boundaries); ESRI (2008)

Country	Coastal/landlocked	LECZs (km²)	Exposed population
Panama	c	3,284	236,432
Papua New Guinea	c	7,567	96,631
Paraguay	l	0	0
Peru	c	6,540	612,185
Philippines	c	20,165	12,960,900
Pitcairn	c	0	0
Poland	c	5,799	903,503
Portugal	c	1,986	531,822
Puerto Rico	c	865	617,335
Qatar	c	2,498	173,582
Republic of Moldova	l	740	86,716
Reunion	c	164	94,251
Romania	c	8,582	777,072
Russia	c	271,546	3,511,820
Rwanda	l	0	0
Saint Helena	c	0	0
Saint Kitts and Nevis	c	28	3,793
Saint Lucia	c	29	7,112
Saint Pierre and Miquelon	c	74	3,164
Saint Vincent	c	40	9,782

Country	Coastal/landlocked	LECZs (km²)	Exposed population
San Marino	l	0	0
Sao Tome and Principe	c	55	18,197
Saudi Arabia	c	14,073	2,768,490
Senegal	c	14,873	2,933,090
Serbia and Montenegro	c	124	8,368
Seychelles	c	22	7,837
Sierra Leone	c	4,971	342,320
Singapore	c	107	620,330
Slovakia	l	0	0
Slovenia	c	26	18,402
Solomon Islands	c	2,263	57,373
Somalia	c	6,329	582,333
South Africa	c	2,208	392,006
Spain	c	6,286	3,176,470
Sri Lanka	c	5,364	2,293,230
Sudan	c	2,977	355,407
Suriname	c	7,159	318,011
Svalbard	c	3,046	90
Swaziland	l	0	0
Sweden	c	7,912	590,511
Switzerland	l	0	0

Country	Coastal/landlocked	LECZs (km²)	Exposed population
Syrian Arab Republic	c	105	98,900
Taiwan	c	3,254	3,548,010
Tajikistan	l	0	0
Thailand	c	35,375	16,422,700
Togo	c	643	482,642
Tokelau	c	11	0
Tonga	c	236	35,081
Trinidad and Tobago	c	524	164,094
Tunisia	c	4,616	1,388,660
Turkey	c	7,720	2,131,930
Turkmenistan	l	0	0
Turks and Caicos Islands	c	462	14,733
Tuvalu	c	30	9,903
Uganda	l	0	0
Ukraine	c	12,336	1,396,120
United Arab Emirates	c	4,142	517,628
United Kingdom	c	21,389	7,071,210
United Rep. of Tanzania	c	2,920	635,599
United States of America	c	235,336	23,366,000

Country	Coastal/landlocked	LECZs (km²)	Exposed population
United States Virgin Islands	c	79	25,137
Uruguay	c	6,953	425,369
Uzbekistan	l	0	0
Vanuatu	c	848	9,917
Venezuela	c	17,758	1,377,720
Vietnam	c	66,232	43,050,100
Wallis and Futuna	c	120	9,899
Western Samoa	c	149	27,226
Yemen	c	3,899	477,281
Zambia	l	0	0
Zimbabwe	l	0	0
Total		2,601,880	628,753,970

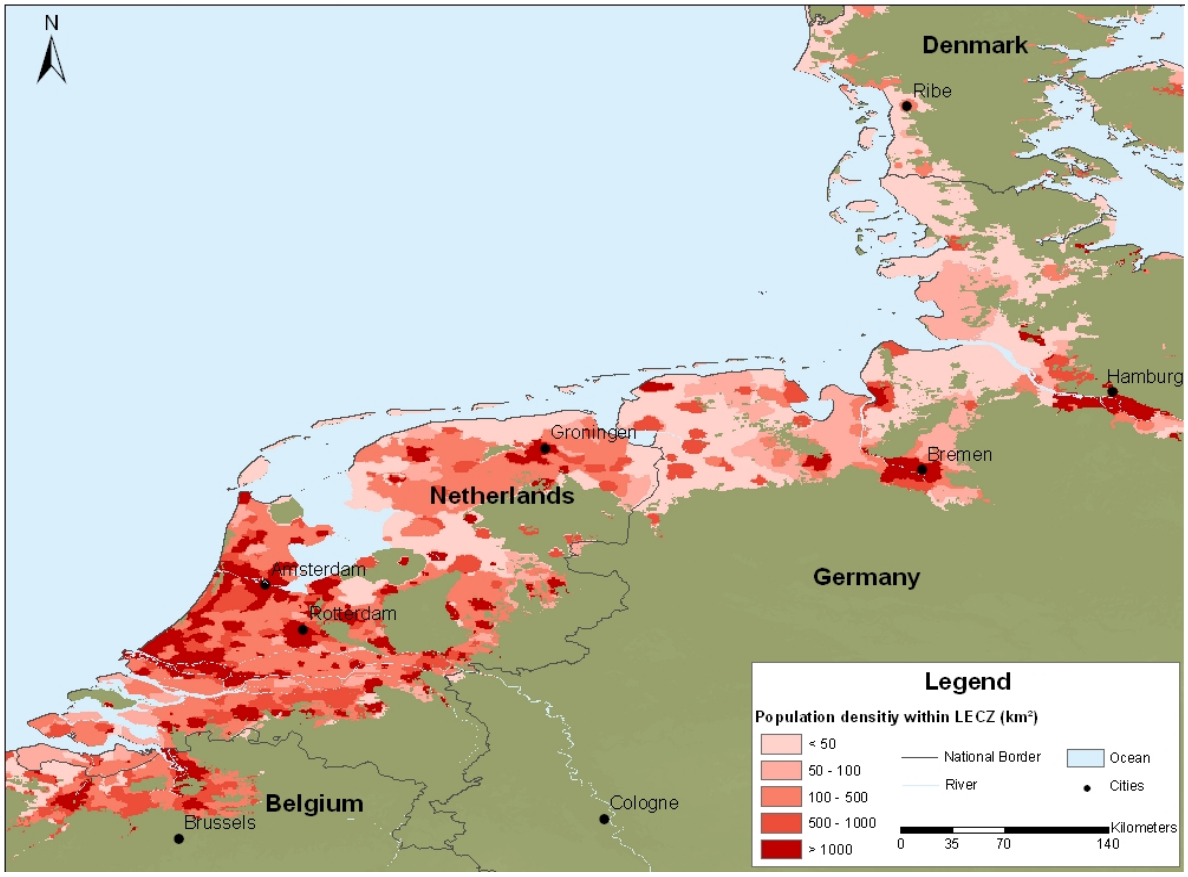

Figure 1: Population in LECZ for north-west European countries in 2000.

Area and population in the LECZ for the Mediterranean

Table 6 includes results for the Mediterranean countries. This geographical region was not listed in the Foresight specifications document (UK Government Office for Science, 2011a) but results were produced after an additional request from the Foresight GEM project office. The table includes two population estimates, derived from different global population datasets; the first is for the year 2000, using GRUMP, and the second is for 2008 Landscan (Landscan, 2008). Differences appear to be significant (not only because of the different periods) therefore we have included both outputs. The most likely causes for these differences are errors caused by misregistration of administrative boundary and population datasets and errors because of the way in which the two population datasets model the spatial distribution of people. Results for the Mediterranean are also available at administrative level and can be provided upon request.

Table 6: Extent of LECZ and population within LECZ for Mediterranean countries[11]

[11] Base data: SRTM Global Digital Elevation Model, ESRI (3 arc seconds); GRUMP (alpha) Population Grid, CIESIN (resampled from 30 to 3 arc seconds; population year 2000); LandScanTM (30 arc

Country	LECZs (km²)	Population in 2000[12]	Population in 2008[13]
Albania	1,735	336,482	438,731
Algeria	1,236	681,480	1,100,490
Bosnia and Herzegovina	72	3,645	11,924
Croatia	612	84,372	208,992
Cyprus	296	65,879	56,820
Egypt	21,761	24.891,200	26,299,200
France[14]	3,407	635,292	844,674
Gibraltar	2	8,480	11,896
Greece	5,376	763,148	915,346
Israel	201	245,195	366,263
Italy	16,954	4,682,790	5,734,320
Lebanon	66	173,070	260,537
Libya	9,550	549,695	1,263,930
Malta	11	14,975	15,840
Monaco[15]	0.4	861	3,481
Montenegro	288	21,823	41,322

seconds; population year 2008); Land Area Grid (GRUMP), CIESIN (30 arc seconds); National Administrative Boundaries (Level 00), GADM (2008)

[12] Generated with GRUMP (alpha) Population Grid.

[13] Generated with LandScan™ population data.

[14] Country borders manually corrected.

[15] Country borders manually corrected.

Morocco[16]	238	110,077	253,015
Palestine	21	71,918	40,042
Slovenia	26	17,313	31,815
Spain	2,390	1,782,990	1,370,490
Syria	74	63,178	182,578
Tunisia	4,026	1,127,830	1,703,600
Turkey	5,759	1,742,520	2,682,270

Area and population in LECZ for selected countries (calculated at regional scale)

Table 7 includes results for the specific countries listed in the Foresight specifications document (UK Government Office for Science, 2011a). These results have been produced using higher-resolution elevation data and more detailed coastline and country-border maps. Figures vary from those produced at global scale because of differences in resolution, accuracy and registration issues. Proportionally larger variations can be observed for smaller countries (e.g. Maldives, Tuvalu) whereas smaller differences (< 1.5%) can be observed for larger ones, e.g. China. These differences are in agreement with the results of Lichter *et al*. (2011), who compared exposure of land area and population to coastal flooding using different input data sources. Lichter *et al*. (2011) attributed these differences largely to the methods associated with the development of the input datasets. However, in this study we have combined digital data with other types of data sources to address this issue. Hence we believe that the figures computed at national scale in the present study for the countries listed in Table 7 provide improved estimates of area and people in the LECZ.

Table 7: Extent of LECZ and population within LECZ for selected countries[17]

Country	LECZs (km^2)	Population in 2000

[16] Excluding western Sahara.

[17] Base data: SRTM 90 m Digital Elevation Data, CGIAR (3 arc seconds); GRUMP (alpha) Population Grid, CIESIN (resampled from 30 to 3 arc seconds; population year 2000); Land Area Grid (GRUMP), CIESIN (30 arc seconds); National Administrative Boundaries (Level 00), GADM (2008).

Bangladesh	47,024	54,663,600
Bermuda	11	10551
China	176,008	140,570,000
Egypt	22,002	23,813,900
India	73,865	56,732,600
Iraq	32,658	2,567,690
Maldives	9	14,376
Nigeria	13,103	6,741,540
Pakistan	20,266	3,964,530
Tuvalu	2	503
Vietnam	64,637	41,625,700

Table 8: Comparison of global and regional assessment results of population within the LECZ, for selected countries

Country	Population 2000 Global Analysis (GRUMP)	Population 2000 Regional Analysis (GRUMP)	Difference (Global – Regional) (GRUMP)
Bangladesh	63,122,300	54,663,600	8,458,700
Bermuda	29,381	10,551	18,830
China	143,989,000	140,570,000	3,419,000
Egypt	25,461,200	23,813,900	1,647,300
India	63,925,500	56,732,600	7,192,900
Iraq	2,664,710	2,567,690	97,020
Maldives	290,799	14,376	276,423
Nigeria	7,355,540	6,741,540	614,000
Pakistan	4,556,230	3,964,530	591,700
Tuvalu	9,903	503	9,400
Vietnam	43,050,100	41,625,700	1,424,400

Area and population in LECZ for large river deltas

Table 9 shows the areal extent and the population of the LECZ for the large delta regions that were defined in the Foresight specifications document (UK Government Office for Science, 2011a). Delta boundaries have been digitised manually and their definitions have been based on a combination of different data sources, as discussed in the Methods section. The Ganges–Brahmaputra delta (Figure 2) appears to be the most exposed region, followed by the Yangtze River delta. The estimates presented in Table 9 are to our knowledge the best available estimates of people living in the LECZ of the largest world delta regions.

Table 9: Extent of LECZ and population within LECZs for delta regions[18]

Delta	LECZs (km^2)	Population in 2000
Chao Phraya River	18,955	12,549,200
Ganges – Brahmaputra	62,859	72,539,400
Indus River	16,589	3,855,180
Irrawaddy River	30,177	9,144,050
Mekong River	53,697	24,379,600
Niger River	11,626	2,899,490
Nile River	19,573	23,556,300
Pearl River	11,192	17,910,700
Red River	11,492	13,825,700
Tigris – Euphrates	48,834	3,875,430
Yangtze River	38,371	40,317,300

[18] Base data: SRTM 90 m Digital Elevation Data, CGIAR (3 arc seconds); GRUMP (alpha) Population Grid, CIESIN (resampled from 30 to 3 arc seconds; population year 2000); Land Area Grid (GRUMP), CIESIN (30 arc seconds); National Administrative Boundaries (Level 00), GADM (2008); Manually digitised delta masks.

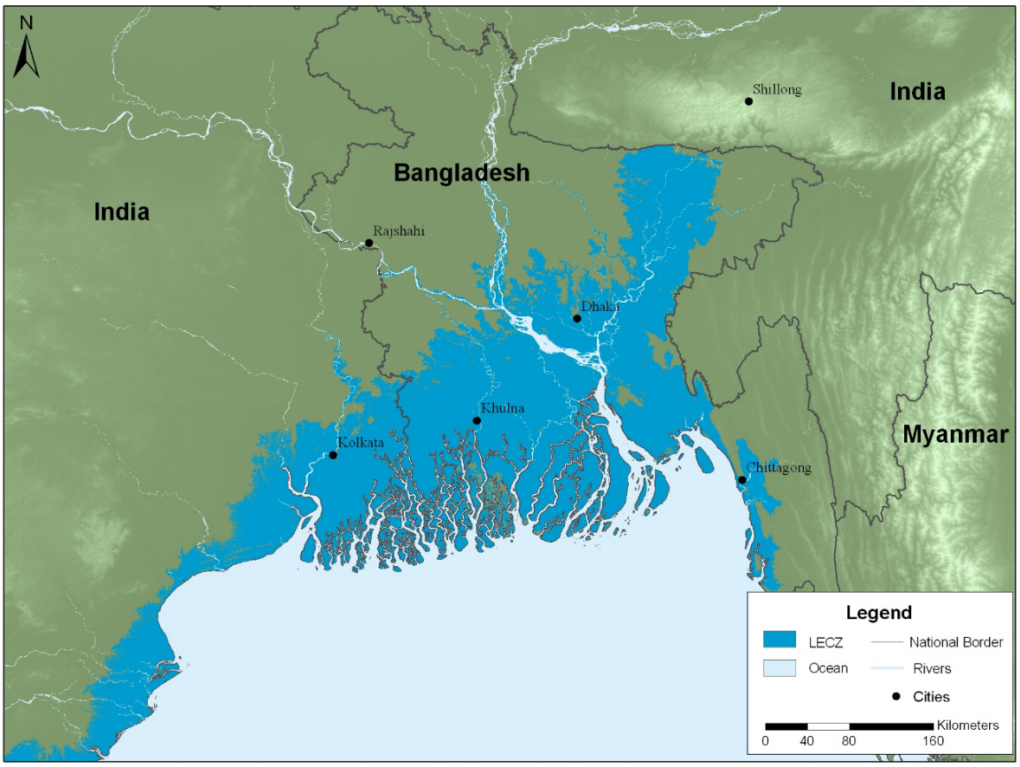

Figure 2: Extent of LECZ for the Ganges–Brahmaputra delta.

Area and population in LECZ for specified cities

Table 10 shows the areal extent and the population of the LECZ for the six large coastal cities that were defined in the Foresight specifications document (UK Government Office for Science, 2011a). Similarly to the analysis for the delta regions, city boundaries have partially been digitised manually and their definitions have been based on a combination of different data sources.

Specifically, administrative boundaries from the GADM (Global Administrative Areas) datasets were used in most cases (see Table 2): Cairo (GADM1, Level 1: Governorate Al Qahirah); Port Harcourt (GADM1, Level 2: Local Authorities Obi/Akpor and Port Harcourt); Hanoi (GADM1, Level 2: City of Hanoi and Province Hà Tây); and Shanghai (GADM1, Level 2: Municipality of Shanghai). For Dhaka, the Dhaka Metropolitan Statistical Area[19] was defined using GADM data for Bangladesh at Level 4 (subdistricts Gazipur S., Savar, Tejgaon, Keraniganj, Narayanganj S., and Bandar) and additional information from other sources[20]. The

[19] Other definitions of the Dhaka city: Dhaka City Corporation; Dhaka Metropolitan Area; Dhaka Metropolitan Development Planning Area (cp. “Climate Change Vulnerabilities for Urban Areas in Bangladesh: Dhaka as a Case”, Md. Golam Rabbani, Senior Research Officer, Bangladesh Centre for Advanced Studies. Presentation, available from: http://resilient-cities.iclei.org/fileadmin/sites/resilient-cities/files/docs/B4-Bonn2010-Rabbani.pdf (11 April 2011).

[20] *Bangladesh – Dhaka Agglomeration*. Available from: http://www.citypopulation.de/Bangladesh-Dhaka_d.html (8 April 2011)

Kolkata Metropolitan Area (KMA)[21] was chosen for the representation of the urban agglomeration of Kolkata, but had to be digitised manually (using Google Earth satellite imagery and additional sources depicting the Kolkata Metropolitan Area) as GADM1 Level 4 data were not available for India. The definition of the city areas was validated by comparing the final total population numbers, derived by combining GRUMP data and the city area delineations, with official statistical data, while adjusting the figures for the different dates of the population estimates[22].

An example for the city of Hanoi is shown in Figure 3. According to the results Shanghai appears to be the most exposed coastal city. Interestingly, Cairo, which lies further inland, is not directly exposed to coastal flooding. However, it must be noted that this analysis does not consider river backwater effects, which could potentially affect the city of Cairo.

Table 10: Extent of LECZ and population within LECZs for selected cities[23]

[21] The spatial evaluation of sustainability in urban growth: measurement, analysis and approach for south-east region of Kolkata, India, Arindam Biswas. Available from: http://rdarc.itakura.toyo.ac.jp/webdav/ask/public/ACP2010/2.pdf (8 April 2011); Map of west Bengal Showing KMA ULBs. Available from: http://www.wbdma.gov.in/HTM/map-of-wb-showing-kma-ulbs.htm (8 April 2011); Metropolis 007 Kolkata (India). Available from: http://www.metropolis.org/sites/default/files/metropolitan_regions/438_007_kolkata_eng.pdf (8 April 2011); "Development of New Townships: A Catalyst in the growth of rural fringes of Kolkata Metropolitan Area (KMA)". Ar. Uttam K.Roy, Annual Conference of HUDCO Chair 2005.

[22] *Demographic Yearbook* – United Nations Statistics Division. Available from: http://unstats.un.org/unsd/demographic/products/dyb/dyb2.htm; *The World Factbook 2009* (CIA, 2009). Available from: https://www.cia.gov/library/publications/the-world-factbook/

[23] Base data: SRTM 90 m Digital Elevation Data, CGIAR (3 arc seconds; *y*ear 2008); SRTM Global Digital Elevation Model (3 arc seconds); GRUMP (alpha) Population Grid, CIESIN (resampled from 30 to 3 arc seconds; population year 2000); Land Area Grid (GRUMP), CIESIN (30 arc seconds; *y*ear 2004); Cairo: Administrative Unit Boundaries (Level 01), GADM (2008); Port Harcourt, Hanoi, Shanghai: Administrative Unit Boundaries (Level 02; aggregated), GADM (2008); Dhaka:

City	LECZs (km²)	Population in 2000
Dhaka	671	4,924,690
Cairo	0	0
Kolkata	987	4,368,350
Port Harcourt	186	488,878
Hanoi	1,585	2,746,720
Shanghai	6,095	9,015,430

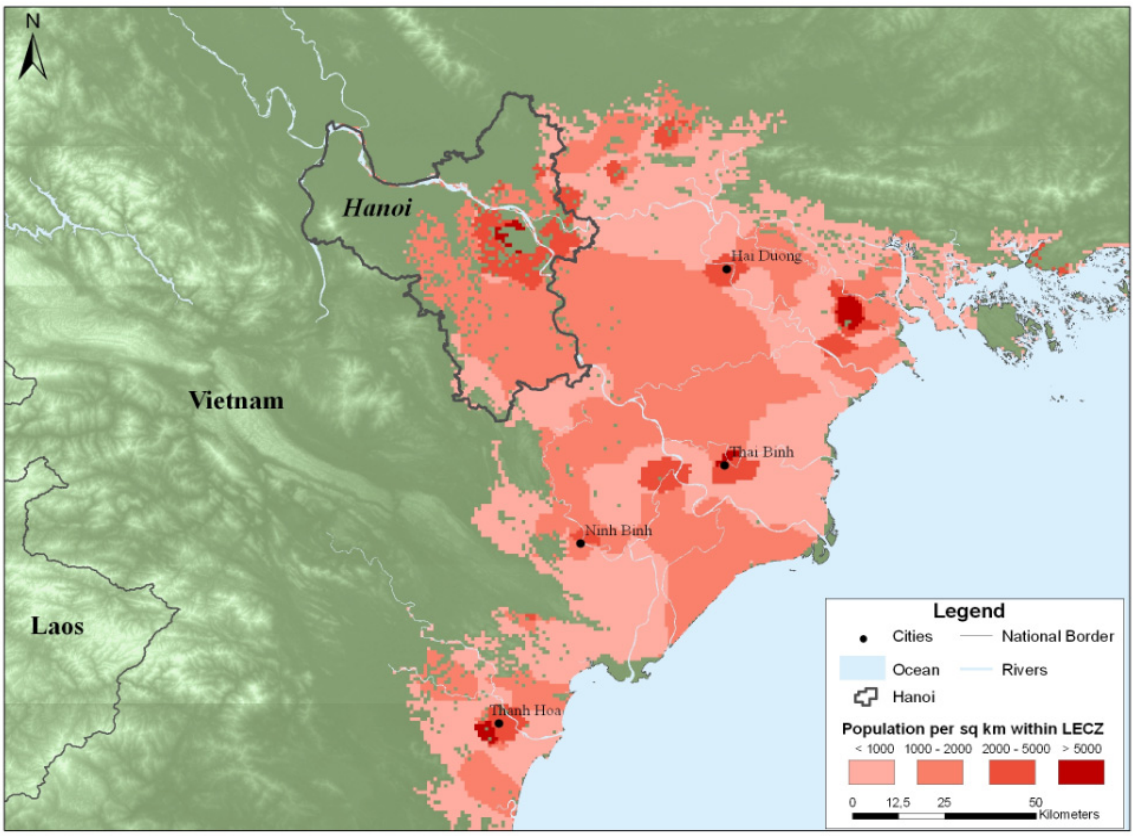

Figure 3: Extent of LECZ and population distribution within LECZ for the city of Hanoi.

Administrative Unit Boundaries (Level 04; aggregated), GADM (2008); Kolkata: administrative boundary of the Kolkata Metropolitan Area (KMA) manually digitised.

Area and population in the LECZ for SILLS and UKOTs

Tables 11 and 12 present the areal extent and the population of the LECZ for SILLS and UKOTs respectively, as those were defined in the specifications document. This analysis has been based on the fusion of several different datasets and sources of information to account for problems related to the small size of the islands and the resulting registration issues with the different datasets, as described in the previous sections. However, for a small number of these islands, the LECZ area could still not be estimated (e.g. Tuvalu). Furthermore, differences between the results of this estimate and others in the report (e.g. American Samoa, Barbados and Guam) because of the use of different datasets can be noticed. Nevertheless, we believe that these results constitute the best available estimates of LECZ area and population for these islands.

Table 11: Extent of LECZ and population within LECZs for SILLS[24]

Island(s)	LECZs (km^2)	Population in 2008
American Samoa	33	15,214
Antigua and Barbuda	155	17,400
Aruba	41	31,402
Bahamas	12,342	249,795
Barbados	14	31,933
Cape Verde	262	89,788
Comoros	39	110,556
Cook Islands	53	6,331
Dominica	9	19,988
Fiji	1,500	277,801
French Polynesia	1,398	137,364

[24] Base data: SRTM 90 Global Digital Elevation Model (ESRI 2008; 3 arc seconds); GTOPO30 Global Digital Elevation Model (30 arc seconds); Land Area Grid (GRUMP), CIESIN (30 arc seconds); LandScan™ (30 arc seconds; population year 2008); National Administrative Boundaries (Level 01), GADM (2008).

Island(s)	LECZs (km^2)	Population in 2008
Grenada	16	15,129
Guadeloupe	175	119,629
Guam	34	20,331
Isabela (+ Fernandina)	224	338
Kiribati	860	95,759
Maldives	268	380,357
Marshall Islands	–	60,062
Martinique	80	70,656
Mayotte	25	38,769
Micronesia	141	55,179
Nauru	4	6,707
Netherlands Antilles	199	45,123
New Caledonia	1,253	69,751
Niue	4	514
Northern Mariana Islands	49	43,121
Palau	43	6,481
Papua New Guinea	13,760	511,737
Reunion	44	67,034
Saint Kitts and Nevis	18	8,545
Saint Lucia	32	38,959
Saint Pierre	7	2,907

Island(s)	LECZs (km^2)	Population in 2008
Saint Vincent and the Grenadines	15	22,137
Saint-Martin and Saint-Bartholomew	26	15,452
Samoa	45	56,876
San Cristobal	48	1,780
Santa Cruz	82	2,262
Sao Tome and Principe	17	56,385
Seychelles	256	24,797
Solomon Islands	1,074	282,138
Tokelau	9	1,355
Tonga	171	69,580
Tuvalu	–	10,551
Vanuatu	281	95,065
Virgin Islands, US	46	16,103
Wallis and Futuna	24	6,891
Total	**35,210**	**3,306,032**

Table 12: Extent of LECZ and population within LECZ for UKOTs[14][25]

Island(s)	LECZs (km^2)	Population in 2008
Anguilla	23	2,613
Ascension	4	106
Bermuda	–	22,313
British Indian Ocean Territory	45	0
British Virgin Islands	63	6,786
Cayman Islands	230	44,139
Falkland Islands	1,926	818
Montserrat	3	490
Pitcairn Islands	7	22
South Georgia	445	0
South Sandwich Islands	84	0
St Helena	25	23
Tristan de Cunha	12	19
Turks and Caicos Islands	889	17,575
Total	**3,755**	**94,904**

[25] SRTM 90 Global Digital Elevation Model (ESRI 2008; 3 arc seconds); Land Area Grid (GRUMP), CIESIN (30 arc seconds); LandScan™ (30 arc seconds; population year 2008); National Administrative Boundaries (Level 01), GADM (2008).

Population living in the 1-in-100-year floodplain

Table 13 presents estimates of the number of people living in the 1-in-100-year floodplain in 2000 and in 2030 and 2060, considering global mean sea-level rise only. The 1-in-100-year return period has been selected for the definition of the coastal floodplain because it is the standard period used for coastal protection in many countries; it has been extensively used in previous studies (e.g. Hanson *et al*., 2011; Hallegatte *et al*., 2011) and it is relevant to most predictions of future sea-level rise, which provide values for 2100. Results have been produced by using information on storm surge heights from the Dynamic and Interactive Vulnerability Assessment (DIVA) database (Vafeidis *et al*., 2008) and displacing those heights by the amount of sea-level rise assumed in the Foresight scenarios for 2030 and 2060 (10 cm and 21 cm, respectively; see UK Government Office for Science, 2011b). We must note that this analysis does not consider human response (in the form of adaptation) to rising sea levels. Furthermore, possible climate-induced changes in storm/cyclone activity in the future have not been considered in this analysis.

Results for small islands in which the total population in the floodplain was less than 85% of the total population number according to the *World Factbook 2009* (CIA, 2009) have been excluded from the results as this is probably an error in the calculations (because of the data issues discussed earlier) because the majority of the population of those islands is coastal. The results of this analysis, shown in Table 13, illustrate that although the estimated number of people in the floodplain increases with sea-level rise, the changes are not especially large. The major issue concerning sea-level rise is the increased risk to the population already within the flood plain, rather than expansion of the flood plain.

Table 13: Population per country, living in the 1-in-100-year floodplain in 2000, 2030 and 2060. The floodplain for the year 2030 is displaced upwards by sea-level rise (10 cm and 21 cm, respectively). Numbers for population in the

floodplain for 2030 and 2060 are based on year 2000 population data and constitute the basis for the population projections in Part B. [26, 27]

Country	Coastal/ landlocked	Exposed population in the floodplain		
		In 2000	In 2030[28]	In 2060[29]
Afghanistan	l	0	0	0
Åland	c	3,784	3,787	3,790
Albania	c	117,111	120,269	123,697
Algeria	c	186,373	190,094	193,127
American Samoa	c	17,749	17,749	17,749
Andorra	l	0	0	0
Angola	c	111,145	111,479	111,850
Anguilla	c	–	–	–
Antigua and Barbuda	c	–	–	–
Argentina	c	724,602	762,619	804,437
Armenia	l	0	0	0
Aruba	c	–	–	–

[26] Base data: SRTM30 Enhanced Global Map, ISciences (30 arc seconds; year 2003); GRUMP (alpha) Population Grid, CIESIN (30 arc seconds; population year 2000); National Administrative Boundaries (Level 01), GADM (2008); DIVA 1 in 100-year Storm Surge Heights. Variation in base data for Greenland: ESRI (2008). GTOPO30. ESRI Data & Maps 9.3. Redlands, CA. GADM (Global Administrative Areas), Level 0.

[27] Calculations were made in consideration of a rising sea-level but without projecting the population.

[28] Assuming a sea-level rise of 10 cm as compared with the baseline value; population not projected (= population year 2000 in floodplain 2030).

