

Scientific Software
and
Electronic Publications

by

Gerhard K. Heilig

The following description covers scientific software packages and electronic publications authored by Gerhard K. Heilig since 1995.

It includes both products from his research at the International Institute for Applied Systems Analysis (IIASA) and from his private business activities at CLF SOFTWARE.

ChinaFood - Can China Feed Itself?

A System for Evaluation of Policy Options

Gerhard K. Heilig – International Institute for Applied Systems Analysis (IIASA)

<i>Main use:</i>	a) Electronic publication of research results (ISBN: 3-7045-0134-4). b) Reference tool for China-related research.
<i>Type:</i>	Extensive Web document and CD-ROM (more than 5,000 internal links).
<i>Assumed knowledge:</i>	Subject: advanced. Computer: beginner.
<i>Keywords:</i>	CHINA / FOOD SECURITY / AGRICULTURE / DEVELOPMENT / DEMOGRAPHY

PROGRAM DESCRIPTION

a. <i>Purpose:</i>	Publication of research results, reference tool.
b. <i>Algorithm:</i>	Web-based documents (html - format) on CD-ROM and Web site.
c. <i>Data requirements:</i>	None.

USER-RELEVANT INFORMATION

a. <i>Manual:</i>	Not necessary.
b. <i>Input:</i>	Keyboard, mouse.
c. <i>Output:</i>	On screen: graphics, animations, tables. Printing: Through Web browser.
d. <i>User interface:</i>	Type: menu-driven. Language: English.
e. <i>On-line help:</i>	Not necessary.
f. <i>Product support:</i>	E-mail.
g. <i>Error messages:</i>	Limited.

DISTRIBUTION

a. <i>Distributor:</i>	International Institute for Applied Systems Analysis (IIASA) Schlossplatz 1, 2361 Laxenburg, Austria. ChinaFood was developed by Gerhard K. Heilig when he was Senior Research Scholar at IIASA's Land-Use and Land-Cover Project (LUC).
b. <i>Fax:</i>	(+43-2236) 71313.
c. <i>Telephone:</i>	(+43-2236) 807-551.
d. <i>Electronic mail:</i>	heilig@iiasa.ac.at
e. <i>Web site:</i>	www.iiasa.ac.at/Research/SRD/ChinaFood www.iiasa.ac.at/Research/LUC/ChinaFood
f. <i>Can be downloaded:</i>	Yes (Only Web version).
g. <i>Availability:</i>	Worldwide on-line orders at Web site: http://www.iiasa.ac.at/Research/SRD/ChinaFood/cd_info.htm
h. <i>Price:</i>	US\$ 39.00 (Single-user CD-ROM). US\$ 199.00 (20-user Classroom Version).

TECHNICAL INFORMATION

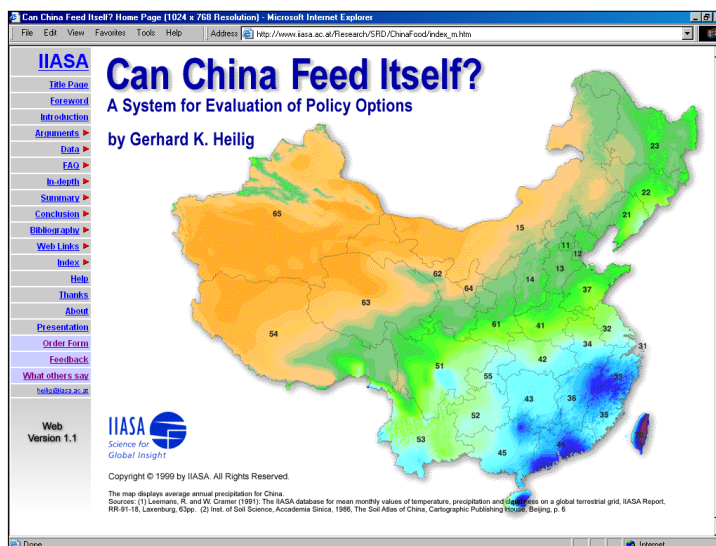
- a. *Current version:* ChinaFood, Version 1.1.3.
b. *Hardware:* Any computer (PC, Macintosh, Workstation) with Web browser.
Graphical card: SVGA (800 x 600 pixel) minimum.
Other hardware: mouse, printer (optional), color printer (optional).
c. *Software:* Operating system: Any.
d. *Code:* Language: html documents (Web standard)
Availability of source: available.

