

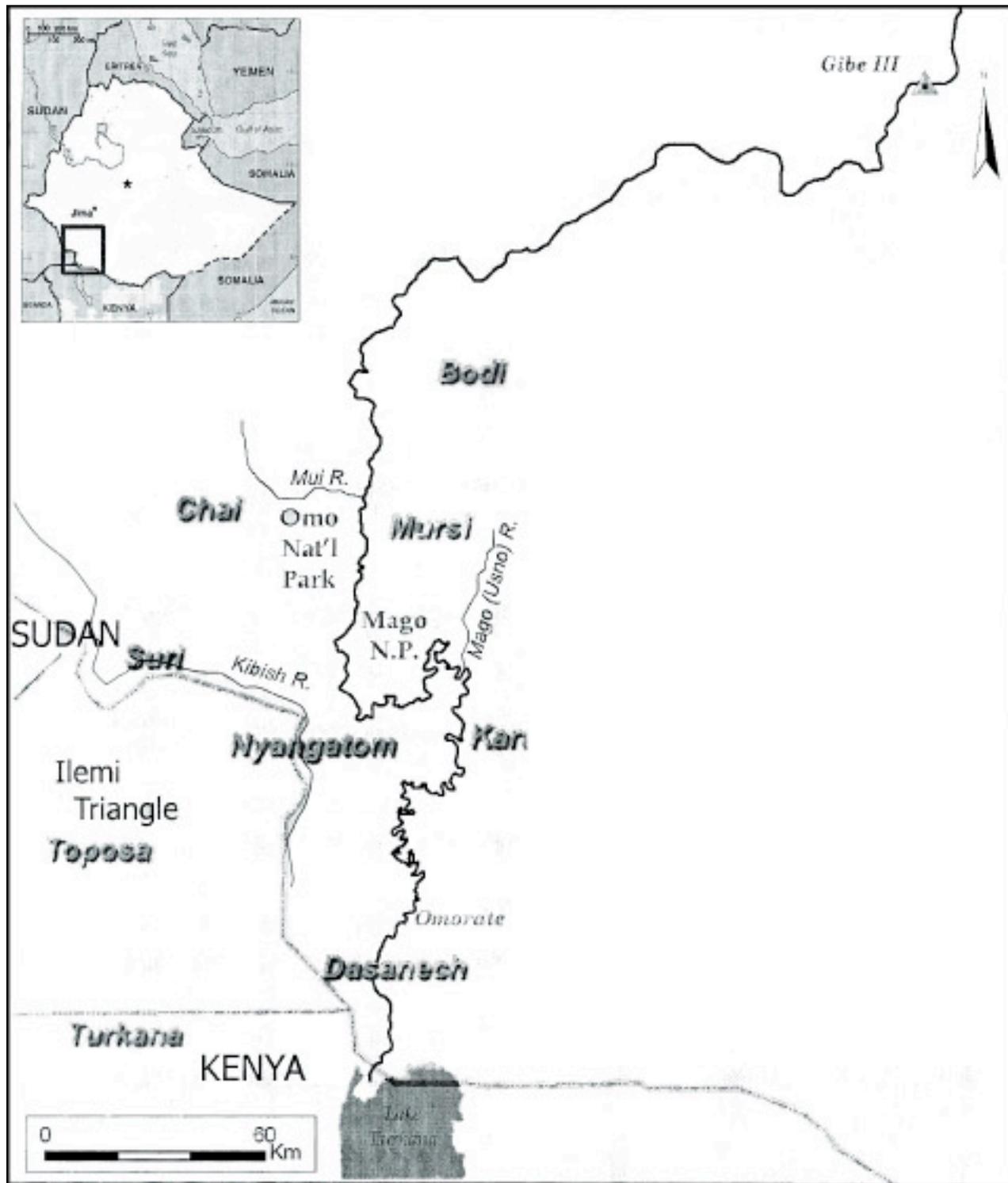
**A Commentary on the Environmental, Socioeconomic and Human Rights
Impacts of the Proposed Gibe III Dam
in the Lower Omo River Basin of Ethiopia
JANUARY, 2009**

by the

**Africa Resources Working Group (ARWG)
ARWG-GIBE.org**

in response to:

**The Downstream Environmental Impact Assessment
for the GIBE III Hydroelectric Project
by
Agriconsulting S.P.A. and MDI Consulting Engineers for
the Government of Ethiopia (April 2008)**



INTRODUCTION

The Africa Resources Working Group (ARWG) is a cluster of eight scholars and consultants from the United States, Europe and eastern Africa, with extensive experience in large hydrodam and river basin development research and policy issues in the Horn and East Africa, including in Ethiopia. Because of the political sensitivities involved in conducting professional work within the region, members of the ARWG have chosen to withhold their identities, for the time being, with one member of the Group serving as the contact person for purposes of communication with interested parties. Professor Jeffrey A. Gritzner, Department of Geography, University of Montana, Missoula, Montana (jeffrey.gritzner@umontana.edu), is presently serving in this role.

In May of 2008, the ARWG released its Commentary regarding the 2006 Gibe III Hydroelectric Project Environmental Impact Assessment (EIA), prepared by the Italian firm Centro Elettrotecnico Sperimentale Italiano (CESI) for the Ethiopian Electric Power Corporation (EEPCo) and the Italian construction firm, Salini Costruttori S.P.A.

An additional EIA, entitled “Gibe III Hydroelectric Project: Environmental Impact Assessment - Additional Study on Downstream Impact”, prepared by Agriconsulting of Italy, in association with MDI Consulting Engineers for EEPCo, was released in April of 2008. This Commentary focuses on the 2008 Downstream EIA.

The Gibe III Hydroelectric Project on the Omo River is a ‘public-private partnership’ planned as part of the 25-year national energy master plan of Ethiopia. (This plan was based on a study prepared by the Canadian firm, Acres International Ltd., in 2003; a 2005 update of the plan set the objective of tripling the power supply in five years, to 2,842MW by 2010. The planned increase in power generation, however, far exceeds domestic needs, with the surplus (by some estimates – 50%) being exported to neighboring countries. The Gibe III Hydroelectric Project is planned to generate 1870 MW of electricity. The dam is planned at a height of 240 m, with a reservoir of 151 km in length – the second largest in Africa. The cost of the Gibe III project is estimated at \$1.7 billion, for which foreign financing is currently being sought. The EEPCo predicts the export of 200MW to both Djibouti and Sudan, and 500 MS to Kenya.¹

¹ The basic characteristics and history of the Gibe I, Gibe II, and Gibe III projects are described in two important recent reports: “The Giggle Gibe Affair. An analysis of the Gilgel Gibe hydroelectric projects in Ethiopia.” Campagna per la Riforma della Banca Mondiale (CRBM). 2008; “What Cost Ethiopia’s Dam Boom?” A look inside the Expansion of Ethiopia’s Energy Sector. International Rivers (Terri Hathaway). 2008.

After thorough evaluation of the ‘Downstream EIA’, there is consensus among ARWG members that the document rests on a series of faulty premises and that it is further compromised by pervasive omissions, distortions and obfuscation. The downstream EIA is laced with tables and figures with multiple types of ‘quantitative data’, creating the illusion of a scientific work. While this practice is well known to increase the likelihood of approval by development, finance and oversight agencies, it is fully unacceptable.

The quantitative (and qualitative) data included in virtually all major sections of the report were clearly selected for their consistence with the predetermined objective of validating the completion of the Gibe III hydrodam. The design and content of the entire environmental and social ‘investigation’ is demonstrably crafted to support this predetermined conclusion.

These failings combine to invalidate the document as a whole.

According to the ‘downstream’ EIA, the Gibe III dam will not cause significant harm. Rather, the report asserts, the dam is actually “necessary” in order to “preserve Lake Turkana”, to address a largely “backward and primitive concept of land use” by the region’s indigenous population, and to preserve – even restore - the region’s biological integrity and diversity.

To the contrary, an accurate assessment of environmental and social processes within the lower Omo Basin indicates that completion of the Gibe III dam would produce a broad range of negative effects, some of which would be catastrophic in the tri-country region where Sudan, Ethiopia and Kenya intersect. The following are some of the key effects that are predictable from the proposed completion of the Gibe III dam that are either distorted or omitted altogether in the ‘downstream’ EIA produced by EEPCO.

