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**Assessment of effectiveness of Chinese aid in competence building and
financing development in Sudan**

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**Assessment of Effectiveness of Chinese Aid in Competence Building and Financing
Development in Sudan**

By Dr. Samia Satti Osman Mohamed Nour

(January, 2014)

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Abstract

This paper discusses the effectiveness of Chinese aid for competence building and financing development in Sudan using new primary data at the micro level. We find that Chinese aid and loans to Sudan caused mixed positive-negative impacts. The positive impact is competence building and providing alternative complementary sources of finance to complement domestic capital and financing development projects; the negative impact is increasing Sudanese debts to China. We find that the effectiveness of Chinese aid to Sudan is undermined by offering aid tied to trade, FDI and the importance of oil to the Chinese economy. Despite the global economic crisis, China has continued to offer tied aid to maintain access to oil in Sudan. Despite a long period of economic sanctions, Sudan was able to grow thanks to the robust and increasing intensification of special economic relations with China which relaxed the development finance constraint. From the perspective of new approaches to financing development, our findings imply that even when a country is facing binding political and economic sanctions, it can still proceed with competence building and finance a high growth strategy if it is endowed with natural resources and a partner that is in need of such resources. In addition to aid in the form of financial capital, Chinese aid and development assistance include technical assistance in the form of scholarships for training and education. The outcome of Chinese aid directed towards capacity building in Sudan implies that the majority of scholarships provided for specialization fields of Engineering, followed by Science and related fields, and finally Arts, Social Science and related fields respectively, and provided for PhD degree, followed by MSc degree, research and training respectively over the period (1999-2013).

Keywords: Competence building, financing development, aid effectiveness, China, Sudan.

JEL: F, F3, F35, O, O1, O19

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1. Introduction

Following the declaration of the United Nations Millennium Development Goals (MDGs) in September 2000, there is increasing interest in the international community to enhance the old and new means for financing for development. For instance, several studies in the international literature confirm the main concern of the international community to issues of financing for development and reaffirmed that mobilizing financial resources for development and the effective use of all these resources are vital to the achievement of internationally agreed development goals, including the MDGs. It confirms the importance of both domestic resources and development strategies and also foreign resources flows, both private and public, in financing development in developing countries. In the context of national development strategies aiming at effecting development, the most important topics regarding sources for financing development in developing countries include for example, Mobilization of Domestic Resources, Foreign Direct Investment (FDI), and other private flows, Financial Markets, Official Development Assistance and External Debts. The importance of financing development is also confirmed with the new challenges including the effect of the 2008 international financial crisis on development finance sources, the additional costs imposed by increasing concerns about climate change, the increased volatility in the prices of primary commodities, the additional resource needs of countries emerging from conflict, and increasingly recognized special needs of middle-income countries. In the Arab and African regions, leaders confirm a high priority accorded to development finance issues. Financing development in the Arab and African countries depends on foreign direct investment, official development assistance and aid. Notably, Sudan's economy has relied heavily on a large influx of foreign aid.

This paper is motivated by the recent debate in the international literature on recent increasing challenges confronting financing development and also by the observation that the extremely rapid and sustained expansion of the giant economy of China has been associated with a robust and increasing intensification of its economic relations with Sudan, and that these relationships in turn imply both opportunities and challenges for financing development in Sudan. In particular, despite a long period of economic sanctions, Sudan was able to grow thanks to special economic relations with China which relaxed the development finance constraint in Sudan. From the perspective of the new approaches to financing development our findings imply that even when a country is facing binding political and economic sanctions, it can still proceed with competence building and finance a high growth strategy if it is endowed with natural resources and a partner that is in need of such resources. The contribution and results of this paper fill a gap in the Sudanese literature by examining the issues that are not adequately discussed in Sudanese literature. This paper adds to the existing international literature on country risks and presence/contribution of foreign investors, by investigating the case of Sudan as a new case from African countries.²

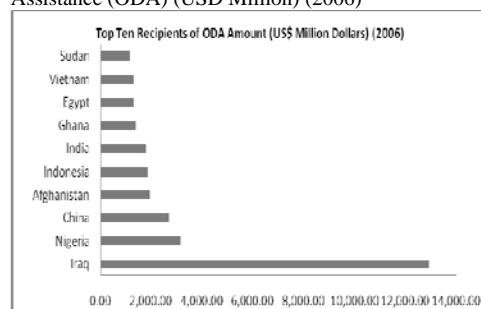
Starting with the general overview of Sudan's economy, one stylized fact is that it has long been among the least developed, poor, low income and highly indebted countries, according to World

² See for example, the Journal of International Business Studies.

Bank classification. The implementation of economic reform policies in the late 1990s and the exportation of oil since 1999 together lead to significant improvements in most macroeconomic indicators and impressive real economic growth and rapid increase in per capita income. According to the World Bank (2008) Sudan is one of the newest significant oil producing countries in the world; Sudan is the third largest oil producer in Sub-Saharan Africa (SSA) behind Nigeria and Angola. In recent years, the structure of Sudan's economy has shifted, from being predominantly reliant on agriculture for growth and exports, to its current reliance on the oil sector (WB, 2008), Sudan's real economic growth averaged about 9% during (2005-2006), putting Sudan among the fastest growing economies in Africa (WB, 2008). Consequently, following the improvement in the economic performance, Sudan turned from a low income economy into a lower medium income economy, according to the World Bank classification.

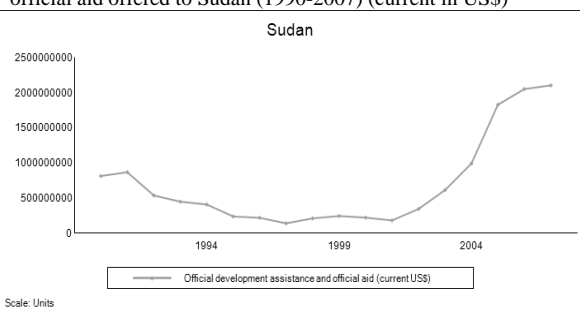
Despite the increasing dependence on the wealth from oil but like most other poor developing countries, Sudan has relied heavily on a large influx of foreign aid from different sources, Sudan is among the top 10 recipients of gross Official Development Assistance (ODA) over the period (1990-2007)- see Figures 1-2 below. There has long been a significant flow of foreign aid to Sudan from various sources including the USA, EU countries (e.g. the Netherlands, Italy and Germany), Arab countries (e.g. Saudi Arabia, Kuwait and United Arab Emirates), China, the World Bank, International Monetary Fund, United Nations, Arab Fund for Economic and Social Development and Organization of Petroleum Exporting Countries. In the 1970s, China also began to offer aid and development assistance to Sudan. During the late 1970s and 1980s the large inflow of foreign aid to Sudan was mainly offered by the International Monetary Fund and the World Bank. Since the mid-1990s, following the large drop in the inflow of foreign aid from traditional Western donors, Sudan looked for alternative sources of foreign aid and development assistance from emerging donors, mainly China. This policy is incidentally consistent with China's increasing economic interests in Sudan as a new resources oil-rich economy. Consequently, in the last two decades, China has increased foreign aid and development assistance to Sudan and some other resources-rich developing countries. Chinese aid to Sudan as in many other resource-rich developing countries is essentially motivated and intended to accomplish broader strategic objectives and achieve mutual interests. In Sudan, for example, China accounted for 58% of total contracted loans and grants over the period (2005-2007)- see Table 1 below.

Figure 1- Top Ten Recipients of Gross Official Assistance (ODA) (USD Million) (2006)



Source: Adapted from OECD, DAC 2006, www.oecd.org/dac

Figure 2- Official development assistance (ODA) and Development official aid offered to Sudan (1990-2007) (current in US\$)



Source: Adapted from the World Bank-World Development Indicators Database WDI (April 2009)

Based on the above, this paper will first examine the importance of Chinese aid, development assistance, loans and grants offered to support competence building and financing development in Sudan over the period (1997-2007). Second, it will assess the effectiveness of Chinese aid, development assistance, loans and grants in competence building and financing development in Sudan over the period (1997-2007). This paper aims to examine two stylized facts: first the importance of Chinese aid, development assistance, loans and grants in competence building and financing development in Sudan (1997-2007), second the mixed positive-negative impacts of Chinese aid, loan and grant to Sudan (1997-2007) as Chinese aid to Sudan is tied to trade, FDI and importance of oil to Chinese economy. It is interesting to note that Sudan was under economic and political sanctions for a fairly long period, yet it was able to grow thanks to special economic relations with China which relaxed the development finance constraint.

Based on the above, the rest of this paper is organized in the following way: section 1 presents introduction, objectives and structure; section 2 gives background and context of the paper; section 3 provides the conceptual framework and literature review; section 4 shows research methodology; section 5 discusses the results; and finally section 6 provides the conclusion and policy recommendations.

2. Background and Context of the Research

Based on the above and before assessing the impacts of Chinese aid to Sudan it will be useful to explain the trend, distribution and composition of Chinese aid to Sudan.

We find that over the period (1999-2007) loans and grants were offered by several international institutions and donor countries including China. According to the Central Bank of Sudan annual reports (2003-2005) the share of China constituted 8.75%, 6.1%, and 75.9% out of the total loans contracted in 2003, 2004 and 2005 respectively. The significant investment of China in oil sector in Sudan motivated China to increase its involvement in financing development to Sudan economy over the period (1997-2009). For instance, we notice the significant and rising share of China in total loans and grants to Sudan from 33% to 45% and 58% during the periods (2002-2007), (2004-2007) and (2005-2007) respectively. Notably, the share of China in total foreign loans and grants offered to Sudan shows a declining trend over the period (1999-2004) from 17% in 1999 to 7%, 8% and 7% in 2002, 2003 and 2004 respectively, but it is rapidly increased to 76% in 2005, it is declined to 24% in 2006 but it is increased to 73% in 2007 and it is declined to 3.35% in 2008 and increased to 27.44% in 2009- see Table 1 below. One possible interpretation of this changing trend is that the rapid increase in the share of China in total foreign loans and grants to Sudan in 2005 and 2007 is probably attributed to China's consistent policy to increase international involvement by increasing aid, investment and trade with developing countries such as Sudan. Another explanation is that the implementation of peace agreement accord in 2005 probably encouraged China to offer more loans and grants to Sudan. Another justification is the increase of China involvement in oil sector in Sudan, China is the largest foreign investor in Sudan's oil sector accounts for 48% of total investment

in Sudan oil sector, it is Sudan's main trade partner, as 86% of total Sudan oil export is exported to China and this accounts for 10% of China oil imports, this implies that Sudan is major oil supplier to China. On the other hand, the declining trend in 2006 is probably due to the policy of China government to reduce loans and grants to developing countries such as Sudan. The great decline over the period (2007-2009) is probably related to the global economic and financial crisis that leads to drop in the inflow of foreign resources from foreign donors. We find that despite the global financial and economic crisis but China has reaffirmed its commitment to fulfil earlier commitments and to maintain further loans, aid and development assistance to Sudan, China is expected to continue commitment to a win-win policy and is likely to continue offering tied aid to Sudan to maintain strategic economic opportunities and interests of its engagement in Sudan and its access to oil.

Table 1- The Distribution, Trend and Share of China in total loans and grants offered to Sudan (1999-2009) (US\$ Millions)

	1999	2002	2003	2004	2005	2006	2007	2008	2009
Total loans									
Grand total loans	76104	691,17	114,35	243,2	1072,5	589,5	1491113704	436.8	507.60
China total loans	12000	50,7	10	14,8	814	155,2	1104921672	22.20	202.24
Share of China in total loans (%)	16%	7%	9%	6%	76%	26%	74%	5.08%	39.84%
Total grants									
Grand total grants	1200	9,83	17,42	6,72	3,3	138,2	15635358,55	225.48	229.5
China total grants	1200	0	0	3,6	1,2	19,5	0	0	0
Share of China in total grants (%)	100%	0%	0%	54%	36%	14%	0%	0%	0%
Total loans and grants									
Grand total loans and grants	77304	701	131,77	249,92	1075,8	727,6	1506749063	662.28	737.10
China total loans and grants	13200	50,7	10	18,4	815,2	174,7	1104921672	22.20	202.24
Share of China in total loans and grants (%)	17%	7%	8%	7%	76%	24%	73%	3.35%	27.44%
Share of China in total loans and grants (1999-2009) (%)	24%	33%	38%	45%	58%	49%	73%	38%	35%

Sources: Adapted from the Central Bank of Sudan Annual Reports (1999-2009), Ministry of International Cooperation and Ministry of Finance and National Economy.

Note: (1) For calculation of the average share of China in total loans and grants (1999-2007) and (2007-2009) we use the year 2007 as a reference year because it witnessed the largest inflow of Chinese aid and development assistance to Sudan over the period (1999-2009).

