

China and Aid Coordination: Feasibilities of Trilateral Cooperation on Geothermal Financing in Kenya

Le DONG

Doctoral student, Graduate School of Global Environmental Studies, Kyoto University

E-mail : dong.le.78e@kyoto-u.jp

Akihisa MORI

Associate Professor, Graduate School of Global Environmental Studies, Kyoto University

E-mail : mori.akihisa.2a@kyoto-u.ac.jp

Abstract

Traditional donors have made wide debates and attempts to coordinate aid to reduce transaction cost and increase aid effectiveness. Several obstacles have been studied, one of which is emerging donors' bilateral approach with recipients. This not only complicates existing aid coordination, but also increases transaction cost for recipients. Relation between China and traditional donors is mostly heated discussed due to its prominence in aid provision. This paper, applying the geothermal financing in Kenya as a case, tests the hypothesis that trilateral cooperation based on comparative advantages can provide a configuration to coordinate traditional and Chinese donors at project or sectoral level, with expected results of reducing transaction cost and increasing aid effectiveness. This paper contributes to the field by showing potential improvement of transaction costs and aid effectiveness through trilateral cooperation engaging emerging donors in energy project or sector, which also sheds lights on aid coordination in infrastructure sector.

1. Introduction

Realizing the necessity of aid coordination is not a new consensus. It dates back to the beginning of development assistance after World War II, and recent years see growing interest and attempts from the Development Assistance Committee (DAC) countries of the Organisation for Economic Cooperation and Development (OECD), such as the Rome Declaration on Harmonization in 2003, the Paris Declaration on Aid Effectiveness in 2005, the Accra Agenda for Action in 2008, and the Busan Partnership for Effective Development Cooperation in 2011. Aid coordination is believed to reduce the transaction cost through less tying aid and less poaching qualified local staff so as to increase aid effectiveness (Brautigam 2000; Knack & Rahman 2007), and to reduce poverty (Bigsten & Tengstam 2012).

However, there is "a wide gap between words and deeds" concerning the national-level aid coordination (Aldasoro et al. 2010, pp. 920). Several challenges posing to the wishful aid coordination have been studied, such as the strategic interests of some donors, the bureaucratic incentives within aid agencies (Winters 2012; Delputte & Orbie 2014), the increased skepticism and resistance from recipients, and the growing complexity of aid architecture (Olivié & Pérez 2016; Carbone 2017). Nunnenkamp et al. (2013) reckoned that insufficient integration of emerging donors, especially China, into formal aid negotiation arrangement have weakened aid coordination, considering the fact that the Official Development Finance (ODF) from China to Africa ranked 6th in 2013, rising

from 16th in 2001, in comparison with all DAC countries (Kitano & Harada 2014).

China's rising in global aid architecture complicates aid coordination and poses new challenge to old ones among traditional donors. On one hand, it seems that China is unwilling to fully align to existing international mechanisms, *inter alia*, joining the national-wide aid coordination led by traditional donors, and is exploring its own approach by formulating new rules, manifested by recent establishment of Asian Infrastructure Investment Bank (AIIB) and the "Belt and Road" Initiative. On the other hand, the parallel ODF approach of emerging donors particularly China to traditional donors' increases transaction cost for recipients, with empirical evidence from Rwanda where local staff had to deal with multi-donors' requirements and aid effectiveness became challenged with China's joining (Grimm et al. 2010).

Against this background, the paper asks the question: how can traditional and Chinese donors coordinate their aid towards the reduction of transaction cost and the increase of aid effectiveness to achieve the Sustainable Development Goals (SDGs) by 2030, with the full awareness that integrating China to existing national-level aid coordination may take a long term to realize.

A case study is adopted to explore feasible coordination mechanism engaging traditional and Chinese donors to reduce transaction cost and increase aid effectiveness. Kenya is chosen because it is one of the top largest ODF recipients in Africa for both DAC donors (second largest after Democratic Republic of Congo in 2011, OECD 2013) and Chinese donors (third largest after Angola and Ethiopia in 2000–2015, Atkins et al. 2017). The Olkaria I and IV geothermal project is further selected, the single largest completed geothermal project in the world with multi-donors, to examine current aid coordination in energy sector and shed light to future coordination.

This paper is organized in seven sections: Section two elaborates analytical framework based on aid coordination and trilateral cooperation. Section three introduces the case of Kenya, examines aid coordination in Kenya and aid modalities of the Olkaria I and IV geothermal project. Section four proposes the trilateral cooperation on geothermal drilling. Section five examines costs and benefits for each actor. Section six discusses whether this trilateral cooperation is feasible and can generate positive impacts, and the implications. Finally, section seven concludes the paper.

2. Analytical framework

The paper holds the premise that directly including emerging donors to current national-level aid coordination led by traditional donors may face challenges due to divergent aid modalities between these two groups. First, emerging donors are mainly recipients' demand driven and seldom provide budget support (Vazquez et al. 2016), hence there may be low incentive to join national-level coordination. Second, emerging donors, particularly China, provide primarily Other Official Flow (OOF, including concessional and market-rate export credits, as well as other OOF) than Official Development Assistance (ODA, including grants and concessional loans) (Brautigam 2011b), indicating that commercial-oriented export credits is one important consideration which seems rather incompatible with ODA dominated national-level coordination. In addition, the weakening multilateralism in aid regime makes the national-level aid coordination with emerging donors unlikely, given that the established donors already face sever challenges in reaching coordination among themselves (Woods 2008).

As an alternative to bridge traditional and emerging donors for enhanced aid effectiveness, trilateral cooperation, also named as triangular cooperation, has gradually gained its ground in recent decades (Piefer 2014), with several exploration involving 16 DAC countries in developing countries across Africa, Asia, Eastern Europe and Latin America. Several DAC donors have set objectives for triangular cooperation in their development cooperation policies, such as Japan and Spain (Fordelone 2009, pp. 4, 21–24). No international definition is agreed yet. According to Japan MOFA (2011), south-south cooperation between developing countries may face capability restrictions. Developed countries can provide with technology, fund, and knowledge in trilateral cooperation (Figure 1). A and B respectively indicate one developed and one developing country providing assistance. C stands for

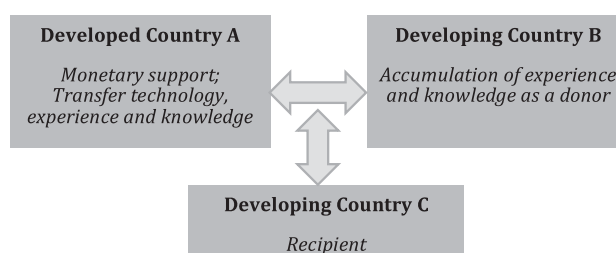


Fig. 1 The Flow of Trilateral Cooperation

Source: Author compilation based on Japan MOFA (2011)

one developing country receiving assistance.