The following are some of the expected key effects:

(1) Radical reduction of inflow to Lake Turkana, since the Omo River provides up to 90% of the total input to the Lake. Estimates as high as a 10-12 meter drop in lake level are realistic; even the most minimal drop in lake level (e.g., 5 meters) would cause cessation of flooding in the Omo delta altogether, and large scale retreat of much of Lake Turkana. Radical reduction of Lake Turkana waters, with sharply rising salinity conditions, would lead to a decline of aquatic ecosystems – including fish stocks, the loss of potable water for human populations and livestock, and the destruction of significant commercial interests (fishery, tourism, etc.) at the lake. **A possible 50-75% leakage of waters from the reservoir,** due to multiple fractures in the basalts at the planned reservoir site, with only a portion of these waters *ever* re-entering the Omo River system, would produce an even greater reduction of inflow to Lake Turkana.

(2) Risk of seismic activity in the Gibe III project region, with the possibility of a major seismically determined event – including earthquake and massive landslide potential. The seismic danger is actively discounted within the 2006 Environmental Impact Assessment

released by EEPSCO, and omitted altogether in the ‘downstream’ EIA (in the following pages, ‘the EIA’ refers to the *downstream* EIA, unless the 2006 document is specified).

(3) Major tri-country transboundary economic, political and ecological repercussions, involving southwestern Ethiopia, northwestern Kenya and southeastern Sudan.

Kenya: In addition to the above mentioned effects, the sharp drop in Lake Turkana volume will include the **virtual elimination of the approximately 500 square kilometer modern Omo delta, which is presently located mainly within Kenya – *not* “between Kenya and Ethiopia”**, as stated in the EIA (the recent rise in the lake puts some of the delta back into Ethiopia – cf. Google Earth image, December 2005). **Ethiopia:** destruction of subsistence economies dependent on riverine cultivation, herding, fishing and other activities, with attendant escalated poverty and conflict; deterioration of newly pressured grazing lands throughout the lower Omo Basin (see below). **Sudan:** In the Ilemi Triangle region, increasing competition for grazing and water resources, with political conflict involving at least five of the region’s ethnic groups.

(4) Elimination of the riverine forest and woodland, due to at least a 57% to 60% reduction of river flow volume, with accompanying destruction of forest biodiversity and virtually all riverine associated economic activities, including human settlement.

(5) Cessation of all recession cultivation (or ‘flood retreat’ cultivation), along the lower Omo River and throughout the Omo delta, resulting in economic collapse for tens of thousands of agropastoralists who are *directly* dependent upon such cultivation for their survival, and massive impoverishment for a far greater number of the lower Basin’s indigenous population dependent on these cultivation systems for food products through trading relations. Moreover, there is no rainfed cultivation ‘alternative’, as the EIA states. At least 200,000 indigenous pastoralists and agropastoralists within the lower Omo basin will face livelihood devastation from such losses.

(6) Exponential increase in expropriation of pastoral and agropastoral lands in the riverine zone, for planned government sponsored and private large-scale irrigation agriculture and industry. Significant expropriation of these lands has been underway for the past twenty years, in particular, within the lowermost Basin and in the Omo and Mago park regions. This reduction of access would occur within the context of already severely depleted livestock herds.

(7) Pervasive downstream destruction of ecological systems and indigenous that would not be mitigated by ‘planned’ flood simulation (or flood release from the reservoir). Such flood simulation has not been extended or effective in Sub-Saharan Africa, and there is strong evidence that circumstances would dictate against this practice in Ethiopia. Although described as a definite component of the proposed Gibe III program, it is a fact that there is no case of successful implementation of downstream flooding within Sub-Saharan Africa.

(8) Obfuscation and distortion, if not outright fabrication – of the ‘Public Consultation’ process allegedly implemented by the EIA network of researchers, consultants and government-controlled local officials.

Altogether, more than 200,000 indigenous peoples of the lowermost Omo Basin are dependent on riverside and delta recessional cultivation, as well as grazing resources, food gathering, fishing and other activities wholly dependent on flooding by the Omo River. This population would face massive economic losses, with widespread severe hunger, disease and loss of life occurring on a regional scale, if completion of the Gibe III dam is completed.

Faced with an entirely new level of desperate circumstances, the region's already disenfranchised and impoverished ethnic groups – virtually all of them, heavily armed – will likely be forced into intense political conflict with one another over resources no longer adequate for their mutual survival. Combined with the repressive policies of the region's governments toward their indigenous pastoral populations and the likelihood of further eruption of armed conflict within the southern Sudan region, a human rights crisis of unprecedented proportion must be predicted. The threat of a major humanitarian disaster and political conflict, contributing to a massive human rights crisis zone in the tri-country Ethiopia-Kenya-Sudan border region, should be a matter for major international concern.

AGROPASTORAL ECONOMY AND VULNERABILITY IN THE LOWER OMO RIVER BASIN:

The following is an overview of fundamental ecological and socioeconomic characteristics of the lowermost Omo River Basin that must be understood as 'baseline conditions' for any adequate environmental or social impact assessment. The EIA has ignored and distorted most of the basic features of these conditions.

The lower Omo Basin is internationally recognized as a semi-arid region with extraordinary biodiversity, partly because of its geographic location where different ecosystem types intersect and partly because it supports what may be the only remaining 'pristine' riparian forest within the drylands of Sub-Saharan Africa. There remains strong potential for conserving this natural heritage area of Ethiopia and for a program of sustainable development that protects the environmental integrity of the region, including its expansive grasslands and wildlife.

The lower basin's indigenous pastoral and agropastoral economies are also exceptionally diverse. For the most part, these economies which had maintained sustainable resource use patterns for centuries, have ushered in changes – largely, economic and political in origin – that have resulted in widespread rangeland deterioration, particularly from recent territorial restriction of the region's ethnic groups, who have long been accustomed to seasonal movements and settlement patterns without regard for 'national boundaries'.

Major reliance on recessional cultivation, particularly in the Omo delta, on silt berms and on river banks, has emerged as the major livelihood component for vast numbers of agropastoralists whose herds have radically declined as a result of rangeland deterioration. Recessional cultivation in these different localities, along with the economic

diversification to food gathering, beekeeping, riverine fishing and other activities are dependent on seasonal water infiltration of natural levees and backslopes from the Omo River.

I. Omo Riverine and Upland Environments: Fragile Ecosystems

- **Together with the specialized environments created by the Omo River, the geographical convergence of different ecological zones in the lower Omo Basin contributes to the region's exceptionally high biodiversity, particularly for a semi-arid region.**

Mosaic-like vegetation matches the region's widely varying habitats, which include, in addition to the Omo River, large and small ephemeral watercourses, relict beach ridges, floodplains and basin pans, scattered volcanic highlands and volcanic outcrops, hot springs, tuffaceous exposures, and unique lacustrine habitats surrounding Lake Turkana.

- **The Omo River is one of the last relatively large rivers remaining in semi-arid Africa that is little regulated** (except by the Gibe I and Gibe II projects). With source waters in the highlands of Ethiopia, the river gradually descends to the lower Omo Basin and through a series of gorges in the northern part of the lower Basin. In the Omo National Park, the river is bordered by a mixture of riparian forest-woodland, mixed with a variety of dry community types. Continuing southward, the Omo opens into a relatively open section of predominantly grassland, where it forms a strongly meandering system, then continues to its terminus at the northern end of Lake Turkana.

The Omo River's annual flooding and inundation of banks, or natural levees, is essential to the survival of the unique riparian forest. Both northern and southern riparian forests contribute to the lower Basin's high biodiversity. The dominant species of higher altitude zone forests, such as those near the Mago, Mui and Mara tributaries, are different from those in the lower, meandering portion of the river.

