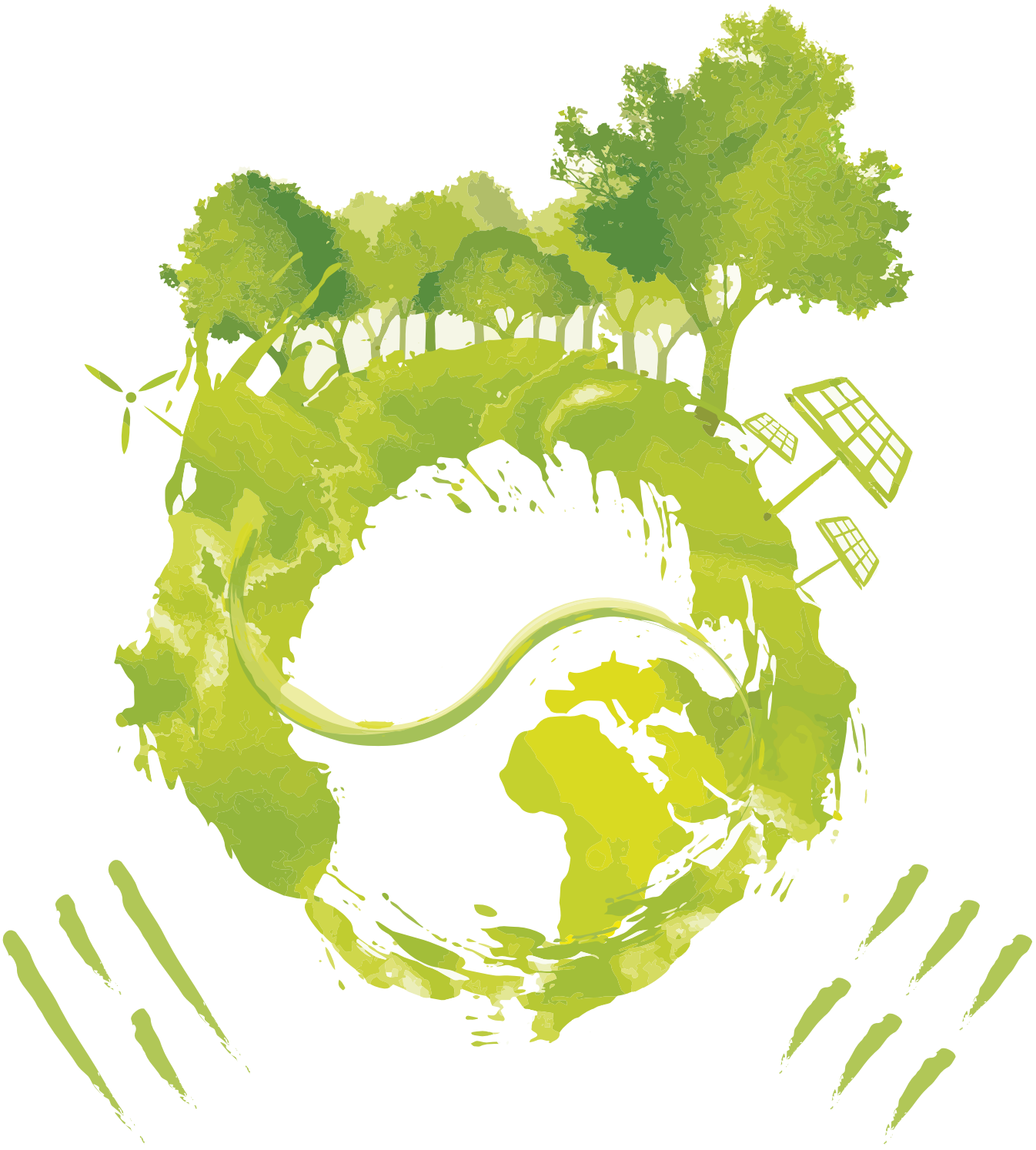
Green Growth as a Determinant of Green Official Development Assistance: Findings from the Republic of Korea

UNDP Seoul Policy Centre

July 2022



Contributing Paper

The UNDP Seoul Policy Centre is part of the United Nations' global development and policy network. The Policy Centre is central to supporting effective development cooperation, South-South and Triangular Cooperation and high-quality programming and action through cutting edge development research, policy dialogue and knowledge sharing on key development issues.

As the co-hosting organization for the national launch of the Human Development Report in the Republic of Korea in 2020, the UNDP Seoul Policy Centre organized a consultative workshop to inform the formulation of the Planetary-Pressure adjusted Human Development Index. Having supported its development, the author of this publication sought to use it to attain insights on how the Centre can support UNDP's strategic objective of facilitating green structural transformations in partner countries, thereby further affirming its analytical value. This paper hopes to provide a glimpse of the prospects and political economy of Green Official Development Assistance, thereby offering insights regarding potential partnership opportunities with relevant public actors.

UNDP is the leading United Nations organization fighting to end the injustice of poverty, inequality, and climate change. Working with our broad network of experts and partners in 170 countries, we help nations to build integrated lasting solutions for people and planet.

Learn more at undp.org or follow at @UNDP.

Published in the Republic of Korea

Acknowledgements

Author

- Mr. Minhyuk Hong, Research Consultant, UNDP Seoul Policy Centre (USPC)

Editing Team

- Dr. Anne Juepner, Acting Director, USPC
- Mr. Chris Ziegler, Programme Analyst, USPC
- Ms. Yasemin Derebasi, Research Consultant, USPC
- Ms. Hye-Jin Park, Communication and Partnerships Specialist, USPC
- Ms. Hojin Chung, Private Sector Engagement Specialist, USPC
- Ms. Sujin Kim, Communications Consultant, USPC
- Ms. JerryLynn Kariuki, Intern, USPC
- Ms. Sara Ceddia, Intern, USPC
- Ms. Hyunjeong Jin, Intern, USPC
- Ms. Sujin Cho, Intern, USPC
- Ms. Yoonha Lee, Intern, USPC

In addition to the colleagues listed above, the author of this paper expresses his upmost gratitude towards the individuals from the London School of Economics, Korea University, and the UNDP Human Development Report Office for their constructive peer reviews, as well as all interviewees for their unique insights.

Executive Summary

Despite the importance of a global transition into a Green Growth (GG) paradigm, many developing countries are unable to independently undergo a green structural transformation without the support of Green Official Development Assistance (G-ODA) defined, in the context of this paper, as climate-related development finance. As such, this paper will address the lack of research on the descriptive drivers of G-ODA by elaborating on donor-specific characteristics, mainly referring to how the GG-levels of the Organisation for Economic Co-operation and Development's Development Assistance Committee member countries, measured through the Planetary-Pressure Adjusted Human Developed Index, affect their G-ODA contributions. To this end, this paper will use a mixed methodology. Quantitative methods will identify 'how' GG affects G-ODA by applying regressions with fixed donor-country effects on panel data of twenty-eight countries from 2013 to 2018. Moreover, interview-based qualitative methods will be utilized to conduct a case study of the Republic of Korea (ROK) to ascertain 'why' GG affects G-ODA.

This paper presents six findings. First, GG shares a positive relationship with the total value of G-ODA. Second, GG possesses a positive relationship with the total value and percentage of multilateral G-ODA. Third, GG boasts a positive relationship with the total value of significant G-ODA. Fourth, there is insufficient data to claim that GG influences the bilateral G-ODA contributions of donors. Fifth, GG cannot be said to have a significant relationship with principal G-ODA. Sixth, there is not enough evidence to claim that GG significantly affects the objective-based commitments of G-ODA, including that of mitigation. Regardless of significance levels, GG had a greater influence on G-ODA than the traditional determinants of ODA in all models. This paper found that these relationships were primarily driven by strong political will, though the issue of capacity spillovers also played a complementary role.

TABLE OF CONTENTS

1. Introduction

Despite the calls to 'build back better' from the COVID-19 pandemic, it is still estimated that the world will face an intolerable temperature rise of around 3 degrees (IPCC, 2022). According to certain scholars, this temperature increase can be overcome, at least to some extent, by undergoing a global transition from the business-as-usual economic model to the Green Growth (GG) paradigm, which, despite lacking a standard definition, is widely seen as an embodiment of the three pillars of Sustainable Development (Bowen, 2014). More specifically, GG is largely characterized by the 'economic' and the 'environment' pillars of the Sustainable Development Goals (SDGs), as most definitions assert the need to decarbonize growth by addressing environmental market failures and leveraging 'green' opportunities to promote economic progress by creating new jobs and technologies. Nonetheless, some definitions also include the 'social' pillar by emphasizing the need to undergo a 'just transition.'

In this context, GG is important to developing countries because of two reasons (OECD, 2012). First, it is intrinsically important as climate change will disproportionately harm developing countries, and the individuals within them (OECD, 2021a) that contributed the least to it (Cardona & Aalst, 2018). Second, it is instrumentally significant because the citizens of developing countries are becoming responsible for a more significant share of global greenhouse gas emissions and thus must play a greater role in carbon abatement going forward.

However, it was found that such developing countries, though often willing, are not fully capable of independently undergoing this transition (OECD, 2013). For this reason, GG in developing countries needs to be actualized by a 'two-track' approach backed by climate finance from developed countries. Indeed, in addition to the moral responsibility to provide such support, many developing countries have highlighted the important role that such support plays in increasing the ambitions of their Nationally Determined Contributions (NDCs).

In this context, Article 6 of the Paris Agreement elaborates on 'collaborative' approaches to NDC achievement. More specifically, Articles 6.2 and 6.4 elaborate on market-based approaches, while Article 6.6 mentions non-market-based approaches. In the context of this paper, the focus will be given to the latter as it oversees the use of Green Official Development Assistance (G-ODA), which refers to financial support that meets two conditions. First, it must be provided from a public organization to a recognized recipient country or multilateral organization, possess developmental

objectives, and be concessional in nature (OECD, 2021b). Second, the funds must support biodiversity, the fight against desertification, or climate-related objectives (OECD, 2013). In the context of this paper, G-ODA was measured as climate-related development finance, as explained in Appendix 1.

In addition to comprising 79% of the 100 billion climate finance commitment (OECD, 2021f), G-ODA is important for two reasons. First, it can be used to support neglected needs. To elaborate, private finance, often driven by profits, tends to prioritize the support of middle-income countries over those from low to least developed contexts, exacerbating the vulnerability of those countries by leaving their adaptive capacity needs unmet. In this regard, G-ODA, being 'developmental' in nature, can support such countries. Second, it can be used to mobilize other forms of public and private finance. Given that finance is often committed when the benefits of a particular intervention surpasses the costs, G-ODA can be used to reduce the latter, thereby lowering the barriers to the participation of green development projects. As such, the Organisation for Economic Co-operation and Development's (OECD) Development Assistance Committee (DAC) has recently released a declaration to emphasize the need to better align development cooperation with the goals of the Paris Agreement (OECD, 2021f).

However, despite its importance, there is insufficient research on the donor-related drivers of G-ODA. This is concerning because of two reasons (Schalatek & Bird, 2017). First, on the quantitative side, it places doubt on whether developed countries will be able to annually mobilize enough climate finance, especially when considering that they were unable to deliver on the Copenhagen pledge to annually provide US$100 billion by 2020 (Timperley, 2021). Second, on the qualitative side, there is a lack of clarity regarding the way climate finance will be mobilized in the future. Hence, especially now that the rules governing G-ODA have been operationalized through the Glasgow Climate Pact (UNFCCC, 2022), this paper will ascertain the relationship between GG levels in donor countries and G-ODA contributions, to provide insights on the prospects of G-ODA during an era in which it is becoming increasingly necessary.

Considering this, the rest of this paper will proceed in the following manner. Section two will present the theoretical basis of this paper. Section three will provide details on the research methodology. Section four will reveal the findings of various quantitative hypotheses. Section five will elaborate on the mechanisms driving these relationships through a case study on the Republic of Korea (ROK). Section six will conclude this paper by summarizing and elaborating on the policy implications.

2. Theoretical Basis

a. Literature Review

In general, existing literature seems to place more focus on the results of G-ODA rather than its drivers. To elaborate, it is argued that G-ODA is unable to promote both the 'green' and the 'growth' components of sustainable development. Regarding the 'green' component, there are contrasting opinions on whether G-ODA can strengthen the environmental sustainability of developing countries. On the one hand, one portion of the literature advances the idea that ODA generally induces carbon abatement in recipient countries through both direct and indirect pathways (Lee et al., 2020). On the other hand, some authors argue that G-ODA has no direct association with carbon abatement in developing countries (Li et al., 2020; Yonemoto and Triendl, 1998). In fact, Persson (2008) argues that developing countries often do not have a strong desire to pursue environmental goals, especially when they conflict with economic ones. As such, even when green objectives are achieved, it comes at the expense of 'green conditionalities' that weakens the ownership of partner countries.

Pertaining to the 'growth' component, G-ODA does not necessarily contribute to the socio-economic development of developing countries. In fact, findings show that G-ODA often instigates trade-offs between GG and poverty alleviation because the short-term poverty alleviation properties of GG are lower than that of carbon-intensive growth (Dercon, 2015). Accordingly, long-term environmental goals may come at the expense of immediate needs such as food security (Davies, 1992). Regardless, these far-off goals are often prioritized due to the hierarchal nature of aid, which leads to global priorities and timelines being promoted over local ones (Kalirajan et al., 2011).

These limitations are concerning due to the uncertain 'additionality' of G-ODA. According to Szabó (2016), donors can use ODA contributions to satisfy their climate finance commitments because methodologies and terminologies are not well-defined. This means that G-ODA does not mobilize new forms of financial support; rather, it is often implemented through those already in existence. Hence, G-ODA may be undesirable because it may 'crowd-out' other forms of development finance by replacing, rather than complementing, traditional forms of ODA.

Nonetheless, some papers have discussed the drivers of G-ODA in the normative sense. For example, Dercon (2014b) argued that development aid, especially in least developed countries, should primarily focus on poverty reduction activities, even if it comes at the expense of GG. In addition to concerns that GG may not be a

feasible policy objective (Hickel & Kallis, 2019; World Bank, 2022), this is because such prioritization would enable southern countries to build the capacity needed to reduce their vulnerability to climate change. In fact, it was suggested that the only time that G-ODA should target least developed countries is when relevant interventions could simultaneously pursue GG and poverty reduction objectives or if the absence of such activities would lead to detrimental 'carbon lock-in.' Accordingly, it was viewed to be more strategic to allocate G-ODA to countries with relatively lower levels of extreme poverty, such as those from middle-income contexts, to ensure that those that have escaped extreme poverty do not fall back into it due to the multi-dimensional effects of climate change (Atanda & Cojocaru, 2021). Recognizing that more than 67 percent of the global poor, which is a number that has increased by 70 million due to the impact of the Covid-19 pandemic (IMF, 2022), live in such countries (UNDP, 2021), other researchers have disagreed with this notion, citing two arguments. First, it reinforces a 'green comfort zone' that results in the usage of a tied aid modality driven by the commercial interests of donor countries (Park, 2016). Second, such support may be unwarranted as middle-income countries, unlike other southern countries, can independently attract private finance (Steele, 2015).

Concurrently, other papers have debated the descriptive aspects of G-ODA allocation, though there is a lack of conclusive agreement. On the one hand, some argue that G-ODA is provided according to need. For example, Carfora et al. (2021) argue that donor countries provide more G-ODA to countries with higher levels of environmental vulnerability and less to those with higher levels of socio-economic development. On the other hand, other scholars advance the argument that national interests are given more weight in G-ODA allocation. For instance, Opršal and Harmácek (2019) state that the environmental needs of recipient countries are not always properly reflected as non-environmental factors such as historical relationships are often prioritized. In the middle of this debate, Bessey and Palumpart (2016) posit that although national interests heavily drive the G-ODA of both the ROK and Germany, the G-ODA of the ROK placed additional emphasis on aspects such as environmental need and merit. Indeed, this is alignment with the traditional debate on ODA allocation, in which it is stipulated that the allocation of ODA is motivated by the strategic interests of donor countries and the need of recipient countries (Maizels & Nissanke, 1984; Alesina & Dollar, 2000; Berthélemy & Tichit, 2003; McKinlay & Little, 1977).

