Facing Gibe 3 Dam: Indigenous Communities of Ethiopia's Lower Omo Valley

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"The rise and fall of the Omo waters is the heartbeat of the Lower Omo Valley. More than any other single factor, the river determines everyday economic practice throughout the region."

Executive Summary
The Omo River is a lifeline for southwest Ethiopia's indigenous peoples whose food security and economy depend on the river's seasonal flooding and subsequent flood-retreat cultivation of the river banks. The Lower Omo Valley is home to an estimated 500,000 people, a significant number of whom practice traditional agro-pastoralist livelihoods.[2] At least eight distinct indigenous communities depend on the river's flood cycle within the isolated Lower Omo Valley: the Mursi, Bodi, Muguji (Kwegu), Kara (Karo), Hamar, Bashada, Nyangatom and Daasanech. Although many also keep livestock, cultivation is essential to local livelihoods as grasslands are becoming more degraded and herding more vulnerable.

Since 2006, construction of the Gibe 3 hydropower dam project has been underway on the Omo River, and two more dams (Gibe 4 and Gibe 5) are planned. The Gibe 3 Dam will greatly alter the river's flow and reduce the seasonal flooding of the Omo River, which provides up to 80-90% of the flow into Northern Kenya's Lake Turkana. According to official Gibe 3 project documents, more than 21,000 families (at least 100,000 individuals)

[1] This report is based on interviews with academic researchers from some of the world's leading universities who have studied the people of the Lower Omo Valley. Most contributions were made upon agreement of anonymity due to the highly politicized nature of the Gibe 3 Dam and concerns that the government could obstruct future academic research in the Lower Omo Valley if researchers are outspoken.

[2] "The Lower Omo stretches over Sala-mago, Hamer, Nyangatom and Dassanech woredas and is well endowed with both cultural diversity and natural resources. […] Its total population is estimated nearly half a million in 2005." CESI. April 2008. Gibe III Environmental and Social Impact Assessment [ESIA], 300 ENV R CS 002 B - A8012330, p. 15. Population estimates of individual communities were provided by researchers. It was not possible in this report to verify population estimates between the ESIA documents and estimates from researchers.

are directly engaged in flood retreat cultivation on nearly 12,000 hectares along the Omo River in the Lower Omo Valley.

The Ethiopian government has not adequately considered either the rights of these indigenous communities or the risks that the Gibe 3 Dam poses to them. There are concerns that project planning has and will continue to result in violations of human rights outlined in Ethiopia's constitution[3] and the 2007 UN Declaration on Indigenous Peoples. If the Omo River's seasonal flood is reduced or eliminated, it will disrupt the entire subsistence economy of the Lower Omo Valley. Not only will food security be severely threatened but regional peace and security as well.[4] The government provides few services to the region, considered home to some of Ethiopia's most vulnerable communities. Mitigation and compensation measures related to the dam's impacts are feared to be wholly inadequate, undermining the existing subsistence economy and impoverishing a politically vulnerable population.

This article attempts to fill the information gap about the indigenous communities of Ethiopia's Lower Omo Valley, how they rely on the Omo River, and the risks posed by the Gibe 3 Dam.

Flood Retreat Cultivation

During August and September in most years, the Lower Omo Valley experiences seasonal river flooding, caused by heavy rains which fall upstream between April and August. The nutrient-rich silt brought to the valley by the annual floods helps renew the fertility of the river banks and the vast Omo delta which spreads out along the northern edge of Lake Turkana. Heavy flooding also renews oxbow lakes, such as Lake Dipa, which dries out over several years, giving access to large areas of well-inundated land for cultivation. Families plant riverbank plots as the floods begin to retreat; harvesting takes place a few months after. Thanks to the silt-laden flood, additional fertilizers are not needed. Main crops are sorghum, maize and beans. Although the size of cultivated areas can vary year to year depending on the height of the flood, it is the reliability of the harvest which makes this a fundamental practice for the region's food security.

Indigenous communities living in the northern part of the Lower Omo Valley, and the higher lands to the east and west of the river where rainfall is higher, also practice rainfed cultivation which often relies on slash and burn practices in order to reach fertile soils. This, coupled with an ever-increasing population, puts greater pressure on available land resources. Rainfed cultivation fails every two or three years (sometimes two years in succession) because of a lack of rain, crop pests and/or birds.

