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**GLOBAL PUBLIC GOODS AND POTENTIAL MECHANISMS  
FOR FINANCING AVAILABILITY**

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## **Table of Contents**

1.	INTRODUCTION	4
2.	GLOBAL PUBLIC GOODS - CONCEPTS AND DEFINITIONS	4
2.1	Geographical Range of Public Goods	6
2.2	Distinguishing GPGs and Externalities	6
2.3	Practicality of the GPGs Concept to Development Policy	7
2.4	Critical Review of GPGs to Development Policy	9
3.	CLASSIFICATION OF GLOBAL PUBLIC GOODS	10
3.1	Sectoral Classification	10
3.2	Types of Benefits	10
3.3	Dimensions of Publicness	10
3.4	Aggregation Technology	12
3.5	Economies of Scope and Subsidiarity	14
4.	PROVISION OF GLOBAL PUBLIC GOODS – DELIVERY SYSTEMS	10
5.	MECHANISMS TO FINANCE GLOBAL PUBLIC GOODS	15
5.1	Internalizing Externalities	15
5.1.1	Taxes User Charges, Fees and Levies	15
5.1.2	Market Creation and Strengthening	19

5.3	International Public Sources	20
5.4	National Public Sources	21
5.5	Private Sector Sources	23
5.6	Partnership Sources	24
6.	CONCLUDING RECOMMENDATIONS	24
6.1	Independent Financing of ODA and GPGs	24
6.2	Mechanisms for Financing GPGs Relevant to Developing Countries	25
6.3	Best Use of GPGs to Achieve Millennium Development Goals	25
6.4	Action Required at the Global and the Local Levels	29

## 1. INTRODUCTION

The Committee for Development Policy in its programming activities during its Fourth Session, focused on *global public goods (GPGs) and innovative financing mechanisms in the pursuit of sustainable development*. One objective related to this theme is to define the concept of sustainable development within the framework of the Millennium Development Goals (MDGs), adopted by the international community in 2000. The international community has recognized the growing importance of GPGs for sustainable development, and in particular, for achieving the MDGs. Another objective is to clarify the concept of Education for Sustainable Development. This is against the background that following the World Summit on Sustainable Development (WSSD) in September 2002, the second Committee of the UN officially adopted the UN Decade of Education for Sustainable Development (ESD) 2005 – 2014. Since achievement of the MDGs requires substantial funding, the final objective of this paper is to examine innovative mechanisms for financing GPGs.

## 2. GLOBAL PUBLIC GOODS – CONCEPTS AND DEFINITIONS

The **World Bank defines GPGs** as commodities, resources, services and systems of rules or policy regimes with substantial cross-border externalities that are important for development and poverty-reduction, and that can be produced in sufficient supply only through cooperation and collective action by developed and developing countries. In practical terms, the determination that the development community should work cooperatively to produce a desired quantity and quality of GPGs also involves consideration of how such action should be implemented and how collective financing can be employed to ensure that the respective public good is not undersupplied.<sup>1</sup>

The **UNDP defines GPGs** as a good meeting two criteria. First, their benefits have strong qualities of publicness, that is, they are marked by non-rivalry in consumption and non-excludability; these features place them in the general category of public goods. Second, their benefits are quasi-universal in terms of countries (covering more than one group of countries); people (accruing to several, preferably all, population groups) and generations (extending to both current and future generations, or at least meeting the needs of current and future generations without foreclosing development options for future generations). This makes humanity as a whole the beneficiary of GPGs.<sup>2</sup>

**Morrissey<sup>3</sup> defines a GPG** as a benefit providing utility that, in principle is available to the global population. They consider three types of benefits: provision of direct utility, risk reduction (or disutility), and capacity enhancement.

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<sup>1</sup> Development Committee (2000). “Poverty Reduction and Global Public Goods: Issues for the World Bank in Supporting Global Collective Action”, Washington DC.

<sup>2</sup> Kaul et al, eds. (1999). *Global Public Goods: International Cooperation in the 21<sup>st</sup> Century*, Oxford University Press.

<sup>3</sup> Morrissey, O. te Velde, D. and A. Hewitt (2002). “[Defining International Public Goods: Conceptual Issues](#)”. In M. Ferroni and A. Mody (eds) *International Public Goods: Incentives, Measurements and Financing*. Dordrecht: Kluwer Academic Publishers.

Anand<sup>4</sup> criticized the Kaul et al (1999) definition contending that it includes a substantially normative component based on the notion of sustainability. He argues that many public *goods* involve irreversible consequences by current generations. Furthermore, it is conceivable that some GPGs involve only the current generation. The Morrissey et al (2002) definition appears to limit GPGs only to *utilitarian* goods. Indeed, some GPGs may be important purely for intrinsic values and not because they generate utility for existing or future generations. However, this might be acceptable on the grounds that in the real world where important utility providing goods are undersupplied or mal-provided, the question of seeking international cooperation for intrinsic goods would be impractical (Anand, 2002).

Kaul et al stress the characteristics of non-rivalry and non-excludability of GPGs and adds a rather restrictive requirement for its geographical and temporal reach. In contrast, the World Bank does not even mention non-excludability and non-rivalry, but focuses on cross-border influences and collective action between countries. This is understandable, given that the collective action problems (e.g., free-riding, prisoner's dilemma, and tragedy of the commons) inherent to public goods in general apply to an even greater extent to GPGs. In terms of cross-border effects, spill-over across countries may vary significantly. These issues beg the question of how *international* a public good should be before it is considered global.

Further, the transition from acknowledging that a commodity, service or outcome is desirable, to declaring that it is a GPG is not straightforward nor automatic. It is a process conditioned by public awareness, political decisions, and collective action at the level of the international community (including governments, private sector and NGOs). It also leaves unanswered the question of for whom is the good desirable. The basket of public goods desired by populations in the North is likely to be different from those in the South. Morrissey et al attempt to get around this issue by arguing that, in principle if not in practice, benefits are available globally.

Despite the lack of consistency in the three definitions, the outlines of a broad agreement is converging around the fact that GPGs must be related to world-wide poverty reduction and a more equitable distribution of the benefits of social, economic and technical progress. It has been suggested that achieving equity at the international level and between generations may be considered a GPG in itself.<sup>5</sup> Thus, the contribution of a particular commodity, service or outcome to poverty reduction and to improvements in international equity could be used as one of the main criteria for deciding what is a GPG.<sup>6</sup> Moreover, since GPGs have to be produced, utilised or provided by some agent in a specific location, it is necessary to specify how far down the local-global continuum to

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<sup>4</sup> P. Anand (2002). "Financing the Provision of Global Public Goods". Discussion paper No. 2002/110, World Institute for Development and Economic Research (WIDER).

<sup>5</sup> J. Rao (1999). "Equity in a global public goods framework". In I. Kaul, I. Grunberg and M. A. Stem (eds), *Global Public Goods: International Co-operation in the 21<sup>st</sup> Century*, New York: Oxford University Press: 68–86.

<sup>6</sup> F. Sagasti and K. Bezanson (2001). "Financing and Providing Global Public Goods: Expectations and Prospects". Report prepared on behalf of the Institute of Development Studies for the Ministry of Foreign Affairs of Sweden, Stockholm.

draw the line between what is a GPG and the regional, national and local activities and policies that are necessary for it to materialise. There is also the need to specify the extent to which intergovernmental organizations (IGOs) and other actors are supposed to arrange for the provision of the GPG, and the extent to which they should intervene in regional, national or even local affairs to ensure that this happens.

## 2.1 Geographical Range of Public Goods

The geographical range over which goods exhibit features of publicness is termed spatial range<sup>7</sup> or spill-over range.<sup>8</sup> The spill-over ranges distinguished are: local, national, regional and global.<sup>9</sup> For a local public good (LPG) the benefits are substantially sub-national. For instance, a lighthouse benefits only ships within its radius of influence and in that sense is an LPG. National public goods (NPGs) are those with benefits accruing, largely, to the national public. Classic examples are education, defence, and material infrastructure. Similarly, regional public goods (RPGs) convey benefits to the public of nations with contiguous borders, adjusting, for instance, for issues specific to small island states.<sup>10</sup> The delineation between each point on the spectrum from local to global is unclear, the least evident being between GPGs and IPGs. In this regard several authors<sup>11</sup> consider it expedient and reasonable to treat GPGs and international public goods (IPGs) as synonymous<sup>12</sup>.

## 2.2 Distinguishing GPGs and Externality

Closely associated with, but separate from the notion of GPGs is the concept of *externality*. Externalities arise when the effects of certain actions are **not** borne directly by the responsible party but by someone else. Such externalities are frequently called third party effects and can be positive or negative. If the production of a private good causes a firm to release polluted water into a nearby river this producer is causing a negative externality. A positive externality is produced if the water is purified. If the cost associated with a negative externality is effectively attributed to the responsible agent the externality is regarded as *internalized*. Positive externalities are *internalized* when the value added by an actor's initiatives is confined to that actor.<sup>13</sup> In the final

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<sup>7</sup> GDF (2001). "Effective Use of Development Finance for International Public Goods". Chapter 5 in Global Development Finance, World Bank.

<sup>8</sup> T. Sandler (1999). "Intergenerational Public Goods: Strategies, Efficiency and Institutions". In I. Kaul, I. Grunberg and M. Stern (eds), Global Public Goods: International Cooperation in the 21<sup>st</sup> Century. New York: Oxford University Press.

<sup>9</sup> R. Kanbur, T. Sandler with K. Morrison (1999). "The Future of Development Assistance: Common Pools and International Public Goods". Policy Essay 25. Washington, D.C.: Overseas Development Council.

<sup>10</sup> M. Ferroni (2000), "Reforming Foreign Aid: The Role of International Public Goods", Operations Evaluation Department Working Paper Series, No. 4, World Bank, Washington, DC.

<sup>11</sup> Morrissey et al, 2002 op. cit. and Sagasti and Bezanson, 2001 op. cit.

<sup>12</sup> Sometimes IPG is used to signify that while benefits extend beyond national boundaries they may not apply everywhere on the globe. IPG and GPG are not clearly defined as one would wish. However, there is broad consensus regarding what is at stake and what is being discussed, despite the nuances of writers.

<sup>13</sup> P. Stalgren (2000). "Regional Public Goods and the Future of International Development Co-operation: A review of the Literature on Regional Public Goods". Working Paper 2000:2, Stockholm: Ministry for Foreign Affairs.

analysis, the motivation for providing GPGs arises from a desire to produce or enhance positive externalities and correct negative ones.<sup>14</sup>

### 2.3 Practicality of the GPGs Concept to Development Policy

There is a growing consensus regarding the existence of implications for development policy of the GPGs approach. First, the framework is aimed at implementing policies for correcting market failures through the increased production and consumption of public goods on a global scale. This is particularly relevant to developing countries where market failures are comparatively more pervasive. As a development paradigm, GPGs have already made important contributions in bringing together challenges and problems of development that have traditionally been treated as separate. For example, the GPGs concept has helped to effectively link the interdependency of communities with environmental concerns, the shared risks from major endemic diseases, shared benefits from peace and security, global inequities which threaten peace and security, and international financial stability. These linkages are serving as effective catalysts for collective action at all levels.

Second, the GPG concept draws attention to the limitations of current political, legal, institutional and financial arrangements for addressing many development issues. It is also expected that it may revive political commitment to expand official development assistance (ODA), since it highlights the universal benefits of GPGs.

Third, several points in the above discussion suggest that many challenges of poverty eradication have solutions that entail the provision of GPGs<sup>15</sup>. The litany of civil disturbances, conflicts, genocides, environmental and health concerns, among others, are consequences of under-provision or mal-provision of GPGs.<sup>16</sup> Indeed, the demand for GPGs is a claim for qualitative and quantitative improvements in global security, trans-boundary environmental regimes and policy, financial stability, and cures for contagious diseases.

Fourth, viewing the world from a GPGs perspective has brought greater awareness of the interdependence between developed and less developed countries. That is, it highlights both the *unidirectional* and *multi-directional* nature of spill-over and their implications for global cooperation and development.