Mcewan & Mawdsley (2012, pp. 1185) argued that trilateral cooperation has potential to improve aid effectiveness. Fordelone (2009) suggested that trilateral cooperation, with certain principles of effectiveness, provides a good opportunity for using comparative advantages of DAC and emerging donors to support the development of developing countries. Schiere (2010) also believed triple-wins can be created and are beneficial to African countries, China and traditional donors. Grimm and Hackenesch (2012) explored trilateral partnerships between European donors and China in Rwanda in the sectors of education, health, agriculture, and transport. JICA RI (2013, pp. 8) reckoned that trilateral cooperation is a gateway to a new form of international cooperation and believed it is more cost effective than traditional North-South cooperation.

However, it is also argued trilateral cooperation could incur higher transaction costs even if services and technologies from emerging donors may be less expensive (Fordelone 2008). An OECD study figured out three conditions to achieve positive trilateral cooperation: 1) beneficiary countries ownership of projects and active participation; 2) projects are aligned with beneficiary countries' development priorities; 3) partners divide responsibilities to make best use of their comparative advantages (Fordelone 2009), which did not touch upon transaction cost issue. JICA RI (2013, pp. 8) admitted that it remained a challenge to evaluate the cost, especially in numerical terms, instead the incentive and willingness to join trilateral cooperation process can act as indicators.

With full awareness of actual challenges in mobilizing China to national-level aid coordination led by traditional donors, and necessity of improving aid effectiveness by engaging China in global aid architecture, this paper assumes that national-level aid coordination between traditional donors and China face more severe challenges in reality than smaller scale aid coordination, within the form of trilateral cooperation involving less donors. This paper aims to test the hypothesis that trilateral cooperation based on comparative advantages can provide a configuration to coordinate traditional and Chinese donors at project or sectoral level, which can reduce transaction cost and increase aid effectiveness.

The renewable energy sector in Kenya is focused. We first present overall aid coordination structure in Kenya, and aid modalities of key donors in a selected geothermal project. Then we propose one possible trilateral cooperation based on comparative advantages, and examines the costs and benefits for all actors. Whether the proposed trilateral cooperation will generate positive impacts is discussed against the three conditions suggested by Fordelone (2009) and other conditions are further explored. The paper applies the primary data from three anonymous informant interviews conducted in September 2015 in Nairobi, another three in December 2016 in Washington, and the secondary data from existing literature and disclosed publication.

This research contributes to the field of international development study by exploring the feasibilities of trilateral cooperation at project and sectoral level as an approach of engaging emerging donors to reduce transaction cost and increase aid effectiveness, given that it is the transaction costs in aid coordination that impair aid effectiveness.

3. Case study of Kenya

In this section, we will firstly depict geothermal and major donors in Kenya. Secondly the historical and current aid coordination is presented. Thirdly we take a deeper look at aid financing of the Olkaria I and IV project. Lastly based on comparative advantages after aid modalities analysis we propose one potential trilateral cooperation.

3.1 Geothermal in Kenya and major financiers

With the highest geothermal potential in Africa, Kenya was the first African country to adopt geothermal power dating back to the 1950s (UNECA 2012). Over 14 potential sites are located along the Great Rift Valley with a potential of 7,000–10,000 megawatts (MW). The Government of Kenya (GoK) projects its geothermal capacity of 5,500 MW by 2030. By October 2014, Kenya has an installed capacity of 340 MW. To achieve the 2030 goal, it will cost an estimated US\$18 billion (Ngugi 2012). Geothermal Development Company (GDC), the main geothermal developer facilitated by GoK, will raise US\$6 billion through credits, budget and revenues. Kenya Electricity Generating Company Limited (KenGen) and the Independent Power Producers (IPPs) will raise US\$12 billion. By 2012, the GoK contributed US\$399 million, while the multilaterals, bilateral and other funds committed US\$1.343 billion (Ngugi 2012), indicating a financing gap of US\$16 billion.

To analyze the key financiers, the Olkaria I and IV geothermal project is chosen, given its high volume of 240 MW marking it the single largest geothermal project in the world with enormous investment involving the GoK, KenGen, International Development Agency (IDA) of World Bank, European Investment Bank (EIB), Japan International Cooperation Agency (JICA), Agency for French Development (AFD), Development Bank of Germany (KfW), and China Export-Import Bank (China EXIM) (SREP 2012).

3.2 Aid coordination in Kenya

In the early 1970s the World Bank organized a Consultative Group (CG) among donors and GoK, and held meetings once every two years, with the last one in 1996. It was not until 2004 that the World Bank set up the Harmonization, Alignment, and Coordination (HAC) Group as a subgroup of the Donor Coordination Group (DCG). Seven bilateral and multilateral agencies joined in with the World Bank as permanent co-chair (Fengler & Kharas 2010). In 2009 the Aid Effectiveness Group (AEG) replaces HAC. AEG reports to Development Partnership Forum (DPF) on the aid and development effectiveness agenda. All these efforts are supported by the Aid Effectiveness Secretariat (AES), which replaced HAC Secretariat in 2010 (Treasury 2016).

From the beginning of the Kenya Joint Assistance Strategy (KJAS) period, the HAC/AEG group comprised 17¹ Development Partners (DPs) with GoK. China is invited to participate as an observer (Treasury 2016). With Kenya's external financing represents 16 percent of its total 2013–14 budget, the role for AEG is to leverage knowledge and financing of DPs. The implementation of the devolved governance system as per the Constitution in 2010 poses challenges to aid coordination (Treasury 2016). According to informant interviews, China did not join the CG or DCG in 2015. It negotiated and directly with GoK. Figure 2 depicts the aid coordination structure in Kenya.

The Sector Working Groups (SWG) in Kenya has been “loose networks without clear terms of reference”. Two programs have been studied by scholars: 1) The governance, human rights, justice, and law and order (GJLOS) Program lasting from 2003 to 2008 was funded by 16 donors. One evaluated that “there is no effective SWG for the governance reform” (McCormick 2008); 2) The health sector reform in 2007–2012 was “in a fledgling sector-wide approach” (Fengler & Kharas 2010). Energy sector coordination has not been studied yet.

