



# FALL OF THE WATER FALLS: A LEGAL ANALYSIS ON IMPACTS OF MINI-HYDRO POWER PROJECTS ON NATURAL SPRINGS IN SRI LANKA

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## ABSTRACT

*Mini-hydro power plants are becoming a popular method of generating power using natural streams and waterfalls. Mini-hydro power plants are targeting the areas which are high in ecological sensitivity and biodiversity. Sri Lanka is blessed with natural waterfalls and streams in wet lands which adds beauty to the environment and also creating base for endemic fauna and flora. Constructing mini-hydropower plants has become a profitable commercial business as it considers the economic benefit rather than the ecological value in the areas. When compared with the large hydropower generation projects, mini-hydro power plants generate a lesser amount of power while the environmental cost becomes higher. Since the waterfalls and natural streams are endangered with high and inadequate number of mini-hydro power plant constructions, making path to disappearing of waterfalls and draining the streams. Several legislations have been enacted for the environmental protection while restrictions are imposed for safeguarding biologically sensitive areas. Central Environmental Authority is governing and examining the process of issuing license and process of conducting Environmental Impact Assessments. Even though Environmental Impact Assessments and Initial Environmental Examinations are carried out in this aspect, there are several loopholes in those proceedings which causes risk to natural water springs and waterfalls. The study examines whether the existing Environmental Impact Assessment process in Sri Lanka is effective in ensuring that the mini-hydro power projects are environmentally benign. Black Letter Approach was used for this research and qualitative data analysis method was followed. Sustainable development goals should be upheld than considering monetary benefits when conducting development projects and special legislations should be enacted governing this particular area. The number of license issuing for the construction of Mini-Hydro power plants should be limited and alternative power generation methods which are suitable to Sri Lanka should be encouraged.*

**KEYWORDS:** *Waterfalls, Mini-hydro power plants, Sri Lanka, Sustainable development, Environmental impact, Environmental law*

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## **1. INTRODUCTION**

Sri Lanka Sustainable Energy Authority (2017) provides that the hydro power is a main contributor to the power demand of Sri Lanka. While the government of Sri Lanka conducts major hydro power generation projects, the private sector is permitted to carry out mini-hydropower projects which supplies less than 2.5% total contribution to the national electricity grid (Perera, 2017). First mini hydropower project in Sri Lanka was started on 30<sup>th</sup> April 1996 at Dick Oya area by Hydro Tech Lanka (PVT) Ltd with a capacity of 1MW. Perera (2019) claims that more than 145 mini-hydro power plants are currently being active and more than 73 new projects has been approved while 1400km area of rivers and streams are going drained, destroying more than 50 waterfalls. Moreover, he claimed that 50% of the projects generate 1MW or lower than that. Several local companies are investing for these projects including installing power plants and selling the generated power to the Ceylon Electricity Board with the approval of Sustainable Energy Authority and Central Environmental Authority (CEA).

Even though mini-hydro power plants have economic benefits in generating electricity and turning into a profitable business nowadays, it has various effects on environment (Silva, 2015). Sri Lanka legal system contains the provisions for the protection of environment, however the impact of mini-hydropower plants reveals the requirement of strengthening the legal provisions on this area. In this study, the researcher attempts to uphold the question of constructing high number of mini-hydro power plants using waterfalls which generates lower amount of electricity while causing huge environmental impact. Objectives of this research is to suggest other alternative methods for generating energy and implement proper Environmental Impact Assessment (EIA) process.

## **2. METHODOLOGY**

This study was conducted using the Black Letter Approach (Doctrinal Methodology). The research was mainly focused on collecting, evaluating and discussing the existing legal provisions. Moreover, it was conducted for determining the adequacy of the

contemporary substantive and procedural legal provisions. Identifying the relevant legal provisions, discussing the ambiguities of those provisions and providing solutions were the main concern. Qualitative method was used as it focuses on gathering descriptive data related to the research area. As primary sources, legislations of Sri Lanka including Acts and Ordinances was referred. Special Ordinances and Acts connected to the area of environmental protection and sustainable development have been discussed. Secondary sources for this study were journal articles, authoritative textbooks, conference proceedings, policy reports, websites, and web articles. Data was collected by referring webpages of Central Environmental Authority, Ministry of Power and Energy, Rainforest Protectors of Sri Lanka Association, Sustainable Energy Authority, Center for Environmental Justice etc.