Fifth, the framework has established critical connections between globalisation and GPGs. Held and McGrew<sup>17</sup> argue that contemporary globalisation is creating a world where the extensive reach of cross-country relations and networks is matched by

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<sup>14</sup> F. Sagasti and K. Bezanson (2001) op. cit.

<sup>15</sup> Development Committee (2000). "Poverty Reduction and Global Public Goods: Issues for the World Bank in Supporting Global Collective Action", Washington D.C.

<sup>16</sup> I. Kaul, P. Conceicao, K. Le Goulven and R. Mendoza (2003). "Why Do Public Goods Matter Today". In Inge Kaul, Pedro Conceição, Katell Le Goulven and Ronald U. Mendoza (eds). *Providing Global Public Goods: Managing Globalization*. New York: Oxford University Press.

<sup>17</sup> D. Held and A. McGrew (2003). "Political Globalisation: Trends and Choices". In Inge Kaul, Pedro Conceição, Katell Le Goulven and Ronald U. Mendoza (eds). *Providing Global Public Goods: Managing Globalization*. New York: Oxford University Press.

their high intensity, velocity, and impact propensity across many facets of life, and under these circumstances national policy responses are often ineffective. Discontent with globalisation often arises because GPGs are not provided or are mal-provided. The concept emphasizes that globalization of economic activities has created several fundamental gaps, which are negatively impacting economic and social progress. Specifically, Kaul argues that the *jurisdictional, participation and incentive gaps* are important obstacles in global policymaking that lead to under-provision or mal-provision of GPGs.<sup>18</sup>

The *jurisdictional gap* exists because of the discrepancy between global boundaries of major issues and essentially national boundaries of policymaking. Therefore, closing the jurisdiction gap will require reengineering of international cooperation to create a clear jurisdictional loop (i.e. coordinating national, regional and global actions).

The *participation gap* is due to international cooperation being essentially inter-governmental even though many other stakeholders contribute to GPGs. Closing the participation gap requires bringing governments, civil society, businesses and various interest groups around the bargaining table to seek consensual solutions. In some multilateral arenas where all countries have a seat, some countries clearly form the inner circle of decision-making, usually leaving the others in the outer circle when making decisions. In this regard, there is a vast gap in negotiating capacity between industrial and developing countries.<sup>19</sup> The GPGs approach calls for a democratic system, which provides for equal participation of rich, poor, strong, and weak in political processes. Such systems are characterized by voice, transparency, accountability and fairness.

The *incentive gap* is predicated on the evidence that moral suasion is insufficient for countries to correct their international spillovers or to cooperate for GPGs. The framework is committed to finding the optimal or first-best incentive structure, offering financial incentives as well as international recognition. Finally, the approach identifies international organizations as central to the provision of public goods in terms of resources, knowledge transfers, negotiations and rule making.<sup>20</sup> The information generated helps reduce transaction costs; create links across issues; and diffuse ideas, norms, and expectations. In addition, they negotiate rules for conditionality, sanctions, and even the use of direct force. The framework posits that international institutions must observe the principle of subsidiarity, partner with others to establish priorities, set

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<sup>18</sup> I. Kaul (2001). "Global Public Goods: Taking the Concept Forward". Discussion Paper 17, United Nations Development Programme, Office of Development Studies.

<sup>19</sup> Industrial countries generally have large delegations equipped with various kinds of negotiating and technical expertise, while developing countries often depend on one-person delegations. Moreover, a one-person delegation today does not necessarily have the same negotiating strength as a one-person delegation several years ago. The negotiating load has increased: the international policy agenda is lengthening, issues are becoming increasingly complex, organizations are multiplying, conference venues are being shifted from continent to continent, meetings are being held in parallel sessions, and "informal informals" are becoming a common negotiating tool. All this stretches small delegations to the limit.

<sup>20</sup> D. Kapur (2002). "The Common Pool Dilemma of Global Public Goods: Lessons from the World Bank's Net Income and Reserves". *World Development*, 30 (3): pp. 337-354.

standards, and use demonstration projects to create knowledge for action. By operating in a network-based system of governance, international institutions influence political decision making to advance global interests.

Although it is obvious that the provision of GPGs support and stimulates the development process, development itself is a prerequisite for nations to take full advantage of the benefits of GPGs. Insufficient development may imply lack of capacity to benefit from GPGs. Moreover, development fosters a resource base for financing GPGs.

#### **2.4 Critical Review of GPGs to Development Policy**

In many instances, countries acting in their own self-interest contribute to the provision of GPGs. For instance, safe financial systems, better public health, more research and development, better education, and reduced emissions of greenhouse gases (GHGs) are all beneficial from a domestic *and* international perspective. For this reason, the supply of GPGs will continue to depend on the willingness and ability of countries to devote national resources to domestic objectives that also contribute to international purposes and goals.<sup>21</sup>

One important implication of the concept of GPGs is that it is primarily the state which provides them. To clarify this point, one may distinguish between core and complementary activities. *Core activities* aim to produce GPGs that are provided via international cooperation. These include global and regional programmes undertaken with a trans-national or multi-country interest in mind, as well as activities focussed in one country with spill-over benefits to others. *Complementary activities* (primary the responsibility of nations) prepare states to consume GPGs that core activities make available, while simultaneously creating valuable NPGs.<sup>22</sup> As shown in table 1, research is a core activity in the creation of knowledge, but education is a complementary activity for its production; while provision of schools and teachers (an NPG in the form of education) is a complementary necessity for its consumption.

A core activity has its own cost to which the components of complementary activities should be added. For instance, reducing global warming is a core activity (table 1). However, this requires know-how derived from research, and then the solution or program needs to be applied (implementation); linking and monitoring these is a co-ordination function. Therefore, *research, co-ordination, and implementation* are three separate cost components in providing public goods. Research and coordination can be considered core activities whereas implementation requires complementary activities (which will tend to involve NPGs). The key point is that implementation costs are most relevant to low-income countries. Implementation requires complementary activities,

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<sup>21</sup> R. Cooper (2001). "Financing international public goods: A historical overview and new challenges". in C.D. Gerrard, M. Ferroni and A. Mody (eds), *Global Public Policies and Programs: Implications for Financing and Evaluation*, Proceedings from a World Bank Workshop held in Washington, D.C., 11–12 July, 2000.

<sup>22</sup> Development Committee (2001). "Poverty Reduction and Global Public Goods: A Progress Report", Washington D.C.

usually NPGs, and relates fundamentally to actions that reduce risk or enhance capacity in the development process.

### **3. CLASSIFICATION OF GLOBAL PUBLIC GOODS**

Several GPGs classification schemes have been employed in the literature. These schemes are essentially the product of combining two or more dimensions of publicness, and include classification by: (a) sectors; (b) type of benefits; (c) dimensions of publicness; and (d) aggregation technology. These classifications serve to highlight policy implications related to institutional designs, financing, and coordinating the supply of GPGs. This is important because calling different things by the same name leads to inaccurate analysis and policy prescription.<sup>23</sup>

#### **3.1 Sectoral Classification**

Morrissey, Gardiner and Le Goulven classify GPGs by sectors such as (i) environmental – oceans, climate, biodiversity; (ii) social – universal human rights, health, peace and security; (iii) economic – trade regimes, financial stability regimes; and (iv) institutional or infrastructure – physical and virtual, knowledge, good governance.<sup>24</sup> As indicated in tables 1 and 2, most aspects of the environment represents core GPGs conveying benefits of risk-reduction or direct utility. Eradication of a communicable disease is the core activity and research on how to eradicate or control the disease are complementary activities to producing the public good, and may be at national or international levels. If a target disease is contagious, each afflicted country must contribute to its control and reduction. This implies need for a health service (an NPG), which is a complementary activity.

#### **3.2 Types of Benefits**

Morrissey identifies three types of interrelated benefits that tend to give rise to pure public goods, namely: (i) risk reduction, (ii) enhancing capacity, and (iii) direct provision of utility. Logically, it is the range over which these benefits apply that determines whether a specific public good is national, regional, or international. If the benefit is to reduce risk or provide direct utility, the good produced would be a GPG, since in principle, everybody can benefit. If the benefit is to enhance capacity it is very likely that the spatial range will be limited (NPG). For instance, pollution of oceans imposes disutility at the international level, so its reduction is an IPG. However, reducing pollution of a lake will be national or regional, depending on whether or not countries share the resource.

#### **3.3 Dimensions of Publicness**

**Table 3** shows five categories of goods distinguished by the extent to which they fulfill the two properties of pure publicness.<sup>25</sup>

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<sup>23</sup> P. Stalgren (2000). “Regional Public Goods and the Future of International Development Co-operation: A review of the Literature on Regional Public Goods”. Working Paper 2000: 2, Stockholm: Ministry for Foreign Affairs.

<sup>24</sup> Morrissey et al (2002) and Gardiner and Le Goulven (2002).

<sup>25</sup> T. Sandler (2001). “On Financing Global and International Public Goods”. School of International Relations, University of Southern California, Los Angeles, CA 90089-0043; T. Sandler (1999). “Intergenerational Public Goods: Strategies, Efficiency and Institutions”. In I. Kaul, I Grunberg and M.

**Pure Global Public Goods** are non-rival and non-excludable. Examples include: containing the spread of contagious diseases since it conveys benefits to the entire at-risk population regardless of whether or not they supported containment; curbing global warming – because the reduced risk experienced by one agent from preventive measures does not limit the protection afforded to other agents; and publicizing basic research findings - research results once made public, diffuse among agents with the capacity to utilize them.

Financing for *pure GPGs* is particularly difficult. With pure public goods, there is always a *neutrality concern*, meaning collective financing crowds out voluntary national provision (see Warr, 1983; Cornes and Sandler, 1996). Crowding-out arises because one agent's provision is a *perfect substitute* for the contribution of others.

**Impure Public Goods** – benefits are either partially non-rival, partially excludable, or excludable at a cost (table 3). An example is ocean fisheries where rivalry applies because increased fishing by one agent limits the catch of others due to crowding. Controlling pests and organized crime, and alleviating acid rain display rivalry as efforts by one agent influence benefits available for others. Improvements to the environment or to security within a society stemming from these activities are, however, non-excludable. *Without excludability*, impure public goods are difficult to supply voluntarily. Neutrality is limited since contributions are less substitutable, and in some cases might promote sufficient private contributions.

**Impure Public Goods with Some Exclusion** – *benefits* can be withheld from non-payers. A country will not be protected by a missile defense system without contributing. Exclusion promotes voluntary financing and emergence of *club-like structures* that can charge a fee, providing use can be monitored. Because exclusion is incomplete, some degree of sub-optimality remains.

**Club Goods** – represent a class of GPG that holds the greatest prospect for self-financing without a push from a lead-nation or guidance from a supranational body. When the exclusion cost is sufficiently low and utilization can be monitored, users can form a club and provide themselves with the shared good. Nonmembers are excluded, while members pay a toll for each use or visit equal to the marginal crowding cost that results. The toll internalizes the crowding externality and resources are directed to their most valued use. Examples of club goods are: transnational parks (the Great Barrier Reef), tracts of pristine rain forests worldwide and national parks.

**Joint products** - simultaneously yield two or more outputs, with varying degrees of publicness. Several GPGs that are joint products are listed in Table 3. For example, rain forests are social products, whose preservation generates purely public benefits worldwide through carbon sequestration and biodiversity. Derived host-nation and regional benefits include erosion control, localized climate effects, watersheds, and eco-tourist sites. Localized benefits provide incentives for preservation and might motivate

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Stern (eds), *Global Public Goods: International Cooperation in the 21<sup>st</sup> Century*. New York: Oxford University Press; R. Kanbur, T. Sandler with K. Morrison (1999), op. cit.

individual contribution. Peacekeeping offers nation-specific benefits for those nearest to conflicts, and yields pure GPGs benefits in terms of enhanced political stability, reduced trade disruptions, and reduced human suffering.

### 3.4 Aggregation Technology

To address the possible configurations of public good provision, one needs to consider more than non-rivalry and non-excludability of benefits. A third aspect is the *aggregation (or production) technology*. Numerous aggregation technologies exist<sup>26</sup> however, the ones most relevant in the present context are summation, weakest-link, best-shot and weighted sum.