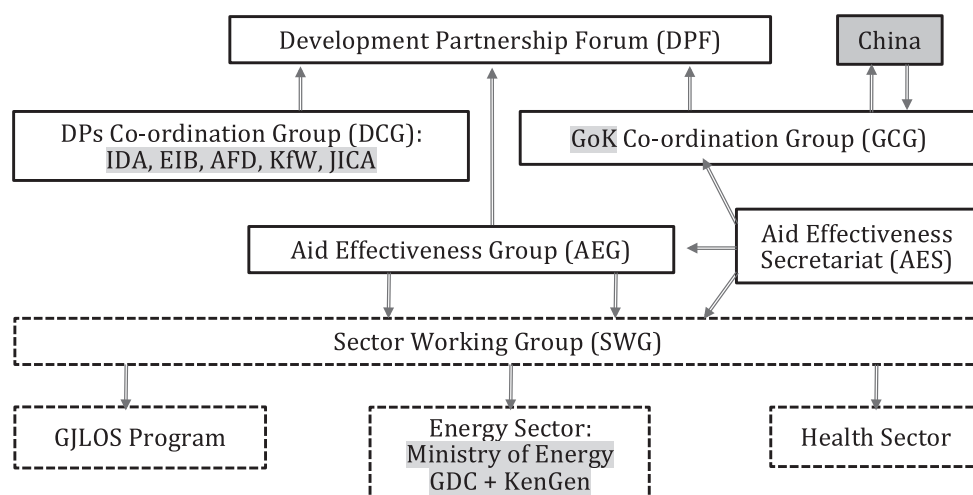


Fig. 2 Aid Coordination Structure in Kenya

Note: DPF, AEG, and AES includes GoK and DPs. DCG includes DPs and Ambassadors. GCG is GoK only. Grey blocks are the key players in Kenya's geothermal ODF coordination.

Source: Author compilation based on McCormick (2008), Fengler and Kharas (2010), Kapika and Eberhard (2013), and Treasury (2016).

Table 1 Financing Breakdown for Olkaria I and IV by 2012, unit: US\$ million

Cost components	By Project		By donors								Total
	Olkaria I	Olkaria IV	GoK	KenGen	IDA	JICA	KfW	EIB	AFD	China	
Drilling	142	186	216				15			97	328
Steam Field	100	68		7	107		54				168
Power Plant	201	194				201		76	118		395
Substation & Transmission	22	13	3					32			35
Consultancy	16	14					30				30
Administration	20	21		29	12						41
Resettlement Action Plan		10		10							10
Board of Consultants	1	1			1						1
Indirect Cost	24	33		57							57
Total	526	540	219	103	120	201	99	108	118	97	1,065

Note: this is the breakdown by 2012, and actual disbursement remains unpublished.

Source: Author compilation based on SREP (2012).

3.3 The Olkaria I and IV geothermal project

As the single largest completed geothermal project in the world, the Olkaria I and IV project consists of 140 MW of Unit 4 and 5 for Olkaria I, and another 140 MW for Olkaria IV. Started in 1998, the project became commercial operation in early 2015. Table 1 shows the financing breakdown by 2012. Power plant and drilling are the most investment needed phases, and there seems two clearly divided groups: GoK, KfW and China funded the drilling, while JICA, EIB and AFD funded the power plant. Table 2 provides details on aid modalities, in terms of

Table 2 ODF Modalities for the Olkaria I and IV Geothermal Project

Donor Modality	IDA	EIB	AFD	KfW	JICA	China EXIM	
Aid Co-ordination	Yes. WB country director acts as donor co-chair of DPF					No. As observer ¹	
ODF definitions	Mainly ODA (concessional funding with grant part of at least 25 percent, and primarily for promoting welfare and economic development); Report the full value of ODA loan.					Mainly OOF; Report only the interest subsidy	
Transparency	Report ODA to DAC; OOF is regarded as confidential					No country data	
Conditionality	Conform to an agreed set of standards on governance, human rights, good economic policy					No political conditionality	
Environmental and social safeguard	E&S framework or policy or principle, require Environmental Impact Assessment (EIA), enforced with evaluation and monitoring policies					Guideline exist, require EIA, not enforced	
Volume ²	Kenya ³	477.57	200.84	92.29	105.7	45.9	/
	Olkaria ⁴	330	101	87	63	300	97
Interest rate & payment period & grace period ⁵	1 % for first 10 years, 2 % for last 20 years	3 %, 15 years, 5 years	1 . 95% + LIBOR ⁶ , 15 years, 3 years	0.75%, 30 years, 10 years	0.2%, 30 years, 10 years	> 4 % ⁷ , 15–20 years, 5–7 years	
Tied with goods and services	Un-observed or un-disclosed				Toyota Tsusho with Toshiba turbines.	China Great Wall Drilling drilled 26 wells.	

Note:

1. China can also be represented by Ministry of Foreign Affairs. One JICA staff in the interview in September 2015 claimed the absence of Chinese actors in DCG meetings. A senior officer from GDC echoed this fact.
2. Unit: US\$ million.
3. Total net ODA data of 2014 to Kenya since OOF is not recipient country based. Source: OECD statistics. Net ODA or ODF data in 2014 from China is unknown.
4. Total planned ODF to Olkaria I and IV projects from 2010–2015. Source: JICA Annual Report of 2014, IDA website, e-PromIS Kenya of National Treasury.
5. The data of Japan and China are Olkaria I and IV. Source: JICA report and AidData. Other data are for Olkaria projects since I and IV data are unknown. Source: Mwangi 2008.
6. LIBOR stands for Intercontinental Exchange London Interbank Offered Rate.
7. In the informant interview a senior officer from GDC disclosed this rate.

Sources: Treasury (2016), Brautigam (2010), and the homepages of each donor.

aid coordination, compliancy with DAC policies on ODF definitions, transparency, conditionality, and environmental and social (E&S) policy, ODF volume in Kenya generally and the Olkaria I and IV project particularly, the interest rate, payment period, grace period, and tied with goods and services.

For aid modalities, traditional donors in principle comply with the DAC regulations and guidelines on ODA, namely, definition of ODF; transparency on reporting ODA to DAC; conformability to an agreed set of standards on governance, human rights, good economic policy governance, human rights, and the establishment of environmental and social (E&S) safeguard policies that require an Environmental Impact Assessment (EIA) and its enforcement. In contrast, China does not have to comply with these, as it is not a member of OECD. Neither is it required to abide by the DAC standards on transparency, governance and human rights, and E&S safeguards.