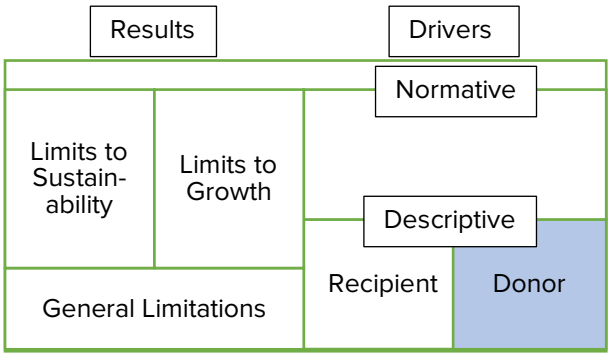
Against this backdrop, this paper argues that the literature on the relationship between GG and G-ODA provides very little reflection on the other side of the donor-recipient spectrum. In the 'results' spectrum of the literature, most papers focus on how the G-ODA of donors affects the GG of recipients. Concurrently, in the 'drivers' section,

scholars mainly discussed the role that the GG levels of recipient countries play in motivating the G-ODA allocation of donor countries at both the ideal and empirical levels. In this regard, there is not much clarity on the relationship between the GG levels of developed countries and their provision of G-ODA. In this regard, this paper seeks to build on the 'descriptive' aspect of the 'drivers' literature, as marked in Figure 1, by elaborating on how the former influences the latter.

Figure 1

Literature Review

Source: Author's own illustration.



In fact, the only mention of the donor-driven aspects of G-ODA can be found in Hicks et al. (2008). This study, which is based on the aggregated project-level panel data of twenty developed countries from 1988 to 1999, advanced that various 'green' aspects within donor countries led to different behaviours in G-ODA allocation. First, it affirmed that countries with a higher post-materialistic lifestyle invested less in environmentally detrimental projects, though not necessarily more in beneficial projects. Second, it argued that there is a substitution effect between international and domestic ambitions. This is because countries participating in more international environmental treaties provided more G-ODA, whereas those with stringent domestic policies provided less. Finally, it posited that countries with many environmental civil society organizations and firms provided less brown aid and more green aid. However, the study concluded that the impact of these variables was minor compared to the traditional determinants of aid allocation.

Accordingly, this paper will contribute to the literature in three ways. First, it will provide an updated understanding of the relationship between GG and G-ODA by basing its findings on more recent and comprehensive panel data and measurement methodologies. For example, it uses and re-creates data from the P-HDI, being the first paper to do so. Second, it will provide an aggregate understanding of how GG affects

G-ODA while comparing the strength of this all-inclusive variable with more recent measurements of traditional aid allocation variables. Third, it will offer insights on the political economy of G-ODA allocation, thereby offering lessons learned on how to approach relevant partnership opportunities going forward.

b. Research Hypotheses

Based on the information that can be ascertained through available disaggregated data, this paper proposes four sets of hypotheses. The first set refers to the general relationship between GG and G-ODA. The second set pertains to the channels through which G-ODA is distributed. In other words, it will ascertain whether increases in GG will lead to improvements in G-ODA that is dispersed bilaterally through national agencies and shared multilaterally through international organizations. The third set concerns the composition of bilateral G-ODA. It will reveal whether improvements in GG result in the rise of interventions specifically targeting climate-related objectives through 'principal' G-ODA and the increase in initiatives where climate-related objectives are mainstreamed through 'significant' G-ODA. The composition of multilateral ODA cannot be ascertained due to data unavailability. The fourth set will discuss whether the objectives of G-ODA change in accordance with the rise in GG. In this sense, it will elaborate on whether GG instigates any changes to G-ODA with adaptation, mitigation, and overlapping objectives. More detailed information on these variables can be found in Appendix A. Finally, these hypotheses on G-ODA will be tested in both absolute dollar amounts and as a relative share of total ODA. In summary, the four sets of hypotheses are as follows:

1. Hypotheses on General Relationship	
H1A	Higher levels of GG will lead to higher absolute amounts of G-ODA
H1B	Higher levels of GG will lead to higher proportions of G-ODA as a share of total ODA
2. Hypotheses on Distributive Channels	
H2A	Higher levels of GG will lead to higher absolute amounts of bilateral G-ODA
H2B	Higher levels of GG will lead to higher proportions of bilateral G-ODA as a share of total ODA
H2C	Higher levels of GG will lead to higher absolute amounts of multilateral G-ODA
H2D	Higher levels of GG will lead to higher proportions of multilateral G-ODA as a share of total ODA
3. Hypotheses on Bilateral Composition	
H3A	Higher levels of GG will lead to higher absolute amounts of principal G-ODA
H3B	Higher levels of GG will lead to higher proportions of principal G-ODA as a share of total ODA

H3C	Higher levels of GG will lead to higher absolute amounts of significant G-ODA
H3D	Higher levels of GG will lead to higher proportions of significant G-ODA as a share of total ODA
4. Hypotheses on Objectives	
H4A	Higher levels of GG will lead to higher absolute amounts of adaptation G-ODA
H4B	Higher levels of GG will lead to higher proportions of adaptation G-ODA as a share of total ODA
H4C	Higher levels of GG will have no effect on the absolute amount of mitigation G-ODA
H4D	Higher levels of GG will have no effect on the proportions of mitigation G-ODA as a share of total ODA
H4E	Higher levels of GG will have no effect on the absolute amount of G-ODA with overlapping objectives
H4F	Higher levels of GG will have no effect on the proportion of G-ODA with overlapping objectives as a share of total ODA

These hypotheses were formulated based on the potential for 'capacity spillovers'. That is, they were made on the assumption that improvements to a nation's capacity to facilitate GG would lead to a rise of technical expertise that could be transferred to G-ODA. Indeed, the important role that national capacity plays in determining policy direction can be widely found in the existing literature. Described as 'policy capacity,' this refers to the ability of governments to leverage existing resources to formulate and implement strategic decisions (Painter & Pierre, 2005; Gleeson et al., 2011; Wu et al., 2015). In the process of decision-making, such competency is exercised as states analyze their sectoral competencies and subsequently mobilize resources in a rational manner. This holds particularly true when discussing the nexus between GG and G-ODA, as Willems and Baumert (2003) assert that a sufficient level of climate-specific and climate-relevant capacity is a pre-requisite for designing and implementing climate policies and follow-up measures. Going further, this spillover effect seems feasible because it supports the interests of environmentally concerned governments, especially when considering that undergoing carbon mitigation in developing countries would be a more cost-effective way of providing support to a global public good.

In this regard, this paper suspected that there would be no significant relationship between the hypotheses that included adaptation objectives. This is because adaptation, being a solution to local environmental problems, would not lead to global externalities that could benefit donor countries. Accordingly, null hypotheses were set for Hypothesis H4C, H4D, H4E, and H4F. For the other hypotheses, positive relationships were predicted as they would lead to reduced carbon emissions that

would also benefit developed countries. In this sense, although certain proportion-based hypotheses may be considered mutually exclusive, this paper does not predict an inverse relationship because the overall increase in G-ODA as a share of total ODA renders it possible to experience improvements in both. Finally, the hypotheses were not lagged as it was assumed that domestic capacity could immediately be transferred to the international level, at least in the form of commitments.

3. Research Methodology

This paper uses a mixed methodology to achieve its research objectives. To this end, it first conducts a quantitative analysis of the impact that GG asserts on G-ODA. Accordingly, it applies a regression with donor country-fixed effects, following the approach of Claessens et al. (2009) as well as Hoeffler and Outram (2011). As approximately half of the allocated aid can be attributed to time-invariant, donor-specific characteristics (Hoeffler & Outram, 2011), this estimation method reduces the unobserved heterogeneity that may bias the results of pooled Ordinary Least Squares regression models. However, unlike the aforementioned two estimation approaches, this paper will not include recipient-country fixed effects, which cannot be incorporated into the model due to data unavailability. Finally, all hypotheses will be tested at the 0.1, 0.05, and 0.01 percent significance levels.

Consisting of panel data for twenty-eight OECD countries from 2013 to 2018, the final dataset used for the quantitative findings included 168 observations. Although the data for an additional country, Hungary, exists for most years, it was removed due to missing and incomputable values for the dependent and control variables of certain years. Moreover, the data for 2012 and 2019 were also omitted due to missing and incomputable data for two control variables. All in all, the two estimator models used are as follows:

Estimator for Absolute Value Model:

$$GreenODATotal_{it} = \beta_1 PHDI_{it} + \beta_2 Needs_{it} + \beta_3 Interests_{it} + \beta_4 ODA_{it} + \beta_5 PHDI{\cdot}ODA_{it} + D_i + \mu_{it}$$

Estimator for Percentage Model:

$$GreenODAPercentage_{it} = \beta_1 PHDI_{it} + \beta_2 Needs_{it} + \beta_3 Interests_{it} + D_i + \mu_{it}$$

The subscripts $_i$ and $_t$ denote donor and time. β represents the coefficient for each variable. D_i indicates the unobserved time-invariant effects of donor countries. μ_{it} refers to the error term. More detailed information on the different variables can be found in Appendix A.

After conducting quantitative analysis, the paper includes a qualitative one for two reasons. The first is to triangulate the direction of its quantitative findings. Indeed, regressions are unable to verify whether it is GG that is empowering G-ODA or if the inverse is true. The second is to identify the mechanisms driving this relationship, enabling these quantitative correlations to acquire causative status.

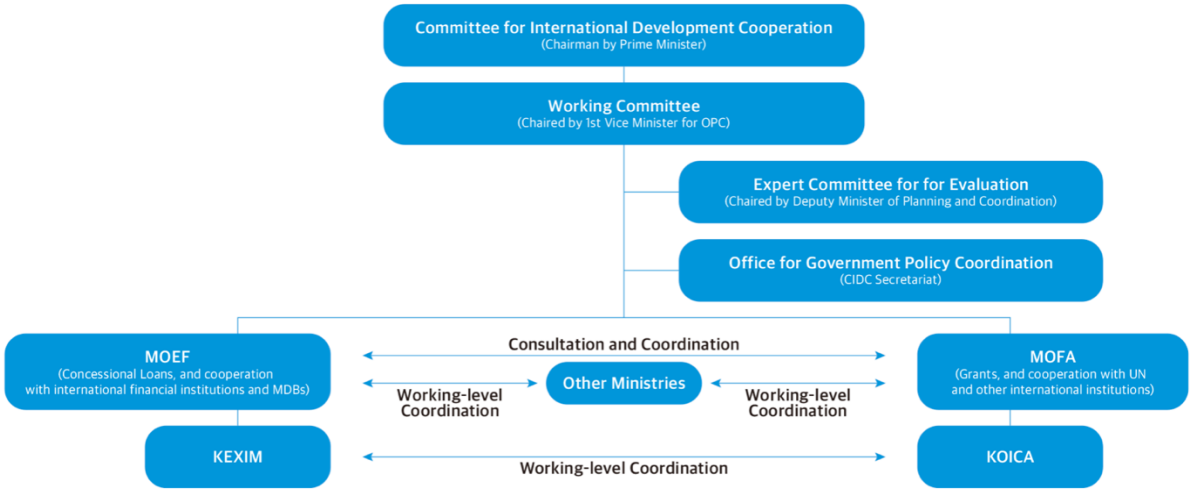
To this end, this paper conducts a case study on the relationship between GG and G-ODA in the ROK. This country was purposefully selected as it is renowned for using its national GG initiatives to strengthen its G-ODA (Hong & Izmestiev, 2020). Subsequently, in addition to undergoing desk research, this paper conducts semi-structured in-depth interviews with relevant experts. These experts were also purposefully selected by a two-step process based on non-probability sampling. First, a list of relevant organizations was created. Second, potential interview targets for each agency were designated based on convenience and snowball sampling methods. More detailed information on the experts interviewed can be found in Appendix B.

These organizations and individuals were chosen based on their relevance to the three-tier development cooperation system of the ROK shown in Figure 2. The first tier refers to the Committee for International Development Cooperation (CIDC), which acts as the primary policymaking body. The second tier consists of various ministries, primarily the Ministry of Foreign Affairs and the Ministry of Economy and Finance, which serves as the mainline ministries supervising the activities of the relevant implementing agencies. That is, the former oversees the Korea International Cooperation Agency, which is the organization responsible for grants, technical assistance, and support from the ROK to international organizations. The latter administers the Economic Development Cooperation Fund, which is mandated to provide loans, and the country's contributions to multilateral banks and funds. These organizations collaborate with non-state actors such as the private sector, civil society, and academia to implement relevant projects and are thus considered the third tier. Although interviews did not take place with individuals from the second tier, the way such experts work closely with their counterparts in the first and third tier sufficiently ensures the comprehensiveness of this study, as various rounds of consultative discussions take place between each tier prior to undergoing any major policy decisions.

Figure 2

Development Cooperation System of the ROK

Source: https://odakorea.go.kr/ODAPage_2022/eng/cate03/L01_S01.jsp. Copyright n.d. by Office of Government Policy Coordination.


Committee for International Development Cooperation
(Chairman by Prime Minister)
Working Committee
(Chaired by 1st Vice Minister for OPC)
Expert Committee for for Evaluation
(Chaired by Deputy Minister of Planning and Coordination)
Office for Government Policy Coordination
(CIDC Secretariat)
MOEF
(Concessional Loans, and cooperation with international financial institutions and MDBs)
Consultation and Coordination
Working-level Coordination
Other Ministries
Working-level Coordination
MOFA
(Grants, and cooperation with UN and other international institutions)
KEXIM
Working-level Coordination
KOICA

4. Findings

This section uses quantitative methods to highlight 'how' GG affects G-ODA. Descriptive data can be found in Appendix C, while the tables mentioned below can be found in Appendix D. Scatterplots can be found in Appendix E.

To begin with, Table 2 in Appendix E shows the general influence that GG asserts on G-ODA. That is, it argues that GG has a positive impact on the total amount and percentage of G-ODA provided by OECD-DAC donor countries. The coefficients for sub-hypotheses H1A and H1B are high since each percentage increase in GG, as captured by the PHDI, leads to a rise of approximately $107 million and 0.013 percent in climate-related G-ODA. Both models have a very high adjusted r-square; the total value model is 0.96 percent, whereas the percentage model is 0.90 percent. However, only the total value model is statistically significant at the 0.1 percent level.

This is somewhat in alignment with the findings from available literature. For example, Liu (2016) states that improvements in Japan's national approach to environmental concerns empowered its G-ODA, whereas Orpšal and Harmácek (2019) observe similar trends in the Czech Republic. Similarly, Casado-Asensio et al. (2014) posit that Nordic countries such as Denmark, Finland, Iceland, Norway, and Sweden are responsible for the coordinated provision of G-ODA in Zambia. As these countries have higher GG levels than the average OECD-DAC country, this affirms that G-ODA is being coordinated in alignment with national comparative advantages, as stipulated by OECD-DAC norms.

Table 3 confirms two findings regarding the channels through which G-ODA is transferred. First, GG has a positive influence on both the total amount and percentage of bilateral G-ODA, as shown in columns H2A and H2B. The coefficients for these relationships are somewhat high since each percentage rise in GG leads to around a $72.8 million and a 0.008 percent increase in bilateral G-ODA. Both the total value (H2A) and percentage (H2B) model can explain almost all the observational variations, as they boast an adjusted r-squared of 0.96 and 0.90 percent, respectively. However, neither model is statistically significant. This can be affirmed as it has been reported that climate objectives have not been well integrated into the bilateral aid programme of OECD-DAC donors, especially those with tighter constraints in terms of budget and capacity (OECD, 2021f).

Second, GG positively influences both the total amount and percentage of multilateral G-ODA, as mentioned in columns H2C and H2D. The coefficients for these

models are moderately strong, as each percentage increase in GG will approximately result in a $34.5 million and a 0.005 percent improvement in multilateral G-ODA. Both the total value and the percentage model can explain most of the observational variations. This is because the adjusted r-squared level is 0.87 and 0.60 percent. Furthermore, both models are statistically significant at the 0.05 percent level. Such findings are aligned with OECD (2021f), which reports that many donors, especially those with a smaller aid programme, facilitate their G-ODA primarily, if not only, through multilateral channels. This is attributed to the predominant role that international organizations play as an implementing agency and a standard setter, particularly when financing the development of key infrastructure.

