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Global Public Goods

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Purpose

This brief reviews the various definitions of global public goods (GPGs) and regional public goods (RPGs) found in the literature and provides examples of each in six frequently discussed sectors: environment, health, knowledge, security, governance, and infrastructure. We then present an overview of the literature on GPG and RPG financing mechanisms, and conclude with an analysis of trends in GPG and RPG financing through Official Development Assistance (ODA) using time series data from the OECD's Creditor Reporting System and other sources.

Defining Global Public Goods

We searched for relevant GPG definitional literature on Google Scholar and Scopus using the search string: *"public good" AND (global OR international OR universal OR human*)*. We screened the first 100 results in Google Scholar and the first 200 results in Scopus and retrieved all articles that referenced either global/international public goods or public goods on a global/international scale in the title or abstract. Of 92 articles that met our initial screening criteria, 89 were accessible for download and further analysis. We reviewed these 89 articles for the GPG definition used, sector(s) discussed, and the primary beneficiaries. We supplemented our searches with results from a Google search for GPGs[1], specific Google and Google Scholar searches for "club goods" and "toll goods"[2], and from searches of various[3] international organization websites for relevant information on GPGs and their definitions.

Eighty of the 89 articles we retrieved on GPGs were published in 1999 or later. This trend could be the result of seminal works on GPGs published in the 1990s, including *Global Public Goods: International Cooperation in the 21st Century* (Kaul et al., 1999), which has since spurred interest in the topic among donor agencies and researchers. Fifty-one of the articles contain a definition for GPGs. The other 38 articles discuss GPG sectors but do not define GPGs.

Among the articles that define GPGs, we find 17 definitions that are unique to particular authors, but six definitions that recur in at least two articles (Table 1). The most widely-cited GPG definition is based on Kaul et al.'s (1999) volume, commissioned by the UNDP, which defines GPGs simply as goods marked by non-rivalry in consumption and non-excludability, with benefits that are "quasi universal" or at least accrue to more than

[1] Using the same search string as for the Google Scholar and Scopus searches.
[2] We used the following search strings for "club goods" and "toll goods": *(definition AND global AND ("public good" OR "toll good" OR "club good"))* and *"definition" AND "global" AND ("toll good" OR "club good")*.
[3] We gathered definitions from the World Health Organization, OECD World Bank, International Task Force on Global Public Goods, and European Union.

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one group of people and multiple countries. However, as summarized in Table 1, there are multiple alternative definitions that have gained some traction in the literature.

Table 1. GPG definitions cited by authors more than once

Author(s)	Citations	Definition
Samuelson (1954)	2	*"Collective consumption goods . . . which all enjoy in common in the sense that each individual's consumption of such a good leads to no subtraction from any other individual's consumption of that good."*
Kaul et al. (1999)	24	*"Global public goods must meet two criteria. The first is that their benefits have strong qualities of publicness—that is, they are marked by nonrivalry in consumption and nonexcludability. These features place them in the general category of public goods. The second criterion is that 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 generations without foreclosing development options for future generations)."*
Ferroni & Mody (2001)	3	*"An international public good is a benefit providing utility that is, in principle, available to everybody throughout the globe."*
Woodward & Smith (2003)	3	*"A good which it is rational, from the perspective of a group of nations collectively, to produce for universal consumption, and for which it is irrational to exclude an individual nation from its consumption, irrespective of whether that nation contributes to its financing."*
Barrett (2007a)	2	*"GPGs offer benefits that are both non-excludable and non-rival. Once provided, no country can be prevented from enjoying them; nor can any country's enjoyment of the good impinge on the consumption opportunities of other countries. When provision succeeds, GPGs make people everywhere better off."*

In addition to the above definitions, Ostrom (2005) outlines four broad types of good based on the extent of excludability and rivalry (Table 2). Although Ostrom's framework does not specifically address *global* public goods, it is informative in distinguishing between "pure" public goods that are non-rivalrous and non-excludable and "impure" public goods that are excludable and non-rivalrous (i.e., club/toll goods) or non-excludable and rivalrous (i.e., common-pool resources). In building on Buchanan's (1965) definition of club goods and research on the economic theory of clubs (Sandler & Tschirhart, 1997; Cornes & Sandler, 1996; Anderson et al., 2004), Hoen (2012) outlines the key assumptions of club goods. He argues that aside from the two defining non-rivalry and excludability characteristics of club goods, in practice they are often underpinned by the assumptions that "club members are homogenous and share the costs of providing the club goods equally, there is no discrimination against any of the club members, and non-members can be excluded from benefitting from the club goods at no cost."

Table 2. Types of goods

	Excludable	Non-excludable
Rivalrous	**Private goods** Examples: food, clothing, cars, parking spaces	**Common goods (common-pool resources)** Examples: fish stocks, timber, coal
Non-rivalrous	**Club/Toll goods**	**Public goods** Free-to-air television, air, national defense

	Cinemas, private parks, satellite television	

Source: Adapted from Ostrom (2005)

In the early 2000s, in response to criticism about the fuzziness of the GPG concept, the UNDP commissioned a new study by Kaul & Mendoza (2003) to report on the evolving nature of the GPG discourse. Kaul & Mendoza propose a broader definition of GPGs integrating three elements – the so-called "triangle of publicness." According to this definition, GPGs must exhibit:

1. Publicness in consumption, which implies that individuals and groups must have access to the good;
2. Publicness in the distribution of benefits, which implies a fair and meaningful enjoyment of the good for all; and
3. Publicness of decision-making, which implies an involvement of all major actors and stakeholders, including developing countries and non-state actors, in decision-making processes.

Because policy choices determine what is and what is not a GPG, there cannot be a fixed list of such goods; some always have the property of global publicness, while others have over time changed from being local or national to being global in terms of benefits and costs. GPGs are thus redefined as goods that are in the global public domain. This definition differs from previous definitions of GPGs, which, according to the UNDP, failed to capture that public goods are largely a matter of policy choices (Kaul & Mendoza, 2003).

In addition to the definitions cited in the academic literature, we also find that major international organizations also employ a variety of definitions of GPGs (Box 1). Although there is considerable overlap among these definitions, the differences illustrate the difficulty in determining what exactly constitutes a GPG.

Box 1. Major International Organization Definitions

World Health Organization (2010): *"Public goods are defined as goods and services that are "non-rival" and "non-excludable". In other words, no one can be excluded from their benefits and their consumption by one person does not diminish consumption by another...Because the benefits of a public good are available to everyone (no one can be excluded), there are diminishing incentives for private sector provision. Consumption by one individual or group does not reduce availability for others, so a price is difficult to set in a market context (non-rivalry)."*

OECD (2004): *"A Public Good is a commodity, measure, fact or service which can be consumed by one person without diminishing the amount available for consumption by another person (non-rivalry); which is available at zero or negligible marginal cost to a large or unlimited number of consumers (non-exclusiveness); and which does not bring about disutility to any consumer now or in the future (sustainability). The degree of non-exclusiveness determines its degree of purity."*

World Bank (2008): *"Public goods are defined as those goods that are both "non-rival" (both of us can consume the good without affecting the utility either of us derive from its consumption) and "non-excludable" (once the good is produced, no one can be prevented from enjoying it)… Global public goods also have a spatial dimension, and so include only those issues that are trans-border in nature."*

International Task Force on Global Public Goods (formed by a joint agreement between France and Sweden) (2006): *"Global public goods are those whose benefits could in principle be consumed by governments and peoples of all states. Examples include mechanisms for ensuring financial stability, the scientific knowledge involved in the discovery of a vaccine and international regulations for civil aviation and telecommunications. Once such global standards and systems*

are established, they are available to all states, and consumption of the good by one state or its people in no way reduces its availability to others."

European Union (2002): *"Global public goods refer to the advantages to society from the provision of certain utilities and from satisfying particular wants and needs such as the eradication of disease or the elimination of pollution. Broadly, they can be classified into five main types: environment, health, knowledge, peace and security, and governance. Within each of these sectors goods can be identified that bring advantages to society as a whole and to which every individual has an equal entitlement. This leads to the public nature of the goods. Although the goods themselves do not have to be provided by governments or public bodies, they should have the potential to be enjoyed by all, regardless of whether the end user has paid for them or not...Not all GPGs are truly global in their reach but they are, at least, regional and/or international in that their benefits extend across several countries… GPGs also have another dimension in that they reach across time as well: what is put in place today can benefit future generations."*

Defining Regional Public Goods

In addition to our searches on GPGs, we conducted additional searches on definitions and categories of Regional Public Goods (RPGs), specifically in Africa. We searched Google Scholar using the search string: *"regional public good" AND Africa*, and retrieved articles that referenced regional public goods in the title or abstract. After reviewing the first 100 results, 30 articles were retrieved for review and coded according to region, categories of RPGs, and references to regional organizations focused on RPGs.