The drilling contractor for this project is China Great Wall Drilling Company, and its backer China Export-Import Bank (China EXIM) offered a US\$97 million loan (Simiyu 2013). China provides financing mainly by export credit instead of ODA. China EXIM Bank recently implemented environmental and social safeguard policies, but the requirements are less stringent and enforcement is less strict than DAC donors.

In comparison with other financiers, China EXIM Bank has the highest interest rate and focuses on drilling, which seems to maximize economic profits of Chinese companies in recipient countries, and at the same time African countries are urged to rebalance its profits in the relations (Pigato and Tang 2015; Wang and Bio-Tchane 2008).

Germany, as the only DAC financier for geothermal drilling, stresses maximizing the development outcomes of RE as well as other sectors, subject to DAC guidelines on transparency, accountability and social and environmental safeguard policies (KfW 2016; BMZ 2016). Japan, though agreed not to provide tied aid as a DAC member, in 2002 established the Special Terms for Economic Partnership (STEP), for which Japanese technologies and equipment are substantially utilized. Power plant is an eligible field (JICA 2013). Thus, JICA, with the lowest interest rate and only focusing on power plant in Olkaria I, maximizes its presence in the power plant practices, also subject to DAC guidelines. France and EIB, co-funding Olkaria IV power plant, could be ranked in between Germany and Japan in terms of interest rate, and subject to DAC guidelines as well (AFD 2014; EIB 2016). World Bank, focusing on stream field and administration, tries to maximize aid effectiveness through aid coordination while providing its own development assistance, subject to maximization strategy of each donor (World Bank 2000).

With the apparently strong E&S regulations by all donors, Kenya still saw this project producing hydrogen sulphide gas, trace metals like boron, arsenic, and mercury, and noise in the Hell's Gate National Park (Mwangi 2010), and introducing the new populations into the resettled area and the associated disruption of the social fabric of the community being resettled (Mwangi-gachau 2011). Thus, Kenya maximizes renewable energy financing, yet subject to E&S safeguards.

Four key findings are worth emphasizing: 1) China, invited as an observer of DCG meetings, in reality pursues bilateral approach with the GoK, which resulted in higher transaction cost according to the interview with an informant from KenGen²; 2) China and Germany funded the drilling phase; 3) Cooperation among DAC countries is rather limited, and the DCG meetings are more like an information sharing platform, according to the interview with an informant from GDC; 4) The E&S regulations by all donors did not prevent Kenya from suffering the E&S complications².

4. Proposal of one trilateral cooperation on geothermal drilling

As current aid structure is featured by segregation between traditional donors and China, a first-hand option is to remove such segregation entirely. However, this can be rather challenging at national level. An alternative is to enhance complementarity between traditional donors and Chinese actors through trilateral cooperation at project or sector level based on their comparative advantages. One possible approach is co-financing for geothermal, as both Germany and China funded the drilling. Other scenarios may exist as well, such as Japan and China, due to space limitation, we focus on the first scenario.

In terms of total installed geothermal electricity in 2015, neither China or Germany ranked the top 15 (Bertani 2015). However, by total direct usage of geothermal energy like space heating and bathing, China ranked top and Germany ranked fourth in 2015, after the U.S. and Turkey (Lund & Boyd 2015).

Germany's incentives may be based on two facts: in 2003 Munich RE Group was the world's first insurer to cover the costs of unsuccessful geothermal drilling projects; and Germany is the only European country who established private and national geothermal risk insurance funds, covering home and abroad (Fraser et al. 2013). Geothermal risk insurance is one of the key incentives for geothermal development. Meanwhile, Germany through

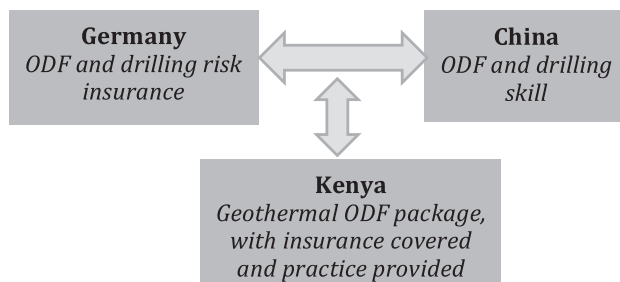


Fig. 3 Trilateral Cooperation on Geothermal Drilling Financing

KfW with African Union Commission in 2012 co-established the Geothermal Risk Mitigation Facility to fund geothermal development in eleven African countries including Kenya.

China has drilling practice advantage. The on-site drilling experiences for direct usage allows Chinese drillers to practice drilling. The China Great Wall Drilling Company, the contractor for the Olkaria IV project, claimed its successful test drilling rate goes up to 100 per cent, while world average is from 60 to 78 per cent. Additionally, Chinese company construction speed is 35 per cent faster than others due to technical advantage³.

It seems both Germany and China have their own advantages to lower geothermal drilling risk. Possible trilateral cooperation between Germany and China in Kenya is outlined in Figure 3, with ODF and drilling skill from China, and ODF as well as drilling risk insurance from Germany.

In the proposal, Chinese Ministry of Commerce (MOFCOM, leading the trilateral cooperation), China EXIM Bank (providing ODF) and Chinese drillers like China Great Wall Drilling Company (practicing the drilling) are involved; German Agency for International Cooperation (GIZ, leading the cooperation), KfW Development Bank (providing ODF as co-financing), German insurance companies like Munich RE (providing drilling risk insurance) are engaged; Kenyan Aid Effectiveness Secretariat (AES) and Ministry of Energy (MOE, leading the trilateral cooperation), KenGen and GDC (receiving the ODF package from China and Germany financial institutions, with drilling risk insurance covered by German actor and practice service provided by Chinese actor).

5. Cost and benefit of the trilateral cooperation on geothermal drilling

The changes without and within the proposed trilateral cooperation are shown (Figure 4). The arrows among German financial institutions, drillers and Kenya are lighter in color, which is to indicate no evidence showing such connection. To examine feasibilities of such trilateral cooperation, cost-benefit is analyzed in terms of financial and non-financial aspects (Table 3).