- **Ground water recharge in periodically active and relict floodplains as well as other depositional units lateral to the present channel requires waters from the Omo River, whether from flooding or lateral inundation: precipitation in the region is too limited and erratic to be able to contribute much in the way of recharge.** With sufficient moisture, vegetation in these areas – mostly grasses and wooded scrub that is irregularly distributed – serves to prevent excessive evaporation from soils, as well as large-scale sheet erosion. Since precipitation is low and erratic, ground water recharge is a critical factor in the maintenance of both riverine zone and floodplain ecosystems.
- **Ethiopian, Kenyan and international wildlife experts regard the region to be one of the richest in species within the broader region, largely due to the presence of the Omo River and its tributaries. Largely as a result of the encroachment of modern systems, causing an accelerating deterioration of the**

region's complex habitats, 'biodiversity' has regressed to 'restoration potential'. This is now a matter for urgent concern, if the natural heritage or 'natural resource capital' of the three nations involved is to be retained. Large wildlife populations have been recorded in recent years in the lower Basin, although many have now become severely depleted. Eland, oryx, topi, Burchell's zebra, hartebeest, lion, leopard, cheetah, elephant, bat-eared foxes, gazelle, gerenuk have long populated the lower Omo Basin's grassland communities. Riparian forest and woodland areas support a rich wildlife population including hippo, elephant, crocodile, at least three species of primates, kudu, bushbuck, waterbuck leopard, and a wide variety of bird species including fish eagle, goliath heron and dwarf bittern.

- **Omo (and secondary) riverine. upland plains ('grassland' or 'savanna') and Lake Turkana environments are comprised of ecosystems that have unique resources and features regional in scope and highly fragile. Already, certain environmental restoration measures will likely have to be taken, if these lands – stretching from the Ilemi Triangle (presently administered by Kenya, with claims retained by Ethiopia), eastward to the fringing highlands, east of the Omo River, southward to Lake Turkana and into contiguous northwest Kenya, where the Omo River delta and Lake Turkana punctuate the otherwise highly arid lands – are to remain part of a future sustainable resource base.**

There is strong potential for ecotourism development in the region, for example, which could be a key component of these three nations' programs to mount an environmentally and economically sustainable resource management program in this ecologically and culturally unique region.

II. Indigenous Economies and Their Dependence on the Omo River

- **At least 200,000 indigenous people are heavily dependent on the Omo River for their survival. These people are part of at least eight distinct ethnic groups reside in the central portion of the lower Basin: the Mursi, Bodi, Kwegu, Suri, Aari, Karo, Nyangatom and Dasanech.** Languages within the lower Omo basin belong to three different families: Cushitic, Nilo-Saharan and Omotic. They are primarily agropastoral, combining livestock herding with recessional cultivation (or flood retreat cultivation), with most recessional cultivation occurring along the Omo River and its tributaries. Cultivation is now an essential part of the economy for the vast majority of these ethnic groups.

In recent years, an increasing proportion of the lower Omo Basin's population has engaged in cultivation. In large part, this shift has resulted in the overgrazing of rangelands and decline of household and village-held livestock herds: a deterioration process largely resulting from Kenya and Ethiopian government enforced territorial constrictions of the territories of these ethnic groups. These decisions are generally made without regard for, or even knowledge of, their populations' sizes and economic needs.

The complex patterns of sharing herding, planting and other resources – as well as

competition for those resources – underscore the tri-country, transboundary system of relationships involving Kenya, Ethiopia and Sudan. The broad system of ethnic groups within the region form one of the most highly diverse cultural indigenous contexts in the world. In addition to those groups identified above, there are neighboring groups who also have significant dependence on the Omo River's resources. These groups include the Me'en, Hamar, Dizzi, Chai, Arbore, Toposa and Turkana, among others.

- **Recessional cultivation and livestock herding are the two fundamental components of livelihood throughout the lower Omo Basin. Herding and recessional cultivation are the two 'pillars' of the lowermost Omo region's indigenous survival strategy systems – systems that have evolved through centuries of cultural knowledge and intricate understanding of the natural environment.** These are essentially risk-minimizing and highly adaptive systems for coping with the difficulties common to semi-arid environments in agropastoral Africa – namely, prolonged drought; crop, livestock and human diseases, social conflict and other disruptions.

This survival strategy system has evolved in such a way as to minimize the risk of economic failure by maximizing options among subsistence activities and the distribution of livestock, cultivation and other products. This type of economy is critically important in view of the unpredictable, but nearly inevitable, occurrence of natural hazards such as prolonged drought or disease epidemics. This 'risk minimizing economy' presupposes access to sufficient land and riverine resources, however, if catastrophic losses are to be prevented.

The agropastoral survival strategies in the lower Omo Basin include: **(1)** accumulation of maximum material capital, or cultivation land (usufruct rights) and livestock (primarily cattle but also goats and sheep) for meeting immediate subsistence needs but also as a means of economic security; **(2)** high mobility of livestock herds, with flexible seasonal movements between upland plains and riverine zones (in order to cope with changing conditions); **(3)** economic diversification – recessional cultivation and livestock herding with secondary production activities including food gathering, fishing, bee-keeping, chicken raising, and household commodity production – most of which are focused in the riverine zone; and **(4)** extensive exchange networks – for material and social exchange, particularly involving recessional cultivation and livestock production.

- **Given the apparent increasing environmental deterioration and declining livestock potential of the lower Basin, however, the transition to partial or heavy reliance on recessional cultivation has essentially become permanent for a high proportion of households throughout the lowermost Omo region.** In this region of highly erratic rainfall in both amount and distribution, recessional cultivation is a key component of subsistence for almost all ethnic groups, especially during periods of prolonged drought or livestock disease epidemics. Shifts to cultivation by a household or village may be temporary or permanent, depending upon circumstances.

- **Recessional cultivation is practiced in the widest possible range of habitats, including point bars, river banks (including those with very steep slopes), natural levee backslopes, active floodplains, throughout the Omo Delta, along the Omo's tributaries (e.g., the Mago River) and some of the larger ephemeral channels.** These cultivation systems are 'sustainable' ones that have evolved in tandem with the Omo River's annual flood, with planting occurring just after the waters recede. Local systems are highly adaptive shifts in the Omo River's *amount* and *seasonality* of flow.

If the Gibe III dam is completed, there will be no flood or recession agriculture along the river or in the delta. Moreover, the region does not support rainfed cultivation, except under the most occasional and opportunistic circumstances. The EIA refers to such 'rainfed cultivation' as a viable alternative to recession cultivation: there is no such alternative.

Extreme flooding, such as that occurring in 2006, has occurred in the lower basin only once within the past fifty years: there have not been destructive floods in numerous years, as repeatedly claimed in the downstream EIA.

Sorghum, millet, maize, peppers, squash, tobacco and a variety of beans constitute much of region's planting. While the technology used by the vast majority of households engaged in cultivation remains basic – mainly hoes, machetes and digging sticks – this should not be confused with low productivity. To the contrary, recessional cultivation systems, practiced for thousands of years along rivers in Africa, are *highly productive systems*, given high solar input and other factors. The product harvested is variously used for consumption and for exchange – in the latter case, both through local 'social safety net' or reciprocity relations, and through regional trading systems.

Experience in comparable cultivation systems in Sub-Saharan Africa and elsewhere has clearly shown that the most useful additions to existing productivity or risk minimization techniques (for example, to conditions of widely fluctuating flooding occurrences) come from agroecological practices known in other longstanding traditional systems - not from the introduction of irrigation and chemical requiring crops, such as those introduced in part of the lowermost Omo by missionaries and others, in recent decades.

The substitute of 'modern' -irrigation and chemical dependent – cultivation for centuries old cultivation systems has been consistently shown to markedly increase, not decrease, the risk of crop destruction, food deficit, and social stratification – or destruction of local 'social safety nets' – sometimes with disastrous results.

- A few additional aspects of the survival strategies serve to underscore the importance of riverine resources to the survival of the region's indigenous population.

The Omo River is also essential to indigenous economies of the Basin for livestock herding, which occurs all year (depending on the locale), particularly during dry seasons

and in times of prolonged drought, when pasturage and browse are largely in the surrounding plains. Much of the livestock herding near the river occurs in the 'transition' between forest and closed woodland, on the one hand, and the grasslands and 'steppe' (discontinuous ground cover) of the ancient (non-active) floodplains throughout much of the region. Where these grassland communities extend to the river's edge, such as on outside bends of the Omo River, livestock use extends to the water. Livestock also utilize the Omo's waters with traditional watering spots where there is access to water. **The loss of access to watering places along the river, resulting from steep slopes and bank erosion following large dam construction upstream, has been well documented, including along the Awash River in Ethiopia, along the Tana River in Kenya, and elsewhere throughout the Horn and East Africa region.**

- Exchange of food and materials among villages engaged in livestock herding and cultivating are essential to both types of communities. While primary exchange involves milk for grain, livestock – particularly goats and sheep – are also 'traded up' for cattle – an important method of rebuilding herds. Labor cooperation and other forms of social exchange, including gifts and loans – a critical means of wealth redistribution – are pervasive throughout all levels of the region's social systems.

