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Old Wine in New Bottles: The Adaptive Capacity of the Hydraulic Mission in Ecuador

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ABSTRACT: Despite a widely embraced ecological turn and strident critique of megastructures in the 1990s, construction of large infrastructure has been reignited worldwide. While Integrated Water Resources Management (IWRM) and River Basin Management (RBM) have at least discursively held sway as the dominant paradigm in water management since the late 1990s, we argue that the 'hydraulic mission' never really went away and has in some places energetically re-emerged. The development discourse that justified many dams in the past is now supplemented by a new set of appealing justifiers. With the help of the case of Ecuador we show that the hegemonic project of the hydraulic mission has a great discursive adaptive capacity and a new set of allies. The rise of the BRICS (especially China), South-South cooperation and private investors provides non-traditional sources of funding, making the construction of hydraulic infrastructure less dependent on Western conditionalities. The resulting governance picture highlights the disconnect between the still widely embraced policy discourse of IWRM/RBM and the drivers and practices of the hydraulic mission; questioning what value international calls for 'good water governance' have in the midst of new discourses, broader transnational political projects and the powerful dam-building alliances that underlie them.

KEYWORDS: Hydraulic mission, hydropower dams, *buen vivir/sumak kawsay*, Ecuador

INTRODUCTION

Around the world, and especially amongst international and northern donor organisations, funders and non-governmental organisations (NGOs), the 1990s and 2000s seemed to have made a clean and definite break with the long cherished hydraulic mission and its most emblematic exponents, which are the large dams (Baghel and Nüsser, 2010). New paradigms that largely aimed to focus the water management efforts towards more integrative approaches that centred on stakeholder participation and collaboration, environmental sustainability, demand-side management and more diverse (often local small-scale) solutions, seemed to have taken over most policy agendas (GWP, 2000; Giordano and Shah, 2014). The 'new' emphasis in water management was geared at increasing the efficiency with which water was used, finding local solutions to meet water demands and devising strategies that would lead to a stabilisation and/or reduction in total water use. Another important pillar of these proposed strategies was to conserve and release water for environmental purposes that could guarantee the sustainability of riparian and water dependent ecosystems. This period was dominated

by the implementation and advancement of 'soft', i.e. non-infrastructure, strategies such as policies that advocated for decentralisation, river basin management, stakeholder participation, environmental water flows and Integrated Water Resources Management (IWRM) (Warner et al., 2008; Wester et al., 2009; Wesselink et al., 2015). In most policy discourses, centralised authoritarian state-based governance, its vices and its technological temples seemed destined to become a faint memory.

Decentralisation of state responsibilities to lower levels of government, water users and private market players combined with 'soft' demand management strategies such as water pricing and water markets would form the right incentives to advance more 'rational' water use (GWP, 2000). Awareness raising, the establishment of multi-stakeholder platforms and mechanisms of citizen participation at different scales would lead to increased societal awareness, responsibility and accountability; stakeholder collaboration and synergies; and ultimately a better performance of water management institutions (Warner, 2007). To support this transition, technologies to increase water use efficiency in agriculture and industry were heralded: apart from 'soft' interventions, small 'hard' technologies such as drip irrigation, water reuse systems, rainwater harvesting and the like, as well as more effective administrative and management systems, and optimised production processes were also introduced. In terms of scale, bioregions such as the river basin were consecrated as the 'natural' scale, to be managed in an integrated way (IWRM) and governed by multi-stakeholder processes (MSP) (Wester et al., 2007; Warner et al., 2008).

These points illustrate how the liberal imagination sees human development as an ever upward-pointing arrow of enlightenment. This requires conceptual attractors, which of necessity display asymptotic tendencies towards integration such as with IWRM, water security and the Water-Energy-Food Nexus approach (Benson et al., 2015), negotiating a transition towards adaptive management (e.g. Ohlsson and Turton, 2000; Allan, 2003). This would suggest that the 'closed', centralising, mono-sectoral hydraulic mission approach apparently sits ill with integrated, multipurpose, decentralised, reformist approaches.

We argue that far from becoming a faint memory, the hegemonic project of the hydraulic mission has persisted and resurged in most of the global South as enough 'bad good reasons' to build dams persist (see Molle, 2008a). A hegemonic project seeks to create or perpetuate a common sense. The malleability of dam narratives underlies the capacity of the hydraulic mission to appropriate new concerns and concepts such as climate resilience, the shift to a green economy and sustainability. We show that in their capacity to 'adapt' to the traditional ways, advocates of the hydraulic mission have been able to sustain the tenets of their old prevailing paradigms to solve today's 'new' water management challenges. This is achieved by creating ideological alliances, new discourses and coalitions that promote "correcting" nature's water flows at different territorial scales through infrastructure (Swyngedouw, 2007; Biro, 2012).

We first explore how we conceive of the hydraulic mission as a hegemonic project that has been able to maintain its sway in the midst of harsh criticism in late 1990s and early 2000s. Then we show how the hydraulic mission narratives have been able to adapt to and adopt a whole set of new discourses and paradigms as justifications for the continued construction of hydraulic infrastructure. We also show how new paradigms and ideas have opened new (back) doors through which the hydraulic mission creeps in as 'the' solution. Next we explore how this has been facilitated by new funders and dam-building coalitions. Based on these notions we analyse how the case of Ecuador nicely illustrates these processes. The conclusions revisit our argument and critically analyse the value of (inter)national calls for 'good water governance'.

HEGEMONIC PROJECT 'HYDRAULIC MISSION'

The concept of hegemony captures how hard power (coercion, material force) meshes with soft power (the power of ideas, attraction, persuasion, bribes) to create a reality that comes to be seen as the

normal state of affairs. Thus it matters whose ideas become influential and how they are underpinned by material superiority. Hegemonic ideas spread in international arenas through epistemic communities which act like global 'organic intellectuals' who produce and diffuse knowledge (Biersteker, 1992). Internationally hegemonic coalitions transmit ideas into civil society as well, with its "institutions ranging from education, religion, and family to the microstructures of everyday practices, contributed to the production of meaning and values, which direct and maintain the spontaneous consent of the various strata of society" (Gramsci, 1971). Specific knowledge is integrated into social norms as 'authoritative knowledge' (Gomes de Matos, 2015).

