

The power of hydrology in the Omo-Gibe River Basin:

Gibe III and Flood Retreat Agriculture on the River Omo

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Sustainability Studies



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Abstract:

My work discusses how Gibe III is a Sustainable Development but is not sustainable. Along the river Omo are tribes and, unlike Gibe III which utilizes instrumental rationality to harness the flow of the River Omo for the production of hydroelectricity, they plant crops after the flow from the hydrological cycle floods the riverbanks with water and nutrients. I simplified Hågerstrand's (2001) System of Nested Domains into three levels: the local, meso-level, and landscape. Using the nested domains, I outline part of a vast interconnected web between the multinational institutions in the Lower Omo. In the meso-level, by combing Arturo Escobar's (2015 (a)) writing of a One World World with Erik Swyngedouw's (2004) description of Glob/calization, I describe the prolongation of a dominant image of thought which extends into the multitude of worlds on Earth. The localization of a global network of institutes impedes the flow of the river and, in turn, uses the water in the local river to transmit hydroelectricity into the Eastern Africa Power Pool. Gibe III - by impeding the flow of the river Omo - generates hydroelectricity through glob/calization. Gibe III lowering the water level of the river causes a change to the environmental conditions downstream. In the local level, I use a hydrosocial perspective to frame how Flood Retreat Agriculture (FRA) is a dimension of the Omo and different to Gibe III. On the one hand is a hydrological cycle that annually floods a river and deposits nutrients into the river banks and, on the other, Gibe III utilizes the river to generate hydroelectricity. FRA occurs in tandem with the hydrological cycle and Gibe III exports hydroelectricity and redirects water to industrial scale agriculture. As the tribes have lived in the Lower Omo for thousands of years, Sustainability has persisted through the changes of climate in the Lower Omo and does not hide behind a false sense of power generated through a hydropower dam. To transmit how the tribes are a model for sustainability in the Omo I restate the aim of the Transicones to convey how the tribes return to the river for FRA at the same time as the repetition of annual flood in the River Omo. In the Lower Omo, Sustainability is observed through the hydrological cycle of the Omo-Gibe River Basin by the repetition of FRA with the annual flood of the River Omo.

Keywords: Biosphere Integrity, Climate Change, Difference, Hydrology, Sustainability, Transicones

Acknowledgements

Written with gratitude for my Mother.

The following notes lay out how my mind imagined the core of this text.

- A small dense hollow pit hiccups and a calm fleck appears on a black horizon. Threads catastrophically erupt from the core, exploding horror, while a raw and frantic pulsation beats a momentum which turns whispers into writhing howls.
- Rotating around the sun, seasons appear and disappear as the earth spins on its axis. Imagine the way Day turns into Night, from Spring into Summer, Fall, and Winter. Our experiences expand and we extend into the spaces we occupy; participating with a flow of life.
- Rhythms dance beneath and beyond the global orchestration of parts and wholes, an untamed concert wildly basking in a vast sea of noise - differences of intensity, passing signs of existence - tortuously enveloping into one another.
- Beauty peers into the world as Difference - from the divulging tantrum of chaos, pulsating, thriving, seething, groundlessly shaking to the beat of its own drum, nowhere to be found and only to be displaced upon discovery - uncovering and disclosing itself in the faintest and most subtle moments, just to disappear but never to be gone.

Table of Contents

- Abstract: 3**
- 1 Introduction 1**
 - 1.1 Biosphere integrity 1
 - 1.2 Gibe III 4
 - 1.3 Sustainability Science..... 4
 - 1.4 Conundrum..... 5
- 2 Method 7**
 - 2.1 Framework 7
 - 2.2 Fields 7
 - 2.3 Fill the Nest..... 8
- 3 Theory 10**
 - 3.1 The Eternal Return 10
 - 3.2 The Omo 11
- 4 The Nested Domains of Gibe III..... 15**
 - 4.1 Landscape 15
 - 4.2 Meso 15
 - 4.2.1 External 15
 - 4.2.2 International..... 16
 - 4.2.3 National 17
 - 4.3 Local 19
- 5 Analysis of Gibe III 20**
 - 5.1 Hydrology 20
 - 5.2 Tribes..... 21
 - 5.3 Meso 23
 - 5.4 Landscape 25
- 6 Resolution 27**
 - 6.1 Warka Water and Oil 27
 - 6.2 Sustainability in the Pluriverse..... 27
 - 6.3 The Omo 28
- 7 Limits 30**

8 Conclusion	32
9 References	33
10 Appendix	38
10.1 Method	38
10.2 Theory	40
10.2.1 'The OWW' in Deleuze	41
10.2.2 'Glob/calization' in Deleuze.....	41
10.3 Nested Domains of Gibe III	42
10.4 Summary of Deleuze's technique in <i>Difference & Repetition (1968)</i>.	43
10.5 PNSP (square) and PBS (circle) operating in the Lower Omo	43
10.6 Outline of Industrial Agriculture beside the River Omo and Gibe III upstream.	44
10.7 Warka Water Tower	44
10.8 Map of oil in the Southern (Lower) Omo.	45

1 Introduction

1.1 Biosphere integrity

Before the Lund University Masters program of Environmental Studies and Sustainability Science (LUMES), the farthest I was able to extend my thoughts of the world was through considering the Ecosystem Services (ES). I thought ES to be the most direct way to speak about how humans interact with their surroundings. Moreover, they did not apply to just one human in one place but applied to all humans everywhere. The point of ES which I adhered to was stated in the Millennium Ecosystem Assessment, “The diversity of ecosystems is one factor influencing the diversity of cultures” (MEA, 2005: 58). To be said otherwise, I’ve been contemplating how species resonate with(*in*) the dynamics of their surrounding environment. For example, how did the Mayans arise from the forests of Guatemala and the Aborigines across the territories of Australia, likewise, the Inca’s in the mountains of Peru and the Vikings across the lands of Scandinavia? To describe how ecosystems influence the inhabitants in the modern world, my work needed to locate ‘they’ who still live close to the earth by relying fundamentally on the ecosystem which they are embedded in and being surrounded by. In this work I’ll discuss tribes living along the River Omo in Ethiopia, the Omo Valley Tribes.

I am interested in investigating a people’s dynamic nature and ability to sustain community through relationships with their surrounding ecology. As a biologist I alone could not hold this conversation so I had to turn to another discipline to discuss how organisms change along with dynamic shifts in their environment and coevolve with(*in*) their ecosystem. As ecological relationships are built from symbiotic relationships within a habitat, I believe that sustainability is not about learning how to reduce, reuse, and recycle resources. To be sustainable, there must be an authentic comprehension of the systems in which we participate, culturally and ecologically. We are a part of, not apart from, the Earth. We do not act alone, interactions matter and are constitutive of our relation to the environment. I want to show that we live in one ecosystem but emerge from many environments. Environmental studies are concerned with the interconnected qualities of social, ecological, economic and political systems, and within each system that is an acquisition of stock which may be valued through sight, touch, measurement or time (Meadows, 2008). Although many pieces of our systems remain immeasurable and intangible their existence holds us together as humanity. I suggest, by addressing the vastness that exists with the natural world and cognitive aspect of humans, we can radically empower individuals to portray their socio-ecological environments while preserving their ecosystems

innate qualities. To become a sustainable civilization, we should raise awareness towards the ways in which a people's identity is constructed through their socio-ecological relations.

As a Biologist my thoughts circle around a dogma 'Structure and Function'. Like animals in an ecosystem, proteins have precise structures which unlock specific functions in the chemical reactions of a cell. The specificity of a protein is like a key which slides into a keyhole in a receptor molecule and, their conjoining unlocks (i.e. stimulates, activates) cellular process within cells. A plethora of chemical reactions are underway within the cytoplasm of a cell and from them an effect is produced. From this effect an *affect* is observed, like the intangible sense of a sensation. The intangibility of this has stirred questions in my mind. These types of questions, led my previous studies to emphasize a focus on Biodiversity so as to amplify the *affect* in order to understand how the differences between individuals and differences between species are characterized by complex cellular activity which correlate to their environments. For instance, the blubber of whales, the different species of whales, and within a population of whales each individual being a different individual. To have a thorough discussion of this I suggest reading Darwin (2003) because my investigation on species is slightly different. Something that I found to be remarkable was how the conditions of the environment influence and bear a resemblance to the species inhabiting the environment. This idea holds two aspects, one is the reciprocity between the environment and species and, second, the variation inherent to the individuals of a species within an environment. Again, to amplify my thought I related my contemplation of the animal kingdom to *Homo Sapiens* by considering the Cultural Ecosystem Services. The cultural services are the depiction/description of experiences which have formed communities within environments. I am fascinated by "the nonmaterial benefits people obtain from ecosystems through spiritual enrichment, cognitive development, reflection, recreation, and aesthetic experiences" (MEA, 2005: 58). For instance, I contemplate how the Mayans decorated and adorned their bodies and lived with many other species in Guatemala. My question of the Maya became how does the surrounding environmental conditions influence the characteristics of a species. Rupert Sheldrake (2012) on Morphic Fields and Resonance provided a thorough response to my question. The long and short of this idea is that everything is vibrating from rhythmic process of activity and from a reciprocity between the human mind and nature, *Homo sapiens* have formed and been formed in the cosmic web of Nature, "the web of life". Sheldrake (2012) meticulously explains how a traditional gaze towards Nature has been upheld by a mechanistic worldview which arose from the enlightenment thinkers and joins Biology with Philosophical thought to suggest that culture is actually the result of rhythmic processes of activity occurring within morphic fields. "[H]igher-level fields within which new fields come into being are modified by these new patterns of organization within them [...] from new kinds of protein molecules that have arisen within the fields of cells to galaxies within the field of the growing universe.

In every case, the higher-level fields are influenced by what has happened in the past and what is happening within them now” (p. 385-6). For example, a Mayan was an individual of the Maya who lived in the rainforest of the Mirador Basin in Guatemala centuries ago, the Mayan temples are vacant but through the remnants of Maya a depiction of the essence of the Mayans of Guatemala remains to display how they were formed by their environment and influenced the dynamics of the surrounding ecosystem. In a similar vein, my imperative in this work is to elaborate how the tribes of the Omo live embedded within the Omo-Gibe River Basin and are surrounded by the ecology of the Omo. I aim to articulate a description of what is influential to people across the planet and disclose how a reciprocity with the environment is essential to an enviro-cultural identity. I aim to discuss how biota - the tribes living along the river Omo in Ethiopia - endure changes in the climate.

At Lund University I was informed of the article by Rockström et al. (2009) which outlined ‘a safe operating space for humanity’ “[t]o meet the challenge of maintaining the Holocene state” (p. 472). The authors raised the concept of Planetary Boundaries (PBs) to refer to a space for humanity on Earth which does not cause the irreversible degradation of planet’s climatic processes. To clarify an appropriate level of concern, Steffen et al. (2015) revised the initial PBs and postulate that Climate Change and Biosphere Integrity compose the crux of the PBs because “[t]hey operate at the level of the whole Earth System, and have co-evolved for nearly 4 billion years. They are regulated by the other boundaries and, on the other hand, provide the planetary-level overarching systems within which the other boundary processes operate” (Steffen et al, 2015: 6-7). I begin with referencing their work because I explore the two components of Biosphere Integrity, “the genetically unique material [...] that ultimately determines the potential for life to continue to co-evolve with the abiotic component of the Earth System [Climate Change]” and, “the functional traits of the organisms present in an ecosystem” (Steffen et al., 2015: 3). The crux of my argument is that sustaining the Biosphere mitigates Climate Change. As Steffen et al (2015) note that Climate Change and Biosphere Integrity have ‘co-evolved for nearly 4 billion years’ but the crucial aspect of Biosphere Integrity which is in need of elaboration is understanding how organisms form and are formed by their climate. Moreover, how diversity in the gene bank is advantageous for species so they are not obliterated from a single environmental stress (i.e. increased temperature). I’ll briefly note that differences are passed through offspring which affirm the presence of the species but, the offspring of the species are different, perhaps, more fit for the “now” current environmental conditions. Nonetheless, diversity in the ‘gene pool’ allows species (not individuals) to persist through various selection pressures and change with the change inherent to their surroundings. To take into account Rockström’s consideration of the Biosphere, I need to add to their work that genetic diversity is not solely an account of the sheer abundance of Earth populating species but this refers to the variation of various varieties within the populations of all life on Earth.

The substantial quality of differences in genetic diversity in relation to the gene bank of Biosphere Integrity provides context to how species sustain changes in their climate. In this case, however, I am referring to how tribes along the River Omo contribute to the diversity of humanity's gene bank. What is in need of elaboration is describing the manner by which biota are actively participating and interacting with their environment and how this contributes to biosphere integrity sustaining climate change.