[29] Assuming a sea-level rise of 21 cm as compared with the baseline value; population not projected (= population year 2000 in floodplain 2060).

Country	Coastal/ landlocked	Exposed population in the floodplain		
		In 2000	In 203028	In 206029
Australia	c	543,444	551,900	562,201
Austria	l	0	0	0
Azerbaijan	l	0	0	0
Bahamas	c	43,114	43,578	44,407
Bahrain	c	148,700	151,119	153,941
Bangladesh	c	7,529,897	8,309,287	9,166,617
Barbados	c	17,230	17,230	17,230
Belarus	l	0	0	0
Belgium	c	1,775,256	1,792,166	1,810,767
Belize	c	18,601	19,046	19,538
Benin	c	–	–	–
Bermuda	c	–	–	–
Bhutan	l	0	0	0
Bolivia	l	0	0	0
Bosnia and Herzegovina	c	683	686	689
Botswana	l	0	0	0
Brazil	c	3,444,968	3,484,322	3,528,564
British Virgin Islands	c	–	–	–
Brunei	c	14,144	14,150	14,160

Country	Coastal/ landlocked	Exposed population in the floodplain		
		In 2000	In 203028	In 206029
Bulgaria	c	69,509	72,815	77,465
Burkina Faso	l	0	0	0
Burundi	l	0	0	0
Cambodia	c	56,477	61,397	68,029
Cameroon	c	56,274	56,343	56,419
Canada	c	1,114,044	1,117,594	1,121,502
Cape Verde	c	–	–	–
Cayman Islands	c	–	–	–
Central African Republic	l	0	0	0
Chad	l	0	0	0
Chile	c	164,609	165,115	165,672
China	c	59,485,818	61,617,535	63,962,974
Colombia	c	190,250	198,048	212,246
Commonwealth of Dominica	c	9,386	9,454	9528
Comoros	c	–	–	–
Cook Islands	c	–	–	–
Costa Rica	c	24,610	24,660	24,718
Croatia	c	73,954	74,074	74,206

Country	Coastal/ landlocked	Exposed population in the floodplain		
		In 2000	In 203028	In 206029
Cuba	c	416,878	421,200	424,619
Cyprus	c	38,769	40,825	42,774
Czech Republic	l	0	0	0
Democratic Republic of the Congo	c	1,659	1,659	1,660
Denmark	c	531,395	543,140	556,382
Djibouti	c	56,910	58,549	60,351
Dominican Republic	c	48,316	48,902	49,331
East Timor	c	11,322	11,338	11,391
Ecuador	c	290,181	305,254	321,834
Egypt	c	7,820,948	8,251,055	8,483,165
El Salvador	c	39,216	39,478	39,766
Equatorial Guinea	c	6,621	6,686	6,757
Eritrea	c	7,177	7,331	7,500
Estonia	c	23,932	24,298	24,702
Ethiopia	l	0	0	0
Falkland Islands	c	–	–	–
Faroe Islands	c	4,418	4,439	4,462
Fiji	c	47,884	47,932	47,997

Country	Coastal/ landlocked	Exposed population in the floodplain		
		In 2000	In 203028	In 206029
Finland	c	118,865	119,601	120,330
France	c	1,621,575	1,664,688	1,699,626
French Guiana	c	5,870	5,875	5,880
French Polynesia	c	–	–	–
Gabon	c	28,786	28,792	28,799
Gambia	c	148,625	154,506	164,421
Georgia	c	115,006	116,487	118,116
Germany	c	2,762,612	2,783,388	2,806,242
Ghana	c	240,913	250,544	261,138
Gibraltar	c	14,036	14,036	14,036
Greece	c	615,537	670,137	729,906
Greenland[23]	c	24,993	25,019	25,049
Grenada	c	8,945	8,951	8,951
Guadeloupe	c	30,339	32,051	33,159
Guam	c	–	–	–
Guatemala	c	17,509	17,716	17,945
Guernsey	c	–	–	–
Guinea	c	322,834	339,152	346,975
Guinea-Bissau	c	75,390	77,711	80,261
Guyana	c	206,813	215,814	225,596

Country	Coastal/ landlocked	Exposed population in the floodplain		
		In 2000	In 203028	In 206029
Haiti	c	89,851	90,654	91,567
Honduras	c	51,020	52,290	52,860
Hong Kong	c	1,339,801	1,340,616	1,341,513
Hungary	l	0	0	0
Iceland	c	22,750	22,929	23,127
India	c	20,175,930	20,980,452	21,858,938
Indonesia	c	6,484,076	6,761,182	7,066,066
Iran	c	596,106	617,492	641,025
Iraq	c	1,045,477	1,051,307	1,057,456
Ireland	c	157,514	159,153	160,956
Isle of Man	c	–	–	–
Israel	c	51,812	57,376	62,196
Italy	c	2,449,110	2,563,831	2,688,991
Ivory Coast	c	196,849	197,028	197,226
Jamaica	c	82,036	83,754	84,804
Japan	c	8,225,255	8,415,559	8,633,945
Jersey	c	–	–	–
Jordan	c	95	95	95
Kazakhstan	l	0	0	0

Country	Coastal/ landlocked	Exposed population in the floodplain		
		In 2000	In 203028	In 206029
Kenya	c	125,586	126,573	127,658
Kiribati	c	–	–	–
Kosovo	l	0	0	0
Kuwait	c	301,198	302,905	304,691
Kyrgyzstan	l	0	0	0
Laos	l	0	0	0
Latvia	c	169,714	174,157	179,045
Lebanon	c	90,033	99,123	105,416
Lesotho	l	0	0	0
Liberia	c	121,760	121,903	122,060
Libya	c	201,203	209,981	219,140
Liechtenstein	l	0	0	0
Lithuania	c	80,259	81,610	83,098
Luxembourg	l	0	0	0
Macao	c	231,374	234,587	238,121
Macedonia	l	0	0	0
Madagascar	c	274,974	281,651	288,611
Malawi	l	0	0	0
Malaysia	c	730,790	756,838	785,555
Maldives	c	–	–	–

Country	Coastal/ landlocked	Exposed population in the floodplain		
		In 2000	In 203028	In 206029
Mali	l	0	0	0
Malta	c	–	–	–
Marshall Islands	c	–	–	–
Martinique	c	32,678	32,804	32,943
Mauritania	c	84,301	89,277	94,752
Mauritius	c	37,447	37,447	37,447
Mayotte	c	–	–	–
Mexico	c	898,356	921,718	949,450
Micronesia	c	32,641	32,641	32,641
Moldova	l	0	0	0
Monaco	c	23,374	24,226	25,163
Mongolia	l	0	0	0
Montenegro	c	4,899	5,216	5,565
Montserrat	c	–	–	–
Morocco	c	566,018	572,821	580,175
Mozambique	c	899,260	933,124	969,657
Myanmar	c	3,402,656	3,591,677	3,807,157
Namibia	c	84,673	84,691	84,710
Nauru	c	3,431	3,431	3,431
Nepal	l	0	0	0

Country	Coastal/ landlocked	Exposed population in the floodplain		
		In 2000	In 203028	In 206029
Netherlands	c	9,371,072	9,407,506	9,447,583
Netherlands Antilles	c	26,451	26,516	26,587
New Caledonia	c	–	–	–
New Zealand	c	137,225	139,549	142,193
Nicaragua	c	38,695	39,035	39,454
Niger	l	0	0	0
Nigeria	c	542,103	546,488	553,748
Niue	c	–	–	–
Norfolk Island	c	–	–	–
North Korea	c	862,968	891,723	923,228
Northern Mariana Islands	c	–	–	–
Norway	c	247,632	250,766	253,946
Oman	c	109,938	112,584	115,495
Pakistan	c	906,166	970,532	1,041,034
Palau	c	–	–	–
Palestine	c	23,184	23,184	23,184
Panama	c	85,135	86,444	87,959
Papua New Guinea	c	–	–	–

Country	Coastal/ landlocked	Exposed population in the floodplain		
		In 2000	In 203028	In 206029
Paraguay	l	0	0	0
Peru	c	369,132	371,363	374,852
Philippines	c	2,529,685	2,615,942	2,716,580
Pitcairn	c	–	–	–
Poland	c	545,844	553,331	561,567
Portugal	c	379,039	382,222	385,729
Puerto Rico	c	151,852	160,818	169,848
Qatar	c	49,477	51,412	53,609
Republic of Congo	c	37,424	37,424	37,424
Reunion	c	–	–	–
Romania	c	274,905	277,462	280,275
Russia	c	1,500,657	1,520,090	1,541,470
Rwanda	l	0	0	0
Saint Helena	c	–	–	–
Saint Kitts and Nevis	c	–	–	–
Saint Lucia	c	7,532	7,568	7,607
Saint Martin et Saint Barthélemy	c	11,715	11,781	11,854
Saint Pierre and Miquelon	c	–	–	2,910

Country	Coastal/ landlocked	Exposed population in the floodplain		
		In 2000	In 203028	In 206029
Saint Vincent and the Grenadines	c	13,552	13,552	13,552
Samoa	c	12,352	12,352	12,352
San Marino	l	0	0	0
Sao Tome and Principe	c	–	–	–
Saudi Arabia	c	843,340	869,555	898,382
Senegal	c	517,008	542,738	570,786
Serbia	l	0	0	0
Seychelles	c	–	–	–
Sierra Leone	c	74,576	75,438	76,387
Singapore	c	–	–	–
Slovakia	l	0	0	0
Slovenia	c	8,348	8,467	8,598
Solomon Islands	c	–	–	–
Somalia	c	201,235	201,776	202,478
South Africa	c	73,664	74,102	74,585
South Korea	c	1,698,734	1,727,987	1,759,205
Spain	c	1,809,089	1,840,964	1,868,931
Sri Lanka	c	338,681	342,441	346,486

Country	Coastal/ landlocked	Exposed population in the floodplain		
		In 2000	In 203028	In 206029
Sudan	c	17,160	17,667	18,225
Suriname	c	77,268	83,657	90,684
Svalbard and Jan Mayen	c	82	82	82
Swaziland	l	0	0	0
Sweden	c	227,828	231,437	235,386
Switzerland	l	0	0	0
Syria	c	55,322	60,933	61,436
Taiwan	c	1,128,657	1,154,457	1,189,637
Tajikistan	l	0	0	0
Tanzania	c	292,452	296,251	299,766
Thailand	c	1,643,470	1,737,068	1,844,416
Togo	c	74,035	75,865	77,877
Tokelau	c	–	–	–
Tonga	c	–	–	–
Trinidad and Tobago	c	29,256	29,258	29,286
Tunisia	c	684,043	700,131	715,417
Turkey	c	876,568	910,668	945,308
Turkmenistan	l	0	0	0
Turks and	c	–	–	–

Country	Coastal/ landlocked	Exposed population in the floodplain		
		In 2000	In 203028	In 206029
Caicos Islands				
Tuvalu	c	–	–	–
Uganda	l	0	0	0
Ukraine	c	624,822	633,274	642,573
United Arab Emirates	c	181,824	187,720	194,314
United Kingdom	c	4,126,882	4,186,765	4,253,489
United States	c	4,108,886	4,210,120	4,342,237
Uruguay	c	223,426	225,770	228,320
Uzbekistan	l	0	0	0
Vanuatu	c	–	–	–
Venezuela	c	453,858	461,185	469,245
Vietnam	c	26,786,338	27,166,605	27,584,899
Virgin Islands, US	c	24,012	24,142	24,142
Wallis and Futuna	c	–	–	10,461
Western Sahara	c	1,441	1,446	1,451
Yemen	c	312,323	314,822	317,699
Zambia	l	0	0	0
Zimbabwe	l	0	0	0

Part B: Coastal population projections

Introduction

The global coastal population has been growing at considerably higher rates than the inland population, and this trend is likely to continue into the future: coastal urban regions are expected to experience the highest rates of growth in the coming years (Pannell, 2003; Nicholls *et al*., 2008b). Coastal urbanisation trends can, however, vary significantly for different countries, as for example in the case of China, where policies support a very strong urban coastal population growth, or in the case of Bangladesh, where rural population growth is higher than the corresponding urban growth (McGranahan *et al*., 2007). Although there is an extensive literature on projections of global future population development (UN Forecasts; IIASA forecasts; Lutz and Scherbov, 2008; Lutz and Samir, 2010) little research has been conducted to specifically assess the rates of population growth in coastal regions, where the highest increase rates are currently being observed.

The lack of global population estimates for coastal regions is largely the result of the difficulties associated with developing spatially explicit forecasts of the future distribution of population. Two of the first studies addressing this limitation were those by Gaffin *et al*. (2004), who developed a dataset of population distribution for 2025 based on 1996 UN medium population projections, and by Balk *et al*. (2006), who developed spatially explicit population projections for 2015 by extrapolating growth rates from the period 1990–2000. Bengtsson *et al*. (2006) stated that the lack of spatial detail in most population forecasts is a limitation in future assessments of the different processes that impact humans and they developed spatially explicit datasets of future populations, for different socioeconomic scenarios. However, most of the previous studies are based on the assumption that population densities will increase, and there is very little information about how changes in population will correspond with actual change in the urban or rural extent (Seto and Shepherd, 2009). Nevertheless such studies can indirectly provide first-order estimates of how coastal populations may develop.

The aim of this work is to develop forecasts of the coastal population for the years 2030 and 2060, for the Foresight scenarios A to D. We use spatially explicit methods and existing population data and projections to develop these population forecasts for the LECZ and for the 1-in-100-year floodplain. This report describes the methods employed for the forecasts and presents the results of the analysis.

Data and methods

Data

The projections of the coastal population in the LECZ in 2030 and 2060 have been based on the following datasets and sources of information, as well as on the results of the first part of the study (Table 14; see also Tables 2 and Table 5 in Part A).

Table 14: Overview of the base data, LECZS assessments and population projections produced (for 2000, 2030 and 2060)

Metrics	Base data
Coastal population below 10 m (LECZ) separated into urban/rural per country (year in 2000) (see Part A: Table 2, Table 5)	SRTM30 Enhanced Global Map, ISciences (30 arc seconds) National Boundaries (GPWv3), CIESIN (2005) GRUMP (alpha) Population Grid, CIESIN (resampled from 30 to 15 arc seconds; population year 2000) MODIS 500-m Map of Global Urban Extent (15 arc seconds; year 2009)
Coastal urban and rural population below 10 m (LECZ) per country, projected to 2030 and 2060	Annex A.1 Total World Population: Foresight demographic scenarios A, B, C and D for assumptions of population growth depending on economic status of the country. – In: UK Government Office for Science (2011b) Foresight, Paper 2: Future Scenarios (v2), Consolidated data and narratives for each scenario. Unpublished specifications document, UK Government Office for Science, London. World Population Prospects: The 2010 Revision, File 1: "Total population (both sexes combined) by major area, region and country, annually for 1950–2100 (thousands)", http://esa.un.org/unpd/wpp/Excel-Data/DB02_Stock_Indicators/WPP2010_DB2_F01_TOTAL_POPULATION_BOTH_SEXES.XLS (accessed 2011-06-27) (United Nations, 2010b) World Population Prospects: The 2010 Revision, File 0-1: "Location list with codes, description, major area, region and development group, countries with explicit HIV/AIDS mortality modelling in WPP 2010 revision, HIV prevalence rate (%) in population aged 15–49 years in 2009 (UNAIDS, 2011) and by prevalence group", http://esa.un.org/unpd/wpp/Excel-Data/WPP2010_F01_LOCATIONS.XLS (accessed 2011-06-29) (United Nations, 2010b) World Urbanization Prospects: The 2009 Revision, "Percentage of Population Residing in Urban Areas by Major Area, Region and Country, 1950–2050", United Nations, Department of Economic and Social Affairs, Population Division, http://esa.un.org/unpd/wup/CD-ROM_2009/WUP2009-F02-Proportion_Urban.xls (accessed 2011-05-06) (United Nations, 2009b)

The methodology employed for projecting the coastal urban and rural population in 2030 and 2060 involved the following steps:

1. In the first step country-specific population estimates for the Foresight scenarios A–D were developed. This was done by interpreting the Foresight scenario narratives (UK Government Office for Science, 2011b) by employing the UN dataset *World Population Prospects: The 2010 Revision*. Specifically, the low-, medium- and high-population projections of this dataset were used to represent the Foresight scenario assumptions of lower, median and high-end growth predictions, respectively. 'Richer economies' were defined based on the UN classification of 'more developed regions'[30], whereas countries of the 'developing world' were assumed to correspond to the 'less developed regions'[31] of the UN statistics. The specific assumptions for all the scenarios are shown Table 15. Based on this interpretation, the total population, at national scale, for 2030 and 2060 and the respective annual growth rates for the periods 2000–30 and 2030–60 were calculated for scenarios A, B, C and D. In this step there is no differentiation between urban, rural, coastal or inland growth.

Table 15: Foresight scenario definition (see UK Government Office for Science, 2011b) and implementation using UN statistics terms of population growth ('LOW', 'MEDIUM', 'HIGH') and definitions of development status, and global results based on the *World Population Prospects: the 2010 Revision* (United Nations 2010b)

Foresight population scenario definition and implementation	World population (2030)	World population (2060)
Scenario A **Population growth at HIGH END OF CURRENT FORECASTS** **Lower-end growth predictions for richer economies (Foresight): 'LOW' projections for 'more developed regions' (UN statistics)** **Higher-end growth predictions for developing world: 'HIGH' projections for**	8.6 billion	11.1 billion

[30] 'More developed regions' in UN statistics: Japan; Europe; North America; Australia/New Zealand; see. *World Population Prospects*: *The 2010 Revision* (United Nations, 2010a,b).

[31] 'Less developed regions in UN statistics': Africa; Asia except for Japan; Latin America and the Caribbean; Oceania except for Australia/New Zealand; see *World Population Prospects*:*The 2010 Revisio*n.

Foresight population scenario definition and implementation	World population (2030)	World population (2060)
'less developed regions' (UN statistics)		
Scenario B **Population growth at LOWEST END OF FORECASTS:** **Global population growth at the lower end assumed (Foresight): 'LOW' projections for all countries worldwide (UN statistics)**	7.8 billion	7.9 billion
Scenario C **Population growth TOWARDS HIGHEST END OF CURRENT FORECASTS:** **Median growth predictions for richer economies (Foresight): 'MEDIUM' projections for 'more developed regions' (UN statistics)** **Higher-end growth predictions for developing world (Foresight): 'HIGH' projections for 'less developed regions' (UN statistics)**	8.7 billion	11.3 billion
Scenario D **Population growth AT LOW END OF FORECASTS:** **Median-growth predictions for richer economies as well as for the developing world (Foresight): 'MEDIUM' projections for all countries and regions (UN statistics)**	8.3 billion	9.6 billion

2. In the second step urban and rural population estimates, per country for 2030 and 2060, for all the Foresight scenarios were produced. These estimates were based on the UN urban and rural population estimates (for year 2000); on the projections (up to 2050) included in the 'World Urbanization Prospects: The 2009 Revision'; and on the total population per country for 2030 and 2060, for all Foresight scenarios (as calculated in step 1). In detail:
   - The urban and rural population numbers were calculated by estimating the proportion of urban and rural population per country, from the *World*

Urbanization Prospects: The 2009 Revision and assuming the same proportion of urban and rural population for the projections produced in step 1 for scenarios A to D. As the *World Urbanisation Prospects* only provide projections until 2050, urban and rural population were further projected to 2060 on the basis of a constant annual growth rate calculated from 2045 to 2050.

- From the resulting estimates of urban and rural population, annual rates of urban and rural population growth were calculated for the periods 2000–30 and 2030–60 using the 2000, 2030 and 2060 urban and rural population figures per country. These growth rates assume an exponential population growth (Gaffin *et al*., 2004; Salvatore *et al*., 2005) and represent the constant annual country-wide rate of growth over the 30-year period, for the different Foresight scenarios. These were calculated as follows:

$$G_{ut2000-30} = \ln(P_{ut2030}/P_{ut2000})/30 \qquad \text{(equation 1)}$$

where

G_{ut} = total urban population growth rate for a period, for example, for the period 2000–30;

P_{ut2030} = total future urban population in, for example, 2030;

P_{ut2000} = total urban population numbers for base year, e.g. in 2000.

3. In the third step, the coastal urban (P_{uc}) and rural (P_{ur}) populations in the LECZ were estimated for the base year 2000, using the LECZ estimates from part A and the global urban extent dataset developed with the use of MODIS 500-m Map of Global Urban Extent (15 arc seconds; year 2009) (Schneider *et al*., 2009, 2010). In some cases further corrections were applied to these estimates to ensure consistency in the analyses. For example, for some countries[32] coastal rural population estimates were higher than the total country estimates of rural population of the UN statistics data. For these countries rural population in the LECZ in 2000 was therefore adjusted to be lower than or equal to the UN estimates. The 'excessive' coastal rural population was added to the coastal urban estimates so that the national total of coastal population (urban plus rural) remained as estimated in the beginning of this step. In other cases, results showed rural population existing in countries where the UN statistics indicated exclusively urban population. These countries were Hong Kong SAR, Macao SAR, Singapore, Monaco, Bermuda and Nauru. In those cases, the rural population was shifted to urban population. Taiwan was not considered in the projections because the UN statistics do not provide population estimates of the

[32] Réunion, Maldives, Bahrain, Kuwait, Qatar, Denmark, Iceland, Belgium, Netherlands, Anguilla, Bahamas, Cayman Islands, Guadeloupe, Netherlands Antilles, Puerto Rico, Turks and Caicos Islands, United States Virgin Islands, Suriname, Kiribati, Marshall Islands, American Samoa, Cook Islands, Tuvalu.

country. Based on the above, inland urban (P_{iu}) and rural (P_{ir}) populations were also calculated for the base year 2000. The total inland population (P_{it}), and the total coastal population (P_{ct}) were used as input parameters for the calculations in the next step.

4. In the fourth step, projections of coastal urban and rural (non-urban) population growth per country were developed. The previously derived country-wide urban and rural growth projections for 2030 and 2060 (step 2) were downscaled to the coastal zone by applying regionalised assumptions of differential urban and rural growth on the urban and rural population estimates in the LECZ (step 3). This was done by developing a correction factor to account for faster population growth in coastal regions. This factor is based on the assumption that coastal urban/rural growth is *x* (or *y*, respectively) times higher than the respective inland urban/rural population growth. This calculation also includes a further correction step to adjust the values of coastal and inland urban and rural growths according to the mean country growth (calculated in step 2) to ensure that the assumptions on higher coastal population growth do not lead to total national populations that exceed the UN forecasts. In addition, coastal urban and rural population numbers were limited to the maximum projected urban and rural population per country in 2030 and 2060. The assumptions regarding the rates of coastal population growth were based on literature review and expert judgement. The methodology for the projection of the coastal urban and rural population is described in detail below:

   a. Based on the country mean urban/rural growth rates, new rates were derived for the urban and rural population growth for the coastal zone and the inland areas on the basis of the following assumptions:

      - Coastal urban (or rural) population growth is *x* (or *y*) times higher than the inland urban (or rural) population growth.
      - This correction factor *x* varies depending on the overall scenario narratives and the assumptions on economic development, population growth and internal migration to the coast.
      - Inland and coastal growth rates are derived from the mean country-wide urban/rural growth rates that were calculated from the UN Urbanization Prospects 2009 figures and the UN Population Prospects 2010 demographic growth assumptions, assembled for the Foresight scenarios A, B, C and D per country.

   b. Higher coastal urban population growth was estimated based on the following equations:

      $G_{uc} = x * G_{ui}$; if $G_{ui} < 0$ then $G_{uc} = 0.001$ (equation 2)

      (urban coastal population growth rate cannot be smaller than 0.001)

      $G_{ut} = G_{ui} * (P_{ui}/P_{ut}) + G_{uc} (P_{uc}/P_{ut})$ (equation 3)

      where

      G_{uc} = coastal urban growth rate for a period, e g. for the period 2000–30;

x = correction factor for coastal urban growth;

G_{ui} = inland urban growth rate for a period, e.g. for the period 2000–30;

G_{ut} = total urban population growth rate for a period, e.g. 2000–30;

P_{ui} = inland urban population numbers at beginning of the period, e.g. in 2000;

P_{ut} = total urban population numbers at beginning of the period, e.g. in 2000;

P_{uc} = coastal urban population numbers at beginning of the period, e.g. in 2000.

c. General assumptions for coastal non-urban population growth:

$G_{rc} = y * G_{ri}$; if $G_{ri} < 0$ then $G_{rc} = 0.000$ (equation 4)

(rural coastal population growth rate cannot be smaller than 0.000)

$G_{rt} = G_{ri} * (P_{ri}/P_{rt}) + G_{rc} (P_{rc}/P_{rt})$ (equation 5)

where

G_{rc} = coastal rural growth rate for a period, e. g. 2000–30y = correction factor for coastal rural growth;

G_{ri} = inland rural growth rate for a period, e.g. 2000–30;

G_{rt} = total rural population growth rate for a period, e.g. for 2000–30;

P_{ri} = inland rural population numbers at beginning of the period, e.g. in 2000;

P_{rt} = total rural population numbers at beginning of the period, e.g. in 2000;

P_{rc} = coastal rural population numbers at beginning of the period, e.g. in 2000.

d. Additional assumptions:

- Zero population in the base year 2000 results in a zero growth rate and zero population in the projected year, for example: $P_{rt2000} = 0 \rightarrow G_{rc2000–30} = 0 \rightarrow P_{rc2030} = 0$.
- Total projected coastal urban/rural population in 2030 and 2060 is limited to the maximum total urban/rural population per country that is projected for 2030 and 2060.

e. Scenario-specific growth correction factors x (urban) and y (rural) for coastal urban and rural population growth.

Scenario D is used as a reference scenario, where coastal urban growth factor equals 1.7 times the respective inland one, and coastal rural growth factor equals 2 times the respective inland. We assume that the coastal urban growth is 1.7 times higher than the inland coastal growth for all scenarios in rich economies. Developing countries experience a higher coastal urban development in scenarios B and C (2.0 and 1.8, respectively). Rural population growth in the coast is assumed to be twice as high as the inland growth in scenarios A, B, and D for all economies. In scenario C, though, rural population growth in the coast is reduced to 1.7 times higher than the inland rural growth due a stagnating world economy.

Scenario A

Foresight demographic growth AT HIGH END OF CURRENT FORECASTS:

- lower-end growth predictions for richer economies (10th percentile);
- higher-end growth predictions for developing world (90th percentile).

Urban/rural growth correction factor

- Rich economies:
  - $G_{uc} = 1.7 * G_{ui}$ (fast-growing economy but ageing population; growth rates decline anyway; correction factor remains the same as in scenario D).
  - $G_{rc} = 2.0 * G_{ri}$ (no change compared with scenario D).
- Developing countries:
  - $G_{uc} = 1.7 * G_{ui}$ ('internal migration as part of gradual relocation of poverty', no clear indication of increased urban growth; correction factor stays same as in scenario D).
  - $G_{rc} = 2.0 * G_{ri}$ (see above; no change compared with scenario D).

Scenario B

Foresight demographic growth AT LOWEST END OF FORECASTS:

- World converging to population levels at 10th percentile of current forecasts, as population growth in developing world slowing down (especially Africa).

Urban/rural growth correction factor

- Rich economies:

- G_{uc} = *1.7* * G_{ui} (fast economic growth and ageing population; correction factor stays the same as in scenario D).
- G_{rc} = *2.0* * G_{ri} (no change compared with scenario D).

- Developing countries:
  - G_{uc} = *2.0* * G_{ui} (relatively equal distribution of growth in economic activity across the world; implying substantial job creation in the urban areas of the poorer economies; massive migration in developing countries to regional growth poles).
  - G_{rc} = *2.0* * G_{ri} (no change compared with scenario D).

Scenario C

Foresight demographic growth TOWARDS HIGHEST END OF CURRENT FORECASTS:

- median growth predictions for richer economies (50th percentile);
- higher-end growth predictions for developing world, especially Africa and South Asia (90th percentile).

Urban/rural growth correction factor

- Rich economies:
  - G_{uc} = *1.7* * G_{ui} (stagnant world economic growth; relatively quickly ageing population; correction factor stays same as in scenario D).
  - G_{rc} = *1.7* * G_{ri} (rural growth reduced because of stagnant economy and migration is to regional growth poles).

- Developing countries:
  - G_{uc} = *1.8* * G_{ui} (continuing young population in the poorest parts of the world; in general is internal migration controlled and repressed, rapid internal migration only in a few faster growing developing countries).
  - G_{rc} = *1.7* * G_{ri} (rural growth reduced because of stagnant economy and migration is to regional growth poles).

Scenario D

Foresight demographic growth assumptions AT LOW END OF FORECASTS:

- median growth predictions for richer economies and for developing world (50th percentile).

Urban/rural growth correction factor

- Rich economies:
  - $G_{uc} = 1.7 * G_{ui}$ (slow world economic growth; ageing population structures; low wage growth).
  - $G_{rc} = 2.0 * G_{ri}$.
- Developing countries:
  - $G_{uc} = 1.7 * G_{ui}$ (increased local opportunities for skilled workers in poorer economies; high internal migration in a few faster growing developing countries).
  - $G_{rc} = 2.0 * G_{ri.}$

5. Population projections for SILLS and UKOTs were developed. For SILLS and UKOTs, the total population within the LECZ was projected for 2030 and 2060 using the numbers of people within the LECZ, which had been produced using more detailed spatial data (Part A: Area and Population in the LECZ for SILLS and UKOTs). Coastal population growth rates were determined by applying the exponential growth function described in step 2, adjusted to account for the fact that the base year of the LECZ population for SILLS and UKOTs is 2008 (Landscan™ Population).
6. Population in the 1-in-100-year floodplain was projected in a similar manner, by applying the national coastal growth rates, determined for the LECZ, to the un-projected (i.e. year 2000) population figures estimated for the 2030 and 2060 floodplains (see Table 13).

