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بعث أفريقيا الغد في سياق التحولات المعولمة :

رهانات و آفاق

China Dams Construction in Sub Sahara Africa (Ssa): Opportunities, Contending Issues and Challenges

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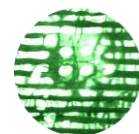
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Abstract

The focus is on the significance and consequences (gains and deficits/gaps) of China's dams' interventions in Sub Sahara Africa (SSA), Taking this into cognizance the paper examined the socio-economic, development and environmental integrity transformations in the context of the development aspiration of the SSA. It also examined the opportunities, inadequacies, imbalances, dysfunctionality of Chinese dams development model in the SSA against internationally recognized dams construction standards. The paper in addition investigated and did a comparative analysis of the strategic gains and deficits/gaps of Chinese dams construction in the SSA against the background of the social transformation, under development of the region, backwardness or inequality gaps of the region and other developing regions of the world with respect to the environmental integrity/protection or economy green aspirations of the region. Essentially, taking the energy development needs of the region into cognizance, the paper x-rayed the emergence of a new multi-polar order in terms of dams constructions in the SSA. This include how China's interventions has altered the basic parameters on which energy partnerships is based (hydropower to the precise) – doing a comprehensive analysis of the role challenges. Based on a comprehensive analysis the paper posits that despite the monumental engagements of China in dams constructions in the SSA there has been lacking any form of big public disaster and so far the conclusion is that the interventions has been positive but there are indications that technical, social and environmental problems are simmering. It also posit that from Ethiopia to Sudan and Ghana to South Africa the Chinese are engaged in huge dams constructions that are largely financed by banks without support from Beijing. Finally it did a policy discourse for strengthening the gains of Chinese dams interventions in the SSA as well as predicting and mitigating against likely disaster/deficits or negative consequences.





Introduction

China rising relations with Sub Sahara Africa in recent times date back to the 1990s. Recent economic relations indicate that there has been a huge increase in trade, foreign direct investments (FDI) and Aid. Matthais Busse et al (2014), indicate that merchandise trade between China and the SSA rose from USD 9billion in 2000 to USD 166billion in 2014, making China SSA largest trading partner (citing UN Comtrade, 2014). Also china's FDI increased from USD 200million in 2000 to USD 2.9 billion in 2011, making China the largest developing country investor in the SSA (citing Comtrade 2013, MOFCOM). In addition, China's SSA economic cooperation projects increased from USAD 1.2 billion to USD 29billion in 2011 (citing China's National Bureau of Statistics).

In terms of dams construction Chinese builders are late entrants to global dams construction market. Despite being late entrants they have challenged the European hegemony, having executed many projects in many regions that are environmentally fragile and plagued by social tensions (SSA inclusive). Most of the engagements have technical and economic aspects that are promoted at the expense of environmental integrity, local communities' livelihood and human right abuses. Examples include Chinese dam construction in Sudan that has resulted in massive human rights violations and in Ethiopia where Chinese dams construction are likely to result in intertribal conflicts and in addition result in the diverstation of a unique World Heritage site.

Africa as a continent suffers from huge irrigation and electricity deficits which makes her the least electrified region in the world; using only 3% of its renewable water, which has created the opportunity for Chinese collaboration and partnership. With respect to dams construction China has become a major factor in dams construction in the SSA, particularly in the last decade. Essentially most of the dams being constructed in Africa by China are financed by China's loans and financial aid, personnel and technology.

Since the industrial growth of China as the second largest economy it has had to develop dam construction technology through intimidation western dams construction interest and domestication of western technology to meet the electric power demands of china's ever growing industries. Consequently these have resulted in having within its territories over half of the world largest dams as well as develop expertise for dam construction. This coupled with its huge financial resources enable China to construct dams in the SSA mainly through loans advanced by the Eximbank. In 2012 Chinese firms took part in the construction of 308 dams in the world, of the number 85 dams were constructed in Africa (Peter Bosshard, 2013).

The SSA suffers from huge electricity or hydro-power infrastructures deficits which cannot support development or poverty reduction. The SSA with some 800,000 residents on a comparative basis generates the same amount of power with Spain, a country of 46 million persons. Since 1995 African power sector has grown by 1 percent annually or less than 1000



mega watts a year, through capacity need seems to have expanded by 10 percent a year to meet demand (World Bank, 2012).