Table 4 discusses two findings on the composition of G-ODA. First, GG has a negative influence on the total amount and percentage of principal G-ODA. The coefficients for the models for H3A and H3B are strong in that each percentage rise in GG instigates around a $130 million and a 0.018 percent decrease in principal G-ODA. Both the absolute value and percentage have a relatively high adjusted r-squared, as they explain around 0.69 and 0.56 percent of the observational variations. However, neither model is statistically significant. This can be affirmed as it was found that only a few OECD-DAC donors have developed a defined approach to supporting the green transformation of partner countries through their aid programmes (OECD, 2021f).

Second, GG has a positive influence on the total amount and percentage of significant G-ODA, as seen in H3C and H3D. The coefficients for both models are very strong since each percentage improvement in GG facilitates a $202 million and a 0.026 percent growth in significant G-ODA. Both the absolute value and percentage model can explain a relatively large degree of the variations in G-ODA, possessing an adjusted r-squared level of 0.77 and 0.70 percent, respectively. However, only the absolute value model is statistically significant at the 0.10 percent level. Indeed, this can be confirmed as the OECD (2021f) reports that several OECD-DAC donors have specific policies for mainstreaming climate objectives throughout their aid programmes.

Finally, Table 5 presents three findings on the objectives of G-ODA. First, GG has a positive influence on both the total amount and percentage of adaptation-based G-ODA, as described in columns H4A and H4B. The coefficients for these models are relatively weak in that each percentage rise in the former will result in a $13.3 million and a 0.00002 percent growth in G-ODA. Second, columns H4C and H4D demonstrate that GG has a strong impact on both the total amount and percentage of mitigation-based G-ODA. The coefficients for both models are strong, as each percentage increase in GG instigates a $73.9 million and a 0.001 percent improvement in the

mitigation-based G-ODA. Third, GG has a positive impact on the total amount and percentage of G-ODA with overlapping objectives, as depicted in columns H4E and H4F. The coefficients for these relationships are weak since each percentage growth in GG facilitates a $14.4 million and a 0.0004 percent increase in the G-ODA with overlapping objectives. The adjusted r-squared for these models differs significantly, ranging from 0.47 to 0.92 percent. Accordingly, all the models can explain a moderate share of the observational variations. However, none of the six models were found to be statistically significant. This supports the findings of OECD (2021f), which demonstrated that many OECD-DAC donors do not possess specific quantitative mitigation or adaptation goals.

For all the models mentioned hitherto, it was found that the coefficients of GG were higher than those of development needs and donor interests. This is especially true when considering the difference in unit scales. Therefore, it can be affirmed that GG is more influential than the traditional determinants of ODA in the allocation of G-ODA.

To test for robustness, this paper substituted the PHDI with the normalized average for the OECD's GG Indicators. These alternative regressions resulted in coefficients, significance levels, and adjusted r-squared levels that were generally consistent with the original model. The detailed findings can be found in Appendix F.

Nonetheless, there were a few minor differences. First, the causative direction for the hypotheses H4B and H4F changed. However, when considering that the coefficients for both are close to zero and statistically insignificant for both models, this is not significant discrepancy. Second, the statistical significance for hypotheses H1A and H2D were lost. However, as the causative direction remains the same and only minor changes in P-values were experienced, the effect of this finding on our model is symbolic at best. Third, hypotheses H3A and H3B were found to be statistically significant at the 0.1 percent level. Once again, as the direction of coefficients remains unchanged and only slight adjustments in P-values occurred, this does not provide evidence against this paper's findings. In fact, it provides evidence for the claim that additional statistically significant relationships may exist. As such, the robustness test supports the findings that the GG levels of donor countries has a significant impact on their provision of G-ODA.

In short, this section revealed six crucial insights; the first three are from statistically significant findings, whereas the last three are from insignificant ones. First, GG boasts a positive relationship with the total value of G-ODA. Second, GG shares a

positive relationship with the total value and percentage of multilateral G-ODA. Third, GG possesses a positive relationship with the total value of significant G-ODA. Fourth, the data does not show that a significant relationship exists between GG and bilateral G-ODA. Fifth, there is insufficient evidence to claim that GG has a significant relationship with principal G-ODA, though the robustness test suggests that such relationships may exist. Sixth, GG cannot be said to affect the objective-based commitments of G-ODA, including that of mitigation. Nonetheless, regardless of significance levels, it seems that GG has a greater influence on G-ODA than the traditional determinants of ODA.

5. Discussion

This section will present a qualitative case study on the ROK to triangulate these quantitative findings and, more importantly, offer insights on 'why' GG affects G-ODA. To provide some context on the relationship between the two in the ROK, former Presidents Lee Myung-bak (2008-2013) and Moon Jae-in (2017-2022) both led a strong push for 'GG' and the 'Green New Deal (GND)' in response to the 2008 Global Financial Crisis and the socio-economic repercussions of the Covid-19 pandemic, respectively. Consequently, this resulted in a strong call for 'GG ODA' and 'GND ODA' in the following years.

Against this backdrop, it seems that the general relationship between GG and G-ODA is only somewhat related to the issue of capacity spillovers. This was affirmed by Interviewees A (personal communication, 2021), B (personal communication, 2021) and C (personal communication, 2021), who affirmed that GG led to additional finance, technologies, and policy knowledge that could be shared with other countries. However, the scale of such externalities was insufficient as they only occurred at the project, as opposed to the programme level (Interviewee E, personal communication, 2021).

Rather, there seems to be a consensus that the interface between GG and G-ODA is primarily driven by political will. This is because ODA traditionally focuses on socio-economic issues, implying that a strong political push is needed for environmental topics to receive additional attention (Interviewee B, personal communication, 2021; Interviewee C, personal communication, 2021). Accordingly, once governments push for improvements in domestic GG, the need for coherence in public policy results in a whole-of-government approach that enhances the environmental sustainability of ODA (Interviewee C, personal communication, 2021; Interviewee G, personal communication, 2021; Interviewee F, personal communication, 2021). Indeed, as ODA is a foreign policy tool reflecting national interests, domestic policy inevitably affects it (Interviewee A, personal communication, 2021; Interviewee I, personal communication, 2021).

These political initiatives were also supported by the private sector, civil society, and the public. To begin with, the private sector supports the increase in G-ODA, as it often results in the additional financial and technical support needed to promote their competitiveness (Interviewee A, personal communication, 2021; Interviewee C, personal communication, 2021; Interviewee E, personal communication, 2021) In fact, this led to some concerns on the intent of G-ODA, as the focus on supporting the

Korean private sector at times seemed to be greater than addressing environmental shortcomings (Interviewee G, personal communication, 2021). Indeed, the Korean government often brings up the issue of involving the private sector when discussing such joint initiatives, which is aligned with its new emphasis on promoting 'mutual benefits' (Interviewee K, personal communication, 2021). Pertaining to civil society, many groups pushed for a greener agenda in all aspects of public policy (Interviewee G, personal communication, 2021). However, the effect of such efforts on G-ODA was limited as most Korean development NGOs focus on service delivery rather than advocacy (Interviewee I, personal communication, 2021). Concerning the public, citizens are proud of their domestic achievements and thus want to see them shared with other countries (Interviewee I, personal communication, 2021).

Consequently, these interests were well-reflected in relevant policy documents (Interviewee B, personal communication, 2021; Interviewee G, personal communication, 2021). For example, the GG initiative of the ROK led to G-ODA becoming an important part of its National Plan on GG (CGG, 2009a), as well as its First and Second Five-Year Strategy on GG (CGG, 2009b; CGG, 2014). Moreover, the GND of the ROK was mentioned as a significant component of its Third Strategic Plan on International Development Cooperation (CIDC, 2021a), 2021 and 2022 Annual Implementation Plan (CIDC, 2021b; CIDC, 2021c), Third Five-Year Strategy on GG (CGG, 2019), and GND Implementation Plan (CIDC, 2021d). These documents, amongst others, provided the policy guidance needed to actively promote G-ODA.

Regarding the channels through which G-ODA is provided, the positive influence of bilateral G-ODA seems to have been attributed to such policy guidance. More specifically, national aid agencies were given strong instructions to align with government policies (Interviewee B, personal communication, 2021). For example, such organizations were required to adhere to specific quantitative targets regarding the number of projects addressing climate change (Interviewee F, personal communication, 2021). As such, it is expected that preferential consideration will be systematically given to projects satisfying such requirements in the upcoming years (Interviewee H, personal communication, 2021).

However, the statistical insignificance of this relationship can be attributed to the inherent characteristics of bilateral ODA. First, the ROK uses an N-2 System to formulate development interventions, meaning that projects can only be implemented two years after an initial plan is created (Interviewee H, personal communication, 2021; Interviewee J, personal communication, 2021). This results in a time-lag that is not fully captured by the data used in this model. Second, G-ODA projects are implemented in

the long-term, rendering them vulnerable to sudden changes in political regime (Interviewee C, personal communication, 2021). Indeed, the transition from the Lee Myung-back (2008-2013) to the Park Geun-hye (2013-2017) administration resulted in the de-prioritization of G-ODA (Interviewee B, personal communication, 2021). This leads to most bilateral projects being implemented through other alternatives. Third, Interviewee J (personal communication, 2021) asserts that interests within the same government structure may limit the extent to which green agendas can immediately be pushed forth, as there is often resistance from experts in the traditional socio-economic sectors. Fourth, bilateral agencies primarily act as 'orchestrators' that mobilize domestic technical expertise, which the ROK is currently lacking (Interviewee F, personal communication, 2021). In fact, Interviewee G (personal communication, 2021) claims that environmental expertise of the ROK lies in research, and thus does not have many service providers capable of implementing aid projects.

These findings align with the recent commitment of the ROK to exceed the OECD-DAC average of bilateral G-ODA, which was proposed in response to the emergence of its GND. To be specific, it seeks to increase its G-ODA levels from 19.6 percent to 28.1 percent (CIDC, 2021a). However, this target is rather unambitious, as it is argued that the ROK needs to increase its target commitment to well over 40 percent when considering the average ODA commitments of current leading G-ODA donors (Rijsberman, 2021). Indeed, the low nature of this target may reflect the limited ability of the ROK to deliver G-ODA interventions, primarily because there may be lack of packaged interventions that are ready to be implemented (Interviewee J, personal communication, 2021).

This is related to the positive and significant findings on multilateral G-ODA. This is because the ROK has increased its earmarked contributions to multilateral organizations with a climate mandate (Interviewee B, personal communication, 2021; Interviewee C, personal communication, 2021). Such changes occurred through a reciprocal process driven by the interests of both donor governments and international organizations (Interviewee F, personal communication, 2021). On the side of donor governments, mobilizing the support of international organizations is the simplest way to fulfil G-ODA commitments as they already have well-established and visible networks, processes, and access to experts (Interviewee E, personal communication, 2021; Interviewee I, personal communication, 2021; Interviewee H, personal communication, 2021). This reduces the need for governments to pay the transaction costs needed to develop such assets (Interviewee G, personal communication, 2021). Moreover, international organizations do not follow a N-2 system and thus, can implement projects immediately (Interviewee H, personal communication, 2021). Finally,

Interviewee J (personal communication, 2021) affirms that the act of increasing one's contributions to multilateral actors is a method of mobilizing funds of other national actors through 'soft reciprocity.'

On the side of international organizations, supporting donor governments in reaching G-ODA commitments is a method of mobilizing additional sources of finance. Hence, Interviewee D (personal communication, 2012) suggested that international organizations often proposed new programmes that were well-aligned with the incumbent government's strategic interests. Indeed, Interviewees E (personal communication, 2021) and K (personal communication, 2021) affirmed that the environment programme in a certain international organization was created and expanded with the understanding that it would lead to more support from the Korean government.

Such insights can be affirmed as the ROK used its GG response to the 2008 Global Financial Crisis to host new international organizations and funds such as the Global Green Growth Institute (GGGI), Green Climate Fund (GCF), and East Asia Climate Partnership, as well as to create thematic programmes within existing organizations such as the World Bank and UN Economic and Social Committee for Asia and the Pacific (Hong & Izmestiev, 2020). Moreover, the ROK's green recovery from COVID-19 resulted in the near tripling of its 2019 commitments to GCF and the establishment of the GGGI GND Trust fund (CIDC, 2021a). It also further the ROK's engagement with multilateral development banks with a climate mandate, which included establishing or providing additional support to the Asian Development Bank's Climate Action Catalyst Fund and ASEAN Catalytical Green Finance Facility, along with the African Development Bank's Korea-Africa Energy Investment Framework (MOEF, 2021).

Building on this, this paper will now explain the quantitative findings on the composition of bilateral G-ODA. To begin with, the negative and insignificant relationship found with principal G-ODA was somewhat disputed; most experts posited that the increase in GG led to an increase in principal G-ODA, at least in the context of the ROK. This finding does not contradict with the findings of this paper's quantitative analysis, as OECD has sought to overcome fragmentation in bilateral ODA by promoting a 'division of labour' between aid donors (Steensen & Ericsson, 2009).' In other words, while other countries decreased their principal projects to focus on other thematic areas, the ROK focused the scope of its bilateral ODA on environmental issues.

Nonetheless, to whatever extent this inverse relationship was understandable, explanations regarding both technical capacity and political willingness were given.

Concerning the former, it was stated that the ROK lacked the expertise needed to undergo the necessary targeted projects (Interviewee D, personal communication, 2021; Interviewee F, personal communication, 2021; Interviewee G, personal communication, 2021). Moreover, even if the necessary expertise was available, the nature of the support was often contextually inapplicable for developing countries (Interviewee C, personal communication, 2021). According to Interviewee D (personal communication, 2021), such limitations often led to a discrepancy between G-ODA disbursements and commitments. This was exacerbated by a principal-agent problem where policymakers seek to set commitments that practitioners in aid agencies find difficult to deliver on.

Pertaining to the latter, it was said that the potential for regime change often weakened the strength of the central government's policy guidance (Interviewee B, personal communication, 2021; Interviewee C, personal communication, 2021; Interviewee E, personal communication, 2021). As such, preparing projects that solely address climate change was viewed risky. Indeed, the transition from the Lee to the Park regime led to the de-prioritization of the GG agenda, weakening the emphasis on G-ODA. Moreover, the increase of more urgent issues such as refugees and conflict may have resulted in some finance being siphoned away from G-ODA (Interviewee B, personal communication, 2021).

Continuing on, the positive and significant changes in significant bilateral G-ODA can primarily be attributed to political reasons. This is because the ROK was under significant pressure to increase its bilateral G-ODA contributions which was below the OECD-DAC average despite the government's ambitions to become a climate leader. (Interviewee G, personal communication, 2021). As mainstreaming represents the 'low-hanging fruit' that enables such increases to occur in a quicker manner (Interviewee A, personal communication, 2021; Interviewee J, personal communication, 2021), existing projects were repackaged with a green label and new integrated projects with a green component were introduced (Interviewee C, personal communication, 2021; Interviewee E, personal communication, 2021; Interviewee I, personal communication, 2021). This was facilitated through the usage of mandatory checklists that required the inclusion of climate change considerations in all projects (Interviewee B, personal communication, 2021; Interviewee H, personal communication, 2021).

Finally, regarding the objectives of G-ODA, it seems that the lack of a significant relationship can be attributed to the absence of top-down policy guidance. This was particularly true at the bilateral level as Interviewees B (personal communication, 2021), F (personal communication, 2021), G (personal communication, 2021), and H (personal

communication, 2021) affirmed that there has traditionally been no target nor mechanism in place to promote any specific objective through the development cooperation of the ROK. Nonetheless, it is worth mentioning that the ROK has recently promoted a strong political focus on mitigation through its GND ODA, though this effect is not captured in this study's dataset (Interviewee K, personal communication, 2021). Similarly, this lack of top-down policy guidance also holds true at the multilateral level, as Interviewees I (personal communication, 2021) and J (personal communication, 2021) affirmed that donors did not seek to exert any objective-related influence. However, as mitigation projects are more expensive and difficult to implement than those focusing on adaptation, bilateral practitioners in the ROK often outsource these interventions to their multilateral counterparts (Interviewee G, personal communication, 2021). Therefore, all in all, it seems that these relationships are primarily driven by strong political will, complemented by the issue of capacity spillovers to a certain extent.

6. Conclusion

All in all, it is evident that a global transition into a GG paradigm is needed to overcome the impending climate disaster. Due to both intrinsic and instrumental reasons, this is particularly true for developing countries, many of which do not possess the capability to independently undergo this change without external climate finance. In this regard, the G-ODA plays an important role in supporting the green structural transformation of developing countries.