Results and discussion

Table 16 presents the results of the calculation of urban and rural population in the LECZ, per country. These estimates have been derived based on the estimated population in the LECZ (Part A) and the global urban extent dataset derived by the MODIS 500-m Map of Global Urban Extent.

Table 16: Urban and rural population within LECZ per country in 2000[33]

Country	Population in LECZ				
	Total	Total urban	Urban (%)	Total rural	Rural (%)
Afghanistan	0	0	0.00	0	0.00
Albania	313,830	19,438	6.19	294,392	93.81
Algeria	739,375	196,507	26.58	542,868	73.42
American Samoa	7,272	0	0.00	7,272	100.00
Andorra	0	0	0.00	0	0.00
Angola	312,236	9,032	2.89	303,204	97.11
Anguilla	4,545	62	1.36	4,484	98.66
Antigua and Barbuda	17,611	1,871	10.62	15,740	89.38
Argentina	3,807,370	2,208,630	58.01	1,598,740	41.99
Armenia	0	0	0.00	0	0.00
Aruba	30,596	13,670	44.68	16,926	55.32
Australia	2,196,520	881,178	40.12	1,315,342	59.88
Austria	0	0	0.00	0	0.00
Azerbaijan	0	0	0.00	0	0.00

[33] Base data: SRTM30 Enhanced Global Map, ISciences (30 arc seconds); National Boundaries (GPWv3), CIESIN (2005); GRUMP (alpha) Population Grid, CIESIN (resampled from 30 to 15 arc seconds; population year 2000); MODIS 500-m Map of Global Urban Extent (15 arc seconds; year 2009).

Country	Population in LECZ				
	Total	Total urban	Urban (%)	Total rural	Rural (%)
Bahamas	267,118	31,771	11.89	235,347	88.11
Bahrain	485,263	305,219	62.90	180,044	37.10
Bangladesh	63,122,300	2,749,140	4.36	60,373,160	95.64
Barbados	16,298	6,055	37.15	10,243	62.85
Belarus	0	0	0.00	0	0.00
Belgium	2,271,170	851,050	37.47	1,420,120	62.53
Belize	97,238	7,400	7.61	89,838	92.39
Benin	1,415,800	560,067	39.56	855,733	60.44
Bermuda	29,381	0	0.00	29,381	100.00
Bhutan	0	0	0.00	0	0.00
Bolivia	0	0	0.00	0	0.00
Bosnia-Herzegovina	753	59	7.84	694	92.16
Botswana	0	0	0.00	0	0.00
Brazil	11,552,800	4,012,140	34.73	7,540,660	65.27
British Virgin Islands	8,889	36	0.40	8,853	99.60
Brunei Darussalam	19,086	1,547	8.11	17,539	91.89
Bulgaria	127,075	41,912	32.98	85,164	67.02
Burkina Faso	0	0	0.00	0	0.00

Country	Population in LECZ				
	Total	Total urban	Urban (%)	Total rural	Rural (%)
Burundi	0	0	0.00	0	0.00
Cambodia	3,196,470	80,742	2.53	3,115,728	97.47
Cameroon	521,099	90,759	17.42	430,341	82.58
Canada	1,192,880	289,766	24.29	903,114	75.71
Cape Verde	55,040	0	0.00	55,040	100.00
Cayman Islands	36,201	2,916	8.06	33,285	91.94
Central African Republic	0	0	0.00	0	0.00
Chad	0	0	0.00	0	0.00
Chile	267,603	34,951	13.06	232,652	86.94
China	143,989,000	26,099,000	18.13	117,890,000	81.87
Colombia	1,408,730	163,534	11.61	1,245,196	88.39
Commonwealth of Dominica	6,033	158	2.62	5,876	97.40
Comoros	51,962	0	0.00	51,962	100.00
Congo	94,809	12,071	12.73	82,739	87.27
Congo, Democratic Republic	35,224	122	0.35	35,102	99.65
Cook Islands	7,122	0	0.00	7,122	100.00
Costa Rica	97,204	4,706	4.84	92,498	95.16

Country	Population in LECZ				
	Total	Total urban	Urban (%)	Total rural	Rural (%)
Croatia	112,354	4,439	3.95	107,915	96.05
Cuba	1,164,490	69,626	5.98	1,094,864	94.02
Cyprus	82,498	32,150	38.97	50,348	61.03
Czech Republic	0	0	0.00	0	0.00
Denmark	1,455,450	404,907	27.82	1,050,543	72.18
Djibouti	204,552	79,757	38.99	124,795	61.01
Dominican Republic	287,900	35,724	12.41	252,176	87.59
East Timor	20,008	438	2.19	19,571	97.82
Ecuador	1,702,070	336,337	19.76	1,365,733	80.24
Egypt	25,461,200	3,735,020	14.67	21,726,180	85.33
El Salvador	200,817	29	0.01	200,788	99.99
Equatorial Guinea	11,379	0	0.00	11,379	100.00
Eritrea	51,335	1,449	2.82	49,886	97.18
Estonia	121,953	28,618	23.47	93,335	76.53
Ethiopia	0	0	0.00	0	0.00
Faroe Islands	2,860	35	1.22	2,826	98.81
Falkland Islands	340	0	0.00	340	100.00
Federated State of Micronesia	0	0	0.00	0	0.00

Country	Population in LECZ				
	Total	Total urban	Urban (%)	Total rural	Rural (%)
Fiji	133,323	0	0.00	133,323	100.00
Finland	236,413	17,125	7.24	219,288	92.76
France	2,949,660	1,072,920	36.37	1,876,740	63.63
French Guiana	25,635	3,938	15.36	21,698	84.64
French Polynesia	33,630	0	0.00	33,630	100.00
Gabon	110,427	29,618	26.82	80,809	73.18
Gambia	477,463	49,057	10.27	428,407	89.73
Georgia	318,760	52,568	16.49	266,192	83.51
Germany	4,585,850	1,103,800	24.07	3,482,050	75.93
Ghana	911,518	154,810	16.98	756,708	83.02
Gibraltar	18,946	7,974	42.09	10,973	57.92
Greece	1,052,030	362,039	34.41	689,991	65.59
Greenland	25,247	0	0.00	25,247	100.00
Grenada	4,240	671	15.83	3,569	84.17
Guadeloupe[34]	85,437	20,922	24.49	64,516	75.51
Guam	6,929	0	0.00	6,929	100.00

[34] includes the island of Saint Martin and the island of Saint Barthélemy, because the dataset used for the calculation was created before their splitting in 2007.

Country	Population in LECZ				
	Total	Total urban	Urban (%)	Total rural	Rural (%)
Guatemala	158,635	1,731	1.09	156,904	98.91
Guernsey	28,653	1,076	3.76	27,577	96.24
Guinea	613,967	71,175	11.59	542,793	88.41
Guinea-Bissau	337,046	12,307	3.65	324,739	96.35
Guyana	410,748	25,854	6.29	384,894	93.71
Haiti	457,677	68,102	14.88	389,575	85.12
Honduras	245,297	19,584	7.98	225,714	92.02
Hong Kong	1,253,580	280,161	22.35	973,419	77.65
Hungary	0	0	0.00	0	0.00
Iceland	34,780	2,526	7.26	32,254	92.74
India	63,925,500	10,513,300	16.45	53,412,200	83.55
Indonesia	39,255,200	11,661,000	29.71	27,594,200	70.29
Iran	1,490,010	86,767	5.82	1,403,244	94.18
Iraq	2,664,710	370,008	13.89	2,294,702	86.11
Ireland	338,629	84,939	25.08	253,690	74.92
Isle of Man	8,618	927	10.76	7,692	89.26
Israel	245,770	80,894	32.91	164,876	67.09
Italy	5,384,250	1,440,990	26.76	3,943,260	73.24
Ivory Coast	1,184,510	306,275	25.86	878,235	74.14
Jamaica	221,350	49,101	22.18	172,249	77.82

Country	Population in LECZ				
	Total	Total urban	Urban (%)	Total rural	Rural (%)
Japan	30,193,500	18,018,400	59.68	12,175,100	40.32
Jersey	11,651	745	6.39	10,906	93.61
Jordan	679	3	0.44	676	99.56
Kazakhstan	0	0	0.00	0	0.00
Kenya	256,141	36,730	14.34	219,412	85.66
Kiribati	82,080	0	0.00	82,080	100.00
Korea	2,988,700	1,005,140	33.63	1,983,560	66.37
Korea, Democratic People's Republic of	2,407,460	363,190	15.09	2,044,270	84.91
Kuwait	400,784	48,279	12.05	352,506	87.95
Kyrgyz Republic	0	0	0.00	0	0.00
Lao People's Democratic Republic	0	0	0.00	0	0.00
Latvia	798,930	215,519	26.98	583,411	73.02
Lebanon	252,132	52,639	20.88	199,494	79.12
Lesotho	0	0	0.00	0	0.00
Liberia	604,649	131,436	21.74	473,213	78.26
Libyan Arab Jamahiriya	645,381	125,268	19.41	520,113	80.59

Country	Population in LECZ				
	Total	Total urban	Urban (%)	Total rural	Rural (%)
Liechtenstein	0	0	0.00	0	0.00
Lithuania	208,408	51,551	24.74	156,857	75.26
Luxembourg	0	0	0.00	0	0.00
Macao	68,960	33,874	49.12	35,087	50.88
Macedonia	0	0	0.00	0	0.00
Madagascar	858,667	26,864	3.13	831,803	96.87
Malawi	0	0	0.00	0	0.00
Malaysia	5,176,750	899,380	17.37	4,277,370	82.63
Maldives	290,799	0	0.00	290,799	100.00
Mali	0	0	0.00	0	0.00
Malta	24,172	10,420	43.11	13,752	56.89
Marshall Islands	51,056	0	0.00	51,056	100.00
Martinique	33,396	3,211	9.61	30,185	90.39
Mauritania	354,883	37,312	10.51	317,571	89.49
Mauritius	83,037	0	0.00	83,037	100.00
Mayotte	21,184	101	0.48	21,083	99.52
Mexico	5,615,320	418,722	7.46	5,196,598	92.54
Monaco	20,596	8,885	43.14	11,711	56.86
Mongolia	0	0	0.00	0	0.00

Country	Population in LECZ				
	Total	Total urban	Urban (%)	Total rural	Rural (%)
Montserrat	350	25	7.14	325	92.86
Morocco and Western Sahara	1,739,490	202,621	11.65	1,536,869	88.35
Mozambique	2,310,220	75,860	3.28	2,234,360	96.72
Myanmar	12,502,200	1,425,920	11.41	11,076,280	88.59
Namibia	116,888	7,851	6.72	109,037	93.28
Nauru	4,693	0	0.00	4,693	100.00
Nepal	0	0	0.00	0	0.00
Netherland Antilles	52,082	21,464	41.21	30,618	58.79
Netherlands	11,551,400	4,715,250	40.82	6,836,150	59.18
New Caledonia	63,883	12,843	20.10	51,040	79.90
New Zealand	472,986	162,717	34.40	310,269	65.60
Nicaragua	117,478	4,165	3.55	113,313	96.45
Niger	0	0	0.00	0	0.00
Nigeria	7,355,540	1,174,600	15.97	6,180,940	84.03
Niue	101	0	0.00	101	100.00
Norfolk Island	0	0	0.00	0	0.00
Northern Mariana Islands	21,534	0	0.00	21,534	100.00
Norway	287,253	7,577	2.64	279,676	97.36

Country	Population in LECZ				
	Total	Total urban	Urban (%)	Total rural	Rural (%)
Occupied Palestinian Territory	72,214	0	0.00	72,214	100.00
Oman	363,637	28,755	7.91	334,882	92.09
Pakistan	4,556,230	1,729,250	37.95	2,826,980	62.05
Palau	6,505	0	0.00	6,505	100.00
Panama	236,432	30,583	12.94	205,849	87.06
Papua New Guinea	96,631	3,938	4.08	92,693	95.92
Paraguay	0	0	0.00	0	0.00
Peru	612,185	171,740	28.05	440,445	71.95
Philippines	12,960,900	1,544,190	11.91	11,416,710	88.09
Pitcairn	0	0	0.00	0	0.00
Poland	903,503	206,045	22.81	697,458	77.19
Portugal	531,822	111,977	21.06	419,845	78.94
Puerto Rico	617,335	256,318	41.52	361,017	58.48
Qatar	173,582	93,862	54.07	79,720	45.93
Republic of Moldova	86,716	24,095	27.79	62,621	72.21
Reunion	94,251	0	0.00	94,251	100.00
Romania	777,072	292,254	37.61	484,818	62.39
Russia	3,511,820	566,230	16.12	2,945,590	83.88

Country	Population in LECZ				
	Total	Total urban	Urban (%)	Total rural	Rural (%)
Rwanda	0	0	0.00	0	0.00
Saint Helena	0	0	0.00	0	0.00
Saint Kitts and Nevis	3,793	340	8.96	3,454	91.06
Saint Lucia	7,112	1,033	14.52	6,079	85.48
Saint Pierre and Miquelon	3,164	31	0.98	3,133	99.02
Saint Vincent	9,782	599	6.12	9,183	93.88
San Marino	0	0	0.00	0	0.00
Sao Tome and Principe	18,197	1,387	7.62	16,811	92.38
Saudi Arabia	2,768,490	424,637	15.34	2,343,853	84.66
Senegal	2,933,090	731,507	24.94	2,201,583	75.06
Serbia and Montenegro	8,368	258	3.08	8,111	96.93
Seychelles	7,837	0	0.00	7,837	100.00
Sierra Leone	342,320	16,681	4.87	325,639	95.13
Singapore	620,330	440,037	70.94	180,293	29.06
Slovakia	0	0	0.00	0	0.00
Slovenia	18,402	7,780	42.28	10,622	57.72
Solomon Islands	57,373	658	1.15	56,716	98.85

Country	Population in LECZ				
	Total	Total urban	Urban (%)	Total rural	Rural (%)
Somalia	582,333	127,634	21.92	454,699	78.08
South Africa	392,006	276,641	70.57	115,365	29.43
Spain	3,176,470	1,126,390	35.46	2,050,080	64.54
Sri Lanka	2,293,230	210,541	9.18	2,082,689	90.82
Sudan	355,407	79,327	22.32	276,080	77.68
Suriname	318,011	96,438	30.33	221,573	69.67
Svalbard	90	0	0.00	90	100.00
Swaziland	0	0	0.00	0	0.00
Sweden	590,511	68,615	11.62	521,896	88.38
Switzerland	0	0	0.00	0	0.00
Syrian Arab Republic	98,900	18,541	18.75	80,359	81.25
Taiwan	3,548,010	446,497	12.58	3,101,513	87.42
Tajikistan	0	0	0.00	0	0.00
Thailand	16,422,700	6,265,580	38.15	10,157,120	61.85
Togo	482,642	115,809	23.99	366,833	76.01
Tokelau	0	0	0.00	0	0.00
Tonga	35,081	0	0.00	35,081	100.00
Trinidad and Tobago	164,094	48,714	29.69	115,380	70.31
Tunisia	1,388,660	355,506	25.60	1,033,154	74.40

Country	Population in LECZ				
	Total	Total urban	Urban (%)	Total rural	Rural (%)
Turkey	2,131,930	482,554	22.63	1,649,376	77.37
Turkmenistan	0	0	0.00	0	0.00
Turks and Caicos Islands	14,733	240	1.63	14,493	98.37
Tuvalu	9,903	0	0.00	9,903	100.00
Uganda	0	0	0.00	0	0.00
Ukraine	1,396,120	509,058	36.46	887,062	63.54
United Arab Emirates	517,628	25,559	4.94	492,069	95.06
United Kingdom	7,071,210	2,166,280	30.64	4,904,930	69.36
United Rep, of Tanzania	635,599	76,181	11.99	559,418	88.01
United States of America	23,366,000	14,343,500	61.39	9,022,500	38.61
United States Virgin Islands	25,137	4,521	17.99	20,616	82.01
Uruguay	425,369	146,198	34.37	279,171	65.63
Uzbekistan	0	0	0.00	0	0.00
Vanuatu	9,917	76	0.77	9,841	99.23
Venezuela	1,377,720	435,193	31.59	942,527	68.41
Vietnam	43,050,100	5,558,450	12.91	37,491,650	87.09
Wallis and	9,899	0	0.00	9,899	100.00

Country	Population in LECZ				
	Total	Total urban	Urban (%)	Total rural	Rural (%)
Futuna					
Western Samoa	27,226	0	0.00	27,226	100.00
Yemen	477,281	70,291	14.73	406,990	85.27
Zambia	0	0	0.00	0	0.00
Zimbabwe	0	0	0.00	0	0.00
Total	**628,753,970**	**140,393,269**		**488,360,701**	

The figures shown in Table 16 were then employed to forecast future coastal population (i.e. population in LECZ) for 2030 and 2060. Table 17 to Table 24 present the results of the coastal population projections for 2030 and 2060, per World region and continent for the Foresight scenarios A–D. Table 25 presents results per country for scenario D while Table 26 and Table 27 present results for SILLS and UKOTs, respectively (for scenario D). Table 28 to Table 30 show the results of the projections of the population living in the 1-in-100-year floodplain, per World region, continent and country. These estimates have been derived based on the estimates of people living in the in 1-in-100-year floodplain in years 2000, 2030 and 2060 (Table 13) and on the assumptions on coastal population growth rates that are described in step 4.

In a further step and to provide a first-order assessment of population distribution in the coastal floodplain, we estimated the urban and rural population living in the 1-in-100-year floodplain. As the coastal floodplain population presented in Tables 28 to 30 had not been defined geographically (i.e. the floodplain boundaries were not defined spatially but the population was estimated based on the distribution of people per elevation increment) the extent of urban and rural areas in the floodplain was not known. Therefore we assumed that the urban and rural population proportion in the coastal floodplain is the same as in the LECZ. The results of this analysis are shown in Tables 31 to 38. Because of the underlying assumptions we must note that the figures presented in Tables 31 to 38 only constitute a preliminary first-order estimate of the urban–rural population proportion in the coastal floodplain. These figures are likely to overestimate the rural population and underestimate the urban population as settlements of all sizes are found to be preferentially concentrated at the coast (e.g. Small and Nicholls, 2003). Actual numbers may vary per region depending on factors such as the location and extent of large urban centres or regional elevation patterns.

Table 17: Population within LECZ per world region – Foresight scenario A 2030/2060[35, 36, 37]

World regions	Population within LECZ in 2000 (adjusted)			Scenario A – Population within LECZ in 2030			Scenario A – Population within LECZ in 2060		
	Urban	Rural	Total	Urban	Rural	Total	Urban	Rural	Total
World	146,945,360	478,242,553	625,187,913	359,320,190	579,606,883	938,927,072	726,759,254	591,518,461	1,318,277,715
AFRICA	8,926,761	45,240,603	54,167,364	39,079,388	78,491,925	117,571,313	141,227,085	88,054,216	229,281,301
Eastern Africa	443,997	4,713,121	5,157,118	3,414,554	11,649,155	15,063,710	22,527,355	17,355,682	39,883,037
Middle Africa	142,988	960,383	1,103,371	737,698	1,420,751	2,158,449	2,285,000	1,475,552	3,760,551
Northern Africa	4,694,249	25,635,264	30,329,513	13,708,884	38,622,374	52,331,258	33,750,024	38,623,121	72,373,146
Southern Africa	284,492	224,402	508,894	674,130	272,992	947,122	1,276,873	272,992	1,549,865

[35] Spatial base data: Base data: SRTM30 Enhanced Global Map, ISciences (30 arc seconds); National Boundaries (GPWv3), CIESIN (2005); GRUMP (alpha) Population Grid, CIESIN (resampled from 30 to 15 arc seconds; population year 2000); MODIS 500-m Map of Global Urban Extent (15 arc seconds; year 2009).

[36] Demographic base data: *World Population Prospects: The 2010 Revision* (United Nations 2010b); *World Urbanization Prospects: The 2009 Revision* (United Nations, 2009b).

[37] Annotations: Definition of countries and regions according to UN classification of countries by major area and region of the world" (see United Nations, 2009a,b, 2010a,b). Data do not include Taiwan: UN data on population and urbanisation prospects were not available; Taiwan is not a member of the UN. For this reason, no population projections could be elaborated for Taiwan.

World regions	Population within LECZ in 2000 (adjusted)			Scenario A – Population within LECZ in 2030			Scenario A – Population within LECZ in 2060		
	Urban	Rural	Total	Urban	Rural	Total	Urban	Rural	Total
Western Africa	3,361,035	13,707,433	17,068,468	20,544,121	26,526,653	47,070,774	81,387,833	30,326,868	111,714,701
Sub-Saharan Africa	4,311,839	19,881,419	24,193,258	25,985,507	40,408,701	66,394,208	109,988,080	49,970,991	159,959,071
ASIA	92,789,744	368,049,964	460,839,708	251,124,042	437,621,545	688,745,587	502,553,048	441,329,796	943,882,844
Eastern Asia	46,808,270	134,092,930	180,901,200	103,916,173	134,161,811	238,077,984	142,155,037	134,161,811	276,316,848
South–Central Asia	15,364,699	120,295,807	135,660,506	59,546,986	165,991,746	225,538,731	179,261,695	165,932,838	345,194,533
SoutheastAsia	28,057,576	105,166,168	133,223,744	77,911,910	119,679,639	197,591,549	158,443,243	119,715,308	278,158,551
Western Asia	2,559,199	8,495,059	11,054,258	9,748,973	17,788,349	27,537,323	22,693,073	21,519,839	44,212,912
EUROPE	20,104,612	29,913,176	50,017,788	24,966,467	27,787,113	52,753,580	25,796,623	26,271,041	52,067,664
Eastern Europe	1,639,593	5,162,713	6,802,306	1,739,639	5,162,713	6,902,352	1,792,619	5,162,713	6,955,332
Northern Europe	3,316,195	7,879,214	11,195,409	4,298,148	7,624,034	11,922,182	4,494,863	7,093,725	11,588,588
Southern Europe	3,102,736	7,538,661	10,641,397	4,167,460	7,538,597	11,706,058	4,298,375	7,532,428	11,830,803
Western Europe	12,046,088	9,332,588	21,378,676	14,761,220	7,461,769	22,222,988	15,210,766	6,482,175	21,692,941

World regions	Population within LECZ in 2000 (adjusted)			Scenario A – Population within LECZ in 2030			Scenario A – Population within LECZ in 2060		
	Urban	Rural	Total	Urban	Rural	Total	Urban	Rural	Total
LATIN AMERICA AND THE CARIBBEAN	9,287,788	22,925,413	32,213,201	18,500,174	23,156,448	41,656,621	27,510,837	23,088,638	50,599,475
Caribbean	1,108,439	2,427,760	3,536,199	2,030,400	2,255,107	4,285,507	3,198,283	2,226,794	5,425,077
Central America	486,920	6,281,501	6,768,421	1,193,149	6,659,039	7,852,188	2,092,419	6,701,094	8,793,513
South America	7,692,430	14,216,151	21,908,581	15,276,625	14,242,302	29,518,926	22,220,135	14,160,751	36,380,885
NORTHERN AMERICA	14,680,035	9,936,637	24,616,672	23,548,760	9,931,989	33,480,749	27,026,057	9,928,727	36,954,784
OCEANIA	1,156,419	2,176,761	3,333,180	2,101,359	2,617,863	4,719,223	2,645,604	2,846,043	5,491,647
Australia/New Zealand	1,043,895	1,625,611	2,669,506	1,881,036	1,651,007	3,532,043	2,107,957	1,651,007	3,758,964
Melanesia	17,514	343,613	361,127	57,939	716,761	774,700	273,151	958,194	1,231,345
Micronesia	88,961	83,836	172,797	150,761	99,274	250,035	242,571	86,459	329,029
Polynesia	6,049	123,701	129,750	11,623	150,822	162,445	21,926	150,383	172,309

Table 18: Population within LECZ per world region – Foresight scenario B 2030/2060[38, 39, 40]

World region	Population within LECZ in 2000 (adjusted)			Scenario B – population within LECZ in 2030			Scenario B – population within LECZ in 2060		
	Urban	Rural	Total	Urban	Rural	Total	Urban	Rural	Total
World	146,945,360	478,242,553	625,187,913	351,483,524	527,659,472	879,142,996	541,799,037	510,987,780	1,052,786,817
AFRICA	8,926,761	45,240,603	54,167,364	41,168,681	67,373,626	108,542,307	121,575,499	68,421,692	189,997,191
Eastern Africa	443,997	4,713,121	5,157,118	4,080,975	9,738,160	13,819,135	24,005,146	10,786,227	34,791,372
Middle Africa	142,988	960,383	1,103,371	798,524	1,185,925	1,984,449	1,814,036	1,185,925	2,999,961
Northern Africa	4,694,249	25,635,264	30,329,513	12,987,543	33,643,187	46,630,730	22,648,552	33,643,187	56,291,739
Southern	284,492	224,402	508,894	607,932	241,193	849,125	684,749	241,193	925,942

[38] Spatial base data: Base data: SRTM30 Enhanced Global Map, ISciences (30 arc seconds); National Boundaries (GPWv3), CIESIN (2005); GRUMP (alpha) Population Grid, CIESIN (resampled from 30 to 15 arc seconds; population year 2000); MODIS 500-m Map of Global Urban Extent (15 arc seconds; year 2009).

39 Demographic base data: *World Population Prospects: The 2010 Revision* (United Nations 2010b); *World Urbanization Prospects: The 2009 Revision* (United Nations, 2009b).

40 Annotations: Definition of countries and regions according to UN classification of countries by major area and region of the world" (see United Nations, 2009a,b, 2010a,b). Data do not include Taiwan: UN data on population and urbanisation prospects were not available; Taiwan is not a member of the UN. For this reason, no population projections could be elaborated for Taiwan.

World region	Population within LECZ in 2000 (adjusted)			Scenario B – population within LECZ in 2030			Scenario B – population within LECZ in 2060		
	Urban	Rural	Total	Urban	Rural	Total	Urban	Rural	Total
Africa									
Western Africa	3,361,035	13,707,433	17,068,468	22,693,707	22,565,161	45,258,867	72,423,016	22,565,161	94,988,177
Sub-Saharan Africa	4,311,839	19,881,419	24,193,258	28,898,303	34,171,099	63,069,402	101,236,886	35,219,165	136,456,051
ASIA	92,789,744	368,049,964	460,839,708	243,062,954	397,272,066	640,335,020	347,080,458	381,568,115	728,648,573
Eastern Asia	46,808,270	134,092,930	180,901,200	101,535,634	134,092,930	235,628,564	104,628,875	134,092,930	238,721,805
South–Central Asia	15,364,699	120,295,807	135,660,506	59,059,450	137,407,589	196,467,039	122,212,967	131,838,034	254,051,002
Southeast Asia	28,057,576	105,166,168	133,223,744	72,445,741	110,174,015	182,619,756	101,505,958	100,086,944	201,592,902
Western Asia	2,559,199	8,495,059	11,054,258	10,022,130	15,597,532	25,619,662	18,732,658	15,550,207	34,282,865
EUROPE	20,104,612	29,913,176	50,017,788	24,966,467	27,787,113	52,753,580	25,796,623	26,271,041	52,067,664
Eastern	1,639,593	5,162,713	6,802,306	1,739,639	5,162,713	6,902,352	1,792,619	5,162,713	6,955,332

World region	Population within LECZ in 2000 (adjusted)			Scenario B – population within LECZ in 2030			Scenario B – population within LECZ in 2060		
	Urban	Rural	Total	Urban	Rural	Total	Urban	Rural	Total
Europe									
Northern Europe	3,316,195	7,879,214	11,195,409	4,298,148	7,624,034	11,922,182	4,494,863	7,093,725	11,588,588
Southern Europe	3,102,736	7,538,661	10,641,397	4,167,460	7,538,597	11,706,058	4,298,375	7,532,428	11,830,803
Western Europe	12,046,088	9,332,588	21,378,676	14,761,220	7,461,769	22,222,988	15,210,766	6,482,175	21,692,941
LATIN AMERICA AND THE CARIBBEAN	9,287,788	22,925,413	32,213,201	16,651,113	22,808,762	39,459,875	17,778,154	22,342,416	40,120,571
Caribbean	1,108,439	2,427,760	3,536,199	1,914,602	2,223,373	4,137,975	2,274,232	2,175,628	4,449,859
Central America	486,920	6,281,501	6,768,421	1,103,980	6,470,892	7,574,872	1,286,480	6,463,874	7,750,354
South America	7,692,430	14,216,151	21,908,581	13,632,531	14,114,497	27,747,028	14,217,443	13,702,915	27,920,358

World region	Population within LECZ in 2000 (adjusted)			Scenario B – population within LECZ in 2030			Scenario B – population within LECZ in 2060		
	Urban	Rural	Total	Urban	Rural	Total	Urban	Rural	Total
NORTHERN AMERICA	14,680,035	9,936,637	24,616,672	23,548,760	9,931,989	33,480,749	27,026,057	9,928,727	36,954,784
OCEANIA	1,156,419	2,176,761	3,333,180	2,085,548	2,485,917	4,571,465	2,542,245	2,455,788	4,998,034
Australia/New Zealand	1,043,895	1,625,611	2,669,506	1,881,036	1,651,007	3,532,043	2,107,957	1,651,007	3,758,964
Melanesia	17,514	343,613	361,127	59,304	616,580	675,884	248,851	617,275	866,126
Micronesia	88,961	83,836	172,797	134,646	88,512	223,158	170,961	61,343	232,304
Polynesia	6,049	123,701	129,750	10,562	129,818	140,379	14,476	126,163	140,639

Table 19: Population within LECZ per world region – Foresight scenario C 2030/2060[41, 42, 43]

World region	Population within LECZ in 2000 (adjusted)			Scenario C – population within LECZ in 2030			Scenario C – population within LECZ in 2060		
	Urban	Rural	Total	Urban	Rural	Total	Urban	Rural	Total
World	146,945,360	478,242,553	625,187,913	382,209,530	566,727,743	948,937,273	812,224,157	575,937,547	1,388,161,703
AFRICA	8,926,761	45,240,603	54,167,364	42,373,017	74,388,240	116,761,256	163,513,830	81,731,208	245,245,038
Eastern Africa	443,997	4,713,121	5,157,118	3,851,328	10,271,609	14,122,937	28,096,932	14,362,194	42,459,126
Middle Africa	142,988	960,383	1,103,371	812,009	1,339,822	2,151,832	2,679,805	1,382,018	4,061,822
Northern Africa	4,694,249	25,635,264	30,329,513	14,459,105	37,829,401	52,288,506	36,948,954	37,829,980	74,778,934
Southern Africa	284,492	224,402	508,894	709,247	265,644	974,890	1,396,336	265,644	1,661,979

[41] Spatial base data: Base data: SRTM30 Enhanced Global Map, ISciences (30 arc seconds); National Boundaries (GPWv3), CIESIN (2005); GRUMP (alpha) Population Grid, CIESIN (resampled from 30 to 15 arc seconds; population year 2000); MODIS 500-m Map of Global Urban Extent (15 arc seconds; year 2009).