With *summation technology* - each unit contributed by an agent *adds identically and in a cumulative manner* to the overall supply available for consumption. This is expressed as:

$$Q = \sum_{i=1}^n q_i \quad (1)$$

where Q is the total supply of the public good and  $q_i$  is the contribution of the i-th country. Examples include (Table 4) air pollution where the total emissions equal the sum of pollutants emitted by all sources; accumulation of greenhouse gases; and cataloguing of species - each species identified adds to the total. Summation technology combined with non-rival and non-excludable benefits, causes financing uncertainties and the need for international coordination. Cooperation is unlikely if benefits to agents exceed the cost in terms of contribution.

With *weakest-link technology* - the smallest contribution fixes the total supply of the good:

$$Q = \min\{q_1, \dots, q_n\} \quad (2)$$

where  $q_i$  is country i's contribution to the public good. In Hirshleifer's (1983) paper, weakest-link was illustrated by dikes along a circular island, for which flood protection hinged on the height of the lowest level.<sup>27</sup> Another example is the integrity of a network where the least reliable part determines the reliability of the entire system. Weakest-link IPGs provides a compelling rationale for ODA. It is relatively easy to convince the North that ODA to fight contagious diseases in the South also provides safety at home. Partnerships to foster financing of weakest-link IPGs can be bilateral or multilateral, and intergovernmental organizations (IGOs) such as the World Health Organization (WHO)

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<sup>26</sup> M. Arce and T. Sandler (2001). "Transnational Public Goods: Strategies and Institutions". European Journal of Political Economy 17 (3): pp. 493-516; T. Sandler and K. Sargent (1995). "Management of Transnational Commons: Coordination, Publicness, and Treaty Formation". Land Economics, 71(2), pp. 145-162; S. Vicary and T. Sandler (2002). "Weakest-Link Public Goods: Giving in-kind or Transferring Money". European Economic Review.

<sup>27</sup> J. Hirshleifer (1983). "From Weakest Link to Best Shot: The Voluntary Provision of Public Goods". Public Choice 41: pp. 371-386.

can *coordinate* such partnerships. If the North has comparative advantage in providing a weakest-link GPG it should do so until the South builds its own capacity<sup>28</sup>

***Best-shot technology*** - represent a case where the level of public goods equals the *largest agent's provision*:

$$Q = \max\{q^1, \dots, q^n\} \quad (3)$$

where  $q^i$  is agent  $i$ 's contribution to the public good. When researching a cure for AIDS, the team expending the largest effort is most likely to succeed. Similarly, the next *green revolution* is likely to be discovered by the team with the greatest resources. In general, scientific and health breakthroughs abide by a best-shot aggregation technology. The underlying game is that of *coordination* where a single provider is needed and potential suppliers must decide amongst themselves which should expend the effort.<sup>29</sup> A number of institutional implications are associated with best-shot technologies (Table 4). For a best-shot IPG in the health sector, partners might include drug companies, poor countries, rich donors, and IGOs. Prospects for financing is poor when rich donors have no interest in a best-shot IPG. In the case of malaria, rich countries are unlikely to be motivated since it poses no threat to their population. Best-shot IPGs of no interest to rich donors need financing from IGOs, and or through partnerships to support important IPG for developing countries such as the Medicines for Malaria Venture.

With ***weighted-sum technology*** - the amount of public goods received by a nation is given by:

$$Q^i = \sum_{j=1}^n \alpha_{ij} q^j \quad (4)$$

where  $q^j$  is country  $j$ 's provision of the public good and  $\alpha_{ij}$  is the share of country  $j$ 's provision received by country  $i$ . This technology is best suited for RPGs, which impacts a few countries in a region.<sup>30</sup> The cleanup of sulfur emissions from power plants adheres to weighted sum, as location of pollution source makes a difference on the pattern of downwind deposits.<sup>31</sup> Efforts to control a pest also adhere to weighted sum when distribution of the pest is unequal, so that eradication efforts in its stronghold yield greater results than where the pest is less prevalent. The greater the country-specific benefits derived from a weighted-sum public good the greater the inducement to contribute. Identifying the weights may promote funding, thus limiting public-sector push or making it more effective.

<sup>28</sup> R. Jayaraman and R. Kanbur (1999). "International Public Goods and the case for Foreign Aid", in Inge Kaul, Isabelle Grunberg, and Marc A. Stern (eds), *Global Public Goods: International Cooperation in the 21<sup>st</sup> Century* (New York: Oxford University Press), pp. 418-435); S. Vicary and T. Sandler (2002) op.cit.

<sup>29</sup> T. Sandler and K. Sargent (1995), "Management of Transnational Commons: Coordination, Publicness, and Treaty Formation". *Land Economics*, 71(2), pp. 142-162; T. Sandler (1998), "Global and Regional Public Goods: A Prognosis for Collective Action". *Fiscal Studies*, Vol. 19, No. 3, pp. 221-247.

<sup>30</sup> P. Anand (2002). "Financing the Provision of Global Public Goods". Discussion paper No. 2002/110, World Institute for Development and Economic Research (WIDER).

<sup>31</sup> J. Murdock, T. Sandler and K. Sargent (1997). "A Tale of two Collectives: Sulphur versus Nitrogen Oxides Emission Reduction in Europe". *Economica*, 64(2), pp. 281-357.

### 3.5 Economies of Scope and Subsidiarity

If two or more GPGs can utilize the same administrative staff, communication network, meeting facilities, and research staff, then there exists cost in common arising from shared inputs.<sup>32</sup> Underutilized infrastructure is a primary source of economies of scope. As the infrastructure of an institution reaches full capacity, it must decide whether it is cheaper to increase capacity to accommodate more GPGs, or whether it's more economical to assign them to specialized institutions under its oversight or to independent institutions.

The *subsidiarity principle* places the problem on agents with the most at stake as well as ability to economize on transaction costs. Subsidiarity is relevant to a wide range of GPGs. For instance the Helsinki Protocol for reducing sulfur emissions in Europe is best handled by Europeans. Several forms of foreign assistance involving IPGs can be enhanced by the subsidiarity principle where a cross-border spillover is handled by the agency whose geographical mandate is closest to the underlying IPG's range of spillover. If the appropriate organization does not have the capacity, it should be augmented by assigning the problem to an agency with a larger geographical jurisdiction, unless economies of scope warrant otherwise.<sup>33</sup>

## 4. PROVISION OF GLOBAL PUBLIC GOODS - DELIVERY SYSTEMS

Elements of an idealized GPGs delivery system as articulated by Sagasti and Bezanson<sup>34</sup> are depicted in figure 1. This delivery system is comprised of the domains of the (a) global, (b) network, and (c) local. *The domain of the global* contains public goods that are related to the global commons, global policy outcomes and global knowledge. *The domain of the networks* contains a variety of institutional arrangements such as international organizations, partnerships, international financial institutions (IFIs), and operational policies and procedures that ensure that GPGs are made available. *The domain of the local* contains the multiplicity of national and local activities related to the production and consumption of GPGs, including domestic policies and incentives, national and local financial mechanisms, and the activities of government agencies, private firms, NGOs and individuals.

**Figure 1** also indicates that conventions, treaties and protocols that formalize agreements for providing a GPG (known as GPG regime) mediate between the upper two domains, while contracts, agreements and legal instruments mediate between the lower two domains. The seven critical components of the Sagasti-Bezanson idealized GPGs delivery system are<sup>35</sup>: (i) knowledge, (ii) public awareness and political decision, (iii) global public goods regimes, (iv) international organizations and partnerships, (v) financing mechanisms, (vi) operational policies and procedures, (vii) agreements and

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<sup>32</sup> Sagasti and Bezanson, (2001) op. cit.

<sup>33</sup> R. Jayaraman and R. Kanbur (1999). "International Public Goods and the Case for Foreign Aid", in Inge Kaul, Isabelle Grunberg, and Marc A. Stern (eds), *Global Public Goods: International Cooperation in the 21st Century* (New York: Oxford University Press), pp. 418- 435.

<sup>34</sup> F. Sagasti and K. Bezanson (2001). "Financing and Providing Global Public Goods: Expectations and Prospects". Report prepared on behalf of the Institute of Development Studies for the Ministry of Foreign Affairs of Sweden, Stockholm.

<sup>35</sup> For a detail description see Sagasti and Bezanson (2001).

contracts, and (viii) capabilities and arrangements for the inclusion of national and local entities in the provision and consumption of a GPG.

## 5. MECHANISMS TO FINANCE GLOBAL PUBLIC GOODS

Several mechanisms are available for financing the provision of GPSs. These are summarized in **Table 5** as internalizing externalities, private resources, public resources, and partnerships. These instruments are briefly outlined in the remainder of the section.

### 5.1 Internalising Externalities

As noted previously, externalities are internalized when the benefits or costs associated with a GPG are assigned or confined to the agents responsible for its production or consumption. Producers and consumers can be made to directly finance the provision of a GPG through (a) imposition of *taxes, user charges, fees and levies*; and (b) *market creation or strengthening*. In other words, the traditional national mechanisms utilized for internalizing externalities can, under certain circumstances, be applied globally.

#### 5.1.1 Taxes, User Charges, Fees and Levies

Imposition of taxes, charges, or user fees provides incentives to deter depletion; congestion, instability or other undesirable outcomes and simultaneously generate revenue to finance the provision of GPGs or development in general.<sup>36</sup> A few examples illustrate the potential of this instrument.

#### Carbon Taxes

Carbon taxes<sup>37</sup> constitute direct payments to government, based on the carbon content of the fuels consumed.<sup>38</sup> Its objective is to lower carbon dioxide emissions. Revenue earned from a Carbon Tax can be utilized to reduce taxes on the other factors of production, particularly on labour, and thus connect environmental protection and employment creation (a kind of win-win situation). When undertaken in such a manner, this is called a *revenue neutral tax* and is generally part of a broader package of environmental tax reform, which attempts to shift the tax burden from ‘*goods*’ like labour, to ‘*bads*’ like pollution.

The potential revenue from a Carbon Tax is substantial. A global tax of US\$21 per ton carbon (equivalent to US\$0.48 per gallon of gasoline) would yield US\$125 billion annually.<sup>39</sup> Accounting for projected increases in fossil fuel utilization, a tax rate of

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<sup>36</sup> E. Ostrom, J. Burger, C. B. Field, R. B. Norgaard, D. Policansky (1999). “Revisiting the Commons: Local Lessons, Global Challenges”. *Science Compass Review*, Vol. 284. Available from: [www.sciencemag.org](http://www.sciencemag.org).

<sup>37</sup> Are based on the *carbon content* of fuels consumed and should be distinguished from other energy taxes. An energy tax, or BTU tax, places the levy on the quantity of *energy consumed*. An ad valorem tax, taxes the final product, such as gasoline or heating fuel.

<sup>38</sup> Coal generates the greatest amount of carbon and is therefore taxed in greater proportion than oil and natural gas, which have lower carbon concentrations. Coal contains .03 tons of carbon per million BTU of energy, while oil and natural gas contain only .024 and .016 tons respectively.

<sup>39</sup> UN, General Assembly (2001). “Preparatory Committee for the International Conference on Financing for Development”. Technical Note No. 3: Existing Proposals for innovative sources of Finance, 20

US\$200 per ton or more would be required to bring about substantial reductions in carbon emissions.<sup>40</sup> Petroleum tax revenues in Germany in 1998 raised US\$38 billion; and in Britain in 1995, charges on transportation fuel raised US\$14 billion.<sup>41</sup> In terms of its distributional impact a carbon tax will most probably be regressive, *ceteris paribus*. This is because fuel expenditure typically accounts for a disproportionately larger share of the budget of low-income groups. However, the mitigating effects of the tax on global warming should compensate for the negatives.