However, existing literature seems to indicate that the G-ODA provided by donor countries is limited in its ability to facilitate both the 'green' and 'growth' aspects of GG in developing countries. This is concerning as the lack of 'additionality' may result in a 'crowding-out' effect, which is particularly detrimental for low-income and least developed countries. Even when this limitation was somewhat overcome by targeting middle-income countries, such approaches often exacerbated sub-optimal aid practices. Finally, despite these shortcomings, there does not seem to be an agreement on the drivers of G-ODA allocation, as there were conflicting opinions on how G-ODA allocations changed in accordance with environmental differences in recipient countries.

In this regard, existing research seems to focus on the impact that G-ODA exerts on GG in partner countries. Taking this into consideration, this paper argued that the literature gap exists on the other side of the donor-recipient spectrum. That is, there is a lack of existing research on the extent to which the GG levels of developed countries impact their contributions to G-ODA. This paper sought to contribute to this area of literature by exploring four sets of hypotheses.

To this end, this paper utilized a mixed methodology. To start off, it used quantitative methods to identify 'how' GG affected G-ODA, applying regressions with fixed country effects on panel data of twenty-eight countries from 2013 to 2018. Subsequently, it incorporated qualitative methods based on a case study of the ROK to ascertain 'why' GG affected G-ODA.

However, the primary limitation of this paper's methodological approach is two-fold. First, the sample size is somewhat limited due to the unavailability of data for certain control variables. Second, to whatever extent data was available, the Rio Markers used to measure bilateral G-ODA can be criticized for being inconsistent, lacking objective standards, and not utilizing proper screening mechanisms, especially during earlier years (Beecher, 2016). Indeed, it was only after the advent of SDGs and

the Paris Agreement that the climate change agenda became more intrinsically integrated into development cooperation. Therefore, this study suspects that additional and stronger statistically significant relationships would have been detected if not for these limitations.

Against this backdrop, this paper offered six key quantitative insights. First, GG shares a positive relationship with the total value of G-ODA. Second, GG possesses a positive relationship with the total value and percentage of multilateral G-ODA. Third, GG boasts a positive relationship with the total value of significant G-ODA. Fourth, there is insufficient data to claim that GG significantly influences the bilateral G-ODA contributions of donors. Fifth, GG cannot be said to have a significant relationship with principal G-ODA, though the robustness test provides evidence that such relationships may exist. Sixth, there is not enough evidence to claim that GG significantly affects the objective-based commitments of G-ODA, including interventions focusing on mitigation. Regardless of significance levels, GG had a greater influence on G-ODA than the traditional determinants of ODA in all models. All in all, this paper found that these relationships were primarily driven by strong political willingness, though the issue of capacity spillovers did play a complementary role.

Against this backdrop, the findings of this paper highlight three policy implications for recipient countries. First, countries in the global south can look forward to receiving increased total amounts of G-ODA in an era of increasing GG. However, it is worth considering that middle-income countries with increasingly high carbon emission levels are gradually 'graduating' from ODA (Krempin, 2019), as this implies that G-ODA will increasingly focus on low-income and least developed countries. Although this may be necessary for adaptation-related G-ODA, it may not be the most optimal method of using mitigation-related G-ODA as these nations are responsible for a relatively small amount of carbon emissions. Second, developing countries can expect an increase in multilateral G-ODA. This may contribute to reducing 'green aid orphans,' as multilateral organizations can support countries that are not prioritized by bilateral donors (Rogerson & Steensen, 2009). Indeed, despite their disproportionate vulnerability to climate change, only four bilateral donors have specific targets or policies guiding their support to Small Island Developing States (OECD, 2021f). Third, recipient countries can primarily expect this G-ODA to occur through 'mainstreamed' projects rather than 'targeted' projects. Although this may be beneficial in that it reduces the potential for G-ODA to 'crowd-out' other more immediate forms of development finance, it is limited in its ability to stimulate the green transformation of southern countries.

Moreover, the findings of this paper accentuate three policy implications for donor countries. First, donors should allocate their bilateral G-ODA in accordance with national comparative advantages, so as to promote better coordination among donor countries (Steensen & Ericsson, 2009). Concurrently, given the discrepancies in the findings between bilateral and multilateral G-ODA, it is important to ensure that bilateral G-ODA is not excessively used to promote objectives, such as national interests, that are different to the development-centric ones held by multilateral organizations. Second, OECD-DAC donor countries need to go beyond 'the low hanging fruit' of mainstreaming environmental considerations across their development portfolios. Rather, those with the ability to undergo targeted climate-related projects should do so, especially in a manner that does not instigate a crowding-out effect and supports self-defined national objectives such as poverty alleviation. Third, OECD-DAC donors need to leverage improvements in domestic mitigation and adaptation capabilities to better support recipient countries. When doing so, it will be important to ensure parity between these two objectives, as there is a noticeable discrepancy between mitigation and adaptation finance (UNFCCC, 2021). By following such suggestions, and further facilitating a green transition at the domestic level, this study hopes that the prospects of using G-ODA to promote GG in developing countries will improve going forward.

References

Alesina, A., & Dollar, D. (2000). Who Gives Foreign Aid to Whom and Why? *Journal of Economic Growth, 5*(1), 33-63. https://doi.org/10.1023/A:1009874203400

Atanda, K., & Cojokaru, A. (2021, March 31). *Shocks and vulnerability to poverty in middle-income countries*. World Bank Blogs. Retrieved April 12, 2022, from https://blogs.worldbank.org/developmenttalk/shocks-and-vulnerability-poverty-middle-income-countries

Ayers, J. M., & Huq, S. (2009). Supporting adaptation to climate change: What role for official development assistance? *Development Policy Review*, *27*(6), 675–692. https://doi.org/10.1111/j.1467-7679.2009.00465.x

Bakker, M. H. N., & Ligtvoet, W. (2011). Climate change adaptation and the role of official development assistance. In P. Hoebink (Ed.), *The Netherlands yearbook on international cooperation 2009* (pp. 35–48). essay, Van Gorcum & Comp. b.v.

Beecher, J. (2016). (rep.). *Climate finance and poverty*. Development Initiatives. Retrieved from http://devinit.org/wp-content/uploads/2016/11/Development-Initiatives-Climate-Finance-report.pdf

Berthelemy, J.-C. (2006). Bilateral donors' interest vs. recipients' development motives in aid allocation: Do all donors behave the same? *Review of Development Economics*, *10*(2), 179–194. https://doi.org/10.1111/j.1467-9361.2006.00311.x

Berthelemy, J-C., & Tichit, A. (2004). Bilateral Donor's Aid Allocation Decisions – A Three-dimensional Panel Analysis. *International Review of Economics and Finance, 13*(3), 253-274. https://doi.org/10.1016/j.iref.2003.11.004

Bessey, D., & Palumbarit, M. (2016). Comparing South Korea and Germany's official development assistance projects in climate protection in Cambodia, Lao PDR, Myanmar and Vietnam. *International Journal of Climate Change Strategies and Management*, *8*(5), 613–631. https://doi.org/10.1108/ijccsm-06-2015-0077

Bowen, A. (2014). Green growth. In G. Atkinson, S. Dietz, E. Neumayer, & M. Agarwala (Eds.), *Handbook of sustainable development* (pp. 237–251). essay, Edward Elgar.

Cardona, O.-D., & Aalst, M. K. van. (2018). (rep.). *Determinants of risk: Exposure and vulnerability*. IPCC. Retrieved from https://www.ipcc.ch/site/assets/uploads/2018/03/SREX-Chap2_FINAL-1.pdf

Casado-Asensio, J., Wang, S., Moilwai, K., & Drutschinini, A. (2014). Green Development Co-Operation in Zambia. *OECD Green Growth Papers*. https://doi.org/10.1787/5js6b25c2r5g-en

Committee on Green Growth. (2009a). (rep.). *National Plan on Green Growth*. CGG. Retrieved from https://www.greengrowth.go.kr/menu001/sub002/GRG_001_201.do

Committee on Green Growth. (2009b). (rep.). *First Five Year Plan on Green Growth*. CGG. Retrieved from https://www.greengrowth.go.kr/menu001/sub002/GRG_001_202.do

Committee on Green Growth. (2014). (rep.). *Second Five Year Plan on Green Growth*. CGG. Retrieved from https://www.greengrowth.go.kr/menu001/sub002/GRG_001_202.do

Committee on Green Growth. (2019). (rep.). *Third Five Year Strategy on Green Growth*. CGG. Retrieved from https://www.greengrowth.go.kr/menu001/sub002/GRG_001_202.do

Committee on International Development Cooperation. (2021a). (rep.). *Third Strategic Plan on International Development Cooperation*. CIDC. Retrieved from http://www.odakorea.go.kr/contentFile/MSDC/03.pdf

Committee on International Development Cooperation. (2021b). (rep.). *2021 Annual Implementation Plan*. CIDC. Retrieved from http://www.odakorea.go.kr/bbs/selectPlanAndResult?searchCnd=0&searchWrd=&menuNo=11023100&bbsId=kor_003&pageIndex=1

Committee on International Development Cooperation. (2021c). (rep.). *2022 Annual Implementation Plan*. CIDC. Retrieved from http://www.odakorea.go.kr/bbs/selectPlanAndResult?searchCnd=0&searchWrd=&menuNo=11023100&bbsId=kor_003&pageIndex=1

Committee on International Development Cooperation. (2021d). (rep.). *Green New Deal Implementation Plan*. CIDC. Retrieved from

http://www.odakorea.go.kr/bbs/selectPlanAndResult?bbsId=kor_001&menuNo=11024200

Claessens, S., Cassimon, D., & Van Campenhout, B. (2009). Evidence on changes in aid allocation criteria. *The World Bank Economic Review*, *23*(2), 185–208. https://doi.org/10.1093/wber/lhp003

Davies, S. (1992). Green conditionality and food security: Winners and losers from the greening of aid. *Journal of International Development*, *4*(2), 151–165. https://doi.org/10.1002/jid.3380040205

Dercon, S. (2014). Is green growth good for the poor? *The World Bank Research Observer*, *29*(2), 163–185. https://doi.org/10.1093/wbro/lku007

Dercon, S. (2015). Climate change, green growth, and aid allocation to poor countries. *Oxford Review of Economic Policy*, *30*(3), 531–549. https://doi.org/10.1093/oxrep/gru028

Gleeson, D., Legge, D., O'Neill, D., & Pfeffer, M. (2011). Negotiating tensions in developing organizational policy capacity: Comparative lessons to be drawn. *Journal of Comparative Policy Analysis: Research and Practice, 13*(3), 237–263. https://doi.org/10.1080/13876988.2011.565912

Guillaume, S. (2018). (rep.). *Development Finance Data*. OECD. Retrieved from https://www.oecd.org/dac/financing-sustainable-development/development-finance-data/METHODOLOGICAL_NOTE.pdf

Gulrajani, N., & Silcock, E. (2020). (rep.). *Principled aid in divided times: Harnessing values and interests in donor pandemic response*. ODI. Retrieved from https://cdn.odi.org/media/documents/pai_working_paper_execsummfinal.pdf

Hicks, R. L., Parks, B. C., Roberts, J. T., & Tierney, M. J. (2008). *Greening aid: Understanding the environmental impact of development assistance*. Oxford University Press.

Hickel, J., & Kallis, G. (2019). Is green growth possible? *New Political Economy*, *25*(4), 469–486. https://doi.org/10.1080/13563467.2019.1598964

Hoeffler, A., & Outram, V. (2011). Need, merit, or self-interest: What determines the allocation of aid? *Review of Development Economics*, *15*(2), 237–250. https://doi.org/10.1111/j.1467-9361.2011.00605.x

Hong, M., & Izmestiev, A. (2020). (rep.). *The transformation of the Republic of Korea's development cooperation*. UNDP. Retrieved from https://www1.undp.org/content/seoul_policy_center/en/home/library/the-transformation-of-the-republic-of-korea-s-development-cooper.html

IMF. (2022, April 21). *World Economic Outlook*. IMF. Retrieved April 22, 2022, from https://www.imf.org/en/Publications/WEO?utm_medium=email&utm_source=govdelivery

IPCC. (2022, April 4). *Climate change 2022: Mitigation of climate change*. IPCC. Retrieved April 11, 2022, from https://www.ipcc.ch/report/sixth-assessment-report-working-group-3/

Kalirajan, K. P., Singh, K., Thangavelu, S. M., Anbumozhi, V., & Perera, K. (2011). Climate Change and Poverty Reduction — Where Does Official Development Assistance Money Go? *Asian Development Bank Institute Working Paper Series*. https://doi.org/10.2139/ssrn.1955706

Krempin, M. (2019, July 31). *Beyond the threshold*. Development and Cooperation. https://www.dandc.eu/en/article/far-fewer-countries-will-be-eligible-receive-oda-future-means-problems-sdg-finance.

Lee, S. K., Choi, G., Lee, E., & Jin, T. (2020). The impact of official development assistance on the economic growth and carbon dioxide mitigation for the recipient countries. *Environmental Science and Pollution Research*, *27*(33), 41776–41786. https://doi.org/10.1007/s11356-020-10138-y

Li, D. D., Rishi, M., & Bae, J. H. (2020). Green official development aid and carbon emissions: Do institutions matter? *Environment and Development Economics*, *26*(1), 88–107. https://doi.org/10.1017/s1355770x20000170

Liu, Q. (2016). Japan's Practice in Green Aid and Its Implications for China. *China Quarterly of International Strategic Studies*, *02*(02), 201–217. https://doi.org/10.1142/s2377740016500111

Maizels, A., & Nissanke, M. K. (1984). Motivations for aid to developing countries. *World Development, 12*(9), 879-900. https://doi.org/10.1016/0305-750X(84)90046-9

McKinlay, R. D., & Little, R. (1977). A foreign policy model of US bilateral aid allocation. *World Politics, 30*(1), 58-86. https://doi.org/10.2307/2010075

Ministry of Foreign Affairs. (n.d.). Korea and ODA. https://www.mofa.go.kr/eng/wpge/m_5447/contents.do.

Ministry of Economy and Finance. (2021). (rep.). *Joint Financing Plan for Multilateral Development Banks*. MOEF. Retrieved from https://policy.nl.go.kr/search/searchDetail.do?rec_key=SH2_PLC20210259392

Overseas Development Institute. (2020, November 9). Principled Aid Index 2020. https://odi.org/en/publications/principled-aid-index-2020/.

Organisation for Economic Cooperation and Development. (2012). (rep.). *Green Growth and Developing Countries*. OECD. Retrieved from https://www.oecd.org/dac/50526354.pdf

Organisation for Economic Cooperation and Development. (2013). Putting green growth at the heart of development. *OECD Green Growth Studies*. https://doi.org/10.1787/22229523

Organisation for Economic Cooperation and Development. (2019). Aligning development cooperation and climate action. *The Development Dimension*. https://doi.org/10.1787/19901372

Organisation for Economic Cooperation and Development. (2020). Trends and insights on development finance. *Development Cooperation Profiles*. https://doi.org/10.1787/5e331623-en

Organisation for Economic Cooperation and Development. (2021a). The inequalities-environment nexus. *OECD Green Growth Papers*. https://doi.org/10.1787/ca9d8479-en

Organisation for Economic Cooperation and Development. (2021b). (rep.). *Financing sustainable development*. OECD. Retrieved from https://www.oecd.org/dac/financing-sustainable-development/development-finance-standards/What-is-ODA.pdf

Organisation for Economic Cooperation and Development. (2021c). *Climate Change: OECD DAC External Development Finance Statistics*. OECD. https://www.oecd.org/dac/financing-sustainable-development/development-finance-topics/climate-change.htm.

Organisation for Economic Cooperation and Development. (2021d). *Green Growth Indicators*. OECD Stats. https://stats.oecd.org/Index.aspx?DataSetCode=green_growth.

Organisation for Economic Cooperation and Development. (2021e). *Net ODA*. OECD Data. https://data.oecd.org/oda/net-oda.htm.

Organisation for Economic Cooperation and Development. (2021, November 12). *Integrating Environmental and Climate Action Into Development Co-operation: Reporting on DAC members' high-level meeting commitments: En*. OECD. Retrieved March 31, 2022, from https://www.oecd.org/dac/integrating-environmental-and-climate-action-into-development-co-operation-285905b2-en.htm

Opršal, Z., & Harmáček, J. (2019). Is foreign aid responsive to environmental needs and performance of developing countries? case study of the Czech Republic. *Sustainability*, *11*(2), 401. https://doi.org/10.3390/su11020401

Painter, M., & Pierre, J. (Eds.). (2005). *Challenges to state policy capacity: Global trends and comparative perspectives.* London: Palgrave Macmillan.