The robust and increasing intensification of China and Sudan economic relations appears from the trend and distribution of the large Chinese total financial aid, loans and grants that amounted to US\$ 2488.6 million over the period (1970-2008). For instance, we observe the rapid increasing trend of China financial aid, loans and grants to Sudan from US\$ 22.5 million to US\$ 66.8 million and finally US\$ 2399.3 million over the periods (1970-1979), (1980-1989) and (1990-2008) respectively. Moreover, of total financial aid, loans and grants that amounted to US\$2488.6 million the distribution is 1%, 3% and 96% for the periods (1970-1979), (1980-1989) and (1990-2008) respectively. This implies a rapid increasing trend of China financial aid, loans and grants to Sudan over the past 18 years, since the incidence of majority of financial aid, loans and grants to Sudan occurred over the period (1990-2008)- see Table 2 below. The composition of China total aid, loans and grants to Sudan over the period (1990-2008) implies that of total Chinese aid, loans and grants the share of grants, technical and commodity aid, loans without interest rates, preferential loans and commercial loans are as follows 2%, 3%, 5%, 3% and 87% respectively. This composition indicates that the commercial loans (87%) represent the majority of total Chinese funds offered to Sudan in the forms of aid, loans and grants over the period (1990-2008). These findings probably indicate that the composition of China- Sudan economic relations is by nature motivated by or based on mutual economic and commercial benefits and interests- see Table 3 below. For instance, until the end of

2008, China government offered Sudan commercial loans of total value equivalent to US\$ 1649.1 million for financing implementation of several strategic projects such as petroleum, electricity, and irrigation. Chinese policy implies that China government offers Sudan government commercial loans upon satisfaction of specific conditionality requirements. First, the projects should be implemented by the Chinese companies; second, the repayment period of the loans lasts for 4-10 years, determined according to the cost of finance that prevalent in the market, with the grace period last between one to five years, third the payment of insurance or guarantee fees that may reach 5% from the value of the loan, fourth, payment of advancement money that equal between 10%-15% of the total loan value, and finally, for obtaining these loans Sudan government pay insurance or give guarantees from the Central Bank of Sudan and petroleum guarantees. We find that the sectoral distribution implies that over the period (1997-2008) Chinese aid, development assistance, loans and grants are biased towards specific sectors, notably, electricity (43%), water and irrigation (26%), Merowe dam (15%), Khartoum refinery (9%), agriculture (3%), others sectors (3%) and roads and bridges (1%) - see Table 4 below.

Table 2- China Government Total Financial Aid, Loans and Grants to Sudan Government (1970-2008 in million US\$)

Period (1970-2008)	China Total Financial Aid, Loans and Grants	Distribution of the share in total (%)
1970-1979	22.5	1%
1980-1989	66.8	3%
1990-2008	2,399.3	96%
Total 1970-2008	2,488.6	100%

Source: Sudan Ministry of Finance and National Economy (2008) - Unpublished Report (2008).

Table 3 – The Composition, Nature and Distribution of China total aid, loan and grant to Sudan (1990-2008)

Form and kinds of fund	Number	Value (US\$ millions)	Distribution and Share in total %
Grant	13 grants	US\$40.1 million	2%
Technical and commodity aid		US\$56.7 mullion	3%
Loans without interest rates		US\$89.4 millions	5%
Preferential loans	3	US\$49.6 million	3%
Commercial loans		US\$1649.1 million	87%
Grand total			100%

Source: Sudan Ministry of Finance and National Economy, Sudan Ministry of National Cooperation-Unpublished Report (2008).

Table 4 – The Sectoral Distribution of China financial aid, loan and grant to Sudan (1997-2008)

Sector	Total (US\$ million)	Share (%)	Sector	Total (US\$ million)	Share (%)
Electricity	1473.7	43%	Electricity	1473.7	43%
Water and Irrigation	877.3	26%	Water and Irrigation	877.3	26%
Merowe Dam	520	15%	Merowe Dam and related projects	603.1	18%
Khartoum Refinery	319	9%	Khartoum Refinery	319	9%
Other Sectors	102	3%	Other Sectors	102	3%
Agriculture	88.6	3%	Agriculture	15.5	0.45%
Roads and Bridges	46.6	1%	Roads and Bridges	36.6	1%
Total	3427.2	100%	Total	3427.2	100%

Source: Sudan Ministry of Finance and National Economy, Sudan Ministry of National Cooperation-Unpublished Report (2008).

We find that from the perspective of the new approaches to financing development the main criticisms of Chinese aid policy are based on several stylized facts. First Chinese aid policy towards Sudan includes little programme aid except for humanitarian aid and debt relief through China's contribution to international organizations. Chinese aid policy towards Sudan includes cancellation of China's debts for Sudan, for instance, China exempted 62% of its loans without interest rates and some commercial loans on Sudan government until December 2000 and indicated exemption of 80%

of Sudan's debt to China in 2007 protocol.³ This implies that Chinese aid to Sudan mainly gives project aid although some of the aid is utilized for technical assistance and training and that China does not give assistance in the form of programme or budget support as prescribed in the Paris Declaration on Aid Effectiveness (Paris High-Level Forum, 2005). Second, Chinese aid policy towards Sudan is based on giving aids with little political conditionality and without interference in allocation of aid this implies giving freedom to Sudan government to decide on allocation of Chinese aid. Third Chinese aid to Sudan has revealed preference for grandiose and prestigious projects and buildings (e.g. friendship hall and presidential palaces) that are perceived as unproductive investment that few traditional donors would be willing to finance. Fourth, the lack of a well-defined and organized systematic monitoring framework to monitor performance of Chinese aid policy in addition to weak institutional arrangements that mainly based on governmental institutions in Sudan and China without involvement of NGOs.

3. Conceptual Framework and Literature Review

Based on the above background on the importance of foreign aid to Sudan, this section first explains the conceptual framework and motives of foreign aid and then explains the literature on the impacts and effectiveness of foreign aid.

The concept Official Development Assistance (ODA) deals with the nature, and philosophy, of international financial and technical cooperation for development. The topic raises controversial issues pertaining to the commitment of donor countries to honour their obligations regarding agreed upon ODA/GDP percentages; the effectiveness, and quality, of ODA in promoting long-term growth; the appropriate restructuring of ODA conditionality to suit domestic conditions of recipient countries; the effectiveness of international, and regional, development finance institutions; and, south-south cooperation. According to the UNDP, the concept of foreign aid is often defined in relation to the concept of Official Development Assistance (ODA).⁴ The substantial inflow of foreign aid has occurred in the period following the end of the Second World War (WWII) (Ali et. al., 1999).

The motivation or rationale for donors to give foreign aid to different recipient countries can be interpreted from different developmental, economic (commercial) and political perspectives. The literature discusses many reasons or motives behind giving aid. The first conventional motive is altruistic motives for giving foreign aid, the definition of ODA implies that the donor's sole purpose

³ See Sudan Ministry of Finance and National Economy, Sudan Ministry of National Cooperation-Unpublished Report (2008).

⁴ According to OECD (2004) definition the words "aid" and "assistance" refer to flows which qualify as Official Development Assistance or Official Aid, aid activities include projects and programmes, cash transfers, deliveries of goods, training courses, research projects, debt relief operations and contributions to non-governmental organizations. According to UNDP, the concept of foreign aid is often defined in relation to the concept of Official Development Assistance. According to UNDP (2007/2008) definition official development assistance, net disbursements of loans made on concessional terms (net of repayments of principal) and grants by official agencies of the members of the Development Assistance Committee (DAC), by multilateral institutions and by non-DAC countries to promote economic development and welfare in countries and territories in part I of the DAC list of aid recipients. It includes loans with a grant element of at least 25% (calculated at a discount rate of 10%). Official development assistance includes untied bilateral ODA for which the associated goods and services may be fully and freely procured in substantially all countries and that is given by one country to another. Official aid grants or loans that meet the same standards as for official development assistance except that recipient countries do not qualify as recipients of ODA. These countries are identified in part II of the DAC list of recipient countries, which includes more advanced countries of Central and Eastern Europe, the countries of the former Soviet Union and certain advanced developing countries and territories.

to help improvement of economic development and welfare in the recipient country, but this definition does not prevent a mutual benefit for both aid donors and aid recipients.

The second conventional motive is that foreign aid is offered to enhance the economic relations, commercial interests and mutual benefits for both aid donors and recipients. This implies that the motive of donors in offering foreign aid is importantly tied to support and promote their own economic and commercial interests. For instance, since long, Western donors, the USA, Arab aid donors and emerging active donors such as China have been pursuing tied aid and giving more aid to recipient countries to which these donors' countries export their goods. More recently, Western donors have reduced the promotion of their own economic interests in aid-giving through the reduction of the costly tying of aid to purchases from the donors' countries, for instance, the OECD-DAC has made a successful effort to eliminate tied aid to the least developed countries, as 92% of DAC countries' aid was untied by 2005 and only the USA is now presumed to keep the bulk of its aid tied (OECD 2007).⁵ Neumayer (2003) indicates that the pattern of untying aid does not imply, however, that Western countries refrain from using ODA to support their own commercial interests.

The third conventional motive is the interference motive, i.e. the conditionality or meeting specific domestic policy requirements. For instance, since long Western donors have been developing aid policies that aim to influence the recipient country's domestic policies more or less separated from the actual main motive for giving aid. For example, the US usually demands democratic reform in the country receiving US aid at the same time that the aid may be used to promote US firms in the country, for example, through giving American grain as food aid. Different from USA and Western donors, both Arab donors and China are less interested in conditionality-interference motive as they perceive that recipient countries should be allowed to choose their own development path and not be hindered by interference policies from donor countries.

The fourth conventional motive is the political motive for giving aid with the purposes to reward or create allies on political issues and strategic considerations rather than the economic needs or policy performance of the recipients, such as the voting in the UN General Assembly. For instance, Alesina and Dollar (2000) indicate that France, Great Britain, Japan, the US and Germany allocate more aid to recipients that vote in tandem with them in the UN. In addition, Neumayer (2003) and Villanger (2007) indicate a similar pattern for Arab aid donors.

The fifth motive recently become more popular among Western OECD donor countries and World Bank implies focusing aid more towards the beneficiaries of poor to contribute towards achieving UN Millennium Development Goal (MDG) of halving the share of people living in poverty by 2015. Analysis of foreign aid offered by donors to poor countries implies that Western donors are more likely to increase offering aid to poor countries, they are increasingly and more directly concerned with aid to poverty than Arab donors (Neumayer, 2003; 2004; Villanger, 2007).

Apart from of the main motives of giving foreign aid, since long there is increasing interest and debate in the international literature on utilization, allocation and effectiveness of foreign aid in

financing development and achieving their assigned economic growth objectives in the recipient developing countries. For instance, several studies in the literature find that foreign aid caused mixed positive and negative impacts. Notably, foreign aid has caused positive impact by offering huge external aid flows to developing countries to achieve two objectives: to reduce poverty and accelerate economic growth. For the majority of poor countries, foreign aid represents a vital external source of finance that was often used to close the resources gap; supplement internal resources; complement low savings; enhance economic growth and to accelerate achievement of MDGs. However, foreign aid has caused negative impact by causing the debt problem and therefore, adversely affecting the public expenditure. The literature indicates the micro-macro paradox in effectiveness of foreign aid in developing countries. A well-known stylized fact is that donors often offered aid funds either through providing aid directly related to specific projects (project aid), or through providing support to the recipient government's budget (budget support, or project financing) while imposing conditionality on how to allocate the available resources. There is a large debate in the literature on the effectiveness and preference of either form of the two instruments of foreign aid, some studies show evidence in support of project aid and in opposition to budget support, whereas, other studies show evidence in support of budget support and in opposition to project aid.⁶

Burnside and Dollar (1997) use a new database on foreign aid to examine the relationships among foreign aid, economic policies, and growth of per capita GDP. Their estimated equation has growth depending on initial income, institutional/political variables, economic policies, foreign aid, and aid interacted with policies. In the institutional/political category, they use a measure of institutional quality that captures security of property rights and efficiency of the government bureaucracy. They also include a number of policy variables in the growth regression. For policies, they use the dummy variable for trade openness; take inflation as a measure of monetary policy, use two fiscal variables the budget surplus and government consumption, both relative to GDP and use education variables to measure other variables. In panel growth regressions for 56 developing countries and six four-year periods (1970-93), they find that the policies that have a great effect on growth are those related to fiscal surplus, inflation, and trade openness. They construct an index for those three policies and have that index interact with foreign aid. They have instruments for both aid and aid interacting with policies. They find that aid has a positive impact in growth in developing countries with good fiscal, monetary and trade policies. Aid appears not to affect policies systematically either for good or for ill, Any tendency for aid to *reward* good policies has been overwhelmed by donors pursuit of their own strategic interests,

Moyo (2009) argues that aid has not made Africa better, she observes that although there could be some marginal benefit from such funding the overall benefit is either negative or negligible. According to Moyo aid has not worked and aid comes out a silent killer of growth because; it

⁵ The US has not report the share of tied aid since the OECD-DAC exerted pressure towards unttying aid. However, the US has traditionally tied three-quarters of its aid.