Domestic taxing authorities would administer the tax in a similar way to value-added taxes (VAT) or sales taxes. Experience in Europe suggests a collection cost of less than one per cent.<sup>42</sup> Denmark, Finland, Germany, the Netherlands, Norway and Sweden have already levied energy or carbon taxes and other EU members are inclined in this direction. Thus, lead countries are emerging that could steadily overcome opposition and facilitate implementation.<sup>43</sup>

### **Aviation Tax and User Charges**

At least three versions of this tax have been proposed: (i) an aviation fuel or kerosene tax; (ii) a charge on passenger and freight tickets; and (iii) a user charge based on aircraft emissions. The potential revenue from a kerosene tax<sup>44</sup> is substantial. Aviation fuel cost US\$ 50 billion in 1998; a tax of 25 per cent on this expenditure could raise US\$12.5 billion in revenue.<sup>45</sup> A tax on international passenger and freight tickets can be justified as a charge for use of global airspace (global common). This tax could generate annual revenues of 10-16 billion Euros.<sup>46</sup> The final version of the aviation tax proposal entails auctioning of emissions permits for polluting the airspace. Emissions trading (ET) offers the opportunity to address the increase in greenhouse gases that will not be fully offset by either technological innovation or improvements in airline operations.<sup>47</sup> The German Advisory Council on Global Change (WBGU) argues that if

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September; R. Cooper (2002). "Toward a Real Global Warming Treaty: The Case for a Carbon Tax". Foreign Affairs, (March/April).

<sup>40</sup> R. Cooper (1998). "Toward a Real Global Warming Treaty: The Case for a Carbon Tax". Foreign Affairs, (March/April).

<sup>41</sup> OECD (2001). "Environmentally Related Taxes in OECD Countries: issues and strategies". Paris: OECD.

<sup>42</sup> European Commission (2002). "Responses to the Challenges of Globalization: A Study on the International Monetary and Financial System on Financing for Development". Available on [www.globalpolicy.org/socecon/un/unctad/2002/0228euglobal.htm](http://www.globalpolicy.org/socecon/un/unctad/2002/0228euglobal.htm).

<sup>43</sup> (Baumert, 1998)

<sup>44</sup> Currently, aviation fuel used in international flights is exempted from fuel taxes under an international convention, putting other less polluting forms of transportation like sea and rail at a competitive disadvantage (ENDS Environmental Daily, 1998).

<sup>45</sup> J. Lee, S. Lukachko, I. Waitz and A. Schafer (2001). "Historical and Future Trends in Aircraft Performance, Cost and Emissions". Annual Review of Energy and the Environment, 26: pp. 167-200.

<sup>46</sup> ICAO (2000). ICAO Annual Report of the Council. Available at: [www.icao.org/icao.int/index.cfm](http://www.icao.org/icao.int/index.cfm).

<sup>47</sup> S. Gander and N. Helme (1999). "Emissions Trading is an Effective, Proven Policy Tool for Solving Air Pollution Problems". ICAO Journal Vol. 54 (7): p. 12.

such permits were auctioned globally and annually, the revenue generated will be similar to that from a kerosene tax.<sup>48</sup>

In the short-run, an aviation tax could reduce demand in an industry that at the moment is under severe financial strain. Until the finances of the industry improve, governments are unlikely to impose such a tax. Projections of rapid growth and consolidation of the industry suggest that in the medium-term it should return to profitability, at which time a tax might seem feasible. A charge on airline tickets or freight would be relatively straightforward and could be collected by the airlines. It also has the advantage that existing international aviation laws allows it.<sup>49</sup> Norway, for instance has applied a 'green' levy on all national flights for which there is an alternative by rail and on all international flights originating in Norway.<sup>50</sup>

The EU has pushed for agreement on the principle of a global tax on aviation fuel at the Earth Summit in June 1997. The US, UK and Australia, are its most outspoken opponents, and have so far prevented its wide-scale implementation in the EU. The main impediment is the fear that non-EU countries not imposing the tax would have a competitive advantage. In conclusion, an aviation tax is promising given its limited reach (aviation sector only), strong concern regarding GHG emissions from air travel, and relatively strong EU support for the measure.

### **Currency Transaction Tax (CTT)**

Recent studies and articles in several scholarly journals have examined the feasibility and desirability of a CTT<sup>51</sup> to promote exchange rate stabilization as well as to generate revenue for IPGs. Over US\$1.5 trillion of foreign exchange transactions take place daily, a volume exceeding the M-1 money supply of the US or the combined foreign reserves of all the world's central banks.<sup>52</sup> Less than 5 per cent of these transactions are necessary to cover international trade, travel and long-term investments. More than 50 per cent of the transactions represent destabilizing activities such as arbitrage, noise trading and speculation on major currency price adjustments.<sup>53</sup>

The potential revenue from a CTT is enormous. A tax of 0.2 per cent combined with a 50 per cent reduction in transactions and existing trading volume of US\$300 trillion would generate annual revenue of about \$300 billion.<sup>54</sup> A tax of 0.1 per cent

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<sup>48</sup> WBGU (2002). "Charging the Use of the Global Commons". Special Report. German Advisory Council on Global Change, Berlin.

<sup>49</sup> Ibid.

<sup>50</sup> A. Bleijenberg, and R. Wit (1998). "European Environmental Aviation Charge: Feasibility Study". Delft: Centre for Energy Conservation and Environmental Technology.

<sup>51</sup> P. Arestis and M. Sayer (1997). "Many Cheers for the Tobin Tax?" and J. G. Smith, "Commentary: Exchange Rate Instability and the Tobin Tax," Cambridge Journal of Economics, Volume 21, Issue 6: November 1997.

<sup>52</sup> R. Mendez (1994). "The provision and Financing of Universal Public Goods". Center for the Study of Global Governance, Discussion Paper No. 7, London School of Economics.

<sup>53</sup> P. Wahl and P. Waldow (2001). "Currency Transaction Tax - a Concept with a Future – Chances and Limits of Stabilising Financial Markets Through the Tobin Tax". Bonn, WEED, February.

<sup>54</sup> Bernd P. Spahn (2002). "On the Feasibility of a Tax on Foreign Exchange Transactions". Report to the German Federal Ministry for Economic Cooperation and Development, Bonn.

would yield annual revenue of US\$132 billion.<sup>55</sup> Travellers and workers sending remittances would pay an extremely small share of the tax. Non-financial firms can be expected to pass through some of the tax's effect to higher prices; however, only very slight additional costs would be borne by low-income groups. The outcome of a CTT would be strongly redistributive, since it would dampen speculation and avoid financial and economic instability. Its *spending outcome* has a problematic aspect, since currency exchange transactions are concentrated in just a few countries. The US, Japan and the EU account for 75 per cent of global currency trades; Switzerland, Hong Kong and Singapore account for another 15 per cent.<sup>56</sup>

There are two main explanations why the CTT proposals have not gained substantial momentum since they were advanced in 1972. First, no country will take the lead and unilaterally adopt a CTT with the expectation that other nations will follow. Second, disagreement over its allocation is extremely likely because a global CTT would raise substantial revenues. Critics maintain that a global CTT would be difficult to collect, since traders are expected to devise avoidance schemes such as (i) creation of non-taxable instruments (special derivatives), and (ii) use of tax-free havens (offshore centres) to shelter trades. However, supporters of CTT<sup>57</sup> have outlined convincing proposals that would block most avoidance schemes. A UN paper concludes that this tax would be administratively inexpensive and compliance costs would be low.<sup>58</sup>

### **Email, Internet or Bit Tax**

This tax consists of a charge for using the Internet, based on the amount of data transmitted. This charge does not intentionally seek to discourage Internet use; its purpose is to generate revenue to be used for narrowing the North-South *digital divide*. An individual sending 100 emails per day, each containing a 10-kilobyte document, could for instance pay a tax of just 1 cent. The UNDP<sup>59</sup> estimated that globally in 1996, a bit tax would have yielded \$70 billion per annum. At the present time Internet users frequently send documents larger than 10-kilobyte at higher transfer rates relative to 1996; also the number of Internet users has grown enormously since 1996. For these reasons, the tax could be substantially below that proposed by the UNDP and still produce large revenue with negligible impact on users.

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<sup>55</sup> UN, General Assembly (2001). "Preparatory Committee for the International Conference on Financing for Development". Technical Note No. 3: Existing Proposals for innovative sources of Finance, 20 September.

<sup>56</sup> J. Paul and K. Wahlberg (2001). "Global Taxes for Global Priorities". Paper prepared in conjunction with a roundtable on Global Taxes for Global Priorities, 5 May.

<sup>57</sup> R. Schmidt (1999). "A Feasible Foreign Exchange Transactions Tax". Paper presented to the North-South Institute. Ottawa, March; Bernd P. Spahn (2002) op. cit.; P. Wahl and P. Waldow (2001). "Currency Transaction Tax – a concept with a Future – Chances and Limits of Stabilising Financial Markets Through the Tobin Tax". Bonn, WEED, February.

<sup>58</sup> UN, General Assembly (2001). "Preparatory Committee for the International Conference on Financing for Development". Technical Note No. 3: Existing Proposals for innovative sources of Finance, 20 September.

<sup>59</sup> UNDP (1999). "Reinventing Global Governance for Humanity and Equity", in Human Development Report 1999. New York: Oxford University Press, 97-114.

## **World Trade Tax**

A trade tax can be justified based on the benefit criterion - 95 per cent of all goods are transported via the oceans, so it can be viewed as a user fee. The first proposal to tax world trade was advanced by the Brandt Commission (1980)<sup>60</sup> as part of the concept of a new international economic order (NIEO). According to the WTO (2001)<sup>61</sup>, world trade in 2000 was US\$ 6.2 trillion. Assuming an elasticity of 5 per cent in response to a 1 per cent tax, this tax would have yielded US\$ 58.9 billion in revenue in 2000. To the extent that the tax would lower trade emanating from developing countries, it would adversely affect their growth prospects, *ceteris paribus*. However, the tax would be highly progressive, given the large share of international trade in the OECD countries.

## **International Arms Trade Tax**

Arms trade could be taxed based on Pigouvian principles. The volume of trade in arms is large and its public bads particularly severe. Taxation would serve the double purpose of generating global revenue and reducing the volume of goods that produce negative externalities globally. Conceptually, an arms trade tax transfers resources from national military budgets to the provision of GPGs, such as peacekeeping. Proposals for this tax have come from sources such as the government of Saudi Arabia, the Brandt Commission and the UNDP.<sup>62</sup> The international arms trade was valued at about US\$25-30 billion in the period 1990-2000. Taking major conventional weapons as a benchmark and assuming a small volume reduction due to the tax effect, and 5 per cent tax rate, an estimated US\$1.2 billion can be expected from this tax.

### **5.1.2 Market Creation and Strengthening**

Since Pigou's (1920) influential work emphasizing the efficiency-enhancing role of taxes in correcting negative externalities, the choice of instruments has received much attention. Environmental economists distinguish between command and control (CAC) measures and the use of market-based incentives (MBIs). Recently, MBIs have played an increasing role in environmental policymaking, reflecting their perceived advantage relative to CAC. Since the Kyoto Protocol of 1997 much debate has focused on tradable permits or emission trading (ET).

## **Leases, Sale and Trading Permits**

These are potential revenue sources as well as mechanisms for reducing the damage to environmental resources. For example, long-term leases could be granted to firms for using assigned areas of the oceans for particular species of fish. Fishing firms with leases would be motivated by self-interest to maintain sustainable yields in these

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<sup>60</sup> Brandt Commission (1980). "North-South: A Programme for Survival", The Report of the Independent Commission on International Development Issues under the Chairmanship of Willy Brandt, London: Pan Books.

<sup>61</sup> WTO (2001). Global Trade Statistics. Geneva.

<sup>62</sup> R. Mendez (1994). "The provision and Financing of Universal Public Goods". Center for the Study of Global Governance, Discussion Paper No. 7, London School of Economics; D. Najman and H. D'Orville (1995). "Towards a New Multilateralism: Funding Global Priorities: Innovative Financing Mechanisms for Internally Agreed Programmes", Paris: Independent Commission on Population and Quality of Life and Committee for Development Planning Report, 4-8 May 1998, E/1998/34.

resources. Another means of internalizing the social and environmental costs of pollution is the sale and international trading of permits to pollute.