1.2 Gibe III

Gibe III is the physical feature of sustainable development which I investigate and compare to the flood retreat agriculture on the River Omo. Gibe III disrupts Biosphere Integrity by impeding a second Planetary Boundary described by Steffen et al (2015), Biogeochemical Flows which is roughly outlined, "there is increasing evidence that ratios between elements in the environment may have impacts on biodiversity" (p. 4). I am not looking at only the Gibe III dam or solely the geomorphology of the landscape in the Omo-Gibe River Basin (OmoGRB) but actually what these two features have in common, nutrient transport in the environment by flowing water. To correlate the conflict of Gibe III to the biogeochemical flow in the OmoGRB, Turton (2010a) notes that "flood cultivation has two characteristics which make it the most valuable agriculture resource available to the people of the lower Omo. First, it is reliable, because it depends on the highland rain rather than on the erratic local rains. Second, *the same plots can be cultivated year after year because their fertility is constantly renewed by the annual deposition of flood silts*" (p. 2-3, emphasis added). Gibe III is ecologically disruptive to downstream biological communities by impeding the flow of water and nutrients in the River Omo.

1.3 Sustainability Science

I discuss the abiotic and biological components in this case because, as a byproduct of projects like Gibe III, dams lead to habitat degradation and loss of biodiversity. The conflict I have with Gibe III is not the dam itself but is seen through a consequence - the dissolution of nutritious silts being annually deposited into the riverbanks downstream. Turton (2010b) revealed that behind Gibe III, "98 percent of the sediment entering the [Gibe III] reservoir will be trapped" (p. 10). Through my work, I am contemplating the consequence of disrupting the ecological processes underlying the flow of the River Omo to suggest that the tribes provide a description of sustainability by annually returning to the River Omo for flood retreat agriculture (FRA). Kates et al. (2001) published an article on Sustainability Science

describing that “research itself must be focused on the character of nature-society interactions, on our ability to guide those interactions along sustainable trajectories, and on ways of promoting the social learning that will be necessary to navigate the transition to sustainability” (p. 642). The case of Gibe III suits sustainability science because as the focal point of my work is the hydropower dam, I focus on how sustainable development negatively impacts the ecosystem downstream. Following the Kates article, I selected Gibe III for study in the field of Sustainability Science because of the different interactions that Gibe III and FRA hold with the River Omo.

To emphasize the difference between Gibe III and FRA, I focus on the biology of the OmoGRB in order to discuss how sustainability emerges from and is seen through the tribes who perform flood retreat agriculture along the River Omo. I am descriptive of Sustainability, rather than definitive (i.e. answering ‘what is sustainability’), because I want to provide a description of how sustainability occurs and discuss how societal dependence on environmental resources may be derived in two ways from the setting of the OmoGRB. I understand Sustainability not as a tangible point but as a perceptual quality circulating throughout the semi-nomadic/pastoralist tribes *of* the Lower Omo *in* the environmental conditions of OmoGRB. The tribes of the Omo grow agriculture along the banks of the River Omo and, as a result of active participation with their ecosystem, sustainability is seen through their return to the River Omo to plant crops at the same time as an annual flood. To say this nonchalantly, I understand sustainability as that which reciprocates with and seamlessly passes through the changing conditions of local environs. To be said more philosophically, Sustainability moves behind “the two figures of difference, movement and disguise - the displacement which symbolically affects the virtual object and the disguises which affect, in imaginary fashion, the real objects in which it is incorporated” (Deleuze, 1968: 109). In the OmoGRB, the return of the annual flood coupled with FRA display the tribes being a part of, not apart from, the changing environment in the Lower Omo. Gibe III threatens the biosphere downstream which reveals, through FRA, a sustainable solution - not for the entire world, but - to Climate Change within the OmoGRB.

1.4 Conundrum

The frame of this case is the Omo-Gibe River Basin. I question the sustainable development taking place in the Lower Omo. The first question of my work asked: Is Sustainable Development - in the form of hydro-electric power from Gibe III - a solution to Climate Change? The aim of my research is not to determine if ‘Sustainable Development is a better alternative than Development?’, nor to delineate the dam in order to identify its shortcomings. Hägerstrand (2001) outlines something else, “the core problem [...] the gap is wide between those who talk, write and make decisions from a bird’s eye view

of the world and those who deal with the material realm [...] Experience as well as knowledge and skills are bound to be unequal” (p. 36. emphasis added). I perceive the problem of Gibe III from the lowering water level and nutrients being trapped behind the dam. I contemplate the consequence of disrupting the flow underlying the ecological process upheld by the River Omo. I hypothesize that: if there are major changes to the flow and transport of nutrients in the River Omo, then the tribes will experience an environmental stress. The focus of this work is to discuss how the tribes living along the River Omo have adapted to the climatic conditions in the Omo. The environment of the Lower Omo is characterized by “harsh and often unpredictable conditions of the region’s semi-arid climate” (Survival International, 2018) but, my question does not come from the sentiment of thinking about why people live in the unfavorable conditions of the Lower Omo. On the contrary, I question ‘how do people live in the Lower Omo and survive?’. On the one hand are the tribes relating to the River Omo through FRA and, on the other, Gibe III stores the water which, consequently, impedes the flow of the River Omo. By juxtaposing Gibe III and FRA my research responds to the question: *How, under what conditions, does sustainability occur along the River Omo?* The conditions of sustainability in the case of Gibe III are set by the Hydrology of the OmoGRB, how an ecological perspective of Hydrology differentiates between development and sustainable development as well as describes sustainability will be the discussion of my thesis.

2 Method

2.1 Framework

For the framework of this case, I turned to the outline of a system of nested spatial domains by geographer Hägerstrand (2001). The spatial domains are comprised of State, Province, Local Government, Landed Property and Action Space. I simplified Hägerstrand's framework into three levels: the Local, Meso-level, and Landscape. Gibe III in the Local Level, Hydropower in the Meso, and Climate Change in the Landscape. To emphasize the difference between Gibe III and FRA, I repeat Hägerstrand's model a second time but from an environmental lens: the River Omo flows into the Lower Omo which is in the Omo-Gibe River Basin. By repeating these three concepts twice [levels (bottom - middle - top), fields (one influencing the other and vice versa), and domains (society and nature)] the two schemata pronounce a system of nested domains in the OmoGRB: Gibe III on the River Omo, hydropower in the Lower Omo, and the Hydrology of the OmoGRB (*Appendix 3*).

2.2 Fields

I emphasize the 'nested' quality of Hägerstrand's domains because relations are not only vertically stacked on levels but enveloped within one another like the organelles in the cells of a tissue. I use the concept of Fields rather than Systems to make sense of the content in this case because fields incorporate a depth at the beginning, whereas, a system reintroduces depth when the system undergoes a phase change. To cut to the chase, the main difference between the materiality of a system and a field is that "fields cannot be explained in terms of matter; rather, matter is explained in terms of energy within fields" (Sheldrake, 2012: 110). Moreover, the concept of fields articulates the problem of Gibe III not as the obstruction at a point on the River Omo but in the disruption of 'the flow of energy' through the OmoGRB. To clarify how I use the system of nested domains I'll distinguish between levels, domains, and fields. A level is equivalent to a layer in a stack - bottom on bottom, middle in the middle, top on top. Domains and Fields resemble one another but a domain is a difference in kind, whereas, a field is a difference of degree. For example, within a cell, a difference in kind between a ribosome makes proteins for the cell and mitochondria produces energy; a difference in degree within the cell is observed through ribosomes resonating with the abundance of other ribosomes and mitochondria with the other mitochondria. To bring the concept of fields to the nested domains of Gibe III, the past influences – flows into – the present and Agricultural products are a different kind to the production of Energy. I do not move through Hägerstrand's system of nested domains by using contradiction, "receiving in contradiction the negativity which is the indwelling pulsation of self-movement and spontaneous activity" (*Hegel in Deleuze, 1968: 44*) because I move

through the various levels of domains, across the multinational lattice which has coalesced to produce Gibe III on the River Omo, only to disclose the power behind the hydrological cycle in the field of the OmoGRB is the force that synthesizes all the components of this case. To discuss how sustainability emerges from the Lower Omo and to speak to the commonality of both particle and wave - the flowing of water - I've rephrased Deleuze's technique in *Difference & Repetition (Appendix 4)* into three points: (1) Disclose how Gibe III is not sustainable but is the representation of what sustainable development is, (2) Discuss how sustainability is seen through the Repetition of the tribes' flood retreat agriculture, and (3) Describe how sustainability occurs through the hydrology of the Omo-Gibe River Basin.

2.3 Fill the Nest

To respond to the research question, I went into the Lower Omo. I did not conduct research, I went to see for myself that the tribes whom I've been reading of are where I've read them to be. My writing was conducted in Sweden but before I invested myself into this work I needed to know that "the Omo Valley Tribes" actually exist. I filled the nested domains with a broad literature review of Gibe III. The literature contains articles from the academic fields of anthropology, biology, development studies, geopolitics, hydrology, reports from non-governmental organizations, summaries from institutional assessments, as well as articles from newspapers and magazines. I use Hägerstrand's schemata as a tool to clarify the national and international 'noise' made by institutions in the Lower Omo. To decipher Gibe III along the River Omo I applied the concept of fields, this allowed me to dissect three different kinds of content in the Meso-level and separate them into three categories to depict a multinational orchestration behind Gibe III. The first category of the Meso-level consists of funds which are exchanged via external networks (i.e funding assistance or aid investments). The second category outlines international institutions that have arrived in Ethiopia to perform business. The third section is composed of national institutions. I've left out many institutions connected to Gibe III not because discussing their presence is unimportant but I do so in order to keep a clear view on the sustainable development taking place in the Lower Omo. To articulate the idea of 'noise' around Gibe III, I refer to Deleuze (1968) who cites Leibniz on hearing the murmur of a sea, "*either we say that the apperception of the whole noise is clear but confused (not distinct) because the component little perceptions are themselves not clear but obscure; or we say that the little perceptions are themselves distinct and obscure (not clear)*" (Deleuze, 1968: 213). Imagine, for a moment, that the case of Gibe III were a beach where a single wave crashes upon the shore and hearing water rush along the sand. Either the wave hitting the shore is heard (clear but confused) or each water particle clinking into the others crashing into the particles of sand is listened to (distinct and obscure). What is clear is that water behind Gibe III holds two purposes: the first is to feed into the industrial agriculture (HRW, 2012; HRW; 2015; HRW;

2017; SI, 2009; SI, 2017) and, the second is to generate the production of hydropower to be transmitted to neighboring countries (IR, 2011; NWNL, n.d.). What is confusing is how hydroelectricity plays a new role in Ethiopia's history of combining hydropower with industrial agriculture for development and how the tribes returning to the River Omo to perform flood retreat agriculture is sustainable.

3 Theory

3.1 The Eternal Return

In this case, I look at the different tribes of *Homo sapiens* along the River Omo, noting that each member is different and question how they relate to their semi-arid environment by planting with a repetitive flood of the River Omo. As Deleuze (1968) connects Repetition to a test, I find a test for sustainability in the Lower Omo in a reoccurring event along the river. Everything becomes different year after year, but something which is irreducible to any one component of the Lower Omo returns to the river, “the present is the repeater, the past is repetition itself, but the future is that which is repeated” (Deleuze, 1968: 94). On the one hand are tribes in the Lower Omo and, on the other, is the River Omo. I locate a moment of the Eternal Return in the return of the flood to the River Omo and, accordingly, the tribes to the riverbanks. The selection begins once the floods cease, the tribe members must survive the arid conditions of Lower Omo until the next flood, “Eternal return alone effects the true selection, because it eliminates the average forms and uncovers ‘the superior form of everything that is’. Eternal return employs negation like a *Nachfolge* and invents a new formula for the negation of the negation: *everything which can be denied is and must be denied*” (Deleuze, 1968: 55). The Omo sustains itself along the River Omo and is observable *through* flood retreat agriculture along a flooding river year after year.

“The eternal return does not bring back ‘the same’, but returning constitutes the only Same of that which becomes. Returning is the becoming-identical of becoming itself. Returning is thus the only identity, but identity as a secondary power; the identity of difference, the identical which belongs to the different, or turns around the different. Such an identity, produced by difference, is determined as ‘repetition’. Repetition in the eternal return, therefore, consists in conceiving the same on the basis of the different” (Deleuze, 1968:41).

I equate the Hydrology of the OmoGRB to the Eternal Return in order to explain that FRA Repeats the annual flood and Gibe III disrupts the flow of the river. As the tribes repeat the force which flows through the hydrological cycle, the Omo masks itself as it paints their faces and becomes displayed in FRA. To perceive sustainability in the Omo and clarify how the tribes display the sustainability of the Omo, I echo Deleuze’s reference of Thomas Carlyle in *Sartor Resartus* to illuminate the allusive aspect of Repetition, “it is the masked, the disguised or the costumed which turns out to be the truth of the uncovered. Necessarily, since this repetition is not hidden by something else but forms itself by

disguising itself” (Deleuze, 1968: 24). In the Lower Omo a sustainable solution is simultaneously masked by and displayed in FRA.