Such knowledge is expressed in the hydraulic mission; acceptance of the 'taming' of rivers through hydraulic infrastructure. After Wester (2008), we shall define the hydraulic mission as "the strong conviction that every drop of water flowing to the ocean is a waste and that the state should develop hydraulic infrastructure to capture as much water as possible for human uses. The carrier of this mission is the hydrocracy, who based on a high-modernist worldview sets out to control nature [...] for the sake of progress and development." (p.10). As Wester (2008) explains the term *mission* is purposefully used to connote the almost military/religious conviction that 'nature' can and must be domesticated to make it meet societal water demands through corrective 'hydraulic surgery' premised on the construction of infrastructure (Swyngedouw, 2007). From this perspective controlling water resources is a means to bring about progress and development to society. The hydraulic modification of 'natural' watercourses meets social development goals (food production, domestic water supply, energy production) while taming the potential threats of drought and flood disaster; both of which are expected to increase with climate change.

Rationalised discourses and narratives around energy independence, 'clean' energy, food production, agro-export growth, poverty alleviation, economic development, reduction of flood risk, increased water needs of megacities and others drive the construction of dams often forging Keynesian class coalitions that promise growth for all (Swyngedouw, 1999). But also issues such as national pride, state building and geopolitics drive dams (Allouche, forthcoming). Globally, dams have been a vehicle of Cold War politics, spreading the Tennessee Valley Authority of the US and Dniepr models of integrated, state-led hydraulic regional development of the USSR (Molle et al., 2009; Baghel and Nüsser 2010; Mukhtarov and Cherp, 2014). Dams and other large-scale infrastructure are also driven emotionally as these have a special attraction to autocratic state leaders due to their monumentality. They are spectacular and connote symbolic power becoming vehicles of nation-building by projecting prestige and popular pride, reifying the greatness of those in power.

After decades of relentless construction around the world, in the 1990s large dams took a major beating. Social movements and environmental NGO campaigns in Africa and Asia successfully raised a voice against large dams. The trilateral World Commission on Dams (WCD) critically reviewed the performance of dams around the world. Its final report, the WCD (2000) highlighted their negative social and environmental costs, adopting a critical stance vis-a-vis existing large dams and the construction of new ones. Finger and Allouche (2014: 48) however claim that for all its nuance, the WCD in practice "legitimised the construction of large dams, as long as they recognise and measure the social and environmental effects". The World Bank (which has historically invested heavily in large dams) ignored WCD's finer points and followed a strategy that lowered the social and environmental standards (Baghel and Nüsser, 2010). These authors claim the World Commission on Dams focused too much on the material effects, ignoring the legitimisation in the name of development.

Even ignoring the social and environmental issues there are studies which suggest that there is no economic (or environmental) case for dams. One of these remarkable studies is that of the noted Oxford team of Ansar et al. (2014). Given the apparently outmoded development model of the hydraulic mission, how do we explain the explosion in dam programmes in the BRICS and elsewhere?

In Science and Technology Studies the socioeconomic context that explains the persistence ('stickiness') of a technological path, which may not necessarily be optimal for the purpose has been well analysed and described. The capacity of a technological regime to persist over time despite attempts to change can be investigated through the perspective of resilient (adaptive) sociotechnical systems (Werfs and Baxter, 2013). Based on these notions we propose that such persistence can be understood as expressing the adaptive capacity of a hegemonic project that sustains the power structures in place as well as that of its interests, paradigms and practices. In line with this reasoning we claim that development on its own is often not enough, and that other arguments have complemented or even displaced development in the new drive to construct hydraulic infrastructure.

The common sense that hydraulic infrastructure is not the key to development clashes with an empirical trend towards more dams, a rupture of integrated approaches towards fragmentation and decentralisation in response to economic crisis. For instance, Lopez-Gunn (2009) shows that in the Iberian Peninsula, after a period of influence of the "new guard advocating a New Water Culture" the old guard has resiliently regained its foothold. Despite the fact that the hydraulic mission was put on the backburner of international water governance paradigms in the 1990s and early 2000s, the hegemonic project has persisted as the mainstream solution to deal with water-related challenges. Plans to (further) tame the rivers remain on developers' shelves "ready to re-emerge when the development climate is amenable" (McCully, 2001 in Pearse-Smith, 2014). As Molle (2009) notes, the 'hydraulic bureaucracy' is resilient. What he backgrounds is that the hydraulic mission is one strategy for state bureaucracies to stay in charge and strengthen their position and legitimacy. The reappearance of large-scale dam construction, an increasing number of interbasin transfers and desalination plants around the world seem to point to the fact that in hydraulic bureaucracies the 'soft' paradigms of the 1990s and early 2000s have slowly given way to the resurgence of a refurbished hydraulic mission and with it the return of 'big state' and 'big infrastructure'. This return is hailed as the new and inescapable approach to address today's and tomorrow's water challenges.

HYDRAULIC MISSION CREEP: THE POWER AND ADAPTIVE CAPACITY OF DAM NARRATIVES

The Nirvana concept, coined by Molle (2008b) offers a valuable entry to better understand the resilience of the hegemonic hydraulic mission paradigm as well as its capacity to adapt, survive and firmly establish itself in the midst of decentralisation, participation and IWRM. Based on Roe (1991), Molle claims that policy narratives tend to acquire a life of their own and are not easily debunked by contradicting empirical evidence, as "they continue to underwrite and stabilise the assumptions" for policy-making "in the face of high uncertainty, complexity, and polarisation" (Roe, 1991). Especially in development, narratives tend to be persistent and resilient, continuing to survive in the mind of practitioners long after they have been debunked or proven wrong by scientific work. All these narratives are appealing, simple, and draw on common sense, which transform them as objects that can lead to agreement more easily. This is the consequence of laborious negotiation taking place at formal and informal institutions at different scales. Therefore, while underpinned by material interests and power capabilities, hegemony, a winning mix of consent and coercion, needs to be constantly reproduced, in a balance between concessions and repression (Cai, 2008).

