

## **Managing the Global Nutrient Cycle**

**Session organized by GPNM during the Global Conference on Land-Oceans Connections (GLOC)  
Manila, the Philippines, 23 January 2012**

### **The Focus and objectives**

Too little or too much of nutrients – both have impacts on human health, human wellbeing and environment. The problems associated with nutrient management, have high economic costs, are often complex and are not amenable to single solutions. The questions therefore are who pays for the costs associated with human wellbeing and environmental problems that are related to either too little or too much of nutrients, and how the cost of conserving our natural resources and the environment should be apportioned among the actors associated with and/or responsible for the current management practices.

The session with some presentations and moderated panel discussions reflected on how to address the seeming divide between societal needs for food and energy and a complex web of adverse environmental impacts associated with current practices of nutrients use, which undermine the natural resource base and the services and livelihoods it supports.

### **Organizing Partners**

This session was organized under the auspices of the Global Partnership on Nutrient Management (GPNM) with support from its various members and partners. The supporting partners included, Department of Environment and Natural Resources, Government of the Philippines, National Oceanic and Atmospheric Administration of the United States of America, Ministry of Infrastructure and Environment, Government of the Netherlands, Chilika Development Authority, Government of Orissa, India, Environment Protection Agency, Government of Ghana, International Nitrogen Initiative (INI), Scientific Committee on Problems of Environment (SCOPE), International Fertilizer Development Centre (IFDC), International Fertilizer Industry Association (IFA), Global Transdisciplinary Processes for Sustainable Phosphorus Management (Global TraPs), Swiss Federal Institute of Technology (ETH) Zurich, Centre for Ecology and Hydrology, Natural Environment Research Council of the United Kingdom, The Netherlands Energy Research Centre, Indian Nitrogen Group (ING), University of Delaware, USA, University of the Philippines, United Nations Development Programme and FAO/GEF Bay of Bengal Large Marine Ecosystem Project (BOBLME).

### **Session Chair, Moderator, Presenters and some key discussants**

Atty. Analiza Rebueta-Teh, Under-Secretary and Chief of Staff, Department of Environment and Natural Resources, Government of the Philippines chaired the session. Prof. Mark Sutton of the Centre for Ecology and Hydrology, Natural Environment Research Council of the United Kingdom moderated the session. The speakers included Dr. Clement Lewsey, Director, National Ocean Service, US-NOAA; Mr. Kaj Sanders, Senior Policy Advisor, Ministry of Infrastructure and Environment, The Netherlands; Prof. Gil S Jacinto, Marine Sciences Institute, University of the Philippines; Mr. Daniel

Amlalo, Acting Executive Director, EPA-Ghana; Dr. Ramakrishna Kilaparathi, Chair, INI; Ms. Angela Olegario, IFA; Dr. Amit Roy, Chief Executive Officer, IFDC; Prof. Roland W Schloz, Department of Environment System Sciences, ETH Zurich; Dr. Vladimir Mamaev, UNDP.

Later when the moderator opened the session for interactive dialogues, the following persons took part in the discussion. Mr. John Murphy, Member of the US Delegation; Dr. Yusuf Al-Sufi, Member, Palestine delegation; Prof. Tom Sims from the University of Delaware, USA; Prof. Jan Willem Erisman of the Energy Research Centre of the Netherlands; Dr. N. Raghuram of ING, Dr. Alfred Duda of Global Environment Facility (GEF); Dr. Tapan Adhya of ING; Mr. Chuck Chaitovitz of Global Environment and Technology Foundation (GETF) USA, and Mr. Gunnar Norén, Coalition Clean Baltic (NGO), Sweden

### **Issues discussed and key outcomes**

The discussion recognized the critical importance of nutrients for global food security and emphasized on the need to review the present nutrient use and management practices that are stimulated by government policies and agronomical practices driven by market forces. The participants also recognized the need to recover nutrients from wastes and recycle them back into food chains for sustainable nutrient management. It was generally acknowledged that nitrogen and phosphorus are the most anthropogenically imbalanced nutrient cycles on earth, and therefore, the Global Partnership on Nutrient Management should address these two nutrients on a priority basis.