In an attempt to meet these chronic power deficit Chinese investments in the SSA has reached levels of dam building not seen in decades. In this respect Chinese technology, corporations, financial institutions and government are involved in billions of dollars' worth of large dams in the SSA. In return the SSA has become a growing source of raw materials for China's industrial sector and market for Chinese goods.

Dam's projects that carry high environmental and social risk for western firms do not present any obstacles for Chinese firm. However, there are indications that Chinese firms have become increasingly environmental Green friendly in dams' construction in the SSA due to previous experience garnered from other regions of the globe where it is building dams as well as having to meet the statutory requirements for dams construction by the Chinese government.

Taking the pace at which dams are being constructed by China in the SSA into cognizance the emerging question is, can there be balance between economic undertone for such construction, environmental integrity, local communities' livelihood and human right in the SSA? This question has become inevitable as a result of the bad safety records of Chinese constructed dams across the world.

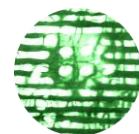
The Chinese model approaches in the SSA to hydropower projects development compare to that of the West is based on bilateral cooperation rather than moralizing political discourse of catch up development, and seeking to minimize the social difference between the recipient and the donor. However scholars inside and outside the SSA has criticized the model on two grounds: 1) environmental quality integrity violations; and 2) a rising imperialist (taking into consideration the huge hydropower infrastructures and technology engagement of China in the SSA), in addition to the rapidly growing Chinese population in the SSA.

Taking the above into consideration the rest of the paper is structured as follows:

1. Project and problems of China growing hydropower infrastructures role in Sub Saharan Africa (section 2);
2. Requirement for successful China hydropower infrastructures partnership with Sub Saharan Africa (section 3)
3. Opportunities for a Chinese hydropower infrastructure partnership.
4. Policy prescription/conclusion

Projects and Problems of China Growing Hydropower Infrastructures Role in Sub Saharan Africa

There is no doubt that hydropower is an important source of electricity and could bridge the huge gap in the power deficits in the SSA. However there are indications that the social,



environmental and economic track record of China's dams projects is far behind international standards. Consequently global concern about the safety of Chinese dams constructions World Wide has forced the Chinese government to make it mandatory for Chinese companies engaged in dams construction and their financiers to be socially and environmentally responsible, but monitoring of this compliance remain a huge task or problem to the Chinese government.

A critical look at Chinese-built dams or projects in selected SSA countries indicates the underlisted hydro power projects engagements among others (Peter Bosshard 2013 and Sean Avery 2012):

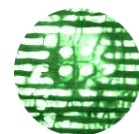
1 Ethiopia

Chinese contractors have built the Tekeze 300MW hydroelectric dam. China National Water Resources and Hydro Engineering Corporation built the main concrete dam for Tekeze, which is 185 meters high and one of Africa's tallest dams.

Gibe III dam on the Omo river is another dam project that has attracted the Chinese attention. It is expected to produce 1800 megawatts, costing USD 2 billion. The World Bank was the original financier but pulled out and since then other banks have declined to get involved. However, China's biggest bank ICBC has approved a loan of USD 5 million for Chinese equipment contract for the project.

On the Neshi River, China's Gezhouba water and power firm is building a 100MW Amerti-Neshi hydro dam. Beside another dam project has been announced, to be known as Gibe IV project on the Omo River, for which the Sino hydro firm has expressed interest. Most of these dams project has social economic and environmental implications. For example the Gobe III dam projects have diverstating social and environmental impacts on the lower Omo river valley and the lake Turkana region.

There is no doubt that China has made great effort to generate electricity through the construction of dams in various parts of the SSA with a view to reduce poverty and scale up industrial development and employment. However there are indications that loans for Gibe III dam and irrigation projects on the Omo River might ignite regional conflict in East Africa that will involve Kenya, Ethiopia and South Sudan because of the sugar plantation projects and the livelihood (agriculture, grazing and fishing) of the indigenous people that depend on the fragile ecosystems of the lower Omo Valley and that lake Turkans (Avery, 2012). According to Avery the issue here is that the sugar plantation will divert at least 28 percent of the Omo rivers annual flow, and lower the lakes water level by at at least 13 meters. Lake Turkana will lose more than half of its current volume and its water care will drop by 28 meters. This could split the lake into two and would likely turn the water in the southern half so saline that it becomes undrinkable. According to Avery, the indigenous peoples of the low Omo Valley and lake Turkana are extremely poor, but well-armed. They have a long history of resource conflicts over water, fisheries, and grazing lands. Consequently these conflicts will escalate and may spiral out of