If an ascending 'Nirvana concept' is to hit the ground, international discourse needs to be integrated into existing locally hegemonic ones. The translation of international agendas is filtered and transformed by local actors who are spread across different scales and spaces. International approaches will thus be appropriated and translated according to distinct alliances in each space and institution of negotiation until it turns to practice its 'concept of control' (Overbeek, 1990). Likewise, in Ecuador the Nirvana concepts of river basin management premised on discourses of IWRM and increased stakeholder participation were effectively used to centralise water control in the hands of the national government since 2007 (Warner et al., 2014).

Multilateral agencies and recipient states build narratives to present a clear case for an area being in need of development (Crush, 1995). These actors present the case for the dam in an apolitical way, based on 'the facts' presented by 'the experts', with grassroots science dismissed as unscientific (Pearse-Smith, 2014). Thus, Egypt is presented as overpopulated, its desert as 'empty' and water as 'abundant' (Mitchell, 1991) to justify investment in hydraulic desert reclamation projects such as Toshka to supply water to a 'new civilisation' in the desert, although so far it has attracted precious few from Cairo to the scorching heat of Toshka (Warner, 2013).

Convincing multiple audiences of the need to support a large hydraulic project requires a hegemonic formula that can convince others that the project is *good for the people, the region and the nation; the neighbours* (or at least will not affect them negatively) *and the planet*. This formula normally includes a (potentially hydra-headed) *construction of scarcity/plenty*. The international consensus is that water is scarce and will become scarcer in the future; that there are large quantities of water that are still untapped; and that we have to make societies climatically resilient. As a result, the global enabling environment for multilateral support is increasingly based on the idea that dams can serve as climate buffers and that socio-environmental sustainability and accountability should be safeguarded.

In this context, internationally, 'green growth' has opened the backdoor for those seeking dam funding. Domestically however, ideological hegemony requires a 'hydraulic mission' discourse that portrays hydraulic infrastructure as the road to a nation's autonomy, its development, modernity and 'inclusive' economic growth. Therefore, dam projects as high modernist icons are important in state building and integration – e.g. mountain dwellers in Southeast Asia should be developed and lead 'normal lives' (Goldman, 2001), see also the attempted integration of the Kurdish population in Turkey through GAP (Reyes-Gaskin, 2005). But Public Relations campaigns aimed at international audiences will emphasise the peace-building potential of dams and the benefits of regional regulation (Warner, 2005). The stickiness of the dam model evidences an adaptive change in rationale (mission creep) as adaptive strategy to face changing (policy-makers) public opinion. The above-mentioned nexus, climate resilience and green growth are internationally pervasive constructs that buttress the return of the dam.

Following the interests that are driving the 'new' wave of dam construction as part of a new policy regime (Foran, 2015), the latter can be characterised as a reinvigorated '*hydraulic mission creep*'. A bifurcation seems to be taking place between the self-funded dams (without recourse to third-party funds), bilaterally and multilaterally funded dams. Especially the latter increasingly need alternative legitimisation. Dams are not only being championed as green development engines but are increasingly legitimised as:

- Tools in the war on terror (Warner, 2010): the Turkish Ilisu Dam on the Tigris as a buffer against Kurdish militants, PKK.
- The war on drugs: Afghanistan's former minister of Energy and Water, Ismail Khan, claimed: "Once we have water, no one will grow poppies, no one will fight, no one will leave Afghanistan [for work]...water will resolve all problems in Afghanistan" (cited in Thomas and Warner, 2015).
- And most influentially, climate adaptation, including the Water-Energy-Food (WEF) Nexus.

In international discourses and narratives, dams have seen a slow return and have increasingly gained more acceptance through expert discursive engineering. One such nirvanic 'meme' is the Water, Energy and Food (and, some add, Climate) Nexus. The year 2014, pronounced the international year of water and energy, was dominated by conferences on the Nexus. The Nexus approach, championed by multilateral agencies, highlights how actions in one area impact on one or all of the others (Lindstrom and Granit, 2012; Allouche et al., 2015; Leese and Meisch, 2015). It became foregrounded in response to a perceived simultaneity of four crises: an ongoing water and climate change crisis, coupled with exploding food and energy prices. Underlying worries concern Malthusian trends of relentless population growth, the demand for better living standards combined with increasing consumption

levels, reinforcing scarcity (Waughray, 2011). These perceived scarcities are 'securitised' (Buzan et al., 1998) in the nexus approach; meaning attribution of a threat to a single problem (water scarcity), and a way out which seems to repeatedly boil down to mega hydro-works which include the construction of dams and other infrastructure hydraulic works such as interbasin water transfers, desalinisation plants, and irrigation modernisation projects, perpetuating the 'irrigationist' dream of transforming arid lands into a green paradise (Blake, 2015). Much store is set by the multipurpose nature of such dams, serving both agricultural and industrial energy goals. Dams however cannot really be multipurpose serving water and energy needs at the same time, never mind that their management structure tends not to promote intersectoral balance (Blake, 2015).