Park, J. B. (2016). Toward the green comfort zone: Synergy in environmental official development assistance. *Global Environmental Politics*, *16*(4), 1–11. https://doi.org/10.1162/glep_a_00376

Persson, A. (2008). Mainstreaming climate change adaptation into official development assistance: A case of international policy integration. https://www.researchgate.net/publication/242115122_Mainstreaming_Climate_Change_Adaptation_into_Official_Development_Assistance_A_Case_of_International_Policy_Integration.

Rijsberman, F. (2021, February 25). Korea's Green Share. https://koreajoongangdaily.joins.com/2021/02/25/opinion/columns/Korea-Green-Share/20210225090200427.html.

Rogerson, A., & Steensen, S. (2009). (rep.). *Aid orphans: Whose responsibility?* OECD. Retrieved from https://www.oecd.org/dac/financing-sustainable-development/OECD_Development_Brief_on_Aid_Orphans.pdf

Silcock, E., & Gulrajani, N. (2020). (rep.). *What is principled aid? Measuring donor motivations in 2020*. ODI. Retrieved from https://cdn.odi.org/media/documents/pai_technical_annex_final.pdf

Steele, P. (2015). (rep.). *Development finance and climate finance: Achieving zero poverty and zero emissions*. International Institute for Environment and Development. Retrieved from https://pubs.iied.org/sites/default/files/pdfs/migrate/16587IIED.pdf

Steensen, S., & Ericsson, F. (2009). (rep.). *Division of Labour*. OECD. Retrieved from https://www.oecd.org/dac/effectiveness/44318319.pdf

Szabo, K. (2016). Bilateral climate-related official development assistance practice of the OECD-DAC countries and its inherent obstacles. *KKI Study Series*. https://kki.hu/assets/upload/06_KKI-Studies_ODA_Szabe_20160725.pdf.

Timperley, J. (2021, October 20). *The broken $100-billion promise of climate finance - and how to fix it*. Nature News. Retrieved April 11, 2022, from https://www.nature.com/articles/d41586-021-02846-3#:~:text=Twelve%20years%20ago%2C%20at%20a,mitigate%20further%20rises%20in%20temperature

UNFCCC. (2021, January 25). *50% of All Climate Finance Needed for Adaptation*. Unfccc.int. Retrieved March 21, 2022, from https://unfccc.int/news/antonio-guterres-50-of-all-climate-finance-needed-for-adaptation

UNFCCC. (2022). *COP26 Outcomes*. Unfccc.int. Retrieved February 2, 2022, from https://unfccc.int/process-and-meetings/the-paris-agreement/the-glasgow-climate-pact/cop26-outcomes-market-mechanisms-and-non-market-approaches-article-6#eq-5

United Nations Development Programme. (2020). (rep.). *Planetary pressures–adjusted Human Development Index Technical Note*. UNDP. Retrieved from http://hdr.undp.org/sites/default/files/phdi_tn.pdf

United Nations Development Programme. (2021). *Human development reports*. The 2021 Global Multidimensional Poverty Index (MPI) | Human Development Reports. Retrieved April 11, 2022, from https://hdr.undp.org/en/2021-MPI

United Nations Development Programme. (n.d.). Human Development Reports. http://hdr.undp.org/en/content/download-data.

United Nations Environment Programme. (2021). *Emissions gap report*. United Nations Environment Programme.

United Nations Environment Programme. (n.d.). World Environment Situation Room. https://environmentlive.unep.org/downloader.

Willems, S., & Baumert, K. (2003). *Institutional capacity and climate action*. OECD. Retrieved from https://www.oecd.org/env/cc/21018790.pdf

World Bank. (2022). *The Changing Wealth of Nations 2021: Managing assets for the future*. The World Bank.

Wu, X., Ramesh, M., & Howlett, M. (2015). Policy capacity: A conceptual framework for understanding policy competences and capabilities. *Policy and Sociey 34*(2015), 165-171.

Yonemoto, S., & Triendl, R. (1998). Environmental diplomacy, regional security, and the limits of “green aid.” *Asia-Pacific Review*, *5*(2), 55–74. https://doi.org/10.1080/13439009808719979

Appendix A: Data

i. Dependent Variable

In this paper, the dependent variable set for the quantitative analysis is G-ODA and its various sub-components. Although G-ODA also captures contributions to biodiversity and desertification, this paper only used data regarding climate-related development finance. This is because the G-ODA modalities targeting other environmental goals do not address concerns that are at least relatively equally shared by both donor and recipient countries, at least when compared to climate change related issues. As such, developed countries would not necessarily invest much capital into these issues at the domestic level. On the other hand, they would actively take domestic climate action due to the global nature of the threat.

Accordingly, this paper measured the amount of G-ODA targeting climate change mitigation and adaptation objectives in accordance with the OECD-DAC's standardized two-step procedure. The first step labels bilateral projects with either the principal or significant Rio Marker. Projects that consider climate change to be an essential objective were given the principal Rio Marker. In contrast, those that view climate change as an important, but non-essential, goal was scored with the significant Rio Marker.

The second step involved identifying the climate component of relevant multilateral contributions. This could be captured from either the provider's or the recipient's perspective. That is, it could reflect the amount of finance that is received by developing countries or provided by developed ones. In this context, this paper used the latter approach because it better captures the donor-related aspects of G-ODA. This was done by calculating the total amount of financial support given to international organizations with a sole climate mandate, while partially measuring the contributions given to multilateral institutions that work on multiple thematic mandates, one of which being climate change. In case of the latter, 'imputed multilateral contributions' were calculated to attribute the extent to which the financial contributions of donors are being allocated to climate interventions (Guillaume, 2018).

Furthermore, although donor finance can be calculated in terms of commitments or disbursements, this paper used commitment values because they provide a clearer picture of donor intentions, unlike the latter, which is contingent on the willingness and capacity of recipient countries (Berthelemy, 2006). Finally, the panel data only included contributions from OECD-DAC donors, as they are required to report data in a reliable

and consistent manner, unlike other countries that only report data on a voluntary basis (Silcock & Gulrajani, 2020). This data was collected from the project-level observations available on OECD-DAC's 'Climate-Related Development Finance' database (OECD, 2021c).

ii. Independent Variable

As for the independent variable, GG was measured by the Planetary-Pressure Adjusted Human Development Index (P-HDI). This composite index is composed of three sub-indexes. The first is the HDI, which uses life expectancy at birth, expected and mean years of education, and Gross National Income per capita to calculate levels of human development (UNDP, n.d.). The second is the Carbon Footprint Index, which measures the amount of carbon produced by a country, divided by its population (UNEP, n.d.). The third is the Material Footprint Index, which quantifies the biomass, fossil fuels, metal ores, and non-metal ores consumed by a country, divided by its population (UNEP, n.d.). All in all, this index was selected because it measures the socio-economic aspects of human development while accounting for the environmental pressures caused by carbon dioxide emissions and material consumption.

However, as P-HDI scores are only available for 2019, panel data for all OECD-DAC countries had to be created using the methodology provided in the Human Development Report (UNDP, 2020). This involved creating an 'adjustment index' that synthesized the values of the Carbon and Material Footprint Index, which was subsequently multiplied to the value of the HDI. However, since the data from the Material Footprint Index was only available until 2017, the 2018 and 2019 values had to be imputed from the most recent observations, as done in the Human Development Report (UNDP, 2020). Nonetheless, the validity of this data can be affirmed as the re-created data for 2019 is equivalent to the pre-existing data for the same year. The data ranges from zero to one, with the planetary pressure levels of a country's human development decreasing as the number becomes closer to one.

Moreover, a new variable was created to measure the dollar value of GDP produced per unit of planetary pressure to check for robustness. To do so, this paper followed the methodological approach of the PHDI (UNDP, 2020) to create a normalized average of two variables from OECD's GG Headline Indicators (OECD, 2021d). The first is Production-based CO2 Productivity, which measures the amount of GDP produced per unit of energy-related carbon emissions. The second is Non-energy Material Productivity, which measures the amount of GDP produced per unit of domestic material consumption. However, as there were missing data from 2018 to

2019, replacement values had to be imputed based on the most recent observations. Overall, the data ranges from zero to one, with lower numbers reflecting higher levels of productivity. Although there were four more variables included in OECD's headline indicators, they were not used due to data inconsistency and incomparability.

iii. Control Variables

In addition to the dependent and independent variables, three additional control variables were used. The first two were selected from the three components of the Principled Aid Index, which reveals the drivers of donor behaviour (Gulrajani & Silcock, 2020). The first measures the extent to which aid addresses development needs, as measured by the amount of ODA targeting poverty, displaced populations, conflicted-afflicted states, and global safety nets. The second estimates the public spiritedness levels of donors by using information on commercial interests, United Nations voting behaviour, arms exports, localization, and elections. The third quantifies the degree to which aid supports global cooperation, as defined by its relationship with global trade, core multilateral funding, climate change, communicable diseases, and peace.

The first two variables were selected because need and self-interest are considered to be the traditional determinants of aid allocation. This can be affirmed as Hoeffler and Outram (2011) report that they determine 36 and 16 percent of aid allocations, respectively. However, although the third variable also explains donor behaviour (Silcock & Gulrajani, 2020), it was removed because it included a climate sub-component that would have introduced some bias into the model. Moreover, a control variable for merit, which is also viewed as a traditional determinant of ODA, was omitted due to its relative unimportance. Indeed, Hoeffler and Outram (2011) report that it only accounts for 2 percent of aid allocations. The dataset for these variables were collected from the Overseas Development Institute (2020). The data ranges from zero to one, with higher numbers representing the extent to which development needs and public spiritedness are reflected.

In addition, total ODA was set as a third control variable, though it was not incorporated into the percentage-based estimations as it was already used to create the dependent variable of this model. Measured by the aforementioned definition of ODA, this variable was selected because G-ODA is a sub-component of net ODA, and thus is directly affected by its changes. In this regard, Gross Domestic Product, though seemingly relevant, was not added to the model as it indirectly affects G-ODA through total ODA. The original dataset was collected from the OECD's net ODA database,

which represents the annual aggregated dollar values of the projects found in the Creditor Reporting System (OECD, 2021e).

iv. Interaction Variable

Finally, the interaction variable was set as the product of PHDI and total ODA for the estimation models that included total ODA as a control variable. This is because the socio-economic status of a country, as partially captured by PHDI, is strongly correlated with the total amount of ODA provided. This is especially true when donors plan to maintain ODA levels as a share of GNI (Ahmad et al., 2020). However, this variable was removed when checking for robustness, as GG Indicators do not share this income component.

Appendix B: Interview Guide

To begin with, I would like to thank you for participating in this interview.

Further information on the context of the interview can be found in the 'Information Sheet and Consent Form' that was provided with this document. To briefly summarize some key points, please note that:
1. This interview will be recorded for data collection purposes and will not be shared. Your name and other relevant details will be anonymous.
2. The information from this interview may be published.
3. There will be no expectation to provide a response to any questions that you feel uncomfortable or unable to answer. If this is the case for any of the questions, please feel free to let me know in advance or during the interview.

This study will elaborate on the relationship between the green growth levels of OECD-DAC countries and their impact on green ODA contributions. To this end, this paper incorporates a mixed methodology; quantitative analysis will be utilized to determine 'how' green growth affects green ODA, whereas qualitative analysis based on in-depth expert interviews will be used to confirm these findings, and more importantly, explain 'why' these relationships exist. As such, this interview will be used to conduct a case study on how green growth has affected green ODA in the Republic of Korea (ROK) to provide generalizable insights for other countries.

In this context, this interview will be conducted in a semi-structured manner based on following guiding questions. Follow-up questions may be given depending on the flow of the discussion.

I will be conducting the interview in English for transcription purposes, but I welcome you to speak in the language that you are most comfortable with.

1. **Context:** Green ODA in the context of this study refers to ODA projects with objectives related to climate change. My research indicates that **green growth has a positive and significant correlation with green ODA.**

   Question(s):
   (a) Does this finding apply to the context of the ROK?
      (I) If you agree, what are some of the mechanisms driving this positive relationship?
      (ii) If you disagree, what is your understanding of this relationship and why?

2. **Context:** Green ODA can be conceptualized as either 'principal' or 'significant' green ODA. Principal green ODA refers to targeted projects such as renewable energy plants, whereas significant green ODA refers to mainstreamed projects such as eco-friendly schools. My research indicates that **green growth has a negative but insignificant relationship with principal green ODA, as well as a positive and significant relationship with significant green ODA.**

   Question(s):

   (a) Does the finding on principal green ODA apply to the context of the ROK?

   (i) If you agree, what are some of the causative mechanisms driving the inverse relationship between green growth and principal green ODA?

   (ii) If you disagree, what is your understanding of this relationship and why?

   (b) Does the finding on significant green ODA apply to the context of the ROK?

   (I) If you agree, what are some of the mechanisms driving the positive relationship between green growth and significant green ODA?

   (ii) If you disagree, what is your understanding of this relationship and why?

3. **Context**: Green ODA can be provided bilaterally through national agencies such as the Korea International Cooperation Agency and the Export-Import Bank of Korea, or multilaterally through international organizations such as UN and the World Bank. My research indicates that **green growth is positively but insignificantly correlated with bilateral green ODA**. It also shows that **green growth has a positive and significant relationship with multilateral green ODA**.

   Question(s):

   (a) Does the finding on bilateral green ODA apply to the context of the ROK?

   (i) If you agree, what are some factors preventing the formation of a significant relationship between green growth and bilateral green ODA?

   (ii) If you disagree, what is your understanding of this relationship and why?

   (b) Does the finding on multilateral green ODA apply to the context of the ROK?

   (i) If you agree, what are some of the mechanisms driving the positive relationship between green growth and multilateral green ODA?

   (ii) If you disagree, what is your understanding of this relationship and why?

4. **Context**: Green ODA projects can target adaptation objectives, mitigation objectives, or both. My research indicates that **green growth has a positive but**

insignificant effect on green ODA with adaptation, mitigation, and overlapping objectives.

Question(s):

(a) Do these findings apply to the context of the ROK? You are welcome to provide your thoughts on each relationship either collectively or separately.

(i) If you agree, what are some factors preventing the formation of a significant relationship?

(ii) If you disagree, what is your understanding of this relationship and why?