## **3. RESULTS AND DISCUSSION**

### **Mini-hydro Power Plants and Its Contribution to the National Electricity Grid**

Hydropower projects which generates less than 10 MW is falling into the category of “mini-hydro power projects”. Mini-hydro power plants have commenced to assist the national power grid since 1996, contributing 1MW in its first attempt. Since then the number of mini hydro projects has been increasing day by day namely Ma Oya Mini Hydropower project, Magala Ganga Mini Hydro-power project, Bambarabatu Oya Mini Hydropower Project, Atabage Mini Hydropower project, Ethamala Ella Mini Hydropower project etc. According to the annual report of Sustainable Energy Authority (2015) the total contribution of these mini-hydro plants to the national power supply is approximately 3% and according to the current reports there are more than 145 active mini-hydro power projects in Sri Lanka. More than 120 mini-hydropower projects have been approved to commence. However, there is a long queue to obtain permission for proposed mini-hydro power plants in Kithulgala because these investments provide high profits in return. Even though the mini-hydropower projects were measured as an effective method of generating energy, it has harmful effects to the environment including disappearance of waterfalls.

## **Environmental Impact of Mini-hydro Power Plants**

The major effect of mini-hydro projects is the disappearance of waterfalls which supply the main source to generate its power. According to Silva (2015) more than 50 waterfalls has been disappeared while 1400km river length has been blocked. Moreover, he claimed that two waterfalls named as Athawatuwawa Ella and Diganahinna Ella in Belihul Oya (Mandaramnuwara Valley) has been drained due to the uncaring constructions of mini-hydro power plants occurred since fifteen years.

According to Perera (2017), over 500 acres of paddy fields are affected without water due to the construction of Manakola, Deegalahinna and Medapitiya mini-hydro plants in Belihul Oya Valley. According to Silva (2015), “Eli Hatha” waterfalls situated near Malimbada area also got effected due to mini-hydro power plant which blocks and carries away the water of the second waterfall out of seven waterfalls, resulting the disappearance of the second waterfall. Streams which are high in bio diversity and ecological validity are becoming dead zones due to obstruction and diversion of water. Breeding patterns of endemic and native fish species have been disturbed and it risks the existence of species and collapse the whole ecological system (Rodrigo, 2016).

Moreover, absorbing water for mini-hydro power plants causes the significant loss of ground water resulting various social and environmental issues. Disappearance of waterfalls and biodiversity in those areas harms the tourism industry which is one of main income resource of the country.

Draining waterfalls and streams in mountain areas are creating social and health issues to the people who lives down streams as they are facing shortage for water. Illegal activities are carried out causing high damage to the environment in tropical areas such as timber trading, illicit drug making, sand mining etc. Sustainable development strategies should be used, whereas waterfalls are not only adding beauty to the environment, but also it creates the base to the natural biological eco-system.

## **Existing Legal Framework**

*State Land Ordinance No.8 of 1947* interpreted in its Section 70 that the word “stream” includes any river, creek, Ela and branches of these which flowing in a natural channel and “public stream” is all the other streams which are not private streams. According to the said Ordinance, there should be reservations near any public stream prohibiting any nearby constructions. Section 77 of the Ordinance permits to divert water and construct bridges and other works under a permit issued on behalf of the state while it should concern the rights and effects towards the people who lives in the area. Article 12(1) of the Sri Lankan Constitution ensures the ‘Right to Equality’ as a fundamental right, while Article 17 and Article 126 empowers to file fundamental rights petitions to Supreme Courts against executive and administrative actions. *National Environment Act No.47 of 1980* is the main legal document in Sri Lanka for management and protection of the environment. Under Section 2 of the Act, Central Environmental Authority (CEA) has been established as the responsible institution in order to examine the administration and protection of the environment. The requirement of conducting EIA was established in its Amendment Act No.56 of 1988 including the stage of acquiring public comments before granting permission. Obtaining license was made mandatory with applicable to prescribed projects as set out in the extraordinary gazette No.1533/16 dated 25.01.2008. EIA process consist with two levels which based on Initial Environmental Examination (IEE). IEE is a report which addresses the significance of the impact of the projects where the possibility of such impacts will be measured according to their intensity. Thereafter, the identified impacts will be studied with suggested options which has minimum impact on environment in order for granting approval. Project Approving Agencies (PAA) are established under the provisions of the Act under the supervision of CEA. All those agencies and institutions are responsible for maintaining a balance between sustainable development and protection of environment. The CEA has a duty to conduct awareness programmers for the public and prevent any conduct which provides any environmental harm.