Two conditions are analyzed first. German players may lose if Chinese EXIM Bank does not decrease the amount of tying ODF to Chinese drillers. In this case, the provision of re-insurance to a Chinese driller will simply replace other drillers including German ones, despite the current level of drilling practices among German

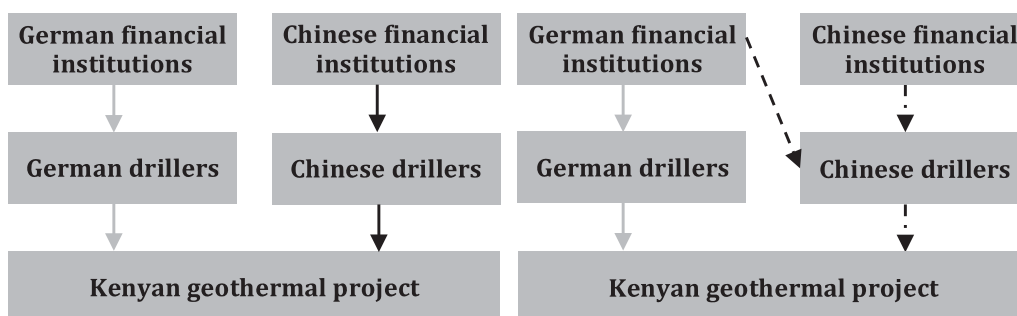


Fig. 4 Relations without (left) and within (right) trilateral cooperation

Table 3 Cost and benefit of Each Player in the Trilateral Cooperation

Player		Cost		Benefit	
		Financial	Non-financial	Financial	Non-financial
China	Government	More staff cost	Extra work; Lose sovereignty; More stringent E&S safe-guard policies	Less risk of de-fault	Better reputation
	Banks	More staff cost; More loans	Extra work; More strict sanction in case of drillers' in-compliance with E&S policies	More business opportunities	Better reputation
	Drilling companies	More staff cost; Possible loss in competition	Extra work; Comply with more stringent E & S guidelines	More chances of getting loan	Better reputation
Germany	Government	More staff cost	Extra work	/	Better reputation
	Banks	More staff cost	Extra work	More business opportunities	/
	Insurance companies	Possible increase E&S risks by Chinese driller	/	More income	More successful cases
	Drilling companies	Possible loss in competition	/	More loans chances from Chinese banks	/
Kenya	Government	Slower loan dis-bursement	/	Increase geother-mal power quickly	Less co-ordina-tion; Less E&S risks
	Geothermal companies	/	/	Less staff cost; Cheaper loan	Less co-ordina-tion
	People	/	/	Increasing access to energy	Less E&S risks

drillers in Kenya is limited. The other condition is the stringent and enhanced enforcement of environmental and social safeguard policies for Chinese actors. The price of insurance may become higher or the loan package may be affected if Chinese drillers encounter local protests for in-compliance with E&S policies, which make both China and Germany lose, and same for Kenya.

In the scenario satisfying these two conditions, the payoff seems beneficial for Chinese actors: lowering loan default risks for banks, and improving their reputation as a responsible international community member. This is potentially offset in finding impediments in pursuing its national objectives, and that all Chinese players have to spend more staff cost and extra work, which may generate transaction cost for Chinese players internally.

German government such as GIZ at the initial stage has to coordinate with Chinese counterpart such as MOF-COM to activate this cooperation with Kenyan counterparts, either AES or MOE. For German insurance compa-

nies, since they are seeking business opportunities, there will not be extra staff cost or work. For instance, the Exploration Risk Insurance (ERI) by Munich RE Group covers the costs of the well in unsuccessful exploration. Munich RE evaluates the projects' risk before the agreement, and it remains uncertain whether the involvement of German driller make the project more insurable and to what extent. Thus, it is uncertain whether the German drillers will definitely lose. To date, few German driller has operated in Kenya.

Kenya could enjoy a finance package with more security against risk, and bear almost no loss. The project proponents in Kenya, such as KenGen, GDC, and Akiira, a special purpose vehicle owned by a Kenyan-U.S.-Denmark consortium, could purchase the ERI, secure co-financing from China EXIM and KfW, and then find a Chinese driller. Importantly, the Kenyan players will save staff cost from current heavy coordination with multiple donors, in trilateral cooperation only two donors. What is more, current environmental and social risks caused by various financiers in geothermal projects might be paid more attention to, or even to some extent mitigated, as long as the trilateral cooperation pushes Chinese players to implement more stringent social and environmental safeguard policies with stricter enforcement.

To conclude, the trilateral cooperation on geothermal drilling between China and Germany in Kenya would gain financial and non-financial benefits for all. This case proves the hypothesis holds true that trilateral cooperation based on comparative advantages not only helps reduce transaction cost for Kenyan side, despite at the cost of increasing transaction cost for Chinese and German players, improve aid effectiveness in mobilizing more finance for geothermal drilling, the most challenging phase for securing finance in the whole project cycle, but also help increase the electricity access from renewable energy for the Kenyan population.

6. Discussion

This section further discusses whether the proposed Germany-China-Kenya trilateral cooperation, are feasible in terms of incentives, especially with the expectation of increasing the internal transaction cost for both German and Chinese players; and whether, compared with non-cooperation scenario, it improves the pre-studied conditions leading to positive cooperation by Fordelone (2009): 1) beneficiary countries ownership of projects and active participation; 2) projects are aligned with beneficiary countries' development priorities; 3) partners divide responsibilities to make use of their comparative advantages.

6.1 Incentives for German and Chinese players

With full awareness of increasing transaction cost for both German and Chinese actors, we discuss what bring these two sides to cooperate and coordinate in Africa.

Recent media coverage revealed that German government and business are looking towards trilateral cooperation with China in African countries (Demissie 2017), and Chinese enterprises have been encouraged by Germany's advocacy for Sino-German cooperation in third-country markets during the G20 Hamburg Summit, which is believed to give full play to their respective advantages, especially in the field of industrialization and renewable energy (Global Times 2017). The Munich RE has also been proactively engaging with developing countries for the provision of geothermal risk insurance. Therefore, it seems the German side may be enthusiastic and supportive on the proposed trilateral cooperation.

It seems reasonable to doubt the incentive of Chinese players, especially given that the proposed trilateral cooperation may requires the Chinese to improve on transparency (basis for cooperation in one project), provide less tying aid (ensuring equal access for business) and environmental and social safeguard policies (controlling the financial risks).