control if the dam and irrigation projects are completed. This is because local groups displaced from their livelihoods and homelands will seek out resource on other lands of their neighbors in the Kenya-Ethiopia territory. China has good bilateral relations with both countries. Based on the recent history of conflict among local communities they can be expected to react largely through raids and warfare. Well-armed, primed by grudges, and often divided by support from different state and local governments these conflicts can be expected to be bloody and persistent.

A disagreement also exists between Ethiopia and Egypt over the construction of Great Ethiopian Renaissance Dam. The dam is expected to produce 8,000 megawatts of electricity. It is a source of increased tension. Egypt demand that this be scaled down to 1400 or 1800 megawatts (Binyam Alemayehu, 2014). The dam which is under construction in Berishanyui-Gumu regional state is built on the World's longest river that runs through 4,160 miles high but Egypt is proposing 90 metres. Planned capacity is 74 billion cubic metres but Egypt is proposing 14 billion cubic metres.

2. Ghana:

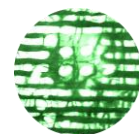
China is building the Bini Dam project at a cost of USD 700 million. In addition 16 potential sites for the production have been identified. The implication of this is that More Rivers will be dammed through the country. As at present the Bini Dam project is flooding nearly a quarter of Bini National Park, destroying natural habitat for rare hippos. It has also forcibly resettled 2600 persons and affecting thousand more. It is pertinent to note that in recent years Ghana has been plagued by power rationing because of its dependence on large hydro projects.

3. Gabon:

In Gabon, a Chinese consortium headed by China National Machinery and Equipment Import and Export Corp signed a deal in September 2006 to invest in a USD 3 billion to mine iron ore for export to China in return for the construction of railways, a port and two hydroelectric dams. Reports on environment quality violations are also not favourable.

4. Mozambique:

China EximBank is financing the Mphanda Nkawa Dam on the Zambazi River. Before now the Zambezi River has already suffered serious harm from the upstream Cahora Bassa and Kariba dams. This project could derail efforts to restore the lower Zambezi Delta by improving Cahora Bassa water release patterns to more closely mimic natural flows. The Mphanda Nkuwa will require Cahora Bassa to operate according to its current destructive release patterns and make down stream restoration very difficult. The dam could also worsen downstream environmental damage by causing daily fluctuations in river levels, and reducing the natural flow of river sediments, which are critical to the delta's health. In addition Chinese funding has also been made available for the Boa Maria Dam on the Pungue River. The first significant structure on the punque, which like Mphanda Nkuwa is experted to have negative effects on the Zambezi delta.



5. Nigeria:

Various loans have been secured from China to finance various dams projects, particularly in connection with oil concessions. In May 2006, Nigeria accepted a USD 2.5 billion loan from China to finance the Mambila hydro power dam, which would increase Nigeria's electricity supply by 4,000 MW. In 2013 the Zugeru hydro power project at the cost of USD 1.293 billion was signed with the China National Electrical Equipment Corporation and the Sino hydro corporation. The project is expected to produce 700,000 kilowatts. The facility was provided by EximBank of China who is to bear 75% of the cost. Mabilla hydroelectric plant agreement was signed in 2013 at a cost of USD 3.2 billion to produce 3050 MW of electricity. The project was awarded to Gezhouba Group company and Sino hydro consortium with counterpart funding of 15%. Also awarded is the Gurara 11 Dam with a counterpart funding of 25%. The environmental and social implications of the projects are though receiving attention there are indications that it is negative.

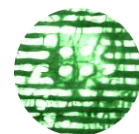
6. Republic of Congo

The China, Eximbank bankrolled the construction of the 120 imboulon Dam on the Lefirm river, a tributary of the Congo river. It was estimate to cost USD 280 million. The environmental quality violating is also diversttating.