- All indigenous economies in the lower Basin engage in production activities other than herding and recessional cultivation. These types of *subsidiary production* play a vital role in the survival of large segments of the population, especially during prolonged drought periods or other times of extreme hardship. While specific types of production vary among groups, they include: gathering of food and other plants; fishing – particularly in the Omo River and Lake Turkana; chicken raising; crafting of cooking pots (utensils and gourds); bee-keeping; woodcutting and charcoal sale; and occasional hunting. The majority of these subsidiary activities are dependent upon riparian environment resources and, in most economies, the level of dependence on these resources increases with poverty level.

Despite its relative geographic isolation from major social changes underway in East Africa and the Horn region during the nineteenth century and early decades of the twentieth century, the lower Omo Basin was significantly impacted by those years. Early explorers and plunderers caused some havoc and disruption of culture and economy. Early British colonial and monarchical military incursions began, notably those accompanying Menelik's creation of an Ethiopian empire. These incursions easily overwhelmed the poorly armed pastoralists and agropastoralists of the region. The rinderpest epidemic of the 1890s dealt an additional blow to the livestock economy.

The long process of displacement of indigenous pastoralists from lands where they once moved freely, with loss of access to resources vital to their livelihood, has been intensifying for the region's indigenous peoples in recent decades. The proposed Gibe III project promises to raise this dispossession process to a new level.

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Northern and southern portions of the lower Omo Basin have experienced different versions of dispossession. For example, ‘soldier settler’ seizures in the northern area have been distinct from displacement by national boundary definition in the southern area.

In the southern region, new border agreements between British colonial systems in Kenya and Sudan on the one hand, and the Ethiopian monarchy on the other, designated specific land areas for entire ethnic groups, with little cognizance of who some of them were, let alone their population size or livelihood needs. A series of agreements and new ‘boundary lines’ in the Ilemi Triangle, for example, were established but all of these agreements were disadvantageous to the indigenous pastoralists.

The negative effects of these historical processes on the livelihoods of the region’s different peoples have much in common. Dispossession through relatively *indirect* means has occurred in both the lower Omo occurred through land titling in regions of both Ethiopia and Kenya - regions well removed from the Lower Omo region and Kenya/Ethiopia border region, with local groups forced into smaller land areas as ‘waves of displacement’ have occurred. All in all, these changes produced a disruption of the long-term sustainable but fragile agropastoral economies throughout the lower Omo Basin.

World War II brought waves of new external power impacts – from Italy during its occupation years, and then the routing forces of the British (who actually bombed the southernmost Omo region). Ironically, throughout these decades, in addition to being dubbed ‘primitive, most of the indigenous peoples were considered to be ‘warlike’ by the very forces engaged in dispossessing them. Meanwhile, a new process began that has continued and progressed to increasingly dangerous levels – namely, the acquisition of firearms. By the post-World War II years, certainly, the effects of these various types of dispossession reverberated throughout the entire region, with numerous clashes among ethnic groups reflecting their growing need to claim the shrinking available resource base.

- **The past few decades in particular have ushered in an era of new types of intervention and impact on the region, especially by the ‘modernization’ processes underway in Kenya and Ethiopia, which have involved major restrictions of the region’s pastoralists and agropastoralists to resources they have traditionally used.** Crisis level droughts occurring in the 1970s and in 1984-85 resulted in countless deaths from hunger and disease. In the face of largeness disasters would have been even more catastrophic for indigenous peoples throughout the region, had it not been for the Omo River and its recessional cultivation potential. During these two decades, most agropastoralists experienced huge livestock losses and developed new settlements and economy focused on cultivation – a transition that has become essentially irrevocable.

This has been particularly evident in the lowermost part of the Omo Basin, to cite one example, where the Nyangatom and Dasanech peoples (with a combined population of about 50,000) have had to cope with natural hazards they have long been adapted to - such as prolonged drought – but with the changed circumstances of their restriction from lands they have long used, both in the Ilemi Triangle (Sudan) and in the case of the Dasanech – in northern Kenya. Similar problems have confronted surrounding groups – including, for example, the Turkana and the Gabbra of Kenya, the Borana of the Kenya/Ethiopia border area, and many others within this

transborder region. As a consequence, all of the area's pastoral and agropastoral peoples have been forced to compete with one another for the diminishing grazing, water and other resources.

Additional dispossession and disruption of the ethnic groups of the lowermost Omo basin, from the planned irrigation agricultural schemes and industrial projects described in the downstream EIA and planned by the Ethiopian government (as described in Investment Commission and other documents) will precipitate waves of new conflicts among groups already competing with one another over the shrinking natural resource base available to all of them.

In view of the long-term violent conflict within southern Sudan – a conflict that already has fundamentally impacted the lower Omo region through massive infusion of firearms and shifting cultural alliances and conflicts, these are regional and international problems.

Indigenous groups in the *northern* portion of the lower Omo Basin have also been dealt a major blow to their economies in recent years. The establishment of the Omo National Park (1966) and the Mago National Park (1979) has particularly impacted the Mursi group that has long resided along the Mago and Omo rivers. Their situation is largely shared by the neighboring ethnic groups – the Bodi, Kwegu, Dizzi, Aari and Karo. Despite the fact that these peoples have long been settled in and sustainably exploited the resources in and around the territories allocated to the two national parks, recent park authority and government policies have severely restricted their access to these areas, and instead, have regarded them as 'invaders,' or 'poachers.' The Mursi and the neighboring groups continue to cultivate along relatively steep riverine slopes and in other suitable localities that they are still able to access. To date, the government has given no attention to their plight, let alone made an effort to redress their worsening situation.

SELECTED DEFICIENCIES OF THE DOWNSTREAM EIA REPORT

I. Errors in Calculations and Interpretation Concerning Omo River Flow Volume.

- Omo River overflow into the extensive adjacent 'floodplains', resulting in "excessive evaporation", has caused the recent drop in the level of Lake Turkana, along with deprivation of vital waters for recessional cultivation in the lowermost Omo Basin (including the delta).

Huge evaporation losses as a consequence of excessive, uncontrolled flooding further contribute to the current recession of Lake Turkana. **[From EIA]**

FALSE. In fact, the floodplain has played no role in the lowering of Lake Turkana. The 'floodplains' referred to are not active floodplains at all; they are ancient, or relict 'floodplains', or mudflats. Hence, there is no excessive evaporation and certainly no such "cause" of the recent drop in the level of Lake Turkana or withholding of waters from cultivated lands. Despite repeated references in the EIA to "unproductive

evaporation losses” in the floodplains “after the floods retreat” and “frequent critical events in the river delta having “...large and sudden floods”, **there has in fact been only one seriously destructive flood within the past fifty years, i.e., in 2006, and even that flood was primarily destructive only in the Omo delta region.**

The EIA asserts that “evaporation losses as a result of uncontrolled flooding” has been a cause of Lake Turkana’s recession. This is simply untrue. Flooding has never been controlled, yet Lake Turkana has risen and fallen significantly in the past 50 years. The sharp drop in lake level in recent years results from reduced precipitation in the large (more than 200,000 sq. kilometer) upper Omo Basin. (Variation between rainfall and lake levels in Omo River Basin and the Tana River Basin, with its far smaller drainage area, can be explained by slight shifts in the latitudinal position of the intertropical convergence zone).

- Increase in the Omo River’s flow volume during the dry season (by dam engineers, following the construction of the dam), will alleviate the “severe drought” and associated overgrazing conditions in the lower Basin. [From EIA]

FALSE. There is no causal relationship between volume of river flow during the dry (or wet) season, on the one hand, and drought conditions within the extensive rangelands of the lower Basin on the other. Drought conditions result from lack of rain. Overgrazing results from a complex of changes, including territorial restriction of indigenous peoples, with consequent overcrowding of livestock, among others.

The EIA’s assertion that there will be a carefully regulated flow that will actually alleviate grazing conditions is also completely unfounded. In fact, the reverse is overwhelmingly likely to occur: the precipitous drop in river flow, by radically reducing available pasturage and browse near the river, will cause massively increased grazing pressure throughout the region’s grasslands.