Fully complying with DAC policies on ODF definitions for Chinese players may require a thorough philosophical change on development assistance. As Brautigam (2011) pointed, the DAC sees foreign aid as important for

development in the poorest countries, while the Chinese see investment and infrastructure as central. The transparency of Chinese ODF should be improved, however, Chinese players have many concerns to not disclose the country level ODF data, hence national-level coordination is rather challenging. As Grimm et al. (2011) analyzed, the recipients actually released several Chinese ODF data at project or sectoral level. In the proposed trilateral cooperation, the ODF transparency at the project-level deal seems more realistic. For tying aid, Germany may lose if Chinese players do not decrease the amount of tying ODF in the project or sector. Theoretically, the break-even requirement is one of the most influential conditions for cooperation (Sexton 1986). Thus, this trilateral cooperation exists with the critical condition that all the drillers are at the same starting line, which could be satisfied while China decreases its tying ODF for drilling.

Another condition could be the stringent and enhanced enforcement of environmental and social safeguard policies for Chinese actors. Dinar, Albiac and Sanchez-Soriano (2008) reckoned that environmental problems stem from non-cooperation, and cooperative solutions can result from binding agreements with built-in penalties. In the proposed cooperation, the price of insurance can become higher in the case Chinese drillers encounter local protests for incompliance with E&S policies. In this case, both China and Germany lose, the same for Kenya. Thus, the Germany-China cooperation should include one necessary facet that both make binding agreements on minimized standards on environmental and social safeguards, with associated penalty policies.

To satisfy these two conditions and get them in place, Chinese players must overcome considerable costs. According to current practices, the trilateral cooperation model is in line with recent official declarations on cooperation with a third country between China and Germany, France, and also Canada. China and France offered to coordinate to finance and insurance in public and private financing towards a third country. They agreed on a joint fund for Africa where France has traditional strength. On the other hand, China's ODF enables Kenya to exploit maximum benefits from the competition between traditional donors and China through leveraging negotiation capitals with donors. This can work for both sides: to intensify the competition and to provide incentive for collaboration. As Sato et al. (2011) revealed in the case of Cambodia, recipients benefit from competition generated by the joining of emerging donors, and the scope of aid coordination should be tailored to each recipient.

These dynamics manifest the complexity of aid coordination between traditional donors and China. Though it is not yet ready or possible for China to join national-level aid coordination, the trilateral cooperation at project or sectoral level can be the first step for China and traditional donors to explore and understand mutually, and to build up towards a fully cooperative game.

6.2 Cross-check with three pre-studied conditions

6.2.1 Empowering more Kenya's ownership

Ownership, mostly referring to the scope of national level, indicates the sources leveraged by the recipients for negotiations with donors, and the degrees of control the recipients have (Whitfield & Fraser 2010). Given the proposed trilateral cooperation is at project or sectoral level, it is hard to measure change to national-level ownership.

The Germany-China financing cooperation on geothermal drilling may result in either empowering or violating Kenya's ownership. If the Kenyan energy sector has enough sources of leverage in negotiations with Germany and China, the trilateral cooperation may further empowering Kenya's ownership from the energy sector, and vice versa. Therefore, whether this trilateral cooperation leads to positive or negative results depends largely on Kenyan national ownership per se. And the empowerment of country ownership is beyond the scope of this paper. Nonetheless, the implication is that the analysis of trilateral cooperation at project or sectoral level has to take ownership at national level into consideration.

6.2.2 Aligning better with Kenya's development priorities

Kenya has set ambitious goal to develop geothermal so as to increase its electrification rate and provide clean electricity for the Kenyan. The proposal is believed to help realize its development priority of utilizing geothermal for electricity in two ways.

On one hand, the trilateral cooperation may help shift the Chinese energy investment in Kenya from hydro power or fossil fuel like coal to renewables like geothermal. Currently Chinese energy infrastructure financing also goes to hydro power sector, such as the High Grand Falls Dam which is to be the largest dam in Kenya, as well as coal power plants. With financial support from German insurance companies, geothermal financing from China may be increased in geothermal sector. Hence, Chinese energy financing in Kenya would be better shifted to be in line with Kenya's development priority.

On the other hand, the trilateral cooperation could help expand the Chinese drilling areas with financial support from Germany. At present, the Chinese drillers with Chinese ODF mostly practice in the Olkaria region, a fairly well-developed geothermal field. With the drilling insurance covering the failed test drillings, the Chinese drillers may practice at broader geothermal fields along the Great Rift Valley, which therefore is in line with Kenya's development priority.

6.2.3 Utilizing their comparative advantages

As analyzed in previous section, Germany is one of the leading countries in providing geothermal insurance to cover the failed test drillings, while China has experienced geothermal drilling companies. The proposed trilateral cooperation combines the comparative advantages of both countries. Most importantly, this combination will provide the geothermal drilling finance for Kenya, which faces challenging to raise finance, especially for drilling phase of geothermal project.

7. Conclusion

In recent decade, China's rising in international aid complicates aid coordination. It seems desirable for traditional donors and China to coordinate their aid in developing counties so as to reduce transaction cost and improve aid effectiveness. With this aim, this paper examines the feasibilities of trilateral cooperation between traditional donors and China in energy sector for the first time. The case study on Olkaria I and IV geothermal projects in Kenya found that, though invited to join aid coordination meetings, China pursues bilateral negotiation. Aid modalities in the project indicated one cooperative potential between China and Germany in co-financing geothermal drilling, inter alia. The most recent trend suggests China is exploring collaboration with traditional donors in trilateral cooperation and Germany is welcoming China to cooperate in Africa.

The research proved that the hypothesis holds true that trilateral cooperation based on comparative advantages can provide a configuration to coordinate traditional and Chinese donors at the project or sectoral level, and the expected results of reducing transaction cost and increasing aid effectiveness are desirable, yet with two conditions that Chinese players provide less tying ODF, and improve environmental and social safeguard polices.

The contribution of this paper lies in showing potential of reducing transaction costs through trilateral cooperation with traditional and emerging donors in Africa. The implication is that the improvement on transaction costs through trilateral cooperation in energy sector may shed lights on broader cooperation in transforming developing countries' infrastructure sector, where Chinese ODF has advantages and requires technological assistance from traditional donors. Additionally, trilateral cooperation at the project or sectoral level could act as a gateway towards future national-level aid coordination. We admit that implementing the proposed trilateral cooperation may face multiple challenges in reality. However, attempts to this wishful goal are worth.

Notes

- 1 They are Canada, Denmark, Finland, France, Germany, Italy, Japan, the Netherlands, Norway, Sweden, Spain, the United Kingdom, the United States, and the African Development Bank, the European Commission, the United Nations, and the World Bank Group.
- 2 Based on the interviews with a staff from Kenya Electricity Generating Company (KenGen) on September 17, 2015, and a manager from Geothermal Development Company (GDC) on September 15, 2015.
- 3 This is claimed by China Great Wall Drilling and confirmed by the GDC informant in the interview.