LITERATURE

- a. *Algorithm:* No references.
b. *Application:* No references.
c. *Description:* No references.
d. *Product reviews:* Brochure available from: heilig@iiasa.ac.at
See also: http://www.iiasa.ac.at/Research/SRD/ChinaFood/wot_1.htm

NEXT RELEASE Not planned.

SCREEN COPY Main screen (Web version):



RAPS-China

A Regional Analysis and Planning System

Gerhard K. Heilig – International Institute for Applied Systems Analysis (IIASA)

Main use: a) Electronic publication of research results.
b) Tool for developing indicators on China's regional development.
e) Database and data visualization tools for regional planning.

Type: Software package, and database on CD-ROM, (ISBN: 3-7045-0144-1)

Assumed knowledge: Subject: advanced.
Computer: advanced.

Keywords: CHINA / REGIONAL DEVELOPMENT / RURAL AREAS / DATA ANALYSIS / DEVELOPMENT INDICES

PROGRAM DESCRIPTION

a. *Purpose:* Publication of research results, database, planning tools, data analysis and visualization.

b. *Algorithm:* Custom programmed software.

c. *Data requirements:* None. Extensive database is included.

USER-RELEVANT INFORMATION

a. *Manual:* Tutorial is included in software.

b. *Input:* Keyboard, mouse.

c. *Output:* On screen: graphics, animations, tables.
Printing: High-quality printing of maps, tables, charts, etc.

d. *User interface:* Type: menu-driven.
Language: English.

e. *On-line help:* Included.

f. *Product support:* E-mail.

g. *Error messages:* Limited.

DISTRIBUTION

a. *Distributor:* International Institute for Applied Systems Analysis (IIASA)
Schlossplatz 1, 2361 Laxenburg, Austria.
RAPS-China was developed by Gerhard K. Heilig as Leader of the IIASA research on Sustainable Rural Development (SRD).

b. *Fax:* (+43-2236) 71313.

c. *Telephone:* (+43-2236) 807-551.

d. *Electronic mail:* heilig@iiasa.ac.at

e. *Web site:* http://www.iiasa.ac.at/Research/SRD/RAPS/title_1.htm

f. *Can be downloaded:* No.

g. *Availability:* Worldwide on-line orders at Web site:
http://www.iiasa.ac.at/Research/SRD/RAPS/orderform_1.htm

h. *Price:* US\$ 39.00 (Single-user CD-ROM).
US\$ 199.00 (Classroom / Seminar Version).

TECHNICAL INFORMATION

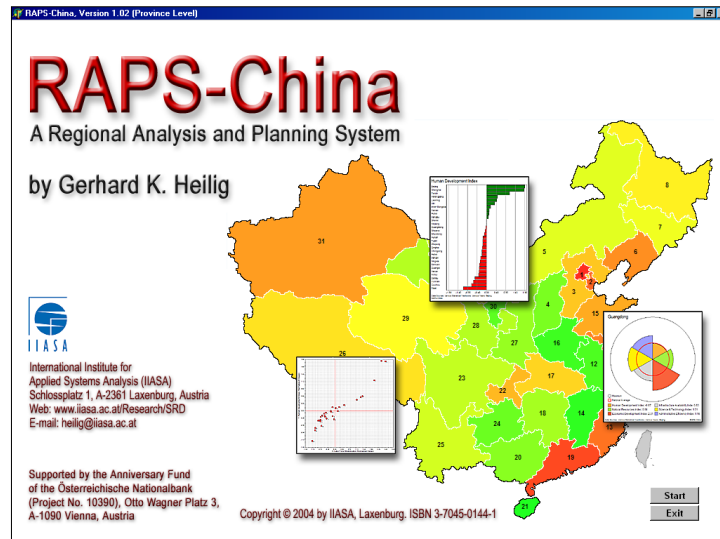
- a. *Current version:* RAPS-China, Version 1.02b. Released: October 2004
- b. *Hardware:* Computer: PC with Web browser.
Graphical card: SVGA (1024 x 768 pixel) minimum.
Other hardware: mouse, printer (optional), color printer (optional).
- c. *Software:* Operating system: MS-Windows '98, ME, NT 4.0, 2000, XP.
- d. *Code:* Language: Borland Delphi 6 Professional.
Availability of source: Not available.