- The Gibe III dam will stabilize, not lower, the present level of Lake Turkana. No appreciable drop in lake level or constitution will result from the dam’s construction. [From EIA]

FALSE. Dam completion and reservoir filling will result in a substantial drop in the level of Lake Turkana. High estimates extend to 10 to 12 meters. A minimum of a 3 to 4 meter drop in lake level, calculated purely from the volume of water required for reservoir fill, is improbable as an estimate, in view of two phenomena:

(1) The high frequency of fissures in the basalts at the reservoir, with potentially extensive potential leakage from the reservoir, and

(2) Extensive ‘offtake’ of river waters downstream from the dam, primarily for planned large-scale and commercial agriculture and industrial development.

LEAKAGE OF RESERVOIR WATERS. A 50-75% leakage of reservoir waters is reasonable to predict from a completion of the Gibe III dam. Such leakage would result from the abundance of fractures in the basalts surrounding the proposed reservoir. This reservoir leakage would produce a markedly higher decline in flow volume into Lake Turkana than indicated by the EIA, and greater catastrophic effects on the region’s ecology and agropastoral livelihoods than otherwise predicted, even in this ARWG account. Although a portion of this water would eventually reenter the Omo River system (much of it only after decades, *or more*, however), but a significant portion of it would not reenter the river system at all. The well known ‘forty springs’ of Arba Minch, approximately 60 kilometers from the Gibe III dam location, result from fractures in basalts contiguous with those at the proposed dam site. There is no mention in the EIA of potential leakage from reservoir basalts.

‘OFFTAKE’ OF RIVER WATERS for irrigation agricultural and other water consuming (and *highly* polluting industries) – an abundance of which are already being solicited by the Ethiopian government, in anticipation of the completion of the Gibe III dam. Numerous projections are made throughout the EIA report for planned irrigation agriculture. Quantitative estimates of the hectares ‘planned’ or already allocated for corporate, or plantation agriculture (for example, cotton, and oil palm) are offered in different sections of the report, but the total potential irrigation in the lower basin are inconsistently estimated. One major problem is that some of the proposed ‘small-holder’ and other private agricultural ‘enterprises’ are erroneously regarded to be ‘rainfed’ or ‘flood agriculture’.

The EIA estimates ‘Rainfall rates, runoff coefficients and flows for the main sub-catchments of the Omo River’ (summary on page 30 /EIA). The full set of calculations utilized in the EIA for input to Lake Turkana is unclear, thus precluding a full accounting of the figures presented. Several inaccuracies in the EIA’s calculations are significant, however – these inaccuracies point to a fundamental deficiency in the document’s estimation of waters entering Lake Turkana. **Specifically, the EIA estimates far more contribution to Lake Turkana from sources other than the Omo River than is the case.**

- **According to the EIA, the Kibish River is included as a ‘sub-catchment’ component of the Omo River (‘Residual 2 in Figure 8), and its area contributes about 25% of the input to Lake Turkana. In fact, the Kibish River does not contribute waters to Lake Turkana.** The Kibish River terminates in ‘Sanderson’s Gulf’, where it largely remains on the surface, and evaporates. The contribution should therefore be 170 m³/sec., instead of 230 m³/sec. Most of the water on the Kibish plain, northward to the Mwi (Mui) River, also does not reach the Omo River; these waters also largely evaporate from the sediment surfaces.
- **The EIA includes that rainwater between Lake Stephanie & the Omo River enters Lake Turkana. While a portion of this precipitation does reach the lake, some of it does *not*, so the contribution is inflated.** Much of the ‘East Omo Lowlands’, from approximately the latitude of Kangati (or the north end of Nakwa Mt.) southward to Lake Turkana’s northern terminus, contributes zero waters to the Omo system or to the lake. Water from this series of drainage channels evaporates. (Those channels northward from Kangati latitude to the Usno confluence with the Omo do reach the Omo River, but with negligible contribution to its waters).

II. Exclusion of Consideration of Water Quality and Associated Effects of the Gibe III on Lake Turkana

- **The loss of *seasonality* of river flow and input to Lake Turkana, in addition to the marked reduction in flow *volume*, would affect a wide range of biota dependent upon seasonal fluctuation in environmental conditions.** In combination, flow volume reduction and elimination of seasonality may be predicted to have profound impacts on the ecological, economic and cultural features of the Turkana Basin. Empirical investigation regarding each of the following dimensions of potential change – in all probability, including a reduction in biological diversity and resource availability - is essential to an accurate environmental (and social) impact assessment.
- **Lake Turkana’s aquatic ecosystem would likely be affected by volume, seasonal rhythm *and* chemical changes caused by the proposed Gibe III project.** Possible effects range from impacts on the blue-green algae /phytoplankton species that are uniquely characteristic of the lake, to significant impact on the fish populations present. A 1972-1975 fisheries survey provided much ecological information regarding the 48 species of fish recorded: of these 48 species, 12 are confined to the delta region of Omo River inflow. Particularly those species in the littoral (lake margin to about 4 meters depth) region are likely to be affected, and these include several species, including tilapia (*Oreochromis niloticus*) and catfish (*Clarias lazera*) that are important in local economies. As noted in earlier sections, subsistence fishing has become significant – sometimes essential – in the survival strategy systems of the region’s declining indigenous economies (this includes certain segments of the Turkana people, of Kenya). As in

the Lake Victoria region of East Africa, conflict over reduced fisheries resources would likely emerge, and continue to escalate. Kenyan commercial fisheries, already subjected to strong fluctuation in recent years, would also likely be severely impacted.

➤ **Salinity increase in Lake Turkana.**

The EIA omits the effect of decreased flow of the Omo River on salinity of the lake.

A projected 10 meter drop in Lake Turkana waters would cause an approximately 33% reduction in water. With this impact on the lake level, a salinity increase of 146 % results.

Present salinity: 2332 mg/litre

Cl – 447; CO₂ - 1068; Na - 743; F – 9

Salinity with a 100 cubic kilometer decrease: 3397 mg/liter

Cl - 651; CO₂ – (?); Na -1082; F1 – 13

- **The Omo Delta and northern shoreline area, for example, have long provided habitat for a unique abundance of hippopotamus and Nile crocodile, with extraordinary numbers of water birds. This entire area would be the first part of Lake Turkana to undergo major destruction of habitat and wildlife. Consequently, the unique floral and faunal systems of Lake Turkana would undergo major destruction.** The lake is now internationally recognized, including as a World Heritage Site for its abundance of wildlife, as well as unique floral and faunal species – many of which are barely described or understood, from an ecological perspective.
- **Local economies dependent upon recession cultivation (primarily in the delta, but also in lake shoreline localities), as well as lakeside livestock grazing and watering, fishing and food gathering would be destroyed by lake retreat.** Surrounding livelihood systems, including those of the Turkana, Dasanech, Rendille, Gabbra and other groups within Kenya and Sudan will all be severely impacted, with many local livelihood systems effectively destroyed.
- Much of the tourism at and around Land Turkana is likely to be fundamentally affected, if not dismantled. Although sport fishing and tourism have undergone wide fluctuations in recent years, any future recovery would be seriously questionable.

In view of Lake Turkana's unique character within Kenya and its relatively undisturbed character, compared with much of the northern Kenya and the broader East African region, the above combination of changes would result in major biodiversity. It is possible that Lake Turkana will undergo massive drying out, should the planned Gibe III hydroelectric project be completed.

When viewed within the context of possible climate change underway in this region of sub-Saharan Africa, the transformations outlined above may be profound, or even irrevocable, should the proposed Gibe III project be taken to completion.

III. Distortion of Downstream Flood Simulation Likelihood and Effects.

Downstream flood simulation (with periodic, or seasonal reservoir “draw down”) is proposed by the EIA as a major mitigation. In fact, this proposed measure forms much of the basis for ‘justification’ of dam completion.

FACT: There is virtually no sustained implementation - even rare *short term* implementation - of downstream seasonal flooding from hydrodams in Sub-Saharan Africa.

The downstream EIA certainly does nothing to suggest that the Gibe III situation will be different, and in fact, there are numerous disclaimers in the document regarding the likelihood of its implementation, as detailed below.

Two major reasons that artificial flood simulation is not carried out on a sustained basis in large hydrodam projects are:

1. Downstream areas are neglected in virtually all safety net guidelines, and these guidelines rarely take account of the realities of downstream ecological and social systems. Dam analysis routinely neglects to make *accurate* estimates of the peoples affected in downstream environments.
2. Even in cases where flood simulation programs are recommended, included in planning documents, and in a few instances - actually implemented, they are not continued.