### **GHG Emissions Trading System**

Emissions trading (ET) among industrialized countries is a major component of the Kyoto Protocol to the UNFCCC under Article 17. The provision was strongly endorsed by the US in light of its objection to international taxation.<sup>63</sup> ET operates on the premise that some firms and countries are more cost-effective than others in reducing emissions regardless of international borders. International trading in emissions is justified in that consequences of climate change (coastal flooding, increased incidence of violent storms, sea level rise, crop loss, etc.) have no correlation with the origin of carbon emissions. Under an ET regime, an overall “*cap*” is established to limit the total amount of emissions over a specified period for a set of sources. Each source is allotted a portion of the capped quantity, or acquires it through auctions. Each allotment, known as an *allowance, permit or credit*, represents an authorization to emit one unit of pollution. Firms and countries that reduce their emissions to levels below their permits may sell excess units or reserve them for use or sale later. Those sources that cannot make economic reductions sufficient to meet their requirements must purchase permits. This creates a *win-win* situation whereby all sources are in compliance; the beneficiaries are the environment and global society.

Examples of trading programmes are worth mentioning to emphasize the breadth of coverage both geographically and in terms of issues. Examples include: (i) the U.S. system for controlling emissions of sulfur dioxide from electricity generators (Sandor, 2002);<sup>64</sup> (ii) U.S. trading programme as part of its phase-out of leaded gasoline through *oil refinery lead usage rights*; (iii) the Montreal Protocol allowed emissions trading as a component of the programme for eliminating chlorofluorocarbons (CFCs); (iv) tradable fisheries quota in the EU and New Zealand; (v) GHG gas emission reduction trading (GERT) and pilot emission reduction trading (PERT) in Canada; and (vi) internal trading adopted by British Petroleum, Amoco and other companies to achieve voluntary commitments to reduce production related carbon dioxide emissions.

### **5.3 International Public Sources**

**Table 6** provides examples of international financial institutions (IFIs), and intergovernmental organizations (IGOs) such as the United Nations and its agencies that provide GPGs. It also explains the properties of the goods provided and how this influences the design of the various institutions as well as their financing arrangements.

**International Financial Institutions (IFIs)** are mainly the Bretton Woods institutions, i.e. World Bank and the IMF. World Bank funding for GPGs is obtained from net

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<sup>63</sup> The United States Congress blocked any dialogue from taking place within the United Nations regarding international taxation. Led by former Senator Helms, US payments to the United Nations are now conditional upon the UN abandoning efforts which develop, advocate, promote, or publicize proposals that impose taxes or fees on US citizens.

<sup>64</sup> R. Sandor (2002). Emissions Trading: Financing Environmental Public Goods at Least Cost”. In I. Kaul, K. Le Goulven and M. Schnupf (eds) – Global Public Goods Financing: New Tools for New Challenges. New York: United Nations Development Programme, Office of Development Studies.

income and administrative budgets, member contributions and management of various trust funds. Within the World Bank Group, loan rates depend on the per capita GDP of the debtor nation; the poorest qualify for low-interest IDA loans while richer countries must borrow at the higher IBRD rates. The IMF's role in the provision of GPGs is centered on *financial stability*. The IMF raises its funds primarily from quota subscriptions, or membership fees. One potential source of financing GPGs is the creation of *Special Drawing Rights*<sup>65</sup>, the original intention being to allow international reserves to be increased in line with needs without imposing costs on member countries. Although this mechanism has not been activated since 1981, it could be used to enhance GPGs. A similar argument could apply to the sale of gold reserves held by the IMF.<sup>66</sup>

**Intergovernmental Organizations (IGOs)** have been central to the provision of public goods through their financial resources, knowledge transfers, global negotiations, and rule making (Kapur 2002).<sup>67</sup> In addition, they negotiate and manage rules for conditionality, sanctions, and even the use of direct force (as in the case of NATO). A summary of the international organizations (including IFIs) financing GPGs is provided in **Table 6**; accordingly, only a few IGOs are discussed below.

United Nations – is the umbrella organization for several specialized agencies (e.g., WHO and FAO). It is funded through membership fees and donated trust funds. Several GPGs are supplied by the UN taking advantage of economies of scope stemming from its infrastructure. Regular membership assessment is guided primarily by the *ability-to-pay* principle. Assessments are revised periodically to reflect changes in income of member states. In its role as supplier of information, the UN sells its publications and, in so doing, uses exclusion of impure public goods to establish a market in information.

UN Environmental Program (UNEP) – manages a broad range of environmental programmes including treaties to limit CFCs, sulfur, nitrogen oxides, and other pollutants (Sandler, 1997).<sup>68</sup> UN membership fees and grants from various stakeholders fund UNEP. Thus, an official push is required and received from lead-nations in environment policy. For most environmental treaties, significant country-specific benefits accrue from either joint products or a weighted-sum technology; this induces signatories to finance their own cutbacks. It supplies minimal infrastructure in terms of making texts of treaties available and collecting signatures of ratifying countries.

#### **5.4 National Public Sources**

The amounts spent by developing countries to finance GPGs are not exactly known. However, it is known that they provide the major endowment of biodiversity, of sinks for greenhouse gases, and resources to cover cost of national and local activities (complementary activities) required for the provision of GPGs. Additionally, they provide direct financing for cooperative programmes with others, mostly developing countries.

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<sup>65</sup> Buria, 2002; Kaul and Le Goulven, 2003

<sup>66</sup> F. Sagasti and K. Bezanson (2001) op. cit.

<sup>67</sup> D. Kapur (2002), op. cit.

<sup>68</sup> T. Sandler (1997) op. cit.

Kaul and Le Goulven<sup>69</sup> estimate national public spending on public goods worldwide at US\$6 trillion, US\$5 trillion occurring in developed countries and US\$1 trillion in developing countries. Further, national spending is about 200 times international spending (1:200 ratio). National public spending for provision of GPG can be broken down, for convenience, into those from developed countries and developing countries. In the case of the former this is mainly via (a) official development assistance (ODA) and (b) debt relief and debt-for-sustainable development swaps. With respect to developing country sources this is mainly by reducing or removing perverse subsidies.

### **Official Development Assistance (ODA)**

In recent years ODA has exhibited a declining trend. In 2000, ODA fell to its lowest level ever, contracting to US\$53 billion from US\$56 billion a year earlier. ODA in 2000 represents only 0.22 per cent of the GNP of DAC countries, less than a third of the target of 0.7 per cent. One estimate indicates that at least 15 per cent of ODA is being spent on providing GPGs.<sup>70</sup> Using a different methodology, Raffer<sup>71</sup> estimates that at least 40 per cent of ODA has been spent for GPGs over the last few years. Calculations show that if the ODA target of 0.7 per cent of GNP were met in 2000 this would have translated into an additional US\$106 billion.

### **Debt Relief and Debt-for-Sustainable Development Swaps**

During the past several years, major donors have supported the initiative to write off the official debt of a group of heavily indebted poor countries (HIPCs). There is also an enhanced HIPC initiative that is a two-step process of debt relief from bilateral and multilateral creditors available to qualified HIPC countries. Under the enhanced HIPC, 42 countries are eligible, 34 in Africa, 24 of which have reached the decision point. Countries qualify for debt relief at the *decision point*, when they have demonstrated adequate adherence to an IMF program and progress toward developing a national poverty reduction strategy (NPRS). At the *completion point*, countries obtain debt relief once they have completed and committed to a comprehensive poverty reduction strategy paper (PRSP). The 24 countries that have reached the decision point, (majority in Sub-Saharan Africa) should receive some \$56.4 billion in debt relief.

### **Reducing or Removing Perverse Subsidies**

A joint World Bank-IMF-UNEP study identified several areas where developing countries could free resources for financing sustainable development. These include the removal or reduction of subsidies in energy, water and to municipal solid waste sectors (MSWS)<sup>72</sup>. According to a study published by the World Bank<sup>73</sup> in 1999 developing

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<sup>69</sup> I. Kaul, P. Conceicao, K. Le Goulven and R. Mendoza (2003). "Why Do Public Goods Matter Today". In Inge Kaul, Pedro Conceição, Katell Le Goulven and Ronald U. Mendoza (eds). *Providing Global Public Goods: Managing Globalization*. New York: Oxford University Press.

<sup>70</sup> Development Committee (2001). "Poverty Reduction and Global Public Goods: A Progress Report", Washington D.C.

<sup>71</sup> K. Raffer (1999). "ODA and Global Public Goods: A Trend Analysis of Past and Present Spending Patterns". ODS Background Papers. New York: Office of Development Studies, United Nations.

<sup>72</sup> This presentation is highly summarized, only presenting dollar values involved, interested readers should consult the document – "Financing for Sustainable Development". IBRD/World Bank, Washington DC, July 2002.

countries subsidized electricity at a rate of 46 percent, for a total subsidy of US\$102 billion, or 2 percent of the developing world's GDP. The report, however, cautioned that the effect on the public budget and the efficiency gains differs greatly across countries.

According to the same report<sup>74</sup> developing countries spend an estimated US\$10 to US\$15 billion per year subsidizing irrigation water. In India for example, the subsidy is almost US\$5 billion. The salient message is that reducing irrigation subsidy and placing a price on irrigation water is necessary to increase efficiency and sustainability of the irrigation systems. Irrigation pricing reform, however, is a rather sensitive political issue in most developing countries. The IBRD (2002) observes that municipal solid waste collection imposes heavy fiscal burden on municipalities in developing countries, consuming around 20 to 50 percent of their budgets. It is estimated that implicit subsidies represent US\$11.4 per urban citizen per year. Despite this expenditure, low levels of solid waste collection and inadequate disposal are responsible for severe environmental and health problems, a situation that is aggravated by rapid urbanization.

## **5.5 Private Sector Resources**

Foreign direct investment (FDI) and other long-term private flows have strong impact on development through technology transfer, employment generation, national capacity building, diversification of production, well-functioning infrastructure, and entrepreneurial capacity. Thus, measures to promote such flows are desirable, within an appropriate policy framework. In 1992, FDI flows to developing countries were US\$36 billion. By the close of the decade, it climbed to over US\$160 billion. However, 75 per cent of FDI went to just ten middle-income developing countries. Moreover, FDI is heavily concentrated in the automotive, chemical, electronic, energy, petroleum and petrochemicals, and pharmaceutical sectors.

### **For-Profit Corporations**

In 1998, there were more than 47,000 foundations in the US holding assets of over \$385 billion (Foundation Center, 2000).<sup>75</sup> Donations doubled in five years, from \$11.3 billion in 1994 to \$22.8 billion in 1999. While only a small proportion of this has been disbursed for international programs, nearly all of it is dedicated to the pursuit of public goods. Fortunately, the international proportion is increasing as globalization has brought a geographically broader sense of social responsibility.

### **Non-Profit Corporations**

In recent years, independent foundations have been active in a number of areas, such as the International AIDS Vaccine Initiative (e.g., Rockefeller Foundation), pioneering biodiversity conservation efforts in developing countries with funds upwards of US\$50 million during the 1980s and 1990s (e.g., MacArthur Foundation) and conflict prevention (e.g., Carnegie Corporation of New York). International giving by all US independent foundations (including grants to overseas organizations and to US-based

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<sup>73</sup> IBRD 2002, loc. cit.

<sup>74</sup> IBRD 2002, loc. cit.

<sup>75</sup> Foundation Center (2000). International Grant-making II: An Update on US Foundation Trends, Washington, DC: Foundation Center.

recipients for international purposes) reached an estimated US\$1.6 billion in 1998, up from US\$400 million in 1990. This is, nonetheless, a small fraction of total US foundation grant making, which exceeded US\$22 billion per year by the end of the 1990s.<sup>76</sup>

## 5.6 Partnership Sources

Good candidates for applying pull mechanisms are activities that offer the eventual prospect of a commercially run business, for example, developing and distributing new drugs and vaccines, bridging the digital divide, and increasing agricultural productivity in developing countries. Excellent examples of private-public partnership (PPP) are the *Medicines for Malaria Venture (MMV)* and, the *Onchocerciasis Control Program (OCP)*. These are partnerships between WHO, World Bank, Rockefeller Foundation, and associations of pharmaceutical companies. The MMV partnership concentrates resources to achieve best-shot IPGs of discovering new medicines. The GEF is also a type of PPP, involving the World Bank, UNDP, UNEP, and donor countries, private foundations, and international NGOs.