[42] Demographic base data: *World Population Prospects: The 2010 Revision* (United Nations 2010b); *World Urbanization Prospects: The 2009 Revision* (United Nations, 2009b).

[43] Annotations: Definition of countries and regions according to UN classification of countries by major area and region of the world" (see United Nations, 2009a,b, 2010a,b). Data do not include Taiwan: UN data on population and urbanisation prospects were not available; Taiwan is not a member of the UN. For this reason, no population projections could be elaborated for Taiwan.

World region	Population within LECZ in 2000 (adjusted)			Scenario C – population within LECZ in 2030			Scenario C – population within LECZ in 2060		
	Urban	Rural	Total	Urban	Rural	Total	Urban	Rural	Total
Western Africa	3,361,035	13,707,433	17,068,468	22,541,328	24,681,764	47,223,092	94,391,804	27,891,372	122,283,176
Sub-Saharan Africa	4,311,839	19,881,419	24,193,258	28,606,617	37,047,490	65,654,107	129,622,629	44,390,459	174,013,088
ASIA	92,789,744	368,049,964	460,839,708	266,186,186	428,798,628	694,984,814	551,392,874	431,899,905	983,292,779
Eastern Asia	46,808,270	134,092,930	180,901,200	110,322,818	134,154,723	244,477,541	153,081,538	134,154,723	287,236,261
South–Central Asia	15,364,699	120,295,807	135,660,506	64,060,558	159,955,732	224,016,290	203,025,145	159,896,824	362,921,969
Southeast Asia	28,057,576	105,166,168	133,223,744	81,366,412	118,114,667	199,481,078	169,414,630	118,139,671	287,554,301
Western Asia	2,559,199	8,495,059	11,054,258	10,436,398	16,573,507	27,009,905	25,871,561	19,708,686	45,580,247
EUROPE	20,104,612	29,913,176	50,017,788	26,587,786	27,950,946	54,538,732	29,103,455	26,637,430	55,740,886
Eastern Europe	1,639,593	5,162,713	6,802,306	1,780,573	5,162,713	6,943,286	1,852,667	5,162,713	7,015,380
Northern Europe	3,316,195	7,879,214	11,195,409	4,640,196	7,683,396	12,323,592	5,582,878	7,241,541	12,824,418
Southern Europe	3,102,736	7,538,661	10,641,397	4,499,974	7,538,661	12,038,635	5,078,591	7,533,937	12,612,528

World region	Population within LECZ in 2000 (adjusted)			Scenario C – population within LECZ in 2030			Scenario C – population within LECZ in 2060		
	Urban	Rural	Total	Urban	Rural	Total	Urban	Rural	Total
Western Europe	12,046,088	9,332,588	21,378,676	15,667,043	7,566,176	23,233,219	16,589,320	6,699,240	23,288,560
LATIN AMERICA AND THE CARIBBEAN	9,287,788	22,925,413	32,213,201	19,234,148	23,078,905	42,313,053	29,261,220	23,000,664	52,261,884
Caribbean	1,108,439	2,427,760	3,536,199	2,104,788	2,252,193	4,356,981	3,416,262	2,223,997	5,640,259
Central America	486,920	6,281,501	6,768,421	1,258,904	6,595,811	7,854,714	2,289,324	6,627,726	8,917,050
South America	7,692,430	14,216,151	21,908,581	15,870,456	14,230,902	30,101,358	23,555,634	14,148,941	37,704,575
NORTHERN AMERICA	14,680,035	9,936,637	24,616,672	25,559,423	9,950,731	35,510,154	35,587,666	9,947,882	45,535,548
OCEANIA	1,156,419	2,176,761	3,333,180	2,268,971	2,560,293	4,829,264	3,365,112	2,720,457	6,085,569
Australia/New Zealand	1,043,895	1,625,611	2,669,506	2,043,449	1,671,038	3,714,487	2,768,332	1,671,038	4,439,371
Melanesia	17,514	343,613	361,127	62,454	642,429	704,883	330,683	815,879	1,146,562
Micronesia	88,961	83,836	172,797	151,202	99,177	250,379	243,399	86,362	329,761

World region	Population within LECZ in 2000 (adjusted)			Scenario C – population within LECZ in 2030			Scenario C – population within LECZ in 2060		
	Urban	Rural	Total	Urban	Rural	Total	Urban	Rural	Total
Polynesia	6,049	123,701	129,750	11,866	147,648	159,515	22,698	147,177	169,875

Table 20: Population within LECZ per World region – Foresight scenario D 2030/2060[44, 45, 46]

World regions	Population within LECZ in 2000 (adjusted)			Scenario D – Population within LECZ in 2030			Scenario D – Population within LECZ in 2060		
	Urban	Rural	Total	Urban	Rural	Total	Urban	Rural	Total
WORLD	146,945,360	478,242,553	625,187,913	340,257,024	552,667,360	892,924,384	575,303,750	552,769,196	1,128,072,946
AFRICA	8,926,761	45,240,603	54,167,364	36,035,229	72,848,658	108,883,886	109,528,613	76,071,739	185,600,353
Eastern Africa	443,997	4,713,121	5,157,118	3,162,905	10,672,648	13,835,553	17,570,612	13,567,190	31,137,801
Middle Africa	142,988	960,383	1,103,371	676,318	1,300,417	1,976,736	1,701,864	1,300,417	3,002,281
Northern Africa	4,694,249	25,635,264	30,329,513	12,528,563	36,108,723	48,637,287	25,264,085	36,108,723	61,372,809
Southern	284,492	224,402	508,894	606,486	256,676	863,162	882,899	256,676	1,139,575

[44] Spatial base data: Base data: SRTM30 Enhanced Global Map, ISciences (30 arc seconds); National Boundaries (GPWv3), CIESIN (2005); GRUMP (alpha) Population Grid, CIESIN (resampled from 30 to 15 arc seconds; population year 2000); MODIS 500-m Map of Global Urban Extent (15 arc seconds; year 2009)

[45] Demographic base data: *World Population Prospects: The 2010 Revision* (United Nations 2010b); *World Urbanization Prospects: The 2009 Revision* (United Nations, 2009b)

[46] Annotations: Definition of countries and regions according to UN classification of countries by major area and region of the world" (see United Nations, 2009a,b, 2010a,b). Data do not include Taiwan: UN data on population and urbanisation prospects were not available; Taiwan is not a member of the UN. For this reason, no population projections could be elaborated for Taiwan.

World regions	Population within LECZ in 2000 (adjusted)			Scenario D – Population within LECZ in 2030			Scenario D – Population within LECZ in 2060		
	Urban	Rural	Total	Urban	Rural	Total	Urban	Rural	Total
Africa									
Western Africa	3,361,035	13,707,433	17,068,468	19,060,956	24,510,194	43,571,150	64,109,153	24,838,734	88,947,887
Sub-Saharan Africa	4,311,839	19,881,419	24,193,258	24,072,000	37,228,577	61,300,577	86,164,597	40,451,659	126,616,256
ASIA	92,789,744	368,049,964	460,839,708	232,983,560	416,404,942	649,388,503	378,028,934	414,755,298	792,784,232
Eastern Asia	46,808,270	134,092,930	180,901,200	98,272,022	134,092,930	232,364,952	111,240,409	134,092,930	245,333,339
South–Central Asia	15,364,699	120,295,807	135,660,506	54,178,101	151,403,365	205,581,465	129,964,132	151,335,855	281,299,987
Southeast Asia	28,057,576	105,166,168	133,223,744	71,486,206	114,230,597	185,716,803	119,215,960	111,116,793	230,332,753
Western Asia	2,559,199	8,495,059	11,054,258	9,047,231	16,678,051	25,725,282	17,608,432	18,209,720	35,818,152
EUROPE	20,104,612	29,913,176	50,017,788	26,587,786	27,953,218	54,541,004	29,103,455	26,639,702	55,743,158
Eastern Europe	1,639,593	5,162,713	6,802,306	1,780,573	5,162,713	6,943,286	1,852,667	5,162,713	7,015,380

World regions	Population within LECZ in 2000 (adjusted)			Scenario D – Population within LECZ in 2030			Scenario D – Population within LECZ in 2060		
	Urban	Rural	Total	Urban	Rural	Total	Urban	Rural	Total
Northern Europe	3,316,195	7,879,214	11,195,409	4,640,196	7,685,668	12,325,864	5,582,878	7,243,812	12,826,690
Southern Europe	3,102,736	7,538,661	10,641,397	4,499,974	7,538,661	12,038,635	5,078,591	7,533,937	12,612,528
Western Europe	12,046,088	9,332,588	21,378,676	15,667,043	7,566,176	23,233,219	16,589,320	6,699,240	23,288,560
LATIN AMERICA AND THE CARIBBEAN	9,287,788	22,925,413	32,213,201	16,841,220	22,934,309	39,775,529	19,859,332	22,711,816	42,571,148
Caribbean	1,108,439	2,427,760	3,536,199	1,872,798	2,235,108	4,107,907	2,481,669	2,195,984	4,677,653
Central America	486,920	6,281,501	6,768,421	1,080,639	6,562,368	7,643,007	1,485,616	6,562,368	8,047,984
South America	7,692,430	14,216,151	21,908,581	13,887,783	14,136,832	28,024,615	15,892,047	13,953,464	29,845,511
NORTHERN	14,680,035	9,936,637	24,616,672	25,559,423	9,953,185	35,512,608	35,587,666	9,950,336	45,538,002

World regions	Population within LECZ in 2000 (adjusted)			Scenario D – Population within LECZ in 2030			Scenario D – Population within LECZ in 2060		
	Urban	Rural	Total	Urban	Rural	Total	Urban	Rural	Total
AMERICA									
OCEANIA	1,156,419	2,176,761	3,333,180	2,249,805	2,573,049	4,822,854	3,195,749	2,640,305	5,836,054
Australia/New Zealand	1,043,895	1,625,611	2,669,506	2,043,449	1,673,455	3,716,904	2,768,332	1,673,455	4,441,787
Melanesia	17,514	343,613	361,127	53,173	665,538	718,711	206,341	756,177	962,518
Micronesia	88,961	83,836	172,797	142,349	93,889	236,238	203,698	73,208	276,906
Polynesia	6,049	123,701	129,750	10,835	140,166	151,001	17,378	137,465	154,843

Table 21: Population within LECZ per continent – Foresight scenario A 2030/2060[47, 48, 49]

Continent	Population within LECZ in 2000 (adjusted)			Scenario A – population within LECZ in 2030			Scenario A – population within LECZ in 2060		
	Urban	Rural	Total	Urban	Rural	Total	Urban	Rural	Total
AFRICA	8,926,761	45,240,603	54,167,364	39,079,388	78,491,925	117,571,313	141,227,085	88,054,216	229,281,301
ASIA	92,789,744	368,049,964	460,839,708	251,124,042	437,621,545	688,745,587	502,553,048	441,329,796	943,882,844
EUROPE	20,104,612	29,913,176	50,017,788	24,966,467	27,787,113	52,753,580	25,796,623	26,271,041	52,067,664
LATIN AMERICA AND THE CARIBBEAN	9,287,788	22,925,413	32,213,201	18,500,174	23,156,448	41,656,621	27,510,837	23,088,638	50,599,475
NORTHERN AMERICA	14,680,035	9,936,637	24,616,672	23,548,760	9,931,989	33,480,749	27,026,057	9,928,727	36,954,784
OCEANIA	1,156,419	2,176,761	3,333,180	2,101,359	2,617,863	4,719,223	2,645,604	2,846,043	5,491,647

[47] Spatial base data: Base data: SRTM30 Enhanced Global Map, ISciences (30 arc seconds); National Boundaries (GPWv3), CIESIN (2005); GRUMP (alpha) Population Grid, CIESIN (resampled from 30 to 15 arc seconds; population year 2000); MODIS 500-m Map of Global Urban Extent (15 arc seconds; year 2009).

[48] Demographic base data: *World Population Prospects: The 2010 Revision* (United Nations 2010b); *World Urbanization Prospects: The 2009 Revision* (United Nations, 2009b).

[49] Annotations: Definition of countries and regions according to UN classification of countries by major area and region of the world" (see United Nations, 2009a,b, 2010a,b). Data do not include Taiwan: UN data on population and urbanisation prospects were not available; Taiwan is not a member of the UN. For this reason, no population projections could be elaborated for Taiwan.

Table 22: Population within LECZ per continent – Foresights B 2030/2060[50, 51, 52]

Continent	Population within LECZ in 2000 (adjusted)			Scenario B – population within LECZ in 2030			Scenario B – population within LECZ in 2060		
	Urban	Rural	Total	Urban	Rural	Total	Urban	Rural	Total
AFRICA	8,926,761	45,240,603	54,167,364	41,168,681	67,373,626	108,542,307	121,575,499	68,421,692	189,997,191
ASIA	92,789,744	368,049,964	460,839,708	243,062,954	397,272,066	640,335,020	347,080,458	381,568,115	728,648,573
EUROPE	20,104,612	29,913,176	50,017,788	24,966,467	27,787,113	52,753,580	25,796,623	26,271,041	52,067,664
LATIN AMERICA AND THE CARIBBEAN	9,287,788	22,925,413	32,213,201	16,651,113	22,808,762	39,459,875	17,778,154	22,342,416	40,120,571
NORTHERN AMERICA	14,680,035	9,936,637	24,616,672	23,548,760	9,931,989	33,480,749	27,026,057	9,928,727	36,954,784
OCEANIA	1,156,419	2,176,761	3,333,180	2,085,548	2,485,917	4,571,465	2,542,245	2,455,788	4,998,034

[50] Spatial base data: Base data: SRTM30 Enhanced Global Map, ISciences (30 arc seconds); National Boundaries (GPWv3), CIESIN (2005); GRUMP (alpha) Population Grid, CIESIN (resampled from 30 to 15 arc seconds; population year 2000); MODIS 500-m Map of Global Urban Extent (15 arc seconds; year 2009).

[51] Demographic base data: *World Population Prospects: The 2010 Revision* (United Nations 2010b); *World Urbanization Prospects: The 2009 Revision* (United Nations, 2009b).

[52] Annotations: Definition of countries and regions according to UN classification of countries by major area and region of the world" (see United Nations,2009a,b, 2010a,b). Data do not include Taiwan: UN data on population and urbanisation prospects were not available; Taiwan is not a member of the UN. For this reason, no population projections could be elaborated for Taiwan.

Table 23: Population within LECZ per continent – Foresight scenario C 2030/2060[53, 54, 55]

Continent	Population within LECZ in 2000 (adjusted)			Scenario C – population within LECZ in 2030			Scenario C – population within LECZ in 2060		
	Urban	Rural	Total	Urban	Rural	Total	Urban	Rural	Total
AFRICA	8,926,761	45,240,603	54,167,364	42,373,017	74,388,240	116,761,256	163,513,830	81,731,208	245,245,038
ASIA	92,789,744	368,049,964	460,839,708	266,186,186	428,798,628	694,984,814	551,392,874	431,899,905	983,292,779
EUROPE	20,104,612	29,913,176	50,017,788	26,587,786	27,950,946	54,538,732	29,103,455	26,637,430	55,740,886
LATIN AMERICA AND THE CARIBBEAN	9,287,788	22,925,413	32,213,201	19,234,148	23,078,905	42,313,053	29,261,220	23,000,664	52,261,884
NORTHERN AMERICA	14,680,035	9,936,637	24,616,672	25,559,423	9,950,731	35,510,154	35,587,666	9,947,882	45,535,548
OCEANIA	1,156,419	2,176,761	3,333,180	2,268,971	2,560,293	4,829,264	3,365,112	2,720,457	6,085,569

[53] Spatial base data: Base data: SRTM30 Enhanced Global Map, ISciences (30 arc seconds); National Boundaries (GPWv3), CIESIN (2005); GRUMP (alpha) Population Grid, CIESIN (resampled from 30 to 15 arc seconds; population year 2000); MODIS 500-m Map of Global Urban Extent (15 arc seconds; year 2009).

[54] Demographic base data: *World Population Prospects: The 2010 Revision* (United Nations 2010b); *World Urbanization Prospects: The 2009 Revision* (United Nations, 2009b).

[55] Annotations: Definition of countries and regions according to UN classification of countries by major area and region of the world" (see United Nations, 2009a,b, 2010a,b). Data do not include Taiwan: UN data on population and urbanisation prospects were not available; Taiwan is not a member of the UN. For this reason, no population projections could be elaborated for Taiwan.

Table 24: Population within LECZ per continent – Foresight scenario D 2030/2060[56, 57, 58]

Continent	Population within LECZ in 2000 (adjusted)			Scenario D – population within LECZ in 2030			Scenario D – population within LECZ in 2060		
	Urban	Rural	Total	Urban	Rural	Total	Urban	Rural	Total
AFRICA	8,926,761	45,240,603	54,167,364	36,035,229	72,848,658	108,883,886	109,528,613	76,071,739	185,600,353
ASIA	92,789,744	368,049,964	460,839,708	232,983,560	416,404,942	649,388,503	378,028,934	414,755,298	792,784,232
EUROPE	20,104,612	29,913,176	50,017,788	26,587,786	27,953,218	54,541,004	29,103,455	26,639,702	55,743,158
LATIN AMERICA AND THE CARIBBEAN	9,287,788	22,925,413	32,213,201	16,841,220	22,934,309	39,775,529	19,859,332	22,711,816	42,571,148
NORTHERN AMERICA	14,680,035	9,936,637	24,616,672	25,559,423	9,953,185	35,512,608	35,587,666	9,950,336	45,538,002
OCEANIA	1,156,419	2,176,761	3,333,180	2,249,805	2,573,049	4,822,854	3,195,749	2,640,305	5,836,054

[56] Spatial base data: Base data: SRTM30 Enhanced Global Map, ISciences (30 arc seconds); National Boundaries (GPWv3), CIESIN (2005); GRUMP (alpha) Population Grid, CIESIN (resampled from 30 to 15 arc seconds; population year 2000); MODIS 500-m Map of Global Urban Extent (15 arc seconds; year 2009).

57 Demographic base data: World Population Prospects: The 2010 Revision (United Nations 2010b); World Urbanization Prospects: The 2009 Revision (United Nations, 2009b).

58 Annotations: Definition of countries and regions according to UN classification of countries by major area and region of the world" (see United Nations, 2009a,b, 2010a,b). Data do not include Taiwan: UN data on population and urbanisation prospects were not available; Taiwan is not a member of the UN. For this reason, no population projections could be elaborated for Taiwan.

Table 25: Population within LECZ per country – Foresight scenario D 2030/2060[59, 60, 61]

Country	Coastal/ land-locked	Population within LECZ in 2000 (adjusted)			Scenario D – population within LECZ in 2030			Scenario D – population within LECZ in 2060		
		Urban	Rural	Total	Urban	Rural	Total	Urban	Rural	Total
Afghanistan	l	0	0	0	0	0	0	0	0	0
Albania	c	19,438	294,392	313,830	48,788	294,392	343,180	50,492	294,392	344,884
Algeria	c	196,507	542,868	739,375	537,155	542,868	1,080,023	733,487	542,868	1,276,355
American Samoa	c	798	6,474	7,272	2,102	4,166	6,268	3,746	3,597	7,343
Andorra	l	0	0	0	0	0	0	0	0	0
Angola	c	9,032	303,204	312,236	66,294	451,254	517,548	179,956	451,254	631,210
Anguilla	c	4,545	0	4,545	8,830	0	8,830	9,099	0	9,099
Antigua and Barbuda	c	1,871	15,740	17,611	4,035	21,475	25,511	8,858	21,475	30,333

[59] Spatial base data: Base data: SRTM30 Enhanced Global Map, ISciences (30 arc seconds); National Boundaries (GPWv3), CIESIN (2005); GRUMP (alpha) Population Grid, CIESIN (resampled from 30 to 15 arc seconds; population year 2000); MODIS 500-m Map of Global Urban Extent (15 arc seconds; year 2009).

[60] Demographic base data: *World Population Prospects: The 2010 Revision* (United Nations 2010b); *World Urbanization Prospects: The 2009 Revision* (United Nations, 2009b).

[61] Annotations: Definition of countries and regions according to UN classification of countries by major area and region of the world" (see United Nations, 2009a,b, 2010a,b). Data do not include Taiwan: UN data on population and urbanisation prospects were not available; Taiwan is not a member of the UN. For this reason, no population projections could be elaborated for Taiwan.

Country	Coastal/ land-locked	Population within LECZ in 2000 (adjusted)			Scenario D – population within LECZ in 2030			Scenario D – population within LECZ in 2060		
		Urban	Rural	Total	Urban	Rural	Total	Urban	Rural	Total
Argentina	c	2,208,630	1,598,740	3,807,370	3,508,947	1,598,740	5,107,687	4,201,531	1,598,740	5,800,271
Armenia	l	0	0	0	0	0	0	0	0	0
Aruba	c	13,670	16,926	30,596	21,557	19,517	41,073	26,889	19,517	46,406
Australia (including Norfolk Island)	c	881,178	1,315,342	2,196,520	1,764,086	1,315,342	3,079,428	2,408,692	1,315,342	3,724,034
Austria	l	0	0	0	0	0	0	0	0	0
Azerbaijan	l	0	0	0	0	0	0	0	0	0
Bahamas	c	213,645	53,473	267,118	326,039	50,247	376,286	373,274	35,195	408,469
Bahrain	c	411,057	74,206	485,263	1,235,624	154,964	1,390,587	1,373,223	112,247	1,485,470
Bangladesh	c	2,749,140	60,373,160	63,122,300	11,461,068	66,644,731	78,105,799	24,602,758	66,644,731	91,247,489
Barbados	c	6,055	10,243	16,298	12,821	10,243	23,064	16,730	10,243	26,973
Belarus	l	0	0	0	0	0	0	0	0	0
Belgium	c	1,977,653	293,517	2,271,170	2,323,493	231,606	2,555,099	2,495,127	168,416	2,663,544
Belize	c	7,400	89,838	97,238	28,403	118,830	147,233	58,313	118,830	177,143
Benin	c	560,067	855,733	1,415,800	3,018,625	2,020,574	5,039,199	9,398,782	2,149,840	11,548,622
Bermuda	c	29,381	0	29,381	31,644	0	31,644	32,608	0	32,608

Country	Coastal/ land-locked	Population within LECZ in 2000 (adjusted)			Scenario D – population within LECZ in 2030			Scenario D – population within LECZ in 2060		
		Urban	Rural	Total	Urban	Rural	Total	Urban	Rural	Total
Bhutan	l	0	0	0	0	0	0	0	0	0
Bolivia (Plurinational State of)	l	0	0	0	0	0	0	0	0	0
Bosnia and Herzegovina	c	59	694	753	98	694	791	101	694	794
Botswana	l	0	0	0	0	0	0	0	0	0
Brazil	c	4,012,140	7,540,660	11,552,800	7,187,780	7,540,660	14,728,440	7,434,515	7,540,660	14,975,175
British Virgin Islands	c	36	8,853	8,889	92	9,426	9,517	161	8,293	8,454
Brunei Darussalam	c	1,547	17,539	19,086	4,370	17,539	21,909	6,763	17,539	24,302
Bulgaria	c	41,912	85,164	127,075	43,188	85,164	128,351	44,503	85,164	129,667
Burkina Faso	l	0	0	0	0	0	0	0	0	0
Burundi	l	0	0	0	0	0	0	0	0	0
Cambodia	c	80,742	3,115,728	3,196,470	346,250	4,062,909	4,409,158	1,025,002	4,062,909	5,087,910
Cameroon	c	90,759	430,341	521,099	459,473	483,443	942,917	1,172,242	483,443	1,655,686
Canada	c	289,766	903,114	1,192,880	494,694	923,920	1,418,614	678,272	923,920	1,602,192
Cape Verde	c	0	55,040	55,040	0	55,040	55,040	0	55,040	55,040
Cayman Islands	c	36,201	0	36,201	57,904	0	57,904	59,668	0	59,668

Country	Coastal/ land-locked	Population within LECZ in 2000 (adjusted)			Scenario D – population within LECZ in 2030			Scenario D – population within LECZ in 2060		
		Urban	Rural	Total	Urban	Rural	Total	Urban	Rural	Total
Central African Republic	l	0	0	0	0	0	0	0	0	0
Chad	l	0	0	0	0	0	0	0	0	0
Channel Islands (Guernsey, Jersey)	c	1,822	38,483	40,304	3,126	38,483	41,609	5,834	38,483	44,317
Chile	c	34,951	232,652	267,603	58,885	232,652	291,536	62,857	232,652	295,508
China	c	26,099,000	117,890,000	143,989,000	74,538,616	117,890,000	192,428,616	86,305,683	117,890,000	204,195,683
China, Hong Kong SAR	c	1,253,580	0	1,253,580	1,755,181	0	1,755,181	2,098,373	0	2,098,373
China, Macao SAR	c	68,960	0	68,960	157,865	0	157,865	186,396	0	186,396
Colombia	c	163,534	1,245,196	1,408,730	364,722	1,245,196	1,609,918	491,548	1,245,196	1,736,744
Comoros	c	0	51,962	51,962	0	150,313	150,313	0	188,000	188,000
Congo	c	12,071	82,739	94,809	52,748	150,639	203,387	156,726	150,639	307,364
Cook Islands	c	916	6,206	7,122	1,993	3,340	5,333	2,486	2,127	4,614
Costa Rica	c	4,706	92,498	97,204	12,992	92,498	105,490	17,543	92,498	110,041
Côte d'Ivoire	c	306,275	878,235	1,184,510	1,529,529	1,121,052	2,650,581	4,238,753	1,121,052	5,359,806
Croatia	c	4,439	107,915	112,354	5,314	107,915	113,229	5,839	107,915	113,753
Cuba	c	69,626	1,094,864	1,164,490	71,419	1,094,864	1,166,283	73,594	1,094,864	1,168,458

Country	Coastal/ land-locked	Population within LECZ in 2000 (adjusted)			Scenario D – population within LECZ in 2030			Scenario D – population within LECZ in 2060		
		Urban	Rural	Total	Urban	Rural	Total	Urban	Rural	Total
Cyprus	c	32,150	50,348	82,498	64,078	56,391	120,469	79,222	56,391	135,613
Czech Republic	l	0	0	0	0	0	0	0	0	0
Dem. People's Republic of Korea	c	363,190	2,044,270	2,407,460	537,893	2,044,270	2,582,163	719,343	2,044,270	2,763,613
Democratic Republic of the Congo	c	122	35,102	35,224	1,037	83,956	84,993	4,103	83,956	88,059
Denmark	c	659,865	795,585	1,455,450	837,028	584,392	1,421,420	891,383	386,945	1,278,328
Djibouti	c	79,757	124,795	204,552	201,027	189,354	390,381	368,168	189,354	557,521
Dominica	c	158	5,876	6,033	178	5,876	6,054	187	5,876	6,063
Dominican Republic	c	35,724	252,176	287,900	95,749	252,176	347,925	131,294	252,176	383,471
Ecuador	c	336,337	1,365,733	1,702,070	924,111	1,365,733	2,289,844	1,318,857	1,365,733	2,684,590
Egypt	c	3,735,020	21,726,180	25,461,200	9,938,358	31,928,969	41,867,327	20,649,375	31,928,969	52,578,344
El Salvador	c	29	200,788	200,817	58	200,788	200,846	83	200,788	200,871
Equatorial Guinea	c	0	11,379	11,379	0	33,505	33,505	0	33,505	33,505
Eritrea	c	1,449	49,886	51,335	18,105	163,192	181,298	90,707	163,192	253,900
Estonia	c	28,618	93,335	121,953	29,490	93,335	122,825	31,801	93,335	125,136
Ethiopia	l	0	0	0	0	0	0	0	0	0