⁶ For detailed literature review on aid effectiveness, allocation, macro-micro paradox, positive and negative impacts see for instance, White (1992), Griffin (1970), Cassen et. al., (1986); Tarp (2000), Thorbecke, (2000), Robinson and Tarp (2000), Hansen and Tarp (2000); Mosley, (1980; 1986); Burnside and Dollar (1997); Mavrotas and McGillivray (2009).

encourages rent seeking by governments of recipient countries, foreign aid helps continue the cycle of poverty and hinders economic growth in Africa and that the extensive development assistance to African governments, has increased dependency, encouraged corruption and eventually continued poor governance and poverty. She argues that foreign aid has harmed Africa and that it should be phased out, she offers proposals for developing countries to finance development, instead of relying on foreign aid.⁷

Few studies in the literature indicate the interaction between foreign aid and capacity building. For instance, Paris Declaration on Aid Effectiveness implies that partner countries strengthen development capacity with support from donors. It indicates that the capacity to plan, manage, implement, and account for results of policies and programmes, is critical for achieving development objectives — from analysis and dialogue through implementation, monitoring and evaluation. Capacity development is the responsibility of partner countries with donors playing a support role. It needs not only to be based on sound technical analysis, but also to be responsive to the broader social, political and economic environment, including the need to strengthen human resources. It implies that partner countries commit to integrate specific capacity strengthening objectives in national development strategies and pursue their implementation through country-led capacity development strategies where needed. It also implies that donors commit to align their analytic and financial support with partners' capacity development objectives and strategies, make effective use of existing capacities and harmonize support for capacity development accordingly.⁸

Few studies in the Sudanese literature focus on the impacts of foreign aid in Sudan. El-Sayed (1998) presents a historical overview of foreign aid and their impacts on Sudan's economy over the period (1958-1996) and finds that the inflow of foreign aid lead to mixed positive and negative impacts in Sudan during the period (1958-1996). As for the positive impact, the inflow of loans and grants from the other countries and international and regional funding institutions had effective contribution to partially complement the shortage of domestic capital to offer fund to cover the need for hard currencies that required for implementation of development projects. As for the negative impact the expansion in foreign aid and loans lead to increase in total debt obligations.⁹ Abulagasim (2007) discusses the Sudanese Chinese economic Cooperation and shows the positive impacts on development of electricity sector in Sudan, focusing on the case study of Garri Electricity Project. Based on the above and since the impact and effectiveness of Chinese aid and development assistance, notably Chinese project aid has not been adequately covered in the literature. Therefore, it is interesting and important to fill this gap in the literature and to discuss the effectiveness of Chinese aid and development assistance to Sudan, especially, at project level as we will explain in section 5 below.

⁷ See for instance, Moyo, Dambisa (2009) "Dead Aid: Why Aid Is Not Working and How There is Another Way for Africa," New York: Farrar, Straus and Giroux. ISBN 0-374-13956-3.

⁸ See for instance "Paris Declaration on Aid Effectiveness: Ownership, Harmonisation, Alignment, Results and Mutual Accountability" High Level Forum, Paris, February 28- March 2, 2005, pp. 4-5. <http://www.undp.org/content/dam/aplaws/publication/en/publications/capacity-development/paris-declaration-on-aid-effectiveness/ParisDeclaration.pdf>

⁹ See El-Sayed (1998).

4. Research Methodology

Based on the above, this section explains the methodology and data we use to assess the effectiveness, notably, the positive and negative impacts of Chinese aid, development assistance, loans and grants to Sudan over the period (1997-2007). As for assessment of the positive impacts we use the results of the interview questionnaire with the managers of the selected projects using the following indicators: increase or growth in production, increase in employment opportunities, increase in skill level and increase in knowledge and technology transfer for the key selected Chinese aid and development assistance projects implemented in Sudan over the period (1997-2007). The various variables were constructed and measured by asking the project's managers to provide an estimated assessment to explain their own evaluation of the impact of Chinese aid on the selected projects. As for assessment of the negative impact, we will use the increase in total debt to Sudan as a result of the Chinese loans to Sudan over the time period (1997-2007). We are aware of the fact that loans and debt are not the only negative impacts, and assessment should include adverse side effects of aid, notably, unemployment, environmental impacts, displacement of people, waste disposal, wages, incomes, poverty, in addition to other negative impacts as a result of the aid conditionality set between the two governments in the agreements signed which sometimes indicate the level to which China will be using its own inputs. In general, it is clear that China's development assistance is closely tied to state sponsored investment projects, while limited information is available to understand the various objectives of such assistance, or to assess its wider impacts, particularly its social and environmental impacts and contribution to poverty reduction. For instance, there is no adequate data to assess the little systematic evidence on the effectiveness of Chinese aid in reducing poverty or improving the distributional impacts of China's engagement and China's labour practices and implications on Chinese labour or the local workers. Moreover, in some cases such assistance is perceived as not having widespread social benefits (such as the presidential palace). In addition to potential negative impact probably related to the requirements of importation of too many unskilled foreign workers from abroad. In particular, it is useful to provide a comprehensive assessment and cost-benefit analysis of the impacts of aid on the environmental impact. But due to practical problems related to inadequate availability of accurate and reliable data and information it is somewhat problematic to cover all these issues in this paper. So, we leave that for more in-depth future study when adequate, accurate and reliable data and information are available. Therefore, we limit our assessment of the negative impacts to available data on the negative impact of the increase in total debt to Sudan as a result of Chinese loans to Sudan (1997-2007).

Since the Chinese aid policy toward Sudan is mainly based on giving aid and development assistance to projects, this stylized fact implies that the best assessment of the effectiveness of Chinese aid is through assessment of the effectiveness: positive and negative impacts at project level. Therefore, the next section will use primary data from the interview with the managers of the selected cases studies of seven projects to examine the effectiveness or impacts of Chinese aid, development assistance, loans and grants in Sudan over the period (1999-2007). The selection of these cases is

based on the findings in section 2 above which implies that the Chinese aid, development assistance, loans and grants offered to Sudan are biased towards specific sectors (services and infrastructure: building and construction, electricity and water supply) over the period (1997-2007). For instance, the share of electricity projects, Khartoum refinery project and Merowe dam and related projects represent near to 70% of the total Chinese aid and development assistance offered to Sudan over the period (1997-2007)- see Table 4 above. Therefore, based on this finding, it is useful to discuss the results and the implications of the eight selected cases studies in section 4 below.¹⁰

5. Research Results

Based on the above and based on projects assessment, this section discusses the results and assesses the effectiveness of Chinese aid, loans and grants to Sudan over the period (1997-2007).¹¹ We first discuss the positive impacts for competence building and financing development and then show the negative impacts of Chinese aid and loans to Sudan during the period (1996-2013).

5.1. The effectiveness of Chinese aid for competence building in Sudan

To examine the effectiveness of Chinese aid for competence building in Sudan over the period (1996-2013), we use combination of secondary data on education and primary data on training from the interview with the managers of the selected cases studies of seven projects. We explain the outcome of the Chinese aid that was directed towards capacity building in Sudan, for example, of all scholarships provided, we find that it would be more instructive to know the numbers of people who have graduated from these training programmes and we explain that the estimated increase in their skills levels is the increase in their educational qualifications and learning in scientific and technical fields by obtaining the MSc and PhD degrees. For the on-site trainings that were provided, we show the numbers of employees were trained, and we show the indication of their technical skills acquisition. For example, the results of the interview with the managers of the selected projects explain the benefit of training for the Sudanese workers employed in their projects and that there are some technical or managerial tasks that they are now able to carry out but that they previously could not.

The sectoral distribution of Chinese aid to Sudan include training and education sector. Direct allocation of Chinese aid to education is very limited, for instance, during the Chinese president visit to Sudan in February 2007 China offer grant for implementation of rural schools. The structure of Chinese aid to Sudan implies that in addition to aid in the form of financial capital, another form of Chinese aid and development assistance include Chinese technical assistance in the

¹⁰ The data was collected through direct face-to-face interviews that were conducted with the managers of the selected cases studies of seven projects in Sudan in 2009. The selection of these cases is because the share of electricity projects, Khartoum refinery project and Merowe dam and related projects represent near to 70% of total Chinese aid and development assistance offered to Sudan over the period (1997-2007). The eight selected cases studies include four fully completely projects: Merowe Dam Project, Merowe-Karima Friendship Bridge Project, Khartoum Refinery Project and Elgaili-Garri 2 Electricity Project. In addition to two projects in which 95% of the work is almost completed: Garri 4: Petroleum Charcoal Electricity Project and White Nile Grids: Rabak-Obied Third Circuit Elroseires-Khartoum Electricity Project. Further to two proposed projects in which the work is recently started: Al Fula Electricity Power Plant Project and Dongla-Wadi Halfa Electricity Transmission Line Project. The primary data include qualitative and quantitative data. The level of interviewed management was the executive, engineering and technical managers, they only included local management, and the interview follows semi-structured interviews.

¹¹ Although it is difficult to distinguish between the classification of aid and investment projects which the Chinese implemented in Sudan, but the case studies discussed in this section as classified by Sudan's ministry of finance and national economy and Sudan's

form of scholarships. Most of Chinese aid to education sector comes in the form of technical assistance training and scholarships. For instance, according to unpublished information from Sudan Ministry of Higher Education and Scientific Research, in 2006, to activate the cultural agreement signed on 1970, Sudan and China signed cultural agreement that implemented during the period (2006-2008). Following the expiry of the agreement in 2008, new agreement was prepared to enhance the cultural including technical cooperation for the period (2009-2010). The cultural agreement and protocol signed in 2006 between Sudan and China implies the commitment of China to offer Sudan with 30 scholarships annually by substitution system over the period 2006-2008. The 30 annual scholarships are offered for postgraduate, mainly, PhD degree for some specialization fields including engineering fields such as petroleum engineering, biotechnology, technical education, environment and other fields of specializations based on agreement between the two sides. The agreement indicates the exchange of universities professors and researchers and giving lectures and conducting joint research and acquisition of experience between Sudanese and Chinese universities. The agreement indicates the establishment of Chinese technical college in Sudan and offer of scholarships and grants for MSc in technical education.¹²

According to unpublished data from Sudan Ministry of Higher Education and Scientific Research, China offers Sudan with four different kinds of technical assistance in the form of scholarships. For instance, this includes, first, annual scholarships, notably, 30 scholarships annually based on substitution system for postgraduate, mainly doctoral degree in different fields of specializations. This is based on the cultural agreement and protocol signed in 2006 between Sudan and China. Second, one-sided unilateral scholarships, for instance in 2008, the distribution of Chinese one-sided unilateral scholarships offered directly to be allocated in the following way, 5 scholarships for Darfur, 5 scholarships through the Chinese embassy in Sudan, 5 scholarships offered for technical education and 8 scholarships offered for Southern Sudan State. Third, scholarships offered by Chinese companies, for instance, in 2008 one Chinese Engineering Company for Port offered Sudanese 10 full scholarships for postgraduate MSc degree. Fourth, scholarships offered directly to some Sudanese universities in the context of the direct agreements signed between some Chinese and Sudanese universities, for example, Khartoum University and other Sudanese universities. Coordination, implementation and determination of the disciplinary focus of these scholarships programmes are determined jointly with shared influence and in close cooperation between the recipient Sudanese national authorities and the Chinese donor authorities.

The distribution of Chinese scholarships offered to postgraduate Sudanese students to study in China in 2012 implies that the majority was offered for PhD degree students (76%) and few was offered for MSc degree students (14%) and few was offered for research (7%) and training (2%) respectively. The distribution of Chinese scholarships offered to postgraduate Sudanese students to study in China over the periods (1999-2004) (2007-2011) and (2009-2011) implies that the majority

ministry of international cooperation and the central bank of Sudan are project implemented with Chinese loans and grants and as such are classified as projects implemented within Chinese aid and development assistance to Sudan.

was offered for PhD degree students (81%, 95% and 89%) and few was offered for MSc degree students (19%, 5% and 11%) respectively. Notably, the majority (93%) was offered for specialization fields of Engineering (40%, 30% and 43%), Science and related fields (53%, 63% and 49%) and finally few was offered for fields of specialization in Arts, Social Science and related fields (7%, 7% and 8%). Notably, the majority are offered for specialization fields of Engineering, Science and related fields (93%, 93% and 92%); whereas few are offered for fields of specialization in Arts, Social Science and related fields (7%, 7% and 8%). Moreover, the distribution of graduates as a result of the Chinese scholarships offered to postgraduate Sudanese students to study in China over the periods (2002-2012) and (1996-2013) implies that the majority was graduates with PhD degree (82% and (78%)), and few was graduated with MSc degree (16%) and (20%) and few obtained post-doctoral training (2%) and (2%) respectively. Notably, over the period (2002-2012) the majority (47%) was graduated from specialization fields of Engineering (47%), Science and related fields (46%), and finally few was graduated from specialization in Arts, Social Science and related fields (7%) and (6%) respectively. Moreover, over the period (1996-2013) the majority (48%) was graduated from specialization fields of Science and related fields (48%), Engineering (47%), and finally few was graduated from specialization in Arts, Social Science and related fields (6%) respectively. Notably, over the periods (2002-2012) and (1996-2013) the majority are graduated from specialization fields of Engineering, Science and related fields (93%) and (94%); whereas few are graduated from specialization in Arts, Social Science and related fields (7%) and (6%) respectively. In addition, the rates of graduate compared to students as a result of the Chinese scholarships offered to postgraduate Sudanese students to study in China are 71% and 79% over the periods (1999-2012) and (2002-2012) respectively- see Tables 5-6 and Figures 3-19 below.¹³ Furthermore, the number of Sudanese students enrolment in Chinese universities as a result of the Chinese scholarships offered to postgraduate Sudanese students to study in China increased from 17 in 1999 to 20, 27, 47, 53, 39, 51, 69 and 50 in 2005, 2007, 2008, 2009, 2010, 2011, 2012 and 2013 (until June 2013) respectively. Moreover, the number of Sudanese students graduated from the Chinese universities as a result of the Chinese scholarships offered to postgraduate Sudanese students to study in China increased from 1 in 1996 to 9, 3, 3, 10, 16, 16, 22 and 10 in 2005, 2007, 2008, 2009, 2010, 2011, 2012 and 2013 (until June 2013)

¹² The agreement also indicates that Sudan offer some scholarships to Chinese who are interested to study for instance, Arabic language in Sudan.