3.2 The Omo

I’m in the pursuit of addressing what sustainable development is, how to develop sustainably in the face of global catastrophes and attempt to do so in a manner which circumvents the power structures which have orchestrated a Climate Change problem. I begin with the hydrosocial discussion to differentiate between how Gibe III and FRA reciprocate with the River Omo. As Swyngedouw (2009) notes, “every hydro-social project reflects a particular type of socio-environmental organization. *Imagining different*, more inclusive, sustainable and equitable forms of hydro-social organization implies *imagining different* and more effective, assumingly democratic, forms of social organization” (p. 59, emphasis added). Gibe III regulates the unknown monster of Climate Change by regulating the flow of the River Omo to generate hydropower. Conversely, Gibe III interrupting the flow of the river causes a change to the climate downstream. To be clear, the dam literally changes the downstream environment by regulating the river - the water level lowers and nutrients no longer infiltrate the riverbanks in an annual flood. By noting the subtle difference between the global problem and the local impact, I question if Gibe III will withstand the test of the Eternal Return as dams are known to decrease in efficiency and be eroded by sediment (Hydroworld, 2017). I am looking for a solution to climate change in the Omo, something that does not deteriorate from a build-up of sediment. I began to contemplate how FRA occurs in tandem with an annual flood that deposits nutritious silts because Gibe III may not be the solution for the Lower Omo. Imagining something different, I looked at FRA because the tribes have derived some sort of a method to sustain *Homo sapiens* along the River Omo.

Energy from the sun evaporates water and clouds precipitate over the highlands of the OmoGRB. A force creeps through the water cycle flowing through the Lower Omo in River Omo, passively transporting nutrients within annual flood year after year. Deleuze articulates, “every phenomenon refers to an inequality by which it is conditioned. [...] Everything which happens and everything which appears is correlated with orders of differences: differences of level, temperature, pressure, tension, potential, *difference of intensity*” (222). Movement - imagining how everything is in constant motion - is crucial. As water is pulled by gravity from the mountains into the River Omo, the river flows from high to low. From the falling of rain, the River Omo flows through the Lower Omo. The River Omo presents a delirious quality - not intelligible - because the flow follows the force of gravity across the landscape. The effect from the water cycle is subtle, the subterranean flow of the river creeps over dry soil and, when the river swells during the wet season due to rain in the highlands, the water not only

leaves wet soils in its wake but deposits nutritious silts along the riverbank. The consequence of nutritious flood silts being transported and deposited along the riverbanks in the OmoGRB sets the conditions of the phenomena of FRA along the River Omo. The tribes returning to the banks of the River Omo repeat the flow of water that not only harrowed the Omo-Gibe River Basin but annually deposits minerals into Omo's riverbanks. Upon their return to the river, perhaps some members of the tribes have died and the other individuals who've survived are older, nevertheless, the minerals introduced into the riverbanks are freshly withered from the highland mountains, the seeds placed into the soil will grow the same crops but the crop harvested are not identical to the ones from the previous harvest nor are the water molecules in the river the same ones as before. From harvest to harvest, everything becomes different: the climate, the tribes, the water, the minerals transported, the crops cultivated, "like an animal in the process of being tamed, whose final resistant movements bear witness better than they would in a state of freedom to a nature soon to be lost: the Heraclitan world still growls in Platonism" (Deleuze, 1968: 59). To repeat, the tribes of the Omo are a part of - not apart from - the surrounding environment, FRA correlates to differences in the atmospheric conditions of the OmoGRB which cause the River Omo to flow through the Lower Omo and deposit nutrients into the riverbanks of the Omo. To articulate the power of Hydrology, rather than thinking of how Power is orchestrated by harnessing hydrology, I relate a concept essential to the philosophy of Difference - the movement of the Unequal - to the hydrology of the OmoGRB, "Everything goes from high to low, and by that movement affirms the lowest: asymmetrical synthesis" (p. 234). Difference surges through the power of hydrology in the Omo and the tribes repeat flood retreat agriculture as nutritious silts come from the annual flood of the River Omo.

Gibe III inserts catastrophe into the Omo by impeding the flow conducive for FRA along the river. The tribes plant along the River Omo and Gibe III hinders the flow of the river to generate hydroelectricity and redirect water to industrial agriculture. The havoc surrounding Gibe III comes from harnessing flow of the River Omo, guided by gravity, to create a difference in potential energy behind the dam to convert gravitational energy into kinetic (mechanical) energy (Donev, 2018). Swyngedouw (2004) articulates an insidious twin process - Glob/calization - that prolongs a One World World (OWW) by territorializing unbound territories to sustain a circulation of capital from 'the global' to the '(g)local' and back. Escobar (2001) notes - after personal communication with Swyngedouw about the term 'glocal' - how space is reordered for "the localization of the global and the globalization of the local" (p. 156); Swyngedouw (2004) provides further explanation, "the production of space through the perpetual reworking of the networks of flows of capital circulation and accumulation discards existing spatial configurations and scales of governance, while new ones are produced" (p. 32). Through the 'reworking' of 'space', developments such as Gibe III crusade into unknown territories and - unaware

of their own force - wreak havoc. To *imagine the omo*, I unite Escobar's (2011) Pluriverse with Deleuze's contemplation of Ideas - "Ideas are Multiplicities" (p. 182) - and this combination allowed me to conceive how there is not One world nor are there Many but, actually, on Earth nothing exist exterior to its interaction and interconnectedness to planet Earth. On planet Earth; worlds pour out. The consequence of this is imagining that on Earth worlds are enveloping and unfolding within the plurality the Earth's multiple environments. To set the Omo as world of pluriverse in frame my case, the sustainable development from the OWW and the world of the Omo along the River Omo coexist as two worlds on planet Earth. Moreover, as a single droplet of water is already multiple molecules of Hydrogen (H^+) and Hydroxide (OH^-), Gibe III is an orchestration of multiple parts - the turbines for the dam were acquired from IMMI Turbines a company from the US (Power-Technology, 2018) and the concrete wall contains multiple particles of sand. Gibe III and FRA are hydrosocial relationships tied to the Omo's river but what difference is there?

To articulate the difference between Gibe III and the flood-retreat agriculture, I hold fast to the hydrological cycle flowing through the River Omo. To translate the discussion of difference into the frame of Gibe III Arturo Escobar (2015 (b)) refers to John Law's Euro-modernity to portray the OWW "a world allegedly made up of a single Word, and that has aggregated for itself the right to be "the" world, subjecting all other worlds to its own terms or, worse, to non-existence; this is a World where only a world fits" (p. 15). The crushing force of the OWW found a friend in the mind of Newton and forged a mechanistic worldview. The consequence of Newtonian physics has been conceiving the world like an operating machine where measurements can be placed upon the worlds' bodies and calculation infers their motion, "a comprehensive mathematical formulation of the mechanistic view of nature [...] the crowning achievement of seventeenth century science" (Capra and Luisi, 2014: 26). The alliance of the mechanistic world view and the OWW has wreaked havoc on our planet. When Swyngedouw writes 'imagining different', the notion is met with a dark hope. Deleuze (1968) fractures 'I' and 'Self' to explore their chasm and explain that the model of modern thought asserts itself from the four cardinal positions of reason - this 'I think' (identity) and that 'I am' (opposition), I am thinking I am (analogy), I think that I think (resemblance).

"On precisely these branches, difference is crucified. They form quadripartite fetter under which only that which is identical, similar, analogous or opposed can be considered different: difference becomes an object of representation always in relation to a conceived identity, a judged analogy, an imagined opposition or a perceived similitude. Under these four coincident figures, difference acquires a sufficient reason [...] For this reason, the world of representation is characterised

by its inability to conceive difference in itself; and by the same token, its inability to conceive of repetition for itself” (Deleuze, 1968: 138).

Gibe III has been forged in the OWW to generate hydropower but this dam has negative consequences for the tribes downstream. Deleuze (1968) scrutinizes the various OWW models because what lies behind them is a framework set by Descartes, Kant, and Plato for what it means to ‘think’ - an Image of Thought which consequently pronounces ‘a world of representation’. Gibe III is trapped within this model of thought but by conceiving the power of hydrology flowing through River Omo I reiterate what Deleuze (1968) pronounces, “[t]hose whom Nietzsche calls masters are certainly powerful men, but not men of power” (p.54). On the one hand, water is harnessed to generate hydroelectric energy - speaking instrumentally, this is only the utilization of gravitational power. Conversely, there is the power of hydrology which organizes biota in the Omo and is embodied in the tribes that live along the River Omo. The missing link in this treacherous story is understanding how, before Gibe III, there was already a seething flow of energy in the OmoGRB which the OWW marches to obtain.

4 The Nested Domains of Gibe III

4.1 Landscape

Hydropower has reigned as one of the central means for modernization in Ethiopia. Emperor Salessie strived to make Ethiopia “the water tower of Africa” (Carr, 2017: 26). After Salessie, the Derg - led by Mengitsu - constructed dams for Ethiopia's modernization (Fantini and Puddu, 2016). Under the reign of the EPRDF, the pinnacle piece of this study is the recently operational part of the Gilgel-Gibe dam cascade in the Lower Omo: The Gibe III dam. Verhoeven (2013) discusses the Water-Energy-Food nexus across Africa and I relate this frame to the case of Gibe III, “water is not just a key to food production through agriculture, it is also increasingly linked to regional energy security” (p. 2). In 2006, the same year that the Gibe III dam began construction, the Ethiopian government announced a catastrophic flood in the Lower Omo which killed people and their livestock (Carr, 2017). Turton (2011) noted that ‘state-building’ began with Omo and Mago National parks and this announcement contextualized the Omo Rivers’ need for regulation. The Italian company CESI performed an Environmental and Social Impact Assessment, and reported “the presence of Gibe III reservoir will provide flood protection (will reduce floods both in peak and in frequency) to downstream areas. [...] The 2006’ floods caused the death of hundreds of people, thousands of animals and a displaced population of 15,000. As an estimate millions of US\$ of works were needed to rehabilitate Health, Education, Shelter, Water and Sanitation, Agriculture, Livestock, Fishing, Roads, etc facilities washed away. With this regulation, areas prone to frequent flooding can be used for agricultural purposes” (ESIA, 2009: 11). Behind Gibe III water from the River Omo holds two ends, one leads to the production of agriculture and, the other, to the production of hydroelectric power for energy consumption.

4.2 Meso

4.2.1 External

The literature outlines the ambiguity of the International Donor Community and Official Development Aid in Ethiopia. Fantini and Puddu, (2016) remark that these two bodies are comprised of ‘unconventional donors’ such as China, India, Brazil, Turkey, or South Korea and ‘traditional donors’ such as OECD (Organization for Economic Cooperation and Development) the DAC (Development Assistance Committee. Moreover, Fantini and Puddu (2016) explain that the GoE, under Ethiopian People’s Revolutionary Democratic Front, “has confirmed itself as one of the most cherished ‘donor darlings’, constantly ranked among the top-ten recipients of international aid flows worldwide” (p. 95). In the Southern Nations Nationalities and Peoples Region (SNNPR), for example, the National Food

Security Program (NFSP) was launched in 2005 and is comprised of four initiatives: the Household Asset Program (HAP), the Complementary Community Investment Program (CCI), the Resettlement Program (RP), and the Productive Safety Net Program (PSNP) (Oakland Institute, 2013 (a)). The PSNP is a multi-donor trust fund for Ethiopia which focuses on reducing food insecurity by offering economic support and building resilient solutions for rural populations (Europa, 2018). The PSNP holds an “aggregate budget of \$2.3 billion - a budget composed of aid from 10 development partners including DfID, USAID, Irish Aid, Canadian International Development Agency, World Food Program, Swedish International Development Agency, and the Netherlands” (Oakland Institute, 2013 (a): 18-9). Revealing how single programs are full of multinational dynamics is important to understanding Gibe III because what needs to be revealed is how external funds are masked by domestic programs operating in Ethiopia (*Appendix 5*). Another major program operating in the SNNPR is the Promotion of Basic Services (PBS) which extends international assistance to the local level of government for the procurement of health, education, water, agriculture, and road construction (Re:Common, 2016). The PSNP and PBS need mention because of how international development aid appears through bi- and multilateral funds setting programs in motion - furnishing the Gibe III project - and consequently, the destructive force of developments, insidiously wreaks havoc in peripheral regions of the state (Oakland Institute, 2013 (b)). Fantini and Puddu (2016) review the effectiveness of projects and initiatives such as the PNSP are reminiscent of the traditional trajectory of Ethiopian development which assert “population control and agricultural surplus extraction” (p. 96). Survival International (2009) wrote a letter concerning the development in the Lower Omo and, in response, the World Bank, EIB and the ADB withdrew from funding Gibe III (NWNL, n.d.). In 2010, after the Dam’s major funders stepped out of the project, the Industrial and Commercial Bank of China (ICBC) loaned \$459 million for the installation of mechanical equipment (Turton, 2010a; Fratkin, 2014), and the contract with the Dongfang Electric Corporation backed with a \$420 million loan brought the Gibe III project back into production (Carr, 2017). In short, the loan from China resuscitated Gibe III and its sidecar projects to unlock the productive potential of the Lower Omo. In sum, financial entities are masked by programs to either secure land for agriculture by resettling pastoralists in the Lower Omo or acquire water from the River Omo for the watering of crops in agricultural schemes beside the river.

