

Comparison of planning and consenting procedures for water resources projects in Sri Lanka and New Zealand

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Abstract This paper compares and contrasts dam & reservoir water resources development projects between a developing and a developed country taking into consideration the drivers, approval processes, potential conflicts among stakeholders, challenges, and final execution/abandonment. As case studies, the ongoing Moragahakanda-Kaluganga multi-purpose project in Sri Lanka and attempts to develop water resources for hydropower on the upper Waitaki River at five locations on a man-made diversion canal (524MW - NZ\$1.2 billion), three locations on Clutha River at Luggate (99MW-NZ\$508Million), Queensberry (186MW-NZ\$831Million) and Tuapeka (340MW, NZ\$1.3 billion), and on Mokihinui River at Westport (~85MW) in New Zealand are analysed. The project in Sri Lanka is mainly for agriculture while those in New Zealand are for generation of hydropower and can be categorised as completely abandoned, re-considered after being shelved, and newly proposed.

In comparing the two approaches for gaining approval for the development of such water resources in the two countries, the paper concludes that the priorities of the community - food security vs. cheaper power - ensure that projects in Sri Lanka proceed, sometimes with drastic steps taken to circumvent stringent conditions, while in New Zealand the projects may get shelved due to public opposition.

Key Words: Hydropower; Water Resources; RMA (Resource Management Act), EIA, New Zealand; Sri Lanka

INTRODUCTION

Both Sri Lanka and New Zealand rely on water resources for generation of

hydropower. This paper compares and contrasts dam and reservoir water resources development projects, considering the drivers, approval processes, potential conflicts among stakeholders, challenges, and final execution/abandonment in the two countries.

SRI LANKA SCENARIO

Moragahakanda-Kaluganga (M-K) Multi-Purpose Project

Project Description: The M-K project, costing 700 million US\$, is the biggest to date in Sri Lanka. It consists of construction of two dams in Ambanganga and Kaluganga rivers (in central Sri Lanka), with a canal and a tunnel taking the water of Kaluganga reservoir to Moragahakanda reservoir. A 76km long canal (Upper Elahera Canal or upgraded Huruluwewa feeder canal) will carry irrigation water from Moragahakanda to the north of the country. Starting from the Mahaweli Development plan of 1960s, several feasibility studies were completed to build the Moragahakanda reservoir, one of the five major reservoirs in the massive Mahaweli development project (TEAMS, 1998). The Lahmeyer report (Lahmeyer, 2001) was the final feasibility study for Moragahakanda. Kaluganga Agricultural Development Project was considered as a complement to Moragahakanda. This project, studied previously (CECB, 1992; Lahmeyer, 2001) and finally in 2004, proposed a main dam and several saddle dams diverting water to Ambanganga upstream of the Elahera anicut.

The 1998 (Moragahakanda) and 2006 (Kaluganga) EIA studies resulted from the mandatory requirement of an EIA study stipulated by the National Environmental Act (1980). A summary of project components is in Table 1.

Table 1 Summary of the M-K water resources project in Sri Lanka.

Parameter	Moragahakanda	Kaluganga
Main Project Features	Dam in Ambanganga 2 km upstream of Elahera diversion	Pallegama Reservoir
Live Storage	521 MCM	144 MCM
Dam	Roller Compacted Concrete (RCC) dam, maximum height 65m, and two rock-fill saddle dams	Rock-fill Main Dam with maximum height 67m, and two saddle dams one rock fill and the other earth
Hydropower Generation	20 MW	-

Project Drivers: The main driver of the M-K project is irrigation water supply with an overall objective of “improvement of standard of living and quality of life of those affected by the project, with acceptable mitigation of any negative impacts from the project implementation” (Lahmeyer, 2001). The study proposed to, among others, improve availability of irrigation water, increase domestic/industrial water supply to Anuradhapura and Trincomalee industrial area, and if possible, generate hydropower. The main benefit foreseen is the increase in the overall cropping intensity in the Mahaweli irrigation systems H, I/H, M/H, G, D1 and D2 to 185% against a “without-Project” cropping intensity of 165%. The total area to be irrigated is approximately 81,500 ha.