Opportunities, Issues and Challenges of China Growing Hydropower Infrastructures Role in Sub Saharan Africa

In Sub-Saharan Africa more than three-quarters of the population is without electricity. However there are indications that it will soon be lit up, this is because governments across the SSA are building a host of new hydroelectric schemes across the continent. These projects are an attempt to keep up with the rising power demand from Africa's economic boom or development. But the trouble is that, the power seems destined to benefit only small industrial and urban elites. For the rest of Africa's billion inhabitants, this investment looks unlikely to further UN secretary general Ban Ki-moon's goal of "sustainable energy for all." (Fred Pearce)

Sub-Sahara Africa (SSA) exhibits huge unmet demand for hydropower infrastructures for electricity generation; seriously lagging behind other developing regions in most standard indicators of electricity generation. However, in the last two decades the SSA has witnessed the emergence of China in the development or provision of hydropower infrastructures. China seems to be the one that have recorded remarkable hydropower infrastructures growth in aid and investments to the sub region that has been able to draw global attention in past two decades. This new partnership provide fresh opportunities for the SSA to engage on new terms that recognize the need for a new infrastructural perspectives within the context of the infrastructures investments, industrial development and economic transformation that the SSA has been longing



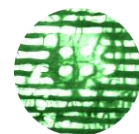
for, in the SSA quest for a development capable region and role challenges in an increasingly complex world. China's hydropower infrastructures partnership has brought along with it opportunities for comparing and experimenting with different types of hydropower infrastructures development model and the associated benefits, controversies, dialogue and challenges.

China in her quest for closer strategic partnership with the SSA has expansively engaged in hydropower infrastructures aid and investments. This infrastructures expansive engagement inherently carries significant implications for EU and United States interest in the SSA as former imperial powers and traditional actors.

In the last decade China has emerged as a major infrastructures (hydropower inclusive) financier to the annoyance of the EU and the US. The SSA suffers from huge hydropower infrastructures deficits. China's involvement in the maintenance and construction of new hydropower infrastructures in terms of commitments of financial resources and the construction industry capacity to help meet the demands in the last decade has been huge or fantastic, compared to the EU and the United States (the traditional actors) who channel their assistance to social sectors or water supply and sanitation. China has channeled her massive assistance to the hard infrastructures sectors. This massive assistance in the last decade in the SSA has a measurable effect on the SSA's growth. 2008 World Bank report (Building Bridges) indicate that Chinese Financial Commitments to infrastructures increased from less than US\$6 billion per year in 2001-2003 to about US\$6 billion per year from 2006-2007, with concentrations in power and railways at concessional terms compared to western nations official development assistance.

One of the factors responsible for western nations moving out of investments in hard infrastructures (hydropower inclusive) includes their extreme/faulty orientation towards private sector participation in the economy. Here, their thinking is that private sector should be the investors in infrastructures that will propel economic growth/development. But it has proved very difficult to attract private investments to hard infrastructures particularly in power, expressways, and rail way; with the exception of telecom that is amenable to private sector delivery. This is because the returns on the hard infrastructures are very long, and there are serious political and economic uncertainties associated with the investments in poor SSA countries. Consequently private sectors demand a very high return to compensate risks. The result is that hard infrastructures suffer huge unmet demand/deficit in the SSA (Lucy Corkin, 2008); the Chinese have stepped in to fill the gap. But their strategy is fraught with unanswered questions

The Chinese hydropower infrastructures development strategy is on isolated basis and it appears that there is little or no attempt to collaborate with European or North American Actors and this represent a global development challenge for the SSA. In relation to the infrastructures development in the SSA the new international order reflects a situation where the hegemony of



the EU and US is threatened by China and thus setting the ground for conflicts, little or no cooperation, collaboration and negotiation.

In the above context China's deepening hydropower infrastructures presence in the SSA challenges the EU and the US to design and implement a dynamic, comprehensive and strategic development assistance delivery as well as engages them in collaborative hydropower infrastructures development in the SSA. This could be reflected in the form of increased participation and impact assessment of Chinese-built dams with a view to combat the increasing Chinese built dams threat to SSA fragile socio-economic and environmental integrity. Given this increasing threat the under listed questions become paramount:

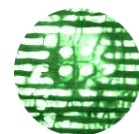
- i. What direction should China relations in the SSA take with respect to hydropower infrastructures development?
- ii. Is there need for a more strategic approach by China-SSA hydropower infrastructures development/commitment?
- iii. What level of hydropower infrastructures development and collaboration in the SSA should exist between China and other infrastructure actors in the SSA?
- iv. What are the social, economic and environmental quality violations implications for the SSA and the host communities?