There was consensus among the participants on the potential for improving nutrient use efficiencies (especially nitrogen and phosphorus) of fertilizers and manures in crop and animal production, including the possibility of further improvements by dietary changes in animal husbandry and human dietary choices. The recovery and recycling of nutrients from sewage, manure and other anthropogenic or industrial releases, the potential for reduced or more efficient combustion of fossil fuels, NO<sub>x</sub> capture and utilization technology were also discussed. It was generally felt that strong policy actions and implementation strategies are urgently needed to harness these opportunities and the associated financial benefits in moving towards a green economy, while taking account of system differences. The national governments may consider setting themselves some achievable targets and timeframes in addressing the use efficiencies at specific steps of individual nutrient cycles (such as nitrogen fertilizer use efficiency or dietary choices), and/or full chain nutrient use efficiencies that allow more flexibility to mix and match multiple interventions for overall sustainability.

During the session the participants also discussed issues that were considered important and merit attention of governments attending the third intergovernmental review meeting of the Global Programme of Action for the Protection of the Marine Environment from Land-based Activities (GPA/IGR3) and their inclusion in the GPA programme of work for the period 2012-2016 and the Manila Declaration to be adopted at the concluding session of the GPA/IGR3. The issues that were suggested for governments' consideration are;

- Setting of global policy goals for sustainable nutrient management and greening of economies
- Global recognition of the need for countries/regions to improve quantification of their nutrient cycles
- Recognition of different sources of nutrients, including sewage, fossil fuel combustion, agriculture (fertilizer and manure/livestock), etc.

- Working with diverse stakeholder to demonstrate co-benefits from improved nutrient managements across sectors (e.g., coastal-marine ecosystems, food security, energy security, climate change mitigation, protection of the quality of water, air and soil, health and biodiversity)
- Consider working towards common goals/targets/timeframes for improved nutrient management
- Sharing of best practices for improving nutrient management practices, including technologies and development of guidance documentation
- The need to develop improved nutrient management practices was accepted as necessary given the evidence of a range of effects of net nutrient loss to the environment
- A key recommendation was to consider the establishment of a target for improved nutrient management and nutrient use efficiency
- A consensus around the need for effectiveness in achieving behavioural changes (e.g., Improving management practices, avoiding over-consumption and minimizing food waste along the production/consumption chain)
- It was agreed that setting quantitative target(s) for improved nutrient management and/or nutrient use efficiency provide a powerful incentive for action; even on a voluntary basis, such targets would be useful in encouraging change.
- The following proposal was made:
  - To set a global goal to improve/work towards improving nutrient use efficiency by 20 % at a country level. The rationale for this proposed target on nutrient use efficiency and various measures that may follow are discussed in a separate document, see Appendix A).
  - To set a mutually agreed timeframe for the above goal to be realized (e.g., by 2016), compared with a baseline year (e.g., 2008 was used as a base year due to availability of FAO data set).
  - It is proposed to implement the global goal through two complementary indicators:
    - To improve crop nutrient use efficiency by 20% relative to the base year for each country, towards an eventual nutrient use efficiency of 70%
    - To improve full chain nutrient use efficiency by 20% relative to the base year for each country, towards an eventual full chain nutrient use efficiency of 50%
  - Definitions and thresholds:
    - Crop NutUE is here defined as nutrients in harvested crops as a % of the total nutrient input at a country level
    - Full chain NutUE is here defined as nutrients in human food available for consumption as a % of the total nutrient inputs at a country level.
    - Relative target: The target is set relative to the base year eg. If the base year for a country is at NUE 25%, the *relative* improvement would aim for a target of NUE at 30%
    - Eventual NutUE enables countries with nutrient limitations to be exempted from the 20% improvement target.
  - Flexibility for country discussions at IGR3:
    - The use of two indicators for nutrient use efficiency allows for maximum flexibility for countries to optimize nutrient management according to local conditions. For example, the full chain approach allows a government to intervene at any or all components of a nutrient cycle, be it at the level of fertilizer, manure, sewage, fuel, or consumption choices.