Because a majority of the rural agricultural land in the country is dependent on irrigation water, political leadership of rural communities is another driver (Wedaarachchi, 2006). Rural Sri Lankans, with a hydraulic civilization extending over 2400 years, accept development of reservoirs and any sacrifices towards them, acceptable and part of their culture.

The Sri Lankan Government allocated Rs. 50 million in 2006 to the Ministry of Agriculture, Irrigation and Mahaweli Development for preliminary work to enable commencement of construction work of the two reservoirs in 2007. By 2006 June, the Mahaweli Authority of Sri Lanka (MASL) requested the Kaluganga EIA study, to be finished within 4 months, so as not to delay the project commencement date.

Environmental Approval Processes: During the 1970s, when the accelerated Mahaweli Project was implemented, environmental impacts and their mitigation got only a passing mention. The National Environmental Act No. 47 of 1980 and its subsequent amendments mandate Environmental Impact Assessments (EIAs) for projects of this nature. According to this Act, an EIA is a written analysis of the predicted environmental consequences of a proposed project, containing an environmental cost benefit analysis, a description of the impacts, a description of alternatives to the activity, and a description of any irreversible or irretrievable commitments of resources required by the project.

In 1984 EIA was made mandatory for all development projects, including all

river basin development and irrigation projects, through a cabinet decision. The Central Environmental Authority (CEA) bears the primary responsibility for the EIA while 22 State Agencies have been designed as “Project Approving Agencies” (PAAs) for the administration of the EIA process. Public participation is mandatory in the EIA process and all relevant reports, published in all three languages, are open for public comments for a mandatory period of 30 working days. Public hearings may be held at the discretion of the PAA (Ellepola, 2007). The EIA application to the Upper-Kotmale Hydropower project first made in 1995 was rejected. After five rejections and a lawsuit it was finally approved in 2000 (Kodituwakku & Moonesinghe, 2004).

The Terms of Reference (ToR) of the EIA is set by the PAA, which for this project was the CEA. Project Proponent was MASL. Ellepola (Ellepola, 2007) noted that ToR is sometimes very detailed and requires the submission of data which may not be used in the evaluation process, thereby making it needlessly tedious.

Potential conflicts among stakeholders: The main conflict areas were the resettlement locations, the actual beneficiaries of diverted water, and elephant corridors. The general public/NGO attitude to projects is to “Stop the Project” rather than improve the project through constructive comments (Ellepola, 2007). Yet in this case the people were pleased to get irrigation water and willing to give up their (to be inundated) land if they had alternative land suitable for agriculture, ensuring employment and food security in their traditional way of life. The ToR for the Kaluganga EIA emphasized on Community Based Management, leaving the communities concerned to manage their own affairs which was expected to reduce costs and promote sustainability and participatory management with the MASL only providing planning and logistical support. The Resettlement Action Plan considered the National Involuntary Resettlement Policy of 2001 the terms of which are lenient to settlers and helped pacify much dissent on land issues.

The MASL identified an area on the Left Bank of Kaluganga for resettlement of displaced families to which the displaced opposed for two reasons: The area was encroached by second generation of the original farmers who were given land in 1950s. Moreover, the area included some gem bearing land which was bound to lead

to involvement of the gentle farming people in rowdy gem politics they shun. Instead they requested for land on the Right Bank, previously abandoned and earmarked as elephant buffer zone, to which the Mahaweli Authority agreed.

Elephant Corridors: The Moragahakanda EIA (TEAMS, 1998) indicated the need to ensure an elephant corridor between Wasgomuwa National Park adjoining M-K project area and Minneriya-Giritale Nature Reserve to its North. The re-acquisition of this land by the MASL irritated the elephant conservationists (Jayawardene, 2008). The EIA offered the mitigation measure of building electric fences to keep the humans and elephants separate.