As Allouche et al. (2014) note, the crisis narrative is driving proposed solutions interpreting these tenets in terms of control and stability, instead of accepting flux and complexity. More hydraulic infrastructure is portrayed as the creation of reliability and a key way of ensuring water security and of managing the trade-offs between water, energy and food. Large dams are also increasingly heralded for providing clean (non-fossil) energy for simultaneous 'green growth' and mitigation of climate change (Nüsser, 2013; Huber and Joshi, 2015). As such "policy approaches emerging from the global nexus discourse have tended to argue in favour of building more large dams as a way to control hydrological variability and thus manage the trade-offs between water, energy and food" (ibid). In so doing, the Nexus is notably reviving solutions that multilateral agencies withdrew in the last 20 years, such as the construction of mega-dams (Bosshard, 2013; Schneider, 2013). The rapid international adoption of the concept led the STEPS Centre at Sussex University, UK to warn that the agenda of the Water-Energy-Food nexus is leading to certain forms of water storage being favoured over others, coming out "in favour of building more large dams as a way to control hydrological variability and thus manage the trade-offs between water, energy and food" (Allouche et al., 2014). In this context, the 'hydraulic mission' is now presented as a solution to guarantee water, food and energy security in times of climate change. Hydropower projects now qualify for top-up funding through the Clean Development Mechanism (CDM) (Mäkinen and Khan, 2010); the World Bank presents dams as climate buffers.

While the approach does not necessarily restrict actions to large-scale interventions, until now, it has predominantly supported large-scale infrastructure solutions rather than small-scale interventions or support for alternative energy sources such as solar and wind power. As a result, the nexus approach has been instrumental in reviving the hydraulic mission as ostensibly "necessary" to ensure safe water access, food provision and 'clean' energy today and in the near future (Gomes de Matos, 2015).¹

FUNDING DAMS: OLD GAMES, NEW PLAYERS

For many countries, the Achilles heel for the construction of big dams has been access to funding. For most developing countries and emerging economies that were not supported by the Soviet Union, until the 1990s, apart from multilateral funding from amongst others, the World Bank was the main source of cash flows for these large-scale projects. As large international funders became more critical of large dams and their effects, the funds for the construction of dams was reduced and tied to an increasing number of conditionalities. Dam developers who used not to see the need for social and environmental impact analysis are changing their networking strategy and seek to improve their Public Relations. Dam developers frequently hire local players – including NGOs – to compensate for the lack of local networks in the new countries they are operating in (Goldman, 2001; Kirchherr et al., 2017).

While World Bank funding of large dams substantially decreased in the late 1990s and early 2000s, not only OECD states but also Brazil, China, Iran, Lao PDR, Mexico, Turkey, and Tajikistan kept on building hydraulic infrastructures on a large scale (McCully, 2001). These countries amongst others do

¹ Fearnside and Peuyo (2012) note how Brazil sells its hydropower as a successful transition to green energy.

not need multilaterals – they build dams with their own or other funds and loans, without the need to appease the World Bank. The economically smaller countries, however, cannot totally go around external funders courting – and finding – bilateral support for dam construction. For funders, geopolitics matter ('if we don't fund/build it, the Russians/Americans/Chinese will') but also (market) 'empire building' for parastatal and private giants (American, European, Asian, Latin American) is important. Thus, we may distinguish at least four funding models (and mixes of those) for large-scale hydraulic infrastructure: a) multilateral support; b) bilaterally-funded (China, Russia); c) privately funded, and d) self-funded, e.g. through 'voluntary contributions' from the population (Tajikistan, Ethiopia). As a result, Hensengerth (2015) notes that "the Northern [socio-environmental] discourse loses its hegemonic character as funding and construction companies come predominantly from emerging economies".

Notably China has become a major funder of dam development in African, Asian and some Latin American countries. In most instances, Chinese funding goes hand in hand with the hiring of Chinese dam construction companies and expertise and little to no conditionalities as to possible socio-environmental effects of these dams. As a result, a refurbished hydraulic mission is at present creeping along, not only with the support of the usual suspects, but also being advanced by powerful new actors and coalitions. The Mekong is currently a good example of this. Dam-building riparians are increasingly side-lining the Western-funded Mekong River Commission (MRC). As a result many new dams in the lower reaches of the Mekong are now funded by China (Hirsch, 2016).

ECUADOR'S REFURBISHED HYDRAULIC MISSION

Sumak Kawsay/Buen Vivir: An opening for mission creep

Ecuador has gone through a sweeping process of change since 2007, when the government of Rafael Correa started its ambitious plan of making Twenty-first Century Socialism a reality through what he termed the 'citizens' revolution'. During the election campaign of 2006, the Patria Altiva I Soberana (PAIS) Movement promised to 'build a new fatherland (patria)' through renewed, stronger State involvement in the country's development (Larrea, 2009; Ospina Peralta, 2009; Acosta, 2010). As part of the policy package of the "citizens' revolution", which rests heavily on Keynesian economic ideas, natural resources management and exploitation were put under increased direct and indirect state control (Boelens et al., 2015). This reinforced national control over several strategic services sectors such as telecommunications, electrification, domestic water supply, health care and transport. In these sectors increased State expenditure followed as a means to reactivate the internal economy and create a foundation for the modernisation of the country. During the last seven years, the profits acquired from the oil sector were particularly important for the central government. Since 2010, about 24 contracts were renegotiated with private oil companies. Under the terms of the new contracts the Ecuadorian State became the only owner of every barrel of oil pumped by private investors. Since then and favoured by the high international oil prices, the citizen's revolution government incremented its oil revenues by several billion dollars.² Heavy investments were made in most sectors including oil exploration and exploitation which is a strategic means to generate revenues for the state which highly depends on the export incomes derived from this sector (Lalander, 2016). Other important investments were the construction of hydraulic infrastructure for hydropower generation, flood control and irrigation expansion (Boelens et al., 2015; Silva, 2016; Hidalgo, 2017). The legal and institutional framework in which these transformations have taken place is established by the Ecuadorian

² *Diario El Telégrafo*. 19 January 2013. www.eltelegrafo.com.ec/noticias/economia/8/renegociacion-de-contratos-petroleros-genero-usd-2-795-millones

Constitution of 2008, which was drafted through a contentious participative process and accepted by a majority vote in a national referendum (Hoogesteger, 2016).