4.2.2 International

The prominent company is a family owned construction company from Italy titled Salini Impregilo. They’ve built several hydro-electric projects in Ethiopia: the Koka Hydroelectric Project (1958-60), the Legadadi Dam (1964-70), the Finchaa Hydroelectric Project (1969-73), Tana Beles Project (1986-92), Dire Dam (1996-98), Gilgel Gibe I Hydroelectric Plant (1999-04), Gilgel Gibe II Hydroelectric Power Plant

(2004-09), The Beles Multipurpose Project (2005-10), Gibe III Hydroelectric Project (2006-16), the Grand Ethiopian Renaissance Dam (2010-ongoing), and the Koyssha Hydroelectric Project [Gibe IV] (2016-ongoing) (Salini Impregilo, 2016). Although Salini builds dams, they are not the sole actors partaking in Ethiopia's Sustainable Development. The Omo-Gibe River Basin is being divided among agencies, companies, corporations, firms, and organizations that operate outside their country of origin. An Indian water, power and infrastructure consulting firm WAPCOS Ltd. prepared the Master Plan in '90; Richard Woodroffe & Associated from the UK prepared the Omo-Gibe River Basin Master Plan in '93; Acres International Ltd. a consulting firm from Canada formulated the power-system plans for the EELPA in '96 (Carr, 2017). Fri-El Green S.p.A. is an Italian company growing palm oil & jatropha in the lower Omo (Turton, 2010b; Re:Common, 2012; Re:Common, 2016; Fri-El-Ethiopia, n.d). From Turkey, Ayka (aykatextile.com, n.d.) and the Omo Valley Farm Cooperation Plc. Omo Valley are farming cotton (IR, 2009; Ecotextile, 2014; Fong, 2015; Re:common, 2016; Kamski, 2016; 2Merkato, 2016) and Ethiopian Sisay Tesfaye Agro Processing is also farming cotton along with mango, banana among their horticulture (sisaytesfaye, 2013; Re:Common, 2016). Whitefield Cotton Farm PLC is an Indian cotton processing facility (Re:Common, 2016; Openlandcontracts, 2015; Embassy of India, 2018). Ethio-Renewable Energy LTC (OBM) is a joint venture between Italy and Ethiopia focusing on growing palm oil, jatropha, and sunflower for agro-fuels (Turton, 2010b; Re:Common, 2012; Re:Common, 2016). The Jiangxi Water & Hydropower Construction Company (JWHC) and the Ethiopian Water Works Construction Enterprise (EWWCE) were contracted to implement the irrigation system in the Kuraz Blocks (Avery, 2013; HRW, 2015; Kamski, 2016; Carr, 2017). The EEPCO awarded the contract of power lines from Gibe III to the Sodo Wolayta power station to the Shanghai Electric Group and the transmission lines were installed by China's TBEA Limited (Global Transmission Report, 2009; Global Power Journal, 2016; Power-Technology, 2018). In sum: biofuels, horticulture, hydropower and textiles outline the sustainable development taking place in the Omo Valley.

4.2.3 National

From the reign of Emperor Selassie who began Ethiopia's project of modernization to the reign of the EPRDF, modern development in Ethiopia has proceeded through hydropower and industrial agricultural. The Derg - through the Water Resources Development Authority assembled 'a comprehensive master plan of the Omo-Gibe River Basins' resource potential' (Kamski, 2016: 572). In 1987, the Awash Valley Authority (AVA) turned into the Ethiopian Valleys Development Studies Authority (EVDSA) which drafted a Master Plan in 1990 for river basin development and was titled the 'Preliminary Water Resources Development Plan for Ethiopia' (Carr, 2017: 29). In 1993, the EPRDF organized the Omo-Gibe Master Plan (published in 1996) for hydropower development assessed the

feasibility of constructing hydroelectric power and agriculture plantations in the Omo-GRB (Avery, 2013; Fong, 2015). The Ethiopian Electric Light and Power Authority (EELPA) was in charge of river basin development and the Derg regime turned this utility into Electric Power Corporation (EEPCO) to conduct a Power System Planning Study (1996) which, after two updates, is known as the Ethiopia Power System Expansion Master Plan (2000, 2005) (Carr, 2017). As the EELPA was the authority in charge of “the generation, distribution, and sale of electricity, with emphasis on commercial and industrial sales” (Carr, 2017: 25), the EEPCO currently “engages in the production, transmission, distribution, and sale of electrical energy. Its projects include hydro, transmission construction, wind, geothermal, IT projects, and waste to energy projects” (Bloomberg, 2018). EEPCO is the state-owned institution which developed Gibe III (ESIA, 2009; Gibe3, 2012; Salini, 2014). To clearly enunciate the point of all these institutions, the Gilgel-Gibe dam cascade found its placement along the River Omo from the studies, assessments and reports carried out in the OmoGRB.

Ethiopia has heralded its transformation into a modern nation through the Growth and Transformation Plan I (2010/11 - 2014/15) and the Growth and Transformation Plan II (2015/16 - 2019/20). These two plans publish the national objectives set for the achievement of their 2025 vision and are contingent on building and executing schematic strategies. The second plan builds on the achievements and conditions of the first, “towards the realization of Ethiopia’s vision of becoming lower middle-income country by 2025, the Second Growth and Transformation Plan (GTP II) is built on the Sectoral policies, strategies and programs, lessons drawn from the implementation of GTP I” (NPC, 2016: 76). Clarified in GTP II is Ethiopia’s aim to improve the sectors of Agriculture and Energy by the expanding Infrastructure, “Given the government’s focus on infrastructure expansion; capital expenditure on infrastructure sector accounts for about 48.4 percent of the total capital expenditure. Within this, drinking water, irrigation and energy, road, railway infrastructures are projected to account for 23.3 percent, 21.6 percent, 2 percent and 1.5 percent, respectively for the plan period.” (NPC, 2016: 115). To correlate this list in the GTP II to Gibe III, Block and Strzepek (2012) refer to Ethiopia’s water as “white oil” because of the water potential of Ethiopia. Thereby, hydro-electricity from Gibe III will be exported to Djibouti, Sudan, and Kenya (Abbink, 2012; Mishra and Kahssay, 2011) and crops leaving the Lower Omo are cotton (International Rivers, 2009; Fong, 2015), floriculture (Clapham, 2017), jatropha (Re:Common, 2012; Re:Common, 2016;), palm oil (Survival International, 2018), and sugarcane (Turton, 2010b; Avery, 2013; Human Rights Watch, 2012; Pearse, 2014; Kamski, 2016). Mosley and Watson, (2016) investigated the Kuraz Sugar Development Project which is “run by the state-owned Ethiopian Sugar Corporation and irrigated from the Omo River, is intended to cultivate 175,000 ha of sugar cane, although as of mid-2016 only about 13,000 ha had been cleared, and 10,000 ha of sugarcane had been planted, with three processing factories still under construction” (p. 461).

Verhoeven (2013) refers to the export of sugarcane from the Kuraz irrigation scheme as “white gold” (Appendix 6). To summarize, Gibe III is the only hydroelectric scheme but is not the sole operator along the Omo aimed at achieving the goal outlined in Ethiopia’s GTP II.

4.3 Local

The focal point of my case is Gibe III. Gibe III is a 250m tall Roller Compacted Concrete (RCC) dam, the tallest RCC dam in the World (Salini, 2016 (a)). Gibe III is an open-air power plant holding 10 Francis-turbines that can generate 187 MW of power each, the structure has a total installed power of 1,870 MW - the capacity to churn-out 6,5000 GWh/yr - “the same amount produced by two nuclear power plants” (Salini Impregilo, 2016 (b)). The EEPKO locates Gibe III at 757,225 North and 312,293 East (ESIA, 2009). “Upon completion, a 150km long lake (a valley dammed reservoir) would be created, flooding the whole canyon from the dam upstream to the Gibe River and retaining about 14.7 billion m³ of water at maximum capacity” (Velpuri and Senay, 2012: 3562). The developer of Gibe III is Ethiopian Electric Power and cost 1,470 billion Euro (approximately 1.75bn USD) (Salini, 2016 (a)). Connected to the dam are transmission lines which allow energy to be transmitted for export to neighboring countries (PowerTechnology, 2018). The dam reservoir connects to the Kuraz sugar cane project by redirecting water to irrigation blocks (Human Rights Watch, 2018). There are two fundamental features along the River Omo, one is water and the other is fertile land. As the Omo Valley is characterized by the River Omo that runs through the terrain of the Omo-Gibe River Basin, the Gibe III dam generates hydroelectricity and facilitates the redirection of water to irrigation beside the River Omo.

5 Analysis of Gibe III

5.1 Hydrology

The hydrological cycle - affectionately known as the water cycle - transports water through various stages in a cyclical process: Precipitation, Accumulation, Surface Runoff, Interception, Infiltration, Evaporation, Condensation, and Advection (USGS, 2017). To pronounce the cycle in short: the sun gives energy to water and causes Evaporation; Precipitation puts the water cycle in motion. What is crucial to the cycle is how flowing water transports nutrients, “mineral particles are derived from geologic materials, such as bedrock [...] by two primary methods. First, the flows of water, ice, and wind mechanically erode rock and sediment. Second, the chemical weathering of rocks” (Hemond and Fechner, 2015: 105). Water is composed of two hydrogen atoms and one oxygen atom (denoted as either H₂O or HOH). Commonly known is that a water molecule is a dipole molecule, meaning the hydrogen (H) pole holds a positive charge and the oxygen (O) pole holds a negative charge. This fundamental principle of water is corrosive. While traversing a terrain water's polarity corrodes compounds that are carrying an electrical charge (i.e. ions) and, simultaneously, water's solvent property passively acquires particles - minerals, nutrients, organic matter - as solutes. Surface waters hold a variety of chemicals, “ions such as hydrogen (H⁺), sodium (Na⁺), potassium (K⁺), Magnesium (Mg²⁺), Calcium (Ca²⁺), Ammonium (NH₄⁺), Bicarbonate (HCO₃⁻), Carbonate (CO₃²⁻), Nitrate (NO₃⁻), Sulfate (SO₄²⁻), Hydroxide (OH⁻), and Chloride (Cl⁻); dissolved gases such as oxygen (O₂), Nitrogen (N₂), Argon (Ar), and Carbon dioxide (CO₂); and dissolved organic matter” (Hemond and Fechner, 2015: 78). Essentially, rivers acquire their nutrient content (i.e. their dissolved solutes) by flowing over and through substrate. In essence, the substrate (i.e. soils, bedrock) influences the materiality contained in the river. The element of my work is encapsulated: *sediment is collected in water and transported by rivers.*

My work concerns the water and minerals traversing the River Omo in Ethiopia. I explore the Omo-Gibe River Basin because a “drainage basin provides the natural framework for the generation of riverflow” (Jones, 1997: 32). The terrain of the OmoGRB is composed of green schist, a metamorphic rock, and amphibolite and granulite facies (EIA, 2006), “[t]he geology of the basin is dominated by a fault feature, filled with alluvial and lacustrine sediments of recent origin associated with the Great Rift Valley” (Jillo et al, 2017: 1202). After rain falls from clouds rivers flow with gravity from high (mountains) to low (sea-level). In the hydro-cycle this repetition is executed passively by fluctuations in thermal energy (heat) and by the gravitational force of a terrain. Rivers support the primary productivity in an ecosystem as they influence ecological dynamics, “the infiltration of water into the

soil is perhaps the most pivotal process within the drainage basin. Most agricultural crops and natural plant species depend upon infiltrated water” (Jones, 1997: 32). Rivers are formed after precipitation by water moving with gravity to the lowest point of a basin and coupled with this movement is the transport of nutrients in tandem with water infiltrating the soil conducive of plant growth. Rivers hold a mysterious quality because what is not known to an observer is that the importance lies not solely in the quantifiable presence of water but in the passing of water through the river annually. To reiterate from the beginning of the cycle, rain falls as precipitation and runoff accumulates in the River Omo, absorbing minerals, nutrients, and sediments along the way to flood the riverbanks of the Lower Omo. *The inflow of water into the soil, along with the annual deposition sediment from the river is what supports a diversity of biota living along the River Omo.* The hydrological cycle spins and, as a by-product of water’s corrosive property, the River Omo transports nutrients. Gibe III dam is not sustainable as it holds back both water and the nutrients transported by the river which sustain downstream biological communities.