The recipients of water: Lessons learnt from a previous project where unauthorised settlements sprouted on the banks of a diverted water canal leaving insufficient water to the downstream legitimate recipients users (Abeynayaka et al., 2007) led to the decision to choose Upper Elahera canal option that runs through the forest reserves.

Challenges and final execution: The EIA process itself created a conflict; The ToR for the Kaluganga EIA study specified a very short 4 month period (July-Nov. 2006) to prepare it which got extended to June 2007. One reason for the extensions was the conflict between the EIA team and the project proponent MASL. Extending the initial ToR to include studying downstream agricultural areas also contributed to the delay. Impartiality of the outcome of the study was maintained by evaluation by the PAA through an independent Technical Evaluation Committee consisting of experts in the relevant fields.

NEW ZEALAND SCENARIO

New Zealand relies on hydropower more than any other country in the world (Leyland & Duder, 2003); on a per capita basis it is world's highest with a massive 70% of the country's power needs being met by hydropower schemes. Considering the unpalatable alternatives such as nuclear power, hydropower still appears to be the most suitable option for New Zealand. Yet, some conservationists consider the big hydro dams are synonymous with "environmental vandalism". The development of

water resources for hydropower generation has had its share of difficulties since the latter part of the 20th century.

APPROVAL PROCESSES IN NEW ZEALAND

Most of the large water resource developments for hydropower in the 20th century were carried out by the NZ Central government and, as a result, completed despite public opposition and perceived poor economic prospects of the projects' outcome. The development of water resources for hydropower in NZ has always been controversial, created approval issues, and has sometimes divided the country. Prior to 1991, the approval process did not involve consultation sometimes leading to extreme measures. However, since the Resource Management Act (RMA, 1991) came into effect, the project proposals need to undergo a rigorous process to gain approval.

The purpose of the RMA (1991) is to promote the sustainable management of natural and physical resources. In this Act, sustainable management means managing the use, development, and protection of natural and physical resources in a way, or at a rate, which enables people and communities to provide for their social, economic, and cultural wellbeing and for their health and safety while (a) Sustaining the potential of natural and physical resources (excluding minerals) to meet the reasonably foreseeable needs of future generations; and (b) Safeguarding the life-supporting capacity of air, water, soil, and ecosystems; and (c) Avoiding, remedying, or mitigating any adverse effects of activities on the environment (Government_NZ, 1991).

Proposals of a dam/reservoir project require consent to be obtained under the RMA. Even if the project proponents of the hydropower schemes - power generating companies - are able to get resource consent in a consent hearing, they need to proceed to obtain approval of the conservation minister if the project is to take place on conservation land. This gives the opponents a second chance to oppose. Moreover, the Department of Conservation has to make a separate submission on the dam development proposals under the Conservation Act (1987) which is even tougher than the Resource Management Act of 1991(Henzell, 2008).

The government's National Energy Strategy promotes a target of 90% of electricity being supplied by renewable resources \rightarrow (usually taken to mean hydro, geothermal and wind) by 2025. However, since 1991 only 17% of new generation built has been renewable and the current proportion of electricity generated from renewable sources is between 60-70% per year depending on rainfall into hydro storage lakes. The RMA has been widely blamed for hindering hydropower projects. One of the main reasons is that while the benefits from these water resource projects such as increased use of renewable energy (security of electricity supply, reduced carbon emissions etc) are nation-wide, the environmental costs of implementing the projects are confined to the local councils involved in giving resource consents. Besides, while the RMA provides for councils to take into account issues like protecting heritage areas and natural amenities, it does not allow them to take energy goals into account (Thomas, 2008).

Project Aqua

Drivers and description of project: There are 8 hydro-power projects on the Waitaki River, only 3 of which are on the lower Waitaki. Numerous investigations have been carried out since the 1960s to capture the abundant water resources in the lower Waitaki River (downstream of the existing Waitaki reservoir) for generation of hydropower. Meridian Energy, a renewable energy producer and a state-owned enterprise with shares belonging to the Crown established in early 1999, reviewed the previous investigations and developed the Project Aqua proposal. The main driver was to reduce New Zealand's dependency on non-renewable sources to meet the projected energy demand for 2009-2011 and beyond (MED, 2005).