Appendix C: Anonymized List of Interviewees

Interviewee	Expertise	Affiliation	Mandate
A	GG, G-ODA	National Agency	Implementation
B	ODA	Academia	Implementation
C	GG, G-ODA	National Agency	Policymaking
D	ODA	National Agency	Implementation
E	ODA	International Organization	Implementation
F	ODA	National Agency	Implementation
G	ODA	Academia	Policymaking
H	ODA	Academia	Policymaking
I	GG, G-ODA	International Organization	Implementation
J	GG, G-ODA	International Organization	Implementation
K	ODA	International Organization	Implementation

Appendix D: Descriptive Statistics

Table 1

Descriptive statistics

Variable		Mean	Std. dev.	Min	Max	Observations
GreenO~l	overall	1.10e+09	2.13e+09	318340.5	1.07e+10	N = 168
	between		2.11e+09	1441288	8.88e+09	n = 28
	within		4.35e+08	−1.35e+09	3.03e+09	T = 6
GreenO~e	overall	.1610312	.1640002	.0013229	1.040949	N = 168
	between		.1592598	.0073946	.8503559	n = 28
	within		.0478724	−.0081301	.351624	T = 6
Bilate~l	overall	9.12e+08	1.93e+09	2075.761	9.58e+09	N = 168
	between		1.92e+09	349802.5	8.13e+09	n = 28
	within		3.89e+08	−1.40e+09	2.57e+09	T = 6
Bilate~e	overall	.1287154	.1542516	7.52e−06	.93412	N = 168
	between		.1498313	.0012786	.7786639	n = 28
	within		.0449027	−.0438204	.2968232	T = 6
Multil~l	overall	1.89e+08	2.91e+08	108335.8	1.38e+09	N = 168
	between		2.77e+08	1086218	1.01e+09	n = 28
	within		1.02e+08	−1.94e+08	5.67e+08	T = 6
Multil~e	overall	.0323158	.0199547	.0005129	.1068287	N = 168
	between		.0162296	.006116	.071692	n = 28
	within		.0119446	.0016939	.0684091	T = 6
Princi~l	overall	4.26e+08	1.01e+09	0	5.42e+09	N = 168
	between		8.80e+08	16458.33	3.21e+09	n = 28
	within		5.15e+08	−1.95e+09	3.35e+09	T = 6
Princi~e	overall	.0543058	.0882002	0	.5503478	N = 168
	between		.070985	.0001365	.2715171	n = 28
	within		.0537705	−.1867347	.3586124	T = 6
Signif~l	overall	4.86e+08	1.29e+09	0	9.04e+09	N = 168
	between		1.17e+09	275242.4	5.63e+09	n = 28
	within		5.87e+08	−3.53e+09	3.89e+09	T = 6
Signif~e	overall	.0744096	.112328	0	.8815836	N = 168
	between		.0981756	.0009412	.5326228	n = 28
	within		.0571638	−.2870363	.4233705	T = 6
Mitiga~l	overall	6.66e+08	1.47e+09	0	8.20e+09	N = 168
	between		1.43e+09	161508.3	5.97e+09	n = 28
	within		4.04e+08	−1.51e+09	2.89e+09	T = 6
Mitiga~e	overall	.0882171	.1203991	0	.7997187	N = 168
	between		.1139357	.0012413	.5751322	n = 28
	within		.0436264	−.1659649	.3128036	T = 6
Adapta~l	overall	4.20e+08	7.19e+08	2075.761	3.95e+09	N = 168
	between		6.90e+08	211751.7	2.82e+09	n = 28
	within		2.34e+08	−5.75e+08	1.55e+09	T = 6
Adapta~e	overall	.0749894	.0603888	7.52e−06	.2942177	N = 168
	between		.0534084	.0012786	.2274094	n = 28
	within		.0296606	−.0092918	.1533974	T = 6
Overla~l	overall	1.74e+08	2.89e+08	0	1.77e+09	N = 168
	between		2.55e+08	18190	1.18e+09	n = 28
	within		1.43e+08	−4.89e+08	9.17e+08	T = 6
Overla~e	overall	.0344911	.0306268	0	.1386049	N = 168
	between		.0233426	.0002109	.0837126	n = 28
	within		.0202346	−.0139818	.1210614	T = 6
PHDI	overall	.7630602	.0634289	.4662964	.8292727	N = 168
	between		.0642247	.4857879	.8173307	n = 28
	within		.0046805	.7435687	.7752257	T = 6
Develo~s	overall	5.377941	1.77592	0	10	N = 168
	between		1.675447	2.1666	9.464704	n = 28
	within		.6563649	3.211342	8.490061	T = 6
Public~s	overall	5.913606	2.140569	0	10	N = 168
	between		1.983126	1.946839	9.058522	n = 28
	within		.8757815	3.519308	9.121242	T = 6
TotalODA	overall	4.99e+09	7.80e+09	4.12e+07	3.66e+10	N = 168
	between		7.83e+09	5.41e+07	3.51e+10	n = 28
	within		1.12e+09	−2.53e+09	1.06e+10	T = 6
GGIndi~s	overall	.5901315	.143629	.1075702	.8362139	N = 168
	between		.1435748	.1919648	.8270509	n = 28
	within		.0251547	.5057369	.6845857	T = 6

Appendix E: Regression Tables

Table 2

Regression table on GG and G-ODA

	H1A	H1B
PHDI	1.07279e+10*	1.296
	(0.084)	(0.147)
Development Gaps	1742176.0	0.00454
	(0.968)	(0.472)
Public Spiritedness	-24544736.2	-0.00354
	(0.485)	(0.471)
Total ODA	-1.009	
	(0.319)	
PHDI*Total ODA	1.426	
	(0.259)	
Constant	-7.39268e+09	-0.831
	(0.103)	(0.216)
Observations	168	168
Adjusted R-squared	0.959	0.898

p-values in parentheses
* p<0.10, ** p<0.05, *** p<0.01

Table 3

Regression table on GG and Bilateral/Multilateral G-ODA

	H2A	H2B	H2C	H2D
PHDI	7.28140e+09	0.828	3.44648e+09**	0.468**
	(0.159)	(0.295)	(0.020)	(0.019)
Development Gaps	-1924657.7	0.00132	3666833.7	0.00322**
	(0.963)	(0.827)	(0.663)	(0.017)
Public Spiritedness	-24713128.9	-0.00428	168392.6	0.000745
	(0.463)	(0.365)	(0.980)	(0.523)
Total ODA	-1.070		0.0613	
	(0.199)		(0.833)	
PHDI*Total ODA	1.464		-0.0377	
	(0.163)		(0.916)	
Constant	-4.77021e+09	-0.485	-2.62247e+09**	-0.347**
	(0.202)	(0.415)	(0.021)	(0.021)
Observations	168	168	168	168
Adjusted R-squared	0.958	0.898	0.873	0.602

p-values in parentheses
* p<0.10, ** p<0.05, *** p<0.01

Table 4

Regression table on GG and Principal/Significant G-ODA

	H3A	H3B	H3C	H3D
PHDI	−1.29603e+10	−1.762	2.02417e+10*	2.589
	(0.152)	(0.138)	(0.085)	(0.105)
Development Gaps	65722070.8	0.00603	−67646728.5	−0.00471
	(0.361)	(0.448)	(0.397)	(0.541)
Public Spiritedness	−40009921.6	−0.00376	15296792.8	−0.000520
	(0.394)	(0.496)	(0.748)	(0.917)
Total ODA	0.534		−1.604	
	(0.628)		(0.272)	
PHDI*Total ODA	−0.610		2.073	
	(0.653)		(0.244)	
Constant	9.87690e+09	1.388	−1.46471e+10*	−1.873
	(0.137)	(0.121)	(0.089)	(0.118)
Observations	168	168	168	168
Adjusted R-squared	0.687	0.561	0.774	0.698

p-values in parentheses
* p<0.10, ** p<0.05, *** p<0.01

Table 5

Regression table on G-ODA with Adaptation/Mitigation/Overlapping Objectives

	H4A	H4B	H4C	H4D	H4E	H4F
PHDI	1.32591e+09	0.00176	7.39159e+09	0.863	1.43610e+09	0.0373
	(0.628)	(0.997)	(0.219)	(0.307)	(0.380)	(0.926)
Development Gaps	23972509.4	0.00145	−8573456.1	0.00142	17323711.0*	0.00156
	(0.203)	(0.686)	(0.830)	(0.785)	(0.092)	(0.453)
Public Spiritedness	−2852916.3	0.000926	−33283749.5	−0.00569	−11423536.9	−0.000488
	(0.862)	(0.767)	(0.339)	(0.196)	(0.213)	(0.803)
Total ODA	−0.239		−1.075		−0.243	
	(0.633)		(0.186)		(0.446)	
PHDI*Total ODA	0.396		1.436		0.369	
	(0.524)		(0.155)		(0.351)	
Constant	−1.03270e+09	0.0604	−4.88695e+09	−0.545	−1.14944e+09	0.000517
	(0.607)	(0.881)	(0.267)	(0.392)	(0.353)	(0.999)
Observations	168	168	168	168	168	168
Adjusted R-squared	0.891	0.707	0.917	0.843	0.763	0.469