According to Gibe 3 Dam project documents, government officials reported that the grain produced from flood-retreat cultivation was only sufficient for three to six months, and tribal communities thereafter depend on food aid.[5] However, researchers observe that the

[3] Article 92 of Chapter 10 of the Ethiopian Constitution states: "people have the right to full consultation and to the expression of their views in the planning and implementation of environmental policies and projects that affect them directly."

[4] The Omo delta touches the edge of the Ilemi Triangle, a longtime international border dispute between Sudan, Ethiopia and Kenya. The Lower Omo basin is witnessing not only the impacts of hydropower development but oil and mineral exploitation as well. These projects are dramatically altering the region's landscape and economy. As traditional resources such as the Omo River are degraded and mineral exploitation increases, long-standing border disputes could quickly be renewed.

[5] "Woreda officials reported that for most people, the grain produced from these cultivations was only sufficient for 3 - 6 months. Thereafter, they depend on food aid from the government and NGOs." ESIA, p. 92. "Taking

communities of the Lower Omo Valley seldom benefit from food aid except during rare crises and are more self-sufficient in terms of food production than other arid regions of Ethiopia. Only the Nyangatom are reported to receive food aid regularly, but at a very limited scale.

Mursi and Bodi

An estimated 10,000 Mursi people live along the Omo River. Immediately north of the Mursi's territory are the Bodi, who number about 5,000 to 6,000 people. These communities live and cultivate along both banks of the Omo River. The Mursi and Bodi have three main components to their livelihood system: flood-retreat cultivation, rainfed cultivation and cattle herding. All three elements are needed to support the population's food security.

Some Bodi have moved further away from the Omo River and closer to the Dime Mountains east of their traditional territory where there is more rainfall. Many Bodi depend on rainfed cultivation in the lowlands between the Omo River and the Dime Mountains, but lowland production alone is insufficient. Many Bodi supplement their lowland cultivation with either riverbank flood-retreat cultivation and/or rainfed cultivation on the lower slopes of the Dime Mountains. The daily diet of families depends heavily on maize or sorghum, although young men sometimes maintain a diet exclusively of blood and milk from cattle. The Bodi do not eat fish but some Bodi living in the north of their territory reportedly hunt and eat hippopotamus.

In 2003, 5,000 Konso were resettled in Bodi territory on lands traditionally used for grazing, as part of a large, government-based resettlement scheme. The land was of great value to Bodi pastoralists, who received no compensation for the loss of this resource. This uncompensated displacement of resources has led to serious tensions between Bodi and Konso. In December 2007, violent conflict erupted between the two communities, resulting in the killing of several Konso and the burning of some Bodi granaries. Tensions could be exacerbated by the Bodi's loss of fertile river bank resources.

Muguji (Kwegu)

The Muguji population is estimated at up to 2,000 people. The majority live either along the Omo River within Bodi and Mursi territories or downstream among the Kara and Nyangatom communities. The remaining Muguji are found in their own village, Kuchuru, situated on the western bank of the Omo River, close to the confluence of the Omo and Usno rivers. The Muguji used to base their economy on hunting and fishing but today rely mostly on flood-retreat cultivation and fishing. They have no livestock with the exception of a few goats. The residents of Kuchuru are virtually entirely dependent on the river for their food source. However, beekeeping is an important component of their economy and honey can be considered a staple food during the season of highest production.

Kara, Hamar and Bashada

The Kara number between 1,500 and 2,000 (the official 2006 census was 1,401) and cultivate both sides of the lower Omo River as well as the banks of Lake Dipa and other oxbow lakes. The Kara are nearly entirely dependent upon the Omo through flood-retreat cultivation, dry season pasture, riverine forest for large game and tourism, and fishing. An estimated 80% of the Kara's food supply is based on flood-retreat cultivation and they are only marginally

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the cropped area to be around 12,000 ha, food production will be some 5,000 tonnes annually. With 20,000 households (100,000 people) this would provide 250 kg of food per household per year, which in theory would be enough for a family of five for about 6 months (200-300gm/person/day)." ESIA, p. 95.

involved in fishing, beekeeping and small stock husbandry. "And for some families, food dependency on the Omo is total. Rain-fed agriculture is the supplementary practice, which people only engage in if either the river did not inundate the land sufficiently, or if the riverbank is too dangerous to cultivate there (due to warfare with the Nyangatom)," says a researcher who studies the Kara. In a good year, a family can by and large feed itself for the entire year by the yields of its riverbank harvests. Many young Kara engage in opportunistic fishing to supplement their diet, but eating crocodile and hippopotamus is considered taboo.