- Estimates have been based on available FAO dataset, which can be used for future monitoring, or countries may choose to submit their own national data.
- Ambition level of the proposal may be varied according to: a) the % improvement (e.g., 15, 20%), b) baseline and timeframe (e.g., 2008-2016), c) the eventual NutUE for setting exemptions from the target for nutrient limited countries, d) the extent to which countries agree to achieve the targets on a voluntary basis or agree to make progress towards the targets.
- Choice of the nutrient use efficiency indicators:
  - The indicators were identified based on the simplicity of their calculation from available FAO data and being integrators allowing maximum flexibility in the means to improve nutrient management (e.g., including all sectors including crops, livestock and sewage).
  - The use of NutUE as an indicator highlights the financial benefits for the stakeholders and the green economy
  - In the longer term, further efforts may be put in developing nutrient balances to calculate surpluses and to calculate nutrient inputs into different marine areas. These have benefits but require further data to support their calculation.

The session participants, however, did not only ask for governments' commitment to address the nutrient challenges, they also made voluntary commitments to undertake a number of activities individually and/or in partnership, and they included;

- The participants agree that the GPNM can be further strengthened by wider participation by governments and other stakeholders from various countries/regions, and renewed their call for wider participation.
- The participants reiterated their commitments to GPNM and agreed to work through GPNM. The key tasks that were outlined include:
  - Development of guidance documents and policy toolkits of best practices for improved nutrient management, linking the different source and activity sectors
  - To provide further guidance documentation on the calculation of the nutrient use efficiency indicators, refining the existing spreadsheet approach, for sharing between countries.
  - To compare country-scale and regional approaches versus site specific, field scale methods (e.g., partial factor productivity, farm-scale nutrient recovery efficiency etc.) to better clarify and communicate the relationships between the different indicators and scales
  - To share experiences of successes and failures of nutrient management in different countries/sectors
  - To make further efforts in mainstreaming nutrient management to show how efforts to reduce coastal eutrophication can deliver co-benefits to meet other environmental targets e.g., climate change, food security, health, biodiversity, air, soil and water quality.
  - Start implementing monitoring system and work with existing organizations on reporting methods and procedures.

## Proposed nutrient use efficiency targets and their basis for considerations by the Governments for inclusion in the Manila declaration.

### Background and proposed targets

1. In order to make progress in reducing the release of nutrients from land-based sources into coastal and marine areas, there is the important opportunity for GPA/IGR3 to move from qualitative recognition of the problem to setting quantitative targets.
2. The following target was therefore proposed in the draft of the Manila Declaration:  
*An improvement in baseline of the nitrogen use efficiency of fertilizer application of 20% within 5 years, by country.*
3. During a pre-GPA/IGR3 GPNM preparatory meeting in Paris, 14-15 November 2011, it was noted that this target covered only the fertiliser to crop harvest part, and did not take account of the substantial role played by livestock in affecting nutrient use efficiency (NutUE). It was therefore proposed that the overall goal to improve NutUE be implemented using two complementary indicators:
  - a. Each country should aim to improve its nutrient use efficiency in the crop sector (Crop NutUE) by 20% *relative* to its baseline (over the next 5 years), towards achieving an eventual NutUE target of at least 70%.
  - b. Each country should aim to improve its nutrient use efficiency across the 'full chain' of food production activities (Full-chain NutUE), by 20% relative to its baseline (over the next five years), towards achieving an eventual NutUE target of at least 50%.

### Definition and illustration

4. **Crop NutUE** is here defined as the nutrients in harvested crops in a country as a % of the total nutrient input (mineral fertilizer input plus crop biological nitrogen fixation);
5. **Full-chain NutUE** is defined as the nutrients in food available for consumption in a country as a % of the total inputs (fertilizer, crop+grassBNF and import).
6. Example. The target to increase by 20% is taken as a relative change based on current value (i.e. it is not the absolute difference). For example: If the current NutUE of a country is 40%, a relative increase of this number by 20%, would set that country's 5 year target at 48% NutUE.