Country	Coastal/ land-locked	Population within LECZ in 2000 (adjusted)			Scenario D – population within LECZ in 2030			Scenario D – population within LECZ in 2060		
		Urban	Rural	Total	Urban	Rural	Total	Urban	Rural	Total
Faroe Islands	c	35	2,826	2,860	68	2,826	2,894	129	2,826	2,955
Falkland Islands (Malvinas)	c	0	340	340	0	340	340	0	333	333
Fiji	c	0	133,323	133,323	0	133,323	133,323	0	133,323	133,323
Finland	c	17,125	219,288	236,413	22,650	219,288	241,938	24,426	219,288	243,714
France	c	1,072,920	1,876,740	2,949,660	1,849,157	1,876,740	3,725,897	2,226,400	1,876,740	4,103,140
French Guiana	c	3,938	21,698	25,635	16,886	41,982	58,869	39,354	41,982	81,336
French Polynesia	c	0	33,630	33,630	0	45,619	45,619	0	45,619	45,619
Gabon	c	29,618	80,809	110,427	91,129	80,809	171,938	176,644	80,809	257,453
Gambia	c	49,057	428,407	477,463	311,019	554,426	865,445	869,597	554,426	1,424,023
Georgia	c	52,568	266,192	318,760	54,169	266,192	320,361	55,818	266,192	322,011
Germany	c	1,103,800	3,482,050	4,585,850	1,168,835	3,482,050	4,650,885	1,170,431	3,482,050	4,652,481
Ghana	c	154,810	756,708	911,518	874,514	1,065,859	1,940,373	2,431,651	1,065,859	3,497,510
Gibraltar	c	18,946	0	18,946	20,413	0	20,413	21,035	0	21,035
Greece	c	362,039	689,991	1,052,030	506,065	689,991	1,196,056	639,854	689,991	1,329,845
Greenland		14,907	10,340	25,247	16,028	6,332	22,360	16,516	3,627	20,142

Country	Coastal/ land-locked	Population within LECZ in 2000 (adjusted)			Scenario D – population within LECZ in 2030			Scenario D – population within LECZ in 2060		
		Urban	Rural	Total	Urban	Rural	Total	Urban	Rural	Total
Grenada	c	671	3,569	4,240	1,324	3,569	4,894	1,679	3,569	5,248
Guadeloupe[62]	c	78,601	6,836	85,437	96,877	6,802	103,679	99,827	4,542	104,369
Guam	c	0	6,929	6,929	0	8,661	8,661	0	8,661	8,661
Guatemala	c	1,731	156,904	158,635	9,466	324,207	333,674	30,451	324,207	354,659
Guinea	c	71,175	542,793	613,967	443,264	1,034,608	1,477,872	1,823,243	1,034,608	2,857,851
Guinea-Bissau	c	12,307	324,739	337,046	51,646	639,812	691,458	233,468	698,378	931,846
Guyana	c	25,854	384,894	410,748	43,957	384,894	428,851	83,731	319,570	403,301
Haiti	c	68,102	389,575	457,677	408,342	389,575	797,917	713,718	389,575	1,103,293
Holy See	l	-	-	-	-	-	#WERT!	-	-	#WERT!
Honduras	c	19,584	225,714	245,297	85,636	292,721	378,358	186,458	292,721	479,179
Hungary	l	0	0	0	0	0	0	0	0	0
Iceland	c	13,323	21,457	34,780	23,862	19,492	43,354	30,251	15,064	45,315
India	c	10,513,300	53,412,200	63,925,500	35,324,205	75,579,548	110,903,753	87,359,078	75,579,548	162,938,627

[62] *The projections for Guadeloupe include population estimates and projections for the islands of Saint Martin and Saint Barthélemy.*

Country	Coastal/ land-locked	Population within LECZ in 2000 (adjusted)			Scenario D – population within LECZ in 2030			Scenario D – population within LECZ in 2060		
		Urban	Rural	Total	Urban	Rural	Total	Urban	Rural	Total
Indonesia	c	11,661,000	27,594,200	39,255,200	26,058,509	29,712,438	55,770,947	42,513,921	29,712,438	72,226,359
Iran (Islamic Republic of)	c	86,767	1,403,244	1,490,010	193,964	1,403,244	1,597,208	215,762	1,403,244	1,619,005
Iraq	c	370,008	2,294,702	2,664,710	1,566,356	7,752,782	9,319,138	5,111,931	9,402,948	14,514,879
Ireland	c	84,939	253,690	338,629	196,874	272,157	469,032	328,691	272,157	600,849
Isle of Man	c	927	7,692	8,618	1,225	8,837	10,062	1,727	8,837	10,563
Israel	c	80,894	164,876	245,770	190,135	249,333	439,467	314,796	249,333	564,129
Italy	c	1,440,990	3,943,260	5,384,250	1,906,796	3,943,260	5,850,056	2,107,758	3,943,260	6,051,018
Jamaica	c	49,101	172,249	221,350	68,985	172,249	241,234	80,034	172,249	252,283
Japan	c	18,018,400	12,175,100	30,193,500	19,910,292	12,175,100	32,085,392	20,516,650	12,175,100	32,691,750
Jordan	c	3	676	679	8	1,413	1,420	12	1,413	1,425
Kazakhstan	l	0	0	0	0	0	0	0	0	0
Kenya	c	36,730	219,412	256,141	311,112	672,714	983,827	1,859,552	843,606	2,703,157
Kiribati	c	34,159	47,921	82,080	65,563	63,898	129,461	110,431	50,015	160,446
Kuwait	c	365,834	34,950	400,784	1,094,943	51,311	1,146,254	1,751,949	49,789	1,801,738
Kyrgyzstan	l	0	0	0	0	0	0	0	0	0

Country	Coastal/ land-locked	Population within LECZ in 2000 (adjusted)			Scenario D – population within LECZ in 2030			Scenario D – population within LECZ in 2060		
		Urban	Rural	Total	Urban	Rural	Total	Urban	Rural	Total
Lao People's Democratic Republic	l	0	0	0	0	0	0	0	0	0
Latvia	c	215,519	583,411	798,930	222,083	583,411	805,494	224,204	343,430	567,634
Lebanon	c	52,639	199,494	252,132	83,424	199,494	282,918	85,965	199,494	285,458
Lesotho	l	0	0	0	0	0	0	0	0	0
Liberia	c	131,436	473,213	604,649	741,298	1,119,274	1,860,572	2,441,922	1,204,311	3,646,233
Libyan Arab Jamahiriya	c	125,268	520,113	645,381	277,924	578,221	856,145	389,758	578,221	967,979
Liechtenstein	l	0	0	0	0	0	0	0	0	0
Lithuania	c	51,551	156,857	208,408	53,121	156,857	209,978	53,888	156,857	210,745
Luxembourg	l	0	0	0	0	0	0	0	0	0
Madagascar	c	26,864	831,803	858,667	224,834	2,613,523	2,838,358	1,217,467	3,211,403	4,428,870
Malawi	l	0	0	0	0	0	0	0	0	0
Malaysia	c	899,380	4,277,370	5,176,750	3,038,437	4,277,370	7,315,807	4,812,970	4,277,370	9,090,340
Maldives	c	75,702	197,534	273,236	230,151	153,080	383,231	313,010	85,570	398,580
Mali	l	0	0	0	0	0	0	0	0	0
Malta	c	10,420	13,752	24,172	12,846	13,752	26,598	13,237	9,028	22,265

Country	Coastal/ land-locked	Population within LECZ in 2000 (adjusted)			Scenario D – population within LECZ in 2030			Scenario D – population within LECZ in 2060		
		Urban	Rural	Total	Urban	Rural	Total	Urban	Rural	Total
Marshall Islands	c	34,560	16,496	51,056	51,686	14,298	65,985	66,889	10,217	77,106
Martinique	c	3,211	30,185	33,396	3,639	31,735	35,374	3,749	24,842	28,591
Mauritania	c	37,312	317,571	354,883	175,676	682,791	858,467	577,882	682,791	1,260,674
Mauritius	c	0	83,037	83,037	0	91,812	91,812	0	91,812	91,812
Mayotte	c	101	21,083	21,184	540	60,258	60,797	1,889	63,262	65,152
Mexico	c	418,722	5,196,598	5,615,320	840,884	5,196,598	6,037,482	1,037,623	5,196,598	6,234,221
Micronesia (Fed. States of)	c	0	0	0	0	0	0	0	0	0
Monaco	c	20,596	0	20,596	20,908	0	20,908	21,323	0	21,323
Mongolia	l	0	0	0	0	0	0	0	0	0
Montserrat	c	25	325	350	126	456	581	390	456	846
Morocco and Western Sahara	c	202,621	1,536,869	1,739,490	497,784	1,536,869	2,034,653	695,343	1,536,869	2,232,212
Mozambique	c	75,860	2,234,360	2,310,220	610,970	3,572,025	4,182,995	2,233,834	3,572,025	5,805,859
Myanmar	c	1,425,920	11,076,280	12,502,200	4,554,043	11,076,280	15,630,323	7,947,312	11,076,280	19,023,592
Namibia	c	7,851	109,037	116,888	38,076	141,311	179,387	94,399	141,311	235,710
Nauru	c	4,693	0	4,693	5,289	0	5,289	5,451	0	5,451

Country	Coastal/ land-locked	Population within LECZ in 2000 (adjusted)			Scenario D – population within LECZ in 2030			Scenario D – population within LECZ in 2060		
		Urban	Rural	Total	Urban	Rural	Total	Urban	Rural	Total
Nepal	l	0	0	0	0	0	0	0	0	0
Netherlands	c	7,871,119	3,680,281	11,551,400	10,304,650	1,975,780	12,280,430	10,676,038	1,172,034	11,848,072
Netherlands Antilles	c	34,407	17,675	52,082	48,103	9,591	57,694	49,568	5,325	54,893
New Caledonia	c	12,843	51,040	63,883	26,258	74,857	101,115	41,525	74,857	116,382
New Zealand	c	162,717	310,269	472,986	279,363	358,113	637,476	359,641	358,113	717,754
Nicaragua	c	4,165	113,313	117,478	10,410	130,876	141,286	16,688	130,876	147,564
Niger	l	0	0	0	0	0	0	0	0	0
Nigeria	c	1,174,600	6,180,940	7,355,540	7,877,742	10,307,651	18,185,393	30,170,387	10,307,651	40,478,038
Niue	c	0	101	101	0	101	101	0	101	101
Northern Mariana Islands	c	14,802	6,732	21,534	18,036	5,055	23,091	18,585	3,022	21,607
Norway (including Svalboard)	c	7,577	279,766	287,343	13,242	279,766	293,008	17,969	279,766	297,735
Occupied Palestinian Territory	c	0	72,214	72,214	0	163,373	163,373	0	178,084	178,084
Oman	c	28,755	334,882	363,637	73,497	423,174	496,671	86,507	423,174	509,681
Pakistan	c	1,729,250	2,826,980	4,556,230	6,553,139	4,842,882	11,396,021	16,293,864	4,842,882	21,136,746
Palau	c	747	5,758	6,505	1,774	1,977	3,751	2,342	1,293	3,635

Country	Coastal/ land-locked	Population within LECZ in 2000 (adjusted)			Scenario D – population within LECZ in 2030			Scenario D – population within LECZ in 2060		
		Urban	Rural	Total	Urban	Rural	Total	Urban	Rural	Total
Panama	c	30,583	205,849	236,432	92,790	205,849	298,639	138,458	205,849	344,307
Papua New Guinea	c	3,938	92,693	96,631	19,945	288,774	308,719	126,697	369,709	496,406
Paraguay	l	0	0	0	0	0	0	0	0	0
Peru	c	171,740	440,445	612,185	364,153	440,445	804,598	488,918	440,445	929,363
Philippines	c	1,544,190	11,416,710	12,960,900	4,796,734	17,367,207	22,163,940	11,009,821	17,367,207	28,377,027
Pitcairn	c	0	0	0	0	0	0	0	0	0
Poland	c	206,045	697,458	903,503	219,653	697,458	917,111	241,676	697,458	939,134
Portugal	c	111,977	419,845	531,822	175,998	419,845	595,843	181,358	419,845	601,203
Puerto Rico	c	413,152	204,183	617,335	436,319	16,027	452,346	449,607	8,328	457,935
Qatar	c	143,709	29,873	173,582	1,096,733	73,177	1,169,910	1,247,567	54,618	1,302,184
Republic of Korea	c	1,005,140	1,983,560	2,988,700	1,372,175	1,983,560	3,355,735	1,413,964	1,983,560	3,397,524
Republic of Moldova	l	24,095	62,621	86,716	26,009	62,621	88,630	26,801	62,621	89,422
Réunion	c	19,421	74,830	94,251	36,444	36,908	73,352	43,132	24,759	67,891
Romania	c	292,254	484,818	777,072	383,688	484,818	868,506	397,907	484,818	882,725
Russian Federation	c	566,230	2,945,590	3,511,820	583,474	2,945,590	3,529,064	601,244	2,945,590	3,546,834

Country	Coastal/ land-locked	Population within LECZ in 2000 (adjusted)			Scenario D – population within LECZ in 2030			Scenario D – population within LECZ in 2060		
		Urban	Rural	Total	Urban	Rural	Total	Urban	Rural	Total
Rwanda	l	0	0	0	0	0	0	0	0	0
Saint Helena	c	0	0	0	0	0	0	0	0	0
Saint Kitts and Nevis	c	340	3,454	3,793	861	4,755	5,616	1,904	4,755	6,659
Saint Lucia	c	1,033	6,079	7,112	2,394	7,716	10,110	5,227	7,716	12,943
Saint Pierre and Miquelon	c	2,481	683	3,164	2,490	433	2,922	2,560	289	2,849
Saint Vincent and the Grenadines	c	599	9,183	9,782	1,029	9,183	10,212	1,530	9,183	10,713
Samoa	c	0	27,226	27,226	0	32,230	32,230	0	32,230	32,230
San Marino	l	0	0	0	0	0	0	0	0	0
Sao Tome and Principe	c	1,387	16,811	18,197	5,636	16,811	22,447	12,193	16,811	29,004
Saudi Arabia	c	424,637	2,343,853	2,768,490	1,433,969	3,302,021	4,735,990	2,130,304	3,302,021	5,432,324
Senegal	c	731,507	2,201,583	2,933,090	3,308,445	4,610,818	7,919,263	9,994,064	4,666,488	14,660,552
Serbia and Montenegro	c	258	8,111	8,368	323	8,111	8,434	363	8,111	8,474
Seychelles	c	0	7,837	7,837	0	7,837	7,837	0	7,837	7,837
Sierra Leone	c	16,681	325,639	342,320	97,194	776,017	873,211	307,845	776,017	1,083,862
Singapore	c	620,330	0	620,330	1,183,792	0	1,183,792	1,191,982	0	1,191,982

Country	Coastal/ land-locked	Population within LECZ in 2000 (adjusted)			Scenario D – population within LECZ in 2030			Scenario D – population within LECZ in 2060		
		Urban	Rural	Total	Urban	Rural	Total	Urban	Rural	Total
Slovakia	l	0	0	0	0	0	0	0	0	0
Slovenia	c	7,780	10,622	18,402	9,332	10,622	19,954	13,177	10,622	23,799
Solomon Islands	c	658	56,716	57,373	6,330	145,167	151,497	35,082	154,871	189,952
Somalia	c	127,634	454,699	582,333	912,070	1,151,211	2,063,282	5,377,636	1,870,507	7,248,143
South Africa	c	276,641	115,365	392,006	568,410	115,365	683,775	788,500	115,365	903,865
Spain	c	1,126,390	2,050,080	3,176,470	1,814,000	2,050,080	3,864,080	2,045,378	2,050,080	4,095,458
Sri Lanka	c	210,541	2,082,689	2,293,230	415,574	2,779,880	3,195,454	1,179,661	2,779,880	3,959,541
Sudan	c	79,327	276,080	355,407	565,334	488,642	1,053,977	1,900,069	488,642	2,388,712
Suriname	c	153,915	164,096	318,011	263,589	136,699	400,288	306,303	84,484	390,787
Swaziland	l	0	0	0	0	0	0	0	0	0
Sweden	c	68,615	521,896	590,511	95,679	521,896	617,575	116,776	521,896	638,672
Switzerland	l	0	0	0	0	0	0	0	0	0
Syrian Arab Republic	c	18,541	80,359	98,900	70,288	126,135	196,422	139,403	126,135	265,538
Tajikistan	l	0	0	0	0	0	0	0	0	0
TFYR Macedonia	l	0	0	0	0	0	0	0	0	0

Country	Coastal/ land-locked	Population within LECZ in 2000 (adjusted)			Scenario D – population within LECZ in 2030			Scenario D – population within LECZ in 2060		
		Urban	Rural	Total	Urban	Rural	Total	Urban	Rural	Total
Thailand	c	6,265,580	10,157,120	16,422,700	13,167,833	10,157,120	23,324,953	19,739,953	10,157,120	29,897,073
Timor-Leste	c	438	19,571	20,008	4,485	68,085	72,570	24,969	82,702	107,671
Togo	c	115,809	366,833	482,642	632,003	522,272	1,154,275	1,621,558	522,272	2,143,830
Tokelau	c	0	0	0	0	0	0	0	0	0
Tonga	c	0	35,081	35,081	0	40,588	40,588	0	40,588	40,588
Trinidad and Tobago	c	48,714	115,380	164,094	151,863	115,380	267,243	318,713	115,380	434,093
Tunisia	c	355,506	1,033,154	1,388,660	712,009	1,033,154	1,745,163	896,052	1,033,154	1,929,206
Turkey	c	482,554	1,649,376	2,131,930	1,105,877	1,649,376	2,755,253	1,433,236	1,649,376	3,082,612
Turkmenistan	l	0	0	0	0	0	0	0	0	0
Turks and Caicos Islands	c	11,817	2,916	14,733	36,656	1,160	37,816	37,773	683	38,456
Tuvalu	c	4,335	5,084	9,419	6,740	4,224	10,964	11,146	3,304	14,450
Uganda	l	0	0	0	0	0	0	0	0	0
Ukraine	c	509,058	887,062	1,396,120	524,561	887,062	1,411,623	540,536	887,062	1,427,598
United Arab Emirates	c	25,559	492,069	517,628	245,951	1,031,812	1,277,764	339,775	869,227	1,209,002
United Kingdom	c	2,166,280	4,904,930	7,071,210	3,141,748	4,904,930	8,046,678	3,855,798	4,904,930	8,760,728

Country	Coastal/ land-locked	Population within LECZ in 2000 (adjusted)			Scenario D – population within LECZ in 2030			Scenario D – population within LECZ in 2060		
		Urban	Rural	Total	Urban	Rural	Total	Urban	Rural	Total
United Republic of Tanzania	c	76,181	559,418	635,599	847,802	1,963,500	2,811,301	6,378,227	3,341,432	9,719,659
United States of America	c	14,343,500	9,022,500	23,366,000	25,014,567	9,022,500	34,037,067	34,857,710	9,022,500	43,880,210
United States Virgin Islands	c	17,135	8,002	25,137	17,657	3,088	20,744	18,194	1,743	19,937
Uruguay	c	146,198	279,171	425,369	176,103	206,964	383,067	185,310	141,141	326,451
Uzbekistan	l	0	0	0	0	0	0	0	0	0
Vanuatu	c	76	9,841	9,917	640	23,418	24,058	3,038	23,418	26,455
Venezuela (Bolivarian Republic of)	c	435,193	942,527	1,377,720	978,651	942,527	1,921,178	1,279,126	942,527	2,221,653
Vietnam	c	5,558,450	37,491,650	43,050,100	18,331,754	37,491,650	55,823,404	30,943,269	34,363,229	65,306,498
Wallis and Futuna Islands	c	0	9,899	9,899	0	9,899	9,899	0	9,899	9,899
Yemen	c	70,291	406,990	477,281	732,180	1,177,105	1,909,285	3,458,726	1,269,280	4,728,006
Zambia	l	0	0	0	0	0	0	0	0	0
Zimbabwe	l	0	0	0	0	0	0	0	0	0

Table 26: Population within LECZ for SILLS – Foresight scenario D 2030/2060[63, 64, 65]

Island(s)	LECZ (km²)	Population within LECZ in 2008	Scenario D – population within LECZ	
			In 2030	In 2060
American Samoa	33	15,214	13,644	15,983
Antigua and Barbuda	155	17,400	22,833	27,150
Aruba	41	31,402	38,971	44,031
Bahamas	12,342	249,795	321,155	348,623
Barbados	14	31,933	41,193	48,175
Cape Verde	262	89,788	89,788	89,788
Comoros	39	110,556	240,923	301,327
Cook Islands	53	6,331	5,121	4,430
Dominica	9	19,988	20,038	20,069
Fiji	1,500	277,801	277,801	277,801
French Polynesia	1,398	137,364	171,782	171,782
Grenada	16	15,129	16,806	18,024
Guadeloupe[66]	175	119,629	137,870	138,787

[63] Base data: SRTM 90 Global Digital Elevation Model (ESRI 2008; 3 arc seconds); GTOPO30 Global Digital Elevation Model (30 arc seconds); Land Area Grid (GRUMP), CIESIN (30 arc seconds); LandScan™ (30 arc seconds; population year 2008); National Administrative Boundaries (Level 01), GADM (2008).

[64] Demographic base data: *World Population Prospects: The 2010 Revision* (United Nations 2010b); *World Urbanization Prospects: The 2009 Revision* (United Nations, 2009b).

[65] Annotations: Definition of countries and regions according to UN classification of countries by major area and region of the world" (see United Nations, 2009a,b, 2010a,b).

Island(s)	LECZ (km²)	Population within LECZ in 2008	Scenario D – population within LECZ	
			In 2030	In 2060
Guam	34	20,331	23,945	23,945
Kiribati	860	95,759	133,754	165,767
Maldives	268	380,357	487,455	506,979
Marshall Islands	–	60,062	72,492	84,710
Martinique	80	70,656	73,701	59,569
Mayotte	25	38,769	83,996	90,012
Micronesia	141	55,179	–	–
Nauru	4	6,707	6,707	6,707
Netherlands Antilles	199	45,123	45,123	45,123
New Caledonia	1,253	69,751	97,678	112,427
Niue	4	514	514	514
Northern Mariana Islands	49	43,121	45,386	42,469
Palau	43	6,481	4,328	4,195
Papua New Guinea	13,760	511,737	1,199,428	1,928,627
Reunion	44	67,034	55,777	51,624
Saint Kitts and Nevis	18	8,545	11,394	13,512
Saint Lucia	32	38,959	50,422	64,556

[66] Projections for Guadeloupe without Saint Martin and Saint Barthélemy. Projections for Saint Martin and Saint Barthélemy were not possible, though, because the UN statistics do not give separate data for the islands yet.

Island(s)	LECZ (km²)	Population within LECZ in 2008	Scenario D – population within LECZ	
			In 2030	In 2060
Saint Pierre	7	2,907	2,743	2,674
Saint Vincent and the Grenadines	15	22,137	22,846	23,968
Samoa	45	56,876	64,368	64,368
Sao Tome and Principe	17	56,385	65,767	84,978
Seychelles	256	24,797	24,797	24,797
Solomon Islands	1,074	282,138	575,050	721,017
Tokelau	9	1,355	–	–
Tonga	171	69,580	77,432	77,432
Tuvalu	–	10,551	11,794	15,544
Vanuatu	281	95,065	82,576	79,362
Virgin Islands, US	46	16,103	30,843	33,916
Wallis and Futuna	24	6,891	6,891	6,891
Isabela (+ Fernandina)	224	338	–	–
Saint-Martin and Saint-Bartholomy	26	15,452	–	–
San Cristobal	48	1,780	–	–
Santa Cruz	82	2,262	–	–
Total	**35,210**	**3,306,032**	**4,755,130**	**5,841,651**

Table 27: Population within LECZ for UKOTs – Foresight scenario D 2030/2060[67, 68, 69]

Island(s)	LECZ (km²)	Population within LECZ in 2008	Scenario D – population within LECZ	
			In 2030	In 2060
Anguilla	23	2,613	4,253	4,382
Bermuda	–	22,313	23,561	24,278
British Virgin Islands	63	6,786	7,134	6,337
Cayman Islands	230	44,139	62,290	64,187
Falkland Islands	1,926	818	818	801
Montserrat	3	490	711	1,034
Pitcairn Islands	7	22	–	–
St Helena	25	23	–	–
Turks and Caicos Islands	889	17,575	35,084	35,678
Ascension	4	106	–	–
British Indian Ocean Territory	45	0	–	–
South Georgia	445	0	–	–

[67] Base data: SRTM 90 Global Digital Elevation Model (ESRI 2008; 3 arc seconds); GTOPO30 Global Digital Elevation Model (30 arc seconds); Land Area Grid (GRUMP), CIESIN (30 arc seconds); LandScan™ (30 arc seconds; population year 2008); National Administrative Boundaries (Level 01), GADM (2008).

[68] Demographic base data: *World Population Prospects: The 2010 Revision* (United Nations 2010b); *World Urbanization Prospects: The 2009 Revision* (United Nations, 2009b).

[69] Annotations: Definition of countries and regions according to UN classification of countries by major area and region of the world" (see United Nations, 2009a,b, 2010a,b).

Island(s)	LECZ (km²)	Population within LECZ in 2008	Scenario D – population within LECZ	
			In 2030	In 2060
South Sandwich Islands	84	0	–	–
Tristan de Cunha	12	19	–	–
Total	3,755	94,904	133,851	136,698

Table 28: Projected population in the 1-in-100-year floodplain per continent – Foresight scenarios A to D 2030/2060[70, 71, 72]

Continent	Scenario A – population in floodplain			Scenario B – population in floodplain			Scenario C – Population in floodplain			Scenario D – population in floodplain		
	In 2000	In 2030	In 2060	In 2000	In 2030	In 2060	In 2000	In 2030	In 2060	In 2000	In 2030	In 2060
AFRICA	14,170,867	29,958,163	55,810,332	14,170,867	27,217,901	45,788,640	14,170,867	29,564,247	59,006,311	14,170,867	27,745,183	45,406,014
ASIA	147,292,754	226,284,280	318,953,868	147,292,754	213,825,230	248,109,985	147,292,754	228,787,979	332,291,828	147,292,754	214,750,218	268,178,622
EUROPE	29,756,487	31,805,985	31,908,849	29,756,487	31,805,985	31,908,849	29,756,487	32,986,191	34,240,762	29,756,487	32,987,200	34,241,782
LATIN AMERICA AND CARIBBEAN	8,367,262	10,981,679	13,567,924	8,367,262	10,393,905	10,724,694	8,367,262	11,164,309	14,019,886	8,367,262	10,484,308	11,371,391
NORTHERN AMERICA	5,247,923	7,071,556	7,948,741	5,247,923	7,071,556	7,948,741	5,247,923	7,481,789	9,681,130	5,247,923	7,484,088	9,683,437
OCEANIA	762,085	997,746	1,092,195	762,085	993,356	1,080,242	762,085	1,045,383	1,272,135	762,085	1,043,540	1,263,934

[70] Spatial base data: SRTM30 Enhanced Global Map, ISciences (30 arc seconds; year 2003); GRUMP (alpha) Population Grid, CIESIN (30 arc seconds; population year 2000); National Administrative Boundaries (Level 01), GADM (2008); DIVA 1 in 100-year Storm Surge Heights; Variation for Greenland: GTOPO30 Global Digital Elevation Model (30 arc seconds; year 2005).

[71] Demographic base data: *World Population Prospects: The 2010 Revision* (United Nations 2010b); *World Urbanization Prospects: The 2009 Revision* (United Nations, 2009b).

[72] Annotations: Definition of countries and regions according to UN classification of countries by major area and region of the world" (see United Nations, 2009a,b, 2010a,b). Data do not include Taiwan. UN data on population and urbanisation prospects were not available; Taiwan is not a member of the UN. For this reason, no population projections could be elaborated for Taiwan. The floodplain was defined by flood heights from a 100-year event plus sea-level rise. Flood heights were derived from the DIVA database (cls_p_16.shp); sea-level rise estimates for 2030 (+10 cm) and 2060 (+21 cm) are based on the Foresight specifications. The Fed. State of Micronesia has not been considered in these projections (Oceania) since urban and rural population estimates for the year 2000 were not available.

Table 29: Projected population in the 1 in 100-yr floodplain per region – Foresight scenarios A–D 2030/2060[73, 74, 75]

World region	Scenario A – population in floodplain			Scenario B – population in floodplain			Scenario C – population in floodplain			Scenario D – population in floodplain		
	In 2000	In 2030	In 2060	In 2000	In 2030	In 2060	In 2000	In 2030	In 2060	In 2000	In 2030	In 2060
WORLD	**205,597,378**	**307,099,408**	**429,281,910**	**205,597,378**	**291,307,934**	**345,561,152**	**205,597,378**	**311,029,898**	**450,512,052**	**205,597,378**	**294,494,537**	**370,145,179**
AFRICA	**14,170,867**	**29,958,163**	**55,810,332**	**14,170,867**	**27,217,901**	**45,788,640**	**14,170,867**	**29,564,247**	**59,006,311**	**14,170,867**	**27,745,183**	**45,406,014**
Eastern Africa	1,895,041	5,784,528	16,194,781	1,895,041	5,331,297	14,288,141	1,895,041	5,431,972	17,360,006	1,895,041	5,311,021	12,619,938
Middle Africa	241,909	475,640	768,081	241,909	428,841	611,617	241,909	465,484	810,915	241,909	435,537	617,888
Northern Africa	9,477,186	16,907,012	23,560,604	9,477,186	15,046,251	18,221,868	9,477,186	16,889,301	24,229,816	9,477,186	15,727,892	20,042,889
Southern Africa	158,337	285,981	448,828	158,337	251,521	294,536	158,337	289,578	478,136	158,337	259,230	342,795
Western Africa	2,398,394	6,505,002	14,838,038	2,398,394	6,159,992	12,372,478	2,398,394	6,487,912	16,127,437	2,398,394	6,011,502	11,782,503

[73] Spatial base data: SRTM30 Enhanced Global Map, ISciences (30 arc seconds; year 2003); GRUMP (alpha) Population Grid, CIESIN (30 arc seconds; population year 2000); National Administrative Boundaries (Level 01), GADM (2008); DIVA 1 in 100-year Storm Surge Heights; Variation for Greenland: GTOPO30 Global Digital Elevation Model (30 arc seconds; year 2005).