The Kara community is also starting to engage in tourism. They own some cattle, but these are mainly kept by Hamar bond-partners who, in exchange, are allowed access to the grasses produced by the flood at the height of the dry season.[6] Virtually all Kara live within their traditional settlement area, between Lake Dipa and the Omo-Usno confluence. (This territory is also important to the Hamar pastoralists living further east.)

The Hamar population is estimated at 25,000 people and the Bashada is estimated at 4,000 people. Both communities exchange goats and sheep for grain cultivated along the Omo River. While Hamar territory does not include the riverbank, the community's well-being is highly dependent on the local resource economy which includes the seasonal flood cycle. Negative economic impacts to the Hamar would likely result in increased migration to new cities (Jinka, Dimeka, Turmi, Omo Rate) and to higher altitudes (to Bashada and Hamar).

Nayangatom

The Nyangatom population is estimated to be between 14,000 and 18,000 people, living mainly on the western bank of the Omo River opposite the Kara. The Nyangatom have access to two independent river systems, the Omo and the Kibish, and also to an area of higher elevation and rainfall, where rain-fed cultivation is possible, but only during high rainfall years. Cultivation of the Omo and Kibish riverbanks is the most reliable source of food. Families only manage to have access to very small plots along the river, providing insufficient food for the year, and many families do not even manage to gain access to riverbank lands, because demand is greater than available land. The Nyangatom also have access to some flooded plains in the delta.

The Nyangatom also keep livestock and implement a rotational grazing pattern on riverbank plots before or after the season for flood-retreat cultivation. A Nyangatom family is typically highly mobile and flexible, diversifying its production cycle among limited access to the Omo River, occasional access to a plot in the flooded plains either along the Kibish or the Omo, cultivating in the highlands when rain is enough, and seasonally moving cattle.

Daasanach

The Daasanach live in the Omo delta and along the eastern banks of Lake Turkana in Kenya. A 1998 census estimated the population at 34,500 people, nearly all of whom reside in the delta.

Despite ritual and symbolic relevance of cattle, the bulk of the economy is flood-retreat cultivation. Cultivation is practiced in the large delta plains or along the seasonally flooded river banks. Flood retreat cultivation provides virtually all the food production for the Daasanach and can even produce a grain surplus which is sold in local markets as far as

[6] A bond-partner is a personal relation with a member of a neighboring group, based on reciprocal expectation of support in times of crisis or need.

Turmi, Konso, Jinka and Arba Minch. Especially in Turmi, the grain produced in the Omo delta constitutes an important complementary food reserve for local pastoralists who seasonally enter into food shortage. The Daasanach often use income from grain sales to purchase livestock, primarily for ritual purposes.

Grasses produced by the seasonal fluctuation of the level of Lake Turkana and the regular flooding of the Omo River are absolutely crucial during the dry season, when no alternative pasture is available for cattle. These fluctuations are the foundation of both the farming and pastoral components of the Daasanach economy and provide nearly the totality of Daasanach livelihoods. A small number of Daasanach practice other livelihoods such as traditional or commercial fishing or irrigated agriculture around the town of Omoratte.

Other River Uses

Additionally, the river is used for transport by dugout canoe, watering livestock, hygiene, gathering flotsam, and other activities. A number of rituals employ the Omo River and its water as a fundamental element. The Hamar, for example, believe that water from the Omo River can heal a child's stuttering.

The dam will impact both traditional and commercial fishing in the river and in Lake Turkana. Important species of fish seasonally migrate between Lake Turkana and the Omo River. Some indigenous communities engage in seasonal fishing. The migration and reproduction of many fish species are triggered by the seasonal variations in the river's flow. Commercial fishing takes place in Lake Turkana; the catch is exported locally as well as to Europe.

Forests along the Omo are also considered very important for providing medicinal and ritual plants, material for house construction, and as habitat for wildlife. Honey and wildlife provide an important complementary food supply for local peoples, and forest and wildlife provide an added value to the landscape for tourism. The Omo runs through the Omo National Park and other protected areas where forest and wildlife could be affected by the changes to the river. Extreme daily pulses in the river flow caused by the opening and shutting of the turbines could be particularly detrimental to protected areas.