Acknowledgements

The authors are grateful to the editors and two referees for their helpful advice and comments. Special thanks go to the interviewees from JICA, KenGen, GDC, PPIAF, IDA and MIGA for their invaluable input. We are also thankful for scholarship from the Nishimura International Scholarship Foundation.

References

- AFD. 2014. "AFD and Kenya." French Development Agency, Kenya. <http://www.afd.fr/webdav/site/afd/shared/AFD-Kenya-VA.pdf> (January 4, 2017).
- Aldasoro, I., Nunnenkamp, P. & Thiele, R. 2010. "Less aid proliferation and more donor coordination? The wide gap between words and deeds," *Journal of International Development*. Vol. 22. No. 7, pp. 920–940.
- Atkins, L. et al. 2017. "China-Africa Economic Bulletin #1: Challenges of and opportunities from the commodity price slump." China Africa Research Initiative, Washington. <https://static1.squarespace.com/static/5652847de4b033f56d2bdc29/t/59f85883ec212d5a70e9624c/1509447812591/bulletin+v5.pdf> (January 4, 2017).
- Bertani, R. 2015. "Geothermal Power Generation in the World 2010 – 2014 Update Report." Proceeding World Geothermal Congress 2010, Bali. <https://www.geothermal-energy.org/pdf/IGAstandard/WGC/2010/0008.pdf> (January 4, 2017).
- Bigsten, A. & Tengstam, S. 2012. "International Coordination and the Effectiveness of Aid." UNU-WIDER. <https://www.wider.unu.edu/publication/international-coordination-and-effectiveness-aid-0> (January 1, 2017).
- BMZ. 2016. "BMZ Kenya situation and cooperation." http://www.bmz.de/en/what_we_do/countries_regions/subsahara/kenia/zusammenarbeit/index.html (January 1, 2016).
- Brautigam, D. 2010. "China, Africa and the International Aid Architecture." AfDB Working Paper. <https://www.afdb.org/en/documents/document/working-paper-107-china-africa-and-the-international-aid-architecture-20268/> (January 1, 2016).
- Brautigam, D. 2011a. "Aid 'with chinese characteristics': Chinese foreign aid and development finance meet the OECD-DAC aid regime," *Journal of International Development*. Vol. 23. No. 5, pp. 752–764.
- Brautigam, D. 2011b. "Chinese Development Aid in Africa: What, where, why and how much? In book *Rising China Global Challenges and Opportunities*." ANU Press, pp. 203–222.
- Carbone, M. 2017. "Make Europe happen on the ground? Enabling and constraining factors for European Union aid coordination in Africa," *Development Policy Review*, Vol. 35. No. 4, pp. 531–548.
- Delputte, S. & Orbie, J. 2014. "The EU and Donor Coordination on the Ground? : Perspectives from Tanzania and Zambia," *European Journal of Development Research*, Vol. 26. No. 5, pp. 676–691.
- Demissie, A. 2017. "Opportunities for Germany-China-Africa cooperation under the G20." China Daily. http://europe.chinadaily.com.cn/opinion/2017-07/07/content_30034785.htm (January 7, 2018).
- Dinar, A., Albiac, J. & Sanchez-Soriano, J. 2008. *Game Theory and Policy Making in Natural Resources and the Environment*. Longdong: Routledge.
- EIB. 2016. "EIB projects in Kenya." European Investment Bank. <http://www.eib.org/projects/loan/list/?region=6&country=KE> (January 1, 2016).
- Fengler, W. & Kharas, H. 2010. *Developing Aid Differently: Lessons from the Field*. Washington: Brookings Institution Press.

- Fordelone, T.Y. 2008. "Trends in South-South and Triangular Development Cooperation." United Nations Economic and Social Council. http://www.un.org/en/ecosoc/docs/pdfs/south-south_cooperation.pdf (January 8, 2018).
- Fordelone, T.Y. 2009. "Triangular Co-operation and Aid Effectiveness: Can Triangular Co-operation Make Aid More Effective ? ." OECD. <http://www.oecd.org/dac/46387212.pdf> (January 8, 2018).
- Fraser, S. et al. 2013. "European Geothermal Risk Insurance Fund (EGRIF)." Energy Europe Programme of European Union. <http://www.geoelec.eu/wp-content/uploads/2011/09/D-3.2-GEOELEC-report-on-risk-insurance.pdf> (January 8, 2018).
- Global Times. 2017. "China, Germany eye greater collaboration in Africa." <http://www.ecns.cn/business/2017/08-02/267725.shtml> (January 1, 2018).
- Grimm, S. et al. 2011. "Transparency of Chinese Aid: An analysis of the published information on Chinese external financial flows." The Global Campaign for Aid Transparency, and Centre for Chinese Studies. https://www.aidtransparency.net/wp-content/uploads/2011/08/Transparency-of-Chinese-Aid_final.pdf (January 4, 2018).
- Grimm, S. & Hackenesch, C. 2012. "European Engagement with Emerging Actors in Development: Forging New Partnerships ?" in book *The European Union and Global Development: An "Enlightened Superpower" in the Making ?* London: Palgrave Macmillan UK.
- Japan MOFA. 2011. "Japan's ODA White Paper." Japan Ministry of Foreign Affairs. http://www.mofa.go.jp/policy/oda/white/2011/html/keyword/keyword_01.html (April 20, 2016).
- JICA RI. 2013. "Tackling Global Challenges through Triangular Cooperation: Achieving Sustainable Development and Eradicating Poverty through the Green Economy." Japan International Cooperation Agency Research Institute. https://www.jica.go.jp/jica-ri/publication/booksandreports/jrft3q00000029oy-att/JICA-RI_2013_TacklingGlobalChallengesThroughTriangularCooperation-v3.pdf (January 8, 2018).
- Kapika, J. & Eberhard, A. 2013. *Power Sector Reform and Regulation in Africa: Lessons from Kenya, Tanzania, Uganda, Zambia, Namibia and Ghana*. Cape Town: HSRC Press.
- KfW. 2016. "KfW Kenya." KfW Development Bank. <https://www.kfw-entwicklungsbank.de/International-financing/KfW-Development-Bank/Local-presence/Subsahara-Africa/Kenya/> (January 1, 2016).
- Kitano, N. & Harada, Y. 2014. "Estimating China's Foreign Aid 2001-2013." JICA Research Institute. https://www.jica.go.jp/jica-ri/publication/workingpaper/jrft3q00000025no-att/JICA-RI_WP_No.78_2014.pdf (January 1, 2016).
- Knack, S. & Rahman, A. 2007. "Donor fragmentation and bureaucratic quality in aid recipients," *Journal of Development Economics*. Vol. 83. No. 1, pp. 176-197.
- Lund, J. & Boyd, T. 2015. "Direct Utilization of Geothermal Energy 2015 Worldwide Review." Proceeding of World Geothermal Congress 2015. <https://www.unionegeotermica.it/pdf/usi-diretti-energia-geotermica-nel-mondo.pdf> (January 1, 2016).
- McCormick, D. 2008. "China & India as Africa's New Donors: The Impact of Aid on Development," *Review of African Political Economy*. Vol. 35. No. 115, pp. 73-92.
- Mcewan, C. & Mawdsley, E. 2012. "Trilateral Development Cooperation: Power and Politics in Emerging Aid Relationships," *Development and Change*. Vol. 43. No. 6, pp. 1185-1209.
- Mwangi-gachau, E., 2011. "Social aspects of geothermal development - a case of Olkaria geothermal project in Kenya." In Short Course VI on Exploration for Geothermal Resources. <http://www.os.is/gogn/unu-gtp-sc/UNU-GTP-SC-13-0806.pdf> (January 4, 2016).
- Mwangi, M.N. 2008. "Financing Geothermal Projects." In Short Course on Geothermal Project Management and Development. <http://www.os.is/gogn/unu-gtp-sc/UNU-GTP-SC-08-18.pdf> (January 1, 2016).
- Mwangi, M.N. 2010. "Environmental and Socio-Economic Issues of Geothermal Development in Kenya". GRC Bulletin. <https://geothermal.org/PDFs/Articles/10MarApril24.pdf> (January 4, 2016).
- Ngugi, P.K. 2012. "Financing the Kenya Geothermal Vision." In Short Course on Geothermal Development and Geothermal Wells. <http://www.os.is/gogn/unu-gtp-sc/UNU-GTP-SC-14-14.pdf> (January 4, 2016).
- Nunnenkamp, P., Öhler, H. & Thiele, R. 2013. "Donor coordination and specialization: Did the Paris Declaration make a