The proposal was to divert two thirds of the mean flow of the lower Waitaki River from Kurow into a 60 km long, 80m wide, 7m deep canal on the south bank of the river. Along the canal, a cascade of six 95MW power stations were to generate a total of 3200GWh/year with the potential to satisfy up to 8% of New Zealand's current energy demand (McCormick & Grimston, 2003).

Challenges, conflicts and outcome: Project Aqua was by far the largest water resources hydropower project proposed after the RMA came into effect. Public announcement for the project was made in April 2001. Environmental and engineering studies followed in consultation with a wide range of stakeholders. Meridian Energy had to obtain necessary permissions from the four local authorities with responsibilities under the RMA, namely, Waitaki and Waimate District Councils, Otago Regional Council (ORC) and Environment Canterbury (EC).

The Resource Consent was sought from the ORC and EC to (a) dam, take, and divert water in the Waitaki River, (b) carry out the construction on the river bed, and (c) intercept and divert ground water in the construction of the canal system. Waitaki and Waimate District councils were requested to include designations in their district plans to provide for all the works associated with the project (Campbell, 2003). Extensive consultation with the affected parties and all stakeholders was carried out with informative “Fly-by” animations to dispel misinformation and misunderstanding that has grown around the Project Aqua proposal (EIN, 2004b).

However, the Project Aqua prompted polarised views and divided the community on the lower Waitaki valley. The locals, environmentalists and recreational users of the river opposed the project to protect the ecology, amenities and culture values of the lower reaches of the Waitaki River stating that it is one of the few broad braided rivers in the world and the largest in the South Island. The diversion of 70% of the water was viewed to have an enormous detrimental effect on wildlife habitat, wetlands, fishing and other recreational activities (GPANZ, 2003) and the diversion canal which would cover around 1000 hectares of prime agricultural land was seen to severely disrupt communities along the valley.

The project proposal eventually became mired in a complex consents process. The major part of the campaign lasted only 8 months (07/2003 – 03/2004) and the proposal was abandoned by Meridian Energy Ltd in March 2004. The reasons behind the discontinuation given included the High Court decisions highlighting "significant uncertainties" around the nature of water rights; the unlikelihood of Project Aqua becoming operational fast enough to meet electricity demand growth within the next

five years; uncertainties concerning the company's securing of resource consents; the need to be decisive, particularly for the people of Waitaki Valley; the "substantial" levels of expenditure for the project; rapidly growing project cost; and some recently completed geotechnical investigations which indicate that design changes may be required for the project (EIN, 2004a; PB, 2008). The abandonment prompted such criticism from supporters of the project as nimbyism (not-in-my-back-yard-syndrome), inadequacies of the RMA to cope with large-scale projects, and concerns about NZ's commitment to environmentally sustainable power generation. On the other hand, an amendment (Resource Management (Waitaki Catchment) Amendment Bill) was introduced to remedy the failure of the regional council to set an environmental flow regime. This is a water allocation framework for the river with competing and increasing demands for water from irrigation and hydropower which appeased the environmentalists who were concerned that any future proposals will leave the Waitaki with extremely low flows.

Clutha River - Luggate, Queensberry and Tuapeka

Drivers and Description of the projects: The main driver for the Luggate and Queensberry proposals was the identification of the difference in elevation of 83m, on the upper Clutha river, between lake Wanaka to the head of lake Dunstan (created by Clyde Dam built in 1994) with flow of approximately 260m³/s (MED, 2006) as a potential for generation of hydro-power. State owned enterprise, Electricity Corporation of New Zealand (ECNZ) in 1991 identified and proposed Luggate, Queensbury and Tuapeka dam projects as ECNZ's preferred options. The three projects were to develop hydropower generation capacities of 99MW, 186MW and 340MW and cost NZ\$508Million, NZ\$831Million, and NZ\$1.3 billion respectively.