Flowing from the above there are obvious green economy implications. Green economy in the context of hydropower development in the SSA refers to the carrying capacity of China's hydropower electricity development model to assist the SSA countries to integrate into the global, production, financial and economic architecture; and to meet their citizens needs through intra- and inter- national production, exchange of goods and services, through the environmentally sustained policies that should promote or protect the integrity/quality of the environment with a view to meeting the needs of the present and future generations.

However, there are indications that China's hydropower development model is fast becoming core sources of environmental quality/integrity violations. Also there are indications that the circumstances in which hydropower infrastructures agreement were entered into served as incentives for Chinese companies to engage in environmentally unfriendly dam construction activities as a survival and going concern strategy respectively. There are also evidence of Chinese dams construction induced environmental quality violations that have left the SSA in a bad shape, in an attempt by the Chinese to import the much needed raw materials in exchange for dams.

Consequently the emerging questions that flow from the above, among others include:

- * What are the social, environmental and national security failures or deficits of Chinese built dams in the SSA?
- * What are the gains or accomplishment of Chinese built dams in the SSA?
- * How have Chinese hydropower projects in the SSA assisted green economy compliance?





- * What are the gains or accomplishments of the Chinese hydropower projects in the SSA?
- * How has the Chinese built dams impacted on green economy in the SSA?
- * Political Conclusion: what remain to be done or what is the way forward?

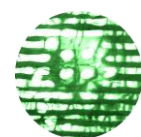
Taking the above into consideration there is the critical need to x-ray the past; address the present; and proactively manage the economies of the SSA within the context of the interactions of Chinese hydropower projects, green economy and sustainable development.

Successful China Hydropower Infrastructures Partnership with Sub Sahara Africa

SSA largely remains deficit in hydropower infrastructures and this represents a fundamental issue in the rising incidence of poverty in the SSA. China has to intervene in the last decade, but this may leave the SSA worse off if not properly coordinated/monitored. Against the foregoing background, in order for the current Chinese hydropower infrastructure development effort in the SSA to be a success, a partnership between the EU, the United States and China that seek to genuinely construct mechanisms and measurements aimed at assisting the SSA enthrone a sustainable hydropower infrastructures development framework needs to be developed.

As China's dams construction increase in the SSA, there is the likelihood that huge problems may emerge that could bring its own development risks and long-term repercussions across the SSA. Consequently key questions of infrastructural dependency, ownership and macroeconomic development emerges. These include:

- * In what ways do the patterns of Chinese hydropower infrastructures reinforce existing macroeconomic reforms and structures industrial development and jobs creation in the SSA, or does it work against them?
- * How has or will Chinese dams constructions transform ownership of development process in the SSA?
- * How has or will Chinese dams projects affect the reduction of poverty in the SSA?
- * How do the different classes of SSA citizens perceive China's growing hydropower infrastructures role in the SSA?
- * How do politicians and political parties in the SSA countries play the China card, are they active or docile in assessing the social, economic, environmental and national security implications?
- * In what ways does China deliver hydropower infrastructures development aid and how is it different and distanced from that of the West? How are different discourse of sovereign cooperation and development mobilized with respect to hydropower infrastructures development?
- * How are Chinese hydropower projects engagements in the SSA decided upon and allocated?



- * What level of conditionality exists in Chinese dams projects aid? What effects does this have on policy autonomy in the SSA states?
- * What tensions exist on ground over hydropower infrastructures actors' coordination in the SSA? Are traditional and other emerging infrastructures actors and China seeking to cooperate and collaborate with each other?
- * To what extent does Chinese dams engagement in the SSA comply with the equator principles?
- * What are the earthquake implications of the current spade of Chinese built dams in the SSA?

Other emerging questions aimed at exposing the fundamental requirements for China hydropower infrastructure aid/investments partnership in the SSA include:

- * How beneficial is China's hydropower relationship with the SSA?
- * Is the SSA learning the ropes?
- * Is the SSA leveraging on China's experience?
- * Is the leveraging on strategies which saw China out of hydropower deficits?
- * Is SSA-China hydropower infrastructures with the SSA akin to that of the traditional actors?
- * Is there a strategic blueprint in place in the SSA to make China transfer its technology to the SSA? The enthronement of a dominant structuralist paradigm in which the challenge should be to constantly seek optimum combination of the participation of public and private organizations (SSA, Chinese, European etc) in infrastructures development for the purpose of maximizing of SSA citizens welfare effectively, efficiently and equitably.
- * The promotion of investment in infrastructures, especially improvement of systems maintenance practices that should sustain infrastructures.