### Comparison of the Crop and Full-chain indicators

7. The crop and full-chain indicators fulfil complementary functions. To meet the overall goal of improving nutrient use efficiency, both the indicators should be used.
8. The crop NutUE indicator is the simplest to calculate, but necessarily only provides a partial view of the challenge to improve overall NutUE to reduce environmental pollution. It should be noted that crop NutUE target may also be calculated excluding crop biological nitrogen fixation.
9. The 'full-chain' indicator provides the basis to assess overall improvement in nutrient use efficiency. It also provides governments with maximum flexibility in how they achieve the targets set – i.e. they can achieve it through improved nitrogen management and/or education to avoid over consumption of animal products.
10. Animal protein production plays an important role in the nitrogen losses to the environment because of lengthening the food chain which reduces NutUE. Animal protein is not taken into account separately, since it is aimed to base the indicator on new nitrogen inputs and

because it is implicitly taken into account in the full chain approach (i.e., a larger fraction of N going to human food with a smaller fraction going to animal feeds increases NutUE).

11. The present calculation of full-chain NutUE is based on the amount of nutrients in food available for consumption, which is the simplest to derive based available FAO statistics.

#### **Provision for countries with low nutrient inputs**

12. Using the definitions outlined in paragraph 3, the focus of the quantitative targets is on countries with high nutrient use and consequent low nutrient use efficiency. By contrast, countries with low nutrient use may face other challenges to avoid mining of soil nutrient stocks. Such countries typically also have a low per capita consumption of animal products. These aspects are handled by setting of the eventual target NutUE. A low input of fertilizer N and low consumption of animal products both favour high NutUE, so that such countries may already meet the long term target NutUE values. This is reflected in the present calculations.

#### **Calculations presented**

13. The present analysis is based on nitrogen use efficiency calculations. To demonstrate the concept, a draft methodology is being developed using existing FAO data.
14. For the baseline for the two targets/indicators, we used FAO data, together with data from the IMAGE model (Bouwman et al., 2010) to calculate Crop NutUE and Full-chain NutUE on a country basis.

The quantitative targets and eventual target thresholds are subject to agreement by the countries. In this document we compare the countries in relation to their current values of the crop and full-chain NutUE indicators, and show the NutUE values that would meet the 5 year targets for 2016 defined in paragraph 3.

In addition, we calculate the equivalent nutrient saving (expressed as ktonne N per country) that represents the reduction in N losses to the environment as a result of changing from the baseline NutUE to the 5 year target. This saving may be met by different ways, including improving production efficiency, reducing inputs, and altering the share of different animal and plant products produced.

The following maps show the current (2008) Crop NutUE and Full-chain NutUE, and the total nutrient savings per country in absolute numbers for the two indicators. In the appendix the numbers are given in Table form.

#### **Future options**

- Societal choices on the consumption pattern of different food types affect the full-chain NutUE.
- Further work can provide information on how certain choices would affect the situation – i.e. changes from red meat to white meat and/or fish can also have an impact.
- Further work could also extend this approach to incorporate phosphorus use efficiency (PUE).
- With further development of the statistical base, the calculation of full-chain NutUE based on available nutrients in food could be extended to incorporate the waste losses occurring between food production and human consumption.
- Further scenarios may be calculated using different percentage improvements in NutUE and the values set of the eventual targets.