[74] Demographic base data: *World Population Prospects: The 2010 Revision* (United Nations 2010b); *World Urbanization Prospects: The 2009 Revision* (United Nations, 2009b).

[75] Annotations: Definition of countries and regions according to UN classification of countries by major area and region of the world" (see United Nations, 2009a,b, 2010a,b). Data do not include Taiwan. UN data on population and urbanisation prospects were not available; Taiwan is not a member of the UN. For this reason, no population projections could be elaborated for Taiwan. The floodplain was defined by flood heights from a 100-year event plus sea-level rise. Flood heights were derived from the DIVA database (cls_p_16.shp); sea-level rise estimates for 2030 (+10 cm) and 2060 (+21 cm) are based on the Foresight specifications. The Fed. State of Micronesia has not been considered in these projections (Oceania; Micronesia) since urban and rural population estimates for the year 2000 were not available.

World region	Scenario A – population in floodplain			Scenario B – population in floodplain			Scenario C – population in floodplain			Scenario D – population in floodplain		
	In 2000	In 2030	In 2060	In 2000	In 2030	In 2060	In 2000	In 2030	In 2060	In 2000	In 2030	In 2060
Sub-Saharan Africa	4,710,841	13,108,523	32,406,177	4,710,841	12,229,205	27,707,820	4,710,841	12,733,670	34,958,382	4,710,841	12,069,683	25,485,616
ASIA	**147,292,754**	**226,284,280**	**318,953,868**	**147,292,754**	**213,825,230**	**248,109,985**	**147,292,754**	**228,787,979**	**332,291,828**	**147,292,754**	**214,750,218**	**268,178,622**
Eastern Asia	71,843,950	99,374,532	120,465,507	71,843,950	98,133,256	102,968,857	71,843,950	101,966,994	125,194,719	71,843,950	96,599,973	106,005,242
South–Central Asia	29,546,780	55,314,790	93,156,537	29,546,780	48,104,094	68,500,234	29,546,780	54,729,006	98,232,688	29,546,780	50,247,048	75,091,051
Southeast Asia	41,658,958	60,416,758	85,964,361	41,658,958	57,151,251	61,434,573	41,658,958	61,133,797	88,701,660	41,658,958	57,475,466	71,512,519
Western Asia	4,243,066	11,178,200	19,367,463	4,243,066	10,436,628	15,206,320	4,243,066	10,958,183	20,162,761	4,243,066	10,427,732	15,569,810
EUROPE	**29,756,487**	**31,805,985**	**31,908,849**	**29,756,487**	**31,805,985**	**31,908,849**	**29,756,487**	**32,986,191**	**34,240,762**	**29,756,487**	**32,987,200**	**34,241,782**
Eastern Europe	3,015,737	3,097,114	3,167,849	3,015,737	3,097,114	3,167,849	3,015,737	3,113,181	3,195,040	3,015,737	3,113,181	3,195,040
Northern Europe	5,715,055	6,246,279	6,291,040	5,715,055	6,246,279	6,291,040	5,715,055	6,453,665	6,960,098	5,715,055	6,454,674	6,961,118
Southern Europe	5,471,806	6,270,590	6,584,393	5,471,806	6,270,590	6,584,393	5,471,806	6,451,677	7,034,460	5,471,806	6,451,677	7,034,460
Western Europe	15,553,889	16,192,002	15,865,567	15,553,889	16,192,002	15,865,567	15,553,889	16,967,668	17,051,164	15,553,889	16,967,668	17,051,164
LATIN AMERICA AND THE CARIBBEAN	**8,367,262**	**10,981,679**	**13,567,924**	**8,367,262**	**10,393,905**	**10,724,694**	**8,367,262**	**11,164,309**	**14,019,886**	**8,367,262**	**10,484,308**	**11,371,391**
Caribbean	1,043,143	1,209,320	1,465,744	1,043,143	1,165,496	1,236,769	1,043,143	1,224,747	1,512,344	1,043,143	1,163,484	1,288,750
Central America	1,173,142	1,399,978	1,620,993	1,173,142	1,348,425	1,420,576	1,173,142	1,402,949	1,649,721	1,173,142	1,360,150	1,478,476
South America	6,150,977	8,372,381	10,481,188	6,150,977	7,879,984	8,067,348	6,150,977	8,536,612	10,857,821	6,150,977	7,960,674	8,604,164

World region	Scenario A – population in floodplain			Scenario B – population in floodplain			Scenario C – population in floodplain			Scenario D – population in floodplain		
	In 2000	In 2030	In 2060	In 2000	In 2030	In 2060	In 2000	In 2030	In 2060	In 2000	In 2030	In 2060
NORTHERN AMERICA	5,247,923	7,071,556	7,948,741	5,247,923	7,071,556	7,948,741	5,247,923	7,481,789	9,681,130	5,247,923	7,484,088	9,683,437
OCEANIA	762,085	997,746	1,092,195	762,085	993,356	1,080,242	762,085	1,045,383	1,272,135	762,085	1,043,540	1,263,934
Australia/New Zealand	680,669	913,414	989,197	680,669	913,414	989,197	680,669	961,107	1,168,220	680,669	961,820	1,168,946
Melanesia	47,884	47,932	47,997	47,884	47,932	47,997	47,884	47,932	47,997	47,884	47,932	47,997
Micronesia	3,431	4,137	4,712	3,431	3,612	3,722	3,431	4,155	4,745	3,431	3,867	3,985
Polynesia	30,101	32,262	50,289	30,101	28,398	39,327	30,101	32,189	51,173	30,101	29,921	43,006

Table 30: Projected population in the 1-in-100-year floodplain per country – Foresight scenarios A–D 2030/2060[76, 77, 78]

Country	Coastal/land-locked	Scenario A – population in floodplain			Scenario B – population in floodplain			Scenario C – population in floodplain			Scenario D – population in floodplain		
		In 2000	In 2030	In 2060	In 2000	In 2030	In 2060	In 2000	In 2030	In 2060	In 2000	In 2030	In 2060
Afghanistan	l	0	0	0	0	0	0	0	0	0	0	0	0
Albania	c	117,111	129,589	133,808	117,111	129,589	133,808	117,111	131,517	135,937	117,111	131,517	135,937
Algeria	c	186,373	292,139	406,105	186,373	284,696	302,871	186,373	302,184	432,074	186,373	277,675	333,388
American Samoa	c	17,749	16,331	22,749	17,749	15,037	15,505	17,749	16,681	24,090	17,749	15,299	17,922
Andorra	l	0	0	0	0	0	0	0	0	0	0	0	0

[76] Spatial base data: SRTM30 Enhanced Global Map, ISciences (30 arc seconds; year 2003); GRUMP (alpha) Population Grid, CIESIN (30 arc seconds; population year 2000); National Administrative Boundaries (Level 01), GADM (2008); DIVA 1 in 100-year Storm Surge Heights; Variation for Greenland: GTOPO30 Global Digital Elevation Model (30 arc seconds; year 2005).

[77] Demographic base data: *World Population Prospects: The 2010 Revision* (United Nations 2010b); *World Urbanization Prospects: The 2009 Revision* (United Nations, 2009b).

[78] Annotations: Definition of countries and regions according to UN classification of countries by major area and region of the world" (see United Nations, 2009a,b, 2010a,b). Data do not include Taiwan. UN data on population and urbanisation prospects were not available; Taiwan is not a member of the UN. For this reason, no population projections could be elaborated for Taiwan. The floodplain was defined by flood heights from a 100-year event plus sea-level rise. Flood heights were derived from the DIVA database (cls_p_16.shp); sea-level rise estimates for 2030 (+10 cm) and 2060 (+21 cm) are based on the Foresight specifications. The Fed. State of Micronesia has not been considered in these projections since urban and rural population estimates for the year 2000 were not available.

Country	Coastal/land-locked	Scenario A – population in floodplain			Scenario B – population in floodplain			Scenario C – population in floodplain			Scenario D – population in floodplain		
		In 2000	In 2030	In 2060	In 2000	In 2030	In 2060	In 2000	In 2030	In 2060	In 2000	In 2030	In 2060
Angola	c	111,145	202,938	264,058	111,145	176,117	222,085	111,145	194,512	270,522	111,145	184,783	226,114
Anguilla	c	–	–	–	–	–	–	–	–	–	–	–	–
Antigua and Barbuda	c	–	–	–	–	–	–	–	–	–	–	–	–
Argentina	c	724,602	1,089,400	1,550,780	724,602	996,720	1,046,220	724,602	1,111,911	1,611,012	724,602	1,023,073	1,225,505
Armenia	l	0	0	0	0	0	0	0	0	0	0	0	0
Aruba	c	–	–	–	–	–	–	–	–	–	–	–	–
Australia (including Norfolk Island)	c	543,444	738,527	806,933	543,444	738,527	806,933	543,444	773,740	953,169	543,444	773,740	953,169
Austria	l	0	0	0	0	0	0	0	0	0	0	0	0
Azerbaijan	l	0	0	0	0	0	0	0	0	0	0	0	0
Bahamas	c	43,114	65,027	81,800	43,114	57,979	56,070	43,114	65,144	82,009	43,114	61,388	67,906
Bahrain	c	148,700	454,916	563,576	148,700	422,086	424,748	148,700	459,632	569,832	148,700	433,052	471,239
Bangladesh	c	7,529,897	11,141,367	15,398,322	7,529,897	9,734,725	11,385,523	7,529,897	11,205,240	15,900,893	7,529,897	10,281,683	13,250,955
Barbados	c	17,230	25,544	34,828	17,230	24,628	25,166	17,230	26,206	36,501	17,230	24,382	28,515

Country	Coastal/land-locked	Scenario A – population in floodplain			Scenario B – population in floodplain			Scenario C – population in floodplain			Scenario D – population in floodplain		
		In 2000	In 2030	In 2060	In 2000	In 2030	In 2060	In 2000	In 2030	In 2060	In 2000	In 2030	In 2060
Belarus	l	0	0	0	0	0	0	0	0	0	0	0	0
Belgium	c	1,775,256	1,879,187	1,888,235	1,775,256	1,879,187	1,888,235	1,775,256	2,016,213	2,123,600	1,775,256	2,016,213	2,123,600
Belize	c	18,601	31,177	41,748	18,601	27,619	31,523	18,601	31,383	43,421	18,601	28,839	35,593
Benin	c	–	–	–	–	–	–	–	–	–	–	–	–
Bermuda	c	–	–	–	–	–	–	–	–	–	–	–	–
Bhutan	l	0	0	0	0	0	0	0	0	0	0	0	0
Bolivia (Plurinational State of)	l	0	0	0	0	0	0	0	0	0	0	0	0
Bosnia and Herzegovina	c	683	713	719	683	713	719	683	721	727	683	721	727
Botswana	l	0	0	0	0	0	0	0	0	0	0	0	0
Brazil	c	3,444,968	4,666,111	5,535,962	3,444,968	4,391,438	4,512,494	3,444,968	4,758,958	5,714,032	3,444,968	4,442,094	4,573,858
British Virgin Islands	c	–	–	–	–	–	–	–	–	–	–	–	–
Brunei Darussalam	c	14,144	17,478	20,854	14,144	16,412	17,336	14,144	17,626	21,520	14,144	16,243	18,030

Country	Coastal/land-locked	Scenario A – population in floodplain			Scenario B – population in floodplain			Scenario C – population in floodplain			Scenario D – population in floodplain		
		In 2000	In 2030	In 2060	In 2000	In 2030	In 2060	In 2000	In 2030	In 2060	In 2000	In 2030	In 2060
Bulgaria	c	69,509	73,546	79,045	69,509	73,546	79,045	69,509	73,546	79,045	69,509	73,546	79,045
Burkina Faso	l	0	0	0	0	0	0	0	0	0	0	0	0
Burundi	l	0	0	0	0	0	0	0	0	0	0	0	0
Cambodia	c	56,477	93,134	125,308	56,477	78,017	99,770	56,477	91,161	127,175	56,477	84,690	108,284
Cameroon	c	56,274	111,767	228,129	56,274	106,280	182,833	56,274	115,712	256,188	56,274	101,951	179,260
Canada	c	1,114,044	1,272,208	1,333,256	1,114,044	1,272,208	1,333,256	1,114,044	1,326,783	1,504,016	1,114,044	1,329,082	1,506,323
Cape Verde	c	–	–	–	–	–	–	–	–	–	–	–	–
Cayman Islands	c	–	–	–	–	–	–	–	–	–	–	–	–
Central African Republic	l	0	0	0	0	0	0	0	0	0	0	0	0
Chad	l	0	0	0	0	0	0	0	0	0	0	0	0
Channel Islands (Guernsey, Jersey)	c	–	–	–	–	–	–	–	–	–	–	–	–
Chile	c	164,609	183,429	198,201	164,609	179,034	180,722	164,609	184,891	201,187	164,609	179,882	182,948

Country	Coastal/land-locked	Scenario A – population in floodplain			Scenario B – population in floodplain			Scenario C – population in floodplain			Scenario D – population in floodplain		
		In 2000	In 2030	In 2060	In 2000	In 2030	In 2060	In 2000	In 2030	In 2060	In 2000	In 2030	In 2060
China	c	59,485,818	85,175,548	104,559,026	59,485,818	84,368,389	88,652,149	59,485,818	87,327,545	108,737,881	59,485,818	82,346,408	90,708,062
China, Hong Kong SAR	c	1,339,801	2,024,264	2,812,170	1,339,801	1,788,663	1,841,818	1,339,801	2,059,414	2,895,944	1,339,801	1,877,043	2,245,565
China, Macao SAR	c	231,374	580,897	812,895	231,374	543,837	557,882	231,374	604,449	854,835	231,374	537,023	643,632
Colombia	c	190,250	242,178	302,856	190,250	227,306	246,928	190,250	243,878	310,461	190,250	226,332	261,666
Comoros	c	–	–	–	–	–	–	–	–	–	–	–	–
Congo	c	37,424	87,893	162,794	37,424	78,223	121,258	37,424	84,237	168,424	37,424	80,283	121,326
Cook Islands	c	–	–	–	–	–	–	–	–	–	–	–	–
Costa Rica	c	24,610	27,102	29,767	24,610	26,955	27,281	24,610	27,347	30,401	24,610	26,762	27,982
Côte d'Ivoire	c	196,849	481,748	1,134,240	196,849	466,654	918,201	196,849	499,862	1,270,969	196,849	440,890	892,431
Croatia	c	73,954	74,358	74,588	73,954	74,358	74,588	73,954	74,651	75,130	73,954	74,651	75,130
Cuba	c	416,878	424,100	430,444	416,878	421,967	426,189	416,878	424,278	430,820	416,878	421,849	426,066
Cyprus	c	38,769	65,314	87,237	38,769	57,007	60,741	38,769	66,102	90,074	38,769	59,615	70,313
Czech Republic	l	0	0	0	0	0	0	0	0	0	0	0	0

Country	Coastal/land-locked	Scenario A – population in floodplain			Scenario B – population in floodplain			Scenario C – population in floodplain			Scenario D – population in floodplain		
		In 2000	In 2030	In 2060	In 2000	In 2030	In 2060	In 2000	In 2030	In 2060	In 2000	In 2030	In 2060
Dem. People's Republic of Korea	c	862,968	1,001,316	1,194,531	862,968	946,911	988,870	862,968	1,004,722	1,214,013	862,968	956,433	1,059,808
Democratic Republic of the Congo	c	1,659	4,393	5,152	1,659	3,651	3,844	1,659	3,817	4,481	1,659	4,003	4,150
Denmark	c	531,395	496,687	428,497	531,395	496,687	428,497	531,395	530,441	488,673	531,395	530,441	488,673
Djibouti	c	56,910	119,969	201,287	56,910	109,889	148,057	56,910	122,078	210,917	56,910	111,739	164,491
Dominica	c	9,386	9,516	9,705	9,386	9,459	9,540	9,386	9,520	9,719	9,386	9,486	9,575
Dominican Republic	c	48,316	60,829	75,743	48,316	59,868	61,223	48,316	62,003	79,039	48,316	59,098	65,707
Ecuador	c	290,181	427,419	605,442	290,181	418,286	466,454	290,181	438,705	637,599	290,181	410,667	507,613
Egypt	c	7,820,948	14,648,772	20,613,400	7,820,948	12,886,562	15,884,932	7,820,948	14,589,561	21,149,058	7,820,948	13,567,688	17,518,058
El Salvador	c	39,216	39,485	39,784	39,216	39,483	39,773	39,216	39,486	39,786	39,216	39,484	39,777
Equatorial Guinea	c	6,621	21,514	24,552	6,621	17,943	18,134	6,621	18,243	20,495	6,621	19,687	19,896
Eritrea	c	7,177	28,585	49,320	7,177	24,589	40,452	7,177	24,646	48,406	7,177	25,891	37,095
Estonia	c	23,932	24,472	25,060	23,932	24,472	25,060	23,932	24,472	25,347	23,932	24,472	25,347

Country	Coastal/land-locked	Scenario A – population in floodplain			Scenario B – population in floodplain			Scenario C – population in floodplain			Scenario D – population in floodplain		
		In 2000	In 2030	In 2060	In 2000	In 2030	In 2060	In 2000	In 2030	In 2060	In 2000	In 2030	In 2060
Ethiopia	l	0	0	0	0	0	0	0	0	0	0	0	0
Faroe Islands	c	4,418	4,483	4,558	4,418	4,483	4,558	4,418	4,491	4,610	4,418	4,491	4,610
Falkland Islands (Malvinas)	c	–	–	–	–	–	–	–	–	–	–	–	–
Fiji	c	47,884	47,932	47,997	47,884	47,932	47,997	47,884	47,932	47,997	47,884	47,932	47,997
Finland	c	122,649	125,341	126,418	122,649	125,341	126,418	122,649	126,272	127,953	122,649	126,272	127,953
France	c	1,621,575	2,021,416	2,093,761	1,621,575	2,021,416	2,093,761	1,621,575	2,102,770	2,364,274	1,621,575	2,102,770	2,364,274
French Guiana	c	5,870	14,508	23,546	5,870	13,398	18,328	5,870	14,505	24,789	5,870	13,491	18,656
French Polynesia	c	–	–	–	–	–	–	–	–	–	–	–	–
Gabon	c	28,786	47,135	83,396	28,786	46,626	63,463	28,786	48,963	90,805	28,786	44,830	67,143
Gambia	c	148,625	299,866	589,345	148,625	288,875	498,780	148,625	308,988	643,580	148,625	280,056	490,382
Georgia	c	115,006	117,072	124,464	115,006	117,072	119,321	115,006	117,072	124,834	115,006	117,072	119,321
Germany	c	2,762,612	2,803,791	2,848,010	2,762,612	2,803,791	2,848,010	2,762,612	2,822,861	2,847,016	2,762,612	2,822,861	2,847,016
Ghana	c	240,913	583,522	1,254,758	240,913	556,132	1,052,748	240,913	593,852	1,401,740	240,913	533,340	1,001,991

Country	Coastal/land-locked	Scenario A – population in floodplain			Scenario B – population in floodplain			Scenario C – population in floodplain			Scenario D – population in floodplain		
		In 2000	In 2030	In 2060	In 2000	In 2030	In 2060	In 2000	In 2030	In 2060	In 2000	In 2030	In 2060
Gibraltar	c	14,036	14,304	14,739	14,036	14,304	14,739	14,036	15,123	15,583	14,036	15,123	15,583
Greece	c	615,537	737,850	815,672	615,537	737,850	815,672	615,537	761,881	922,656	615,537	761,881	922,656
Greenland		24,993	21,135	18,559	24,993	21,135	18,559	24,993	22,158	19,984	24,993	22,158	19,984
Grenada	c	8,945	10,646	12,839	8,945	10,282	10,366	8,945	10,789	13,248	8,945	10,331	11,079
Guadeloupe[79]	c	42,054	57,222	64,542	42,054	49,992	51,368	42,054	57,857	65,548	42,054	53,191	54,987
Guam	c	–	–	–	–	–	–	–	–	–	–	–	–
Guatemala	c	17,509	41,479	50,276	17,509	33,597	36,646	17,509	37,060	45,482	17,509	37,264	40,119
Guinea	c	322,834	887,016	2,088,168	322,834	825,002	1,780,861	322,834	861,524	2,273,058	322,834	816,369	1,615,075
Guinea-Bissau	c	75,390	170,556	276,928	75,390	151,319	206,424	75,390	163,142	276,485	75,390	159,426	221,901
Guyana	c	206,813	231,760	279,949	206,813	224,294	174,822	206,813	232,417	284,195	206,813	225,325	221,506
Haiti	c	89,851	166,239	274,111	89,851	174,287	219,342	89,851	176,267	304,816	89,851	158,047	220,735
Holy See	l	–	–	–	–	–	–	–	–	–	–	–	–

[79] The projections for Guadeloupe include population estimates and projections for the islands of Saint Martin and Saint Barthélemy.

Country	Coastal/land-locked	Scenario A – population in floodplain			Scenario B – population in floodplain			Scenario C – population in floodplain			Scenario D – population in floodplain		
		In 2000	In 2030	In 2060	In 2000	In 2030	In 2060	In 2000	In 2030	In 2060	In 2000	In 2030	In 2060
Honduras	c	51,020	89,808	125,991	51,020	76,420	95,934	51,020	88,376	131,461	51,020	80,655	103,260
Hungary	l	0	0	0	0	0	0	0	0	0	0	0	0
Iceland	c	22,750	26,658	23,547	22,750	26,658	23,547	22,750	28,581	30,132	22,750	28,581	30,132
India	c	20,175,930	40,299,837	70,048,411	20,175,930	34,796,669	51,252,546	20,175,930	39,639,113	74,001,495	20,175,930	36,398,790	55,715,878
Indonesia	c	6,484,076	10,546,636	16,238,970	6,484,076	9,240,405	11,273,229	6,484,076	10,659,457	16,859,151	6,484,076	9,605,798	13,000,984
Iran (Islamic Republic of)	c	596,106	670,953	735,587	596,106	662,571	690,384	596,106	675,856	745,701	596,106	661,917	696,521
Iraq	c	1,045,477	3,966,293	7,277,667	1,045,477	3,541,626	5,201,113	1,045,477	3,676,221	7,178,839	1,045,477	3,676,676	5,760,043
Ireland	c	157,514	204,307	239,248	157,514	204,307	239,248	157,514	219,433	284,574	157,514	220,441	285,593
Isle of Man	c	–	–	–	–	–	–	–	–	–	–	–	–
Israel	c	51,812	110,662	173,450	51,812	100,524	130,548	51,812	110,825	180,673	51,812	102,595	142,762
Italy	c	2,449,110	2,719,929	2,879,612	2,449,110	2,719,929	2,879,612	2,449,110	2,785,635	3,021,987	2,449,110	2,785,635	3,021,987
Jamaica	c	82,036	96,990	114,685	82,036	89,543	91,417	82,036	97,347	116,583	82,036	91,278	96,655
Japan	c	8,225,255	8,583,741	8,968,660	8,225,255	8,583,741	8,968,660	8,225,255	8,942,869	9,348,329	8,225,255	8,942,869	9,348,329
Jordan	c	95	223	224	95	176	176	95	197	198	95	199	199

Country	Coastal/land-locked	Scenario A – population in floodplain			Scenario B – population in floodplain			Scenario C – population in floodplain			Scenario D – population in floodplain		
		In 2000	In 2030	In 2060	In 2000	In 2030	In 2060	In 2000	In 2030	In 2060	In 2000	In 2030	In 2060
Kazakhstan	l	0	0	0	0	0	0	0	0	0	0	0	0
Kenya	c	125,586	534,191	1,819,670	125,586	500,832	1,570,770	125,586	496,774	2,025,149	125,586	486,162	1,347,225
Kiribati	c	–	–	–	–	–	–	–	–	–	–	–	–
Kuwait	c	301,198	931,272	1,712,302	301,198	902,351	1,250,049	301,198	975,243	1,822,099	301,198	866,317	1,369,749
Kyrgyzstan	l	0	0	0	0	0	0	0	0	0	0	0	0
Lao People's Democratic Republic	l	0	0	0	0	0	0	0	0	0	0	0	0
Latvia	c	169,714	172,736	113,932	169,714	172,736	113,932	169,714	175,588	127,210	169,714	175,588	127,210
Lebanon	c	90,033	114,668	132,357	90,033	109,700	117,677	90,033	115,846	134,631	90,033	111,226	119,350
Lesotho	l	0	0	0	0	0	0	0	0	0	0	0	0
Liberia	c	121,760	403,486	928,089	121,760	384,461	733,722	121,760	399,335	983,641	121,760	375,109	736,062
Libyan Arab Jamahiriya	c	201,203	303,700	391,745	201,203	264,113	289,598	201,203	306,217	403,591	201,203	278,555	328,679
Liechtenstein	l	0	0	0	0	0	0	0	0	0	0	0	0
Lithuania	c	80,259	82,225	84,369	80,259	82,225	84,369	80,259	82,225	84,030	80,259	82,225	84,030

Country	Coastal/land-locked	Scenario A – population in floodplain			Scenario B – population in floodplain			Scenario C – population in floodplain			Scenario D – population in floodplain		
		In 2000	In 2030	In 2060	In 2000	In 2030	In 2060	In 2000	In 2030	In 2060	In 2000	In 2030	In 2060
Luxembourg	l	0	0	0	0	0	0	0	0	0	0	0	0
Madagascar	c	274,974	1,022,355	2,000,121	274,974	872,567	1,347,270	274,974	891,242	1,868,668	274,974	931,008	1,488,610
Malawi	l	0	0	0	0	0	0	0	0	0	0	0	0
Malaysia	c	730,790	1,110,691	1,615,031	730,790	1,107,329	1,236,529	730,790	1,145,183	1,713,158	730,790	1,069,567	1,379,430
Maldives	c	–	–	–	–	–	–	–	–	–	–	–	–
Mali	l	0	0	0	0	0	0	0	0	0	0	0	0
Malta	c	–	–	–	–	–	–	–	–	–	–	–	–
Marshall Islands	c	–	–	–	–	–	–	–	–	–	–	–	–
Martinique	c	32,678	36,838	33,611	32,678	32,949	23,604	32,678	36,804	33,673	32,678	34,747	28,203
Mauritania	c	84,301	234,014	418,540	84,301	209,599	337,256	84,301	222,669	432,110	84,301	215,962	336,594
Mauritius	c	37,447	45,860	45,860	37,447	37,447	37,447	37,447	44,744	44,744	37,447	41,404	41,404
Mayotte	c	–	–	–	–	–	–	–	–	–	–	–	–
Mexico	c	898,356	1,005,468	1,127,518	898,356	990,744	1,024,874	898,356	1,012,710	1,146,354	898,356	991,013	1,054,095

Country	Coastal/land-locked	Scenario A – population in floodplain			Scenario B – population in floodplain			Scenario C – population in floodplain			Scenario D – population in floodplain		
		In 2000	In 2030	In 2060	In 2000	In 2030	In 2060	In 2000	In 2030	In 2060	In 2000	In 2030	In 2060
Micronesia (Fed. States of)[80]	c	-	–	–	-	–	–	-	–	–	-	–	–
Monaco	c	23,374	24,964	26,719	23,374	24,964	26,719	23,374	24,593	26,051	23,374	24,593	26,051
Mongolia	l	0	0	0	0	0	0	0	0	0	0	0	0
Montserrat	c	–	–	–	–	–	–	–	–	–	–	–	–
Morocco and Western Sahara	c	567,459	689,138	835,294	567,459	676,534	704,691	567,459	699,885	865,057	567,459	671,711	746,375
Mozambique	c	899,260	1,841,162	2,981,253	899,260	1,635,961	2,513,835	899,260	1,783,828	3,150,422	899,260	1,689,559	2,436,864
Myanmar	c	3,402,656	4,619,284	6,647,248	3,402,656	4,555,993	5,468,920	3,402,656	4,708,066	6,941,352	3,402,656	4,490,335	5,793,044
Namibia	c	84,673	144,694	208,747	84,673	123,133	160,498	84,673	142,458	219,564	84,673	129,974	170,822
Nauru	c	3,431	4,137	4,712	3,431	3,612	3,722	3,431	4,155	4,745	3,431	3,867	3,985
Nepal	l	0	0	0	0	0	0	0	0	0	0	0	0
Netherlands	c	9,371,072	9,462,644	9,008,842	9,371,072	9,462,644	9,008,842	9,371,072	10,001,231	9,690,223	9,371,072	10,001,231	9,690,223

[80] The Fed. State of Micronesia has not considered in these projections since urban and rural population estimates for the year 2000 were not available.