5.2 Tribes

There are multiple tribes downstream of Gibe III. They are known by the names Arbore (Ulde, Marle), Ari, **Bacha**, Benna, **Bodi**, **Daasenech** (Geleb), **Dime**, Hamar, **Kara** (Karo), **Kwegu** (Mogudji, Yidinit), Mathe (Male), **Mursi**, **Nyangatom** (Bume), Suri (Chai), and Tsamai (List of tribes acquired from: Michael, Hadgu, and Ambaye, 2005; International Rivers, 2009; Hathaway, 2009; Turton, 2010b; Bassi, 2011; Abbink, 2012; Baldwin, 2014; Fong, 2014; Survival International, 2015; Buffavand, 2016; Carr, 2017). This work focuses on the bolded tribes, the tribes which sow their crops on the annually flooded riverbanks of the River Omo through a hydro-social *relation*. The crops harvested include barley, gourds, maize, millet, sorghum, teff, and wheat (Michael, Hadgu, and Ambaye, 2005; ESIA, 2009; Hathaway, 2009; Survival International; 2018). FRA occurs in tandem with the transport of nutrients in the River Omo and a simple dynamic between flooding and recession pulsates in the River Omo’s annual flood. FRA is dependent upon the repetition of an underlying abiotic process, where the past conditions of the Omo-Gibe River Basin influence - literally, flow into - the present and carry nutrients for a hydro-social interaction to ‘play off’ the hydrology of the landscape without technical machinery. *On the banks of the River Omo flood-retreat agriculture plays-off a part of the hydrocycle which deposits particulates (i.e. sediments, silts, organic and inorganic nutrients) into the riverbanks through an annual flood.* The flood is not continuous, the water recedes and is enunciated in the recession part of their agriculture. How flood retreat agriculture becomes enacted through the coupling of tribes’ and the River Omo, Deleuze (1968) notes, “it is imagination which crosses domains, orders and levels, knocking down the partitions coextensive with the world, guiding our bodies and inspiring our souls,

grasping the unity of mind and nature; a larval consciousness which moves endlessly from science to dream and back again” (p. 220). On Earth, the hydrological cycle is ubiquitous but in this valley (the OmoGRB) the cycle is conducive for FRA. The pluriverse gives frame to the conditions of the Omo, in the Lower Omo of Ethiopia’s OmoGRB and an aspect of sustainability is seen through the annual joining and separation of the river and the tribes. Escobar’s (2015 (b)) ‘relational ontology’ discusses a relationship between the inhabitants of the pluriverse and their world. In this case, the tribes along the River Omo,

“enacted minute by minute, day by day, through an infinite set of practices carried out by all kinds of beings and life forms, involving a complex organic and inorganic materiality of water, minerals, degrees of salinity, forms of energy (sun, tides, moon, relations of force), and so forth. [...] impossible to follow in any simple way, and very difficult to map and measure, if at all; it reveals an altogether different way of being and becoming in territory and place. [...] nothing preexists the relations that constitute it. Said otherwise, things and beings are their relations, they do not exist prior to them” (Escobar, 2015 (b): 18).

Sustainability in the Omo is seen through how FRA ‘plays-off’ the hydrological cycle and flows with the ecological dynamisms of the Omo. To explain how sustainability in the Omo relates to Escobar’s relational ontology I have to distinguish between relation and practice. Practice, as used above, holds a connotation of procedure but Deleuze goes further in his diagnosis of habit to explain not only the motor-sensory condition but a primary and passive contemplation. On the other hand, Relation, is similar to connection but the difference is how a relation oscillates from here to there and back, whereas, a connection is constitutive, a conjoining of what is contemplated onto a contractile plate, namely - habit. The relational ontology may be pronounced as a continual contraction of habits within a habitat and, Deleuze writes, “it is simultaneously through contraction that we are habits, but through contemplation that we contract [...] We do not contemplate ourselves, but we exist only in contemplating - that is to say, in contracting that from which we come” (Deleuze, 1968: 74). The tribes of the Omo cultivate along the banks of the River Omo in the Omo Valley as a result of their active participation with their ecosystem display the sustainability of the Omo through a hydrosocial interaction *in* the OmoGRB. As a member of one of the Tribes notes in an interview with Yale360, “It was the rain that used to raise the River Omo. After the rain, the river overflows. When it overflows, we get a good harvest” (Abramson, 2010: 5:18-50). The flow of the River Omo is exemplified in the reciprocity between the river and Flood Retreat Agriculture. The Omo, uniquely adorning their bodies,

moves behind the annual flood of the river as the force which connects the domains of nature and society through flood-retreat agriculture.

The river which annually reintroduces nutrients to the riverbanks downstream is dammed by Gibe III. Gibe III inhibits the flow of water which transports nutrients essential for FRA along the River Omo and lowers the water level that the tribes have learned how to use to cultivate agriculture from the flooding of the river. The hydrological cycle is imperative for agriculture at both the local and the industrial scale. Gibe III inhibits the flow of the River Omo from the Omo inhabitants and, albeit ironic, what is getting constructed at the industrial scale is the same as what is performed at the local level - using the flowing water in the river for agriculture. Irrigation which is not connected to the River Omo or Gibe III is irrational because *“there is insufficient rainfall in the lowermost Omo basin for rainfed agriculture, so that flood recession agriculture is all that is possible in the Omo region”* (Carr, 2017: 57). This work contemplates the difference between the power of hydrology and harnessing the power in hydrology. ‘What’s the difference between flood-retreat agriculture and industrial-scale agriculture?’, the sustainability of FRA occurs in tandem with the hydrological cycle which harrowed the OmoGRB and introduces fertility to the riverbanks through a flood and, Gibe III impedes this river to harness its flow for the production of hydroelectricity and redirect its water to industrial agriculture.

5.3 Meso

The imperative of this analysis is to discuss how hydropower correlates to the flow of the Hydrological cycle in the OmoGRB. Dams are not new in Ethiopia. Although Gibe III being Africa’s tallest RCC dam may be distracting, the novelty of Gibe III comes from a new avenue of sewing capital into the economy. To be straightforward, Gibe III does not establish permanence but does coalesce as a node for capital to pass through - like water down a river - providing a constant contribution to sustainable development in the Lower Omo. *“The accumulation imperative (which is, of course, always place bound) and the quest to sustain the circulation of capital seems to be of paramount importance”* (Swyngedouw, 2004: 37, emphasis added). Gibe III is a sustainable development insofar as it sustains the circulation of capital and accumulates a surplus of hydropower and agriculture. As the river is composed of water and accumulates nutrients by flowing through substrate, the flow of River Omo is harnessed for two reasons: one is to sustain agriculture and the second is for the production of hydroelectric power. Gibe III harnesses the flow in the River Omo and extracts with instrumental precision what it fundamentally requires of the hydrological cycle - gravitational potential energy for the generation of hydropower. After deciphering all the noise around Gibe III, much of this case circles around agriculture, the ‘needle in a haystack’ which articulates how Gibe III is a sustainable

development is noticing how Gibe III plays into a regional power pool launched in 2005: East African Power Pool (EAPP) (EAPP, 2016). Dams are not new to Ethiopian development but what is new is how electricity is transmitted to the EAPP through the Wolayta Sodo substation to the East African Power Pool (EAPP). The point is simple, the dam connects to the EAPP through the Wolayta Sodo substation, more specifically, the transmission lines which thread Gibe III to the EAPP through Sodo. To pronounce how Gibe III is an example of glob/calization, the structure of Gibe III represents the first half of a reciprocal relation from global to local and the transmissions lines string the production of local hydroelectricity back into the global network. On the one hand is regional distribution, the hydroelectric energy from Gibe III is to be exported to Djibouti, Kenya and Sudan (IR, 2009; Addis Fortune, 2013; Salini, 2016) and, on the other, is the extension to the transnational network, China's Export-Import Bank (EXIM) bank provided the loan to construct the lines from Gibe to Sodo (Carr, 2017). Just as sustainability is seen through the tribes cultivating in tandem with the flood, sustainable development presents itself through Gibe III - water from the River Omo is harnessed for the implementation of industrial agriculture and export of energy. In line with the aim of the GTP II, "efforts will be made to provide the required energy for the development of industrial, agricultural, and service sectors so as to position Ethiopia among the lower middle-income countries by 2025" (NPC, 2016: 177). In the Lower Omo, the tribes repeat Flood Retreat Agriculture along the River Omo and the hydrological cycle is reassembled to connect to the Kuraz sugarcane plantations and generate hydroelectricity through Gibe III. Gibe III runs off a difference in gravitational potential energy, the water upstream (behind) Gibe III is higher than the water downstream, when the water is released by the dam it flows from high to low, converting potential energy into kinetic energy, generating hydroelectricity. From the installation of Gibe III comes the harnessing of the gravitational power in the hydrological cycle to transmit hydroelectricity to neighboring countries and the redirection of water to an industrial agriculture scheme. Instead of planting in tandem with the flood of the River Omo, the dam holds back the flow of water and reintroduces its flow into the technical instrumentation calculated by engineers to conduct power into generators for the sale and export of hydroelectric power. There is a power of Hydrology that Hydropower is a derivative of and, in the local level, Gibe III harnesses this force to generate hydro-electricity for use by people who do not live in the OmoGRB. "The World Bank, African Development Bank, key African state executives and international investors have long considered the 45,000 MW hydropower potential of Ethiopia as a 'tower of hydropower' for the broader African region, not just the 'tower of water' extolled by Ethiopia's Haile Selassie (Carr, 2017: 201). I am writing this thesis on sustainable development to make explicit that the circulation of capital on the River Omo is run by the hydrological cycle in the OmoGRB. The difference between FRA and Gibe III is discovering the power of hydrology in the Omo-Gibe River Basin reigns supreme.

5.4 Landscape

Gibe III is a sustainable development that utilizes the hydrosphere to combat Climate Change. To make the relation between Climate Change and the hydrosphere explicit, "Climate Change merely alters the proportions held in different stores and the fluxes, not the total volume of water" (Jones, 1997: 22). If the dam alters the stores [Lake Turkana] and alters the flux [the flow of Omo River] then we have climate change. Is this likely to happen? Yes (International Rivers, 2009; Avery, 2012; Carr, 2017). Does knowing that this is likely to happen stop development? No, "Critique has everything - a tribunal of justices of the peace, a registration room, a register - except the power of a new politics which would overturn the image of thought" (Deleuze, 1968: 137). By opposing Gibe III to the FRA of the tribes, I differentiate between the power of hydrology and hydropower along the River Omo - Gibe III is not a sustainable solution to climate change because it impedes the transport of nutrients flowing in the water of the River Omo which are essential to sustaining the biological communities inhabiting the downstream ecosystem. There is not one element of Gibe III to critique that will have all the glory of the heavens and the clarity of Apollo to make us act otherwise. The significance of my work is to make explicit that even the biggest and most perfect technology is still bound within an 'image of thought' and the profound forces acting in and upon the Earth.

Climate change and sustainable development provide the context of Gibe III. Although the dam is disguised by the term sustainable development and found its ground as a sustainable development by mediating the effects of Climate Change, Gibe III cannot be a sustainable development as neither the machinery nor the assemblage of developing institutions are formulated differently from the image of thought which is upholding and tethered to the insidious prolongation of the OWW. Gibe III is the focal point of my work. By living downstream of Gibe III the tribes will not only experience the wrath of Climate Change but will endure - as they always have - the changing of Earth's climate. FRA is formed through active participation with the flow of hydrology in the River Omo and Gibe III remains apart from the environment harnessing the flow of the River Omo to produce hydropower. In the Lower Omo, development roams under the pleasant guise of sustainable development - a 'necessary evil' behind Climate Change with its confidant of 'Extreme Weather Events'. The tribes inhabiting the Omo along the river are in opposition to Climate Change because they are different, unbound to the OWW. "The GOE has continually asserted that the "catastrophic losses" of 2006 were just the most recent of such events from the Omo River's alleged "excessive" and "destructive" flooding with repeated "major losses" of human life and livestock" (Carr, 2017: 87). The limit of Gibe III's sustainability is found in the irony that the dam impedes the flow of water and nutrients in the river to downstream communities while combating climate change. The grand opposition in my work is the difference between the

rendering of hydroelectric-power from the Gibe III dam playing into the strongholds of Capitalism and a sustainability within the power of Hydrology observable through the tribes FRA playing off of the River Omo. The change within the climate of the Lower Omo is constant,

“[O]ne of the reasons given by the Ethiopian authorities for building the dam was to prevent seasonal floods that allegedly had killed ‘hundreds of people’, notably in 2006 (EEPCo 2008c: 141). But in interviews with Turton, local Dassanetch and Nyangatom individuals were not able to recall any victims of such a flood. Floods do occur, but people are used to them and the casualty figures seem to be incorrect and exaggerated” (Abbink, 2012: 139).

One World uses modern instrumentation to accumulate capital from inhibiting the flow of a river’s water and, the other, uses a river’s flood to cultivate agriculture. The crucial node of my work is the difference between the extraction of information by the accuracy of technical machinery and the tribes in the Omo contemplating the hydrological cycle of the OmoGRB. The difference between sustainable development and sustainability: one is concerned with the accurate utilization of information to construct instruments which harness the environment’s mechanistic activity and, the other is actively interacting within their environment. They are both repetitions which circle around the power of hydrology - Difference in the Omo-Gibe River Basin - *“One concerns accuracy [Gibe III], the other has authenticity as its criterion [FRA]” (Deleuze, 1968, 24).* Difference seethes behind and wears the mask of the Hydrological cycle in the Omo and the Repetition of FRA by the Tribes lends a face to the Sustainability of FRA along the riverbanks of the River Omo.