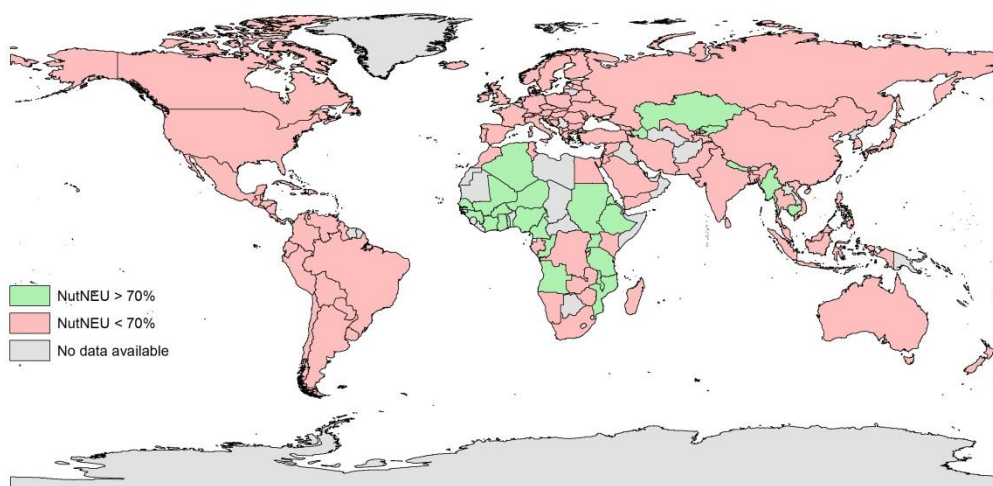


Figure 1. Countries that have a Crop NutUE below 70% (situation 2008), for which the target in paragraph 3a applies.

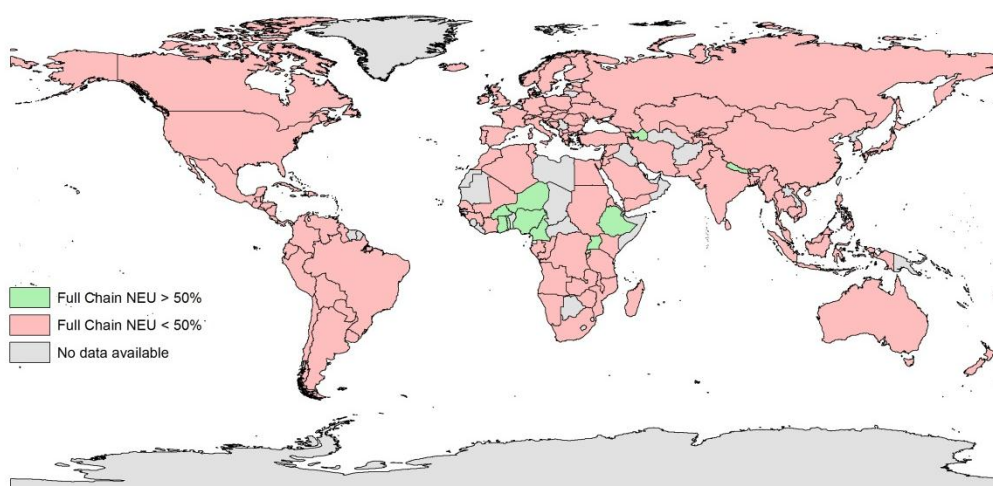


Figure 2. Countries that have a Full-chain NutUE below 50% (situation 2008), for which the target in paragraph 3b applies.

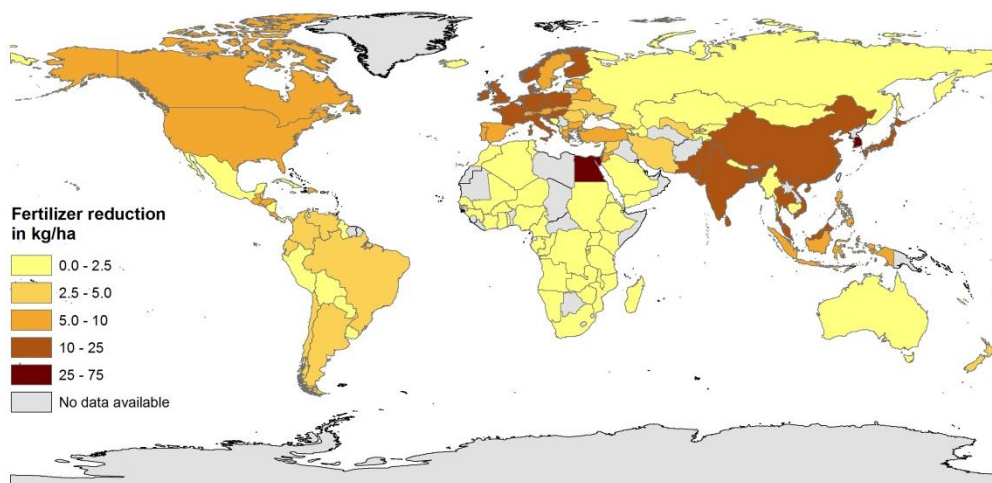


Figure 3. Absolute nutrient savings achieved as a result of meeting the 5 year target for countries that have a Crop NutUE below 70% (situation 2008). The results are expressed here as the equivalent fertilizer reduction in kg N /ha / year, and can be envisaged as representing efficiency improvements (which in some cases may be achieved while increasing nutrient inputs).

