



# **Approval Process for Large Hydropower Projects & Analysis of their Stakeholders: A Case Study of the Nu River**

**JANUARY 2016**



## ABSTRACT

Due to the high scenic and cultural value of China's Nu River, hydropower development on the Nu has been a hot topic of public discussion among Chinese conservationists and scientists. A comparison of two large hydropower projects, the Maji Hydropower Station on the Nu River and Dahuaqiao Hydropower Station on the Lancang River, illustrates procedural problems in the current development of large hydro stations, such as illogical approval processes, insufficient disclosure of information and public participation, and ineffective environmental impact analysis. A look into how stakeholders are involved in the decision-making process is also critical to the consideration of development procedures.

In order to ensure sustainable and just development of the Nu River, a few key steps must be taken: A greater understanding of the biodiversity and ecology of the area must be obtained through scientific research; the decision-making process should better reinforce information disclosure and public participation; and a regionally appropriate mode of development should be explored.

## ABBREVIATIONS

BEC	Beijing Engineering Corporation
CEA	China Earthquake Administration
CECPA	China Environmental and Cultural Promotion Association
CIECC	China International Engineering Consulting Corporation
CREEI	China Renewable Energy Engineering Institute
DRC	Development and Reform Commission
EIA	Environmental Impact Assessment
IWHR	China Institute of Water Resources and Hydropower Research
MLR	Ministry of Land and Resources
MWR	Ministry of Water Resources
NEA	National Energy Administration
NDRC	National Development and Reform Commission
SAWS	State Administration of Work Safety
SEA	Strategic Environmental Assessment
WHC	World Heritage Committee