Of the 30 relevant articles, 17 reference one or more African countries. Three articles focus on Asian countries or organizations, with the remaining articles categorized as theoretical. Twenty-five of the articles were in 2004 or later, potentially building on Estevadeordal et al.'s (2004) frequently-cited book *Regional Public Goods: From Theory to Practice*. The book is based on a 2002 conference, "Regional Public Goods and Regional Development Assistance," and builds on Kaul et al.'s (1999) work on GPGs but specifically focuses on RPGs. The OECD (2015) defines Regional Public Goods (RPGs) as "an International Public Good which displays spill-over benefits to the countries in the neighborhood of the producing country, in a region which is smaller than the rest of the world." The World Bank (2015) notes that regional-level involvement may be more effective in some areas, "including HIV/AIDS, malaria, TB, shared water-resources management, infrastructure for trade, adaptation to climate change, trans-boundary air pollution and protection of common exhaustible resources."

We find a greater variety of RPGs than GPGs, including more focus on national public good sectors. For instance, while Kaul et al. (1999) categorize international free trade as a GPG, a regional public good might include improving coastal access to neighboring countries to increase region-wide trade (Collier, 2007). Categories of RPGs discussed in the 30 articles include: climate and the energy (7), trade (5), infrastructure (5), health and disease (4), regional cooperation (3), agriculture (2), and financial stability (2).

While these major categories of RPGs are similar to those of GPGs, their sub-categories (with more examples provided in Table 2) are often region-specific and focus heavily on spillovers between neighboring countries. Ferroni (2002) and other authors highlight that while a purely public good is both non-rival and non-excludable, in reality most RPGs are "mixed, meaning that they bestow a combination of national and transnational benefits." Based on this, Kanbur (2001) and Ferroni (2002) identify three kinds of activities to pursue RPGs that could potentially help donors or regional organizations make funding decisions (Box 2):

1. Non-country specific investments in knowledge, dialogue, basic research into technologies meant to be in the public domain (for example, vaccines) and negotiating agreement on shared standards and policy regimes.

2. Inter-country mechanisms for managing adverse cross-border externalities or creating beneficial ones, e.g., coordinated public health measures to contain the spread of disease; investments in cross-border infrastructure to enhance the preconditions for growth through trade and integration among participating countries; creation of regional institutions to facilitate solutions in areas ranging from financial and banking stability to the sustainable management of shared environmental resources. (An externality occurs when action or inaction of one country has consequences for others.)
3. Country-specific action to take advantage (or enable absorption) of the benefits created by the two means above. This will create national public goods such as improved policy environments and institutional indicators. In turn, these can engender transnational externalities.

Categorizing GPGs and RPGs

Researchers generally categorize GPGs and RPGs under one or more of five categories, and a number of authors add a sixth category – infrastructure –that is specific to *regional* public goods (Andrews-Speed, 2011; Ferroni, 2002; Hettne and Soderbaum, 2006; Sandler, 2007). The commonly-referenced categories are:

1. **Knowledge**: for example, the provision of information, the publication of analyses of that information, scientific research and development, education and training, and dialogue.
2. **Environment**: for example, measures to prevent pollution, to reduce levels of pollution and to clean-up pollution (Andrews-Speed, 2011; Navarro, 2004; Rufin, 2004).
3. **Health**: for example, preventing or eradicating disease, and stopping the spread of epidemics (Rufin, 2004; Ferroni, 2002).
4. **Peace and security**: for example, shared responsibility for providing security in areas of common security concern (Andrew-Speed, 2011; Navarro, 2004).
5. **Governance**: for example, establishing and implementing shared standards, best practices and policy regimes, setting up regimes to address cross-border problems, and creating networks of regulatory agencies. Governance is an intermediate public good which is essential in order to generate the desired final public goods (Andrews-Speed, 2011, Navarro, 2004; Rufin, 2004).
6. **Infrastructure (*RPGs only)***: for example, the construction and operation of cross-border infrastructure to deliver services, and joint investment in infrastructure to gain economies of scale. Infrastructure is not in itself a public good, but rather it provides services which have elements of a public good (Rufin, 2004; Botchwey, 1999; De, 2010; NDulu, 2006).

Of the reviewed articles, 49 discuss the environmental sector, 29 health, 26 security, 23 knowledge, and 13 governance (many articles discuss more than one sector). In addition, 60 articles describe at least one specific example of a GPG. The four most common examples are: international environment (21), international financial stability / regulation (13), international trade (8), and climate change mitigation (8).

Table 3 contains a list of all examples of GPG and RPG mentioned in the literature we reviewed, categorized into the five main sectors described above. While there is widespread agreement on some of the GPG and RPG examples listed, such as disease eradication or acid rain prevention, many other goods have little consensus over their classification. The table below is illustrative and should not be considered an authoritative or comprehensive classification of GPGs or RPGs.

Table 3. Cited Examples of Global Public Goods and Regional Public Goods

Sector	Cited as GPG Examples	Cited as RPG Examples	Cited as both GPG and RPG
Knowledge	Science and information technologies (Sctienstra, Watzke & Birch, 2007), education (Menashy, 2009), cultural	Knowledge processing and dissemination, study of innovations and best practices,	The provision of information, the publication of analyses of

	heritage (Francioni, 2012), research centers (Knotterus, 2015), internet services (Lindholt & Jorgensen, 2007), language (Taylor, 2014), open source/access (Verschraegen & Schiltz, 2007), remote sensing data (Di Ciaccio & Rum, 2007), GNSS (Global Navigation Satellite System) signals (Plattard, 2014), Global Earth Observation Systems of Systems (GEOSS) (Heumesser & Obersteiner, 2009), intellectual property rights (Chou & Sylla, 2011)	comparative assessment of learning outcomes, content development, support for regional integration in education (Navarro, 2004)	that information, scientific research and development, education and training
Environment	International environment/atmosphere (Morgera, 2012; Tavoni et al., 2011; Ng & Liu, 2003; Llu, 2011), climate change mitigation (Bayer & Urpelainen, 2013; Hammitt & Adams, 1996; Michaelowa, 2015)), international environmental agreements (Seo, 2012), Amazon rainforest (Schittecatte, 1999), biodiversity conservation (Bayer & Urpelainen, 2013), international agriculture (Pingali, 2010), geoengineering (Gardiner, 2013), food security (Page, 2013), ozone layer protection, international waters (Rubbelke, 2005), food safety (Unnevehr, 2007), Consultative Group on International Agricultural Research (CGIAR) (Dalrymple, 2008; Brooks, 2011)	Flood prevention/control, environmental education, water policy/management, water resources protection (Reiner, 2004), waste management (Birdsall, 2006), acid rain prevention, limiting sulfur emissions (Sandler, 2004), climate information systems, forest fire suppression (Guingla, 2009)	Measures to prevent pollution, to reduce levels of pollution and to clean-up pollution, energy supply and demand (Escribano, 2015)
Health	Disease eradication (Barrett, 2007b), disease surveillance (Smith, 2012), vaccination R&D (Archibugi & Bizzarri, 2004), communicable disease control (Smith & MacKellar, 2007), animal health/veterinary services (Schneider, 2011; Vallat & Mallet, 2006), affordable access to medicines (Faunce, 2006), genomics (Smith et al., 2004; Chadwick & Wilson, 2004))	Health policy/management, medical services, malaria eradication (Ferroni, 2002), medical education/training (Birdsall, 2006), health education (Inter-American Development Bank, 2015), health personnel development (Reiner, 2004), protection and pest control, rural regional development (Kaul & Conceição, 2006)	Preventing or eradicating disease, and stopping the spread of epidemics
Peace and Security	Drug trafficking control (Gregor, 2011), corruption control (Eigen & Eigen-Zucchi, 2003), strategic defense (McGuire, 2004), peace-keeping (Kaul et al., 1999), international humanitarian assistance (Stiglitz, 1999), refugee protection (Bubb, Kremer & Levine, 2011), maritime security (Bellais, 2013)	Post-conflict peace building, demobilization, land mine clearance, reconstruction relief (Reiner, 2004)	Shared responsibility for providing security in areas of common security concern (Ferroni, 2002)
Governance	Financial stability, international financial regulation (Griffith-Jones, 2003), political stability, international	Setting up regimes to address cross-border problems (Ferroni,	Establishing and implementing shared

	trade (Dulbecco & Laporte, 2005), global institutions (Kaul et al., 2003), equity and justice, universal human rights (Kaul et al., 1999), tax competition (Bjorvatn & Schjelderup (2002)	2002), creating networks of regulatory agencies	standards, best practices and policy regimes