In addition to the above the following also need to be activated or installed as further imperatives for hydropower infrastructure sustainable development in the SSA:

- * The two continental mechanisms of African Peer Review Mechanism (APRM) and Pan African Parliament (PAP) should be strengthened and made more responsible in its oversight function or to serve as a check on the negotiation, implementation and monitoring and evaluation of hydropower infrastructures rehabilitation, maintenance and new construction by both the traditional and emerging infrastructures actors in the SSA (China inclusive).
- * Infrastructure financial crime and corruption reduction and elimination agencies (parallel judicial bodies) such as the Economic and Financial Crimes Commissions should be installed and strengthened in the SSA as a means of tackling infrastructures (hydropower inclusive) embedded corruption.





In addition efforts must be setup to assist in the development of institutional support mechanisms in dealing with hydropower infrastructures rehabilitation and new negotiation and full commitments with both the traditional and emerging infrastructures actors in the SSA (China inclusive). As a matter of urgency continental and sub regional infrastructures development secretariats in the SSA be domiciled in the AU and sub-regional organization such as SADC, ECOWAS etc.

Others include (Olu Ajakaiye, 2003):

- * The introduction of regulatory framework and capacity building for regulations with a view to promote policy and regulatory harmonization with a view to facilitate cross boarder interactions
- * The installation of policy and legislative framework that should encourage competition among traditional and hydropower infrastructures actors in the SSA (China inclusive).
- * The promotion of community and user involvement in hydropower infrastructure construction, maintenance and management especially in poor urban and rural areas.
- * To be able to ensure a better deal in the China-SSA hydropower infrastructures relations, the AU and other regional infrastructures development agencies should redefine the infrastructures partnership between China, EU, the United States and others from an African Perspective and Leadership.

The continental mechanisms of African Peer Review Mechanism and the Pan African Parliament should be strengthened and made more responsible to carry out its oversight function or to serve as a check on: the negotiation, implementation, and evaluation of hydropower infrastructure rehabilitation and new construction by both traditional and emerging infrastructure actors; and corruption, with a view to ensuring the integrity and efficiency of hydropower infrastructures development process in the SSA.

Policy Prescription/Conclusion

The SSA continues to present a sad case of a region excluded from world trade and development largely as a result of the decay and deficits in infrastructures development (hydropower inclusive). However, as at today China offers a wide range of monetary and non-monetary packages for hydropower infrastructures development in the SSA. This includes grants and loans, plants and equipments and training and technical assistance, which is largely tied to china's quest for raw materials. However the potential impact of China's infrastructures aid or investments in the SSA will depend to a large extent on the institutional, structural and governance capacity of the SSA (Dorothy McCormick) which for now seems very low, but to which China should remain committed and proactive for mutual benefit of China and the SSA.



The SSA hydropower infrastructures development partnership offered by China can be strengthened or deepened through a lot of ways amongst which are:

- i. China should within the context of Sino-Africa strategic partnership commit the SSA governments to a medium term hydropower infrastructures development and wealth creation priorities within the goals and aspirations of the Millennium Development Goals (MDGs) and Economic Partnership for Africa Development (NEPAD) that is driven on the terms of both China and the SSA.
- ii. China should evaluate the contribution of aid/investments in hydropower infrastructures in the SSA within the context of Sino-Africa strategic partnership and from time to time evaluate and rely on them in terms of:
 - * To what extent has hydropower infrastructures aid/investment resulted in building domestic investments?
 - * To what extent do hydropower infrastructures aid/investments impact on human welfare?
 - * What extent have Chinese built dams engagements induced social and environmental concept?
 - * To what extent has hydropower infrastructures FDI from China facilitated development in the SSA?
- iii. China should put in place a hydropower infrastructures collaboration and cooperation actions and goals that is targeted at developing jobs and export manufactures in the SSA to which both the Chinese and Africans are employees
- iv. Within the context of Sino-Africa relations and long term strategic survival and development, China and the SSA should develop strategy for supporting NEPAD and expanding regional hydropower infrastructures integration programmes. With a view to supporting intra-regional developments in terms of:
 - * Vastly improved utilities-power, energy and communications.
 - * Provision of quality water-for irrigation, with necessary reticulation, portable water and water for industrial use.
 - * Investments for human capital with emphasis on entrepreneurial and technological skills and information technology competences.