As Lalander (2016) amongst others points out: "The Ecuadorian Constitution of 2008 is the hitherto most radical constitution of the world, considering Nature's own rights, i.e. the constitutional protection of the environment/Mother Nature/Pachamama" (p. 624). The Constitution, which received strong backing from the Ecuadorian population, at least discursively laid the foundation for the creation of an inclusive economy in which people and nature took centre stage based on the principles of *Sumak Kawsay/Buen Vivir* or 'good living' (see Gudynas, 2011). In its most extreme definition *Sumak Kawsay* proposes that development and modernisation are avoidable by developing strategies to live in harmony with the environment and other human beings without the burden of global capitalism. Nonetheless, the National Development Plan for Good Living, asserts that while:

It acknowledges the economy's dependence on nature; it admits that economy is part of a broader structure – the ecosystem – which supports life as a resource-supplier... [but]... It is not about keeping our natural heritage unharmed – given the use of energy and materials by different societies and given the ecosystems' assimilative capacity, this is impossible. It is about protecting at the adequate levels (SENPLADES, 2009: 21, cited in Lalander, 2016: 628).

Such principles have been translated into and merged with ideas of 'new' green development, the Water-Energy-Food Nexus and climate-change resilience and adaptation. These principles and accompanying discourses have been used to wholeheartedly embrace a reinvigorated Hydraulic Mission in Ecuador since 2007 in the midst of institutional 'reinforcement' reforms that organised water management based on both watershed boundaries and river basin councils (Warner et al., 2014). Cornerstones of this Hydraulic Mission, pushed by the central government, are unleashing Ecuador's hydropower potential as the 'clean and sustainable' source of energy of the future, the construction of flood control dams to protect the population from the dangers of climate change and the expansion of the irrigated area of the country to sustain its increasing national food demands and its growing agro-export sector.

Spearheading hydropower development with Chinese funds

In its drive to develop a green and sovereign economy Ecuador's government aimed at making the country energy self-sufficient by 2020 with 'clean' energy that does not use fossil fuels and that as such does not contribute to air pollution and CO₂-induced climate change. In line with these aims, during its initial years in power the national government enthusiastically defended the so-called Yasuni ITT initiative, the core of which was to leave the oil in the ground in the Yasuni area in exchange for international compensation. In fact, Ecuador had the ambitious plan of producing 90% of its energy with environmentally friendly renewable resources by 2017 and become a net energy exporting country in the future.

To materialise this ambition between 2007 and 2015, USD 5900 million were invested in the simultaneous construction of eight hydropower plants in the country (see Figure 1) (MICSE, 2016). A promotional movie of the government starts with the following text: "energy is a necessary condition for the development of the country, and in a process that is exemplary to the world Ecuador is changing its energy matrix, generating from 2016 onwards 93% of its energy using hydropower".³ The first 'new' hydropower plant, Manduriacu, was inaugurated in 2015, followed by Coca-Codo Sinclair in 2016. Through the inauguration of Coca-Codo Sinclair and other power-generating plants since 2006 the power-generation capacity of Ecuador has increased from 4070 MW to 6010 MW in 2015 and will increase to a projected 8.678 MW in 2017 (MICSE, 2016). The promotional film for Manduriacu, for

³ <https://www.youtube.com/watch?v=H1a5ae0hs2U> / 22-11-2016

instance, the smallest of the eight projected dams with a capacity of 65 MW, finishes hailing the dam: "for development, energy for good living, energy for inclusion; Ecuador has changed".⁴ It also shows that the dam will reduce the emission of CO₂ with 73,000 tons a year, bolstering its contribution to the mitigation of climate change. In line with the discursive principles of the "citizens' revolution" and *sumak kawsay*, respect for the environment and socially inclusive growth the Coca-Codo Sinclair project is heralded by the government as "(a) project that is environmentally responsible because of its conception and development that uses water as fuel and the majority of its works are underground with which there is no major damage to the environment and its energy is clean".⁵ In this way the hydropower mission of Ecuador has been framed as a means to achieve green, climate-smart development while at the same time acquiring energetic sovereignty.

Figure 1. Hydropower plants constructed/in construction in Ecuador since 2007 (own elaboration).



After having turned its back to the hegemonic power of the United States of America and multilateral funding organisations, small Ecuador established close ties with other (then) socialist countries in South America such as oil- and gas-rich Venezuela, Brazil and Bolivia. Yet, to find funding for the ambitious

⁴ www.youtube.com/watch?v=m1PyObzRi5g / 22-11-2016

⁵ www.cocacodosinclair.gob.ec/el_proyecto/ 22-11-2016

hydraulic plans of the citizens revolution, Rafael Correa turned his gaze outwards, to China as well as inwards, to Ecuador's vast Amazonian oil and mineral reserves. In exchange for loans to fund the construction of the eight new hydropower plants and other multipurpose dams, Ecuador committed to hiring Chinese state firms for the construction of some of the infrastructure while simultaneously promising a large portion of the sale of its oil reserves to Petrochina. At present 32% of the foreign debt of the Ecuadorian state is to China; most of which has been acquired since 2006. Part of the current government's strategies to acquire funds is granting the country's mineral reserves to the biggest Chinese mining companies. Although mining projects are not yet in their exploitation phase, the companies provide high royalties paid in advance to the government. Those royalties are partly used to fund Ecuador's Estrategico EP, which is a public company directed toward the implementation of social and infrastructural compensation measures to communities affected by national 'strategic' projects such as mega hydroelectric and multipurpose dams.⁶ Therefore, it is not surprising that upon the first visit of the Chinese President (Xi Jinping) to Ecuador in November 2016, Rafael Correa received him with the words: "China has helped to change the history of Ecuador"⁷. During this visit both dignitaries jointly inaugurated Ecuador's largest hydroelectric power plant, the 1500 MW Coca-Codo Sinclair, constructed by the Chinese state corporation SinoHydro. It cost more than USD 2245 million,⁸ 70% of which was financed by the Eximbank of China and the remainder by the Ecuadorian state.