Source: Framework from Andrews-Speed (2011) and examples from literature search

In addition to these sectors of public goods, the literature describes complementary activities and products that help countries and organizations pursue global and regional public goods. The World Bank states that core activities aim to *produce* public goods, whereas complementary activities prepare countries to *consume* public goods (World Bank, 2001). However, Morrissey et al. (2002) note that "public" goods should be classified as complementary activities in cases where the publicness of international activities is limited (i.e. exclusion is possible). This productive-consumptive distinction separates direct provision of the global benefit (i.e., the core) from help to provide a good or assistance to derive utility from a good (i.e., the complementary). Ferroni & Mody (2002) use the example of eliminating malaria, a core GPG, to illustrate the role of complementary goods. To eliminate malaria, individual countries must contribute to provision via complementary products and activities such as a system for distributing of mosquito nets (a consumption complementary activity) or research and development for vaccinations (a production complementary activity). Core activities, complementary activities, the five key public good sectors, and some examples of their intersections are included in Table 4 (Morrissey et al., 2002).

Table 4: Core and Complementary Activity Examples

		Core Activity	Complementary Activity	
		Production-Only	**Production (publicness limited)**	**Consumption**
Public Good Sector	*Knowledge* **International National**	Reduce emissions Conservation	Research Agriculture support	Poverty reduction
	Environment **International National**	Eliminate disease Preventive health care	Research on disease Health care systems	Health clinics
	Health **International National**	Research centers Education service	Internet services Universal education	Global networks Schools
	Peace & Security **International National**	Conflict prevention Crime-reduction	Peace-keeping UN Security Council Policing	Reduce poverty
	Governance **International National**	Global institutions 'Good government'	Research Government capacity	Financial stability Equity

Source: Morrissey et al., in Ferroni's *International Public Goods* (2002)

GPG and RPG Financing Mechanisms

The literature emphasizes four main categories of financing mechanisms for GPGs: 1) internalizing externalities, 2) private resources, 3) public resources, and 4) partnerships.

Internalizing Externalities

'Internalizing' externalities refers to mechanisms where external benefits or costs to a good (i.e., the positive or negative spillovers of an activity not captured by market prices) are assigned to the agents responsible for producing or consuming it. There are two primary ways in which producers and consumers of a GPG can be

made to finance public goods provision: by creating a market for the GPG, and by levying taxes and fees allowing government to provide the GPG directly (UNDP, 2002).

Payments by users and beneficiaries: A common example of creating a market is assigning tradable pollution and emissions permits which confer the 'right' to pollute. A number of institutional arrangements are required to enable market mechanisms to function at an international level, including an international permits exchange, a regulatory agency to distribute and govern permits, and agreed-upon pollution allocation quotas. Heal (1998) argues that the way in which quotas are distributed to various countries could lead to a redistribution of international wealth, while Kaul (2002) outlines an alternative scheme that could generate substantive revenues to finance emissions reduction programs via a tradable emissions permit auction. Kelly & Jordan (2004) note that designs for market mechanisms to internalize externalities have been tested at the international level in the case of carbon sequestration and the Prototype Carbon Fund.

Taxes, fees and levies: These mechanisms could be used to finance the provision of goods directly associated with the specific source of revenue (e.g., revenue from carbon taxes used to finance energy conservation and programs to mitigate climate change) or to finance the provision of GPGs in general (Seo, 2013; Nordhaus, 1999). Ostrom et al. (1999) suggest taxes and user fees can be levied to provide incentives to avoid depletion, congestion, instability or other public bads associated with the unregulated use of global commons. While the practicality of an international tax system has been hotly debated since the 1980s (Brandt, 1980), systems for collecting taxes at the national level through existing revenue collection agencies followed by transfers to an international institution are common. Other suggestions include a currency transactions tax (Tobin Tax), international air transport tax, carbon tax, charges for the use of maritime transport, and fees for auction revenues for geostationary satellites (United Nations, 2001; Cooper, 2001; Panayotou, 1997; Mendez, 1994).

Private Resources

Private resources for financing GPGs derive from three broad sources: not-for-profit corporations, profit-making firms, and individual persons. In relative terms, private resources are modest sources of financial support, but could be an important component of any larger financing scheme.

Not-for-profit corporations: Private independent foundations are often willing to support risky endeavors and initiatives with large payoffs that would be difficult for public or other private entities (Letts, Ryan & Grossman, 1997). There are instances of foundations playing catalytic roles in areas such as agricultural development and infectious disease control. For example, the Rockefeller and Ford Foundations' development of 'green revolution' technology was later supported by international financial institutions and governments (Stansfield et al., 2002) and the Bill & Melinda Gates Foundation's funding for the development of new drugs, vaccines, and diagnostics for infectious diseases spurred international cooperation (Jamison et al., 2006). NGOs also contribute to GPG finance and can have a significant influence in mobilizing support, but some authors are concerned that channeling funds through NGOs rather than through multilateral agencies can increase coordination costs and reduce accountability (Sandler, 2005).

Profit-making firms: Corporate philanthropy and social responsibility programs could contribute to financing GPGs in the future, given the right tax and regulatory incentives. Strategies to enhance private industry's incentives to contribute toward GPGs include "push" policies, in particular subsidizing or developing new facilities for research, development, and manufacturing, as well as "pull" incentives, including favorable changes in patent and marketing rights, tax credits, and pre-commitments to purchase products. The U.S. Millennium Vaccine Initiative, for example, offered up to $1 billion in tax credits to corporations to promote the delivery of existing vaccines and accelerate new vaccine development for developing countries (Kaul,

2005). At this moment, however, for-profit entities are mostly leveraged through foundations or governments rather than as separate entities (Sagasti & Bezanson, 2001).

Individual persons: Cooper (2001) points out that private philanthropy is well developed in a few countries, but poorly developed in other countries that are equally well off economically, suggesting that the engineering of laws and regulations may be an effective method to incentivize generosity. Cumulative small individual donations or large donations by wealthy individuals to civil society organizations involved in GPG financing, such as Live Aid's fundraising to combat AIDS in Africa, is one example. A second area described in the literature is a world-wide 'United Nations Lottery', first proposed in the early 1970s, but renewed more recently as a 'People's Earth Fund' and 'Blue Planet Global Lottery' to finance global environmental initiatives (Buchner et al., 2011).

Public Resources

Public resources for financing GPGs are obtained from government revenues and can be channeled through both national mechanisms (e.g., donor country contributions, budget allocations, and tax incentives) and international mechanisms (e.g., international financial institutions and multilateral development organizations and banks).

National mechanisms: Developed countries can finance the provision of GPGs using at least four different devices: (i) public goods contributions from Official Development Assistance (ODA) via bilateral agencies; (ii) debt swaps and debt reduction operations; (iii) contributions from the budgets of non-ODA ministries and agencies; and (iv) tax incentives for private firms to encourage the provision of a public good (Birdsall & Diofasi, 2015; Guillaumont, 2009).

In developing countries, national budgets are key contributors to providing activities that enable the consumption of GPGs. The incremental costs of complying with international financial regulations (such as costs associated with the Basel Accord bank liquidity requirements which seek to promote to international financial stability) is one instance (Herman, 2011). There are also resources specifically allocated by developing countries to develop, maintain, and distribute products that contribute directly to the provision of GPGs (UNDP, 2002). Common examples include national funding for health R&D and support for smallholder farmers who sustain agricultural biodiversity that is essential for resilient food systems (Negroni & Kendell, 2004; IAASTD, 2009).

International mechanisms: International financial institutions finance the provision of GPGs from their net income, member contributions, and administrative budgets. Much of the literature on international financial stability points to the International Monetary Fund, World Bank Group, and other multilateral development banks as key financing mechanisms. The distribution of loans and grants to developing countries to finance domestic financial and institutional development is considered important for global financial stability (Birdsall, 2011; World Bank, 2007; Ferroni, 2004). However, international financial institutions play a limited role in the provision of other GPGs.