¹³ Over the period (1999-2009), the numbers of Chinese scholarships offered to post graduate Sudanese students to study in China are: 1, 3, 10, 8, 9, 11, 20, 14, 42 and 81 in 1999, 2000, 2001, 2002, 2003, 2004, 2008, 2009, (1999-2004) and (1999-2009) respectively. This implies that Chinese scholarships to Sudanese students increased rapidly from 9% in the period (1999-2000) to (91%) in the period (2001-2004). Over the period (1999-2004) these scholarships (42) are offered in different specialization fields including Engineering (17), Geophysics (2), Math (4), Physics (4), System (1), Geography (1), Chemistry (2), Botany (1), Genetic (2), Agriculture (1), Public health (1), Geochemistry (1), Chinese language (1), Science (1), Economics (African and Asian Studies) (1), Geology (1) and Animal Production (1). See Sudan Ministry of Higher Education and Scientific Research unpublished statistics (2009-2012). Over the period (1996-2013) the graduate from the various fields of specialization including: Remote Sensing, Chemistry, Physics, Mathematics, Applied Mathematics, Computer, crop genetics breeding, Crop Protection, Combating desertification, Plant Pathology, Molecular Genetics, Inheriting the animal, Parasites, Medical Physiology, Laser Spectroscopy, Pharmaceuticals, Veterinary and theoretical Medicine, Veterinary Pathology, Hematology and Blood Transfusion, Medical devices, Food Technology, Biological Oceanography, Water Sciences, Synthetic fibre, Industrial incentives, Production, Engineering, Biomedical Engineering, Civil Engineering, Water Resources Engineering, Hydrological water sources and water management, Mechanical Engineering, mechanical vibrations, Petroleum Engineering, Engineering reservoirs, Agricultural Engineering, Electronic Engineering, Electrical Engineering, Communication Engineering and Information Systems, Textile Engineering, Engineering Geology, Economics, Geology and Mining, Epidemiological and health statistics, Atomic and Molecular Physics,

respectively- see Tables 5-6 and Figures 3-19 below. The distribution of enrolment and graduation over the periods (1999-2013) and (1996-2013) respectively implies that the majority of postgraduate Sudanese students are enrolled over the period (2009-2013) (60%) and the majority are graduated over the period (2009-2013) (68%). Notably, the majority of postgraduate Sudanese students are enrolled in 2012 (16%) and the majority are graduated in 2012 (20%), while in 2013 (until June 2013) the share of postgraduate Sudanese students enrolled represents (11%) and the share of postgraduate Sudanese graduated represents (9%). Therefore, we show the outcome of the Chinese aid that was directed towards capacity building in Sudan, for example, of all scholarships provided, we explain the numbers (232) and rates (71% and 79%) of Sudanese people who have graduated from these training programmes during the periods (1999-2012) and (2002-2012) respectively. We observe that the estimated increase in their skills levels is the increase in their educational qualifications and learning in scientific and technical fields by obtaining the MSc and PhD and post-doctoral degrees.

Table 5– Distribution and fields of specialization of Chinese postgraduate scholarships offered to Sudanese student and graduates (1999-2012)

(a) Fields of specialization	Students						Graduates			
	1999-2004		2007-2011		2009-2011		2002-2012			
	Total	Share (%)	Total	Share (%)	Total	Share (%)	Total	Share (%)	Total	Share (%)
Engineering	17	40%	18	30%	34	43%	72	47%		
Science and related fields	22	53%	37	63%	39	49%	71	46%		
Engineering, science and related fields	39	93%	55	93%	73	92%	143	93%		
Arts, social science and related fields	3	7%	4	7%	6	8%	10	7%		
Total	42	100%	59	100%	79	100%	153	100%		
(b) Degree	Students				Graduates					
	1999-2004		2007-2011		2009-2011		2012		2002-2012	
	Total	Share (%)	Total	Share (%)	Total	Share (%)	Total	Share (%)	Total	Share (%)
Research							3	7%		
Training							1	2%		
MSc	8	19%	3	5%	9	11%	6	14%	25	16%
PhD	34	81%	56	95%	70	89%	32	76%	125	82%
Post-doctoral									3	2%
Total	42	100%	59	100%	79	100%	42	100%	153	100%
	Students		Graduates		Graduates/students					
Total (1999-2012)	326		232		71%					
Total (2002-2012)	294		232		79%					

Source: Sudan Ministry of Higher Education and Scientific Research unpublished statistics (2009-2012)¹⁴

Table 6– Distribution and fields of specialization of Sudanese student and graduates offered Chinese postgraduate scholarships (1996-2013)

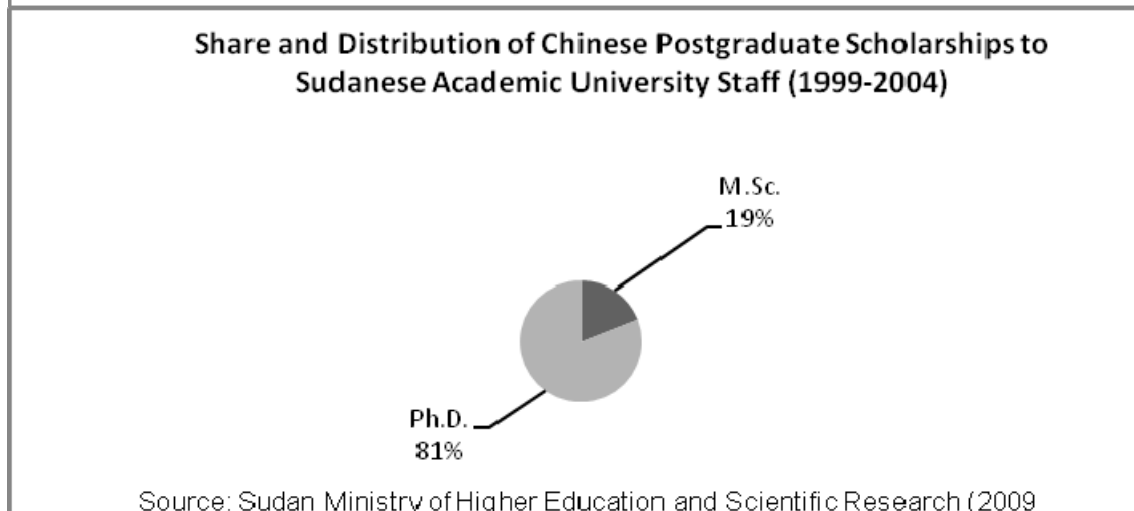
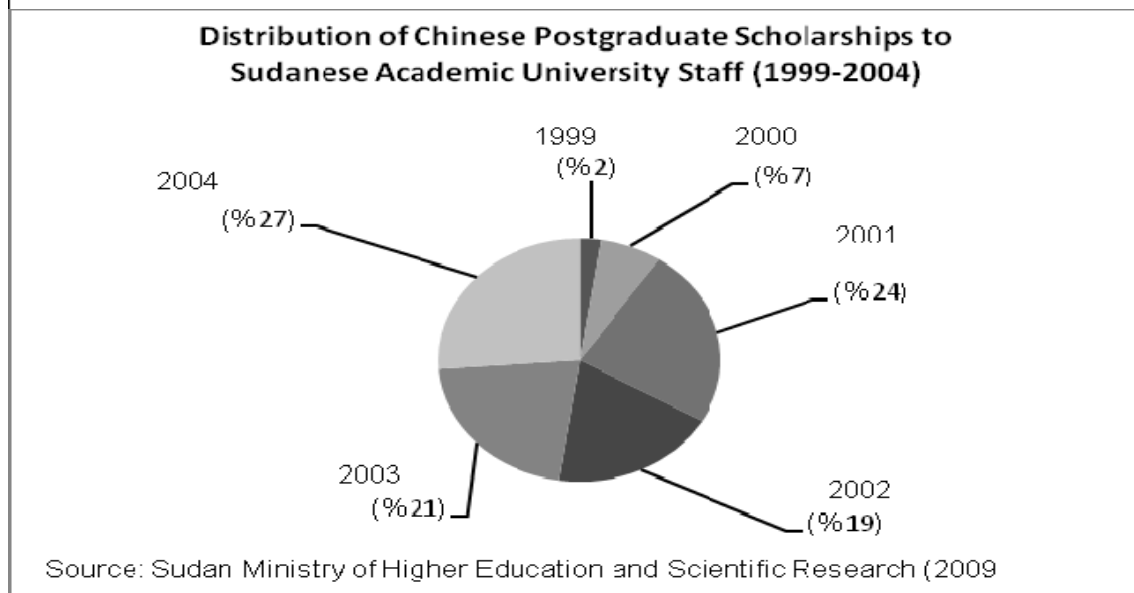
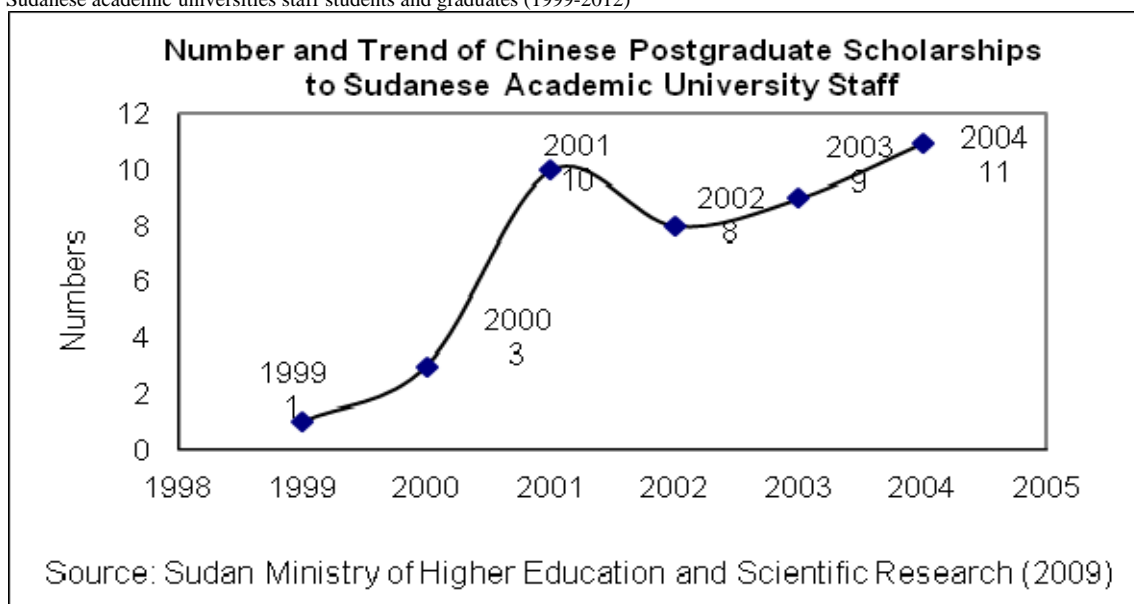
(a) Fields of specialization	MSc		PhD		Post-doctoral		Total	
	Total	Share (%)	Total	Share (%)	Total	Share (%)	Total	Share (%)
Engineering	12	55%	39	46%		0%	51	47%
Science and related fields	6	27%	45	53%	1	50%	52	48%
Engineering, science and related fields	18	82%	84	99%	1	50%	103	94%
Arts, social science and related fields	4	18%	1	1%	1	50%	6	6%
Total	22	100%	85	100%	2	100%	109	100%
(b) Fields of specialization	MSc		PhD		Post-doctoral		Total	
Share (%) in total	Total	Share (%)	Total	Share (%)	Total	Share (%)	Total	Share (%)
Engineering	12	11%	39	36%		0%	51	47%
Science and related fields	6	6%	45	41%	1	1%	52	48%
Engineering, science and related fields	18	16%	84	77%	1	1%	103	94%
Arts, social science and related fields	4	4%	1	1%	1	1%	6	6%
Total	22	20%	85	78%	2	2%	109	100%

Source: Sudan Ministry of Higher Education and Scientific Research Unpublished statistics (2013), accessed on September 16, 2013.

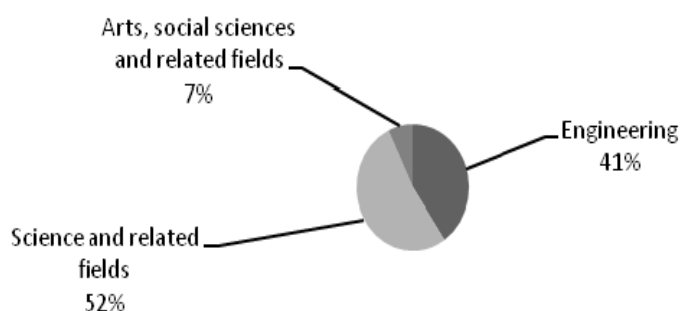
condensed matter physics, Computer applications, Chinese language, Educational Administration, Educational Planning and Administration, Petroleum and mineral exploration Science curricula and teaching methods.

¹⁴ Science and related fields include Science, Geophysics, Math, Physics, System, Geography, Chemistry, Botany, Genetic, Agriculture, Geochemistry, Animal Production, Geology and Public health. Arts, social science and related fields include, Chinese Language, Economics- African and Asian Studies.