LITERATURE

- a. *Algorithm:* Documentation included.
- b. *Application:* Regional Planning.
- c. *Description:* Included.
- d. *Product reviews:* Not yet available.

NEXT RELEASE Not planned.

SCREEN COPY Main screen:



DemoGraphics '96

A population education program from the United Nations Population Program (UNFPA)

Developed by Gerhard K. Heilig – CLF SOFTWARE

Main use: a) Education (demography, population studies, geography, social studies, political science) at the university and college level
b) Demographic research and vocational training

Type: Software package on CD-ROM.

Assumed knowledge: Subject: beginner.
Computer: beginner.

Keywords: DATA VISUALIZATION / TOOL FOR POPULATION EDUCATION
/ GLOBAL POPULATION TRENDS

PROGRAM DESCRIPTION

a. *Purpose:* Reference, data visualization, and population education.

b. *Algorithm:* Visualization of demographic trends worldwide with graphical user interface, including data-generated animation. Facilities for comparing, tabulating, ranking, mapping, and analyzing aggregate country data.

c. *Data requirements:* None. Data from the UN population estimates and projections (1996 revision) are included.

USER-RELEVANT INFORMATION

a. *Manual:* Included.

b. *Input:* Keyboard, mouse.

c. *Output:* On screen: graphics, animations, tables.
Printing: limited (screen copies).

d. *User interface:* Type: menu-driven.
Language: English.

e. *On-line help:* Context-sensitive.

f. *Product support:* E-mail.

g. *Error messages:* Limited.

DISTRIBUTION

a. *Distributor:* Gerhard K. Heilig, CLF SOFTWARE, Neulinggasse 16/19, 1030 Vienna
The software was developed by Gerhard K. Heilig for the United Nations Population Fund (UNFPA) in association with the Netherlands.
Interdisciplinary Demographic Institute (NIDI).

b. *Fax:* (+43-1) 470 64 11.

c. *Telephone:* (+43-1) 479 33 62.

d. *Electronic mail:* gerhard.heilig@chello.at.

e. *Web site:* members.chello.at/gerhard-k-heilig

f. *Can be downloaded:* No.

g. *Availability:* E-mail orders to: gerhard.heilig@chello.at
Fax orders to: (+43-1) 470 64 11

h. *Price:* US\$ 39.00 (CD-ROM Order from Less Developed Country).
US\$ 69.00 (CD-ROM Order from More Developed Country).
20-user License Package for classroom use is available.
Software comes with the DemoTools package included.

TECHNICAL INFORMATION

- a. *Current version:* DemoGraphics '96.
(Previous Version: DemoGraphics '94 is discontinued)
- b. *Hardware:* Computer: at least 486.
Graphical card: SVGA (800 x 600 pixel) minimum.
RAM memory: at least 640 Kb.
Hard disk: at least 30 Mb.
Other hardware: mouse, printer (optional), color printer (optional).
- c. *Software:* Operating system: MS WINDOWS 98, ME, NT 4.0, XP.
- d. *Code:* Language: C++.
Availability of source code: not available.