## 6. CONCLUDING RECOMMENDATIONS

### 6.1 Independent Financing of ODA and GPGs

During the 1990s, ODA flows stagnated in nominal terms and declined in real terms. Simultaneously, new demands began to account for a growing share of the diminishing pool of ODA funds<sup>77</sup>. It is difficult to define and specify spending on GPGs as a share of ODA, but Cook and Sachs<sup>78</sup> and Morrissey<sup>79</sup> indicate that the proportion of ODA allocated to GPGs have been increasing, from about 4 per cent in 1980 to around 10 per cent currently. Kaul et al<sup>80</sup> estimates that the proportion is in about 25 per cent, and the World Bank estimates that it may be between 30 to 40 per cent.<sup>81</sup>

Against this background, at least two related arguments have been advanced. The first argument contends that since GPGs are crucial to achieving the Millennium

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<sup>76</sup> Ibid.

<sup>77</sup> This resulted in growing competition for the funding of traditional ODA activities (such as infrastructure health and population, food and nutrition, education and training, small and medium size enterprises and technical assistance and the new ODA activities (including GPG) such as flood control; disease eradication; curbing groundwater pollution; curbing global warming; abatement of regional emissions; irrigation systems; post conflict reconstruction; humanitarian relief; assistance to refugees; debt forgiveness; support for democratic institutions; improvement of global governance structures; assistance to transition economies; efforts to fight drug traffic and crime; organizing legal, economic, and social framework; and a host of other new demands.

<sup>78</sup> Sachs (1999)

<sup>79</sup> O. Morrissey (2000). "Pro-poor International Goods": Remarks at a meeting, Overseas Development Institute, 15 November 2000.

<sup>80</sup> I. Kaul, P. Conceicao, K. Le Goulven and R. Mendoza (2003). "Why Do Public Goods Matter Today". In Inge Kaul, Pedro Conceição, Katell Le Goulven and Ronald U. Mendoza (eds). *Providing Global Public Goods: Managing Globalization*. New York: Oxford University Press.

<sup>81</sup> Development Committee (2000). "Poverty Reduction and Global Public Goods: Issues for the World Bank in Supporting Global Collective Action", Washington D.C.

Development Goals, financing their provision is a justifiable component of ODA<sup>82</sup>. The EU, however, argues that in order to ensure transparency and accountability, it may be desirable to finance GPGs through special dedicated funds.<sup>83</sup> The second argument is essentially one of *additionality*. Central to this argument is the recognized risk that resources could be *reallocated* from low-income to middle-income countries. Therefore in order to systematically examine the issue of *additionality*, it is necessary to separate resources earmarked for GPGs from those geared to traditional ODA. This would allow sequential tracking of allocation patterns between these two categories.<sup>84</sup>

## **6.2 Mechanisms for Financing GPGs Relevant to Developing Countries**

While there is renewed interest in the long-standing proposals for international taxes and fees to fund GPGs, these sources are unlikely to be significant in the short-term.<sup>85</sup> In the medium to long-term, international taxes and fees might be feasible for funding GPGs (as well as disincentives for correcting global public bads. The less than optimistic prospect for international taxes, charges and fees is conditioned by several factors. For example, the carbon tax, the aviation tax, and the bit tax could only go forward providing there are lead-countries. The rationale being that within international law, very few treaties or conventions are embraced by all nations. Several important initiatives have been and will continue to proceed without the cooperation of some key countries (e.g., the Kyoto Protocol will go forward without universal participation).

In conclusion, the most reliable mechanisms for financing GPGs in developing countries appear to be (a) ODA – particularly if rich countries honour their commitment of 0.7 per cent of DAC/GNP this would provide an additional US\$100 billion over the actual for 2000; (b) IFIs – including special drawing rights and the sale of gold reserves by the IMF; (c) continued and increased support by the World Bank; (d) UN through its assessment fees; (e) debt-relief under the extended HIPC initiative; (f) freeing resources particularly through removal or contraction in energy subsidies, water subsidies and MSWS; (g) speeding macroeconomic reforms in order to create a more favourable investment climate to attract FDI; (h) attracting grants from both for-profit and non-profit foundations; and (i) forming more private-public partnerships (PPP).

## **6.3 Best Use of GPGs to Achieve Millennium Development Goals**

A number of GPGs could produce high payoffs in terms of contributing to the realization of the targets set by the MDGs and ESD. Below, we list several GPGs according to their potential contribution to each of the eight MDGs and suggest options for their financing.

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<sup>82</sup> Development Committee (2001). “Poverty Reduction and Global Public Goods: A Progress Report”, Washington D.C. R. Kanbur, T. Sandler with K. Morrison (1999), op. cit.

<sup>83</sup> EU Council (2001) Council of the European Union Brussels, 11 December 2001.

<sup>84</sup> I. Kaul, P. Conceicao, K. Le Goulven and R. Mendoza (2003), op. cit.

<sup>85</sup> Development Committee (2001). “Poverty Reduction and Global Public Goods: A Progress Report”, Washington D.C.

## **Goal 1: Eradicate Extreme Poverty and Hunger**

There are close relationships between *economic growth, openness to trade, capacity building, financial stability and market efficiency, and agricultural research*. These are necessary preconditions for poverty alleviation. Accordingly, we focus on the following GPGs:

***International trade regime***<sup>86</sup> – is possibly the most appropriate approach for effective poverty reduction. This requires changes in global institutions, such as the WTO, World Bank, UNCTAD, etc. In terms of financing, the chief input into the process is negotiation towards the promulgation of *development oriented* trade rules. Necessary financing and technical assistance can be obtained from ODA, World Bank, and IMF. Related inputs in strengthening international trade as recommended by the Zedillo (2001)<sup>87</sup> Panel include funding for *compensatory financing facility* (for countries dependent on exports of primary commodities) and *commodity risk management schemes* (to ensure stable agricultural prices).

***Capacity building*** – as it relates to trade negotiation and the implementation of agreements is critical in most developing countries. Potential funding and technical assistance might be expected from ODA, WTO, UNCTAD and the World Bank.

***Financial stability and market efficiency***<sup>88</sup> – economic cycles of booms and busts prevent countries from consolidating progress in poverty reduction, because the poorest are most vulnerable to these swings. In terms of financing, the chief input are rules and standards to safeguard financial stability and enhance market efficiency. The IMF and World Bank could take the lead role with additional support from ODA.

***Agricultural Research and Extension*** – research has improved plant varieties and the genetic potential of livestock, allowing more flexible crop management and boosting productivity. This may accelerate the reduction of rural poverty. Research and development networks, such as the Global Development Network, Consultative Group on International Agricultural Research (CGIAR), Global Water Partnership, World Commission on Dams, Global Reporting Initiative, have all contributed to building intellectual knowledge and breaking through informational barriers. Potential financing - the World Bank (historically supported the CGIAR), ODA and regional development banks (RDBs)(Inter-American Development Bank has given grants and loans for regional agricultural research and support).

## **Goal 2: Achieve Universal Primary Education**

Education is recognized as a basic ingredient for sustainable development; it benefits both the individual recipient and the wider society. Education is a NPG with the

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<sup>86</sup> Mendoza (2003) provides discussion on multilateral trade regime as a GPG.

<sup>87</sup> E. Zedillo (2001). “Technical Report of the High-Level Panel on Financing for Development”. United Nations, New York.

<sup>88</sup> For a detailed discussion on this GPG see Griffith-Jones (2003).

potential to produce GPGs. A high correlation exists between education and (a) lower birth rates that lead to slower population growth, (b) higher labour productivity leading to faster economic growth, and (c) improved health through containment of communicable diseases. Given the potential impact of education on development it is necessary that new financing options be explored to meet the goals of Education for Sustainable Development (ESD), particularly basic education for all (BEFA). Accordingly, the UNESCO proposals as outlined by Buchert (2000)<sup>89</sup> should be supported: (i) DAC/OECD members should increase support for education to constitute \$7 billion by 2005, \$10.5 billion by 2010 and \$14 billion by 2015; (ii) DAC/OECD members should fulfill their commitments to the enhanced HIPC Initiative and ensure that significant amounts of debt relief and debt-for-sustainable development swaps be channeled into support for BEFA; (iii) financing of debt relief should come from new and additional resources, and not be diverted from already declining ODA; (iv) providing countries with technical assistance to produce; (v) World Bank should increase the proportion of soft-loans through IDA for BEFA, relative to the higher priced IBRD loans; (vi) countries should free resources up to finance BEFA. These include removal or reduction in subsidies to energy (electricity), water supply and MWDS; and (vii) private foundations that have traditionally supported education<sup>90</sup>.

### **Goal 3: Promote Gender Equality and Empower Women**

This goal is about *universal human rights*, which is, in effect, a GPG. Increasingly people have realized that growing (economic, social, and cultural) inequity entails significant negative externalities. Large income and wealth gaps contribute to frustration and despair that may translate into terrorism, crime and violence, seriously straining the global political fabric. Options for financing this goal require the participation of IDA, RDBs, ODA, UN and its agencies such as FAO and UNESCO.

### **Goals 4, 5 and 6: Reduce Child Mortality; Improve Maternal Health; and Combat HIV/AIDS, Malaria and other Diseases**

Health is inextricably linked to several inputs that have GPG characteristics. For example, it requires inputs such as pharmaceutical research and knowledge, international trade regimes (especially TRIPs), and global disease surveillance. Where a country's disease burden is excessive, as is currently the case in much of Africa, it produces serious cross-border spill-over in terms of (a) low productivity; (b) lost investment in human capital due to high death rates; (c) faltering economic growth; (d) political unrest; (e) reduced investment in child development; and (f) other aspects that tend to accompany failing states. Here, the following GPGs are required:

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<sup>89</sup> L. Buchert (2000). "Development Partner Cooperation in Support of Education for All: Rationale and Strategies, Education Sector Working Document (ED 2000/WS/36), Office of ADG/ED, UNESCO.

<sup>90</sup> Examples include: Ford Foundation, Rockefeller Foundation, Carnegie Foundation, Aga Khan Foundation, Bernard van Leer Foundation (particularly important for one of the least considered EFA goals, namely early childhood care and education, especially for the most vulnerable and disadvantaged children), the United Nations Foundation (Ted Turner), the Melissa and Bill Gates Foundation, the Gates Library Foundation; and the Soros Foundation. Several big *corporate foundations* such as Kellogg Foundation (have supported education projects in a range of developing countries), PPP between governments, UNESCO, UNICEF and IT companies or foundations.

Developing countries can, usually at minimal cost, manage public goods for health using legal and regulatory instruments. For example, policies that discourage the misuse of antibiotics would contain the spread of antimicrobial resistance (AMR), yielding both national and cross-border benefits. Introduction of harmonized legislation in a region would offer substantial benefits (Arhin-Tenkorang and Conceicao, 2003).<sup>91</sup> The range of existing funding is probably largest in the health sector and points to the possibility for further expansion. WHO (2001) estimates that developed countries need to increase financial assistance to the developing countries to around \$27 billion per year in 2007, and to \$38 billion per year in 2015, as against the current ODA contribution of about \$6 billion to achieve the development goals.<sup>92</sup> WHO has proposed the establishment of two new instruments: (a) a global fund to fight AIDS, tuberculosis, and malaria (GFATM),<sup>93</sup> costing some US\$ 8 billion; and (b) a global health research fund (GHRF), costing \$1.5 billion per year.

The World Bank has endorsed the control of communicable diseases as a priority (Development Committee, 2001).<sup>94</sup> By the end of FY 2000, the World Bank had committed over US\$1.0 billion for 99 AIDS-related projects in 56 countries under IDA's Multi-Country HIV/AIDS Program for Africa (MAP). The World Bank is supporting global initiatives in health such as the International AIDS Vaccine Initiative (IAVI) and the Global Program to Eradicate Lymphatic Filariasis and the Dracunculiasis (Guinea Worm) Eradication Program. Other existing mechanisms include: (i) the Vaccine Fund - the financing instrument of the Global Alliance for Vaccines and Immunization (GAVI), specific to the immunization of *children*; (ii) Medicines for Malaria Venture (MMV) and IAVI; (iii) the Onchocerciasis Control Program (OCP), specific to river blindness in Africa - funded primarily by the US, the Netherlands, the World Bank and WHO; and (iv) the pharmaceutical industry has shown growing interest in contributing to the pursuit of GPGs.<sup>95</sup>

### **Goal 7: Ensure Environmental Sustainability**

Tropical developing countries are more vulnerable to the projected climate change than countries in the temperate zones. High-payoff GPGs in these countries thus include curbing global warming and enhancing environmental knowledge.