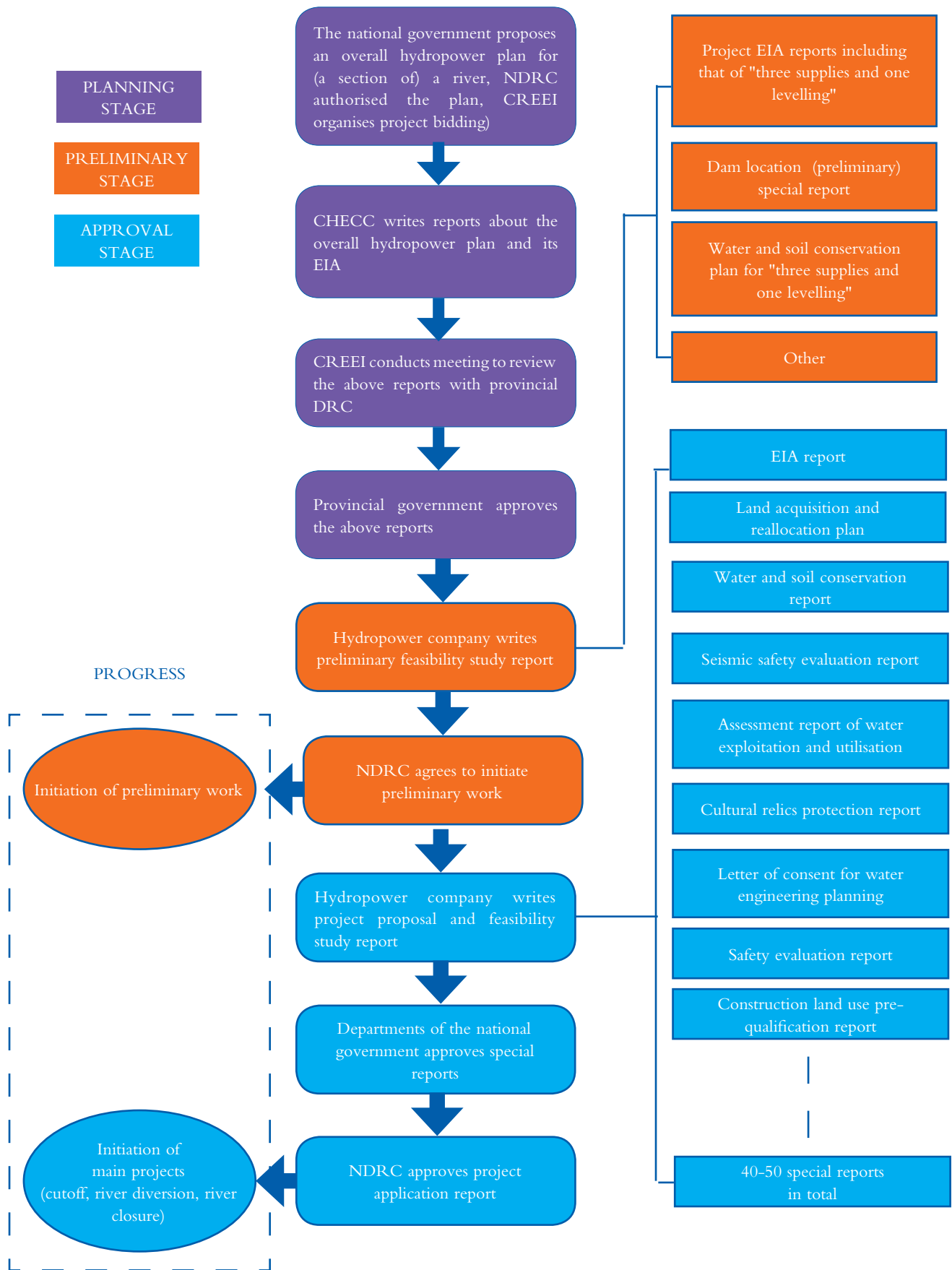


Figure 1. Development and construction procedures of a hydropower project

Hydropower stations on the Nu River are the most controversial development projects in the Nu River area. If the construction of large hydro stations proceed, it will exert tremendous impact on the local ecosystem, involving a number of stakeholders. An analysis of the approval process for large hydro projects and the stakeholders shapes a deeper understanding of how the decision-making process for large hydro development conflicts with conservation efforts.

The Gaoligong Mountain National Nature Reserve and many other scenic areas are located in high-altitude mountainous areas along the Nu River in the Nu Prefecture. These areas are minimally impacted by human activities. However, the Communiqué of China's Scenic Area Development (1982-2012), reported that scenic areas in the region are increasingly subjected to impacts from construction projects, stating: "some large infrastructure projects are poorly designed or insufficiently studied, invading the scenic area and damaging its ecosystem and natural/cultural values." A recent study<sup>1</sup> further confirmed that large hydro projects will have potential long-term negatively impact the biodiversity of forests.

The underwater ecosystem of the River will be most directly affected by hydro development. Once the construction of hydro stations begins, the characteristics of the river flow will change, directly damaging the delimited "National Aquatic Germplasm Resources Reserve for Endemic Fish" in the upper and middle reaches of the Nu River. Since the Reserve was established in 2010 after hydro planning had taken place, it remains to be seen whether it can play a conservation role in the decision-making process of future hydro development.

Maji Hydropower Station is the second of five cascade stations on the middle- and up-stream of the Nu River, and the first power station planned on the Nu River within Yunnan Province. Dahuaqiao Hydropower Station on the Lancang River is a more recent hydro project in the Nu Prefecture. The next section focuses on common problems in the hydro development process in China.

## 1. A Case Analysis of the approval process of large hydropower stations on the Nu River

### 1.1 The approval process of large hydropower stations

Generally speaking, the development of a large hydro station must go through a planning phase and an approval phase. The basic procedures at each phase are illustrated in Figure 1.

#### Hydropower planning:

(1) The general planning for hydro development on river basin is usually commissioned by the National Development and Reform Commission (NDRC) and bidding on the projects is organized by the China Renewable Energy Engineering Institute (CREEI). Planning reports and Environmental Impact Assessment (EIA) reports are usually prepared by institutes such as PowerChina's Kunming Engineering Corporation Limited.

(2) CREEI and provincial development and reform commission (DRCs) hold review and consultation meetings on planning reports and EIA reports, which are then approved by the provincial government. The DRC must submit planning reports to the State Council for approval.

#### Site Preparation:

Hydro companies are responsible for pre-feasibility studies and are not allowed to begin site preparation work, the so-called "three supplies and one leveling" (water, electricity and road supplies and land leveling) until the pre-feasibility study report has been approved by the NDRC. The pre-feasibility study must produce an EIA report of the "three supplies and one leveling" - water, electricity, roads, and land leveling - a water and soil conservation report, a site selection subject report, and a construction diversion subject report. The EIA report of the "three supplies and one leveling" must be reviewed and approved by national or local environmental authorities.

#### Project approval:

(1) Also before site preparation begins, hydro companies must prepare a project proposal that includes a feasibility study report. The report must contain 40-50 subject reports that require approval from different

<sup>1</sup> Benchimol M, Peres CA. 2015. Widespread Forest Vertebrate Extinctions Induced by a Mega Hydroelectric Dam in Lowland Amazonia. PLoS ONE 10(7): e0129818. doi:10.1371/journal.pone.0129818

organizations, including government departments and consulting companies at both national and local levels. According to reporters from *21<sup>st</sup> Century Business Herald*, feasibility study subject reports should be submitted to technical and research institutes such as CREEI and China International Engineering Consulting Corporation (CIECC); local government authorities including the Development and Reform Commission, Environmental Protection Bureau, Forestry Department, Water Resources Department, Land and Resources Department, Resettlement Office, the Cultural Heritage Administration, the Earthquake Administration; and national organizations such as the Ministry of Environmental Protection (MEP), the NDRC, the National Energy Administration (NEA), China Earthquake Administration (CEA), State Administration of Work Safety (SAWS), Ministry of Land and Resources (MLR), Ministry of Water Resources (MWR) and State Grid Corporation of China (or local branches). The most critical reports in this process include: The approval of the hydro planning by the NDRC, the approval of the resettlement plan by the provincial government, the approval of land use by the MLR, the approval of the EIA report by the MEP, the approval of site preparation work by the NDRC, the assessment of the project proposal by CIECC and the approval of the hydro project by the NDRC.<sup>2</sup>

(2) When the whole project approval process is completed and all project files have been approved by the NDRC, the main construction work can begin.