Two *conflicting* ‘logics’ are at play in the consideration of large hydrodam projects: the logic of maximization of power generation for revenues from domestic or export marketing of electrical power vs. the logic of provision for the survival and well-being of downstream indigenous peoples and the natural resources upon which they depend. The virtual absence of *any* effective system of downstream flood simulation in Sub-Saharan Africa, despite the continued stating of an *intention* to carry out such mitigating action in EIA after EIA, including the Gibe III EIA, should be interpreted within this context.

The absence of any successes in ‘planned’ downstream flood simulation within Sub-Saharan Africa is clear from the following list of ‘efforts made’, to date:

Pongola South Africa. Flood simulation that was initiated in the 1970s and 1980s was stopped in the 1990s, because political and economic pressures for in water for irrigation.

Manantali in Senegal. Downstream flooding was conducted for some short period, but was stopped altogether, due to “electric power needs in urban areas”. (Urban and industrial interests typically prevail in deliberations regarding the generation of electricity vs. what is seen as “non-economical”, “backward” or “purely humanitarian” uses of ‘valuable’ river flow.

Nakuro Nigera. Downstream flood simulation was ‘recommended’ for inclusion in the management plan, but it has never been implemented.

Iteshi Teshi Dam, Zambia. In theory, downstream flooding was to continue for a significant period of time. However, such practice was only practiced “out of season”, and subsequently, ceased altogether, due to “conflicting priorities”.

Cabora Basa, Mozambique. This plan included the implementation of downstream flood simulation, and was considered by many as a “good case to watch”.

Richard Beilfuss, of the International Crane Foundation, made the following statement regarding the Cabora Basa case.

"One of the big problems with the management of Cahora Bassa dam is that each year they need to create capacity to store a possible large flood that could overtop the dam and so in order to do so they often have to release waters during dry season. Especially in wet years, they have to release waters downstream to make storage capacity available in the dam and its those dry season floods that have really been a terrible problem for farmers and fishers downstream because they can come at any time of the year. They can come in August or October and they can come and wash out crops along the lower Zambezi. It's quite a big problem, so not only is there the loss of floods during the normal time of peak flooding - there's also the potential for floods at any time of year. In temperate climates it would be something like getting snow in the middle of the summer at a time when you never expect it just coming down - it completely alters the way people can perceive their own environment."

The Gibe III Downstream EIA makes numerous disclaimers regarding the actual efficacy of implementing downstream flood simulation, despite repeated statements throughout the document acknowledging the *importance* of this action for lower Basin’s indigenous economies.

The following selection of qualifications in the downstream EIA illustrate the point:

“The potential loss of flood recession crop area, as well as grazing, would reduce their food supply and could possibly lead to conflicts over grazing areas. It is estimated that some 20,000 families are engaged in flood recession and cropping in the delta, on 12,000 ha or so, meaning that 100,000 people could be affected. The estimated annual crop production this represents is around 5,000 tonnes which may be some indication of the extra amount of food aid which might be required if there was no controlled flooding after dam construction, to allow the continuation of flood recession cropping. p. 155.

“In the event that the annual release is not being implemented as scheduled, some possible adverse impact may occur as described below...” p. 156

“Further desirable instruments have been considered, and may be applied to both integrate the above main measures, compensate in case planned artificial floods are partially withheld due to

unforeseen circumstances, and as desirable confidence-building actions to strengthen support of local authorities and populations.” p. 169

“Some of the potential interventions meant to offset possible negative impacts stemming from possible difficulties in fully implementing designed controlled floods as planned...” p. 178

“This may be necessary in case disruption of artificial floods may no longer fully contribute, by adequate submersion, to rejuvenation of grasses...” p. 178

“In case the annual release does not fully succeed as scheduled, some other compensation measures could be implemented including ...conflict prevent and resolution training programs...” p. 179

“Range Developments and Management- 16. Risks and Uncertainties: 3. Construction of devise along the Omo River to simulation flood may take time.” p. 219

IV. Omission of Seismic Activity and Landslide Potential

There is sufficient evidence of recent seismic activity in the region around the proposed Gibe III project to suggest the possibility of a seismically determined event, possibly with catastrophic results. Available data and perspective from petrology, geochronology and geochemistry concerning the issue are not included in the EIA.

The downstream EIA includes no consideration of seismic activity and landslide potential. (The 2006 EIA for the Gibe mentioned seismic concerns, only to reject the possibility of such an event occurring).

Extensive saturation of clay-rich soils along the canyons presents the danger of earth swelling and landslide. This potential danger is ignored altogether in the EIA.

- The topography in the Gibe III region is strongly developed along a structural grain parallel to a rift. In part, this structural grain is developed along a system of faults that permeate the area. It appears that Pliocene units are confined to the canyon, including a tuff that is approximately 2 Ma old and basalt of approximately 4 Ma. Woldegabriel and Aronson (1987) describe this part of the rift system as ‘failed.’ The ‘failed rift’ is a system partially formed but interrupted through migration. Woldegabriel describes the walls of the Omo Canyon as fault controlled (Giday Woldegabriel. (1987) Volcanotectonic History of the Central Sector of the Main Ethiopian Rift: A Geochronological, Geochemical and Petrological Approach. Ph.D. Thesis, Case Western Reserve University, August, 1987; G. Woldegabriel and J. L.Aronson. 1987. ‘The Chow Bahir Rift: A ‘failed rift in Southern Ethiopia. Geology 15, no.5, pp. 430-433). Faults between Sodo and the Omo River are young and active. Hot springs occur within the region and these are generated by geothermal activity.

The active fault system, considered in combination with the occurrence of hot springs, suggests the possibility that tectonic movements are not finished in the

area. A query of recorded earthquake activity of between 4.1 and 5.4 magnitude, even within the past twenty five years, reveals at least sixteen such occurrences between 5-8° N. and 36-38° E. Some of these earthquakes have been within close range of the project area.

There is record, for example, of a 4.7 magnitude earthquake near the town of Arba Minch in 1999 (approximately 98 km from the proposed dam) and a 5.0 magnitude earthquake just East of the town of Sodo (about 63 km from the dam site) in 1989. Evidence of an eruption of Mt. Wenchi (a volcano on the Nile-Omo divide at the headwaters of the Gibe) within the past 200 years – one that devastated everything downstream – is also available. This volcanic highland consists almost entirely of ash: hence, the mountain is explosive.

- **The proposed Gibe III project may promote the possibility of a major landslide. Impoundment at Gibe III will change the base level of the river in the immediate area: local aquifers are fracture controlled, and there is a possibility that some ‘slip surfaces’ (landslide soles may become lubricated so that rock masses are more likely to slide).**

The 1963 disaster of Vaiont in northern Italy clearly illustrates the significance of these issues.

(See <http://seis.natsci.csulb.edu/bperry/Mass%20Wasting/VaiontDam.htm>). In Vaiont, more than 2600 people were killed when 260 million cubic meters of a slide block moved suddenly into the newly filled Vaiont Reservoir – behind a very tall dam that blocked a deep valley. The intensive landslide occurred within seconds and displaced more than half of the reservoir’s water, generating a giant wave that reached a height of 250 meters and then created a massive wall of water that swept into nearby villages and towns, destroying everything in its path. The dam itself remained intact. In the Vaiont case, the rockslide and ensuing flood could have been readily foreseen by logical consulting. *The cause of the landslide may also be pertinent to a consideration of the Omo situation.* The sedimentary rocks of the Vaiont River Valley include layers of shale, a clay-rich rock. And the rocks comprising the nearby mountain (Mt. Toc) tilt steeply toward the reservoir. When the dam was finished in 1960, filling of the reservoir introduced groundwater into the shale layers, causing them to swell and become slippery. At first, the mountainside began slowly creeping down slope at a rate of half an inch per week. As filling continued and more groundwater seeped into the mountain, the rate of slippage increased to eight inches per day, and ultimately to 30 inches per day, just before the 1963 disaster.

- **ARWG calculations from fill rates in the Omo Basin indicate that the reservoir capacity might be reached within a few years. This rate and extent of sedimentation presents a fundamental problem for the Gibe III project. The downstream EIA, however, gives negligible attention to the problem of sediment trapping in the reservoir.**

The downstream EIA's treatment of downstream sediment transport is also fundamentally inadequate, with some directly false and misleading statements, e.g., its reference to "restored hydrological conditions of the Lake Turkana system", to problems of sediment and erosion problems as occurring as only 'isolated and local' phenomena, and to a presumed adequacy of 'regular monitoring' with small local solutions through 'carefully designed river training works'.