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<sup>91</sup> D. Arhin-Tenkorang and P. Conceicao (2003). "Beyond Communicable Disease Control: Health in the Age of Globalization". In Inge Kaul, Pedro Conceição, Katell Le Goulven and Ronald U. Mendoza (eds). *Providing Global Public Goods: Managing Globalization*. New York: Oxford University Press.

<sup>92</sup> WHO (2001). "Investing in Health for Economic Development". Report of the Commission on Macroeconomics and Health: Investing in Health for Economic Development. Geneva.

<sup>93</sup> The Secretary-General of the United Nations (UN) has already created this fund.

<sup>94</sup> Development Committee (2001). "Poverty Reduction and Global Public Goods: A Progress Report", Washington D.C.

<sup>95</sup> Merck's donation of ivermectin (Mectizan®) to combat onchocerciasis has been cited as stimulating further "pharmaco-philanthropy" (Wehreïn, 1999). More recent important drug donations have included Malarone® for treatment of drug-resistant malaria (GlaxoSmithKline (GSK)), albendazole to accelerate elimination of lymphatic filariasis and Zithromax® to eliminate blinding trachoma (Pfizer, Inc). GSK's donation alone is likely to top US\$1 billion. Merck, Bristol-Myers Squibb, and other pharmaceutical corporations are beginning to take steps to make antiretroviral treatments more accessible for treatment of HIV/AIDS patients in developing countries.

**Curbing global warming** - global warming will adversely impact food production in the tropics and may increase the range of tropical contagious diseases. Some low-lying developing countries like Bangladesh and small island developing states (SIDS), are likely to be disproportionately impacted by a sea level rise and resultant flooding. Possible financing includes: the GEF, UNDP, UNEP, World Bank, and ODA - substantial replenishment financing is required taking into account additional responsibilities.

**Environmental knowledge** - activities to enhance environmental knowledge include networks, e.g. the Global Water Partnership, World Commission on Dams; information databases, e.g. UNEP/World Conservation Monitoring Centre; Global Environmental Outlook; and Global International Waters Assessment. Possible financing includes: the GEF, UNDP, UNEP, World Bank and ODA.

### **Goal 8: Develop a Global Partnership for Development**

Establishing incentives for governments, NGOs, the private sector, and individuals to act in the global interest is the core of providing GPGs. Measures to ensure peace and security, contain global warming, maintain financial stability, and international trade regime are some of the most prominent examples where international coordination is critical.

**Peace and Security** - conflicts trigger instability and social dislocation, hamper growth and reverse progress in poverty reduction. As demonstrated by recent experiences in Africa and Eastern Europe, civil wars and domestic unrest can easily spread, destabilizing entire regions and limiting countries' abilities to share in the benefits of expanding world trade, financial flows, and technological advances. Relevant regulatory tools, such as the International Convention on the Suppression of the Financing of Terrorism, provide a legal method of prosecuting those responsible for raising funds for terrorist activities. Possible financing includes: ODA, United Nations and the World Bank.

## **6.4 Actions Required at the Global and the Local Level**

The prospect for drastic poverty reduction is heavily dependent on the capacity of developing countries to reap substantial gains from trade liberalization. As noted by the Zedillo (2001)<sup>96</sup> report, many developing countries find the decision-making process of the WTO to be selective and exclusionary. Furthermore they believe the WTO lacks the capacity to provide developing countries with technical assistance. In order to support the *development round* of the WTO process launched in Doha in 2001, increased attention should be given to ensuring meaningful participation of developing countries, and especially the LDCs, in multilateral trade negotiations. In this regard, developing countries require assistance in order to participate effectively in the WTO negotiating process through the enhanced cooperation of relevant stakeholders. To those ends, the Zedillo (2001)<sup>97</sup> panel emphasized the importance of effective, secure and predictable financing of trade-related technical assistance and capacity building.

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<sup>96</sup> Zedillo (2001)

<sup>97</sup> Ibid.

Recognizing the potential of PPPs in financing the MDGs (and in particular ESD), there is a need to upscale the engagement of foundations, NGOs and the private sector in general to achieve a breakthrough in the collective action problem plaguing public goods. There is an urgent need to facilitate and sustain partnerships for financing GPGs.

To improve the prospect of achieving the Millennium Development Goals in the short- and medium-term, five activities seem to be of special importance:

- *Quantifying the financing gap* - develop realistic estimates of short- to medium-term financing requirements for each GPG priority area or sector (e.g., health, education and trade that are crucial for development but are neglected by the private sector);
- Mapping of financing mechanisms to ensure better and more flexible use of existing resources and their matching to urgent needs while avoiding costly rigidities;
- Ensuring that existing funding mechanisms have the financial robustness and flexibility to deal with GPG funding needs;
- Agreeing on clear assignment of lead institutional responsibilities and on stronger collaborative arrangements for GPGs so that special-purpose mechanisms are only established where necessary, and the inefficiencies of having many separate funds and separate initiatives for GPG pursuits are avoided; and
- Broadening the role of the private sector in addressing GPGs needs by changing incentives and correcting market failures to encourage private sector participation.

Actions required at the local level to achieve the MDGs include: capacity building; development of NPRS; financial stability; and partnerships between government, NGOs, private sector and other stakeholders. In particular, supporting policies designed to strengthen market institutions (like customs administration, regulatory and legal framework), constitutes powerful instruments for realizing the greatest gains from productivity and trade for most countries. In this context, the IMF and the World Bank could provide both financing and technical assistance in formulating PRSPs. There is also a role for aid agencies and other sector interests (trade, health, education and environment) to participate.

**Table 1. Classifying Public Goods by Sector, Core and Complementary Activities**

<b>Public Good</b>	<b>Core Activity</b>	<b>Complementary Activity</b>	
<b>Sector</b>		<b>Production</b>	<b>Consumption</b>
<b><i>Environment</i></b>			
International	Reduce emissions	Research	
National	Conservation	Agriculture support	Poverty reduction
<b><i>Health</i></b>			
International	Eliminate disease	Research on disease	
National	Preventive health care	Health care system	Health clinics
<b><i>Knowledge</i></b>			
International	Research centres	Internet services	Global networks
National	Education service	Universal education	Schools
<b><i>Security</i></b>			
International	Conflict prevention	Peace-keeping UN Security Council	
National	Crime-reduction	Policing	Reduce poverty
<b><i>Governance</i></b>			
International	Global institutions	Research	Financial stability
National	'Good government'	Government capacity	Equity

*Source: Morissey et al (2001)*

**Table 2. Selected GPGs and GPBs by Sectors**

Class/type of GPGs	Benefits		Supply problem	Corresponding Global Bads	Costs	
	Non-excludable	Non-rival			Non-excludable	Non-rival
<b>Environment</b>						
Oceans	Yes	No	Overuse	Contamination from land-based & atmospheric pollution sources	Partly	Yes
Atmosphere (Climate)	Yes	No	Overuse	Risks of global warming	Yes	Yes
Biodiversity	Yes	Yes	Overuse	Loss/disruption of ecosystems, species, genetic diversity	Yes	Yes
<b>Social</b>						
Universal human rights	Partly	Yes	Under-use (access)	Human abuse, discrimination	Partly	Yes
Freedom from poverty	No	No	Under supply	Crime, corruption, inequity		
Health	Yes	Yes	Under supply	Communicable disease e.g. HIV, malaria, TB	Yes	Yes
Peace	Yes	Yes	Under supply	War and conflict	Partly	Yes
<b>Economic</b>						
Efficient trade	Partly	Yes	Under supply	Fragmented markets	Yes	Yes
Financial Stability	Partly	Yes	Under supply	Financial crises, excessive volatility	Yes	Yes
<b>Institutional/ infrastructure</b>						
Internet (Physical and virtual infrastructure)	Partly	Yes	Under use (access)	Barriers to internet (communication infrastructure)	Partly	Yes
Knowledge	Partly	Yes	Under use	Barriers to information (lack of transparency)	Partly	Yes
Good Governance (rule of law, equity, justice, Democracy)	Partly	Yes	Under supplied	Corruption, injustice	Partly	Yes

Source: Gardiner and Le Goulven (2002).

**Table 3. International Public Goods: Alternative Types and Financing Possibilities**

Good Type	Examples	Financing possibilities	Remarks
Pure public	<ul style="list-style-type: none"> <li>▪ Curbing global warming</li> <li>▪ Basic research</li> <li>▪ Preventing the spread of disease</li> <li>▪ Augmenting ozone shield</li> </ul>	Reliance on public sector push and ability-to-pay. Financing usually coordinated by an international agency using international taxation or fee arrangement. A lead-nation(s) might exist if it can derive sufficient net benefits.	Neutrality concerns exists since voluntary contributions are crowded out by collective contributions. Partial cooperation faces free-riding offsets unless there is sufficient participation. An enforcement mechanism is necessary.
Impurely public with some rivalry but no exclusion	<ul style="list-style-type: none"> <li>▪ Ocean fisheries</li> <li>▪ Controlling pests</li> <li>▪ Curbing organized crime</li> <li>▪ Alleviating acid rain</li> </ul>	Reliance on international agencies and collection arrangement. Rivalry may inspire independent behavior in contrast to purely public goods.	More private incentives to contribute. Rivalry lessens neutrality concerns, but a push from the public sector is still required.
Impurely public with some exclusion	<ul style="list-style-type: none"> <li>▪ Missile defense system</li> <li>▪ Disaster relief aid</li> <li>▪ Extension service</li> <li>▪ Information dissemination</li> </ul>	Exclusion encourages voluntary funding and club-like structures. Public sector may be needed for coaxing and facilitating private sector provision. There may exist an entrepreneurial or leader nation to market the good.	Exclusion is incomplete; so some sub-optimality remains. Question is whether this residual sub-optimality warrants any intervention or official inducements.
Club goods	<ul style="list-style-type: none"> <li>▪ Transnational parks</li> <li>▪ INTELSAT</li> <li>▪ Remote sensing services</li> <li>▪ Canals and waterways</li> </ul>	Non-payers are excluded. Charge each user according to crowding that results. Toll per use equals marginal crowding costs so as to internalize the congestion externality. Taste differences reflected by tolls paid on total visits. Agents with a greater demand visit more and pay more than those with a smaller demand.	Result in efficient outcomes. Clubs limit transaction costs. Full financing is dependent on scale economies, the congestion functions, and competitiveness of factor or output markets. No public coaxing is needed.
Joint products	<ul style="list-style-type: none"> <li>▪ Foreign aid</li> <li>▪ Tropical forests</li> <li>▪ Peacekeeping</li> <li>▪ Defense spending among allies</li> </ul>	As nation-specific private and club good benefits become more prevalent among the joint products, markets and club arrangements can be used to finance the good with greater efficiency. As the share of excludable benefits increases, payments can be increasingly based on benefits received.	Ratio of excludable to total benefits is the essential consideration. As ratio approaches one, markets and clubs work more fully. Institutional arrangements can foster these excludable benefits.