Country	Coastal/land-locked	Scenario A – population in floodplain			Scenario B – population in floodplain			Scenario C – population in floodplain			Scenario D – population in floodplain		
		In 2000	In 2030	In 2060	In 2000	In 2030	In 2060	In 2000	In 2030	In 2060	In 2000	In 2030	In 2060
Netherlands Antilles	c	26,451	31,324	29,815	26,451	28,167	26,548	26,451	31,746	30,252	26,451	29,373	28,022
New Caledonia	c	–	–	–	–	–	–	–	–	–	–	–	–
New Zealand	c	137,225	174,887	182,263	137,225	174,887	182,263	137,225	187,367	215,051	137,225	188,080	215,777
Nicaragua	c	38,695	52,954	57,742	38,695	41,787	43,187	38,695	51,429	56,839	38,695	46,946	49,558
Niger	l	0	0	0	0	0	0	0	0	0	0	0	0
Nigeria	c	542,103	1,459,022	3,840,948	542,103	1,443,004	3,547,342	542,103	1,472,383	4,345,078	542,103	1,351,104	3,047,313
Niue	c	–	–	–	–	–	–	–	–	–	–	–	–
Northern Mariana Islands	c	–	–	–	–	–	–	–	–	–	–	–	–
Norway (including Svalboard)	c	247,714	254,862	259,249	247,714	254,862	259,249	247,714	255,793	263,215	247,714	255,793	263,215
Occupied Palestinian Territory	c	23,184	57,688	76,933	23,184	47,450	47,450	23,184	51,215	66,108	23,184	52,450	57,173
Oman	c	109,938	165,575	181,949	109,938	145,421	149,926	109,938	164,834	182,774	109,938	153,772	161,880

Country	Coastal/land-locked	Scenario A – population in floodplain			Scenario B – population in floodplain			Scenario C – population in floodplain			Scenario D – population in floodplain		
		In 2000	In 2030	In 2060	In 2000	In 2030	In 2060	In 2000	In 2030	In 2060	In 2000	In 2030	In 2060
Pakistan	c	906,166	2,678,894	6,267,195	906,166	2,472,237	4,636,362	906,166	2,702,669	6,872,613	906,166	2,427,490	4,829,447
Palau	c	–	–	–	–	–	–	–	–	–	–	–	–
Panama	c	85,135	112,506	148,166	85,135	111,820	121,360	85,135	115,158	155,977	85,135	109,188	128,091
Papua New Guinea	c	–	–	–	–	–	–	–	–	–	–	–	–
Paraguay	l	0	0	0	0	0	0	0	0	0	0	0	0
Peru	c	369,132	510,560	682,615	369,132	490,310	510,761	369,132	522,808	716,410	369,132	488,084	569,066
Philippines	c	2,529,685	4,890,906	7,109,867	2,529,685	4,231,237	5,465,786	2,529,685	4,794,291	7,323,480	2,529,685	4,473,423	5,947,771
Pitcairn	c	–	–	–	–	–	–	–	–	–	–	–	–
Poland	c	545,844	557,174	569,486	545,844	557,174	569,486	545,844	561,665	583,713	545,844	561,665	583,713
Portugal	c	379,039	418,031	425,441	379,039	418,031	425,441	379,039	428,234	436,051	379,039	428,234	436,051
Puerto Rico	c	151,852	128,357	155,244	151,852	114,845	122,562	151,852	129,195	157,366	151,852	117,838	125,992
Qatar	c	49,477	359,986	461,287	49,477	402,927	426,263	49,477	386,368	495,875	49,477	346,507	402,166
Republic of Korea	c	1,698,734	2,008,766	2,118,224	1,698,734	1,901,716	1,959,477	1,698,734	2,027,996	2,143,717	1,698,734	1,940,197	1,999,847

Country	Coastal/land-locked	Scenario A – population in floodplain			Scenario B – population in floodplain			Scenario C – population in floodplain			Scenario D – population in floodplain		
		In 2000	In 2030	In 2060	In 2000	In 2030	In 2060	In 2000	In 2030	In 2060	In 2000	In 2030	In 2060
Republic of Moldova	l	0	0	0	0	0	0	0	0	0	0	0	0
Réunion	c	–	–	–	–	–	–	–	–	–	–	–	–
Romania	c	274,905	298,533	305,418	274,905	298,533	305,418	274,905	310,110	318,382	274,905	310,110	318,382
Russian Federation	c	1,500,657	1,527,554	1,556,839	1,500,657	1,527,554	1,556,839	1,500,657	1,527,554	1,556,839	1,500,657	1,527,554	1,556,839
Rwanda	l	0	0	0	0	0	0	0	0	0	0	0	0
Saint Helena	c	–	–	–	–	–	–	–	–	–	–	–	–
Saint Kitts and Nevis	c	–	–	–	–	–	–	–	–	–	–	–	–
Saint Lucia	c	7,532	12,046	17,216	7,532	9,842	12,078	7,532	11,763	17,688	7,532	10,758	13,844
Saint Pierre and Miquelon	c	–	–	2,640	–	–	2,640	–	–	2,620	–	–	2,620
Saint Vincent and the Grenadines	c	13,552	14,302	15,772	13,552	14,098	14,318	13,552	14,362	16,007	13,552	14,147	14,842
Samoa	c	12,352	15,931	15,931	12,352	13,361	13,361	12,352	15,508	15,508	12,352	14,622	14,622
San Marino	l	0	0	0	0	0	0	0	0	0	0	0	0

Country	Coastal/land-locked	Scenario A – population in floodplain			Scenario B – population in floodplain			Scenario C – population in floodplain			Scenario D – population in floodplain		
		In 2000	In 2030	In 2060	In 2000	In 2030	In 2060	In 2000	In 2030	In 2060	In 2000	In 2030	In 2060
Sao Tome and Principe	c	–	–	–	–	–	–	–	–	–	–	–	–
Saudi Arabia	c	843,340	1,608,061	2,083,258	843,340	1,453,905	1,620,834	843,340	1,625,339	2,164,866	843,340	1,487,527	1,762,803
Senegal	c	517,008	1,577,105	3,588,416	517,008	1,462,368	2,715,691	517,008	1,569,582	3,740,072	517,008	1,465,378	2,852,977
Serbia and Montenegro	c	4,899	5,239	5,595	4,899	5,239	5,595	4,899	5,257	5,635	4,899	5,257	5,635
Seychelles	c	–	–	–	–	–	–	–	–	–	–	–	–
Sierra Leone	c	74,576	210,083	280,663	74,576	182,067	236,163	74,576	192,220	277,950	74,576	192,432	241,858
Singapore	c	–	–	–	–	–	–	–	–	–	–	–	–
Slovakia	l	0	0	0	0	0	0	0	0	0	0	0	0
Slovenia	c	8,348	8,844	9,545	8,348	8,844	9,545	8,348	9,181	11,120	8,348	9,181	11,120
Solomon Islands	c	–	–	–	–	–	–	–	–	–	–	–	–
Somalia	c	201,235	765,162	3,099,495	201,235	770,591	2,933,852	201,235	752,401	3,407,309	201,235	714,919	2,520,189
South Africa	c	73,664	141,287	240,081	73,664	128,387	134,037	73,664	147,119	258,572	73,664	129,256	171,974
Spain	c	1,809,089	2,161,734	2,224,675	1,809,089	2,161,734	2,224,675	1,809,089	2,239,477	2,409,633	1,809,089	2,239,477	2,409,633

Country	Coastal/land-locked	Scenario A – population in floodplain			Scenario B – population in floodplain			Scenario C – population in floodplain			Scenario D – population in floodplain		
		In 2000	In 2030	In 2060	In 2000	In 2030	In 2060	In 2000	In 2030	In 2060	In 2000	In 2030	In 2060
Sri Lanka	c	338,681	523,739	707,022	338,681	437,892	535,418	338,681	506,128	711,986	338,681	477,167	598,250
Sudan	c	17,160	57,372	156,449	17,160	57,555	141,049	17,160	58,724	181,887	17,160	52,392	122,491
Suriname	c	77,268	112,584	141,242	77,268	99,840	93,181	77,268	113,524	143,134	77,268	105,301	111,437
Swaziland	l	0	0	0	0	0	0	0	0	0	0	0	0
Sweden	c	227,828	239,065	244,214	227,828	239,065	244,214	227,828	242,044	254,584	227,828	242,044	254,584
Switzerland	l	0	0	0	0	0	0	0	0	0	0	0	0
Syrian Arab Republic	c	55,322	135,052	207,074	55,322	117,117	152,441	55,322	132,251	217,444	55,322	121,017	164,950
Tajikistan	l	0	0	0	0	0	0	0	0	0	0	0	0
TFYR Macedonia	l	0	0	0	0	0	0	0	0	0	0	0	0
Thailand	c	1,643,470	2,576,015	4,017,996	1,643,470	2,441,176	2,960,176	1,643,470	2,615,770	4,129,483	1,643,470	2,467,136	3,357,708
Timor-Leste	c	11,322	44,816	80,894	11,322	38,724	56,338	11,322	37,962	72,715	11,322	41,124	61,299
Togo	c	74,035	198,584	437,942	74,035	190,511	345,288	74,035	204,355	482,754	74,035	181,437	345,919
Tokelau	c	–	–	–	–	–	–	–	–	–	–	–	–

Country	Coastal/land-locked	Scenario A – population in floodplain			Scenario B – population in floodplain			Scenario C – population in floodplain			Scenario D – population in floodplain		
		In 2000	In 2030	In 2060	In 2000	In 2030	In 2060	In 2000	In 2030	In 2060	In 2000	In 2030	In 2060
Tonga	c	–	–	–	–	–	–	–	–	–	–	–	–
Trinidad and Tobago	c	29,256	49,870	95,352	29,256	47,828	68,138	29,256	50,958	98,969	29,256	47,650	77,473
Tunisia	c	684,043	915,891	1,157,611	684,043	876,791	898,728	684,043	932,730	1,198,150	684,043	879,872	993,898
Turkey	c	876,568	1,224,802	1,611,202	876,568	1,187,929	1,244,597	876,568	1,253,297	1,685,231	876,568	1,176,924	1,366,845
Turkmenistan	l	0	0	0	0	0	0	0	0	0	0	0	0
Turks and Caicos Islands	c	–	–	–	–	–	–	–	–	–	–	–	–
Tuvalu	c	–	–	–	–	–	–	–	–	–	–	–	–
Uganda	l	0	0	0	0	0	0	0	0	0	0	0	0
Ukraine	c	624,822	640,306	657,061	624,822	640,306	657,061	624,822	640,306	657,061	624,822	640,306	657,061
United Arab Emirates	c	181,824	487,699	535,169	181,824	477,492	437,197	181,824	496,324	563,091	181,824	463,386	453,851
United Kingdom	c	4,126,882	4,615,443	4,741,946	4,126,882	4,615,443	4,741,946	4,126,882	4,764,326	5,269,771	4,126,882	4,764,326	5,269,771
United Republic of Tanzania	c	292,452	1,427,243	5,997,775	292,452	1,379,421	5,696,458	292,452	1,316,259	6,604,392	292,452	1,310,340	4,584,059

Country	Coastal/land-locked	Scenario A – population in floodplain			Scenario B – population in floodplain			Scenario C – population in floodplain			Scenario D – population in floodplain		
		In 2000	In 2030	In 2060	In 2000	In 2030	In 2060	In 2000	In 2030	In 2060	In 2000	In 2030	In 2060
United States of America	c	4,108,886	5,778,213	6,594,287	4,108,886	5,778,213	6,594,287	4,108,886	6,132,848	8,154,510	4,108,886	6,132,848	8,154,510
United States Virgin Islands	c	24,012	20,470	20,036	24,012	19,763	18,838	24,012	20,509	20,105	24,012	19,923	19,148
Uruguay	c	223,426	218,089	229,912	223,426	190,201	151,726	223,426	219,613	234,092	223,426	203,318	175,225
Uzbekistan	l	0	0	0	0	0	0	0	0	0	0	0	0
Vanuatu	c	–	–	–	–	–	–	–	–	–	–	–	–
Venezuela (Bolivarian Republic of)	c	453,858	676,342	930,683	453,858	649,159	665,711	453,858	695,403	980,911	453,858	643,105	756,684
Vietnam	c	26,786,338	36,517,797	50,108,193	26,786,338	35,441,959	34,856,489	26,786,338	37,064,280	51,513,627	26,786,338	35,227,151	41,845,969
Wallis and Futuna Islands	c	–	–	11,609	–	–	10,461	–	–	11,575	–	–	10,461
Yemen	c	312,323	1,378,917	4,139,312	312,323	1,353,847	3,823,239	312,323	1,327,417	4,686,193	312,323	1,259,394	3,147,166
Zambia	l	0	0	0	0	0	0	0	0	0	0	0	0
Zimbabwe	l	0	0	0	0	0	0	0	0	0	0	0	0

Table 31: Urban/rural population within 1-in-100-year floodplain per world region – Foresight scenario A 2030/2060[81,82,83]

World regions	Population within Floodplain in 2000 (adjusted)			Scenario A - Population within Floodplain in 2030			Scenario A - Population within Floodplain in 2060		
	Urban	Rural	Total	Urban	Rural	Total	Urban	Rural	Total
WORLD	**50.813.589**	**154.783.789**	**205.597.378**	**121.022.997**	**186.076.412**	**307.099.408**	**233.169.692**	**196.112.218**	**429.281.910**
AFRICA	**2.141.298**	**12.029.569**	**14.170.867**	**8.557.755**	**21.400.408**	**29.958.163**	**30.980.910**	**24.829.422**	**55.810.332**
Eastern Africa	157.691	1.737.350	1.895.041	1.345.100	4.439.428	5.784.528	9.350.322	6.844.459	16.194.781
Middle Africa	25.507	216.402	241.909	128.668	346.972	475.640	401.721	366.360	768.081

[81] Spatial base data: SRTM30 Enhanced Global Map, ISciences (30 arc seconds; year 2003); GRUMP (alpha) Population Grid, CIESIN (30 arc seconds; population year 2000); National Administrative Boundaries (Level 01), GADM (2008); DIVA 1 in 100-year Storm Surge Heights; Variation for Greenland: GTOPO30 Global Digital Elevation Model (30 arc seconds; year 2005).

[82] Demographic base data: *World Population Prospects: The 2010 Revision* (United Nations 2010b); *World Urbanization Prospects: The 2009 Revision* (United Nations, 2009b).

[83] Annotations: Definition of countries and regions according to UN classification of countries by major area and region of the world" (see United Nations, 2009a,b, 2010a,b). Data do not include Taiwan. UN data on population and urbanisation prospects were not available; Taiwan is not a member of the UN. For this reason, no population projections could be elaborated for Taiwan. The floodplain was defined by flood heights from a 100-year event plus sea-level rise. Flood heights were derived from the DIVA database (cls_p_16.shp); sea-level rise estimates for 2030 (+10 cm) and 2060 (+21 cm) are based on the Foresight specifications.

Percentage distribution of urban and rural population was taken from distribution within LECZs (estimates and projections).

The Fed. State of Micronesia has not been considered in these projections (Oceania; Micronesia) since urban and rural population estimates for the year 2000 were not available.

World regions	Population within Floodplain in 2000 (adjusted)			Scenario A - Population within Floodplain in 2030			Scenario A - Population within Floodplain in 2060		
	Urban	Rural	Total	Urban	Rural	Total	Urban	Rural	Total
Northern Africa	1.480.926	7.996.260	9.477.186	4.378.938	12.528.075	16.907.012	10.689.562	12.871.043	23.560.604
Southern Africa	57.673	100.664	158.337	149.965	136.016	285.981	312.644	136.184	448.828
Western Africa	419.501	1.978.893	2.398.394	2.555.085	3.949.917	6.505.002	10.226.660	4.611.377	14.838.038
Sub-Saharan Africa	664.202	4.046.639	4.710.841	4.209.389	8.899.134	13.108.523	20.420.112	11.986.065	32.406.177
ASIA	**29.908.970**	**117.383.784**	**147.292.754**	**85.822.186**	**140.462.094**	**226.284.280**	**171.390.662**	**147.563.206**	**318.953.868**
Eastern Asia	17.963.422	53.880.528	71.843.950	43.602.593	55.771.939	99.374.532	62.636.823	57.828.684	120.465.507
South-Central Asia	4.055.844	25.490.936	29.546.780	16.085.141	39.229.649	55.314.790	51.683.930	41.472.607	93.156.537
South-Eastern Asia	6.830.952	34.828.006	41.658.958	21.984.606	38.432.152	60.416.758	46.451.467	39.512.894	85.964.361
Western Asia	1.058.751	3.184.315	4.243.066	4.149.846	7.028.354	11.178.200	10.618.442	8.749.021	19.367.463
EUROPE	**13.213.183**	**16.543.304**	**29.756.487**	**16.583.242**	**15.222.743**	**31.805.985**	**17.340.615**	**14.568.234**	**31.908.849**
Eastern Europe	720.580	2.295.157	3.015.737	770.697	2.326.417	3.097.114	806.362	2.361.487	3.167.849
Northern Europe	1.666.618	4.048.437	5.715.055	2.231.274	4.015.005	6.246.279	2.369.418	3.921.622	6.291.040
Southern Europe	1.616.548	3.855.258	5.471.806	2.268.963	4.001.628	6.270.590	2.427.324	4.157.069	6.584.393
Western Europe	9.209.437	6.344.452	15.553.889	11.312.308	4.879.694	16.192.002	11.737.512	4.128.056	15.865.567

World regions	Population within Floodplain in 2000 (adjusted)			Scenario A - Population within Floodplain in 2030			Scenario A - Population within Floodplain in 2060		
	Urban	Rural	Total	Urban	Rural	Total	Urban	Rural	Total
LATIN AMERICA AND THE CARIBBEAN	**2.471.875**	**5.895.387**	**8.367.262**	**4.972.340**	**6.009.338**	**10.981.679**	**7.468.998**	**6.098.926**	**13.567.924**
Caribbean	292.943	750.200	1.043.143	497.167	712.152	1.209.320	758.682	707.062	1.465.744
Central America	86.250	1.086.892	1.173.142	224.693	1.175.285	1.399.978	411.170	1.209.823	1.620.993
South America	2.092.683	4.058.294	6.150.977	4.250.480	4.121.901	8.372.381	6.299.147	4.182.041	10.481.188
NORTHERN AMERICA	**2.807.662**	**2.440.261**	**5.247.923**	**4.593.840**	**2.477.716**	**7.071.556**	**5.419.893**	**2.528.849**	**7.948.741**
OCEANIA	**270.600**	**491.485**	**762.085**	**493.633**	**504.113**	**997.746**	**568.614**	**523.581**	**1.092.195**
Australia/New Zealand	265.222	415.447	680.669	483.886	429.528	913.414	551.624	437.573	989.197
Melanesia	0	47.884	47.884	0	47.932	47.932	0	47.997	47.997
Micronesia	3.431	0	3.431	4.137	0	4.137	4.712	0	4.712
Polynesia	1.948	28.153	30.101	5.610	26.652	32.262	12.278	38.011	50.289

Table 32: Urban/rural population within 1-in-100-year floodplain per continent – Foresight scenario A 2030/2060[84,85,86]

Continents	Population within Floodplain in 2000 (adjusted)			Scenario A - Population within Floodplain in 2030			Scenario A - Population within Floodplain in 2060		
	Urban	Rural	Total	Urban	Rural	Total	Urban	Rural	Total
AFRICA	2.141.298	12.029.569	14.170.867	8.557.755	21.400.408	29.958.163	30.980.910	24.829.422	55.810.332
ASIA	29.908.970	117.383.784	147.292.754	85.822.186	140.462.094	226.284.280	171.390.662	147.563.206	318.953.868
EUROPE	13.213.183	16.543.304	29.756.487	16.583.242	15.222.743	31.805.985	17.340.615	14.568.234	31.908.849
LATIN AMERICA AND THE CARIBBEAN	2.471.875	5.895.387	8.367.262	4.972.340	6.009.338	10.981.679	7.468.998	6.098.926	13.567.924

[84] Spatial base data: SRTM30 Enhanced Global Map, ISciences (30 arc seconds; year 2003); GRUMP (alpha) Population Grid, CIESIN (30 arc seconds; population year 2000); National Administrative Boundaries (Level 01), GADM (2008); DIVA 1 in 100-year Storm Surge Heights; Variation for Greenland: GTOPO30 Global Digital Elevation Model (30 arc seconds; year 2005).

[85] Demographic base data: *World Population Prospects: The 2010 Revision* (United Nations 2010b); *World Urbanization Prospects: The 2009 Revision* (United Nations, 2009b).

[86] Annotations: Definition of countries and regions according to UN classification of countries by major area and region of the world" (see United Nations, 2009a,b, 2010a,b). Data do not include Taiwan. UN data on population and urbanisation prospects were not available; Taiwan is not a member of the UN. For this reason, no population projections could be elaborated for Taiwan. The floodplain was defined by flood heights from a 100-year event plus sea-level rise. Flood heights were derived from the DIVA database (cls_p_16.shp); sea-level rise estimates for 2030 (+10 cm) and 2060 (+21 cm) are based on the Foresight specifications.

Percentage distribution of urban and rural population was taken from distribution within LECZs (estimates and projections).

The Fed. State of Micronesia has not been considered in these projections (Oceania) since urban and rural population estimates for the year 2000 were not available.

Continents	Population within Floodplain in 2000 (adjusted)			Scenario A - Population within Floodplain in 2030			Scenario A - Population within Floodplain in 2060		
	Urban	Rural	Total	Urban	Rural	Total	Urban	Rural	Total
NORTHERN AMERICA	2.807.662	2.440.261	5.247.923	4.593.840	2.477.716	7.071.556	5.419.893	2.528.849	7.948.741
OCEANIA	270.600	491.485	762.085	493.633	504.113	997.746	568.614	523.581	1.092.195

Table 33: Urban/rural population within 1-in-100-year floodplain per world region – Foresight scenario B 2030/2060[87,88,89]

WORLD	**50.813.589**	**154.783.789**	**205.597.378**	**118.115.658**	**173.192.276**	**291.307.934**	**174.075.008**	**171.486.144**	**345.561.152**
AFRICA	**2.141.298**	**12.029.569**	**14.170.867**	**8.810.698**	**18.407.203**	**27.217.901**	**26.443.923**	**19.344.717**	**45.788.640**
Eastern Africa	157.691	1.737.350	1.895.041	1.623.550	3.707.747	5.331.297	10.044.448	4.243.693	14.288.141
Middle Africa	25.507	216.402	241.909	139.283	289.557	428.841	321.313	290.304	611.617

[87] Spatial base data: SRTM30 Enhanced Global Map, ISciences (30 arc seconds; year 2003); GRUMP (alpha) Population Grid, CIESIN (30 arc seconds; population year 2000); National Administrative Boundaries (Level 01), GADM (2008); DIVA 1 in 100-year Storm Surge Heights; Variation for Greenland: GTOPO30 Global Digital Elevation Model (30 arc seconds; year 2005).

[88] Demographic base data: *World Population Prospects: The 2010 Revision* (United Nations 2010b); *World Urbanization Prospects: The 2009 Revision* (United Nations, 2009b).

[89] Annotations: Definition of countries and regions according to UN classification of countries by major area and region of the world" (see United Nations, 2009a,b, 2010a,b). Data do not include Taiwan. UN data on population and urbanisation prospects were not available; Taiwan is not a member of the UN. For this reason, no population projections could be elaborated for Taiwan. The floodplain was defined by flood heights from a 100-year event plus sea-level rise. Flood heights were derived from the DIVA database (cls_p_16.shp); sea-level rise estimates for 2030 (+10 cm) and 2060 (+21 cm) are based on the Foresight specifications.

Percentage distribution of urban and rural population was taken from distribution within LECZs (estimates and projections).

The Fed. State of Micronesia has not been considered in these projections (Oceania; Micronesia) since urban and rural population estimates for the year 2000 were not available.

Northern Africa	1.480.926	7.996.260	9.477.186	4.104.855	10.941.395	15.046.251	6.982.684	11.239.184	18.221.868
Southern Africa	57.673	100.664	158.337	138.545	112.976	251.521	181.397	113.139	294.536
Western Africa	419.501	1.978.893	2.398.394	2.804.465	3.355.527	6.159.992	8.914.080	3.458.398	12.372.478
Sub-Saharan Africa	664.202	4.046.639	4.710.841	4.741.492	7.487.713	12.229.205	19.579.690	8.128.130	27.707.820
ASIA	**29.908.970**	**117.383.784**	**147.292.754**	**83.170.859**	**130.654.371**	**213.825.230**	**119.456.074**	**128.653.911**	**248.109.985**
Eastern Asia	17.963.422	53.880.528	71.843.950	42.386.830	55.746.425	98.133.256	45.166.588	57.802.270	102.968.857
South-Central Asia	4.055.844	25.490.936	29.546.780	15.952.494	32.151.600	48.104.094	35.290.118	33.210.116	68.500.234
South-Eastern Asia	6.830.952	34.828.006	41.658.958	20.545.354	36.605.898	57.151.251	30.045.296	31.389.277	61.434.573
Western Asia	1.058.751	3.184.315	4.243.066	4.286.181	6.150.447	10.436.628	8.954.072	6.252.248	15.206.320
EUROPE	**13.213.183**	**16.543.304**	**29.756.487**	**16.583.242**	**15.222.743**	**31.805.985**	**17.340.615**	**14.568.234**	**31.908.849**
Eastern Europe	720.580	2.295.157	3.015.737	770.697	2.326.417	3.097.114	806.362	2.361.487	3.167.849
Northern Europe	1.666.618	4.048.437	5.715.055	2.231.274	4.015.005	6.246.279	2.369.418	3.921.622	6.291.040
Southern Europe	1.616.548	3.855.258	5.471.806	2.268.963	4.001.628	6.270.590	2.427.324	4.157.069	6.584.393
Western Europe	9.209.437	6.344.452	15.553.889	11.312.308	4.879.694	16.192.002	11.737.512	4.128.056	15.865.567
LATIN AMERICA AND THE CARIBBEAN	**2.471.875**	**5.895.387**	**8.367.262**	**4.464.097**	**5.929.809**	**10.393.905**	**4.850.931**	**5.873.763**	**10.724.694**
Caribbean	292.943	750.200	1.043.143	464.086	701.410	1.165.496	549.647	687.122	1.236.769

Central America	86.250	1.086.892	1.173.142	209.572	1.138.853	1.348.425	253.817	1.166.760	1.420.576
South America	2.092.683	4.058.294	6.150.977	3.790.439	4.089.545	7.879.984	4.047.467	4.019.881	8.067.348
NORTHERN AMERICA	**2.807.662**	**2.440.261**	**5.247.923**	**4.593.840**	**2.477.716**	**7.071.556**	**5.419.893**	**2.528.849**	**7.948.741**
OCEANIA	**270.600**	**491.485**	**762.085**	**492.922**	**500.435**	**993.356**	**563.573**	**516.669**	**1.080.242**
Australia/New Zealand	265.222	415.447	680.669	483.886	429.528	913.414	551.624	437.573	989.197
Melanesia	0	47.884	47.884	0	47.932	47.932	0	47.997	47.997
Micronesia	3.431	0	3.431	3.612	0	3.612	3.722	0	3.722
Polynesia	1.948	28.153	30.101	5.424	22.974	28.398	8.227	31.099	39.327

Table 34: Urban/rural population within 1-in-100-year floodplain per continent – Foresight scenario B 2030/2060[90,91,92]

AFRICA	2.141.298	12.029.569	14.170.867	8.810.698	18.407.203	27.217.901	26.443.923	19.344.717	45.788.640
ASIA	29.908.970	117.383.784	147.292.754	83.170.859	130.654.371	213.825.230	119.456.074	128.653.911	248.109.985
EUROPE	13.213.183	16.543.304	29.756.487	16.583.242	15.222.743	31.805.985	17.340.615	14.568.234	31.908.849
LATIN AMERICA AND THE CARIBBEAN	2.471.875	5.895.387	8.367.262	4.464.097	5.929.809	10.393.905	4.850.931	5.873.763	10.724.694

[90] Spatial base data: SRTM30 Enhanced Global Map, ISciences (30 arc seconds; year 2003); GRUMP (alpha) Population Grid, CIESIN (30 arc seconds; population year 2000); National Administrative Boundaries (Level 01), GADM (2008); DIVA 1 in 100-year Storm Surge Heights; Variation for Greenland: GTOPO30 Global Digital Elevation Model (30 arc seconds; year 2005).

[91] Demographic base data: *World Population Prospects: The 2010 Revision* (United Nations 2010b); *World Urbanization Prospects: The 2009 Revision* (United Nations, 2009b).

[92] Annotations: Definition of countries and regions according to UN classification of countries by major area and region of the world" (see United Nations, 2009a,b, 2010a,b). Data do not include Taiwan. UN data on population and urbanisation prospects were not available; Taiwan is not a member of the UN. For this reason, no population projections could be elaborated for Taiwan. The floodplain was defined by flood heights from a 100-year event plus sea-level rise. Flood heights were derived from the DIVA database (cls_p_16.shp); sea-level rise estimates for 2030 (+10 cm) and 2060 (+21 cm) are based on the Foresight specifications.

Percentage distribution of urban and rural population was taken from distribution within LECZs (estimates and projections).

The Fed. State of Micronesia has not been considered in these projections (Oceania) since urban and rural population estimates for the year 2000 were not available.

NORTHERN AMERICA	2.807.662	2.440.261	5.247.923	4.593.840	2.477.716	7.071.556	5.419.893	2.528.849	7.948.741
OCEANIA	270.600	491.485	762.085	492.922	500.435	993.356	563.573	516.669	1.080.242

Table 35: Urban/rural population within 1-in-100-year floodplain per world region – Foresight scenario C 2030/2060[93,94,95]

WORLD	**50.813.589**	**154.783.789**	**205.597.378**	**128.518.612**	**182.511.286**	**311.029.898**	**258.993.022**	**191.519.031**	**450.512.052**
AFRICA	**2.141.298**	**12.029.569**	**14.170.867**	**9.231.654**	**20.332.593**	**29.564.247**	**36.019.247**	**22.987.064**	**59.006.311**
Eastern Africa	157.691	1.737.350	1.895.041	1.522.836	3.909.136	5.431.972	11.721.853	5.638.154	17.360.006
Middle Africa	25.507	216.402	241.909	141.590	323.895	465.484	471.830	339.085	810.915

[93] Spatial base data: SRTM30 Enhanced Global Map, ISciences (30 arc seconds; year 2003); GRUMP (alpha) Population Grid, CIESIN (30 arc seconds; population year 2000); National Administrative Boundaries (Level 01), GADM (2008); DIVA 1 in 100-year Storm Surge Heights; Variation for Greenland: GTOPO30 Global Digital Elevation Model (30 arc seconds; year 2005).

[94] Demographic base data: *World Population Prospects: The 2010 Revision* (United Nations 2010b); *World Urbanization Prospects: The 2009 Revision* (United Nations, 2009b).