p-values in parentheses
* p<0.10, ** p<0.05, *** p<0.01

Appendix F: Scatterplots

Figure 3

Scatterplot of PHDI and total G-ODA

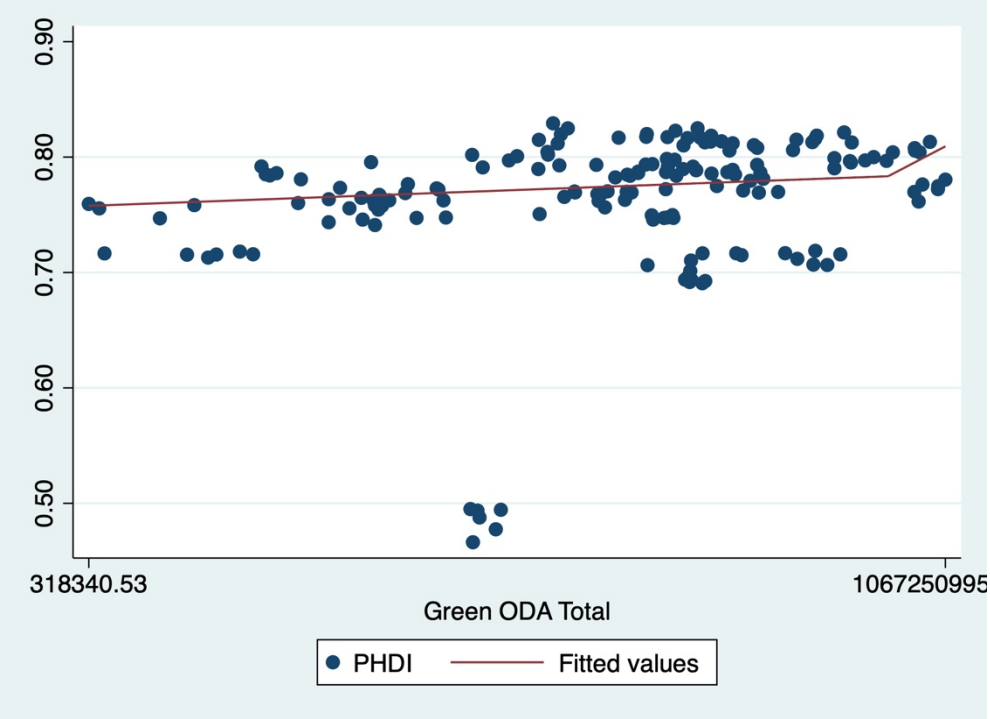


Figure 4

Scatterplot of PHDI and percentage of G-ODA

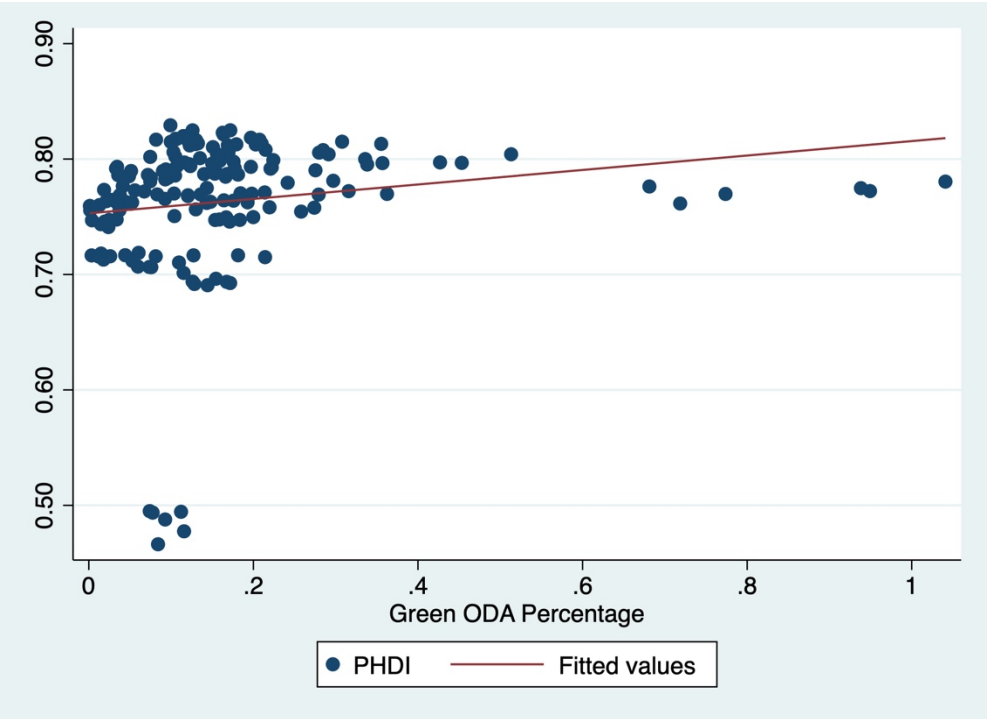


Figure 5

Scatterplot of PHDI and total Bilateral G-ODA

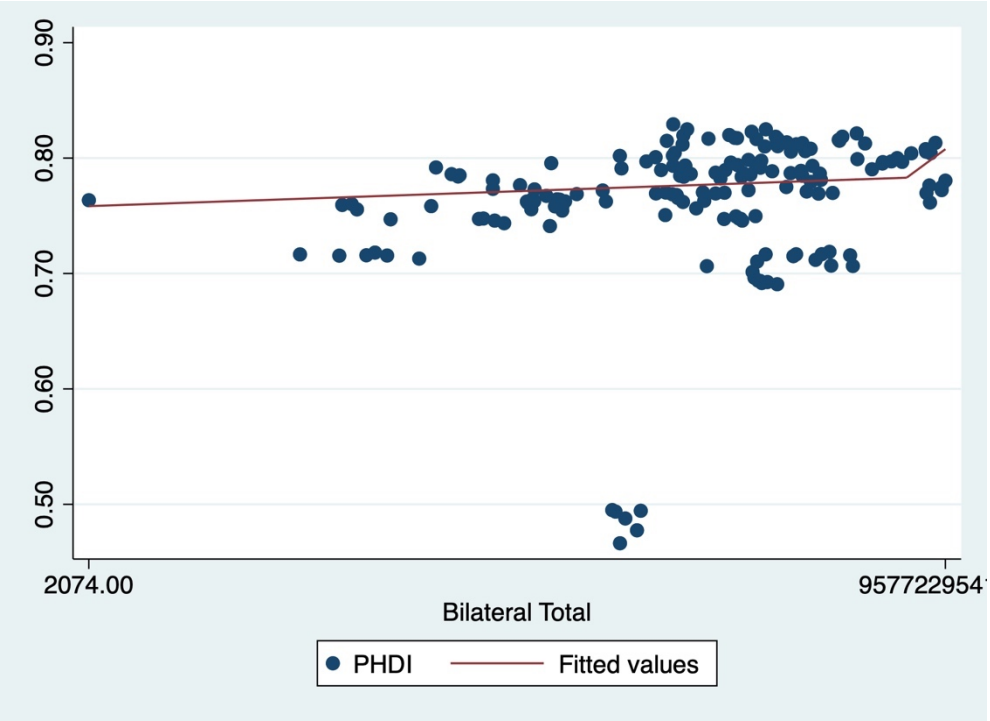


Figure 6

Scatterplot of PHDI and percentage of Bilateral G-ODA

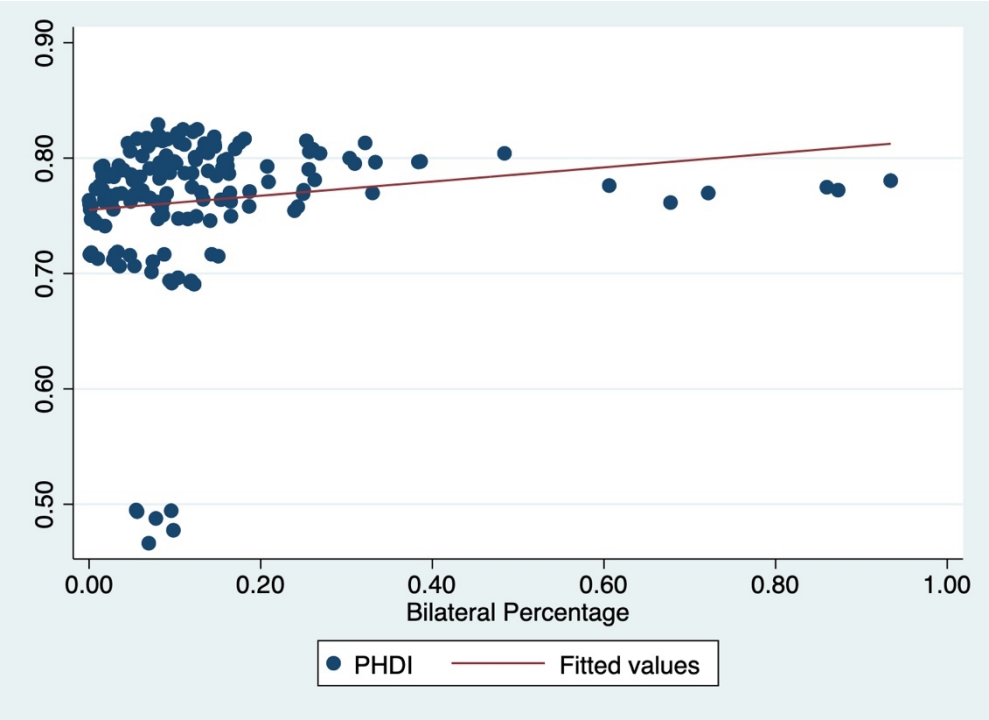


Figure 7

Scatterplot of PHDI and total Multilateral G-ODA

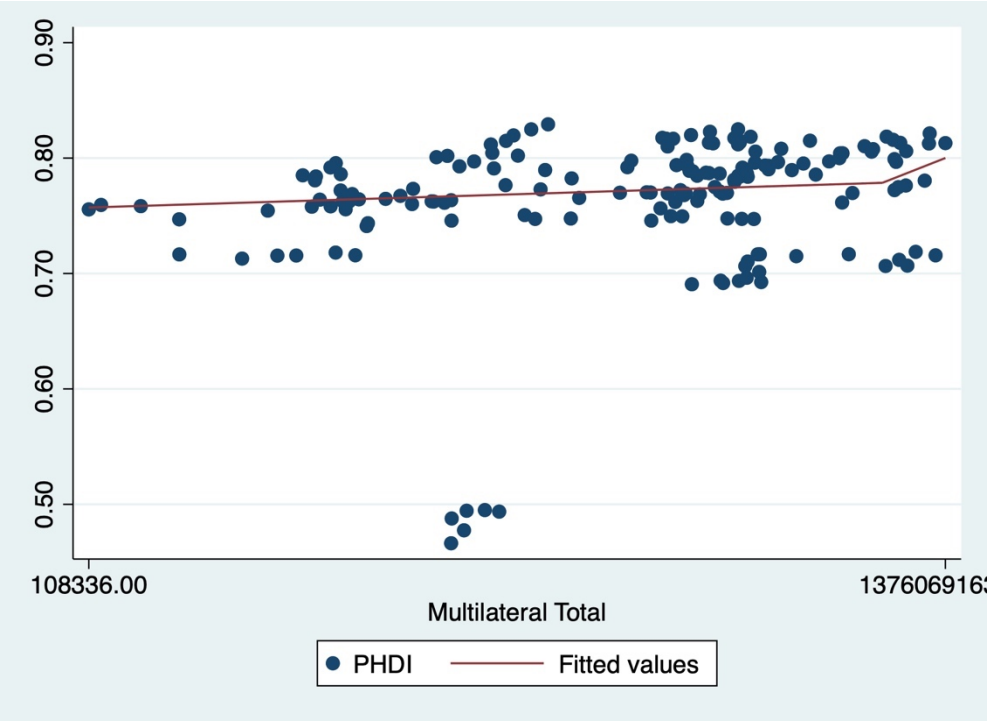


Figure 8

Scatterplot of PHDI and percentage of Multilateral G-ODA

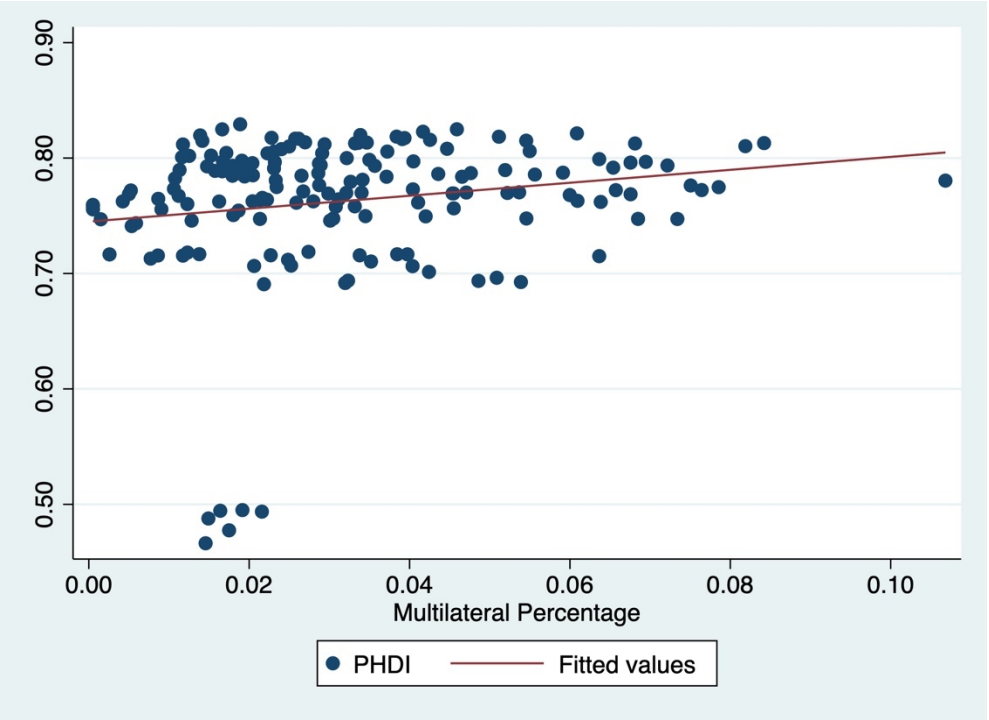


Figure 9

Scatterplot of PHDI and total Principal G-ODA

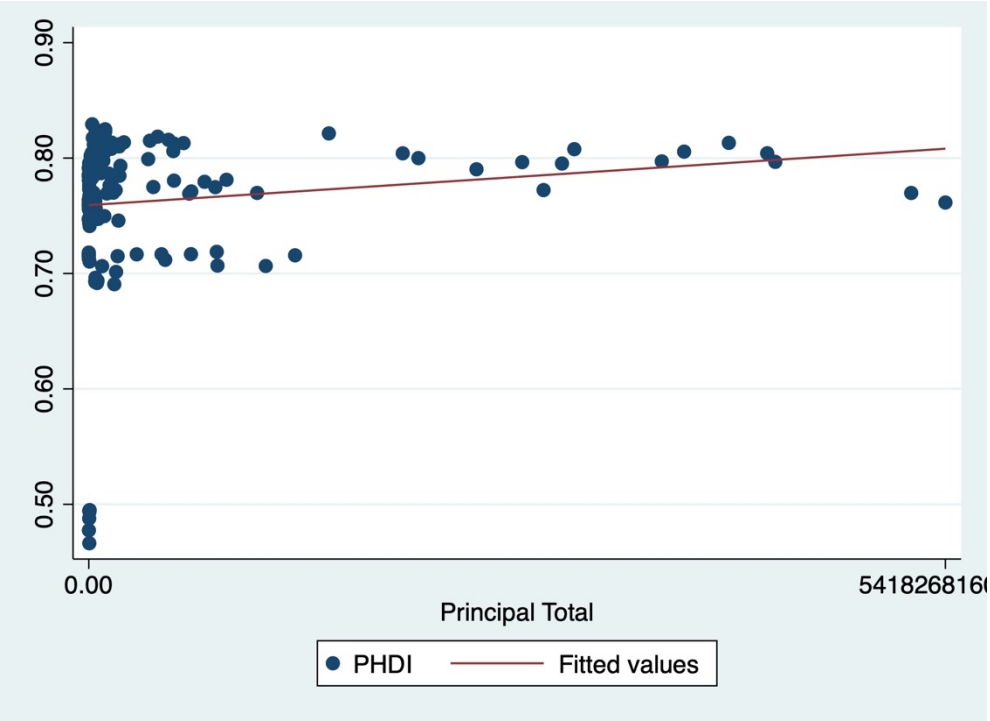


Figure 10

Scatterplot of PHDI and percentage of Principal G-ODA

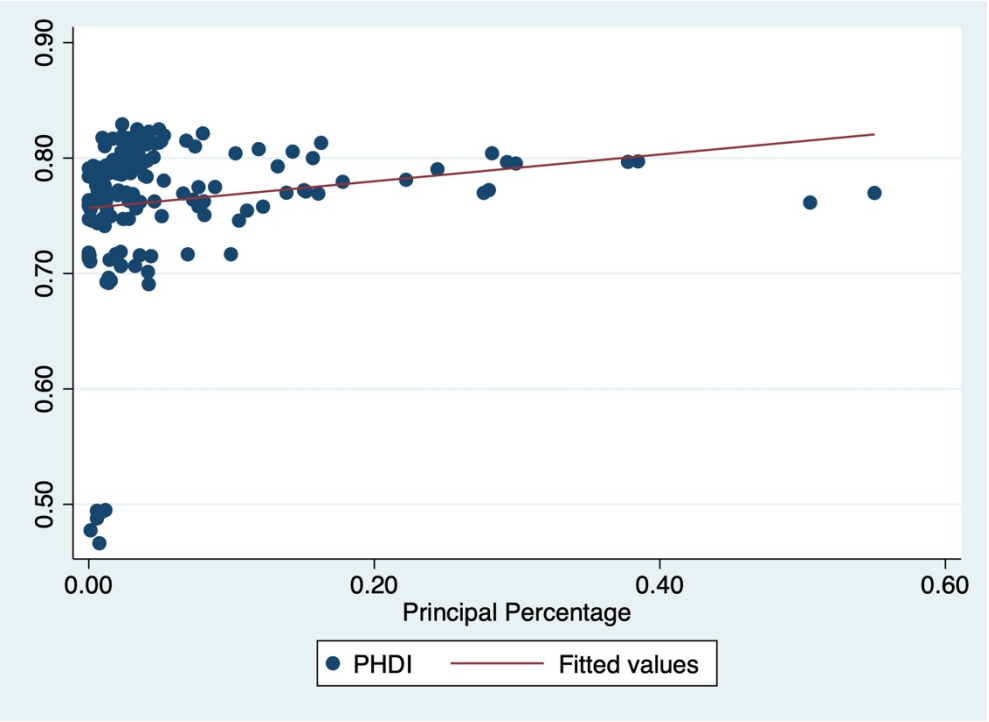


Figure 11

Scatterplot of PHDI and total Significant G-ODA

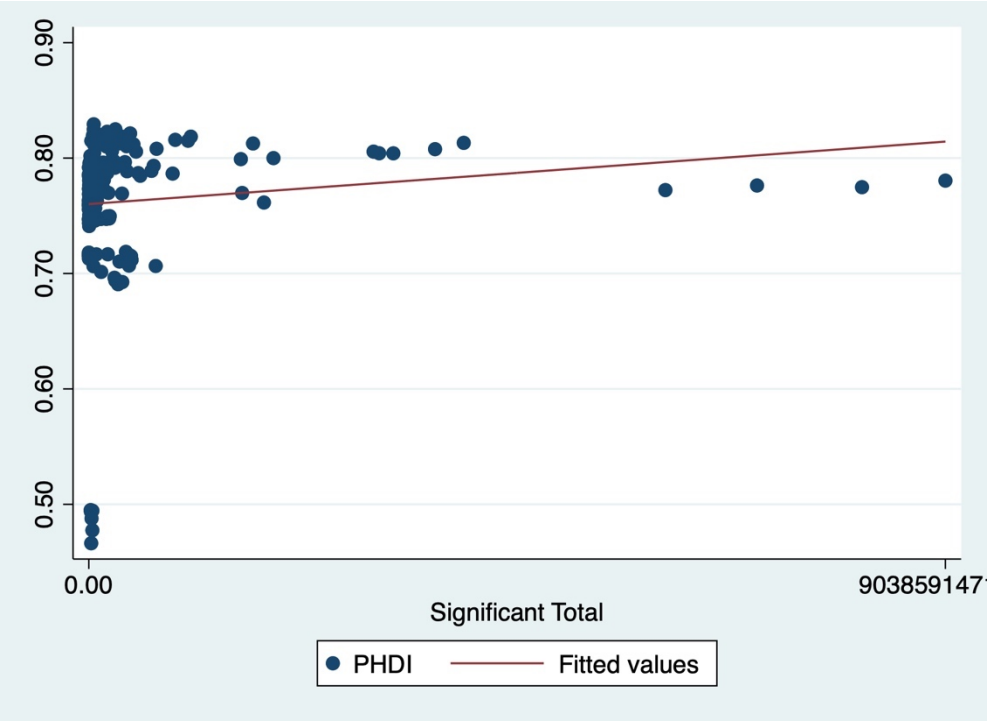


Figure 12

Scatterplot of PHDI and percentage of Significant G-ODA

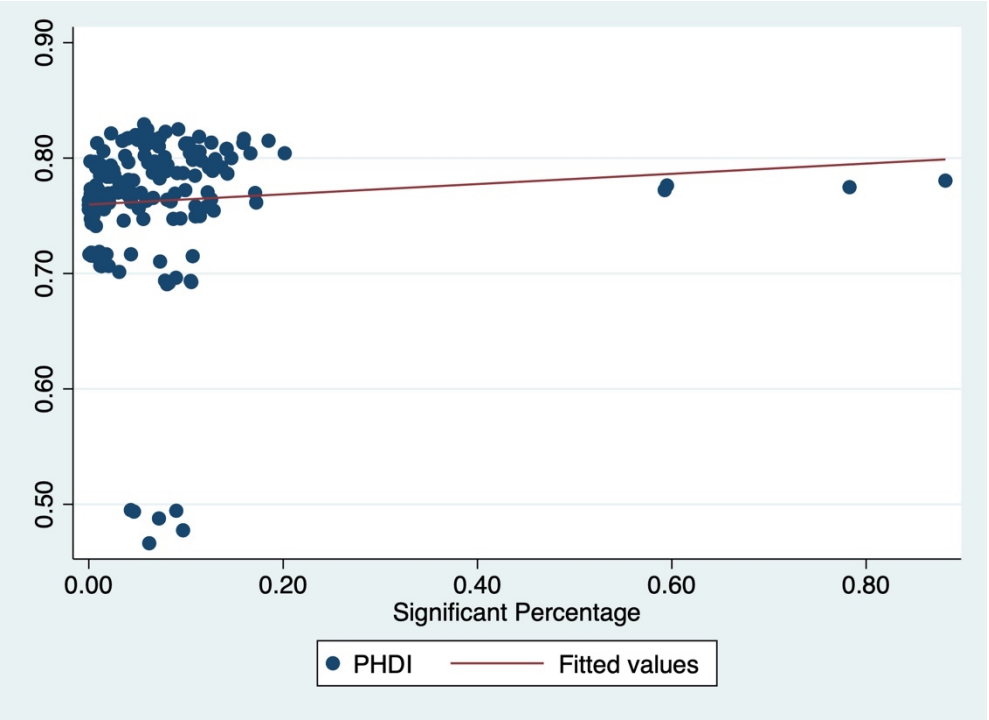


Figure 13

Scatterplot of PHDI and total Adaptation G-ODA

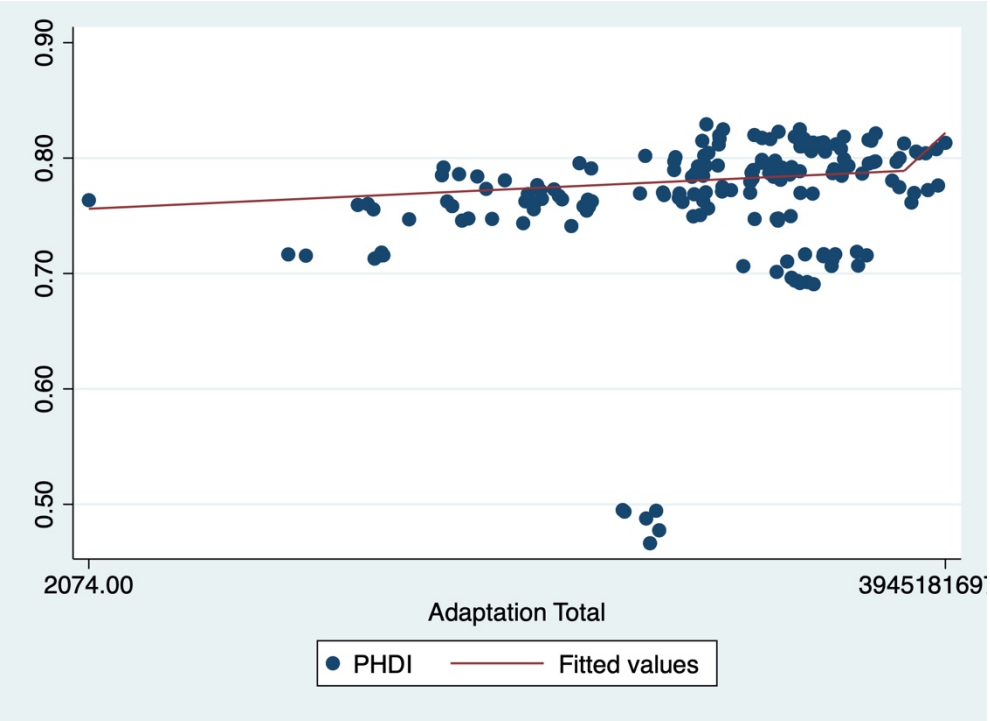


Figure 14

Scatterplot of PHDI and percentage of Adaption G-ODA

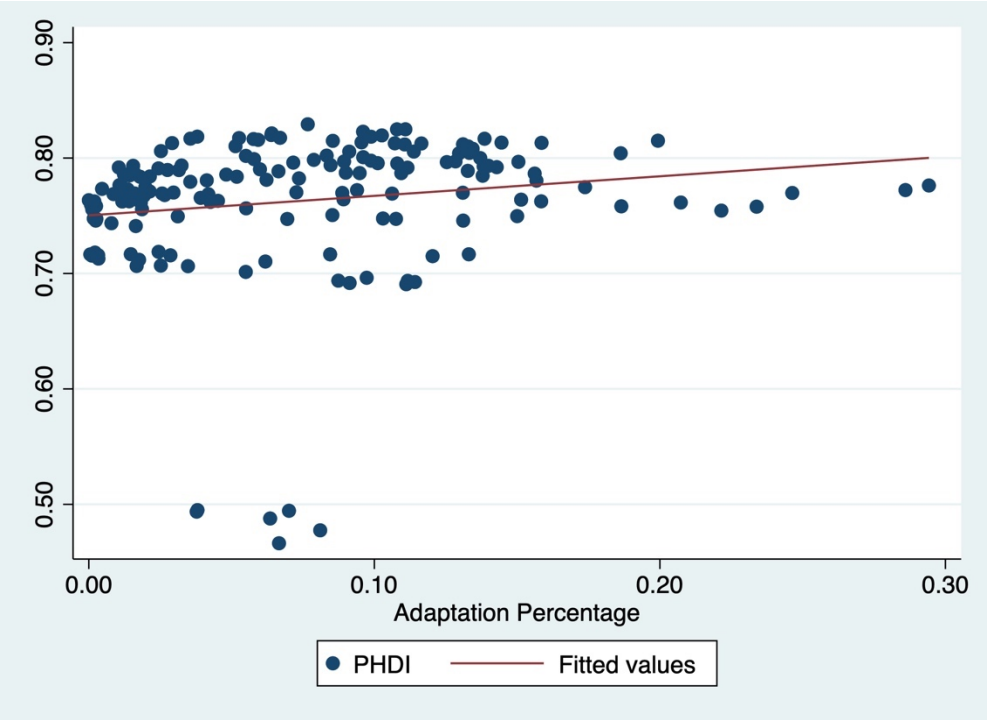


Figure 15

Scatterplot of PHDI and total Mitigation G-ODA

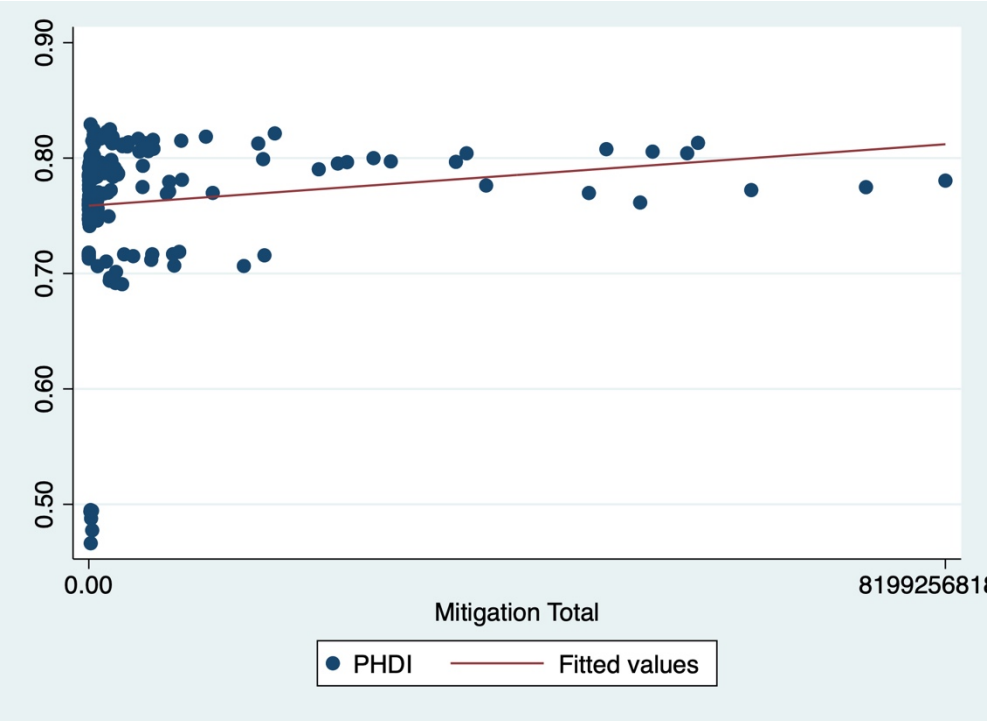


Figure 16

Scatterplot of PHDI and percentage of Mitigation G-ODA

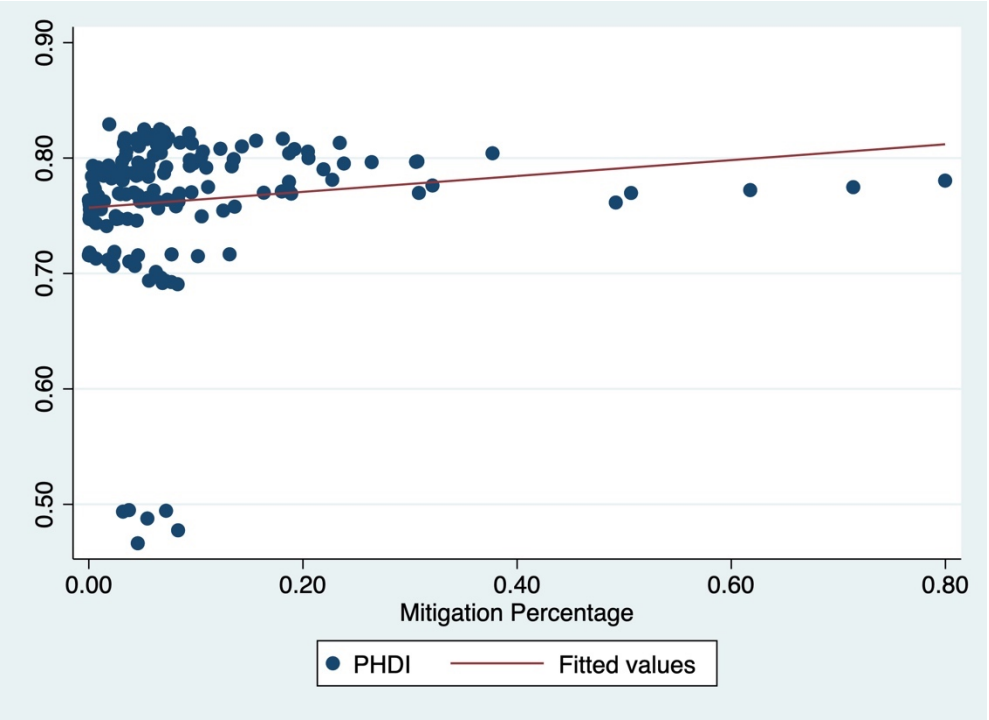


Figure 17

Scatterplot of PHDI and total G-ODA with overlapping objectives

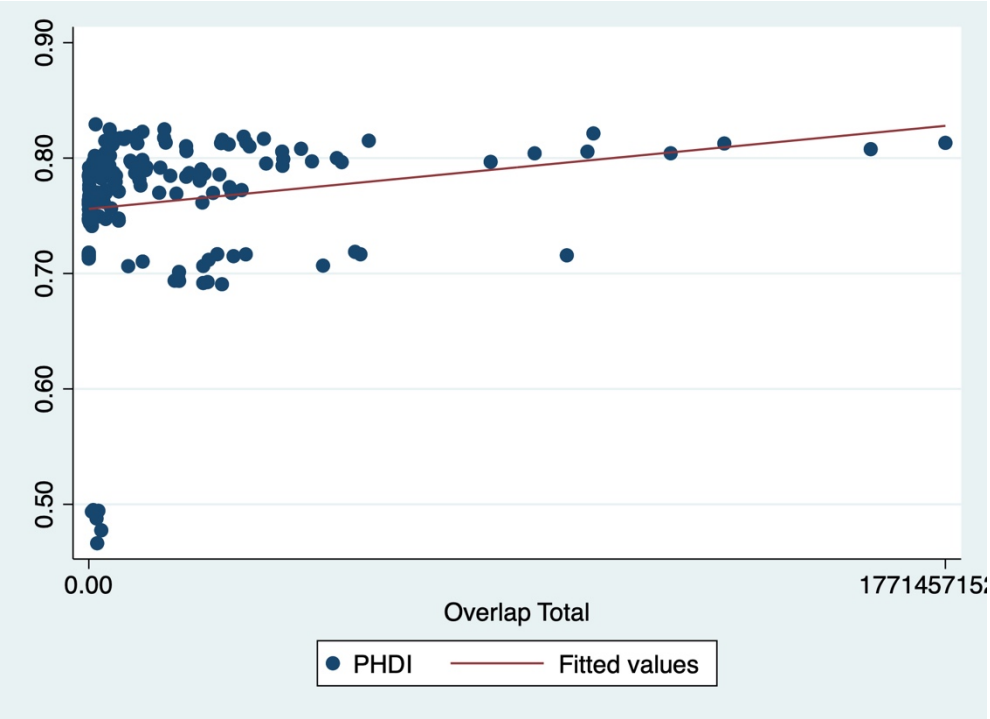
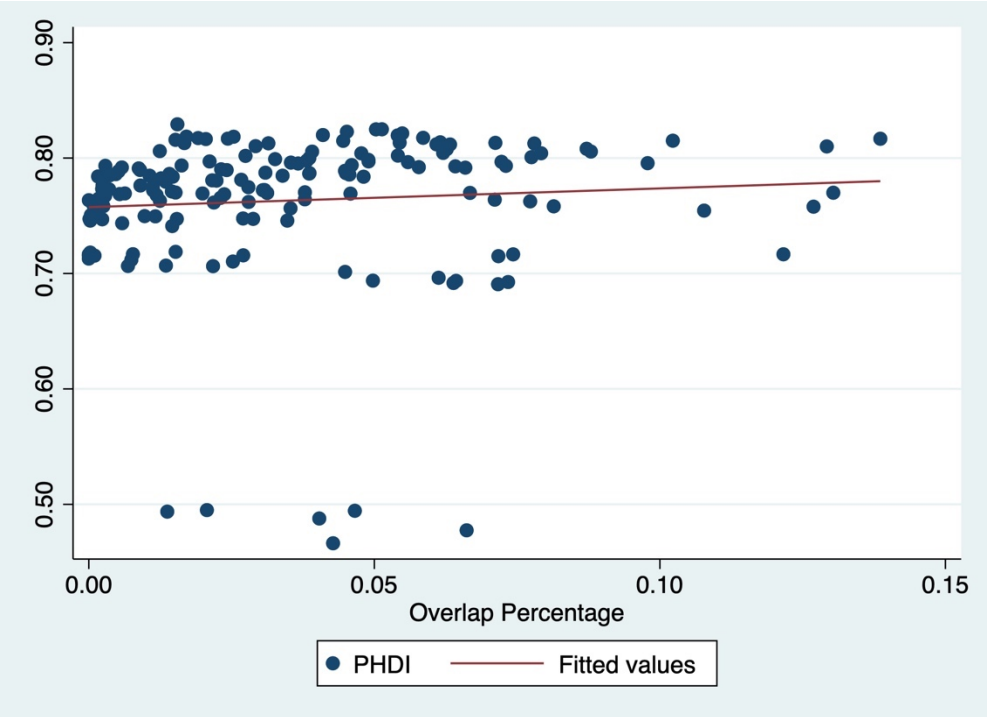


Figure 18

Scatterplot of PHDI and percentage of G-ODA with overlapping objectives



Appendix G: Robustness Test

Table 6

Robustness check on GG and G-ODA

	H1A	H1B
GG Indicators	-2.27915e+09	-0.108
	(0.135)	(0.543)
Development Gaps	-1533608.5	0.00519
	(0.972)	(0.409)
Public Spiritedness	-26013101.9	-0.00275
	(0.456)	(0.564)
Total ODA	0.147*	
	(0.080)	
Constant	1.87394e+09	0.213*
	(0.118)	(0.066)
Observations	168	168
Adjusted R-squared	0.958	0.897

p-values in parentheses
* p<0.10, ** p<0.05, *** p<0.01