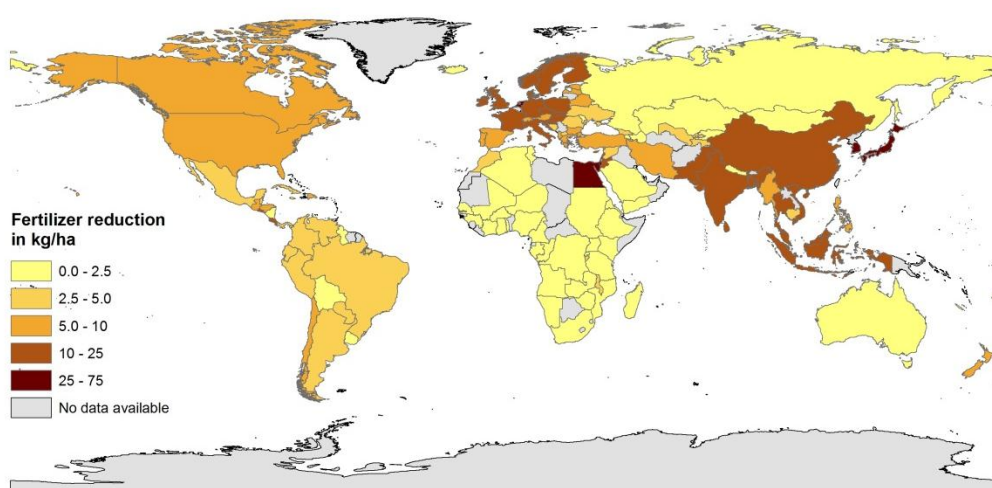


Figure 4. Absolute nutrient savings achieved as a result of meeting the 5 year target for countries that have a Full-chain NutUE below 50% (situation 2008). The results are expressed here as the equivalent fertilizer reduction in kg N /ha / year, and can be envisaged as representing efficiency improvements (which in some cases may be achieved while increasing nutrient inputs).



The current baseline (2008) Crop NutUE and Full-chain NutUE per country, the target values of NutUE for 2016 based on a 20% improvement from the 2008 values, and the equivalent total nutrient savings per country (ktonne N /year). For countries where the baseline values exceed the eventual target values, the nutrient saving is set at zero in the last two columns. No data: -

Country	Baseline Crop NutUE (2008)	Baseline Full-chain NutUE (2008)	Target value Crop NutUE (2016)	Target value Full-chain NutUE (2016)	N saving from target: 'crop NutUE' (ktonne /yr)	N saving from target: 'Full-chain NutUE' (ktonne /yr)
ALBANIA	25	40	31	48	5	7
ALGERIA	78	45	70	50	0	56
AMERICAN SAMOA	-	-	-	-	-	-
ANGOLA	92	11	70	14	0	55
ANTIGUA AND BARBUDA	10	83	12	50	0	0
ARGENTINA	23	7	27	8	395	494
ARMENIA	58	43	69	50	2	4
AUSTRALIA	36	4	43	4	203	531
AUSTRIA	68	30	70	36	18	25
AZERBAIJAN	102	71	70	50	0	0
BAHAMAS	-	-	-	-	0	0
BANGLADESH	30	29	37	35	214	228
BARBADOS	6	36	7	43	0	1
BELARUS	22	9	26	10	83	84
BELGIUM	-	-	-	-	-	-
BELIZE	34	27	41	32	1	1
BENIN	-	-	-	-	-	-
BERMUDA	-	-	-	-	-	-
BOLIVIA	25	11	30	13	16	43
BOSNIA AND HERZEGOVINA	55	37	66	44	5	7
BOTSWANA	-	-	-	-	-	-
BRAZIL	30	14	36	17	878	1043
BRUNEI DARUSSALAM	3	63	3	50	0	0
BULGARIA	23	13	27	15	39	41
BURKINA FASO	129	80	70	50	0	0
BURUNDI	53	43	64	50	6	7
CAMBODIA	79	42	70	50	0	16
CAMEROON	75	56	70	50	0	0
CANADA	47	7	56	8	395	419
CAPE VERDE	-	-	-	-	-	-
CENTRAL AFRICAN REPUBLIC	-	-	-	-	-	-
CHAD	-	-	-	-	-	-
CHILE	12	15	14	18	61	79
CHINA	22	14	27	17	5906	6431