Irrigation development and flood control

Ecuador's reinvigorated hydraulic mission has also turned its gaze to the other classical dam construction sectors; irrigation development and flood control. In the election campaign Rafael Correa promised to 'sow the landscape with irrigation canals' as one of its important political bastions was the peasantry. Initially the government sought a close collaboration with the peasantry for the planning and execution of the investments in the irrigation sector. For this a special institution was created: the National Institute for Irrigation (INAR) coming under the Ministry of Agriculture (MAGAP). After its creation INAR became enmeshed in a series of corruption scandals and the institute was downgraded to a sub-secretariat within MAGAP. In parallel to these institutional shifts, the provincial governments also demanded funds to establish their own decentralised departments of irrigation. The basis for this demand was the 2008 Constitution which recognised that Provincial Autonomous Decentralised Governments (GADs) were responsible for the irrigation sector within their jurisdictions. The political struggles between the central government and the provincial governments over the control of the irrigation sector led to a reduction in the budgets assigned for this sector through the GADs and the sub-secretariat of Irrigation within MAGAP. Since 2007 the investments in the irrigation sector through both MAGAP and the GADs have been in the order of USD 500 million, most of which was spent on O&M and the construction of relatively small irrigation systems (Hidalgo, 2015).

Most state investments in the irrigation sector and flood control have been made by the central government through the National Water Secretariat (SENAGUA). These investments have been dominated by the construction of large-scale infrastructure. In SENAGUA many 'old' plans and projects (some of which were conceived in the 1970s) were taken out of the cupboards and updated by civil engineers who had been involved in Ecuador's hydraulic bureaucracy for decades. These 'old' and refurbished projects together with a couple of new ideas for which funding was made available have resulted in large-scale investments in dams for flood control and irrigation. In order to do the job, SENAGUA formed a large team of engineers under the 'megaprojects department' which developed into the Public Water Company in 2014. By 2015, SENAGUA's investments in flood control and irrigation

⁶ Ecuador Estratégico EP. www.ecuadorestrategicoep.gob.ec

⁷ www.elcomercio.com/actualidad/xijinping-alianza-ecuador-visita.html (last consulted 18-11-2016)

⁸ www.celec.gob.ec/cocacodosinclair/

dams amounted to USD 1130 million as shown in Table 1. With these six projects the state claims to have expanded the irrigated area in the country from 172,000 hectares (ha) in 2012 to almost 355,000 ha in 2017; additionally the homes protected from flooding increased from 200,000 to almost 532,000 (MICSE, 2016). What is remarkable is that four of these projects were executed by Chinese construction companies as Chinese funding has not only brought money but also a marked presence of public and private Chinese building companies and know-how.

Table 1. Large hydraulic projects constructed by SENAGUA.

Project	Kind	Province	Investment (million USD)	Irrigation expansion (ha)
Chone	Multipurpose dam	Manabí	132.92	2,250
Bulubulu	Flood control	Guayas and Cañar	83.97	2,450
Daule-Vinces	Interbasin transfer for irrigation	Los Ríos and Guayas	352.63	169,911
Chongón-San Vicente	Multipurpose interbasin transfer	Santa Elena	65.17	7,700
Control de Inundaciones Naranjal	Control de Inundaciones	Guayas	175.99	0
Cañar	Flood control	Guayas y Cañar	319.42	0
Total			1130.01	182,311

Sources: SENAGUA, 2015; Hidalgo, 2015.

Table 1 presents the ambitious plans in this sector which reach far beyond these six completed projects. Table 2 and Figure 2 show the irrigation and flood-control projects SENAGUA has invested in and which are at different stages of completion: from pre-studies to the six concluded projects. Together these projects are expected to further expand the irrigated area of the country as well as to protect the population from flooding in different regions. The construction of these new hydraulic projects with heavy investments is far removed from the initial demands of the organised water users whose interest lies above all in ensuring enough funding to make existing irrigation systems work and gain voice in decision-making. Contrary to the initial promise of including water users in decision-making over investments and policies in the irrigation sector (Boelens et al., 2015), the central government through SENAGUA has pursued the deeply rooted hydraulic mission conviction. In the process other alternatives to increase food production (such as investing in small-scale producers) and cope with flooding have been side-lined and strategically ignored by the government. However, within civil society things did change as grassroots organisations and NGOs increasingly allied to defend their interests and rights (see Hoogesteger, 2014; Hoogesteger and Verzijl, 2015). While before the 1990s and 2000s the government had not faced strong opposition to dam projects, many projects of Ecuador's reinvigorated hydraulic mission met strong grassroots resistance which the government and construction companies have overcome through different strategies as illustrated by the two cases below.