LITERATURE

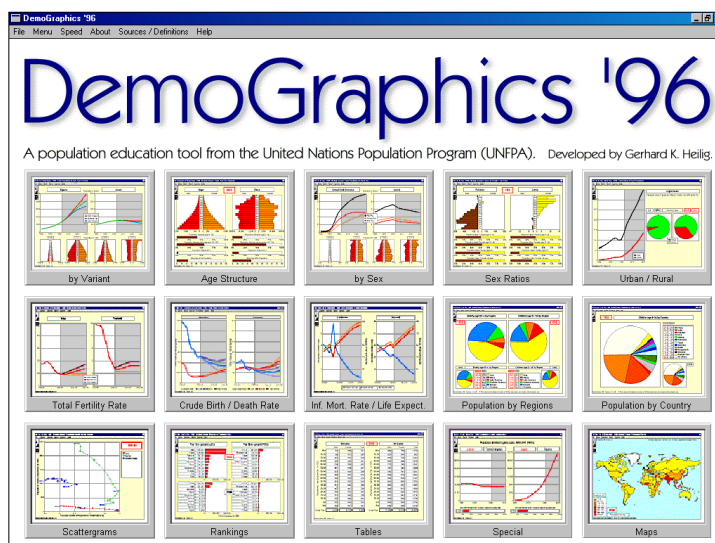
- a. *Algorithm:* No references.
- b. *Application:* No references.
- c. *Description:* No references.
- d. *Product review:* Brochure available at: gerhard.heilig@chello.at

NEXT RELEASE

Planned for 2005. DemoGraphics '05 (Expected release date: March 2005)

SCREEN COPY

Main screen:



DemoTables '96

Gerhard K. Heilig – CLF SOFTWARE

Main use: a) Education (demography, population studies, geography, social studies, political science) at the university and college level
b) Demographic research and vocational training

Type: Software package on CD-ROM.

Assumed knowledge: Subject: beginner.
Computer: beginner.

Keywords: DATA SCREENING / TOOL FOR POPULATION EDUCATION / GLOBAL POPULATION TRENDS

PROGRAM DESCRIPTION

a. *Purpose:* Reference, data screening, population education.

b. *Algorithm:* Easy screening, sorting / ranking and filtering of demographic data worldwide between 1950 and 2050 with graphical user interface.

c. *Data requirements:* None. Data from the UN population estimates and projections (1996 revision) are included.

USER-RELEVANT INFORMATION

a. *Manual:* On-line manual included.

b. *Input:* Keyboard, Mouse.

c. *Output:* "Smart" tables that can be easily filtered, and sorted.

d. *User interface:* Type: menu-driven.
Language: English.

e. *On-line help:* Context-sensitive.

f. *Product support:* E-mail.

g. *Error messages:* Limited.

DISTRIBUTION

a. *Distributor:* Gerhard K. Heilig
CLF SOFTWARE, Neulinggasse 16/19, 1030 Vienna, Austria.

b. *Fax:* (+43-1) 470 64 11.

c. *Telephone:* (+43-1) 479 33 62.

d. *Electronic mail:* gerhard.heilig@chello.at.

e. *Web site:* members.chello.at/gerhard-k-heilig

f. *Can be downloaded:* No.

g. *Availability:* E-mail orders to: gerhard.heilig@chello.at
Fax orders to: (+43-1) 470 64 11

h. *Price:* US\$ 39.00 (CD-ROM Order from Less Developed Country).
US\$ 69.00 (CD-ROM Order from More Developed Country).
20-user License Package for classroom use is available.
Software comes with the DemoGraphics package included.