Public Consultation Practices for the Gibe 3 Dam Project

Meaningful public consultations are a critical component of major public development projects. For project-affected peoples, the consultation process is often their single opportunity to interact with project authorities and bring their concerns and needs to the negotiating table. Too often, consultation processes use a one-way flow of information – from the project authorities to the people – and the information is often decorated with verbal promises but scant on discussion of potential risks. A meaningful consultation process will include mechanisms to ensure that participation of affected peoples results in sufficient information sharing, mitigation of their risks and compensation for their losses. Such a process should allow for regular sharing of information, and ensure that information is distributed and concerns are collected in a manner that reaches a critical quorum of affected people. Processes should not be unduly rushed by the project's schedule, but allow sufficient time for affected communities to understand, react and consult with outside experts if needed.

Based on a review of project documentation, the Gibe 3 consultation process with project-affected communities in the Lower Omo Valley was limited, selective, and violated their right to full consultation as protected under the national constitution of Ethiopia. While the

dam will affect flood-retreat cultivation that supports an estimated 100,000 people and indirectly benefits an additional 100,000 or more people engaged in the Lower Omo Valley economy, less than 300 individuals participated in official project consultations that took place in the area (see Table 1).[7] In addition to involving small numbers of affected people, the meetings took place 10-17 months after the project contract was signed and construction began.

Table 1. Public Consultations in the Lower Omo Valley

	Ethiopian Calendar Date	Gregorian Calendar Date	Location	Number of Participants
1.	8/29/1999	7 May 2007	Hammer Woreda	17
2.	8/30/1999	8 May 2007		20
3.	9/02/1999	10 May 2007		40
4.	9/03/1999	11 May 2007		33
5.	3/30/2000	10 Dec 2007	Dasenech Woreda	21
6.	4/05/2000	15 Dec 2007		9
7.	4/05/2000	15 Dec 2007		31
8.	4/07/2000	17 Dec 2007		17
9.	4/08/2000	18 Dec 2007		25
10	4/09/2000	19 Dec 2007		12
11.	4/09/2000	19 Dec 2007		15
12.	4/10/2000	20 Dec 2007		45
			Total Participants	**285**

There is no mention of additional routes through which affected communities can access project information nor additional mechanisms through which they can provide feedback on project impacts and proposed mitigation.

Consultations were effectively by invitation only:

> "The groups that are chosen for the consultative meetings were selected with great care on the basis of the location of the project so that their views could represent the entire attitudes of the community as well as the officials in which the project is located. The sampling groups of the people are taken from the communities residing with in various villages and kebeles, weredas, zones, Federal Offices and NGO's. The people that can best represent the ideas of the people were selected from the directly affected people and from the administration offices that administer the project areas."[8]

[7] Appendix 9 of Agriconsulting's April 2008 Environmental Impact Assessment Additional Study on Downstream Impact identifies a total of twelve consultation meetings in which 275 individuals participated. However, the same document states, "In the consultation process, a total of 165 participants drawn from different administrative levels were consulted. Of these, 4 were contacted from Zonal offices, 49 from Woreda officials, and 116 from representatives of the different ethnic groups at Kebele and Village level."(p. 161) The ESIA states that a total of 1,749 government officials and community members participated in the *entire* project consultation process. (p. 25) No other documentation of additional meetings or consultation participation relevant to the Lower Omo Valley is provided.

[8] ESIA, p. 231.

While this statement implies that consultants had the intention to include those who could provide a comprehensive picture, the selective process and limited access to project information reduces the legitimacy of the process and makes it prone to poor results. The consultants state that public consultations have "provided an exhaustive list of the impacts of the project and their mitigation measures."[9] While several key risks have been identified, the lack of comprehensive consultation means this statement is over-confident and short-sighted.

The ESIA states that "the project will organize a national consultative workshop to bring all key players together to express their views and concerns on the project and its impact and discuss the contents of the ESIA and contribute to its finalization."[10] This statement implies that the ESIA is not yet final and there is still room to consider changes. However, as the project is two years into construction, public consultation and disclosure did not commence until almost a year after construction began, and a significantly low level of public awareness remains, an ongoing consultation process seems unlikely to influence project outcomes in any meaningful way.

First-hand reports by academic researchers engaged in the region raise serious concerns about the consultation process.

One researcher noted that the Kara have been aware of the dam plans at least since 2004, "in the way of a vague worry, tempered by the experience that the development projects they have been promised often have failed to materialize. The understanding that the future will make their current livelihood unsustainable is increasingly internalized, and people are beginning to consider alternatives, realizing that there is little they can do."

The Mursi were reportedly never informed of the dam project by government officials. Mursi representatives report first hearing of the dam in late 2007, by word of mouth. "Questionnaires were supposedly distributed to Mursi, but in reality were filled out by government administration in Hana. No Mursi saw these questionnaires. The Mursi still have very little idea of what the dam is, or what impact it will have on their life."