International organizations such as the United Nations (UN) comprise a rich web of international institutional arrangements that commonly finance GPGs (Mistry & Olsen, 2000). UN programs are financed through assessed budget contributions from member states, voluntary contributions to various funds, and ad hoc funding arrangements such as cost-sharing and special pledging sessions to cover emergencies. Mistry & Olsen (2000) argue that moving to a more stable and predictable core-funding base for the UN would be an effective GPG financing mechanism, given most UN bodies perform functions closely related to the provision of GPGs.

Partnerships

Partnerships appear more frequently in the recent literature, usually involving the combination of several sources of financing for specific purposes (Janik, 2014; Brooks, 2011; Ng & Ruger, 2011; Smith et al., 2004). They often take the form of temporary programs, and involve coalitions of government agencies, private firms, foundations, and international institutions. Financing is usually ad hoc and focused on financing a specific GPG. Partnerships in the fields of biodiversity conservation and immunization programs (e.g. the Global Alliance for Vaccines and Immunisation) are common examples (Bendell, 2000). Authors have noted, however, that some public-private partnerships are structured such that the public sector absorbs most of the risk and costs, while the private sector absorbs a disproportionate share of the profit (Wheeler, 2001; Bezanson et al., 2000).

Additional RPG Financing Mechanisms

In addition to the four general financing mechanisms described above, the literature suggests two additional categories of regional mechanisms to finance or regulate RPGs: regional development banks and other regional organizations.

Regional Development Banks: A majority of Regional Development Banks (RDBs) finance RPGs by means of allocating funds from their administrative budgets, limited transfers of net income, donor-funded trust funds, and lending (Ferroni, 2002). The African Development Bank is often referenced as a key regional mechanism for funding RPGs in Africa. For instance, Botchwey (1999) notes that while the African Development Bank (AfDB) allocated about 40% of its total loan commitments in the period of 1967-1997 to infrastructure, "not enough attention has gone to regional projects in infrastructure development". The African Development Bank is referenced by a number of authors for its ability to affect region-specific problems and to provide funding for RPGs and infrastructure projects in particular. Kremer (2006) calls on the AfDB and World Bank to join efforts to "provide for a continued role of international institutions in preservation and maintenance of the road, including preventing the overloading of trucks, which damages roads."

In order to support RDBs, however, some authors believe there must be a shift in funding. Sandler (2004) notes that "in the long run, financing of multi-country projects within Africa should devolve from the World Bank to the AfDB, yet the AfDB clearly does not yet have the capacity to do this." He therefore recommends that donors divert resources to the AfDB to help it build capacity. The World Bank could then decrease its role, and instead provide "global syntheses of experiences across regions" (Sandler, 2004).

Regional Organizations: Much of the attention on public goods has previously been at the national and global levels. With the rise of regional entities—such as the Andean Community (AC), Central American Common Market (CACM), European Union (EU), North American Free Trade Association (NAFTA), etc. —many authors believe there is growing demand for regional public goods whose benefits influence a well-defined region (Ferroni 2002, Devlin & Estevadeordal, 2001). For health, environment, financial stability, infrastructure, and security, regional public goods are becoming an increasingly important component of development and authors argue that it should be considered by regional organizations (Cook & Sachs, 1999; Arce & Sandler, 2002). Hettne & Soderbaum (2006) group regional cooperation organizations into four categories:

1. *Uni-dimensional organizations* which may focus on regional economic integration, or which may be limited to a single sector such as health, security, education or communications;
2. *Multi-dimensional organisations* which may drive regional cooperation (such as ASEAN), those which enhance collaboration in a river basin, and certain UN organisations such as UNESCAP;
3. *Uni-dimensional networks* which promote cooperation and coordination in such activities as research and development, and may draw on civil society and private commercial parties as well as on public

bodies. A regional electrical power pool, such as the Nordpool, is a more technically sophisticated example. A particular type of organisation which can be of great value in establishing a regional market is the regulatory network (Matthews, 2003; Berg and Horrall, 2008); and

4. *Multi-dimensional networks* are less common, and include growth triangles, development corridors and other micro-regional economic organisations. The final organisation of relevance is the research institute, for research underpins the improved provision of many types of transnational public good (Hettne and Soderbaum, 2006).

Examples of regional cooperation organizations from the literature include successful RPG-providers like the African Union (AU) and initiatives like the AU's New Partnership for African Development (NEPAD) (Sandler, 2004; Bilal, 2012). Bilal notes that this "South-South cooperation" is an RPG, and that the "African integration and cooperation framework" must also be viewed as an RPG (2012). Other regional organizations, such as agricultural research centers, can also be considered delivery mechanisms for RPGs because in their absence country-level provision of agricultural research would potentially be well below the economically optimal level (Otsuka, 2008).

Initiatives that involve both regional development banks and regional organizations hold some promise for uniting countries to provide RPGs. For instance, ClimDev-Africa is an initiative of the African Union Commission, UN's Economic Commission for Africa, and the African Development Bank to address climate change in Africa and has been supported "at the highest level" by African leaders (ClimDev-Africa, 2015).

Challenges to GPG and RPG Provision and Financing

A number of authors highlight that the main challenges with GPGs and RPGs are their susceptibility to free riding and the failure of collective action (Estevadeordal et al., 2004; Morrissey et al., 2002; Sandler, 1998). These challenges are most apparent in cases where the benefits of a GPG or RPG exceed total costs across all countries, but do not necessarily exceed total costs for any individual country, an example of a "prisoner's dilemma" (Ferroni, 2000).

A second challenge to providing and financing optimal GPG or RPG levels concerns the degree of "publicness" and the requisite amount of collective action. Both Barrett (2007a) and Sandler (2001) argue in their major volumes on GPG financing that the decision of which countries should pay and how much depends on the publicness of the good and the type of effort that can address its provision. Arce & Sandler (2002) contend that there are four main levels of aggregated effort that influence RPG provision:

1. **Summation aggregation**: The overall level of public good equals the sum of country contributions. This is the scenario most likely to create a Prisoner's Dilemma situation, as every nation has an incentive to freeride and therefore will cause an undersupply of the RPG. In order to provide an efficient amount of the RPG, there must be "some kind of regional institution building to realign individual incentives" (Arce & Sandler, 2002)
2. **Weighted sum**: Each country's contribution can have a different additive impact on the overall level. Because each country could gain benefits from providing a local RPG, this scenario is likely to create a small undersupply or efficient level of the RPG. However, because of the individualized benefits there could be a lack in coordinated action, as many agents would act voluntarily for local benefits (Murdoch, Sandler, & Sargent, 1997).
3. **Weakest link:** The smallest effort determines the public good level. This scenario could lead to an undersupply of the RPG, as there is effect and therefore no incentive to contribute beyond the level provided by the "poorest nation" in the region (Arce and Sandler, 2002). These RPGs will therefore require significant coordination from countries within the RPG region.

4. **Best-shot:** The largest effort determines the public good level. Best-shot aggregation is categorized by the independent action of one regional country, and undersupply will rely on the capacity of the supplier. In this aggregation, "the role for aid is to ensure that the single best supplier produces enough to efficiently provide for the entire region" (Ferroni, 2000).

Barrett (2007a) adds an additional category of aggregated effort (or lack of), **mutual restraint**, specifically for GPGs. While summation, weighted sum, weakest link and best shot efforts are particularly susceptible to free riding, mutual restraint goods require countries *not* to do something. In effect, these GPGs are already supplied if countries take no action, but become undersupplied when countries decide to break the status quo. Mutual restraints among countries include the non-use of nuclear weapons, chemical weapon non-proliferation, or bans on nuclear testing and biotechnology research. International cooperation and strong enforcement is necessary for provision, but financing is not.

Table 5 summarizes the expected supply levels of GPGs and RPGs and the proposed institutional arrangements based on level of publicness. Examples are also provided for each category of aggregation and type of public good. While the aggregation technology determines the incentives to contribute funding, Sandler (2002) notes that "the ultimate source of any additional financing need not follow the distribution pattern prescribed by the aggregation technology." For example, funding for any good could follow a summation technology, while the impact of the funds to providers could correspond to any good in the "weakest link" category.