TECHNICAL INFORMATION

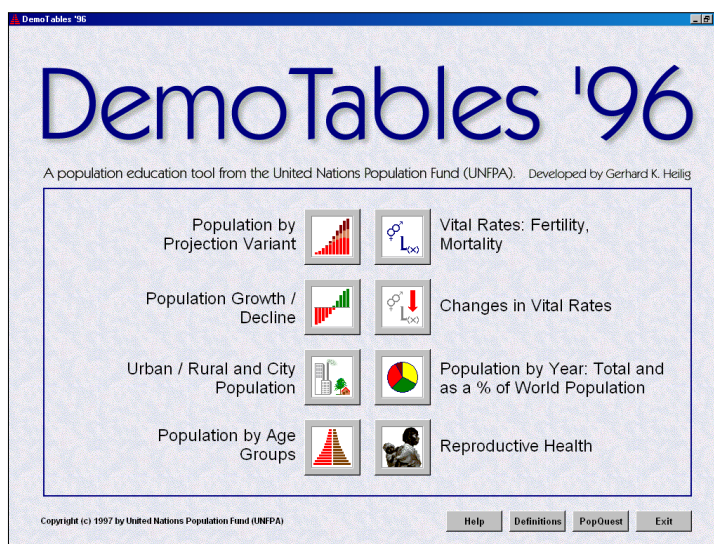
- a. *Current version:* DemoTables '96.
- b. *Hardware:* Computer: at least 486.
Graphical card: SVGA (800 x 600 pixel).
RAM memory: at least 640 Kb.
Hard disk: at least 30 Mb.
Other hardware: mouse, printer (optional), color printer (optional).
- c. *Software:* Operating system: MS WINDOWS 98, ME, NT 4.0, XP.
- d. *Code:* Language: Borland Delphi 6 Professional (Pascal).
Availability source: not available.

LITERATURE

- a. *Algorithm:* No references.
- b. *Application:* No references.
- c. *Description:* No references.
- d. *Product review:* Brochure available at: gerhard.heilig@chello.at

NEXT RELEASE Integrated in DemoGraphics '05 (Expected release date: March 2005).

SCREEN COPY Main screen:



DemoTools: Tool #1 – Population Projections

Easy-to-use Population Projection Software

Developed by Gerhard K. Heilig – CLF SOFTWARE

<i>Main use:</i>	Research, education.
<i>Type:</i>	Software package on CD-ROM.
<i>Assumed knowledge:</i>	Subject: beginner to advanced demographer. Computer: beginner; for <i>custom</i> projection: advanced user.
<i>Keywords:</i>	COHORT-COMPONENT PROJECTION, DATA VISUALIZATION POPULATION PROJECTION SOFTWARE.

PROGRAM DESCRIPTION

- a. *Purpose:* Calculation of cohort-component population projections; visualization of results; tool for demographic education.
- b. *Algorithm:* Custom-programmed projection software with graphical user interface.
- c. *Data requirements:* None. Data from the UN population Estimates and Projections (1998 Revision) are included. User can input his/her *own* data.

USER-RELEVANT INFORMATION

- a. *Manual:* An on-line manual is included. Advanced Version also includes 10 detailed lectures, which describe particular projection problem.
- b. *Input:* Keyboard, open ASCII input files.
- c. *Output:* Screen: pre-designed tables, (animated) charts (“moving” age pyramids); Printer: detailed tabulation of input data and results; output can be copy-pasted into other documents (MS-WORD, MS-PowerPoint, etc.).
- d. *User interface:* Type: menu-driven.
Language: English.
- e. *On-line help:* Context-sensitive.
- f. *Product support:* E-mail.
- g. *Error messages:* Limited.

DISTRIBUTION

- a. *Distributor:* Gerhard K. Heilig,
CLF SOFTWARE, Neulinggasse 16/19, 1030 Vienna, Austria
- b. *Fax:* (+43-1) 470 64 11.
- c. *Telephone:* (+43-1) 479 33 62.
- d. *Electronic mail:* gerhard.heilig@chello.at
- e. *Web site:* members.chello.at/gerhard-k-heilig
- f. *Can be downloaded:* No.
- g. *Availability:* E-mail orders to: gerhard.heilig@chello.at
Fax orders to: (+43-1) 470 64 11
- h. *Price:* Standard Version (US\$ 99);
Professional Version (US\$ 169);
Advanced Version (US\$ 239)

TECHNICAL INFORMATION

- a. Version 1.1 Date of release not given.
- b. *Hardware*: Computer: at least Pentium III.
Graphical card: SVGA (1024 x 768 pixel)
RAM memory: at least 640 Kb.
Hard disk: at least 30 Mb.
- c. *Software*: Other hardware: mouse, printer (optional), color printer (optional).
Operating system: MS-Windows 98/NT4/2000/XP.
Other software: none.
- d. *Code*: Language: Borland Delphi 6 Professional.
Availability source: not available.