6 Resolution

6.1 Warka Water and Oil

Deleuze (1968) announces “the task of modern philosophy has been defined: to overturn Platonism” and, I suggest it’s the challenge of sustainability science to continue this effort, “that this overturning should conserve many Platonic characteristics is not only inevitable but desirable” (p. 59). Gibe III is characterized by the glob/calization of the OWW and I have two additional sacrifices for the g-ds of no-one. The first is the Mechanistic worldview in Warka Water and, the second pronounces the gist of the OWW, “out of Africa in to the rest of the world; from the world into Africa” (Mærsk, 2017). Implemented in 2015, the Warka Water Project provides rural populations with drinkable water (WarkaWater, 2018). Similar to Gibe III, this tower utilizes the water cycle by harnessing the gaseous property of water and condensing water vapor into droplets which collect in a basin at the bottom of the column in the center of the Tower (*Appendix 7*). Unsurprisingly, an Italian company is constructing Gibe III and an Italian based architect is installing these pillars in the Lower Omo. Warka Water joins the mechanistic worldview to the OWW in the sense that “the successes of science and the growth of new industries increasingly strengthened faith in scientific progress [...] Where Christian missionaries failed, the missionaries of technological progress succeeded. [...] The process of conversion has now been extended to the remotest villages and tribes” (Sheldrake, 2012: 52). Last but not least, this thesis would be incomplete if it didn’t show that although sustainable development is conducted under the premise of being an alternative to fossil fuels (i.e. hydro-electricity), the literature reveals the exploration of oil in the Southern Omo (*Appendix 8*). In 2016, Africa Oil stated the interests held by these companies in the South Omo ‘block’: 50% to Tullow Oil (project operator), 20% to Marathon, 15% to Maersk, and 15% to Africa Oil (Africaoil Corp., 2011; Africa Oil Corp., 2016). Erecting Gibe III besides these other projects brings into focus that the Mechanistic Worldview and the OWW are alive and well in the Lower Omo.

6.2 Sustainability in the Pluriverse

Rather than erecting Sustainable Development everywhere, as if we live *in* One World, it should be made clear that that global problems don’t have local solutions, instead, local problems have local solutions. I continue to consider this thought to think that there is not One sustainable development nor are there Many, but sustainability is different everywhere, sustainability is different for each world of the pluriverse. In this case, the local solution to climate change along the River Omo is FRA. Hydropower may be an alternative to fossil fuels and a sustainable solution to climate change, but Gibe III does not bring about a solution to climate change in the Omo. To *image something different* for the

worlds of the pluriverse Escobar (2015 (c)) proposes the Transicones. A transicone is medium for different modes of knowledge are translated into a dialogue about how everywhere is different than everywhere else. The aim of a Transicone is create a space “for collective thinking and debate about narratives and strategies of transition toward less destructive models of socio-natural life than those predominant at present” (Escobar, 2015(c): 13-4). For example, the debate on narratives would resemble my description of how Gibe III acts the point of connection between the local and the global in the Glob/calization of the OWW and how flood retreat agriculture of the tribes reciprocates differently with the hydrological cycle of the OmoGRB. One world incorporates modern technology into the surroundings and, the other, synchronizes with the ecological dynamisms which revolve around them. The optimal result from a Transicone would be similar to what Hägerstrand (2001) notes from Regier and Baskerville (1986), describing how solutions emerge from “a specification of the geographic control of actions in the sense of: do this, at this time, to cause this to happen at this place in the future” (p. 57). The tribes planting along the river after a flood that deposits nutrients into the riverbanks is the observation of this phenomena. If there is to be sustainable development in the Omo then the tribes who’ve been cultivating along the River Omo are the model for sustainable development along the River Omo because they understand the synchrony of the ecological dynamics and how to survive within the environment of the Lower Omo. A model of after development that repeats the tribes would plant agriculture at the bends in the river for a reliant flood instead of redirecting water to agriculture plantations beside the river. This resolution to climate change seems mundane but *flood-retreat agriculture has occurred on this river for thousands of years.*

6.3 The Omo

I chose to focus on the Lower Omo because the remains of ‘pre-modern’ *Homo sapiens* - the bones of our ancestral lineage - were found embedded in the Earth (Tattersall, 2009; Foley, Martin, Lahr, and Stringer, 2016). The Lower Omo has been referred to as the Cradle of Mankind (HRW, 2015; TIME, 2018), the Garden of Eden (McCarthy, 2017), and the United Nations Educational, Scientific, and Cultural Organization (UNESCO) inscribed the Lower Valley of the Omo as a world heritage site because the oldest evidence of tool use by humans was discovered here (UNESCO, 2018 (a)). Our species has been living in this valley for thousands of years and are currently cultivating along the river. The terrane of the Omo-Gibe River Basin holds a subtle *movement* which has resulted from changes in abiotic conditions over a long period of time, changes observable in geologic strata. The imperative to this work is the question of how the tribes *learned* and to adapted to minute changes in weather ‘day-in and day-out’ over a long period of time. Along the river Omo are tribes and, unlike Gibe III which utilizes instrumental rationality to harness the flow of the river Omo for the production of hydroelectricity,

they plant agriculture after the hydrological cycle floods the riverbanks with water and nutrients. Learning is not just about knowledge, learning comes from actively encountering and experiencing the conditions of the surrounding world (Deleuze, 1968). Clarifying how different people have learned to survive on Earth not only preserves humanity's gene bank but also contributes to multiple narratives on the local conditions of the worlds on earth. As long as humans survive on Earth sustainability is out there, and to conceive 'what sustainability is' requires imagination and engagement with the worlds of the pluriverse. Sustainable solutions come from the worlds of the pluriverse in the sense that each world is enveloped in different environmental conditions. In the grand scheme, Chac of the Mayans and Poseidon of the Greeks were pieces of ancient mosaics reigning over the dominion of water, G-ds lending a face to the tantrum of the Eternal Return.



Image of two Kara Dus. (Source: Own photo).

7 Limits

My background is in biology and I emphasized in biodiversity, accordingly, I approached this work from a bio-ecological perspective. “If a truly unified theory is ever to emerge [...] there is a need for a new natural philosophy that goes further than physics alone can go but remains in harmony with it” (Sheldrake, 2012: 150). My work is based upon a hypothesis of formative causation outlined by Sheldrake (2012), and I support this with Deleuze’s philosophy of Difference & Repetition (1968). I revamp a discussion about the concept of fields and apply them to sustainability science to explore how at all levels of ‘life’, energy is patterned in fields which exists within fields within fields and matter is solely the result of rhythmic patterns of activity which are organized by past and present conditions of cosmic activity. Jerneck et al (2011) speaks to the trajectory of Sustainability Science through a series of questions, “What exists? What and how can we talk about it? And what is the nature of that knowledge?” (p. 72). However, I would rephrase the questions: ‘how does existence occur? And, what are the past and present conditions of this knowledge?’.

I have only scraped the surface of many topics ranging from gene expression to dialectics. For instance, in the local level of the analysis Deleuze describes how Difference is non-being, that ‘being’ is both Nomadic Distribution and Crowned Anarchy. Moreover, how Repetition is a discussion of space/time embodied in ‘cases of Repetition’ rupturing onto an Explicit Order ‘on top’ of an Implicit order (Spatium, the depth of space). For instance, “while the laws of nature govern the surface of the world, the eternal return ceaselessly rumbles in this other dimension of the transcendental or the volcanic spatium” (Deleuze, 1968: 241). To stay on point, I did not elaborate the discussion of ontology further than Escobar (2015 (c)) on a relational ontology (which is an idea Escobar borrows from Deleuze’s third book with Guattari, *A Thousand Plateaus*). I have not read this book ... yet. In the meso-level, I did not go into financial mechanisms, international policy concerning international rivers, nor the geopolitics of transboundary groundwater resources. Escobar (2015 (a)) provided a choice to follow either Degrowth or Post-Development. I followed Post-Development because I have a thought founded upon the water cycle which moves aimlessly and does not adhere to strict rationality that upholds territorial lines drawn upon Earth. Therefore, it should be apparent, that I didn’t not go into a discussion of Climate Change as a discourse in the landscape level or describe how the platonic method of dialectics to introduces a myth for division, Climate change as the myth and 2°C acting as an ‘Imparticipable claim’ for separating sustainable development [Gibe III] from development [Dams]. Escobar (2001, 2015 (a), 2016) and Swyngedouw (2004, 2005) to give titles to the various disguises of the OWW: Anthropocentrism, Authoritarianism, Capitalism, Civilizationism, Colonialism, Developmentalism, Industrialism, Internationalization, (neo) Liberalism, Modernity, Patriarchalism, Rationalism and

Secularism and I wrote as if sustainable development was already added to this delightful list. Lastly, one of my favorite quotes from Deleuze, “We are led to believe that problems are given ready-made, and that they disappear in the responses or the solution. [...] the master sets a problem, our task is to solve it, and the result is accredited true or false by a powerful authority [...] consoling or distracting us by telling us that we have won simply by being able to respond: the problem as obstacle and the respondent as Hercules” (p. 154). At every level, there is much work that could be added to clarify the mayhem fracturing the Lower Omo. My work is only an initial response to the literature collected with the aim of speaking to the difference of Gibe III and FRA on the River Omo.

8 Conclusion

Earth's climate changes. Climate Change is occurring here, on Earth, and now. As we all live on Earth, it is reasonable to think that we all live in One World. Sustainable development will dismantle and dissolve the ecological flows of the Omo by surpassing the Planetary Boundaries. The tribes downstream of Gibe III will experience Climate Change and the negative impacts of Gibe III will be exacerbated by the change inherent to Earth's climate. The change constant to climate holds a double meaning in Climate Change. One is accurate, the other authentic. I am not saying that the climate isn't changing, actually, the contrary, I am arguing that the climate does change - always will. I question the sustainability of development taking place in Ethiopia's Lower Omo of the Southern Nations, Nationalities, and People's Region by opposing the tribes along the River Omo to the sustainable development of Gibe III. **(1) Gibe III is a sustainable development because it produces hydroelectric power.** Gibe III is not sustainable because it impedes the flow of water in the River Omo and traps nutrients behind its wall disrupting an abiotic flow essential to ecology downstream. The water level of the River Omo will lower and nutrients will not be annually deposited to the riverbanks because of Gibe III. The water in the River Omo is the focal resource which focuses the impending catastrophe of climate change downstream. Gibe III, by acquiring what is fundamentally relied upon erases what it fundamentally relies on, the flowing of a river. This is a problem for the tribes of the Omo who return to the river to cultivate in tandem with the flooding of the River Omo because the water in the River Omo floods the riverbanks and deposits nutrients for FRA to occur at the same time as the flood. **(2) Sustainability is seen through the Repetition of flood retreat agriculture.** The tribes have been living in the Lower Omo for thousands of years, Sustainability is seen through their return to the river to plant in tandem with an annual flood. As Gibe III is bound within the profound forces acting in and upon the Earth, Sustainability is that which has persisted and been upheld through the changes of climate in the Lower Omo and does not hide behind a false sense of power generated through a hydropower dam. **(3) The hydrology of the Omo-Gibe River Basin sets the conditions of sustainability in the Omo.** Sustainability comes from being a part of - not apart from - the surrounding environment. The tribes of the Lower Omo are fascinating because they adorn their bodies with flowers, leaves, and grasses and paint themselves with mixtures of rock, clay, and tree saps, bound together with the water of the River Omo. The tribes of the Omo live in a different world and are essential to sustaining the changes of the climate. Their difference holds two aspects, one is the genetically unique material that they hold which contributes to the genetic diversity of the species *Homo sapien* and, the second is how the Omo has molded them into the tribes who cultivate along a river.

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10 Appendix

10.1 Method

In 2014, I conceived the idea of connecting the Omo Valley Tribes to how I imagine Sustainability. As a biologist, my background consists of reading texts on gene expression, cellular biology, ecosystem ecology and animal behavior. My previous thesis was performed in a chemistry lab and I worked with Thin-Layer Chromatography (TLC) to separate organic acids and sugars from a solution. This study of the Omo Valley has been quite different but, nevertheless, I pulled on my previous knowledge of chemistry and biology to understand the foundation of my case in the OmoGRB. The central theme appears in the dichotomy of biota [living] and abiota [non-living] or, the species and the environment. Sheldrake (2012) allows me to bridge my natural science mind with the social sciences by noting, “All organisms are structures of activity, and at every level of organization they undergo rhythmic oscillations, vibrations, periodic movements, or cycles. In atoms and molecules, the electrons are in ceaseless vibratory movement” (p. 121). To relate this notion to the case at hand, the environment is the OmoGRB and the species are *Homo sapiens*, I focused these two with a third idea which is characteristic of (i.e. shared by) both the environment and the species, the flow of nutrients [abiotic process] in the River Omo. By focusing on the river, I was able to investigate how FRA is an interaction that a species upholds with(in) their environment. My critic of the dam is passive as I allude to the presence of a subterranean abiotic process but I speak outright through a discussion the different interactions Gibe III and FRA have with the river.