Completion of the Gibe III project would cause a major reduction of sediment and nutrient replenishment in soils of cultivation areas and in natural habitats throughout the riverine *and* delta regions, and reduction of nutrients essential to fish populations throughout downstream reaches of the river, the delta and Lake Turkana. This sediment and nutrient replenishment is essential to the continued biological reproduction of these downstream habitats. This major impact is accompanied by sediment build-up within the Gibe III reservoir.

The loss of sediment deposits and nutrient replacement will contribute to the degradation of both terrestrial vegetation and aquatic resources and will accelerate the loss of cultivation and other riparian subsistence production systems, including fishing – the 'last resort' for many of the local economies in the Lower Omo Basin.

V. Underestimation and Misrepresentation of Dam Impact on Riverine Forest Riverine Economy.

None of the fully predictable dimensions of riverine forest and woodland destruction are responsibly dealt with by the authors of the EIA. Instead, the report asserts that riverine environments (like Lake Turkana and local subsistence systems) will "benefit" from dam construction and river "regulation".

Completion of the Gibe III dam and filling of the planned reservoir would result in a 57 to 60 percent drop in the Omo River's downstream flow volume. This decrease in flow volume would initiate a 'drying out' of plant communities all along the river, destroying most of them. The riverine forest would be eliminated.

The riverine forest of the lowermost Omo Basin is widely believed to be the last remaining "pristine" forest in drylands Sub-Saharan Africa. At least 125 square kilometers of riparian ('fringing') forest will be eliminated. The area of forest death would be about 290 square kilometers if riparian closed canopy woodland is included. All indigenous subsistence economy dependent upon the forest and its immediate environs will be destroyed.

The above estimate is a highly conservative estimate, for several reasons. (1) The estimate of 125 sq. km is calculated only for forest cover from the dam site to the southern extent of continuous forest (at 4.855° N) – a distance of 625 km, including the Omo's relatively sinuous channel segment, and it assumes an average forest/woodland width of 100 meters - a highly conservative figure. (2) The 125 square kilometer estimate does *not* include those forests along the lower reaches of Omo tributaries where they intersect the Omo channel and where substantial flooding and seasonal water back-up presently occur, resulting in

some 300-400 meter wide forests. (3) Even the 290 square kilometer figure reflects only well-developed *forest and closed canopy woodland*, not the extensive *open* woodland adjacent to the river that will be subjected to massive scale drying out, should river flooding and inundation be reduced. (4) Both estimates exclude extensive wooded habitat scattered throughout the Omo Delta and along the lowermost river.

- **Experience with river basin development in a myriad of semi-arid environmental contexts has demonstrated that massive kill of riparian forest can occur within only a few years, following hydroelectric project construction.** This experience is documented for the Awash River Basin in Ethiopia, as well as the Tana River and Turkwel River in Kenya, several rivers in Sudan, and elsewhere in east and northeast Africa.

Riparian forest canopy trees are predominantly shallow-rooted, so they are quickly killed when river flooding is eliminated. The Omo River's fringing forest and woodland are adapted to annual flooding or inundation, in most years, and also to periodic flooding or inundation that corresponds with biological 'readiness' of woodland or forest plants for germination or growth. Both types of river water delivery are key to the successful regeneration of these riparian systems, and both would be eliminated by the Gibe III project. These issues are not addressed in the downstream EIA.

- **Since the level of Lake Turkana primarily controls the elevation of the Omo River's channel, the Gibe III would cause the lake level to be reduced by up to 10-12 meters, the differential in levels would effect downcutting of the channel toward the establishment of a new equilibrium with the lower level of the lake.** Downcutting of the Omo's channel would further reduce the high water maximum, so that river banks would be newly exposed by this downcutting and by the absence of water bringing new sediments. Soil erosion into the river would occur in large scale. As the maximum level lowers, the newly exposed riverbanks are highly susceptible to erosion of sediments. This process would reduce even further any remaining lateral infiltration of waters into the Omo's natural levees - reinforcing the permanence of riverine forest elimination.
- **Although flowing principally across basalts below the proposed dam, in its actively meandering section farther downriver the Omo would cease meandering and the present meanders would entrench. This would effectively eliminate a wide range of microhabitats and their biota.**
- **Lateral infiltration of floodwaters - the other critical source of moisture for riparian vegetation, would largely cease.** In general, water movement into low-lying backswamps, channel cut-offs, cracking systems would also be eliminated, along with backup of floodwaters reduced downstream river water infiltration into subterranean floodplain and other river-associated environments would lead to **severe reduction of groundwater recharge throughout the Lower Basin, since this process is largely dependent on Omo River waters. Other sources of recharge would not compensate for this loss, since precipitation is generally highly limited and unreliable.**

Massive-scale drying out of sediments and soils in floodplains would occur, with sheet erosion prevailing over soil infiltration and extensive loss of plant cover. With denudation and lack of river water replenishment, evaporation in the A soil horizon

would generally increase, concentrating salts at the surface. Salt concentration in the newly exposed B soil horizon would also increase. Eroding sediments and salts may be transported by sheet erosion into the Omo River.

Reports of **salinization** in the failed agricultural scheme at Omorate along the lowermost Omo River's eastern shore, and in other locales of this highly aridic environment, serve to underscore the seriousness of the soil denudation, erosion and salinization process in the region.

- **The destruction of flooding regime and seasonal patterns of hydrological changes would directly affect the feeding patterns and the reproduction of fauna throughout riverine, floodplain and delta environments.** Animal species eliminated would range from microfauna of all types to insects, amphibians and fish species (see below), the fish eagle and numerous other water-loving birds, crocodile, hippo, elephant, kudu, bushbuck, buffalo, leopard, colobus monkey, grevet monkey and baboon, monitor lizards and a wide range of reptiles. **The habitat of most of these animals would be largely eliminated by the Gibe III development.** Quite apart from the intrinsic importance of wildlife in biodiversity terms and those of utility for the region's indigenous economies, recent recognition by the Ethiopian government and international conservation agencies of the potential for conservation, park and tourism development in the Mago and Omo National Parks region indicates that there is increasing awareness of its importance to Ethiopia's (and Kenya's) national heritage.

There are significant species and ecological differences between the riverine forests of relatively higher altitudes, such as those in the Omo National Park and the Mago National Park near the proposed Gibe III dam, and the forests of the meandering river in the lowlands toward Lake Turkana. Neither of these riparian forest types, however, will survive the loss of riverine waters and sediment that will result from the Gibe III construction. A new succession of largely exotic species would invade these areas, bringing a sharp reduction in riparian biodiversity. This would include large-scale loss of wildlife.

VI. Exclusion of Transboundary Problems Involving Ethiopia, Kenya and Sudan

The Gibe III project would have major transboundary impacts, specifically, in northwestern Kenya, where both the Omo River Delta and Lake Turkana are located, and in the Ilemi Triangle of southeastern Sudan. These transboundary effects include immediate impacts, such as those described for Lake Turkana, and pervasive 'spillover effects' in all three countries.

- **The Omo River is a transboundary river. It contributes at least 80 percent of the waters of Lake Turkana, and most estimates (including an estimate in the downstream EIA) are closer to 90 percent. Its terminus is at the northern end of Kenya's Lake Turkana, and the present day active Omo delta is almost entirely within Kenya, not "between Kenya and Ethiopia", as stated in the EIA. At least 500 square kilometers of deltaic sediments have been newly exposed during the past twenty-five years through a combination of sedimentation and lake-level recession.**

With reduced flow to *even the predicted 57-60%*, the Omo delta would no longer receive flooding. In fact, the entire northern end of Lake Turkana will undergo massive scale retreat.

Because most of the Omo Delta, as well as the northern and northeastern shorelines of Lake Turkana is already *intensively* utilized for recession cultivation, livestock herding, fishing and settlement and other subsistence activities by the region's agropastoralists, this change would produce immediate and devastating effects on the local subsistence economies that are already subjected to periodic severe hunger conditions.