National Environment Act has provisions to prevail any other written law in a situation of inconsistency or conflict. Therefore, obtaining approval from the CEA for conducting EIA is a legal requirement before constructing a mini-hydro power plant. *Fauna and Flora Protection (Amendment) Act No.22 of 2009* made provisions for management of plans and assessments of impacts for national reserves including the procedure for obtaining approval from Director General of Wild Life Authority of Sri Lanka before starting development projects.

### **Adequacy of Existing Legal Provisions**

There are various environmental issues of mini-hydro projects which have been occurred during past years notwithstanding the existence of legal provisions governing the area. Mini-hydro power plants are located in extremely sensitive ecosystems like tropical forests where there is rich biodiversity. Contribution of a waterfall towards the natural balance of the environment is priceless as it increases the oxygen level of the water while reducing the ammonia level. The power generation plants situated very far from the national electrical grid's transmission lines and public transportation systems (Rodrigo, 2016). Massive constructions of the mini-hydropower plants disturb to the sensitivity of the environment and harms the natural activities of the ecosystem. Waterfalls are blocked building barriers to its natural paths resulting the disappearance of waterways. People who resides in those areas have to face lots of complications due to the disturbances occurred to natural waterways. They have to adopt themselves to face the changes in the environment including deforestation, change of water flows and draining of the natural water springs.

All the mini-hydro plants require a huge flow of water path and a prominent drop as in waterfalls attracting the constructors. Even though there are precautionary steps and legal requirements to fulfill before providing approval for EIA in mini-hydro projects, the inadequacy and ineffectiveness of those proceedings cause serious issues. Flow rate of the natural waterways and general ecology of the environment are not getting sufficient attention during the EIA process which resulted the disappearance of waterfalls due to the constructions of mini-hydro projects. Sri Lanka's

EIA system was criticized as a corrupted and manipulated mechanism due to political influence and bribes paid by the investors to officers in regulating agencies for obtaining license (Nizam, 2017). Constructing mini-hydro power plants without following proper EIA procedure causes several other damages such as draining of waterways and natural springs, deforestation, threatening the wild fauna and flora including endemic species etc. 'Anda Dola', which is located at Galle is the most recent target of Mini-Hydro projects while concrete channels have been constructed through 'Dellawa' rain forest which belongs to Sinharaja rain forest complex (Dissanayake, 2016). Those constructions have been ongoing in the protected forest reserve of Sinharaja forest and neglect of the developers causes hazardous results to the entire area including the stream, endemic fauna and flora and the soil. Moreover, Dissanayake (2016) claimed that mini-hydro power project would damage section of 6.5 kilometers of 'Anda Dola' as its water was taken away to the power plant located in several kilometers far away and resulted extinction of many endemic species.

Obtaining public comments is a necessary part of the EIA process, but in practice it fails to achieve the objectives of the EIA. Lack of awareness of the people who lives in particular areas is a major issue in this context. Public comments and protests are based on political and personnel reasons hiding the actual reasons which have to be addressed (Dissanayake, 2016). PAA has the authority to approve or refuse the application for construction of mini-hydro projects, but evaluators are simply reliant on the documents other than directing actual researches before approving the projects. Moreover, the political influences to these decision making proceedings are risking the environmentally rich areas by granting permission for huge constructions of mini-hydro projects.

The Association of Rainforest Protectors of Sri Lanka has been referred a letter to several international organizations including UNESCO (United Nations Educational, Scientific and Cultural Organization), UNFCCC (United Nations Framework Convention on Climate Change), UNEP (United Nations Environment Program), IUCN (International Union For Conservation of Nature) and to local public

authorities emphasizing the explosive growing of mini-hydro projects in the areas of endangered rainforests and specially in buffer zones of them threatening the rare flora and fauna and destroy unspoiled streams and waterfalls (Perera,2019). Establishing a fish ladder to safeguard the passage of travelling species in the stream up and down ways is an essential element when constructing mini-hydro projects. As Rodrigo (2016) explains, most of the projects do not include this in their constructions and even the available fish ladders are not in expected standard.