Table 5. Optimality and Proposed Institutional Arrangements for Various Classes of RPGs

Aggregation Technology	Pure Public	Impure Public	Club	Joint Product
Summation: **Overall level of public good equals the sum of country contributions**	• Undersupplied • Treaty or multilateral	• Undersupplied • Multilateral	• Efficient • Club structure	• Some undersupply • Treaty or multilateral
	Examples: • Limiting air pollution • Desertification • Ozone layer protection	Examples: • Providing public health infrastructure • Market boards for commodities	Examples: • Satellite communication network • Transnational parks	Examples: • Deterrence through peacekeeping • Preservation of rain forests
Weighted sum: **each agent's contribution can have a different additive impact on the overall level**	• Somewhat undersupplied • Treaty, if information available	• Somewhat undersupplied • Bargaining, if localized	• Efficient • Club structure	• Some undersupply • Treaty or multilateral
	Examples: • Reducing ambient pollutants • Limiting the spread of AIDS	Examples: • Limiting run-off pollution • Curbing acid rain	Examples: • Free trade agreements • Power grids	Examples: • Eliminating the threat of terrorism • Eliminating threats of revolution
***Weakest link*:** **The smallest effort determines the public good level**	• Supply may be efficient • Regional collective, rich nation contribution, partnership	• Somewhat undersupplied or efficient • Regional collective, rich nation contribution, partnership, or loose agreement	• Undersupply due to externality • Official intervention	• Some undersupply or efficient • Treaty or multilateral
	Examples:	Examples:	Examples:	Examples:

	• Inhibiting the spread of a pest • Labor standards	• Surveillance of a disease outbreak • Drug interdiction	• Transportation network • Basle Accord among G-10	• Family planning • Security intelligence
***Best shot*: The largest effort determines the public good level**	• Undersupply or efficient • Partnership	• Undersupply or efficient • Partnership	• Efficient • Club structure	• Efficient • Coordinated Need
	Examples: • Cure for orphan diseases • Monitoring technologies • Asteroid defense	Examples: • Agricultural research findings • Genetically engineered crops	Examples: • Crisis management • Satellite launch site	Examples: • Quelling of a flare-up by peacekeepers • Bioprospecting

Source: Adapted from Arce & Sandler (2002) and Barrett (2007a)

Aid Financing for GPGs and RPGs

Estimates of Aid Financing for GPGs

Though it is difficult to define and disaggregate spending on GPGs as a share of ODA, Cook (1999) and Morrissey (2000) offer data suggesting that the proportion of ODA committed to GPGs rose from about 4% in 1980 to around 10% in the late 1990s. These estimates are generally derived from classifying certain sectors of aid commitments reported to the OECD Development Assistance Committee's Credit Reporting System (CRS) as financing GPGs. Kaul et al. (1999) postulate as much as 25% of aid going to GPGs rather than just the purely national concerns of poor countries. A later study by Te Velde et al. (2002) estimates that by the late 1990s the share of aid to GPGs and included 10% of total aid was allocated to GPGs and at least 30% to national public goods (NPGs). Aid allocated to environmental public goods was approximately half of the GPG total. The authors also highlight that using CRS data may underestimate the share of aid allocated to GPGs by up to 50%, depending on the classification of spending as contributing to the provision of GPGs.

Birdsall & Diofasi (2015) estimate that in 2012 the percentage of aid allocated to GPGs was still approximately 10%. In addition, the authors provide non-comprehensive donor commitment estimates for 2009, 2011, and 2012 ODA spending on GPGs (Table 6). They limit their compilation of GPGs to specific categories of spending closely associated with development-related benefits that transcend borders.

Table 6. Estimated Annual Commitments for GPG Facilities (USD millions)

Sector	Initiative	2009	2011	2012
Global Health	Advance Market Commitment	125	172.2	128.3
	International Finance Facility for Immunizations	291	204.2	233
Global Environment	Global Environmental Facility	606	885.5	885.5
	Montreal Protocol	113	115	131
	Climate Investment Fund	-	1258.7	1258.7
	Forest Carbon Partnership Facility	79.3	166.7	38.5
	Amazon Fund	-	164.1	164.1
Global Peace & Security	UN Peacekeeping Operations	8,968	7,840	7,330
Data & Research for Global Development	International Initiative for Impact Evaluation	13	38.9	29.9
	EITI Multi-Donor Trust Fund	25	10.9	14.2
	CGIAR Fund	606	383	505

	IMF Surveillance	363	253.1	239
	World Bank	(not available)	(not available)	53.1
	African Development Bank	13.3	15	14.6
	Inter-American Development Bank	(not available)	7.8	8
	Asian Development Bank	7.4	8.3	9.9
TOTAL		**11,210**	**11,523.4**	**11,042.8**

Source: Birdsall & Diofasi (2015)

Birdsall & Diofasi (2015) further estimate GPG spending by specific UN agencies (Table 7), but add that the data are questionable given the difficulty of distinguishing between spending for country-based programs versus spending on goods with global benefits. Mandatory contributions are required and are assessed based on each member state's capacity to pay, whereas voluntary contributions have no guidelines or limits to payments (Birdsall & Diofasi, 2015).

Table 7. Contributions to select UN agencies (USD millions)

Organization	Contribution Type	2011	2012	Estimated Share of GPGs (2012)	Total Estimated Spending on GPGs
World Health Organization	Mandatory Voluntary	472 1,424	475 1,539	55%	1,107.7
UN FAO	Mandatory Voluntary	1,000 1,234	995 1,023	35%	706.3
UNDP	Voluntary (all)	4,197.5	4,741	0.001%	5.1
UNICEF	Voluntary (all)	2,171.5	3,791	6%	483
UNAIDS	Voluntary (all)	252.5	234.7	100%	234.7
UNEP	Voluntary (all)	386.35	458.5	100%	458.5

Source: Birdsall & Diofasi (2015)

Trends in Aid Financing for GPGs and RPGs

To analyze trends in GPG and RPG funding concentration and levels of financing from different sources, we use data from the OECD Development Assistance Committee's Credit Reporting System (CRS). The studies we reviewed take different approaches to what categories of ODA they count as financing GPGs or RPGs. We apply a framework based on OECD CRS coding from Reiner et al.'s (2004 article "Financing Global and Regional Public Goods Through ODA: Analysis and Evidence from the OECD Creditor Reporting System." We then categorize the OECD's data according to the general sectors established from our literature: Knowledge, Environment, Health, Peace & Security, Governance, and Infrastructure (RPGs only). As the CRS codes for ODA have been updated since Reiner et al.'s study, we selected the current codes that most closely matched those used in that analysis, when available. Appendix A contains a table comparing the codes used by Reiner et al. with the current CRS codes and corresponding sub-sectors.

We first analyze gross ODA disbursements by all donors in the DAC database (countries, multilateral organizations, etc.) that contributed towards expenditures that Reiner et al. categorized as GPG and RPG sub-sectors. We find that 14% of ODA in 2014 was allocated to sub-sectors labelled by Reiner et al. as GPGs, while 15% of ODA was allocated to RPGs (Figure 1). These proportions are 4-5% higher than previous estimates from other studies. This discrepancy may be partly explained by increases in aid financing targeting GPGs and RPGs, and by differences in what ODA allocations are classified as going towards GPGs and RPGs.