Source: Sandler (2001)

**Table 4. Alternative Aggregation Technologies of Public Supply**

<b>Supply technology</b>	<b>Examples</b>	<b>Strategic Considerations</b>	<b>Institutional implications</b>
<p><b>Summation:</b> public good level equals sum of individual contributions</p>	<ul style="list-style-type: none"> <li>? Reducing air pollution</li> <li>? Reducing global warming</li> <li>? Cataloguing species</li> </ul>	<p>Characterized by Prisoner’s Dilemma or chicken game form. In the former, there are strong incentives to free ride and not contribute; in the latter, there is an incentive on behalf of the richest to inhibit dire consequences.</p>	<p>There is a need for a multilateral organization or rich nation to assume leadership and to provide the public good. Cannot rely on voluntary action at the national level.</p>
<p><b>Weakest-link:</b> the smallest effort determines the public good level</p>	<ul style="list-style-type: none"> <li>? Reducing river blindness</li> <li>? Maintaining the integrity of networks</li> <li>? Limiting the spread of insurrections</li> </ul>	<p>Characterized by assurance games where matching behavior characterizes the equilibrium. Actions and or contracts are self-enforcing. Well-endowed players have an incentive to assist those less well off.</p>	<p>Multilateral agencies can channel funds and direct actions to raise public good levels to acceptable standards. Capacity building required in poor countries. Rich countries may contribute the public good directly to increase levels in poorer countries. Partnerships apply.</p>
<p><b>Best-shot:</b> the largest effort determines the public good level</p>	<ul style="list-style-type: none"> <li>? Finding a cure for AIDS</li> <li>? Neutralizing a pest</li> <li>? Engineering the next green revolution</li> </ul>	<p>Characterized by coordination games where only a single provider is required. Problem of identifying this agent if there are two or more candidates - this is where coordination is needed. For development concerns, problems arise when best-endowed nation derives little benefit from the action.</p>	<p>Concentrate efforts where prospects and resources are greatest for success. Multilateral organizations or a leader nation can serve to coalesce and focus resources and efforts. Partnerships among various participants can circumvent collective action problems.</p>
<p><b>Weighted sum:</b> each country’s contribution can have a different additive impact</p>	<ul style="list-style-type: none"> <li>? Cleanup of sulfur emissions</li> <li>? Monitoring the planet from different vantages</li> <li>? Controlling a pest</li> </ul>	<p>Weighted sum implies that some participants receive greater private benefits and thus have greater inducements to contribute. Captures pure public and private good representations as special cases. A host of alternative game forms.</p>	<p>Multilateral organizations need to support efforts among only those nations with less country-specific benefits. Collect and provide information on the weight matrix to encourage independent financing.</p>

**Table 5. Financing Mechanisms for Global Public Goods**

Internalizing externalities	<ul style="list-style-type: none"> <li>▪ Market creation or strengthening</li> </ul>	<ul style="list-style-type: none"> <li>▪ Create markets with property rights, price formation mechanisms, competition policies, information exchange and regulatory agencies</li> <li>▪ Guaranteed purchase GPGs products or services</li> </ul>
	<ul style="list-style-type: none"> <li>▪ Taxes, fees and levies</li> </ul>	<ul style="list-style-type: none"> <li>▪ Establish international tax system (need international authority or coordination of national agencies)</li> <li>▪ Charge user fees and determine assessed contribution by users and beneficiaries</li> <li>▪ Charge for the use of resources or removal of nuisances</li> </ul>
Private sources	<ul style="list-style-type: none"> <li>▪ Corporations (for profit)</li> </ul>	<ul style="list-style-type: none"> <li>▪ Grants and donations from foundations, NGOs, religious groups and other non-profit entities</li> <li>▪ Contributions from academic institutions and their administrative budgets</li> </ul>
	<ul style="list-style-type: none"> <li>▪ Corporations (non-profit)</li> </ul>	<ul style="list-style-type: none"> <li>▪ Donations and social responsibility activities of private corporations</li> <li>▪ Internal corporate practices geared to provide GPGs</li> </ul>
	<ul style="list-style-type: none"> <li>▪ Individuals</li> </ul>	<ul style="list-style-type: none"> <li>▪ Gifts and donations from individuals</li> <li>▪ Lotteries and other games of chance</li> </ul>
Public sources	<ul style="list-style-type: none"> <li>▪ National</li> </ul>	<u>Industrialized Countries</u> <ul style="list-style-type: none"> <li>▪ Contributions from ODA channeled through bilateral agencies (grants, soft loans, guarantees, export credit, debt swaps)</li> <li>▪ Contributions from budgets of non-ODA ministries and agencies</li> <li>▪ Tax incentives for private firms to provide public goods (remove incentives and subsidies for activities that produce a public bad)</li> </ul>
		<u>Developing Countries (DCs)</u> <ul style="list-style-type: none"> <li>▪ DC contributions to provision of public goods</li> <li>▪ Resources to pay for loans associated with provision of GPGs</li> <li>▪ Tax incentives for private firms to provide public goods (remove incentives and subsidies for activities that produce a public bad)</li> </ul>
	<ul style="list-style-type: none"> <li>▪ International</li> </ul>	<u>International Financial Institutions (IFIs)</u> <ul style="list-style-type: none"> <li>▪ Grants to Finance provision of a GPGs, usually from net income or trust funds.</li> <li>▪ Use of administrative budgets to provide public goods directly</li> <li>▪ Loans to DCs to finance complementary activities to provide GPGs</li> </ul>
		<u>International Organizations and Agencies</u> <ul style="list-style-type: none"> <li>▪ Grants from UN and regional trust funds, and from their admin. budgets</li> </ul>
Partnerships	<ul style="list-style-type: none"> <li>▪ Combinations of the various sources</li> </ul>	

**Table 6. Examples of Supranational Institutions and Their Financing Arrangement**

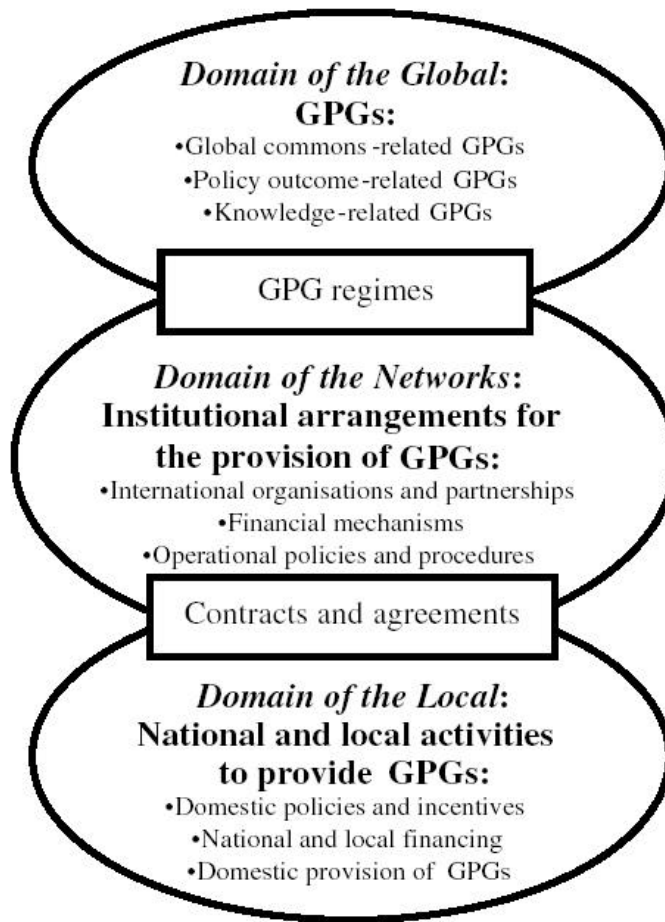
Institution	Institutional description	Financial arrangement
<b>INTELSAT</b>	A communication network with countries and firms as members. Satellites positioned in geo-stationary space provide global communication.	Operates as a club with toll charges to members based on congestion. Total tolls differ based on total utilization.
<b>UN Peacekeeping</b>	Countries are assessed shares to support each operation. Voting privilege in the General Assembly can be suspended for a nonpayer if assessments are too far in arrears.	Countries are distinguished by 4 categories based on ability to pay (horizontal and vertical equity) and benefit principle. Vertical equity considerations dominate.
<b>United Nations</b>	The UN provides a host of GPGs and IPGs through regular membership fees and members' voluntary contributions. These public goods differ according to exclusion, non-rivalry, and joint products. Economies of scope being exploited.	Financing is based on ability to pay with emphasis on vertical equity and UN status. Less vertical equity than peacekeeping assessments. Voluntary contributions are small part of funding.
<b>NATO</b>	An alliance established in 1949 which has grown from 12 to 19 allies. Article 5 indicates that an attack on one ally will be viewed as an attack on all allies. Mission has changed numerous times and now involves crisis management and nonproliferation of weapons of mass destruction. Multiple public goods provided to exploit economies of scale.	99.5% of allies' expenditures on defense are done independently, while only 0.5% are done commonly to maintain infrastructure, NATO civil structure, and NATO military command. Defense spending based on the benefit principle owing to high ratio of excludable benefits.
<b>WHO</b>	Mission is to pursue the maintenance of world health. Part of the United Nations. Joint products are present.	Based on membership assessments and thus ability to pay. Also based on donated trust funds for specific purposes.
<b>UNEP - Environmental treaties</b>	Agreements to curb various pollutants including CFCs, sulfur, nitrogen oxides, and GHGs.	Montreal Protocol on CFCs relies on a multilateral fund with contributions based on ability to pay. Most treaties depend on members financing their own cutbacks based on the benefit principle.
<b>European Union</b>	Economic Union to eliminate trade and nontrade barriers among members. EU pursues the free movement of goods, services, people, and capital. Public good of trade creation within union and gains in efficiency (i.e., specialization of labor, economies of scale, and growth). A host of other public goods of varying purity and joint products (e.g., security, traffic control, contract conventions, and health standards). Also income redistribution practiced. Economies of scope are being exploited.	Value-added taxes on exchanges within the EU is used to finance public goods and infrastructure linking EU members. Taxation abides by ability to pay rather than benefit principle. Significant redistribution and inefficiency tied to the Common Agricultural Policy.

**Table 6. Continued: Examples of Supranational Institutions and Their Financing Arrangement**

Institution	Institutional description	Financial arrangement
<b>World Bank</b>	A multilateral agency providing development assistance, technical advice, and research findings. It also coordinates development assistance from other donors (e.g., nongovernmental organizations and bilateral donors). The Bank's activities vary in their degree of publicness and the presence of joint products. Alleviation of poverty with little or no conditionality has a large share of purely public benefits. The Bank's research outputs possess mostly purely public benefits.	Financing for the bank's activities come from member countries' subscriptions to the capital stock. Country-specific inducements for subscribing derive, in part, from its number of votes, which is based directly on its subscription. Larger subscribers obtain a greater number and, thus, share of votes on Bank's policies.
<b>International Maritime Organization (IMO)</b>	For international shipping, IMO oversees international trade and institutes conventions on accidents and accident prevention, innocent passage, pollution, and other concerns.	IMO is a UN specialized agency financed through membership fees. Nations willing to sacrifice autonomy to achieve coordination and public good of safety that results.
<b>International Telecommunication Union (ITU)</b>	ITU establishes practices to curb signal interference and allocates the frequency bands of electromagnetic spectrum to purposes and countries. Promotes adoption of standardized equipment.	ITU is a UN specialized agency financed through membership fees. In nations' interests to achieve cooperation.
<b>New Medicines for Malaria Venture (MMV)</b>	A joint public/private partnership to control malaria that involves WHO, World Bank, Rockefeller Foundation, the United States, International Federation of Pharmaceutical Manufacturers Association, and the Association of British Pharmaceutical Industries. Aim is to discover and develop new drugs for the treatment and prevention of malaria.	Funding comes from multilateral agencies, donor countries, nonprofits, foundations and NGOs. Some pharmaceutical firms will partner drug discovery projects by lending their expertise and facilities. MMV will approach industrial partners to manufacture and market newly discovered and effective drugs. High risk activity of discovery being collectively funded by multilaterals and other donors. Pooling of efforts to achieve best-shot discovery.
<b>Onchocerciasis Control Program (OCP)</b>	In operation in West Africa for over 25 years to control river blindness from a parasitic worm. Partners include multilaterals, Merck Corporation, African governments, local communities, bilateral donors, foundations, and NGOs. Exploit participants' comparative advantage.	Funding supplied by the various participants with Merck making Ivermectin available for free. Control of river blindness and its contagion is an example of a weakest-link public good.

Note: Source for MMV and OCP is Ferroni (2000, pp. 10, 17).

Figure 1 Global public goods in a fractured global order



Source: Sagasti and Bezanson, op.cit., p.8