In December 2007, according to researchers, a few men from Addis came to survey the road that will be built in Bodi territory to the proposed Gibe 4 Dam site. Some weeks later, members of the Bodi community observed airplanes regularly surveying the area. Around the same time, questionnaires were given to the local administration to be completed with the Bodi. However, the questionnaires were filled out by the administrators themselves. One researcher recalls briefly seeing one of the questionnaires which included questions about the kind of crops cultivated, the size of the fields, and their preferred solution to the end of the flood retreat cultivation. "Administrators systematically wrote 'irrigation' for that one. Not even the Bodi chiefs are fully aware of this project, let alone consulted about it. When they are told about the dam, the explanation has been that 'stones will be put in the river,' which makes it difficult for them to imagine the consequences."

In February 2008, another researcher heard community members referring to a team having come from Addis Ababa to interview local government officials and community members in the main administrative centers along the Omo River. It was the first time community members had heard about the dam. The interviewees were asked about their farming and

[9] ESIA, p. 235.
[10] ESIA, p. 26.

pastoral activities, and what they would require should the flood stop or be reduced. The possibility of using pumps as an alternative to the natural flood was also discussed. The communities were very concerned and were often discussing this topic.

In March 2008, one researcher was told by members of the Kara that they had been visited by government representatives, who asked them, "'If the river stops rising and falling as it used to, what are you going to do? Would you be happy to engage in irrigation farming?' Members of the Kara recounted how they had grimly replied, 'Yes, some pumps would be nice,' realizing that they had no choice or say in the decisions."

Based on the evidence from the report and accounts shared through interviews, the ESIA does not fulfill any of its identified objectives for the public consultation process because the consultations were so limited and selective, and apparently took place without any intention of influencing the dam planning process.[11]

Gibe 3 Dam Project Risks and Mitigation for Lower Omo Valley Communities

Communities of the lower Omo have historically faced social, economic and political marginalization. The great majority of the lower Omo population is totally dependent upon access to local natural resources. This isolated resource economy is, in turn, highly dependent on the Omo River flood cycle. Impacts will ripple across the region, touching all those engaged in the local economy. The dam will bring two types of changes: first, traditional livelihoods based on flood-retreat cultivation will be significantly eroded, and second, new opportunities in the labor market and a transformation of local agricultural techniques will arise. With the introduction of new agricultural techniques, a deep transformation of land tenure is also likely to occur, with a shift from a common pool resources system to either a private or commercial holding system.

The communities of the lower Omo are the worst prepared to compete in the labor and financial market, the large majority being unable to speak any of the national languages. They are likely to experience a loss of livelihoods, eroded health, severe food insecurity, loss of identity and dignity. Researchers state:

> "If the dam reigned in the seasonal floods, the entire economy and way of life would be just as eroded as the river banks. Livelihoods will be fundamentally transformed, from a wide-ranging independence to dependence on external dynamics. It will alter tribal life in so many ways that it is difficult to imagine a positive outcome."
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> "The dam will destroy the basis of several groups' cultural identities."

Guns and other weapons have long flooded into the lower Omo region. Many experts believe that the new economic strains could significantly increase tensions and warfare. Competition for the dwindling supply of cultivable land could quickly intensify violent conflicts.

[11] The ESIA identifies three objectives for its public consultation process: 1)To identify potential negative and positive impacts of the project as well as the associated appropriate remedial measures that could be identified through the participation of the people; 2) To include the attitudes of the community and the officials that will be affected by the project so that their views and proposals in the formulation of mitigation and benefit enhancement measures; and 3) To increase public awareness and understanding of the project and its acceptance.

Despite the alarming lack of comprehensive consultation, the ESIA accurately depicts the overall risk to the downstream communities in its summary of views of the downstream community:

> "A reduction in the flow of the Omo River will exacerbate the socio economic life and livelihood problems of all of the communities depending mainly on farming and cattle raising. The project will affect major economic activities such as crop production and fishing. A decrease in the flow of the river will also bring about a reduction in the size of flood-retreat cultivation and crop production, as well as decline in fishing activities. Lack of grazing lands will lead to serious shortage of livestock feed and other related problems. Shortage of livestock feed is a critical problem for all of the communities residing along the river due to the fact that many of the people own large number of livestock population."[12]