Challenges and outcome: The plans were shelved in 1996 after a successful campaign by the residents of townships that were to get flooded. Friends of Beaumont (FOB), a residents' group formed in February 1994, among other opposing groups, carried out an untiring campaign opposing the Tuapeka project which included

making presentations at the Green-Peace conference, protesting on the Clyde Dam at its official opening, moving to have Birch Island (on Clutha at Tuapeka Mouth) protected by a conservation order (which was refused by the conservation minister at the time), publicising through 20/20 TV programme. Discovery of rare vertebrates on the Birch Island by scientists in 1995 favoured their campaign and strengthened their resolve. Contact Energy is the current owner of Clutha River based power stations still owning most of the land it bought when planning the Tuapeka Mouth-Beaumont dam in the late 1980s (Conway, 2008b, 2008c). Contact Energy is now (Aug. 2008) revisiting these projects as part of an investigation into all renewable energy options (Williams, 2008) and the opposition to these projects are mounting (Conway, 2008a).

Mokihinui Project

Drivers and Description of project: Mokihinui is the only river in the Buller district identified as suitable for generation of large-scale hydropower; the others have protected status or insufficient flows. Mokihinui does not have elevated protection status apart from an area identified as a priority site due to the presence of native blue ducks. The relative inaccessibility of the river also means that it has less value for the visitors compared to other rivers in the region (Buller and Karamea). The main drivers of this project are the annual production of 310- 360 GWh of renewable electricity to meet the current and immediate future electricity needs of the NZ South Island's West Coast and provide security of supply to the West Coast region, reduced electricity prices and reduced transmission losses. Other expected benefits include upgrade/new sections of the 16km degraded walking track from Mokihinui Gorge to the Mokihinui Forks area and the formation of a Trust to investigate the potential for further walking track that would link the Mokihinui Forks to Lyell.

The proposal includes a 85m concrete dam located on the Mokihinui River approximately 3 km upstream of Seddonville township and 11km upstream from the river mouth and installed generating capacity of 65-85MW. The storage reservoir will impound the gorge upstream of the dam site up to a level of 100m and extend up the gorge approximately 14 km to the east of the site. This limit has been chosen to avoid

inundating the Gazetted ecological area upstream of the gorge and an area of observed slope instability. The proposed dam being upstream of Seddonville avoids the interference with a popular white-baiting recreation area between the river mouth and the Karamea highway river crossing (on SH 67) (Lloyd, 2007; WCDC, 2008).

Challenges and outcome: Meridian Energy Ltd, with the West Coast Regional Council and the Buller District Council, made resource consent applications in December 2007 and hearings started in August 2008 and continues as this paper goes into publication (October 2008). The public have access to the officers' reports and applicants' evidence on the Councils' website (WCDC, 2008). More than two thirds of the 366 submissions from the affected parties and the public on the scheme are in opposition (Henzell, 2008). All submissions are also uploaded to the same website.

CONCLUSIONS

In comparing the approaches in Sri Lanka and New Zealand, it can be concluded that the expectation of the people for employment and food security in the traditional way of life, vs. cheaper power ensures that projects in SL go ahead, while in NZ the projects can get shelved due to public opposition.

In Sri Lanka, resettlement locations, the actual beneficiaries of diverted water, and elephant corridors were main conflict areas. Opposition, if any, came from elephant conservationists. The farmers wanted the water; only the routes of the irrigation canals were disputed, as everyone wanted them through their area, ensuring year-round irrigation. The public participation is ensured by the EIA process. Rural Sri Lankans do not oppose agricultural development, as irrigation development is part of the Sri Lankan culture for over 2400 years.

In New Zealand, dam/reservoir projects are subject to robust debate. An environmentally conscious, free-thinking public have the freedom, desire, and the resources to oppose any project that they deem unfavourable to the ultimate sustainability. While overseas funding builds the dams in Sri Lanka, it is private capital that builds and operates reservoirs in New Zealand and hence is driven by low operating costs, long asset lives, profits, and company share value.

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