Figures 3-11– Numbers, trend, share, distribution and fields of specialization of Chinese postgraduate scholarships offered to Sudanese academic universities staff students and graduates (1999-2012)

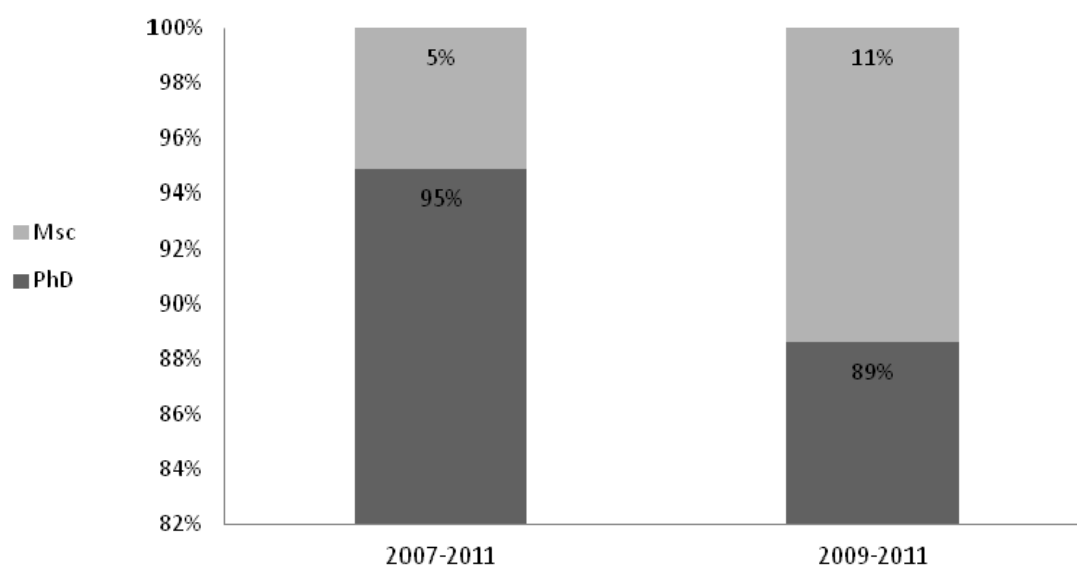


Share and Distribution of Chinese Postgraduate Scholarships to Sudanese Academic University Staff by fields of Specialisation (1999-2004)

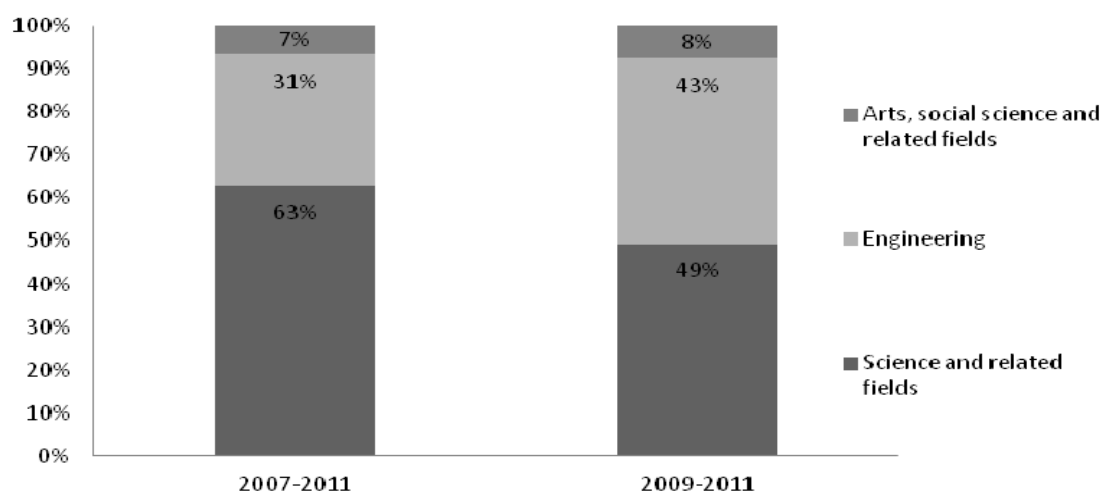


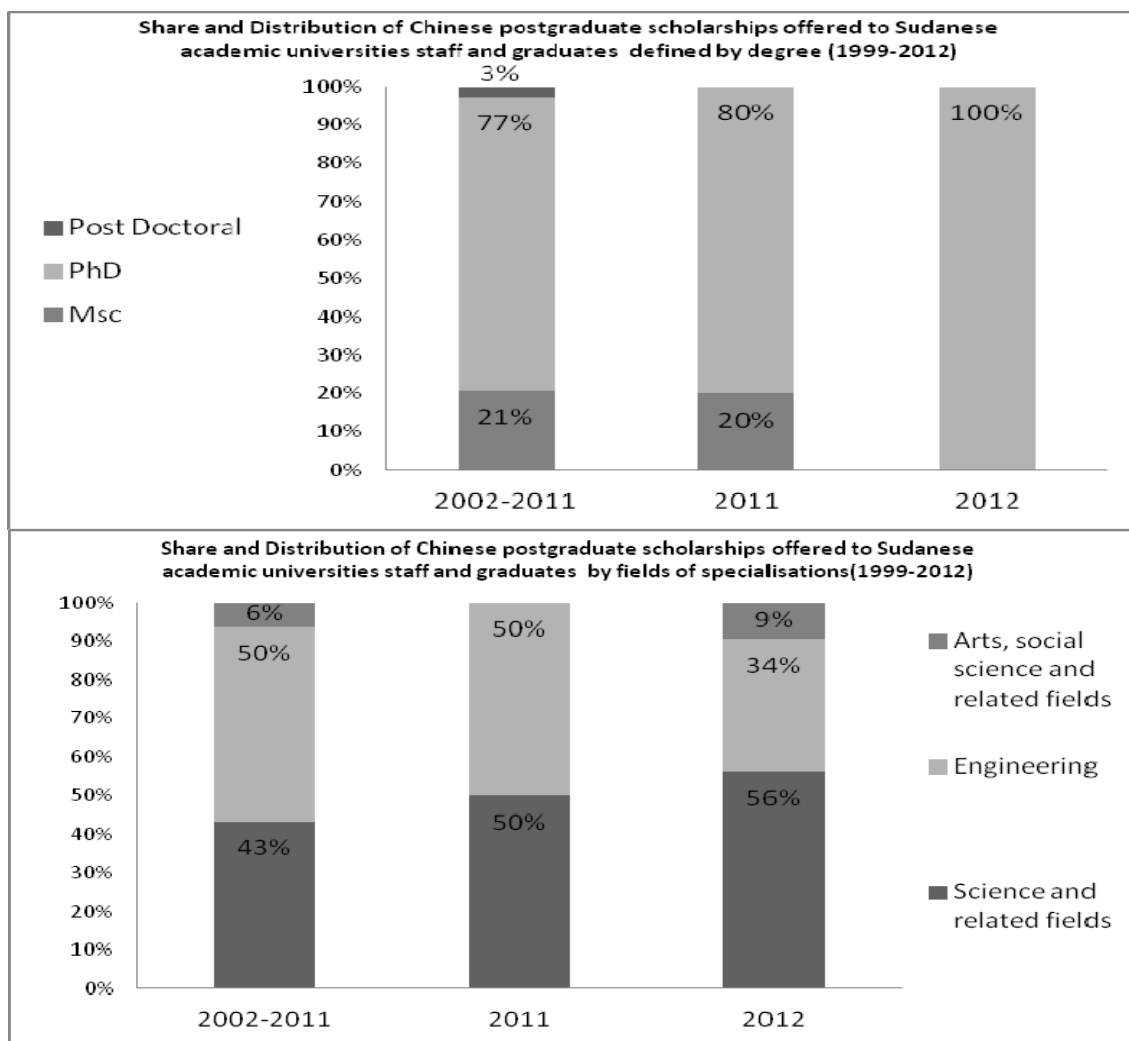
Source: Sudan Ministry of Higher Education and Scientific Research (2009)

Share and Distribution of Chinese postgraduate scholarships offered to Sudanese academic universities staff and students defined by degree (1999-2011)



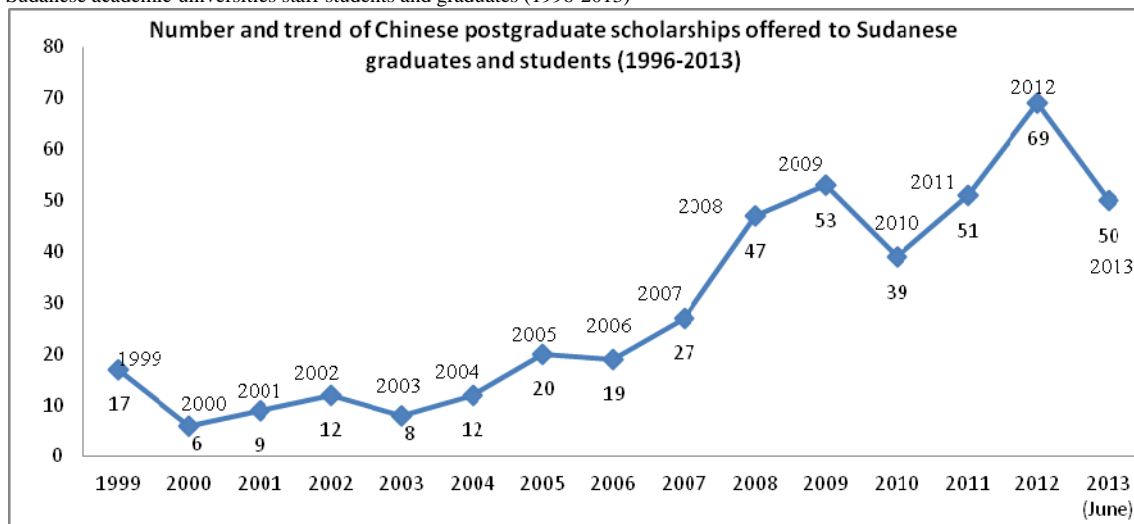
Share and Distribution of Chinese postgraduate scholarships offered to Sudanese academic universities staff and students by fields of specialisations(1999-2011)

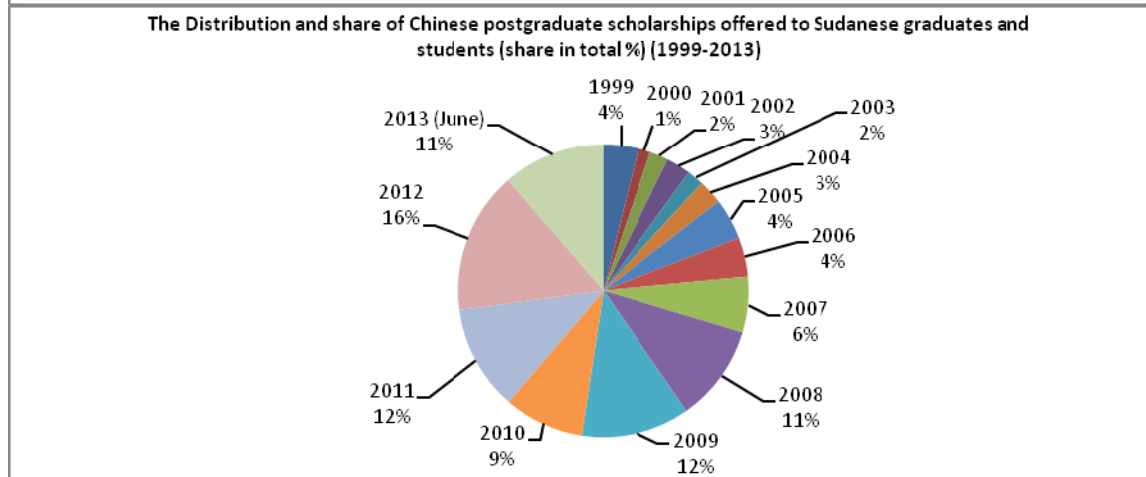
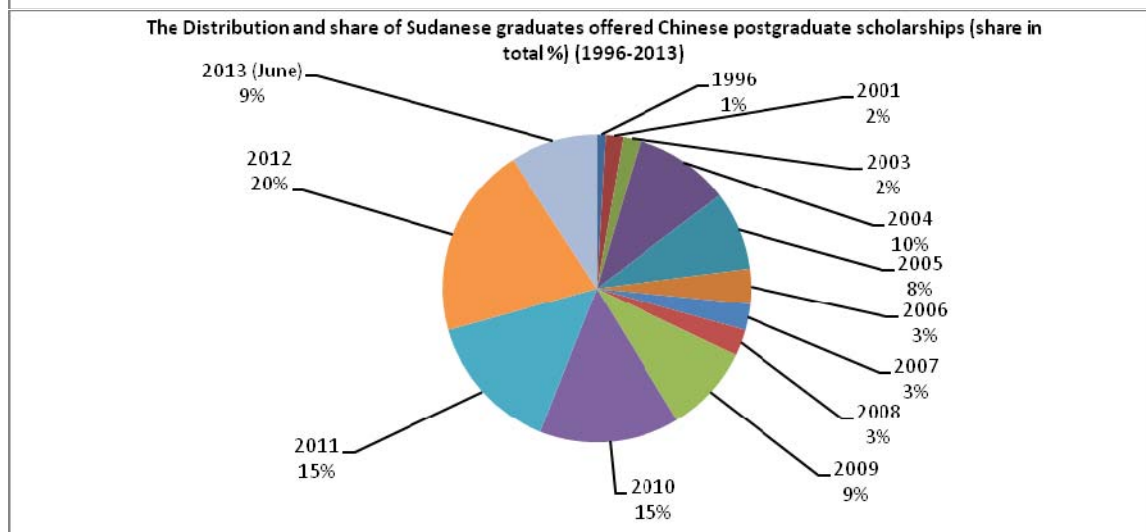
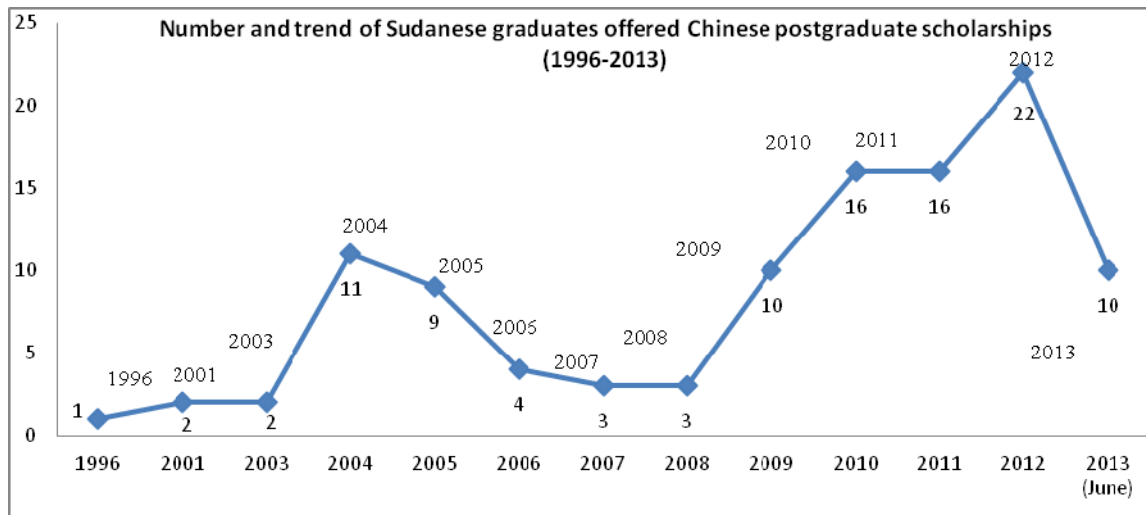