[95] Annotations: Definition of countries and regions according to UN classification of countries by major area and region of the world" (see United Nations, 2009a,b, 2010a,b). Data do not include Taiwan. UN data on population and urbanisation prospects were not available; Taiwan is not a member of the UN. For this reason, no population projections could be elaborated for Taiwan. The floodplain was defined by flood heights from a 100-year event plus sea-level rise. Flood heights were derived from the DIVA database (cls_p_16.shp); sea-level rise estimates for 2030 (+10 cm) and 2060 (+21 cm) are based on the Foresight specifications.

Percentage distribution of urban and rural population was taken from distribution within LECZs (estimates and projections).

The Fed. State of Micronesia has not been considered in these projections (Oceania; Micronesia) since urban and rural population estimates for the year 2000 were not available.

Northern Africa	1.480.926	7.996.260	9.477.186	4.604.356	12.284.945	16.889.301	11.608.800	12.621.016	24.229.816
Southern Africa	57.673	100.664	158.337	158.886	130.692	289.578	347.278	130.858	478.136
Western Africa	419.501	1.978.893	2.398.394	2.803.987	3.683.925	6.487.912	11.869.487	4.257.950	16.127.437
Sub-Saharan Africa	664.202	4.046.639	4.710.841	4.661.732	8.071.938	12.733.670	24.567.247	10.391.135	34.958.382
ASIA	**29.908.970**	**117.383.784**	**147.292.754**	**90.940.120**	**137.847.860**	**228.787.979**	**187.714.396**	**144.577.433**	**332.291.828**
Eastern Asia	17.963.422	53.880.528	71.843.950	46.197.680	55.769.313	101.966.994	67.368.752	57.825.966	125.194.719
South-Central Asia	4.055.844	25.490.936	29.546.780	17.299.593	37.429.413	54.729.006	58.642.374	39.590.315	98.232.688
South-Eastern Asia	6.830.952	34.828.006	41.658.958	22.988.511	38.145.286	61.133.797	49.493.045	39.208.615	88.701.660
Western Asia	1.058.751	3.184.315	4.243.066	4.454.335	6.503.848	10.958.183	12.210.225	7.952.536	20.162.761
EUROPE	**13.213.183**	**16.543.304**	**29.756.487**	**17.656.916**	**15.329.275**	**32.986.191**	**19.447.153**	**14.793.609**	**34.240.762**
Eastern Europe	720.580	2.295.157	3.015.737	786.764	2.326.417	3.113.181	833.553	2.361.487	3.195.040
Northern Europe	1.666.618	4.048.437	5.715.055	2.416.880	4.036.785	6.453.665	2.990.083	3.970.016	6.960.098
Southern Europe	1.616.548	3.855.258	5.471.806	2.450.049	4.001.628	6.451.677	2.877.391	4.157.069	7.034.460

Western Europe	9.209.437	6.344.452	15.553.889	12.003.222	4.964.445	16.967.668	12.746.127	4.305.037	17.051.164
LATIN AMERICA AND THE CARIBBEAN	**2.471.875**	**5.895.387**	**8.367.262**	**5.167.623**	**5.996.686**	**11.164.309**	**7.935.002**	**6.084.884**	**14.019.886**
Caribbean	292.943	750.200	1.043.143	513.466	711.281	1.224.747	806.079	706.265	1.512.344
Central America	86.250	1.086.892	1.173.142	237.617	1.165.332	1.402.949	451.120	1.198.601	1.649.721
South America	2.092.683	4.058.294	6.150.977	4.416.539	4.120.073	8.536.612	6.677.803	4.180.018	10.857.821
NORTHERN AMERICA	**2.807.662**	**2.440.261**	**5.247.923**	**4.986.517**	**2.495.272**	**7.481.789**	**7.134.234**	**2.546.896**	**9.681.130**
OCEANIA	**270.600**	**491.485**	**762.085**	**535.783**	**509.600**	**1.045.383**	**742.989**	**529.146**	**1.272.135**
Australia/New Zealand	265.222	415.447	680.669	525.669	435.438	961.107	724.625	443.595	1.168.220
Melanesia	0	47.884	47.884	0	47.932	47.932	0	47.997	47.997
Micronesia	3.431	0	3.431	4.155	0	4.155	4.745	0	4.745
Polynesia	1.948	28.153	30.101	5.960	26.230	32.189	13.619	37.554	51.173

Table 36: Urban/rural population within 1-in-100-year floodplain per continent – Foresight scenario C 2030/2060[96,97,98]

AFRICA	2.141.298	12.029.569	14.170.867	9.231.654	20.332.593	29.564.247	36.019.247	22.987.064	59.006.311
ASIA	29.908.970	117.383.784	147.292.754	90.940.120	137.847.860	228.787.979	187.714.396	144.577.433	332.291.828
EUROPE	13.213.183	16.543.304	29.756.487	17.656.916	15.329.275	32.986.191	19.447.153	14.793.609	34.240.762
LATIN AMERICA AND THE CARIBBEAN	2.471.875	5.895.387	8.367.262	5.167.623	5.996.686	11.164.309	7.935.002	6.084.884	14.019.886

[96] Spatial base data: SRTM30 Enhanced Global Map, ISciences (30 arc seconds; year 2003); GRUMP (alpha) Population Grid, CIESIN (30 arc seconds; population year 2000); National Administrative Boundaries (Level 01), GADM (2008); DIVA 1 in 100-year Storm Surge Heights; Variation for Greenland: GTOPO30 Global Digital Elevation Model (30 arc seconds; year 2005).

[97] Demographic base data: *World Population Prospects: The 2010 Revision* (United Nations 2010b); *World Urbanization Prospects: The 2009 Revision* (United Nations, 2009b).

[98] Annotations: Definition of countries and regions according to UN classification of countries by major area and region of the world" (see United Nations, 2009a,b, 2010a,b). Data do not include Taiwan. UN data on population and urbanisation prospects were not available; Taiwan is not a member of the UN. For this reason, no population projections could be elaborated for Taiwan. The floodplain was defined by flood heights from a 100-year event plus sea-level rise. Flood heights were derived from the DIVA database (cls_p_16.shp); sea-level rise estimates for 2030 (+10 cm) and 2060 (+21 cm) are based on the Foresight specifications.

Percentage distribution of urban and rural population was taken from distribution within LECZs (estimates and projections).

The Fed. State of Micronesia has not been considered in these projections (Oceania) since urban and rural population estimates for the year 2000 were not available.

NORTHERN AMERICA	2.807.662	2.440.261	5.247.923	4.986.517	2.495.272	7.481.789	7.134.234	2.546.896	9.681.130
OCEANIA	270.600	491.485	762.085	535.783	509.600	1.045.383	742.989	529.146	1.272.135

Table 37: Urban/rural population within 1-in-100-year floodplain per world region – Foresight scenario D 2030/2060[99,100,101]

WORLD	**50.813.589**	**154.783.789**	**205.597.378**	**115.086.784**	**179.407.754**	**294.494.537**	**185.538.549**	**184.606.631**	**370.145.179**
AFRICA	**2.141.298**	**12.029.569**	**14.170.867**	**7.863.287**	**19.881.897**	**27.745.183**	**23.768.436**	**21.637.578**	**45.406.014**
Eastern Africa	157.691	1.737.350	1.895.041	1.245.575	4.065.446	5.311.021	7.273.422	5.346.516	12.619.938
Middle Africa	25.507	216.402	241.909	117.980	317.557	435.537	299.508	318.380	617.888

[99] Spatial base data: SRTM30 Enhanced Global Map, ISciences (30 arc seconds; year 2003); GRUMP (alpha) Population Grid, CIESIN (30 arc seconds; population year 2000); National Administrative Boundaries (Level 01), GADM (2008); DIVA 1 in 100-year Storm Surge Heights; Variation for Greenland: GTOPO30 Global Digital Elevation Model (30 arc seconds; year 2005).

[100] Demographic base data: *World Population Prospects: The 2010 Revision* (United Nations 2010b); *World Urbanization Prospects: The 2009 Revision* (United Nations, 2009b).

[101] Annotations: Definition of countries and regions according to UN classification of countries by major area and region of the world" (see United Nations, 2009a,b, 2010a,b). Data do not include Taiwan. UN data on population and urbanisation prospects were not available; Taiwan is not a member of the UN. For this reason, no population projections could be elaborated for Taiwan. The floodplain was defined by flood heights from a 100-year event plus sea-level rise. Flood heights were derived from the DIVA database (cls_p_16.shp); sea-level rise estimates for 2030 (+10 cm) and 2060 (+21 cm) are based on the Foresight specifications.

Percentage distribution of urban and rural population was taken from distribution within LECZs (estimates and projections).

The Fed. State of Micronesia has not been considered in these projections (Oceania; Micronesia) since urban and rural population estimates for the year 2000 were not available.

Northern Africa	1.480.926	7.996.260	9.477.186	4.000.608	11.727.285	15.727.892	7.995.459	12.047.431	20.042.889
Southern Africa	57.673	100.664	158.337	135.036	124.194	259.230	218.436	124.359	342.795
Western Africa	419.501	1.978.893	2.398.394	2.364.088	3.647.415	6.011.502	7.981.612	3.800.891	11.782.503
Sub-Saharan Africa	664.202	4.046.639	4.710.841	3.890.781	8.178.902	12.069.683	15.870.412	9.615.204	25.485.616
ASIA	**29.908.970**	**117.383.784**	**147.292.754**	**79.521.176**	**135.229.042**	**214.750.218**	**129.067.214**	**139.111.408**	**268.178.622**
Eastern Asia	17.963.422	53.880.528	71.843.950	40.853.548	55.746.425	96.599.973	48.202.972	57.802.270	106.005.242
South-Central Asia	4.055.844	25.490.936	29.546.780	14.640.509	35.606.539	50.247.048	37.438.696	37.652.354	75.091.051
South-Eastern Asia	6.830.952	34.828.006	41.658.958	20.182.299	37.293.166	57.475.466	35.196.057	36.316.461	71.512.519
Western Asia	1.058.751	3.184.315	4.243.066	3.844.820	6.582.912	10.427.732	8.229.488	7.340.323	15.569.810
EUROPE	**13.213.183**	**16.543.304**	**29.756.487**	**17.656.916**	**15.330.284**	**32.987.200**	**19.447.153**	**14.794.629**	**34.241.782**
Eastern Europe	720.580	2.295.157	3.015.737	786.764	2.326.417	3.113.181	833.553	2.361.487	3.195.040
Northern Europe	1.666.618	4.048.437	5.715.055	2.416.880	4.037.794	6.454.674	2.990.083	3.971.035	6.961.118
Southern Europe	1.616.548	3.855.258	5.471.806	2.450.049	4.001.628	6.451.677	2.877.391	4.157.069	7.034.460

Western Europe	9.209.437	6.344.452	15.553.889	12.003.222	4.964.445	16.967.668	12.746.127	4.305.037	17.051.164
LATIN AMERICA AND THE CARIBBEAN	**2.471.875**	**5.895.387**	**8.367.262**	**4.524.221**	**5.960.087**	**10.484.308**	**5.383.758**	**5.987.633**	**11.371.391**
Caribbean	292.943	750.200	1.043.143	458.335	705.150	1.163.484	593.734	695.017	1.288.750
Central America	86.250	1.086.892	1.173.142	203.593	1.156.557	1.360.150	292.377	1.186.099	1.478.476
South America	2.092.683	4.058.294	6.150.977	3.862.293	4.098.381	7.960.674	4.497.647	4.106.517	8.604.164
NORTHERN AMERICA	**2.807.662**	**2.440.261**	**5.247.923**	**4.986.517**	**2.497.571**	**7.484.088**	**7.134.234**	**2.549.203**	**9.683.437**
OCEANIA	**270.600**	**491.485**	**762.085**	**534.667**	**508.873**	**1.043.540**	**737.753**	**526.181**	**1.263.934**
Australia/New Zealand	265.222	415.447	680.669	525.669	436.151	961.820	724.625	444.322	1.168.946
Melanesia	0	47.884	47.884	0	47.932	47.932	0	47.997	47.997
Micronesia	3.431	0	3.431	3.867	0	3.867	3.985	0	3.985
Polynesia	1.948	28.153	30.101	5.131	24.790	29.921	9.143	33.862	43.006

Table 38: Urban/rural population within floodplain per continent – Foresight scenario D 2030/2060[102,103,104]

AFRICA	2.141.298	12.029.569	14.170.867	7.863.287	19.881.897	27.745.183	23.768.436	21.637.578	45.406.014
ASIA	29.908.970	117.383.784	147.292.754	79.521.176	135.229.042	214.750.218	129.067.214	139.111.408	268.178.622
EUROPE	13.213.183	16.543.304	29.756.487	17.656.916	15.330.284	32.987.200	19.447.153	14.794.629	34.241.782
LATIN AMERICA AND THE CARIBBEAN	2.471.875	5.895.387	8.367.262	4.524.221	5.960.087	10.484.308	5.383.758	5.987.633	11.371.391

[102] Spatial base data: SRTM30 Enhanced Global Map, ISciences (30 arc seconds; year 2003); GRUMP (alpha) Population Grid, CIESIN (30 arc seconds; population year 2000); National Administrative Boundaries (Level 01), GADM (2008); DIVA 1 in 100-year Storm Surge Heights; Variation for Greenland: GTOPO30 Global Digital Elevation Model (30 arc seconds; year 2005).

[103] Demographic base data: *World Population Prospects: The 2010 Revision* (United Nations 2010b); *World Urbanization Prospects: The 2009 Revision* (United Nations, 2009b).

[104] Annotations: Definition of countries and regions according to UN classification of countries by major area and region of the world" (see United Nations, 2009a,b, 2010a,b). Data do not include Taiwan. UN data on population and urbanisation prospects were not available; Taiwan is not a member of the UN. For this reason, no population projections could be elaborated for Taiwan. The floodplain was defined by flood heights from a 100-year event plus sea-level rise. Flood heights were derived from the DIVA database (cls_p_16.shp); sea-level rise estimates for 2030 (+10 cm) and 2060 (+21 cm) are based on the Foresight specifications.

Percentage distribution of urban and rural population was taken from distribution within LECZs (estimates and projections).

The Fed. State of Micronesia has not been considered in these projections (Oceania) since urban and rural population estimates for the year 2000 were not available.

NORTHERN AMERICA	2.807.662	2.440.261	5.247.923	4.986.517	2.497.571	7.484.088	7.134.234	2.549.203	9.683.437
OCEANIA	270.600	491.485	762.085	534.667	508.873	1.043.540	737.753	526.181	1.263.934

According to the results Asia has the largest portion of people living in the LECZ, in the base year 2000 and in all future forecasts (Figure 4). South–Central Asia can be identified as the region with the highest population growth in the LECZ, followed by Eastern and Southeast Asia (Figure 5). However, Africa will be experiencing the highest growth rates in all scenarios (between 0.18 and 0.26), with growth rates in Asia amounting to only half of the projected growth rates of Africa. Characteristically, in scenario C (high growth for the developing world, which applies to all African countries and, with the exception of Japan, to all Asian countries), the population in the LECZ in Asia will reach 1 billion in 2060, whereas the coastal population of Africa will have reached 245 million by that year. Scenarios assuming a lower-end population growth in the developing world (scenario B with low growth, and scenario D with median growth) will lead to much smaller numbers of people in the LECZ for these 'developing' regions.

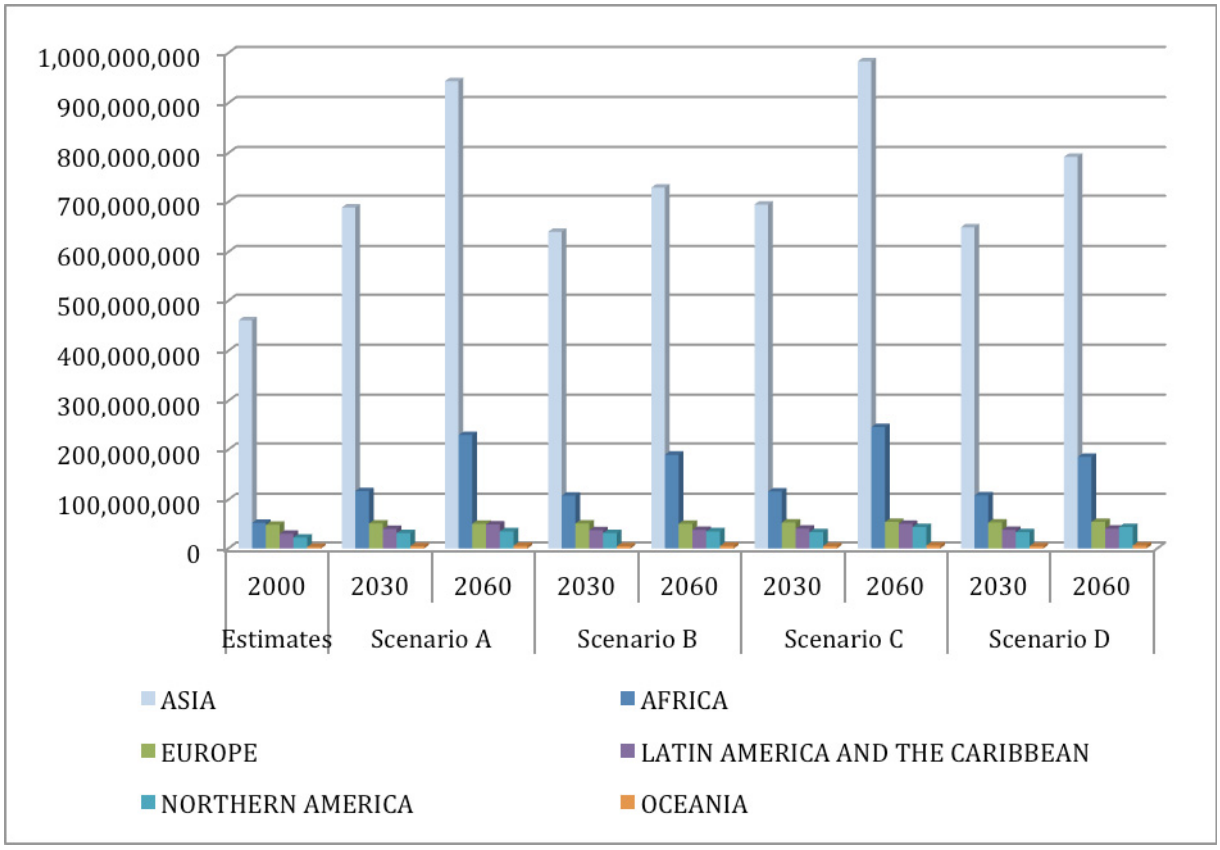

Figure 4: Population within LECZ in 2000, 2030 and 2060, per continent for scenarios A to D.

Whereas the developing world exhibits high growth, the rich economies (Europe, North America and Australia/New Zealand in Oceania), are projected to have only low to moderate population growth in the LECZ. In Europe, the population growth will stagnate in 2060, and, according to our projections, this will also be the case in the LECZ. North America shows higher growth of population in the LECZ with rates of up to 0.012. Interestingly, these rates are higher than those projected for the coastal zone of Latin America and the Caribbean. This is mostly a result of the urban–rural population distribution: North America has more people living in urban areas in the coastal zone,

whereas in Latin America and the Caribbean the rural population dominates coastal regions; this is very obvious in Central America, while in South America urban and rural population in the LECZ are evenly distributed in many scenarios (e.g. scenarios B and D). Latin America shows the strongest growth in scenario A by 2060 (high growth projections for the developing world – Latin America; low projections for rich economies – Europe), with a total population nearly equal to the total population of Europe.

Table 39: Population within LECZ per continent and region – Foresight scenarios A–D 2030/2060[105, 106, 107]

World/region/continent	Estimates 2000	Scenario A – population within LECZ		Scenario B – population within LECZ		Scenario C – population within LECZ		Scenario D – population within LECZ	
		In 2030	In 2060	In 2030	In 2060	In 2030	In 2060	In 2030	In 2060
WORLD	**625,187,913**	**938,927,072**	**1,318,277,715**	**879,142,996**	**1,052,786,817**	**948,937,273**	**1,388,161,703**	**892,924,384**	**1,128,072,946**
AFRICA	**54,167,364**	**117,571,313**	**229,281,301**	**108,542,307**	**189,997,191**	**116,761,256**	**245,245,038**	**108,883,886**	**185,600,353**
Eastern Africa	5,157,118	15,063,710	39,883,037	13,819,135	34,791,372	14,122,937	42,459,126	13,835,553	31,137,801
Middle Africa	1,103,371	2,158,449	3,760,551	1,984,449	2,999,961	2,151,832	4,061,822	1,976,736	3,002,281
Northern Africa	30,329,513	52,331,258	72,373,146	46,630,730	56,291,739	52,288,506	74,778,934	48,637,287	61,372,809
Southern Africa	508,894	947,122	1,549,865	849,125	925,942	974,890	1,661,979	863,162	1,139,575
Western Africa	17,068,468	47,070,774	111,714,701	45,258,867	94,988,177	47,223,092	122,283,176	43,571,150	88,947,887
Sub-Saharan Africa	24,193,258	66,394,208	159,959,071	63,069,402	136,456,051	65,654,107	174,013,088	61,300,577	126,616,256
ASIA	**460,839,708**	**688,745,587**	**943,882,844**	**640,335,020**	**728,648,573**	**694,984,814**	**983,292,779**	**649,388,503**	**792,784,232**
Eastern Asia	180,901,200	238,077,984	276,316,848	235,628,564	238,721,805	244,477,541	287,236,261	232,364,952	245,333,339
South–Central Asia	135,660,506	225,538,731	345,194,533	196,467,039	254,051,002	224,016,290	362,921,969	205,581,465	281,299,987
Southeast Asia	133,223,744	197,591,549	278,158,551	182,619,756	201,592,902	199,481,078	287,554,301	185,716,803	230,332,753

[105] Spatial base data: Base data: SRTM30 Enhanced Global Map, ISciences (30 arc seconds); National Boundaries (GPWv3), CIESIN (2005); GRUMP (alpha) Population Grid, CIESIN (resampled from 30 to 15 arc seconds; population year 2000); MODIS 500-m Map of Global Urban Extent (15 arc seconds; year 2009)

[106] Demographic base data: *World Population Prospects: The 2010 Revision* (United Nations 2010b); *World Urbanization Prospects: The 2009 Revision* (United Nations, 2009b)

[107] Annotations: Definition of countries and regions according to UN classification of countries by major area and region of the world" (see United Nations, 2009a,b, 2010a,b). Data do not include Taiwan: UN data on population and urbanisation prospects were not available; Taiwan is not a member of the UN. For this reason, no population projections could be elaborated for Taiwan.

World/region/continent	Estimates 2000	Scenario A – population within LECZ		Scenario B – population within LECZ		Scenario C – population within LECZ		Scenario D – population within LECZ	
		In 2030	In 2060	In 2030	In 2060	In 2030	In 2060	In 2030	In 2060
Western Asia	11,054,258	27,537,323	44,212,912	25,619,662	34,282,865	27,009,905	45,580,247	25,725,282	35,818,152
EUROPE	**50,017,788**	**52,753,580**	**52,067,664**	**52,753,580**	**52,067,664**	**54,538,732**	**55,740,886**	**54,541,004**	**55,743,158**
Eastern Europe	6,802,306	6,902,352	6,955,332	6,902,352	6,955,332	6,943,286	7,015,380	6,943,286	7,015,380
Northern Europe	11,195,409	11,922,182	11,588,588	11,922,182	11,588,588	12,323,592	12,824,418	12,325,864	12,826,690
Southern Europe	10,641,397	11,706,058	11,830,803	11,706,058	11,830,803	12,038,635	12,612,528	12,038,635	12,612,528
Western Europe	21,378,676	22,222,988	21,692,941	22,222,988	21,692,941	23,233,219	23,288,560	23,233,219	23,288,560
LATIN AMERICA AND THE CARIBBEAN	**32,213,201**	**41,656,621**	**50,599,475**	**39,459,875**	**40,120,571**	**42,313,053**	**52,261,884**	**39,775,529**	**42,571,148**
Caribbean	3,536,199	4,285,507	5,425,077	4,137,975	4,449,859	4,356,981	5,640,259	4,107,907	4,677,653
Central America	6,768,421	7,852,188	8,793,513	7,574,872	7,750,354	7,854,714	8,917,050	7,643,007	8,047,984
South America	21,908,581	29,518,926	36,380,885	27,747,028	27,920,358	30,101,358	37,704,575	28,024,615	29,845,511
NORTHERN AMERICA	**24,616,672**	**33,480,749**	**36,954,784**	**33,480,749**	**36,954,784**	**35,510,154**	**45,535,548**	**35,512,608**	**45,538,002**
OCEANIA	**3,333,180**	**4,719,223**	**5,491,647**	**4,571,465**	**4,998,034**	**4,829,264**	**6,085,569**	**4,822,854**	**5,836,054**
Australia/New Zealand	2,669,506	3,532,043	3,758,964	3,532,043	3,758,964	3,714,487	4,439,371	3,716,904	4,441,787
Melanesia	361,127	774,700	1,231,345	675,884	866,126	704,883	1,146,562	718,711	962,518
Micronesia	172,797	250,035	329,029	223,158	232,304	250,379	329,761	236,238	276,906
Polynesia	129,750	162,445	172,309	140,379	140,639	159,515	169,875	151,001	154,843

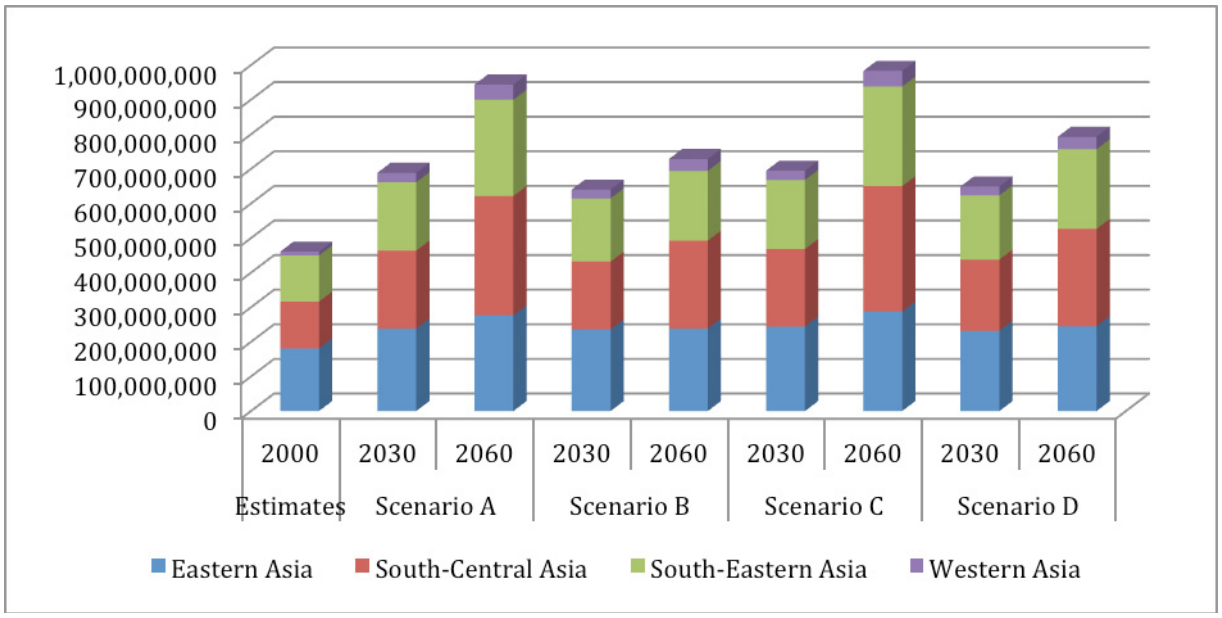

Figure 5: Population within LECZ in Asia per region in 2000, 2030, 2060 – scenarios A to D.

The population projections for the LECZ and for the number of people living in the 1-in-100-year floodplain that have been produced in this study are, to our knowledge, the only quantitative estimates of population development in the coastal zone that account for the rapid increase of population in coastal regions (in comparison with inland population) and for processes such as coastal urbanisation. Our estimates are based on a series of scenario-dependent assumptions and provide useful information for a better understanding of future exposure to coastal flooding and submergence at global, regional and national scales.

Conclusions and further work

The analysis carried out in this study has focused on the assessment of the present and future exposure of land and population to coastal flooding at national to global scales. For this purpose, new estimates of the present land area and population (in 2000) in the LECZ and in the 1-in-100-year coastal floodplain have been produced. These results are based on a more detailed analysis than any earlier work. Furthermore this study has developed forecasts of population in the LECZ and the 100-year coastal floodplain for 2030 and 2060. These are based on the four Foresight scenarios A to D, that were developed specifically for the Foresight Migration study, and include demographic change and sea-level rise. This analysis considers the processes that are attracting people to coastal areas. The main increase in exposure is the result of demographic changes, with sea-level rise contributing only a minor change. Furthermore, the coastal population grows more rapidly than the global population, reflecting a continuation of historic trends. Hence, these forecasts are the most detailed estimates of future coastal population that are currently available.

These new baseline and scenario estimates of coastal population allow scope for much further analysis beyond the analysis of exposure as presented here. In particular, they provide a good basis for further analysis on how the number of people at risk of coastal flooding will change into the future. This number will be sensitive to demographic trends, as well as sea-level rise

and assumptions about adaptation. Such analysis can be carried out with the use of impact assessment models, such as the Dynamic and Interactive Vulnerability Assessment (DIVA) model (Vafeidis *et al*., 2008; Hinkel *et al*., 2010). In addition to the population scenarios, such analysis can also take into account possible human adaptation, such as improved flood defences for coastal cities.

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