COLOMBIA	11	17	14	20	108	151
COMOROS	-	-	-	-	-	-
CONGO	82	15	70	18	0	9
CONGO _THE DEMOCRATIC REPUBLIC OF THE	63	34	70	41	15	35
COSTA RICA	13	16	16	19	12	19
CÔTE D'IVOIRE	95	38	70	45	0	23
CROATIA	24	11	29	14	24	26
CUBA	21	36	25	43	12	21
CYPRUS	17	25	20	30	1	3
CZECH REPUBLIC	48	17	57	21	45	48
DENMARK	46	11	55	14	38	42
DJIBOUTI	-	-	-	-	-	-
DOMINICA	21	26	25	32	0	0
DOMINICAN REPUBLIC	14	25	17	30	13	18
EAST TIMOR	-	-	-	-	-	-
ECUADOR	24	22	29	26	24	31
EGYPT	27	27	33	33	195	228
EL SALVADOR	25	25	30	29	13	16
ERITREA	113	27	70	33	0	8
ESTONIA	36	18	43	22	5	6
ETHIOPIA	114	74	70	50	0	0
FIJI	10	26	12	32	1	2
FINLAND	34	13	41	16	33	34
FRANCE	34	12	40	14	456	477
FRENCH POLYNESIA	82	74	70	50	0	0
GABON	58	18	70	21	1	5
GAMBIA	149	60	70	50	0	0
GEORGIA	16	33	19	39	7	9
GERMANY	35	18	42	22	319	379
GHANA	136	64	70	50	0	0
GREECE	44	28	53	33	29	39
GRENADA	-	-	-	-	-	-
GUATEMALA	19	20	23	25	26	32
GUINEA	187	30	70	36	0	14
GUINEA-BISSAU	-	-	-	-	-	-
GUYANA	43	13	52	16	2	3
HAITI	-	-	-	-	-	-
HONDURAS	16	22	19	27	17	19
HUNGARY	63	12	70	15	60	63
ICELAND	0	5	0	6	4	4
INDIA	22	20	26	24	2862	2887
INDONESIA	28	19	33	22	497	519
IRAN _ISLAMIC REPUBLIC OF	30	21	37	26	193	249
IRELAND	8	7	10	8	55	60
ISRAEL	16	36	19	43	11	21
ITALY	34	28	41	34	154	194
JAMAICA	32	56	38	50	1	0