To spell this out, sustainability comes from either the hydrological cycle or, from installing a huge technological innovation into a peripheral region of Ethiopia. Although this seems to become a very simple discussion of either ‘this’ or ‘that’, the problem has deeper roots that are, like a wart, in need of excavation. My reason for thinking that there are unseen dynamics is quite clear - if the problem were blatantly obvious the conflict would already be resolved. From one of the articles collected in my literature review, Abbink (2012) outlines 5 perspectives circulating around the case of Gibe III: engineering, economic use, environment, state legitimacy, and the local people affected. Unfortunately, Abbink pronounced what I already knew, that ‘the answer’ is not clear within any one of the outlined perspectives and research must go further into the void between academic disciplines to fathom a result for sustainability science. To be clear, ‘the void’ isn’t solely about raw and empty depth but harboring the eruption of a brute and ferocious imagination to fathom a commonality to the vantage points and offer a plane of thought for something different to be raised into discussion. David Turton outlines such an endeavor for Gibe III,

“This is not an argument for abandoning a project like Gibe 3, [...] It is, however, an argument for seeing Gibe 3 as a spectacular case of one of the most important and pressing problems in world development today. Namely, how to ensure that development projects which displace people and/or deny them access to land and resources, are turned into genuine development opportunities for the very same people whose involuntary sacrifices made the projects possible in the first place” (Turton, 2010a: 8).

The System of Nested Domains by Hägerstrand (2001) was suggested to me by advisor as framework to decipher socio-spatial relations around a development project like Gibe III. To fill the framework, I performed a literature review. I began with entering 'the Omo Valley Tribes' into the search bar of Google Scholar. This was followed by other keywords which related to my case: Sustainable Development, Gibe III, Lower Omo, Rift Valley, Omo River, Omo-Gibe River Basin, Climate Change, etc.... The list became endless as one article had the potential to contain several findings and nodes of information. As I began sorting the information in the articles, I looked to Sheldrake (2012) because his discussion on morphic resonance elaborates on the importance of information, "Information plays a formative or in-formative role" (p. 126). Sheldrake discusses how information is not solely based on fact but upon the fact of a seething flow of energy throughout '*spacetime*'. To sort the pieces of Gibe III, I relied on Sheldrake's description of the mechanistic worldview, Escobar's OWW, and Deleuze's Image of Thought to guide the sorting of the various kinds of information to obtain a broad, yet, clear, picture of what the development surrounding Gibe III is. As I gathered information from sources such as the New York Times to Government Reports like Ethiopia's GTP (I & II), I joined Sheldrake's concept of fields with Hägerstrand's system of nested domains to separate the various parts of Gibe III into different levels by contemplating the kinds of information the articles presented about Gibe III. This was done in three steps, I thought about the kind of information presented about Gibe III, the proximity of this information to the dam, and how the information related to the other relations presented in the literature on Gibe III. For instance, the World Development Bank is external to a nation and is not in Ethiopia so I placed this entity in the External section of the Meso-Level, likewise, the Kuraz Sugar Development Project which is "run by the state-owned Ethiopian Sugar Corporation and irrigated from the Omo River" is in the Meso-Level directly above the Local Level describing Gibe III. Although this sorting of information seems sufficient to have a substantial discussion about Gibe III, the framework and sorting of literature only constructed a mirror of the empirical evidence in my case. Difference has not yet been given an opportunity to be brought into the work and I would remain in the same box as Swyngedouw when he writes 'imagining different' if I did not press further to consider the roots of the problem. Sheldrake set the ground for speaking about the materiality of the world and provides valuable insight for how to question what is real and what is not, nevertheless, I continue my aim of writing about a different way of interacting with the surrounding environment.

Deleuze (1968) taught me how to contemplate and use thought to focus the obscure and clarify the labyrinth masking Gibe III. I rely on Deleuze to probe what it means 'to think', "here begins a long and inexhaustible story: I is another, or the paradox of inner sense" (p. 86), and reimagine the case of Gibe III. With the context of sustainability science and climate change the importance of Deleuze to my work is understanding how to seek out underlying imperatives, the fundamental questions of sustainable development, 'How is Gibe III a novel development, does Gibe III fit the mold of sustainable development?'. To decipher how the problems of the OWW relate to sustainable development, I think of how Deleuze cites the infamous phrase in the *Contribution to the Critique of Political Economy*, 'mankind always sets itself only such tasks as it can solve', to clarify that this "does not mean that the problems are only apparent or that they are already solved, but, on the contrary, that the economic conditions of a problem determine or give rise to the manner in which it finds a solution within the framework of the real relations of the society" (p. 186). In this case, Gibe III found its place in the Lower Omo through the OWW of Escobar (Deleuze's third chapter on the Image of Thought) and Swyngedouw's discussion of Glob/calization (Different/cation in Deleuze's fourth chapter). My reason for sticking with Escobar and Swyngedouw in the text is to display that

the philosophy of difference is coming to be articulated in various modes of thought. Moreover, I translate difference in the Omo through the Sheldrake's concept of morphic fields with resonance and Escobar's idea of the pluriverse. Altogether, the literature was distributed into the general categories of the OWW through the system of nested domains of Gibe III where the top is large and vague and the bottom is small and specific. Nevertheless, Deleuze opens his fifth chapter with a note, "God makes the world by calculating, but his calculations never work out exactly [*juste*], and this inexactitude or injustice in the result, this irreducible inequality, forms the condition of the world. The world 'happens' while God calculates; if the calculation were exact, there would be no world" (p. 222). In this work, I focus my method by following Deleuze into a contemplation of how, under what conditions, does an occurrence such as FRA occur in tandem with an annual flood that deposits nutritious silts without the presence of a divine g-d.

10.2 Theory

I required a theory which would encourage me to view the world in a different way - challenging me to extend my thoughts outside of a biological perspective - and decipher the literature I would collect from various disciplines. The overarching theory of this work is *Difference & Repetition* by Gilles Deleuze (1968). To bring the depth of this philosophy to the simplest terms, "there is no true beginning in philosophy, or rather that the true philosophical beginning, Difference, is in-itself already Repetition" (p. 129). The philosophy of Difference not only acknowledges the negatives' double aspect of limitation and opposition but discovers difference as the groundlessness beneath two logical monsters, 'that which denies what it is not and distinguishes itself from everything it is not' (Deleuze, 1968: 49). To relate Difference to the case of Gibe III, if Sustainable Development is discussed as being different from Development then a philosophy of Difference is essential to the conversation. To articulate difference in the Omo, I use four concepts from three thinkers, Swyngedouw on Glob/calization (2004) and Hydrosociology (2009), Sheldrake (2012) on Morphic Resonance, Escobar on the Pluriverse (2015).

As we all live on Earth, it is reasonable to think that we all live in One World. Escobar (2015(b)) refers to the tendency of assuming that on Earth there is only a single world as the 'One World World'. Swyngedouw (2004) raises the concept of Glob/calization and I position his concept between Gibe III at the (g)local level and Escobar's OWW at the global level. By stacking these three concepts on one another [Gibe III - Glob/calization - OWW, from local to global] they shed light on an insidious process which progressively expands and extends global institutions. With Gibe III as the focal point of this case, Glob/calization reveals how the dam is utilized as a means to extend and expand the circulation of global capital from global networks into a local point and back. The crucial element of my work is not only understanding that the focal point - Gibe III - is erected in a world of the Pluriverse but also how this development is done. As Gibe III and FRA are two hydrosocial interactions on the River Omo in the OmoGRB, their different relations to the water of the River Omo allow for a discussion to clarify how sustainability occurs in the OmoGRB. One world is informed by the technological instrumentation constructed through instrumental rationality - Gibe III - and the other is informed by that which is explicitly known and experienced with the repetition of an annual flood. In relation to the OWW, Sustainable Development progresses by the means of powerful men and the tribes of the Omo exist tuned into a different source of power. The river and the tribes display sustainability, 'that which' is seen through them but irreducible to any one component of the OmoGRB. At this point the text goes metaphysical, Sheldrake (2012) reiterates the concept of

Morphic Resonance and Deleuze (1968) discusses Repetition and both philosophers embark on the interplay between Habit and Memory. In sum, the repetition of the hydrological cycle, which not only carved out OmoGRB by flowing through the River Omo, resonates with(in) the tribes and has become observable in their repetitive flood retreat agriculture.

In the Omo-Gibe River Basin is the Omo and to discuss the Omo I focus on the River Omo. I articulate two concepts at the local level to decrypt how water sustains not only the development of the Gibe III dam but also the local inhabitants. Fundamental to the local level is the dynamic question of how nature and society reciprocally influence one another. Erik Swyngedouw (2009) elaborates on the hydrosocial topic by discussing how water plays an informative role towards a society's institutional arrangement. In short, FRA and Gibe III are both hydrosocial interactions with the River Omo that lead to two different ends, one is the Omo and the other is the EAPP. To describe the intricacy of these two hydrosocial dynamics on the River Omo I introduce Escobar on the Pluriverse (2015) to stabilize the distinction between the tribes along the banks of the river Omo and the OWW which orchestrates the institutions building Gibe III Dam underneath the cloak of sustainable development. The Omo, a different world in the pluriverse, enunciates how the tribes of the Lower Omo Valley interact with the River Omo in a hydrosocial dynamic different to anywhere else on Earth.

10.2.1 'The OWW' in Deleuze

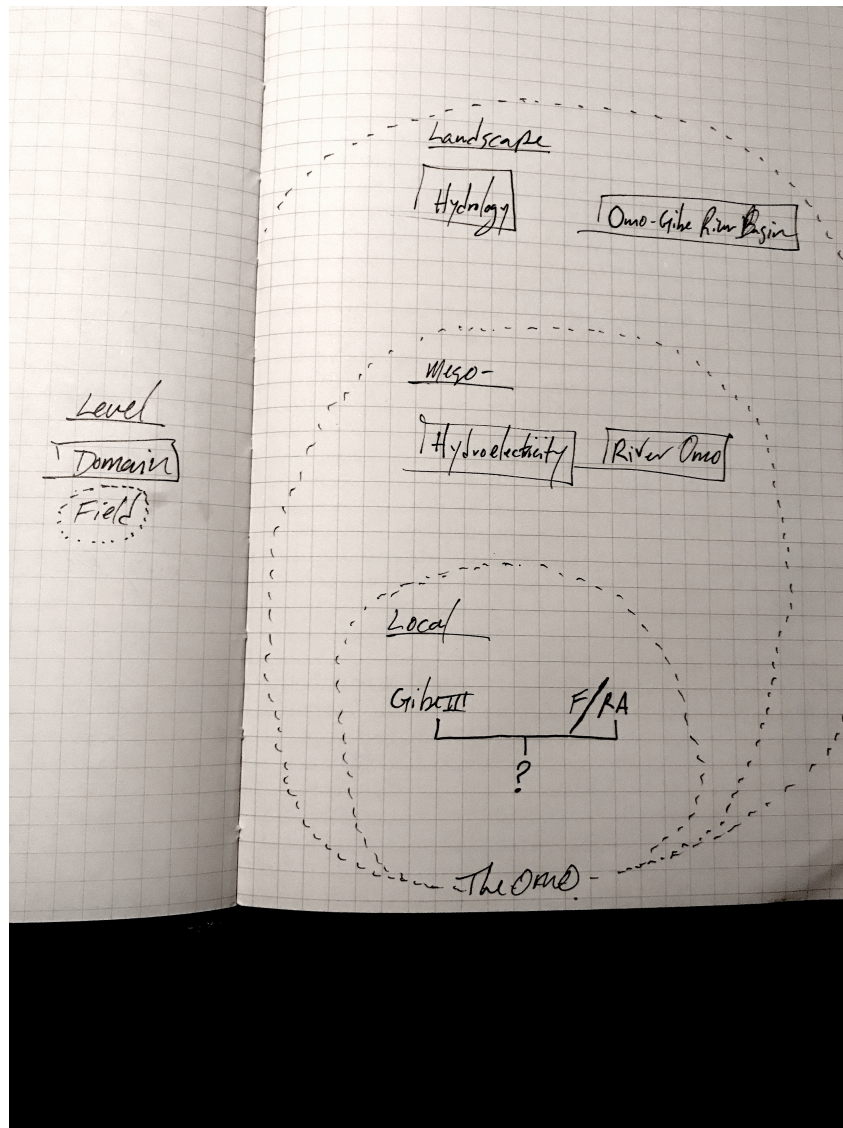
“The model of recognition is necessarily included in the image of thought, and whether one considers Plato's Theaetetus, Descartes's Meditations or Kant's Critique of Pure Reason, this model remains sovereign and defines the orientation of the philosophical analysis of what it means to think. Such an orientation is a hindrance to philosophy. The supposed three levels - a naturally upright thought, an in principle natural common sense, and a transcendental model of recognition - can constitute only an ideal orthodoxy. Philosophy is left without means to realise its project of breaking with doxa. No doubt philosophy refuses every particular doxa; no doubt it upholds no particular propositions of good sense or common sense. No doubt it recognises nothing in particular. Nevertheless, it retains the essential aspect of doxa - namely, the form; and the essential aspect of common sense - namely, the element; and the essential aspect of recognition - namely, the model itself (harmony of the faculties grounded in the supposedly universal thinking subject and exercised upon the unspecified object). The image of thought is only the figure in which doxa is universalised by being elevated to the rational level. However, so long as one only abstracts from the empirical content of doxa, while maintaining the operation of the faculties which corresponds to it and implicitly retains the essential aspect of the content, one remains imprisoned by it” (p. 134).