Figure 1. Total ODA Gross Disbursements, 2014

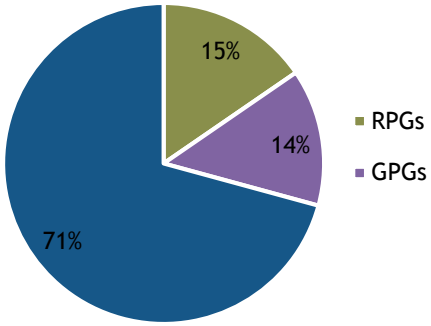
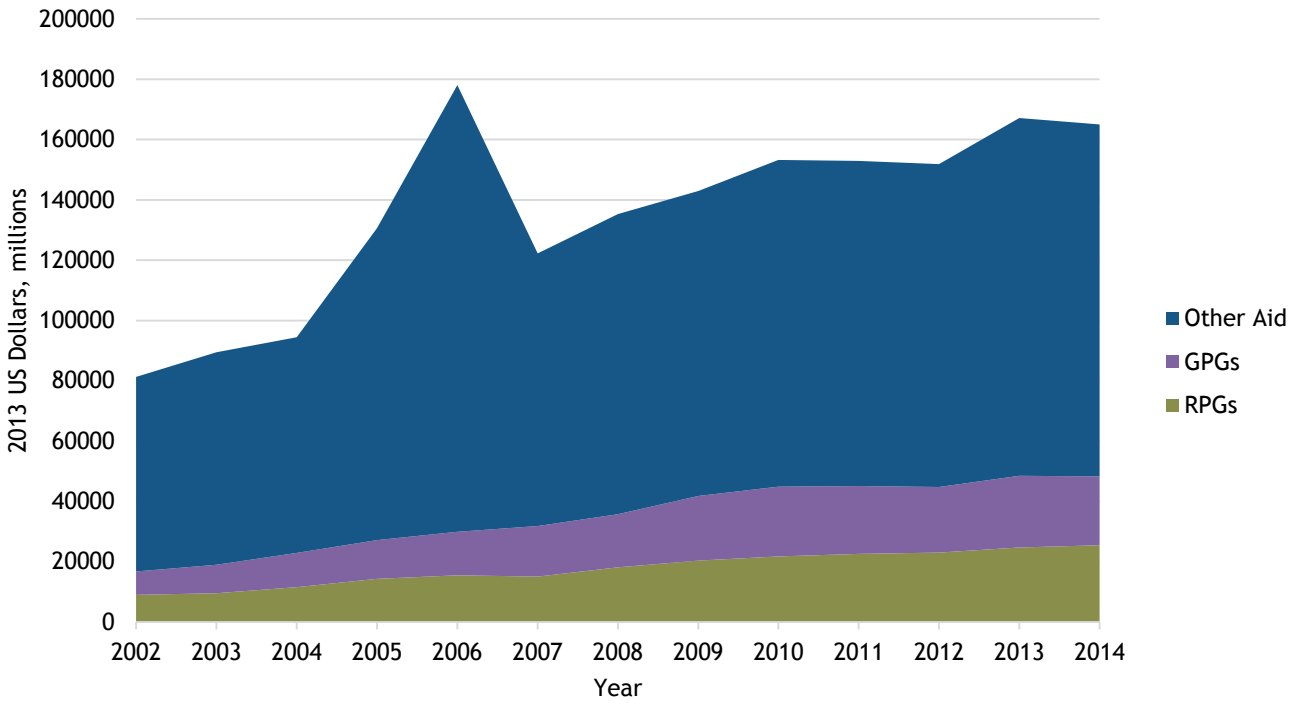


Figure 2 shows the trend of GPG, RPG, and Other Aid commitments from 2002 to 2014, which together comprise total ODA spending. While the figure shows Other Aid spending has been somewhat volatile with a substantial peak in spending in 2006, GPG and RPG spending has steadily increased over time. This represents an upward shift from Reiner et al.'s (2004) trend analysis, which shows RPG and Other Aid funding declining overall from 2000-2001. Evans & Davies (2015) argue that the growth in GPG and RPG spending is likely to continue for a number of reasons. First, new GPG financing mechanisms such as the GAVI Alliance, Global Fund to Fight AIDS, Tuberculosis and Malaria, and Climate Investment Funds are receiving significant and growing amounts of aid funding. Second, although excluded from this analysis, philanthropic donors, notably the Bill & Melinda Gates Foundation, are contributing substantially to the overall aid budget with a strong emphasis on GPG funding. Finally, recent climate change agreements in Copenhagen and Paris as well as the establishment of new Sustainable Development Goals are likely to increase funding for the environmental activities, a key GPG sector.

Figure 2. GPG, RPG, and Other Aid Gross Disbursements, 2002-2014



We also categorize each CRS code into one of the six sectors of GPGs and RPGs discussed in the literature (e.g., for RPGs, “road transport” is categorized under “infrastructure”). Figures 3 and 4 then present gross ODA disbursement amounts by sector for GPGs and RPGs, respectively.

Figure 3. Global Public Goods Gross Disbursements to Developing Countries by All Donors, 2002-2014

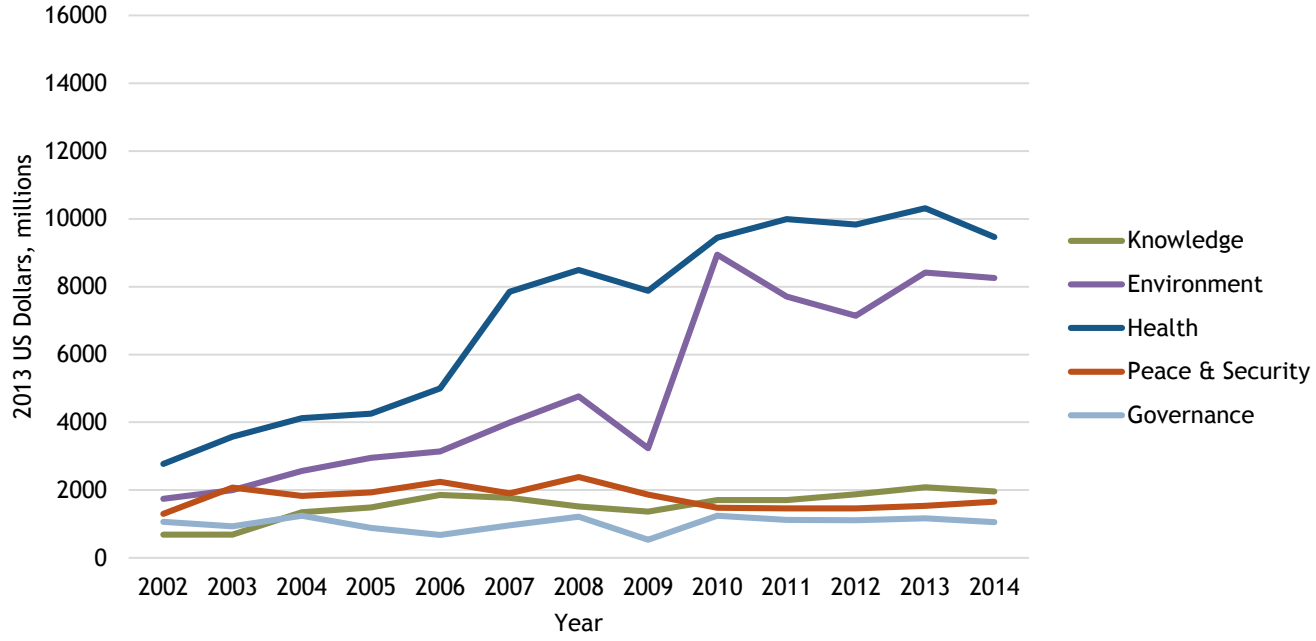
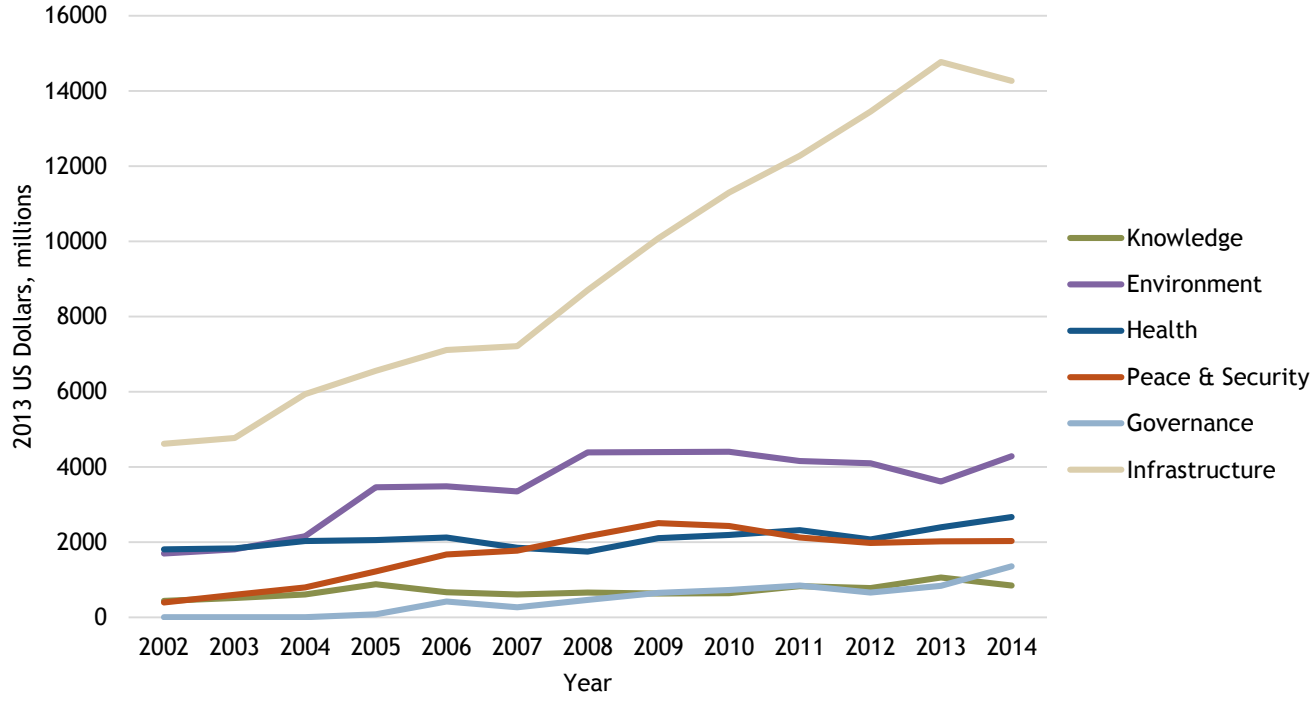