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JAPAN	20	35	24	42	101	229
JORDAN	5	28	6	33	7	15
KAZAKSTAN	146	8	70	10	0	183
KENYA	51	45	61	50	24	44
KIRIBATI	-	-	-	-	-	-
KOREA Democratic People's Republic of	-	-	-	-	-	-
KOREA Republic of	16	28	19	34	65	101
KUWAIT	-	-	-	-	-	-
KYRGYZSTAN	72	26	70	31	0	14
LAO People's Democratic Republic	-	-	-	-	-	-
LATVIA	37	15	45	18	10	11
LEBANON	19	39	23	46	4	7
LESOTHO	-	-	-	-	-	-
LIBERIA	-	-	-	-	-	-
LIBYAN ARAB JAMAHIRIYA	-	-	-	-	-	-
LITHUANIA	-	-	-	-	-	-
MACEDONIA The Former Yugoslav Republic of	28	25	34	30	4	5
MADAGASCAR	63	23	70	28	11	34
MALAWI	71	36	70	44	0	20
MALAYSIA	7	10	8	12	123	138
MALDIVES	-	-	-	-	-	-
MALI	115	22	70	26	0	35
MALTA	33	52	39	50	0	0
MAURITANIA	-	-	-	-	-	-
MAURITIUS	1	33	2	40	1	2
MEXICO	37	24	44	29	231	363
MOLDOVA Republic of	40	37	48	44	5	6
MONGOLIA	17	1	20	2	1	119
MOROCCO	13	24	15	29	66	97
MOZAMBIQUE	71	15	70	18	0	47
MYANMAR	105	43	70	50	0	64
NAMIBIA	54	4	65	4	1	33
NEPAL	124	106	70	50	0	0
NETHERLANDS	15	14	18	17	45	101
NETHERLANDS ANTILLES	-	-	-	-	-	-
NEW CALEDONIA	13	27	15	33	0	1
NEW ZEALAND	5	5	6	6	53	61
NICARAGUA	38	25	45	30	9	13
NIGER	131	57	70	50	0	0
NIGERIA	166	76	70	50	0	0
NORWAY	15	18	18	22	18	21
PAKISTAN	15	18	19	22	486	491
PANAMA	17	31	20	37	4	7
PARAGUAY	68	6	70	8	48	60
PERU	27	20	32	24	46	79
PHILIPPINES	51	33	61	40	104	115

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POLAND	34	15	41	18	208	218
PORTUGAL	14	27	17	33	22	35
ROMANIA	37	33	44	40	57	64
RUSSIAN FEDERATION	66	30	70	36	320	392
RWANDA	141	112	70	50	0	0
SAINT KITTS AND NEVIS	4	24	5	29	0	0
SAINT LUCIA	-	-	-	-	-	-
SAINT VINCENT AND THE GRENADINES	-	-	-	-	-	-
SAO TOME AND PRINCIPE	-	-	-	-	-	-
SAUDI ARABIA	18	15	21	19	43	119
SENEGAL	76	47	70	50	0	12
SEYCHELLES	-	-	-	-	-	-
SIERRA LEONE	-	-	-	-	-	-
SLOVAKIA	38	16	46	20	18	20
SLOVENIA	24	25	29	30	5	7
SOLOMON ISLANDS	-	-	-	-	-	-
SOUTH AFRICA	29	21	35	25	87	167
SPAIN	38	16	45	19	192	237
SRI LANKA	18	23	22	28	33	37
SUDAN	71	24	70	29	0	108
SURINAME	-	-	-	-	-	-
SWAZILAND	-	-	-	-	-	-
SWEDEN	40	22	48	27	31	35
SWITZERLAND	29	44	34	50	10	14
SYRIAN ARAB REPUBLIC	33	23	39	27	50	65
TAJIKISTAN	19	20	23	25	11	15
TANZANIA_ UNITED REPUBLIC OF	127	35	70	42	0	50
THAILAND	21	10	26	12	263	269
TOGO	95	59	70	50	0	0
TRINIDAD AND TOBAGO	-	-	-	-	-	-
TUNISIA	59	34	70	41	14	23
TURKEY	30	22	36	26	271	285
TURKMENISTAN	-	-	-	-	-	-
UGANDA	98	58	70	50	0	0
UKRAINE	58	24	70	28	142	145
UNITED ARAB EMIRATES	-	-	-	-	-	-
UNITED KINGDOM	29	24	35	29	189	219
UNITED STATES OF AMERICA	43	10	52	12	2811	2949
URUGUAY	24	7	29	8	22	33
UZBEKISTAN	16	16	20	19	95	115
VANUATU	-	-	-	-	-	-
VENEZUELA	13	22	15	26	61	83
VIET NAM	31	22	38	26	224	231
YEMEN	55	39	67	47	5	27
ZAMBIA	29	12	35	14	15	42
ZIMBABWE	39	21	47	26	14	29