LITERATURE

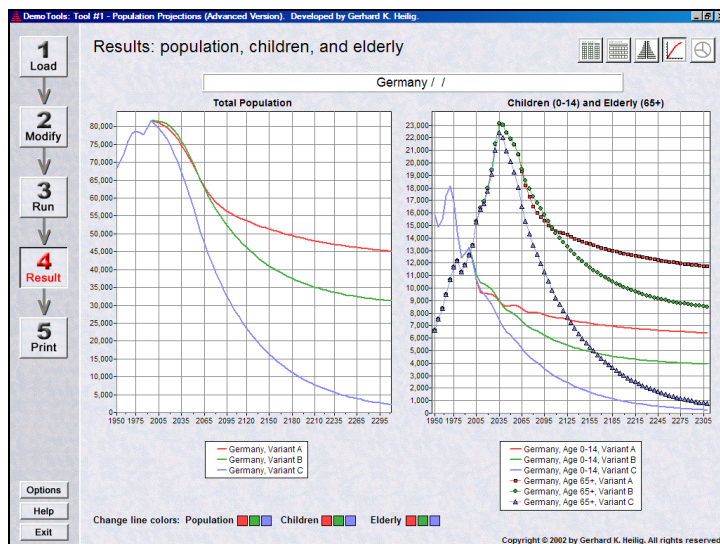
- a. *Algorithm*: Cohort-component population projection in 5-year steps for base population in 5-year age groups. Technical description of algorithm is included in the application.
- b. *Application*: No references.
- c. *Description*: Examples are described in the application.
- d. *Product review*: Brochure available at: gerhard.heilig@chello.at

NEXT RELEASE

- a. *Modifications*: Internal revision 1.1.10.
- b. *Date of release*: Not given.

SCREEN COPY

Result screen 1 of 5:



World Population Prospects

Analyzing the 1996 UN Population Projections

Web site developed by Gerhard K. Heilig – IIASA LUC Project

Main use: Publication of demographic research results.
Type: Web document.
Assumed knowledge: Subject: advanced course level in global demographics.
Computer: beginner.
Keywords: WORLD POPULATION TRENDS, POPULATION PROJECTIONS,
POPULATION MOMENTUM, DEMOGRAPHY.

PROGRAM DESCRIPTION

a. *Purpose:* Analysis of the United Nations World Population Prospects, 1996
Revision.
b. *Algorithm:* Web site.
c. *Data requirements:* None. Tables and figures are included.

USER-RELEVANT INFORMATION

a. *Manual:* Not necessary.
b. *Input:* Keyboard, mouse.
c. *Output:* Screen: pre-designed tables, (animated) charts;
Printer: through Web browser.
d. *User interface:* Type: menu-driven.
Language: English.
e. *On-line help:* Not necessary.
f. *Product support:* E-mail.
g. *Error messages:* Limited.

DISTRIBUTION

a. *Distributor:* International Institute for Applied Systems Analysis (IIASA)
b. *Fax:* (+43-1) 470 64 11.
c. *Telephone:* (+43-1) 479 33 62.
d. *Electronic mail:* heilig@iiasa.ac.at
e. *Web site:* www.iiasa.ac.at/Research/SRD
f. *Can be downloaded:* Yes.
g. *Availability:* <http://www.iiasa.ac.at/Research/LUC/Papers/gkh1/>
h. *Price:* Free.