Figure 4. Regional Public Goods Gross Disbursements to Developing Countries by All Donors, 2002-2014

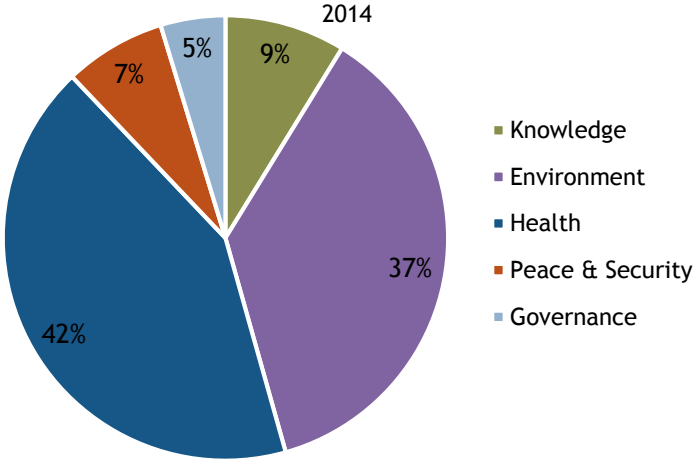


We find that while gross disbursement of ODA to GPGs has increased over time, most of this increase in financing has targeted the environment and health sectors, while financing to knowledge, peace & security, and governance has been relatively flat. For RPGs, we observe increases in financing across all sectors, with a notably large and ongoing increase in financing targeting infrastructure-related RPGs, with the exception of a

small decrease from 2013 to 2014. The large amount of financing to infrastructure may reflect the fact that infrastructure contributes to the provision and consumption of other public goods. We also note that these data reflect gross disbursements, which while providing an accurate representation of real aid transfers of financial resources to recipient countries in a given year (in contrast to multi-year commitments), they do not net out any repayments of loan principal or recoveries on grants. This could mean that the apparent level of financing to certain sectors is inflated if the primary funding type is concessional loans or there is a high likelihood of grant recovery. Moreover, the decrease in funding for environment-related GPGs in 2009 followed by a substantial increase in 2010 may reflect multi-year commitments ending or starting rather than significant changes in policy decisions on disbursements. Data on gross disbursements also begin in 2002, meaning that we cannot evaluate whether the general trend of increasing GPG and RPG financing began before that time.

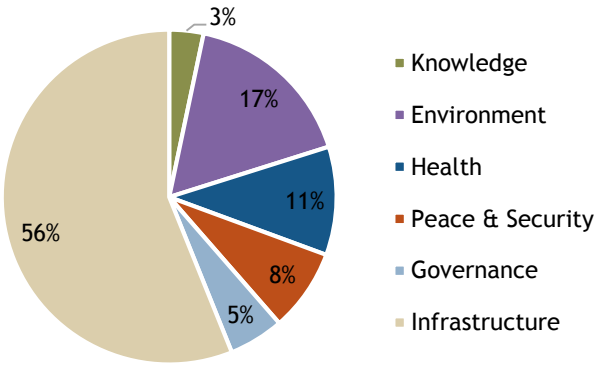
Figure 5 highlights the substantial proportion of ODA financing for GPGs in 2014 that targeted health- and environment-related activities (42% and 37%, respectively). The significant and increasing proportion of environmental sector funding may reflect the additional funding promised by donors after negotiations on the Copenhagen Accord (UNFCCC, 2009). Over half of the environmental sector spending is for environmental policy and management and renewable source power generation. For the health sector over 75% of funding comprises STD control including HIV/AIDS, which is increasingly argued by some to be a regional rather than global public good (Smith & MacKellar, 2007). Relatively little is spent on global knowledge-related activities, with the largest spending group being research-scientific institutions.

Figure 5. Total GPG Gross Disbursements by Sector, 2014



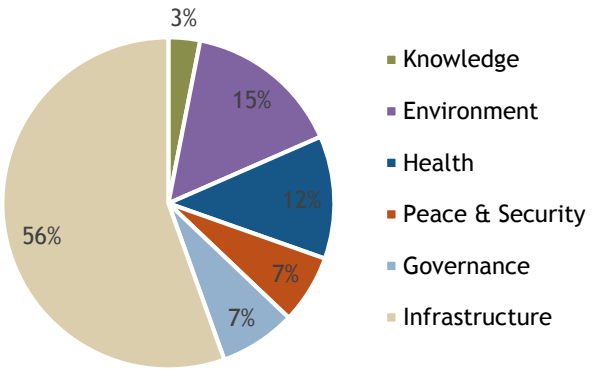
Source: OECD DAC 2014 Data

Figure 6. Total RPG Gross Disbursements to Developing Countries by Sector, 2014



Source: OECD DAC 2014 Data

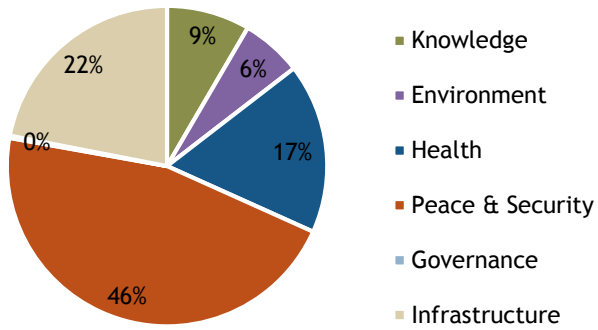
Figure 7. Sub-Saharan Africa: Total RPG Gross Disbursements by Sector, 2014



Source: OECD DAC 2014 Data

The significant proportion of RPG funding for infrastructure is especially evident when considering the percentage of gross disbursements spent on individual sectors in 2014, as seen in Figure 6. Over half of all RPG funding from DAC donors in 2014 went towards infrastructure projects, compared to the 44% of total disbursements that financed RPGs in the knowledge, environment, health, peace & security, or governance sectors. The results are nearly identical after filtering to include only recipient countries located in Sub-Saharan Africa, indicating that a large amount of this increase in infrastructure could result from investments in Sub-Saharan Africa (Figure 8). Conversely, when considering only ODA to recipients in South Asia, the majority of RPG-related funding targets peace & security (46%) rather than infrastructure (22%), and a smaller share of funding goes to the environment (Figure 9). This difference may be due to the recent and current conflicts in South Asian countries, as the four CRS categories that fall under Peace & Security are peace-building, demobilization, land mine clearance, and reconstruction relief.

Figure 8: South Asia: Total RPG Gross Disbursements by Sector, 2014



Source: OECD DAC 2014 Data

DAC data also allows for filtering based on multilateral and regional organizations. A number of major multilateral organizations - such as the World Bank's International Development Association (IDA), the United Nations Development Programme (UNDP), and the World Health Organization (WHO) – provide annual financial statistics, as do regional banks such as the African Development Bank (AfDB) and the Asian Development Bank (AsDB). Table 8 compares gross disbursements across multilateral organizations, categorized by RPG sector. The first column, Multilateral Organizations, sums the total disbursements from all multilateral organizations in 2014, including organizations not specifically presented in the table. According to the DAC data, multilateral organizations accounted for more than $9.6 billion (2013 dollars) in RPG funding in 2014. Of this $9.6 billion, 3% was allocated to RPGs within the knowledge sector (education, training, etc.), nearly 16% was allocated to environmental RPG projects, 9% towards health RPGs, nearly 4% towards peace & security measures, less than 1% towards governance, and nearly two thirds of funding was spent on infrastructure-related RPGs.