- difference ?” *Review of World Economics*. Vol. 149. No. 3, pp. 537–563.
- OECD. 2013. “Development Aid at a Glance Statistics by Region – Africa”. OECD. [http://www.oecd.org/dac/stats/documentupload/2_Africa - Development Aid at a Glance 2014.pdf](http://www.oecd.org/dac/stats/documentupload/2_Africa_-_Development_Aid_at_a_Glance_2014.pdf) (January 4, 2016).
- Olivié, I. & Pérez, A. 2016. “Why don’t donor countries coordinate their aid? A case study of European donors in Morocco,” *Progress in Development Studies*. Vol. 16. No. 1, pp. 52–64.
- Piefer, N., 2014. “Triangular cooperation – Bridging South-South and North-South Cooperation?” Workshop on South-South Development Cooperation, University of Heidelberg. http://www.uni-heidelberg.de/md/awi/ssdc_piefer.pdf (January 4, 2016).
- Pigato, M. & Tang, W. 2015. “China and Africa: Expanding Economic Ties in an Evolving Global Context.” World Bank. <http://documents.worldbank.org/curated/en/241321468024314010/China-and-Africa-expanding-economic-ties-in-an-evolving-global-context> (January 4, 2016).
- Sato, J. et al. 2011. “Emerging Donors from a Recipient Perspective: An Institutional Analysis of Foreign Aid in Cambodia,” *World Development*. Vol. 39. No. 12, pp. 2091–2104.
- Schiere, R. 2010. “Building complementarities in Africa between different development cooperation modalities of traditional development partners and China,” *African Development Review*. Vol. 22. No. 1, pp. 615–628.
- Sexton, R.J. 1986. “Cooperatives: A Game-Theoretic Approach with for Cooperative Finance, Implications Decision Making, and Stability,” *American Journal of Agricultural Economics*. Vol. 68. No. 2, pp. 214–225.
- Simiyu, S.M. 2013. “Public-Private Partnership Promoting Renewable Energy in Kenya.” International Renewable Energy Agency. http://www.irena.org/documentdownloads/masdar/gdc_strategies_for_geothermal_development.pdf (January 4, 2016).
- SREP. 2012. “Kenya SREP Fact Sheet.” Climate Investment Funds. <https://www.climateinvestmentfunds.org/knowledge-documents/kenya-srep-fact-sheet> (January 4, 2016).
- Treasury, K.N. 2016. “Aid Effectiveness Kenya.” <http://www.aideffectiveness.go.ke/about-us/2013-02-11-09-42-18> (January 4, 2016).
- UNECA. 2012. “Building Public-Private Partnerships for Climate-Friendly Investment in Africa.” Economic Commission for Africa. <https://zh.scribd.com/document/320526156/Building-Public-Private-Partnerships-for-Climate-Friendly-Investment-in-Africa> (January 4, 2016).
- Vazquez, K.C., Mao, X. & Yao, S. 2016. *Mix and Match? How Countries Deliver Development Cooperation and Lessons for China*. UNDP and CAITEC eds., Beijing: China Commerce and Trade Press.
- Wang, J. & Bio-Tchane, A. 2008. “Africa’s Burgeoning Ties: Maximizing the benefits of China’s increasing economic engagement with Africa,” *Finance and Development*. Vol. 45. No. 1. <http://www.imf.org/external/pubs/ft/fandd/2008/03/wang.htm> (January 4, 2016).
- Whitfield, L. & Fraser, A. 2010. “Negotiating Aid: The Structural Conditions Shaping the Negotiating Strategies of African Governments,” *International Negotiation*. Vol. 15. No. 3, pp. 341–366.
- Winters, M.S. 2012. “The Obstacles to Foreign Aid Harmonization? : Lessons from Decentralization Support in Indonesia,” *Studies in Comparative International Development*. Vol. 47. No. 3, pp. 316–341.
- Woods, N. 2008. “Whose aid? Whose influence? China, emerging donors and the silent revolution in development assistance,” *International Affairs*. Vol. 6. No. 84, pp. 1205–1221.
- World Bank. 2000. “The Drive to Partnership: Aid Coordination and the World Bank.” <http://documents.worldbank.org/curated/en/695441468778194611/The-drive-to-partnership-aid-coordination-and-the-World-Bank> (January 4, 2016).