People who lives in the downstream areas are the one who got affected by such activates as sudden disappearance of a natural waterway causes lots of harm to all the surrounding which depended on it for years. In some situations, the monitoring reports has not been forwarded to the CEA resulting the responsible authority unaware about the harm caused by approved projects unless public protests occurred.

According to findings of Krishantha (2018) environmentalists declared that Kithulgala eco system, which contains high biological diversity is at high risk due to the suggested construction of mini-hydropower plant in that area. The nature of the land in this area is not stable and has the risk of landslides which is unsuitable for construction of a power plant. Kithulgala biodiversity zone can be named as one of the utmost sensitive zone in Sri Lanka, which is going to be endangered because of these projects. Struggling to acquire the approval through political influence while the CEA's consent is still pending can be understood as the major reason behind the creation of high number of mini-hydro power plants.

In *The Environmental Foundation Ltd vs, the Central Environmental Authority and Others* (CA 1556/2004), the petitioner challenges the validity of the CEA's approval given to a private company for constructing the Bomuruella mini-hydro power project in Kandapola-Seetha Eliya forest reservation as it was given without considering the EIA report. Furthermore, the permission was granted by referring to Technical Evaluation Committee's recommendations. The Court of Appeal held that Technical Evaluation Committee has no jurisdiction granted by *National Environmental Act* as a PAA and

issued a writ of Certiorari quashing the decision given by the CEA for its failure to exercise discretion in good faith towards the public.

A case against Kehelgamu Oya Mini-Hydro Power Project (CA/Writ/29/17) which was located at Kithulgala River was filed by Center for Environmental Justice. As argued by the petitioners, the project has been carried out without being subjected to proper EIA or IEE from PAA as required by law. In *Ananda Padmasiri vs Sustainable Energy Authority and Others* (SC FR 191/2017) was filed regarding Maru Kanda mini-hydro power project which was based on Kuru Ganga river which has already four other ongoing projects. Construction of the new projects causes severe damages to the people who uses its water for bathing and other purposes due to the draining of the river. One of their key argument was the lands which used for the projects are river reservations and unavailability to use for commercial purposes, highlighting the inadequacy of EIA carried out.

*Center for Environmental Justice Vs Sustainable Authority and Others* (SC FR 137/2017) was against for Athwelthota mini-hydro power plant situated at Palindanuwara which was commenced without conducting a proper EIA as claimed by the petitioners. As per their argument, the project was carried out in a highly ecologically sensitive area created by Athwelthota waterfall which has endemic fish species and endangered species which is detrimental to its environmental quality.

The importance of following the EIA process was interpreted in *Bulankulama and others vs Secretary, Ministry of Industrial Development and Others* (2000) 3 Sri LR 243 (Eppawela Phosphate Mining Case). As decided, the proposed project was not provided for EIA and it was not approved by the CEA. In his judgment his lordship Amerasinghe J. citing the Indian Judgment of *M.C. Mehta v Kamal Nath* (1997) 1 SCC 388, established that natural recourses of public are held on trust for them by the state as guaranteed by Article 27(14) and 28(f) of the Constitution. The judgment further highlighted the authority of CEA as the statutory authority for conducting EIA process. In *Ravindra Gunawardena Kariyawasam v Central Environmental Authority and Others* (SC FR

141/2015), popular as Chunnakam Power Plant Case, the CEA was found in omission of duty towards the public by granting permission to carry out the operation of the project without issuing license, neither carrying out proper EIA.