Table 8. Gross Disbursements from Select Multilateral Organizations to Developing Countries, 2014 (Millions)

	Multilateral Organizations (Total)		African Development Bank (AfDB)		Asian Development Bank (AsDB)		International Development Association (IDA)		United Nations Development Programme (UNDP)		World Health Organization (WHO)	
	($)	%	($)	%	($)	%	($)	%	($)	%	($)	%
Knowledge	322.11	3.34%	0.29	7.09%	6.33	0.87%	87.38	2.78%	1.05	4.42%	16.72	5.38%
Environment	1539.53	15.96%	2.49	58.99%	86.97	11.98%	516.81	16.42%	2.22	9.31%	0	0.00%
Health	888.90	9.22%	0.59	14.15%	36.83	5.07%	261.13	8.29%	0.58	2.44%	282.83	90.94%
Peace & Security	380.70	3.95%	0	0.00%	0	0.00%	20.761	0.66%	18.10	75.78%	0	0.00%
Governance	92.69	0.96%	0	0.00%	0	0.00%	0.1366	<0.01%	0.22	0.93%	11.45	3.68%
Infrastructure	6419.60	66.57%	0.84	19.77%	596.07	82.08%	2262.25	71.85%	1.70	7.12%	0	0.00%
Totals	**9643.55**		**4.22**		**726.20**		**3148.48**		**23.88**		**311.00**	

Source: OECD DAC 2014 Data

Though there are two regional banks represented, the focus of their financing differs drastically. The AfDB, with $4.22 million disbursed in 2014, allocated most of its funding towards environment-oriented RPGs in developing countries, followed by infrastructure (20%) and health (14%). The AsDB, on the other hand, spent nearly 82% of its $726 million on infrastructure in developing countries, with 12% allocated to the environment sector and 5% to the health sector. Interestingly, the AsDB allocated almost no money towards peace & security in developing countries even though 46% of South Asia's regional RPG gross disbursements were dedicated towards that sector. This inconsistency could be due to the AsDB funding hundreds of projects across all of Asia, while Figure 8 above focuses solely on RPG financing in South Asia.

The final three columns compare the World Bank's IDA, the UNDP, and the WHO across the six key RPG sectors. Seventy-two per cent of the World Bank's $3.15 billion disbursed in 2014 to developing countries went towards infrastructure projects. The UNDP allocated 76% of its 2014 disbursements to peace & security, while the WHO allocated 91% of its $311 million in 2014 towards RPGs related to health.

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Appendix A. 2004 and 2015 OECD DAC Codes and Sectors

2004 GPG Categories (Reiner et al.)			2015 GPG Categories		
GPG Category	**2004 Code**	**Expenditure Title**	**Proposed GPG Category**	**2015 Code**	**Expenditure Title**
Knowledge	11181	Educational research	Knowledge	11182	Educational research
Knowledge	12182	Medical research	Knowledge	12182	Medical research
Knowledge	16362	Statistical capacity building	Knowledge	16062	Statistical capacity building
Knowledge	16381	Scientific institutions	Knowledge	43082	Research/scientific institutions
Knowledge	31183	Agricultural research	Knowledge	31182	Agricultural research
Knowledge	31184	Livestock research	Knowledge	-	N/A
Knowledge	31282	Forestry research	Knowledge	31282	Forestry research
Knowledge	31382	Fishery research	Knowledge	31382	Fishery research
Knowledge	32181	Technological research	Knowledge	32182	Technological research & development
Knowledge	41082	Environmental research	Knowledge	41082	Environmental research
Knowledge	23082	Energy research	Knowledge	23082	Energy research
Human rights	15063	Human rights	Peace & Security	15160	Human rights
Human rights	42010	Women in development	Peace & Security	15170	Women's equality organizations & institutions
Health	12250	Infectious disease control	Health	12250	Infectious disease control
Health	13040	STD control, incl. AIDS	Health	13040	STD control, incl. AIDS
Financial Stability / Growth	15010	Economic policy	Governance	-	N/A
Financial Stability / Growth	24010	Financial policy	Governance	24010	Financial policy & administration management
Financial Stability / Growth	24020	Monetary institutions	Governance	24020	Monetary institutions
Financial Stability / Growth	33110	Trade policy	Governance		Trade policy & administration management
Crime Control	16361	Narcotics control	Peace & Security	16063	Narcotics control
Crime Control	31165	Agricultural alternative	Environment	31165	Agricultural alternative development
Crime Control	43050	Non-agricultural alternative	Environment	43050	Non-agricultural alternative development
Sustainability	13010	Population policy	Health	13010	Population policy & administration management
Sustainability	13030	Family planning	Health	13030	Family planning
Sustainability	23030	Power/renewables	Environment	23030	Power/renewables
Sustainability	23065	Hydro plants	Environment	23065	Hydro-electric power plants
Sustainability	23066	Geothermal energy	Environment	23066	Geothermal energy
Sustainability	23067	Solar power	Environment	23067	Solar power
Sustainability	23068	Wind power	Environment	23068	Wind power
Sustainability	23069	Ocean	Environment	23069	Ocean power
Sustainability	23070	Biomass	Environment	23070	Biomass
Sustainability	31210	Forestry policy	Environment	31210	Forestry policy & administration management
Sustainability	31220	Forestry development	Environment	31282	Forestry development
Sustainability	31261	Fuel wood/charcoal	Environment	31261	Fuelwood/charcoal
Sustainability	31320	Fishery development	Environment	31320	Fishery development

Sustainability	41010	Environmental policy	Environment	41010	Environmental policy & administration management
Sustainability	41020	Biosphere protection	Environment	41020	Biosphere protection
Sustainability	41030	Bio-diversity	Environment	41030	Bio-diversity
Sustainability	41040	Site preservation	Environment	41040	Site preservation

2004 RPG Categories (Reiner et al.)			2015 RPG Categories		
RPG Category	**2004 Code**	**Expenditure Title**	**Proposed RPG Category**	**2015 Code**	**Expenditure Title**
Health	12110	Health Policy/Management	Health	12110	Health Policy/Management
Health	12181	Medical Education/Training	Knowledge	12181	Medical Education/Training
Health	12191	Medical Services	Health	12191	Medical Services
Health	12281	Health Education	Knowledge	12261	Health Education
Health	12282	Health personnel development	Health	12281	Health personnel development
Health	13081	Personnel dvpt: pop. & repro health	Health	13081	Personnel dvpt: pop. & repro health
Water	14010	Water resources policy/admin. Mgmt	Environment	14010	Water resources policy/admin. Mgmt
Water	14015	Water resources protection	Environment	14015	Water resources protection
Water	14020	Supply and sanitation	Environment	14020	Water supply & sanitation
Water	14040	River Development	Environment	14040	River Basins' Development
Water	14050	Waste Management	Environment	14050	Waste Management/Disposal
Water	14081	Water Education/Training	Knowledge	14081	Educ./trng:water supply & sanitation
Peace	15061	Post-conflict peace building	Peace and Security	15220	Civilian peace-building, conflict prevention and resolution
Peace	15064	Demobilization	Peace and Security	15261	Child soldiers (prevention and demobilisation)
Peace	15066	Land mine clearance	Peace and Security	15250	Removal of land mines and explosive remnants of war
Peace	16340	Reconstruction relief	Peace and Security	15240	Reintegration and SALW control
Transport	21010	Transport policy/management	Infrastructure	21010	Transport policy & admin. management
Transport	21020	Road transport	Infrastructure	21020	Road transport
Transport	21030	Rail transport	Infrastructure	21030	Rail transport
Transport	21040	Water transport	Infrastructure	21040	Water transport
Transport	21050	Air transport	Infrastructure	21050	Air transport
Transport	21061	Storage	Infrastructure	21061	Storage
Transport	21081	Transport education/training	Knowledge	21081	Educ./trng in transport & storage
Communication	22010	Communications policy/management	Knowledge	22010	Communications policy & admin. mgmt
Communication	22020	Telecommunications	Knowledge	22020	Telecommunications
Communication	22030	Media	Knowledge	22030	Radio/television/print media
Agriculture	31192	Agriculture Protection and Pest Control	Environment	31192	Plant and post-harvest protection and pest control
Agriculture	43040	Rural regional development	Infrastructure	43040	Rural infr. development
Environment	41050	Flood prevention/control	Environment	41050	Flood prevention/control
Environment	41081	Environmental education/training	Knowledge	41081	Environmental education/training
Support	72030	Local Aid to Refugees	Governance	72050	Relief coordination; protection and support services
Support	92930	Support to NGOs	Governance	N/A	N/A