10.2.2 'Glob/calization' in Deleuze

“On the one hand, complete determination carries out the differentiation of singularities, but it bears only upon their existence and their distribution. The nature of these singular points is specified only by the form of the neighbouring integral curves - in other words, by virtue of the actual or differentiated species and spaces. On the other hand, the essential aspects of sufficient reason - determinability, reciprocal determination, complete determination - find their systematic unity in progressive determination. In effect, the reciprocity of determination does not signify a regression, nor a marking time, but a veritable progression in which the reciprocal terms must be secured step by step, and the relations themselves established between them. The completeness of the determination also implies

the progressivity of adjunct fields. In going from A to B and then B to A, we do not arrive back at the point of departure as in a bare repetition; rather, the repetition between A and B and A is the progressive tour or description of the whole of a problematic field. It is like Vitrac's poem, where the different steps which each form a poem (Writing, Dreaming, Forgetting, Looking for the opposite, Humourising and finally Rediscovering by analysing) progressively determine the whole poem as a problem or a multiplicity" (p. 210).

10.3 Nested Domains of Gibe III

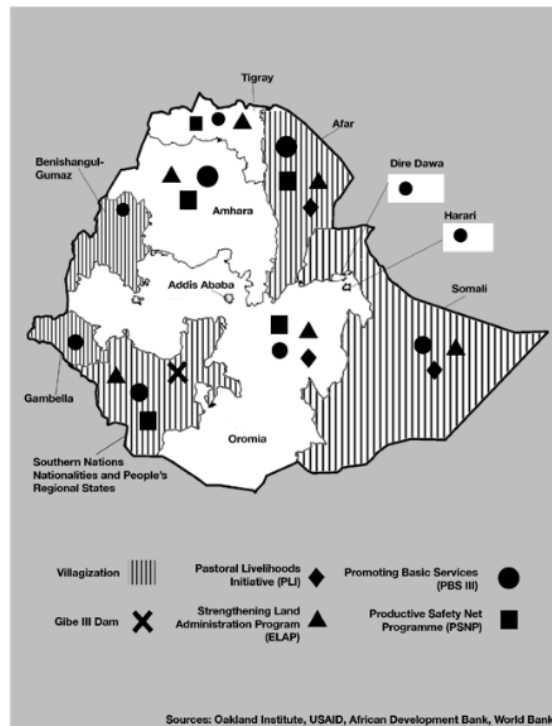


A system of nested domains in the OmoGRB: Gibe III on the River Omo, hydropower in the Lower Omo, and the Hydrology of the OmoGRB. Both FRA and Gibe III are on the River in the Omo and the slash (F/RA) is the point that I connect to the question 'what difference is there between their relation to the river?'. (Source: Own Photo).

10.4 Summary of Deleuze's technique in *Difference & Repetition* (1968).

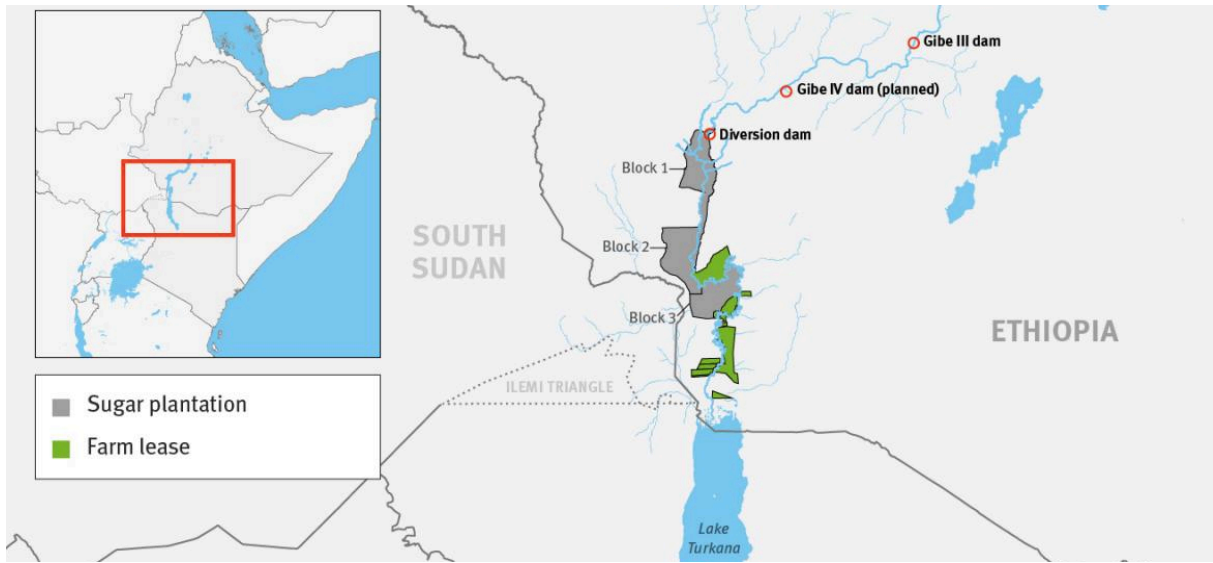
“(1) Make something new of repetition itself: connect it with a test [...] (2) In consequence, oppose repetition to the laws of nature [...] (3) Oppose repetition to moral law [...] (4) Oppose repetition not only to the generalities of habit but also to the particularities of memory” (p. 6-7).

10.5 PNSP (square) and PBS (circle) operating in the Lower Omo of the Southern Nations Nationalities and People's Region (SNNPR).



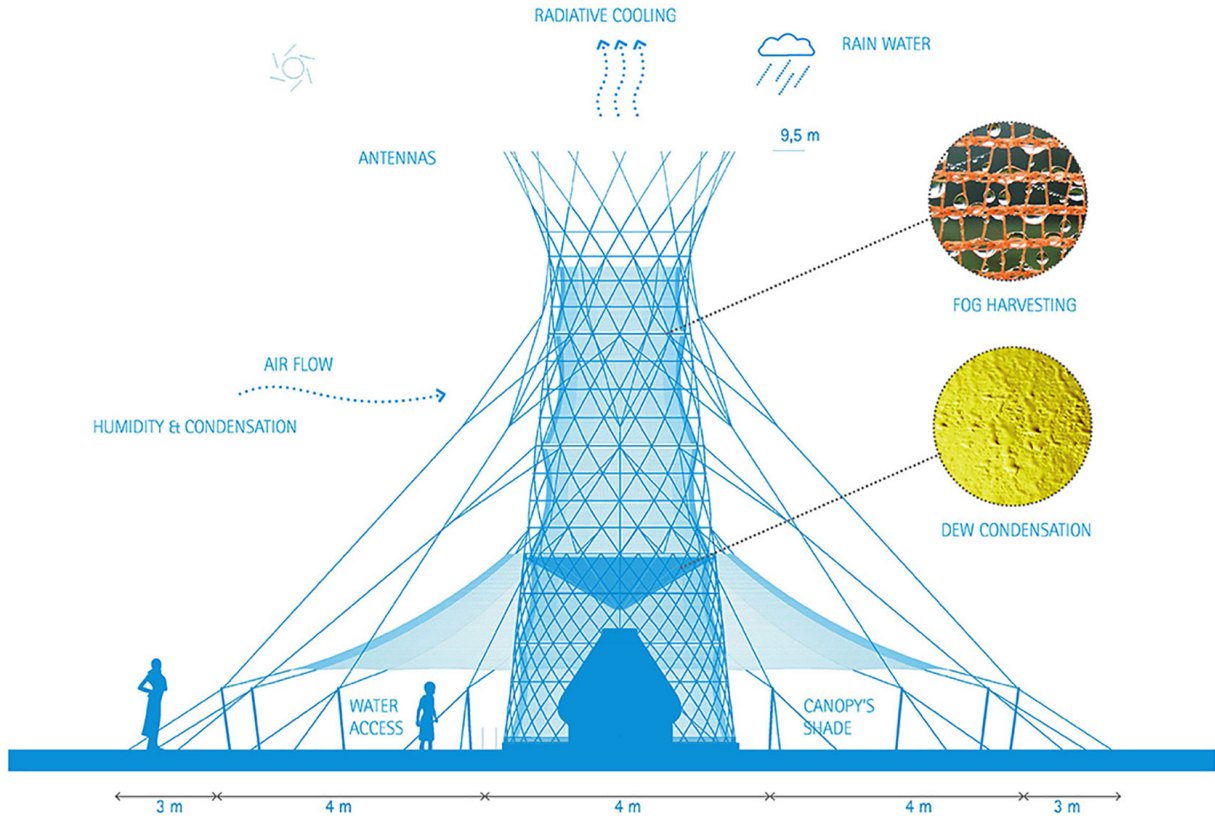
(Source: Oakland Institute, 2013 (a))

10.6 Outline of Industrial Agriculture beside the River Omo and Gibe III upstream.



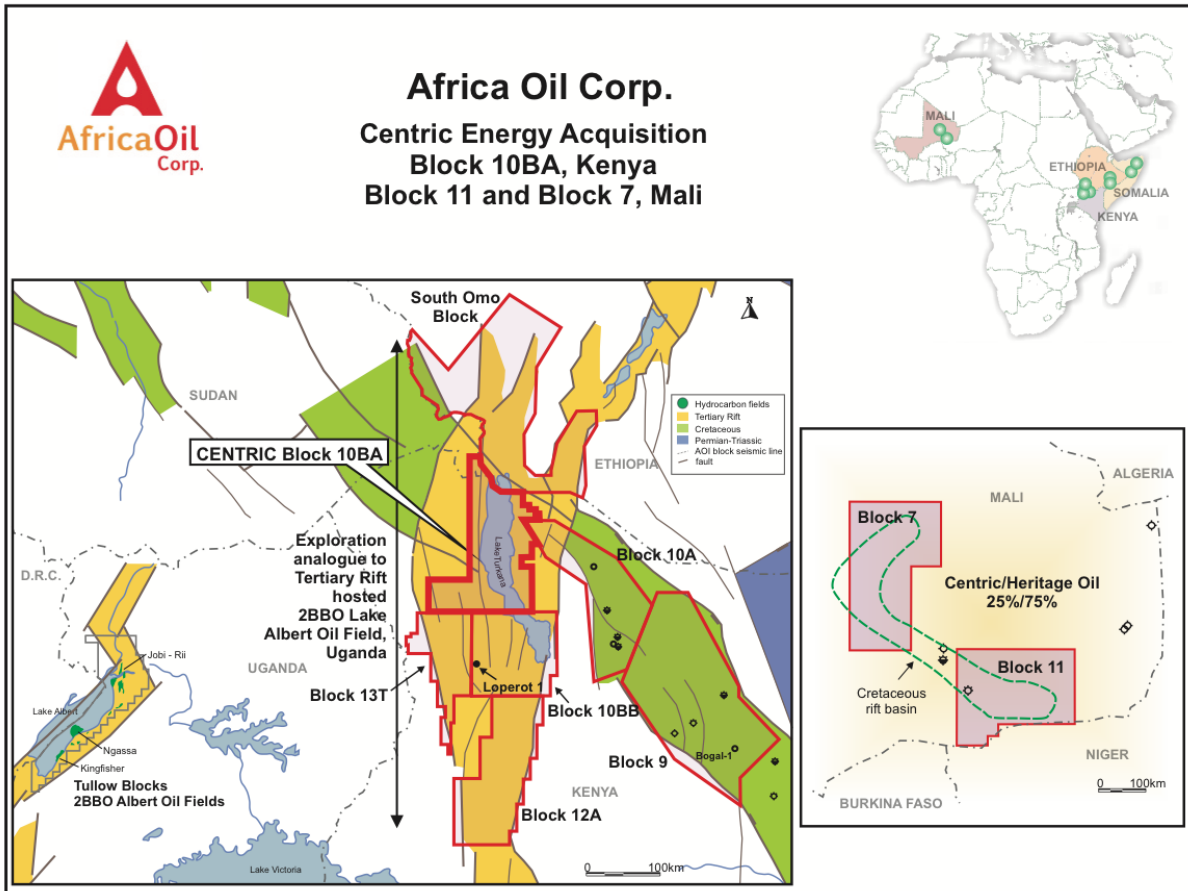
(Source: HRW, 2017).

10.7 Warka Water Tower



(Source: Dezeen, 2016)

10.8 Map of oil in the Southern (Lower) Omo.



(Source: Marketwire, 2015)