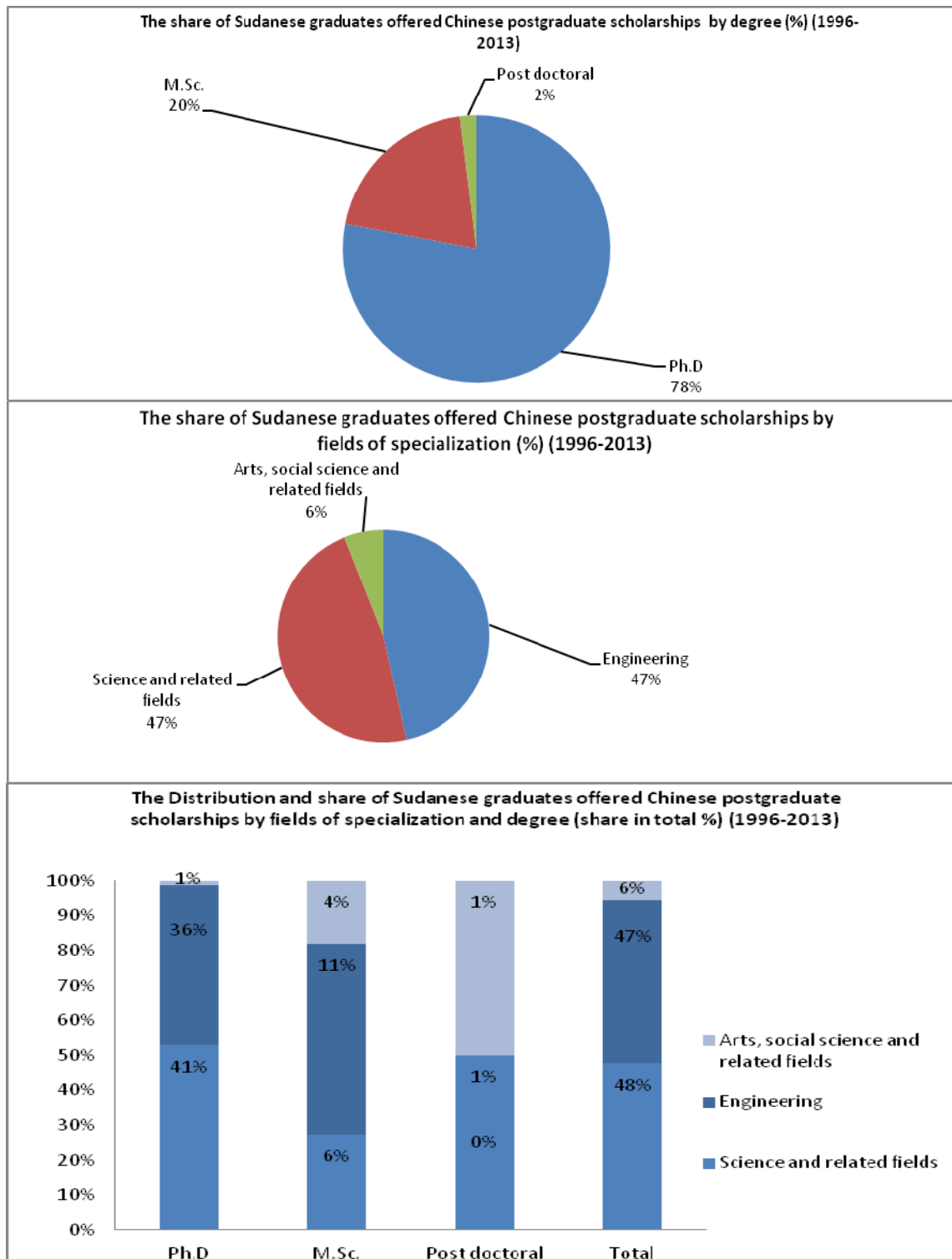


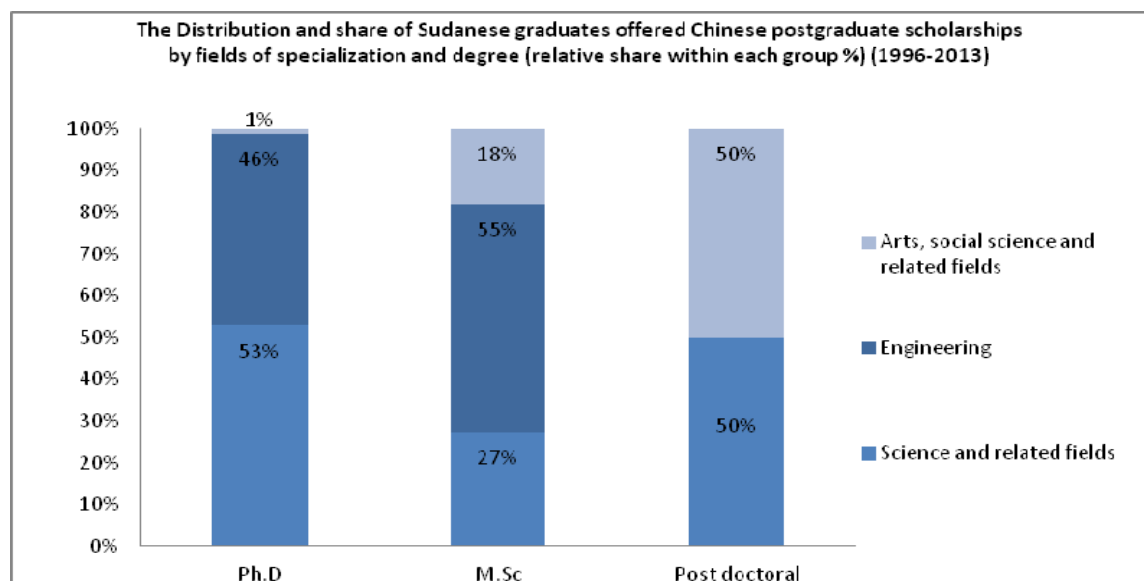
Source: Adapted from Sudan Ministry of Higher Education and Scientific Research Unpublished statistics (2009-2012)

Figures 12-19– Numbers, trend, share, distribution and fields of specialization of Chinese postgraduate scholarships offered to Sudanese academic universities staff students and graduates (1996-2013)









Source: Adapted from Sudan Ministry of Higher Education and Scientific Research Unpublished statistics (2013), accessed on September 16, 2013

In addition to education, one important implication for capacity building is the increase of training, for example, many of the Sudanese workers in Merowe dam project, Merowe-Karima Friendship bridge project, Elgaili - Garri 2 Project, Garri 4 electricity Project and Al Fula Power Plant Project are trained within the Chinese aid and development assistance for the implementation of these projects.

In the Merowe dam, the Chinese aid not only significantly contributed to capital and finance by more than a quarter of total fund (26%) and to the provision of the mechanical equipment, but also significantly contributed to the provision of human capital, labour and experience required for the construction and implementation processes. For instance, the Chinese architecture engineers and workers significantly contributed in the implementation of the Merowe dam. For example, at the beginning of the project, the total Chinese workers were 5 thousand, though the number declined to 134 and 1372 by the end of 2008 when the civil work in the project was almost completed. Moreover, the Chinese companies, engineers and workers cooperate with the Sudanese counterpart to implement the construction and civil works, electricity transformation and electromechanical works, the Chinese contributed to finance iron doors, transmission lines and sub-stations with the Sudanese. China also significantly contributed to the engineering work, for instance, the contractor which is building the dam's body is composed of a Chinese Consortium called the CCMD, which comprises two giant joint venture Chinese engineering companies: the China International Water and Electric Corporation CWE and the CWHEC Company. The CCMD Consortium has placed a good number of highly qualified engineers to work in building Merowe Dam together with local engineers.¹⁵ In addition to

¹⁵ The China International Water and Electric Corporation (CWE) is a company established by the Chinese Government to execute the huge international projects funded by the Chinese Government. It also works on the fields of heavy equipment. The CCMD Consortium: This Consortium is considered the biggest of its kind in the world of hydropower. It is a fact that the Western companies that used to work in this field have retracted after the 1980 decade. As all hydropower projects in America and Europe were completed. Because China is the most densely populated country in the world, which is in need of the cheap hydropower projects, we find that the Chinese companies are still in business of such projects. This qualified them to play a leading role in this field worldwide. Harbin Power Engineering Company Ltd.: Harbin Power Engineering Company Ltd. (HPE) is one of the largest power engineering companies in China. It offers comprehensive services for power plant projects all over the world. Since it was founded in early 1980s, HPE has undertaken 15 EPC projects on turnkey basis, both in China and abroad.

improve and contribute to capacity building, the Chinese company Sinohydro sent some international high skilled engineers to Sudan for the implementation of Merowe dam, rehabilitation of Roseires dam, study, design and implementation of new dams in Southern Sudan.

Moreover, Chinese aid for Merowe dam project not only contributed to electricity production, but also contributes to human development and capacity building by offering internal training for Sudanese in Merowe dam project. The project has provided vast training opportunities for Sudanese workers, including around 1000 graduates and 10,000 engineering students, in addition offering training for 4000 Sudanese engineers in all different engineering fields to operate in all fields at the project was one of the conditions which were signed with the consultant and the Chinese and French contractors. The contractual agreement with the Chinese and French consultant companies also included training of some technical workers and new graduates within the National Training Project in coordination with the Sudanese Engineering Council. In Merowe dam the Chinese trainers contributed to the transfer of knowledge and make it acquainted to other. In terms of capacity building, Chinese aid not only offered internal training, but also offered opportunities for external contractual training held in China over the period (2004-2007) for 57 Sudanese. For instance, the first external contractual training conducted in 2004 by CCMD-CHINA institute in China offered for 2 Sudanese civil engineers, the training course lasts for six weeks and focuses on dams' safety. The second external contractual training conducted in 2005 by China institute in China offered for 33 Sudanese, the first training course lasts for three weeks focuses on acceptance tests and training inspection visit, it was offered for four Sudanese: one administrative manager, two mechanical engineers and one electrical engineer. In 2005 the second training course lasts for one month focuses on operation and maintenance of towers and sub-stations, it was offered for 20 Sudanese: one administrative manager, one head of department, one engineer and 17 electrical engineers. In 2005, the third training course conducted by CCMD-CHINA institute in China lasts for three weeks focuses on operation and maintenance of towers and sub-stations, it was offered for 9 Sudanese: one administrative manager, two heads of departments, one chemical engineer and 5 electrical engineers. In 2006, the third external contractual training lasts for one week conducted in 2006 by CCMD-CHINA institute in China, it was offered for 17 Sudanese: the first training course focused on hydro mechanical equipment offered for three Sudanese civil, mechanical and electrical engineers, whereas the second training course focused on operation and maintenance of towers and sub-stations and operation of the transmission lines, it was offered for 14 Sudanese: one administrative manager, two heads of department, and 11 electrical engineers. Finally, in 2007, the fourth external contractual training conducted in 2007 by CCMD-CHINA institute in China, the training course lasts for two weeks and focuses on training tests in China, it was offered for 5 Sudanese: two administrative managers, one civil engineer, one mechanical engineer and one electrical engineer.¹⁶

In addition to direct internal and external training to improve and contribute to capacity building, the Chinese company Harbin-Jilin offered a grant equivalent to US\$ 10 million to support

¹⁶ See Date from the General Administration for information and training, Dams Implementation Unit (2009).