Table 7

Robustness check on GG and Bilateral/Multilateral G-ODA

	H2A	H2B	H2C	H2D
GG Indicators	-1.74652e+09	-0.0130	-532632569.4	-0.0951**
	(0.175)	(0.936)	(0.160)	(0.011)
Development Gaps	-6301782.2	0.00190	4768173.7	0.00329**
	(0.878)	(0.752)	(0.591)	(0.017)
Public Spiritedness	-26782057.2	-0.00344	768955.3	0.000685
	(0.424)	(0.453)	(0.907)	(0.547)
Total ODA	0.116		0.0306***	
	(0.165)		(0.003)	
Constant	1.55322e+09	0.146	320722138.6	0.0667***
	(0.135)	(0.164)	(0.235)	(0.008)
Observations	168	168	168	168
Adjusted R-squared	0.957	0.897	0.874	0.605

p-values in parentheses
* p<0.10, ** p<0.05, *** p<0.01

Table 8

Robustness check on GG and Principal/Significant G-ODA

	H3A	H3B	H3C	H3D
GG Indicators	3.75590e+09*	0.425*	-5.50242e+09*	-0.438
	(0.098)	(0.054)	(0.072)	(0.120)
Development Gaps	71480511.4	0.00595	-77782293.6	-0.00405
	(0.318)	(0.450)	(0.324)	(0.592)
Public Spiritedness	-33370879.0	-0.00313	6588821.9	-0.000312
	(0.454)	(0.540)	(0.883)	(0.946)
Total ODA	0.0480		0.0685	
	(0.482)		(0.108)	
Constant	-2.21689e+09	-0.210	3.77011e+09*	0.356*
	(0.161)	(0.137)	(0.072)	(0.052)
Observations	168	168	168	168
Adjusted R-squared	0.693	0.568	0.771	0.696

p-values in parentheses
* p<0.10, ** p<0.05, *** p<0.01

Table 9

Robustness check on GG and G-ODA with adaptation/mitigation/overlapping objectives

	H4A	H4B	H4C	H4D	H4E	H4F
GG Indicators	-595820311.2	0.0315	-1.48394e+09	-0.00262	-333241509.7	0.0419
	(0.444)	(0.783)	(0.339)	(0.988)	(0.392)	(0.529)
Development Gaps	21580292.8	0.00155	-11571135.6	0.00206	16310939.4	0.00171
	(0.233)	(0.661)	(0.776)	(0.690)	(0.115)	(0.400)
Public Spiritedness	-4641122.5	0.00112	-33927863.9	-0.00475	-11786929.2	-0.000191
	(0.781)	(0.722)	(0.321)	(0.257)	(0.212)	(0.923)
Total ODA	0.0808**		0.0915		0.0558**	
	(0.045)		(0.221)		(0.016)	
Constant	279245078.7	0.0415	1.34791e+09	0.107	73941353.5	0.00173
	(0.627)	(0.577)	(0.246)	(0.327)	(0.805)	(0.968)
Observations	168	168	168	168	168	168
Adjusted R-squared	0.891	0.707	0.915	0.841	0.760	0.471

p-values in parentheses
* p<0.10, ** p<0.05, *** p<0.01

United Nations Development Programme
Seoul Policy Centre
Korea University 4F, International Studies Hall
145, Anam-Ro, Seongbuk-Gu,
Seoul, Republic of Korea