However, this reflection of risk is underplayed in the rest of the project analysis, and proposed mitigation measures do not appear to seriously address these grave risks. Project developers anticipate the use of an annual artificial flood to mitigate the risks to flood retreat cultivation. Yet, the suggested 10-day artificial flood is much shorter than the natural seasonal flood, which extends over a three- to four-month period. The artificial flood also creates a much more rapid, intense flood peak. The scientific analysis of what is required to support successful harvests from flood retreat cultivation does not seem to have been used to determine the planned flood, but rather, a mathematical analysis of the average annual river flow. No spatial analysis of what area would no longer be flooded has been done. The very narrow flood cycle may not achieve its goals.[13] Yet the ESIA is extremely optimistic in the results of the artificial flood:

> "The planned release from the reservoir intended to artificially induce flooding of both the river banks and floodplains, as well as the provisions for a minimum environmental flow, will mitigate and full compensate all adverse effects."[14]

The ESIA also identifies additional mitigation measures for downstream communities, but these measures are not detailed in the Environmental Social Monitoring Plan. It's not clear if there are any requirements to implement or fulfill these recommended mitigation measures, nor that they would actually help mitigate economic and livelihood risks to affected downstream communities.[15]

One researcher suggests that, if properly implemented, irrigation pumps could cost-effectively help mitigate the reduction in flood-retreat cultivation. "If affected people were offered pumps for irrigation to compensate for the loss of the floods, many of the

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[12] ESIA, p. 236.

[13] The ESIA also uses a questionable methodology to identify a minimum environmental flow release of $25m^3$/second. This flow rate is based solely on the lowest monthly recorded flow since 1964, occurring during March, the driest month of the year. The average monthly flow for March between 1964 and 2001 was $60m^3$/sec.

[14] ESIA, p. 223.

[15] "A set of *ancillary mitigation and compensation activities* and other developmental actions, to be implemented by EEPCO and local Authorities and to be possibly financed through the Federal Budget and electricity-originated revenues: [Fisheries, rainfed and irrigated agriculture, and livestock] Eventually, a further set of actions are planned as confidence-building and socio-economic developmental activities including a community awareness program, the implementation of an information system, co-operative support and agriculture in-service training, co-ordination for food aid, conflict prevention and resolution activities, Woreda institutional strengthening, and EMU capacity building." Downstream study, p. 5, 169.

tribes would probably not object but welcome the new development. If done well, the new development could even make existing exchange relationships between groups more reliable."

However, another researcher points out that the entire area lacks roads and other infrastructure needed to allow such pumps to be brought in, installed, and fueled. The inaccessibility of the region would drive up the cost of implementation far beyond the government's budget.

Another researcher points out the example of the nearby irrigation site at Kundamma which has not worked reliably. The single irrigation pump is at risk of inconsistent access to fuel, no local expertise or spare parts for maintenance, nor car transport. When the pump breaks down, many families worry that weeks or months of crop cultivation efforts may quickly be ruined.

Another researcher warns that mitigation and compensation could fail, leaving these communities at grave risk. "My whole concern is that the project will undermine the economies of the people. The main effort should be to press not only for compensation, but also for investment and benefit-sharing measures aimed at improving the livelihoods and life chances of local people who will be paying the main costs of the dam."

Conclusion

Vulnerable indigenous peoples living in the Lower Omo Valley are at serious risk from the Gibe 3 Dam. The past consultation process was too little, too late to be of value as a way to improve affected peoples' situations, or to improve the dam project. To rectify this, affected peoples' concerns and input should now be actively sought to effectively address project impacts to them, especially regarding the management of dam releases, modalities for sharing benefits, mitigation measures, land tenure, and the particulars of technological innovations that might be introduced as mitigation for loss of flood-based livelihoods. The first and most important requirement is to give them access to adequate information, and assist them in the process of designing and adopting solutions, including the introduction of efficient financial and accountability mechanisms. Specific attention should be paid to the impacts of new production and farming techniques, in terms of changes to land tenure and the access to the new opportunities by different communities, investors and groups that this change will produce.

Contracts that are legally enforceable and mutually agreed-upon must be implemented to protect the rights and livelihoods of downstream communities. Compliance mechanisms which ensure mitigation measures are followed, mitigation is successfully achieved, and new and/or changing impacts are identified and mitigation can be altered to achieve optimal results. Another vital element is a mechanism which allows affected persons to submit a grievance at any time during dam operation and can ensure such grievances are followed up.

Finally, the management of flows from the dam should be subject to a rigorous and professional environmental flows study that takes into account the needs of the downstream communities and ecosystems.