Merowe technological faculty in June 2008. The Chinese grant will be allocated for the purchase of the special equipment that is required especially for the workshops of the college.¹⁷

One important implication for capacity building is the increase of training for Sudanese workers in Merowe dam project that includes about 600 labours and 500 Engineers. The fields or disciplinary focus of training in which Sudanese workers in Merowe dam project are trained include all civil works, all hydro mechanical works, all power transmission system, irrigation and canalization, etc.. The training of Sudanese workers in the Merowe dam project has been demanded and driven by the management department in the Merowe dam project and it has not been driven by Chinese company implemented the Merowe dam project. Therefore, this implies that Chinese aid for implementation of Merowe dam project has positive implications in fulfilling the aims of enhancing capacity building through transfer and acquisition of Chinese knowledge and experiences in dam's construction.

Further important implication for capacity building is the increase of training for Sudanese workers in Merowe-Karima Friendship bridge project, and this includes many labours, skilled, technicians and 3 engineers. The fields or the disciplinary focus of Chinese training in which the Sudanese workers in Merowe-Karima Friendship bridge project are trained include skilled, technicians and engineers trained in work related to construction of bridges. The training of the Sudanese workers in Merowe-Karima Friendship bridge project has been demanded and driven jointly by the management department in Merowe -Karima Friendship bridge project together in close cooperation with the Chinese company implemented the Merowe-Karima Friendship bridge project. In addition an approved policy had been formed mutually according to ISO 9001 to facilitate the presence of explicit and implicit capacity building and implication for project maintenance programme. Moreover, training had been applied on job and external to facilitate the presence of explicit and implicit technology transfer. Finally, an important implication of Chinese building of the bridge is that the target programme was achieved and Sudanese technician are working now in many ongoing bridges projects, which implies the success of Chinese aid in fulfilling the aim of capacity building.

The Chinese aid for Garri 2 electricity project not only contributed to increase electricity production, but also contributed to improve capacity building and human development by offering internal, external and specialized training which was launched upon the start of the work at Garri 2 project. For instance, the contractual agreement in Garri 2 indicated the needs for implementation of package of training to benefit skill upgrading for the project engineers and the station in the future. The training courses include internal training for project engineers and technicians in different fields, external training for project engineers in different fields and specialized training for equipment engineers. For instance, internal training lasts for 40 days was offered for 50 of NEC project engineers and technicians in different fields (mechanical, electricity, equipment control and chemistry) at the beginning of the operations of units and different systems in accordance with the contractual agreement. Moreover, additional internal training was conducted during the implementation of the project and it helped the project to prepare the human resources for

¹⁷ Harbin-Jilin earlier contributed to the construction of Senja bridges, built Alingaz bridge in the White Nile, supervises Manshia

maintenance of the station. In addition to internal training, external training was conducted in China, for instance, within the requirements of the project, specialized external training programme for equipment engineers was offered before the beginning of the project. Furthermore, additional external training in China lasts for three months was offered for 15 of NEC project engineers at the beginning of the project. The number of project engineers benefited from this external training in China is over the number of engineers specified in the initial contractual agreement, because the management of the project in NEC realized the usefulness of expansion of the training to increase the benefit for all engineering fields, so the external training included many different engineering fields (mechanical, electricity, equipment control and chemistry), the training was in theoretical and practical or empirical sides. Moreover, the period of training is extended beyond the period specified in the initial contract, because Harbin Company realized the short time of training period in the initial contractual agreement and appreciated and recommended extension of training period to increase the benefit for the trainers. In addition specialized external training lasts for three months was prepared and conducted by the industrial producing companies in China was offered for three of the control equipment engineers in the project. The external training course is distributed in two terms, the first term includes advanced and detailed training in all controlling programmes systems and structure of the system and methods of treatments and maintenance in the future, the second term includes digital design, ladder design that presented in accordance with the designs implemented in the projects. This implies that Chinese aid offered for Garri 2 considerably contributed to fund, increase electricity generation and capacity building. One important implication for capacity building is the increase of training for Sudanese workers in Elgaili - Garri 2 Project, this includes 25 engineers, and some of local labours, 30 technicians and engineers. The fields or the disciplinary focus of Chinese training in which the Sudanese workers in Elgaili - Garri 2 Project are trained includes labour, technicians and engineers in the fields of mechanical, electrical and instrumentation related to electricity fields. The training of the Sudanese workers in Elgaili - Garri 2 Project has been demanded and driven jointly by the management department in Elgaili - Garri 2 Project together in close cooperation with the Chinese company implemented Elgaili - Garri 2 Project.

Further important implication for capacity building is the increase of training for Sudanese workers in Garri 4 electricity Project that includes 93 persons. The fields or focus of Chinese training in which Sudanese workers in Garri 4 Project are trained include training in mechanical, electrical, control, instrumentation and chemical fields related to electricity fields. The training of Sudanese workers in Garri 4 has been demanded and driven jointly by the management department in Garri 4 Project together in close cooperation with Chinese company implemented Garri 4 Project.

One important implication for capacity building is the increase of training for e Sudanese workers in White Nile Grid Project. The number and fields or the disciplinary focus of Chinese training in which the Sudanese workers in White Nile Grid Project are trained according to executive manager this includes around 23 engineers in engineering fields related to electricity, while according to other

engineer in the project this includes around 45 persons in the fields on erecting the transmission lines, stringing the conductors and in the substations. The training of the Sudanese workers in the White Nile Grid Project implies that the majority (70%) of the training needs has been demanded and driven mainly by the management of White Nile Grid Project.

One important implication for capacity building is the increase of training for the Sudanese workers in Al Fula Power Plant Project. The number and fields or the disciplinary focus of Chinese training in which the Sudanese workers in Al Fula Power Plant Project are trained includes 30 persons in all engineering fields related to electricity. The training of Sudanese workers in Al Fula Power Plant Project has been demanded and driven by the management department in Al Fula Power Plant Project and has not been determined by the Chinese company implemented Al Fula Power Plant Project.

Further important implication for capacity building related to Chinese aid for building of Dongla –Wadi Halfa Electricity Project include offering technical assistance with special emphasis on offering the necessary training for local staff/counterparts to ensure that the local staff will be competent enough to sustain activities at the end of the technical assistance.

5.2. The effectiveness of Chinese aid for financing development in Sudan

To examine the impacts of Chinese aid, loans and grants to Sudan for financing development in Sudan over the period (1999-2007) we use primary data from the interview with the managers of the selected cases studies of seven projects. We are aware of the fact that the economic benefits of the completed infrastructure projects can be more clearly highlighted and substantiated by offering finance to cover the costs of the establishment of these infrastructure projects. But due to practical problem related to lack of accurate and reliable data it is somewhat problematic to measure the outcome and effectiveness of Chinese aid on policy aspects in Sudan based on Burnside and Dollar, (1997) and Moyo (2009) and to examine the role of Chinese aid in increasing the country's absorptive capacity. The results of the interviews with these managers of the projects indicate the effectiveness and significant contribution of Chinese aid, loans and grants in the implementation of their projects. In particular, in these projects the percentage share of the contribution of the Chinese aid, loans and grants in total aid, loans and grants offered for implementation of these projects is important as can be seen from many important indicators. For instance, the share of China in total capital and finance (71%-100%), increase availability of machines and equipment (70%-100%), improve training and capacity building in the project (50%-100%), increase in technology transfer and knowledge transfer (50%-90%), increase employment opportunities (26%-100%) and increase availability of raw materials (5%-100%). Therefore, Chinese aid, loans and grants offered for implementation of these projects has been extremely important for creating many positive impacts in many important indicators. For instance, increase availability of the services (100%), increase in skill level (100%), increase or growth in production (88%), increase in transfer of knowledge (88%), increase availability of machines, equipment and raw materials (75%), increase in employment opportunities (75%), improve capacity building in the project (75%) and increase in technology transfer (63%). For example, the Chinese aid, loans and grants offered for implementation of these projects has been

extremely important for creating many positive impacts in many important indicators. For instance, increase or growth in production (12%-120%), increase availability of the services (60%-120%), increase in technology transfer (50%-100%), increase in the transfer of knowledge (30%-100%), increase in skill level (25%-100%), increase availability of machines, equipment and raw materials (20%-100%), improve capacity building in the project (10%-100%) and increase in employment opportunities (5%-70%). One important implication for capacity building is the increase of training (internal and external), for example, many of the Sudanese workers in these projects are trained within Chinese aid and development assistance for implementation of these projects, this includes labours, technicians and engineers in different fields or disciplines related to the Chinese aid and development assistance for the implementation of these projects. The training of the Sudanese workers in these projects trained within Chinese aid, development assistance, loans and grants for implementation of majority of these projects has been mainly demanded and driven by the management department in these project (75%) and in three cases is driven jointly by the management department in these project together in close cooperation with Chinese companies implemented these projects (38%).¹⁸ - See Table 7 below.

Table 7- The impacts of the Chinese aid and development offered for the implementation of the selected projects

Selected projects and selected indicators	Merowe	Merowe-Karima	Garri 2	Garri 4	White Nile	Al Fula	Dongla-Halfa
(a) The share of the Chinese in total (%)							
Capital and finance	50%	71%	85%	85%	100%	90%	75%
Employment	80%	26%	30%	100%	30%	90%	
Training	80%	100%	80%		50%	90%	
Increase in knowledge transfer	90%	50%	75%			50%	
Increase in technology transfer	90%	50%	90%			50%	
Improve capacity building in the project	90%	100%	80%			50%	
Increase availability of machines	100%	100%	95%			70%	
Increase availability of equipment	100%	100%	90%	75%		70%	
Increase availability of raw materials.	60%	100%	5%			10%	
(b) The positive impacts of the Chinese aid (%)							
Increase or growth in production	120%	100%	60%	80%	12%	50 - 70%	More than 50%
Increase availability of the services	120%	100%	100%	80%	60%	70%	70%
increase in employment opportunities	50%	30%	By 170	40%	70%	20%
increase in skill level	100%	100%	75%		55%	50%	70%
increase in knowledge	100%	85%	75%		30%	50%	70%
increase in technology transfer	100%	85%	95%		--	50%	60%
Improve capacity building in the project	100%	100	80%		10%	50%	10%
Increase availability of machines, equipment and raw materials	100%	100%	100%	80%	35%	20%	75%
Training fields	600 labours and 500 Engineers	some skilled, technicians, 3 engineers	25 engineers, some local labours, 30 technicians engineers	93 persons	23engineers-45 persons	30 persons	n.a.

Source: own calculations based on the results of Micro Survey (2009): Interviews on China-Sudan Aid Relations. Note: n.a. not available.

¹⁸ Although the 100 percent share being attributed to China in the indicators is questionable, but it is worth noting that the 100% implies that the contribution and share in some indicators are completely attributed to Chinese aid, development assistance, loans and grants to the selected projects, whereas Sudan government and other donors have no contribution and share in some indicators. For instance, other Arab donors contributed to capital and finance only in Merowe dam, and they have no contribution in other selected projects. For all other seven selected projects, China is the only donor or partner contributed to implementation of these projects, in all of these seven selected projects. Because of the shortage of domestic capital these projects are either completely or largely financed by Chinese aid, development assistance, loans and grants.

In Table 7 we measure the impacts of Chinese aid and development assistance offered for the implementation of the selected projects and we asked projects' managers about their own qualitative appreciation and quantitative evaluation of the approximate percentages level of impacts they observed in their projects. To measure the positive impact of Chinese aid, we asked projects managers if the Chinese aid resulted in positive impacts for financing and capacity building in their projects. We asked the projects managers to evaluate the importance measured by the share of the Chinese aid and development assistance as a percentage of total foreign aid and development assistance offered for the implementation of their project concerning specific indicators. We also asked the projects managers to give estimated percentages to specify by how much the Chinese aid and development assistance offered for the implementation of their projects has created positive impacts in the selected indicators in their projects. We also asked the project managers to give qualitative evaluation concerning the presence of any explicit or implicit capacity building, qualitative-quantitative evaluation of training and to indicate the fields (the disciplinary focus of Chinese training) in which the Sudanese workers are trained within the Chinese aid and development assistance offered for the implementation of their projects.