The Chone Dam: The power of the *Buen Vivir* discourse

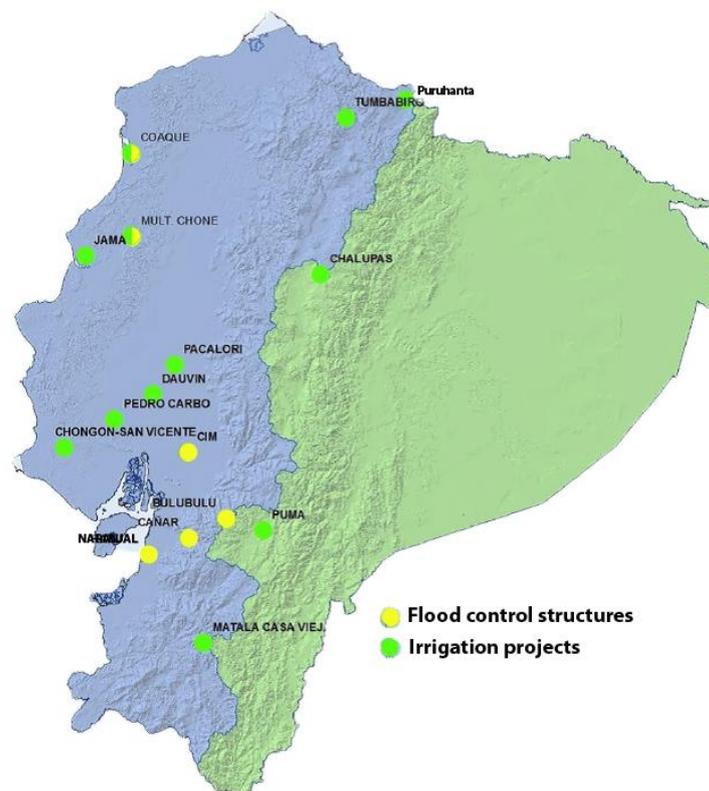
In November 2015, the Chone multipurpose dam was proudly inaugurated by President Rafael Correa. The project is located in coastal Ecuador, nearly 10 kilometres (km) from Chone City (see Figure 2). According to SENAGUA the Chone Dam was built to prevent flooding in the city's lower plains; to

Table 2. Investments made in studies for large scale hydraulic projects for irrigation.

Project	Investments (million USD)	Projected irrigation area (ha)	Province	Projected construction costs (million USD)
Milagro	6.43	80,000	Guayas	160.24
Pacalori	10.24	170,000	Los Ríos y Guayas	392.8
Coaque	6.20	2100	Manabí	54.23
Jama	7.23	6600	Manabí	265.9
Chalupas	6.88	19,000	Cotopaxi	273
Pedro Carbo	5.64	17,000	Guayas y Manabí	278.4
Tahuín	3.67	8000	El Oro	70
Puma	2.26	900	Azuay y Cañar	130
Puruhanta	2.35	10,200	Imbabura	103.3
Tumbabiro	3.32	8574	Imbabura	185
Río Verde	5.60	13,000	Esmeraldas	--

Source: Adapted from Hidalgo (2015).

Figure 2. Irrigation and flood control projects projected in Ecuador since 2007 (based on SENAGUA, 2015).



distribute irrigation water and to provide drinking water to the city. For this a 57.5-metre high dam wall which creates a reservoir that will inundate over 1,600 ha and directly affect more than 240 peasant families was created. The nearly USD 80-million project initially started with USD 8 million coming from Petrochina, and its construction was awarded to a Chinese-Ecuadorian consortium (TIESIJÚ-Manabí). After accusations of technical neglect and unpaid fines SENAGUA unilaterally ended the contract in 2013. A few days later an Ecuadorian consortium took over and finished the construction project.

Although the project was portrayed mainly for flood mitigation, officials strongly leaned on the *Sumak Kawsay* or *Buen Vivir* discourse to legitimise it. Billboards spread all over of the dam's site and Chone City proclaimed: "The Chone multipurpose project promotes '*Buen Vivir*' in your community" and Correa inaugurated the dam with the words: "This is another step towards *Buen Vivir*".⁹ This discourse was internalised by most Chone City inhabitants. Everyone who was against the project was accused of being against *Buen Vivir* and development. As a former opposition leader expressed it as follows: "[s]ometimes while cycling around in Chone City people shouted at me: '*atrasapueblos*,¹⁰ let the project be built'!"¹¹

This leader was part of a multi-actor opposition movement that was active from 2009 to 2011. Its trench was located at the dam site in a farm owned by one of the leaders. The movement demanded respect for the citizens' rights and the immediate suspension of the project. However, the government's determination to conclude construction was strong. It simultaneously deployed subtle techniques to silence and weaken the opposition as well as outright repression and violence.

Alongside the reification of the *Buen Vivir* discourse, towering prices were secretly offered to several opponents as 'compensation' for the lands they would lose and new housing was granted to others. But, as not all opponents could be bought out, in 2011 a violent eviction by the special police forces cleared the opposition camp at the dam site. The day of the eviction Correa signed an Executive Decree,¹² in which he declared the dam site and surroundings to be a 'national security area'. Accordingly, the Ecuadorian armed forces became engaged in guaranteeing that dam construction could conclude.

Baba Dam: Protests and adapted designs

The Baba Dam is located in coastal Ecuador, nearly 200 km southwest of Quito. It promised to serve irrigation, flood control, hydroelectricity generation and water transfer to an older multipurpose dam, Daule-Peripa.¹³ Ten years after its construction started, the Baba 'multipurpose' Dam was inaugurated in 2013 as a symbol of the new energy matrix. As Correa emphasised during the inaugural speech "these types of projects (...) allow the generation of renewable and clean energy".¹⁴

The original designs proposed a 55-metre dam wall. It would inundate 3600 ha of villages and small and medium-sized farms. Soon after dam construction started, local communities organised themselves against the dam. Due to fierce protests the project was temporarily stopped. Protests cooled down but did not stop as opponents demanded the permanent suspension of the project. Some months after the initial mass mobilisations, the government and the construction company announced a redesign of the dam. In the new design the dam was relocated, its crest lowered to less than 20 metres and the inundated area of the dam lake reduced from 3,600 to 1099 ha. With this redesign many protestors

⁹ 24 November 2015.

¹⁰ Literally 'village (people) delayer' but used as a synonym for anti-development.

¹¹ Personal communication, 9 February 2015.

¹² Executive Decree 914. October 2011.

¹³ For details on the Daule-Peripa multipurpose dam see Hidalgo et al. (2018).

¹⁴ Rafael Correa's inaugural speech at Baba hydroelectric plant, 27 June 2013.

claimed victory as more than 2,500 ha were not flooded and higher compensation payments were made. Some opponents to this project claimed not to be completely against 'dam development', but fought for recognition and political participation in decision-making on dams. As a result, the original opposition movement lost support despite the fact that some communities were forced to leave their lands without proper compensation.