### **Recommendations to Overcome the Issues and to Improve Existing Legal Framework**

Perera (2017) claims that waterfalls are not only an element which adds beauty to the nature but also contain vital ecological benefits such as increasing the oxygen level of the water by water filtering. Moreover, he explains that it can be named as an 'ecological crime' to destroy waterfalls as it reduces water pollution and increasing the livelihood of the streams. As Nizam (2017) highlighted, CEA mostly granted conditional approvals which are hard in implementation and lacks the gravity on environmental protection. Standards of CEA should be strictly considered before granting approval for mini-hydro projects especially for extremely sensitive matters such as endemic species and endangered species which are highly dependable on the natural environment of the selected areas. CEA should provide adequate resources to carry out assessments on ecological basis as per the request of the parties of proposed projects. CEA is lack of sufficient expertise and capacity related to construction of mini-hydro projects (Nizam, 2017), therefore sufficient training and knowledge should be given to officials. Flow rate of the water paths and the general ecology of the zone should be carefully studied during the EIA process under the supervision of the professionals. Voluntary agencies and eco-friendly activists who are devoted for environmental protection including general public should be taken as an aid in the process of monitoring these projects. Environmental groups who are ready to voluntarily participate for conducting awareness programs should be encouraged (Rupasighe, 2007). Revealing true information including possible threats, to the general public is a duty of the responsible authorities. The decision making process should be conducted without political interferences in order to maintain EIA process effectively.

A report which contains reasons for approval or rejection should be available to the general public within a minimum time period from the date of

granting it where the public can be aware about the transparency of the process. CEA should effectively monitor the activities of the project developers to ensure that the construction process is in accordance with the approved structure. In situations where the construction method overrides the approved methods, CEA should take immediate measures to cancel the project or remove illegal constructions before it become hazardous. PAA must pay attention to the complaints against the proposed projects without deciding on political influence. CEA should provide supervision on the progress of the constructions to monitor the process and its compatibility with the approved quality and standards. Fish ladders should be established compulsorily in every mini-hydro project in accordance with the prescribed standard.

The approval for mini-hydro projects within protected forest reserves should not be permitted by the Forest Conservation Department as it damages the natural habitat of the bio diversity. All the operations of approved mini-hydro power plants which have hazardous effects on environment should be ceased and CEA should reconsider the EIA process in order to minimize corruption (Perera, 2017). Sustainable Energy Authority and Ministry of Power and Energy should strictly limit mini-hydro projects which have harmful effects and promote environmental friendly solutions for generation of power such as rooftop solar panels, wind turbines using offshore wind, generating energy using garbage and generating power using sea waves etc. As Perera (2019) suggests, rooftop solar and waste-to-energy projects should be considered instead of mini-hydro projects. Sri Lanka, being an island surrounded by sea which has monsoon winds, wind turbines and sea wave energy generation can be used effectively for generating power as per the Sri Lanka Sustainable Energy Authority (2017) suggests. CEA should take immediate measures to cancel all the mini hydro projects which constructed without adhering to the approved manner. Granting approval for new projects should be kept hold until finding proper solutions for existing issues. EIA process has location sensitivity and should be considered in each cases' merits whereas significant impacts can be minimized through proper planning (Pushpakumara, Wijeyawickrama & De Silva, 2003).

Government should encourage the researchers and inventors for inventing new technology in power generation projects using solar, sea wave which are practically suitable for Sri Lanka. Higher fines and punishments should be imposed for the wrongdoers who violated the legal provisions. As interpreted in the Indian judgment of *Vellore Citizens Welfare Forum v Union of India* (1996) 5 SCR 241, polluter pay principle should be applied not only for providing compensation for victims, but also recovering the cost of environmental destruction. Finally, the researcher is suggesting that enacting a special legislation to this particular area will be suitable to govern the entire process in strong manner.

#### **4. CONCLUSION**

Renewable power generation plans are essential for sustainable development of the country but environmental factors should be highly considered during that process. Mini-hydro power plants are based on the waterfalls, using the water to generate electricity. Due to inadequate protection of legal provisions and corruptions occurred during EIA process have resulted unrepairable harm to the biodiversity of the environment. Major hydropower plants have been actively participated to the power generation while there are many more mini hydropower plants ongoing, supporting minimally to the national power grid, but having high environmental cost. While there are possible environmental friendly solutions such as solar power, wind turbines and sea wave power generation, increasing the number of mini hydro power plants based on waterfalls without considering the environmental value of these zones would not support to the objectives of sustainable development. The contribution of a waterfall to balance the ecological natural behavior of the environment is priceless as well as the enormous beauty it adds to the nature. Fall of the waterfalls will not be far away if the necessary legal measures have been taken to protect the nature when constructing mini-hydro projects.

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