We are aware of the fact that it would be interesting to benchmark the results on the Chinese aid projects against the non-Chinese aid projects implemented in Sudan. But due to practical problems related to inadequate availability of accurate and reliable data and information it is somewhat problematic to cover all these issues in this paper. So, we leave that for more in-depth future study when adequate, accurate and reliable data and information are available. Moreover, the focus on the role of Chinese aid, loans and grants in financing development in Sudan is important in view of the fact that Sudan was not receiving aid from most traditional donors (except for emergency, and humanitarian, aid) during the period 1997-2007; but it became an oil exporter in 1999 and its economic relationship with China has intensified and as a result China become not only the major investors in Sudan's oil sector and main trade partner for Sudan but also the major donor offering aid, development assistance, loans and grants to Sudan. Therefore, we limit our assessment and analysis in this paper to compare the key characteristics and features of Chinese aid, loans and grants offered for the implementation of the selected projects in Sudan over the period (1997-2007). The managers of the selected projects indicate several key characteristics and features of Chinese aid loans and grants offered for the implementation of the selected projects in Sudan over the period (1997-2007). We find that for instance, the Chinese aid is by nature of such contracts is characterized by being unconditioned (political), focused on developmental issues and committed to easy process (Merowe dam project). We find that different from other donors Chinese aid concentrates on comprehensive development issues to achieve multi purposes (e.g. Merowe Dam Project). Chinese aid not only significantly contributed to capital and finance but also significantly contributed to construction or implementation of civil works, provision of mechanical equipment, provision of human capital and capacity building by offering internal and external training for Sudanese. In addition, the Chinese are characterized by flexibility (Al Fula Power Plant project), offering acceptable prices and making

equipment available (Dongla –Wadi Halfa Electricity project) and the Chinese machines, equipment and raw materials are characterized by being: cheapest, suitable and simple for maintenance (Elgaili - Garri 2 project). In addition, the Chinese is characterising by being the only partner completely financing the implementation of the project by offering fund in the form of grant (Merowe Karima Friendship project), in the form of loan (White Nile Grid Project) and in the form of loan focusing on partnership (50%) and based on mutual benefit or entirely commercial relations (Khartoum refinery project). In addition, the Chinese is characterising by being also the only source of raw materials and inputs used in the implementation of the project (White Nile Grid Project) and by offering facilitation of initiating the bridge project until completion (Merowe Karima Friendship project).

Our findings in this paper imply that the Chinese aid, loans and grants seem to be allocated or utilized in their targeted or assigned objectives for the implemented projects in Sudan. The Chinese aid, loans and grants offered to the selected projects are effective because they can be perceived as complementary to local resources to help infrastructure development "to close investment-saving gap". But the effectiveness of the Chinese aid, loans and grants offered to these projects is somewhat undermined by the Chinese conditionality of tied aid. For instance, our results find a link between the offer of the Chinese aid, development assistance, loans and grants upon satisfaction of specific conditionality requirements. For instance, in the opinion of the managers of these projects, the Chinese aid, development assistance, loans and grants has been extremely importantly tied to trade in oil and export of Sudanese oil to China (75%), tied to the implementation of these projects by the Chinese companies (75%), tied to the purchase of machines, equipment and raw materials from China (88%), it is moderately tied to investment in oil (63%) and to utilization of Chinese inputs and labour (63%) and slightly tied to the purchase of other Chinese goods and services (38%)- See Table 8 below. Therefore, Our findings are consistent with the stylized facts in the literature which implies that the Chinese aid and development assistance to poor countries is also usually 'tied' to oil, purchase of the Chinese goods and services, generally by the Chinese companies, utilizing the Chinese inputs and labour, undermining the effectiveness of the Chinese aid to poor countries, this implies that Chinese aid to Sudan is tied to trade, FDI and the importance of oil to Chinese economy.

Table 8- The importance of the impacts and conditionality tied to Chinese aid and development assistance in selected projects

selected indicators	Importance (%)
(a) The importance of the Chinese aid and development assistance in creating positive impact	
increase or growth in production	88%
Increase availability of the services	100%
increase in employment opportunities	75%
increase in skill level	100%
increase in knowledge	88%
increase in technology transfer	63%
Improve capacity building in the project	75%
Increase availability of machines, equipment and raw materials.	75%
(b) The importance of the conditionality tied to the y Chinese aid and development assistance	
Tied to trade in oil and tied to export of Sudanese oil to China	75%
Tied to investment in oil	63%
Tied to Implementation of the project by Chinese companies	75%
Tied to purchase of machines, equipment and raw materials from China	88%
Tied to the purchase of Chinese goods and services,	38%
Tied by utilizing Chinese inputs and labour,	63%

Source: own calculations based on the results of Micro Survey (2009): Interviews on China-Sudan Aid Relations.

Based on the above results of the positive impacts of the Chinese finance for all the selected projects, it is also useful to examine the negative impacts of the Chinese aid and loans to Sudan. We limit our assessment of the negative impacts to available data on the negative impact of the increase in total loans and debt to Sudan as a result of the robust and increasing intensification of China and Sudan economic relations over the period (1997-2007). We find that the increase in the inflow of Chinese loans on the one hand, has some positive impacts by financing development projects in Sudan, but on the other hand, we realize that it has a negative impact by increasing Sudan external obligations and debts and therefore, undermines the effectiveness of Chinese aid to Sudan. Table 9 below shows the increase in Sudan's total debt and debt to China during the period (1999-2007), for instance, Sudan's total debt increased from US\$ 8863099 in 1999 to US\$ 8239843.371 in 2007. In particular, Sudan's debt to China increased from US\$ 7738 in 1999 to US\$ 1157697062 in 2007. The share of China in Sudan's total debt increased from 0.9% out of Sudan total debt in 1999 to 13.45% out of Sudan total debt in 2007. Hence, our results in this section show the second stylized fact which implies that Chinese aid, development assistance, grants and loans caused mixed positive and negative impacts for Sudan during (1997-2007).

Table 9- The total and share of China's Debt to total Debt in Sudan (1999-2007) (US\$ millions and %)

Items	1999	2002	2003	2004	2005	2006	2007	Total
China	7738	7,738.00	782,284	702,484	51,928.99	1,143,967,062	1,157,697,062	2303216297
Total	8863099	7,029,815.36	7,645,959	7,639,824	30,539,517.77	8,239,843,371	8,609,533,371	16911094957
China (%)	0.09%	0.11%	10.23%	9.20%	0.17%	13.88%	13.45%	13.62%

Source: Central Bank of Sudan (External Debt Unit) and Ministry of Finance and National Economy

We are aware of the fact that the criterion of the negative effect of debt increase seems quite trivial: when a country receives aid in form of loans, it is obvious that its debt level increases and we are aware of the fact that it would be more interesting to weigh the aspect of increased debt against the increased assets created by the investment of these loans in development projects. If debt increases without a corresponding increase in assets, then the corresponding deficit can be explained in Sudan. But due to practical problems related to inadequate availability of accurate and reliable data and information regarding increased assets created by the investment of these loans in development projects, it is somewhat problematic to cover these issues in this paper. So, we leave that for more in-depth future study when adequate, accurate and reliable data and information are available. Therefore, we limit our assessment and analysis in this paper to compare the total debt Chinese aid against total loans, grants and development assistance from China to Sudan over the period (1997-2007).

Another aspect that deserves more attention in our view is the waste of aid funds on the so-called white elephant projects that implies that part of the aid inflow is directed towards projects without real development benefits. For example, one negative feature of Chinese aid policy toward Sudan is that Chinese aid policy towards Sudan has a revealed preference for grandiose and prestigious projects. While Chinese aid to Sudan finances diverse projects, it has been relatively directly towards grandiose and prestigious buildings (e.g. friendship hall and presidential palaces) which few traditional donors would be willing to finance. Sudanese leaders highly appreciate these highly visible projects for their own political reasons. This finding is consistent with our observations

from unpublished data from Sudan Ministry of International Cooperation which imply that for instance, over the period (2005-2007) China offered loans and grants of total amount equivalent to CNY 260 million for the establishment of the new presidential palace. The composition includes total grants of total amount equivalent to CNY 20 million in 2005 and total loans without interest rate of total amounts equivalent to CNY 240 million over the period (2005-2007: CNY 40 million in 2005 and CNY 200 million in 2007). The Chinese aid used for grandiose and prestigious projects offer opportunities and challenges for Sudan. On the one hand, the utilization of Chinese aid for grandiose or prestigious projects offers Sudan the opportunity to implement projects related to development of building and construction of grandiose or prestigious projects that are unsupported and perceived as “unproductive” investments by traditional donors. On the other hand, the challenge for Sudan related to potential risks that these projects are implemented in isolation from Sudan comprehensive strategic development programme; they come without transfer of technology and capacity building, without benefit to Sudan economy and with potential risk of shifting resources away from priority targeted objectives such as poverty reduction and building infrastructure.

Apart from the debate on the mixed impacts of Chinese aid, grants and loans to Sudan, we find that the robust and increasing intensification of China and Sudan economic relations implies opportunities for financing development in Sudan. In particular, despite a long period of economic sanctions, Sudan was able to grow thanks to special economic relations with China which relaxed the development finance constraint. From the perspective of the new approaches to financing development our findings from the case of Sudan imply that even when a country is facing binding political and economic sanctions, it can still finance a high growth strategy if it is endowed with natural resources and a partner that is in need of such resources. Furthermore, from the perspective of the new approaches to financing development our findings from the case of Sudan imply that the Chinese aid, loans and grants to the selected projects is effective because it goes beyond the conventional approach by focusing not only on humanitarian assistance and financial aspects but also offering new models of development by focusing also on sustainable development aspects. Therefore, Chinese aid to selected projects can be perceived as complementary to local capital and resources that not only significantly contributed to capital and finance, but also significantly contributed to provision of human capital and capacity building by offering training and so enhancing sustainable developmental issues in Sudan.

6. Conclusion and Policy Recommendations

This paper fills the gap in the Sudanese literature and discusses the effectiveness of Chinese aid, loans and grants for competence building and financing development in Sudan using new primary data collected through interviews at the micro (project) level in Sudan in 2009.

We verify the first stylized fact on the significance of China in financing development in Sudan as China's share increased greatly from 17% in 1999 to 73% in 2007 out of total loans and grants offered to Sudan. We show the second stylized fact that Chinese aid, grants and loans offered to Sudan caused mixed positive-negative impacts; the positive impact is offering alternative

complementary source of finance to complement domestic capital and financing development projects, the negative impact is increasing Sudanese debts to China from 0.9% in 1999 to 13.45% in 2007 (in terms of Sudan's total debts). We find that the effectiveness of Chinese aid to Sudan is undermined by offering aid tied to trade, FDI and importance of oil to Chinese economy. We find that despite the recent global economic crisis the inflow of Chinese aid and development assistance continues to Sudan over the period (2008-2009), this implies that China has maintained offering tied aid to maintain its access to oil in Sudan.

We find that the robust and increasing intensification of Chinese and Sudanese economic relations implies opportunities for financing development in Sudan. In particular, despite a long period of economic sanctions, Sudan was able to grow thanks to special economic relations with China which relaxed the development finance constraint in Sudan. From the perspective of the new approaches to financing development our findings from the case of Sudan imply that even when a country is facing binding political and economic sanctions, it can still build competence and finance a high growth strategy if it is endowed with natural resources and a partner that is in need of such resources. Furthermore, from the perspective of the new approaches to financing development our findings from the case of Sudan imply that Chinese aid, loans and grants are effective because they go beyond the conventional approach, providing not only humanitarian and financial assistance but also new and sustainable development aspects. Therefore, Chinese aid to selected projects can be perceived as complementary to local capital and resources that not only significantly contributed to capital and finance, but also significantly contributed to provision of human capital and capacity building by offering internal and external training for many of Sudanese labours, technicians and engineers working in these projects are trained in different fields or disciplines related to implementation of these projects and so enhancing sustainable developmental in Sudan. The training was demanded and driven mainly by the management department in these projects, and in three cases was sought jointly by the management with the Chinese companies that implemented these projects. Our findings are consistent with the stylized facts in the African literature regarding the effectiveness of Chinese aid to Africa to provide alternative complementary sources of finance and to complement domestic capital. For the selected cases or projects, Chinese aid and assistance are allocated and utilized in their targeted or assigned objectives and can be seen as complementary to local resources to help infrastructure development to close the saving-investment gap.

We find that in addition to aid in the form of financial capital, another form of Chinese aid and development assistance includes Chinese technical assistance in the form of scholarships for the training and education sector. The distribution of Chinese scholarships offered to postgraduate Sudanese students to study in China over the period (1999-2013) implies that for both enrolment and graduation the majority were for PhD degree, followed by MSc degree, research and training respectively. And the majority were for specialization fields of Engineering, followed by Science and related fields, and finally a few were offered for specialization fields in Arts, Social Science and related fields. Therefore, the outcome of Chinese aid that was directed towards capacity building in

Sudan, implies that of all scholarships (232) provided, the rates (71% and 79%) of Sudanese people have graduated from these training programmes during the periods (1999-2012) and (2002-2012) respectively. We observe that the estimated increase in their skill levels is the increase in their educational qualifications and learning in scientific and technical fields by obtaining the MSc and PhD and post-doctoral degrees.

Based on our findings discussed above, the major policy recommendations include improving the effectiveness and increasing the benefits from the Chinese aid and development assistance to Sudan with priority given particularly to financing projects contributing to poverty reduction and sustainable and balanced development projects in Sudan. Additionally, more emphasis should be given to capacity building, transfer of technology and knowledge, as well as a consideration of future sustainable debt levels by cutting the potential risk of increasing Sudan's debt obligations and reducing contracting new Chinese commercial loans with large interest rates. Further to reducing reliance on Chinese tied aid to Sudan, and encouraging China to confirm commitments to the Paris Declaration to cease offering tied aid to Sudan. The final recommendations are to improve the institutional framework and arrangements to increase the benefit from Chinese aid, development assistance, loans and grants to Sudan.

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