Although the civil-society movement claimed victory and internationally the redesign of the dam was lauded, the Ecuadorian government stressed the extra costs this redesign had brought about, as put by Correa: "Due to social protests, the project ended with an overhead cost of USD 200 million extra and the construction time doubled" (ibid). Arguably the major beneficiaries of the redesign of the dam were the construction companies and financial institutions.

In addition to the material implications of the refurbished Ecuadorian hydraulic mission, it has also changed the framing of the hydraulic infrastructure. Even though the Baba project was promoted as multipurpose it is a questionable claim. There is no irrigation system that directly depends on the dam. Mostly large banana plantations and a few *haciendas* benefit from irrigation water due to their strategic location around the reservoir. According to a high-ranking official of Baba's operation company "flood control only functions for a few kilometres downstream. It does not protect much".¹⁵ Thus, the only technically defensible purpose of the dam is electricity generation, both at Baba's and Daule-Peripa's hydroelectric plants. Yet using the terminology multipurpose has been a successful strategy to align with the ideals of the *Buen Vivir/Sumak Kawsay* to socially legitimise the project and counter social resistance. It is telling that after construction was completed the billboards along the roads were changed from 'multipurpose dam' to 'hydroelectric dam'.

The attempts to face the water challenges of the future through the 'soft' path of non-infrastructure strategies such as decentralisation, river basin management, stakeholder participation, environmental water flows and Integrated Water Resources Management (IWRM) as enshrined in the 2008 Ecuadorian Constitution are there but seem to have moved backstage. Many responsibilities in the water sector were decentralised to the provincial governments, water management was organised based on river basins and mechanisms were established for user participation at different scales of water management since 2007 (Boelens et al., 2015). Yet, instead of the demanded investments in the modernisation and improvement of existing irrigation systems (as advocated by the national water users federations) (see Hoogesteger, 2017), most investments in the water and irrigation sector are going to the central hydrocracy of SENAGUA to build new dams and create more irrigated hectares. Grassroots protests and civil-society attempts to open dialogues about dam construction are perceived by the hydrocracy as a thorn on the side of development as the cases of Baba and Chone illustrate. Although the *Sumak Kawsay* discourse is continuously mobilised, it is by and large to advance and justify the plans of the central government and its reinvigorated hydraulic mission.

CONCLUSIONS

The hydraulic mission is back on stage in many countries around the world. New dams, interbasin transfers and the increased use of desalinated water in coastal areas seem to point to the fact that the hegemonic project of the hydraulic mission is resilient and adaptive. The drive to harness 'nature' for the benefit of man through large-scale hydraulic interventions continues to be the prevailing paradigm in water resources development. The 'hard' path of steel and concrete has, to a certain extent, won out over the softer management and demand-control approaches as the strategy to deal with the water and development challenges of modern society. Although 'soft' discourses such as decentralisation, participation, IWRM and the Nexus are constantly mobilised for their 'nirvana' appeal, in practice these

¹⁵ Personal communication, 27 November 2015.

are used to serve old wine in new bottles as the hydraulic mission advances unfettered. The entrenched discourses, knowledges, ambitions, power and vested interests of hydraulic bureaucracies and 'old' as well as 'new' construction companies form a resilient stronghold that has been able to convince and find new funders and investors. Resilient coalitions have skilfully incorporated and adopted upcoming paradigms such as the Nexus approach, the greening of the economy, climate change resilience and, perhaps most unexpectedly of all, *sumak kawsay/Buen Vivir* in Ecuador to window dress their agenda. While *Buen Vivir* developed as a counterhegemonic discourse of respect for Mother Earth and as an alternative to exploitative Western practices, in practice modernist economic development prevails. As such, these new paradigms have become doors through which the hydraulic mission has crept into national and international policies, programmes and politics.

In Ecuador mission creep turned hydropower dams from mere development engines to providers of clean energy and 'good living' for Ecuadorians and the world. Opponents are still depicted as anti-developmentalists holding the people back, but as in the case of the Chone Dam, even regional dams may be expediently 'securitised' (Buzan et al., 1998) to fend off protesters. An essentially single-purpose dam was 'sold' as multipurpose to suggest wider utility and compliance with WEF Nexus principles. As a result, Ecuador's reinvigorated hydraulic mission has been progressing steadily with the financial support of China, in a context in which Rafael Correa's government was increasingly accused of authoritarianism and corruption. Internally the functioning of critical NGOs has been greatly curtailed and social protest increasingly silenced with the use of force (Boelens et al., 2015). The country's development now seems alienated from the original intentions of a socio-environmentally sustainable *sumak kawsay* as originally formulated in the 2008 Constitution (García, 2010; Hoogesteger, 2016). Rather *sumak kawsay* was strategically adopted as the discourse to advance, legitimise and champion heavy top-down infrastructure-based development and reinvigorate the hydraulic mission.

As exemplified through the case of Ecuador, funders of dams are now more likely to be bilateral, reducing the burden of social and environmental conditionalities often set by northern and international funders. State capitalist BRICS, especially China, play a noteworthy role in the resurgence of the hydraulic mission as through Chinese loans and investments, Chinese companies are feverishly building dams and hydraulic infrastructure in many countries of the global south. Alongside the often restrictive demands in terms of curtailing the socio-environmental impacts of large infrastructure, the World Bank and its regional dependencies have been weakened in this process.

These developments call into question the impact of international calls for 'good water governance' in the last three decades and their value in the midst of new discourses, broader transnational political projects and the powerful dam-building alliances that underlie them. Despite a widespread decentralisation and on-paper engagement of stakeholders in water governance arrangements, including those in Ecuador, big dams tend to be projected, planned and financed at national level bypassing decentralised power structures, democratic principles and established decision-making procedures. This leads us to conclude that where political will is overwhelming, calls for IWRM, staples such as Environmental Impact Assessments, participation, and other calls and procedures for 'good governance', are more often than not a window-dressing formality to pour old wine into new bottles.

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