There is clear precedence for the omission of Ethiopia-Kenya transboundary concerns with regard to the Omo River, prior to this downstream EIA for the Gibe III. For example, the World Bank, in a 2004 document, states 'There is no significant use of the Omo River by any other country and the river enters Lake Turkana within the boundaries of Ethiopia. It should therefore be relatively easy to negotiate a 'no objection' from Kenya should that be required for multilateral/bilateral funding.' (The World Bank was already actively investigating the economic potential for hydroelectric development along the Omo River by the early 1970s).

Rapid escalation of longstanding conflicts over grazing lands and water would result from the immense loss of cultivation lands and other riverine, delta and lacustrine based resources, should the Gibe III dam be completed. Numerous ethnic groups having settlement histories in both Ethiopia and Kenya as well as longstanding or periodic conflicts with one another would be *immediately* and severely impacted: these include, for example, the Dasanech with the Gabbra, the Dasanech with the Turkana, the Nyangatom with the Turkana and the Dasanech, and the Hamar with the Dasanech and the Nyangatom.

All of these groups are now well-equipped with arms as the result of the escalating arms traffic into South Sudan and the easy access of local people to this trade.

In addition to protests by local groups over the enormous losses they would experience, should the Gibe III dam be completed, conflict throughout the region must be predicted. Such protest and conflict would surely be met with strong responses by the military of Kenya and Ethiopia, thus contributing to the instability of the region.

The Ilemi Triangle is a key component of Ethiopia-Sudan-Kenya Transboundary Issues.

BACKGROUND: The Ilemi Triangle is a large triangular piece of land (approximately 14,000 square kilometers) located at the junction of Kenya, Sudan and Ethiopia. While generally mapped as part of Sudan, it is claimed by each of the three nations.

Since the land was first claimed by Ethiopia's Menelik and the British response with the 'Maud Line,' giving the Triangle to Sudan, and then Anglo-Ethiopian agreement of 1907 when Ethiopia gained most of it. Multiple shifts in unofficial control over the Triangle occurred in subsequent decades, both in terms of its border designation (mostly, its southern border) and military

occupation.² The Kenyan government has actively policed the area since 1914, with new boundary demarcations set out in 1914, 1924, and in several other agreements. The Ilemi Triangle has never been adequately surveyed to delineate national jurisdiction, at least to the satisfaction of the three countries involved. It remains a contested area by Kenya, Ethiopia and Sudan.

Until very recently, the Ilemi was considered to be essentially 'empty,' or 'wasteland'. This situation has now dramatically changed. The Ilemi's proximity to the lengthy war in Sudan, along with the intensive oil and gas development in southern and south central Sudan, have led to major new linkages between South Sudan and Kenya. Road development and major travel and interchange related to extractive industries, other industrial and agricultural development, physical infrastructure construction and all sorts of political and economic exchanges now dominate the relationship. A recent surge in oil and gas exploration in the region has awakened interest in the Ilemi, as well. Sudan, Kenya, and Ethiopia are all making new agreements with international energy corporations and there are new concessions for exploration in the Ilemi itself, in the extreme northwest of Kenya, and most recently, in the Lower Omo Basin of Ethiopia.

Arms trafficking has accompanied all of these economic changes so that weapons are now readily available to all indigenous groups in the region. There are reports of certain ethnic groups being supplied with firearms by their own governments, either directly or with their tacit approval. To a degree, some of them may be viewed as 'proxy' defenders of their respective home country borders.

For many decades, at least five different ethnic groups have utilized the Ilemi Triangle lands, establishing settlements and economic activities ranging from livestock herding, opportunistic cultivation (for example, in open basin pans with water collection) and hunting, to engaging in trade and, at times, political conflict with one another. This long standing presence of so many groups in the Ilemi has established a web of relationships with areas deep inside Sudan, much of the Lake Turkana region, and the entire Lower Omo River Basin – thus, joining this tri-country region into 'one system' of resource utilization. Although now formally closed to use by the region's indigenous groups, by inter-governmental agreement they apparently continue to use it whenever possible (and are considered 'poachers' by authorities). The close connections among groups along the Omo River (including the Delta) in northwestern Kenya, and well into the 'Sudanese' Ilemi, continue.

Major losses of indigenous groups' cultivation lands and dry season grazing for livestock along the Omo River, in the Omo delta region and around Lake Turkana, in addition to the broad grasslands surrounding these areas, would have major consequences for livelihood and ecological conditions in the Ilemi region. In all likelihood, political conflict, including among the Toposa, Nyangatom, Turkana, Suri (Surma) and Dasanech, would sharply increase throughout the Ilemi and contiguous regions.

In fact, the large scale dislocations and disruption of economy that a completed Gibe III dam would produce could easily provoke cross-border conflict that would be difficult, if not impossible, to contain - particularly in light of the struggles already underway in southern Sudan. Presently, a most fragile peace is maintained in the region.

VII. Distortion of 'Public Consultation' Process.

There is serious question regarding the actual dissemination of questionnaires, and most certainly, regarding the accuracy of information concerning the radical alterations of

environmental conditions that can be expected, if the Gibe III dam is completed, as well as the economic repercussions of those environmental changes for local residents. The downstream EIA report itself includes statements that are highly suggestive of fundamental distortions presented to local residents in the lower Omo Basin, regarding the real character of the Gibe III development.

As just one case in point, the downstream EIA states, “The Zonal Administration was informed that the Gibe III development will not cause an all-out reduction in the river flow, but rather, a regularization was to be expected.” At the very least, this is clearly a highly biased interpretation of known and predicted changes in the lower Basin).

There are numerous such statements elsewhere in the section concerning ‘Public Consultation’.

The ARWG arranged inquiries with local officials in two Woredas and in five different villages included in the ‘Public Consultation.’

In one of the Woredas, the local officer in charge of conducting discussions and questionnaires flatly stated that he was told to simply “fill out the forms himself”, so that all “public consultation” was done without any public – in his office.

Within one Woreda, ARWG members and assistants visited five villages allegedly included in the consultation and questionnaire process. In all five villages, residents had no knowledge whatsoever of any such consultations or meetings, and in fact, neither the elders nor others in these villages had ever heard of the Gibe III project, and they most certainly had no knowledge of what a “dam” is.

What is clear is that local ‘consultations’, when conducted at all, have been controlled by local government officials, with full accountability to governmental proponents of the project.

While there are widely variant situations in the lower Omo Basin with regard to ‘local voice’ by indigenous groups being largely independent of the Ethiopian government, the highly repressive government policies in the face of any opposition to state policies should certainly make it clear to the international community that ‘informed consent’, let alone an open process involving open discourse and recording of real local opinion, is likely close to non-existent within the lower Omo region.

The EIA prepared by the Gibe III developers (EEPCo and Salini) presents a fundamentally flawed formulation and analysis of the potential environmental and social impacts of the project. The fact that the proposed Gibe III project would be imposed upon an area of pervasive malnutrition and environmental deterioration underscores the egregious nature of *externalizing* all concerns of indigenous economy and environmental integrity.

There is an urgency to consider the inviability of the ‘trade-off’ between energy development for the purpose of generating foreign exchange (from approximately half of the power generated), on the one hand, and the destruction - inadvertent or not - of the economic systems of the indigenous population of 200,000 in the southern Omo Basin, as well as the priceless natural heritage of Ethiopia and Kenya, on the other.

Despite the construction of the Gibe III already underway, there are still alternative forms of energy development that should be considered. An energy development on the Omo River that avoids the unacceptable trade-off identified above, for example, could lead to a formulation of a program of small dams, with fundamental attention to the maintenance of maximal river flow (and seasonality of that flow). There is precedence for this approach, with evidence of success from the standpoint of serving the needs of national energy demand. This type of approach to energy development could be complemented by the development of alternative energy sources. There is no consideration of alternatives to the proposed Gibe III in the 2006 EIA whatsoever.

The institutional realities of the Ethiopian political system are such that none of the key issues identified in this commentary are acknowledged, let alone given open and substantive consideration, in the downstream EIA.

It may well be that candor between critics and supporters of the proposed project would reveal the following: A truly thorough downstream EIA – that is, one *accurately* characterizing the nature and status of the region's indigenous economies and environmental conditions - would reveal that the size, design and unavoidable effects of the Gibe III project spell disastrous consequences for the region's indigenous population and environmental integrity, for Kenya's economy, and for the region's political stability. No amount of agency *monitoring*, or '*voting*' by an indigenous population utterly unaware of the true consequences of the development, would render the project viable.

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