TECHNICAL INFORMATION

a. *Current Version:* 1.6
b. *Hardware:* Computer: Any computer with Web browser.
Graphical card: SVGA (1024 x 768 pixel)
RAM memory: not applicable.
Hard disk: not applicable.
Other hardware: mouse, printer (optional), color printer (optional).
c. *Software:* Operating system: Any operating system with Web browser.
Other software: none.
d. *Code:* Language: html.

Availability source: available in Web site.

LITERATURE

- a. *Algorithm:* Not applicable.
b. *Application:* Not applicable.
c. *Description:* Was also published as IIASA Working Paper, WP-96-146.
d. *Product review:* Not applicable.

NEXT RELEASE

- a. *Modifications:* Internal revision 1.6.
b. *Date of release:* September 25, 1998.

SCREEN COPY

Chapter 1:

World Population Prospects: The 1996 UN Population Assessments and Projections - Microsoft Internet Explorer
Address: <http://www.iasa.ac.at/Research/LUC/Papers/gh1/>

IIASA WP 96-146

**Chapter 1
World Population: Major Trends**

World population will grow significantly - despite falling fertility.

There is a most striking paradox in global population trends: on one hand we have had a rapid decline in fertility for over two decades in many developing countries - not to mention the already very low fertility in most of the highly developed nations; on the other hand we will almost certainly experience a further massive increase of the world population. In their most recent projection ("World Population Assessment and Projection, The 1996 edition") the United Nations Population Division projects a global population of 8.04 billion for the year 2025 and 9.27 billion for 2050 (see Figure C1.1 and Table C1.1). According to this medium variant, an increase of some 3.25 billion people can be expected worldwide between 1995 and 2025; and an additional 1.3 billion between 2025 and 2050.

These numbers are a little smaller than previous UN estimates, leading some mass media to jump to the conclusion that world population growth will be over soon. This rash judgment might be premature. This UN medium variant projection is based on the assumption that almost all countries worldwide will have a Total Fertility Rate (TFR) of only 2.1 in 2050 at the latest (only for 10, mostly European countries, the UN assumes a TFR in 2050 that is a little less - between 1.84 and 2.1). This assumption would require a further steep fertility decline in many developing nations - especially in Pakistan, Nigeria, Iran or India, where the Total Fertility Rates are still far above the reproductive level of 2.1 children per woman. According to the most recent UN estimates, Pakistan for instance, currently has a TFR of about 5 children per woman - the medium variant projection assumes that it will drop to 2.1 during the next 25 years. In other words, we will only have a world population of about 5.4 billion by 2050, if the Total Fertility Rate, measured as a global average, declines from about 3.0 in 1990-95 to the reproductive level of 2.1 children per woman in 2025-40.

Obviously, there is no guarantee that this will happen. There could be a much higher increase in world population, as indicated by the "high" variant UN projection. If worldwide fertility would drop to only about 2.6 children per woman (instead of 2.1 as assumed in the medium variant), we would have a global population of some 5.6 billion by 2025 and 11.2 billion by 2050. This would be equivalent to a 2.89 billion increase between 1995 and 2025 and a 2.58 billion increase between 2025 and 2050. In other words, we cannot exclude another doubling of the world population between now and the middle of the next century as being projected by the UN high variant projection.

Is it possible to completely stop world population growth during the next few decades? Yes, it is - if fertility, worldwide, would decline to 1.57 children per woman, the global population could stabilize at about 7.5 billion by 2025. This is the result of the 1996 UN low variant projections. Please note that this variant assumes a drastic drop of average fertility to a level of some 24% below replacement - in all countries worldwide. While such a steep decline, in fact, already happened in many European countries, it is rather unlikely that populous developing nations such as Pakistan, India, Indonesia or Nigeria - which greatly determine world population growth - would quickly follow this trend.

Year	World Population (billion)
1995	5.2
2000	5.6
2005	6.0
2010	6.4
2015	6.8
2020	7.2
2025	7.6
2030	8.0
2035	8.4
2040	8.8
2045	9.2
2050	9.6