In addition given the dominant contribution of agriculture in most SSA countries GDP, hydropower infrastructural development within the context of China-Africa relation should emphasize improvement and upgrading competitiveness in the agricultural sector through the development of key process industries.

Against the above background in order for the current Euro-America and Chinese hydropower infrastructural development effort in SSA to be a success, a partnership between the EU, the United States and China that seek to genuinely construct mechanisms and measurements aimed at assisting the SSA enthrone a sustainable hydropower infrastructures development



framework where the SSA is not treated as a development destitute needs to be established. Therefore, the EU, US, China and SSA need to collaborate with each other in a multi-polar framework that should address the following issues:

- * How can SSA hydropower infrastructure be developed through a genuine and collaborative partnership between the US, EU, China and SSA?
- * The private sector is a key player in hydropower infrastructural development. How will a partnership between the EU, US, China and SSA support more effective private sector participation in the SSA infrastructural development?
- * How can the partnership between the EU, US, China and SSA support or accelerate sub-regional infrastructural development in SSA?
- * What are the accompanying measures that the quadrilateral relations can introduce to ensure a sustainable hydropower infrastructural strategy for SSA that encourages economic growth and scale up of poverty reduction?
- * In which way will the EU, US and China participate in an integrated Euro-America, China and SSA infrastructural development framework for hydropower infrastructure related technical assistance with a view to improve trade and scale up poverty reduction?

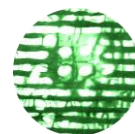
SSA remains a ground for fragmented EU and United States hydropower infrastructural development cooperation and collaboration with each wanting to impose its own terms or conditions which has made it difficult for sustainable development architecture to be put in place. Worse still the Chinese infrastructural development strategy is on isolated basis and no attempt to collaborate with the EU or North American actors. This represents a global development challenge to SSA and call for a paradigm shift in the infrastructural development of an infrastructural complex and deficit SSA. The immediate importance of these is:

- i. Unless the EU, the US, China and SSA re-strategise the basic parameters for a collaborative hydropower infrastructural development role, SSA will continuously be dogged by chronic power deficits and underdevelopment.
- ii. Unless the EU, the US and China collaboration intervene by assisting the SSA using their huge mineral and human resources as a basis for building development capacity (infrastructures inclusive) and within the context of NEPAD, the MDGS or other sustainable alternatives, the consequences will be chronic power deficits and underdevelopment.
- iii. In crafting a new role for the EU, US and China in the hydropower infrastructural development of SSA, they must first identify, harmonize, coordinate and give special high priority to existing infrastructural development policies and their impact on food and security, intra and international trade, and socio-economic challenges.



- iv. This proposed new EU-US-China-SSA partnership should create new infrastructural opportunities in the context of repositioning SSA in the new world economic order and scale up poverty reduction.
- v. The partnership should enhance sub-regional organisations' participatory planning in hydropower infrastructures policy formulation implementation and evaluation with a view to improve SSA global competition and the standard of living.
- vi. In addition, in line with the recommendation of the China Export-Import Bank on infrastructures development (Go Zhen 2007):
 - There should be frequent contact with the World Bank, African Development Bank and other multi-lateral and bilateral agencies.
 - Work with leading commercial banks that are active in the SSA
 - Strengthen the efforts by sub-regional and regional banks.
 - Underline each other's policy and operations and find ways to strengthen it for the interest of the SSA or mutual benefit of the SSA and the hydropower aid donors or infrastructures investors.
 - Identify potential opportunity for cooperation
 - Provide opportunity for contact and periodical meeting for the review of where we are, where we should be, what we are doing wrong and what we are doing right.

If hydropower infrastructural development in the SSA is to yield positive results and scale up poverty reduction the SSA should explore practical avenues for cooperation between North America, European Union, China and the SSA, preferably in NEPAD Policy Field. This notwithstanding, it is fundamental that the critical actors in the whole hydropower infrastructures development process should be the SSA countries and their regional or sub regional organizations; it should be SSA driven/led. In addition China built dams agreement should comply with the equator principles and international environmental quality standards.





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