## 1.2 Case Analyses: Maji Hydropower Station on the Nu River and Dahuaqiao Hydropower Station on the Lancang River

To present a clearer picture of the development process and procedures for hydro stations in China, Figure 2 summarizes publicly available information on the development process of the Maji and Dahuaqiao projects, major relevant events that occurred during the approval process and the stakeholders that were involved.

## 1.3 Problems in the large hydropower project approval process

A look at Figure 1 will indicate several problems in the decision-making and development processes of large

<sup>2</sup> 21世纪经济报道.2014. 能源项目审批全链条调查: 大型水电审批多达10年. <http://finance.qq.com/a/20140726/002213.htm>

hydro projects.

### Unreasonable approval process: complicated and illogical procedures

The approval of site preparation and the main approval of a large hydro project are usually separate. To shorten the project cycle, the Chinese government issued a Notice on Strengthening Environmental Protection for Hydropower Projects in 2005, which permits hydro companies to compile EIA reports for the “three supplies and one leveling” projects before the EIA report of the main project has been approved. However, it is irresponsible to begin construction before comprehensive research on the project has been completed. Staff from the China Institute of Water Resources and Hydropower Research (IWHR) and the MEP wrote<sup>3</sup> that the EIA for the planning of major water conservancy and hydro projects should be enhanced and that overall project planning and assessment should be conducted to rule out projects that might bring serious environmental impacts and postpone site preparation work. In practice many site preparation projects, such as cofferdams, diversion tunnels and even river closure, are often completed before the main project has been approved at the national level.

At present, construction prior to approval is due to discrepancy in the understanding of the scope and content of the “three supplies and one leveling” between various departments. In 2012, the MEP’s Notice on Further Strengthening Environmental Protection Work in Hydropower Development<sup>4</sup> redefined cofferdam (including staged cofferdams) and river diversion works as part of the main project instead of the site preparation project. However, in documents such as Specifications for Construction Planning of Water Resources Engineering and Specifications for Construction Planning of Water Resources and Hydropower Engineering, cofferdam and diversion tunnel projects continue to be listed as part of the site preparation. In the “Three Supplies and One Leveling” Project Impact Report for Dahuaqiao Hydropower Station on the Lancang River in Yunnan Province published in 2010, cofferdam and diversion tunnel projects were still included in the site preparation project. In the EIA for Lawa Hydropower Station approved by the MEP in July 2015, dam abutment

<sup>3</sup> 毛战坡, 曹娜. 2014. 大型水利水电工程 “三通一平” 环境影响管理有关问题探讨. *工程建设与管理*(6):46-48; 曹晓虹、步青云. 2010. 水电建设项目 “三通一平” 工程环境问题浅析. *中国水能及电气化*72(12): 35-37

<sup>4</sup> 环境保护部. 2012. 关于进一步加强水电建设环境保护工作的通知. [http://www.nea.gov.cn/2014-09/29/c\\_133682156.htm](http://www.nea.gov.cn/2014-09/29/c_133682156.htm)

excavation and diversion tunnel works were excluded from the “three supplies and one leveling” project.<sup>5</sup> Even though the scope of the site preparation project is narrowing, the EIA approval process is still separate from the approval of the main project. This approval process should be more restructured so that the hydro planning EIA for the river basin would help eliminate projects that have potentially negative environmental impacts.

The timelines above show that the progress of a hydro project is not based on document reviews and approvals. Huadian Nujiang (the Nu River) Hydropower Company was established before hydro planning on the Nu River was even approved. The progress of the project was inconsistent with document approvals. For instance, the feasibility study of the Maji project has been ongoing even though it is unclear whether the pre-feasibility study has been approved. The pre-feasibility study report was completed in 2008 and the outline for survey, design and research work for the feasibility study was completed in 2011, but the progress of the feasibility study is unclear. Similarly, the pre-feasibility study report for the Dahuaqiao project was approved in 2010, yet few subject reports of the feasibility study had already been reviewed and approved back in 2009. Presumably, once a hydro project is planned and a company assigned, the company will naturally identify the project as “feasible”. Therefore, all of the study and approval procedures merely serve as red tape. It is unlikely that companies would allow the feasibility study report to reject their development projects.

If we take a closer look at the approval information for Dahuaqiao’s feasibility study, we find that the three most important documents - the water and soil conservation report, the EIA report and the land acquisition and resettlement report - were all approved in 2013, raising suspicions that they were produced to catch up with the planned schedule. Also, the pre-feasibility report of the Dahuaqiao project was officially approved one and a half years after it was reviewed, but it is not clear whether the site preparation work began after the report was reviewed or after it was approved.

#### Lack of information disclosure and public participation

A comparison of available information about the decision-making processes of the two projects reveals

that information on Dahuaqiao is more available and complete while the controversial projects on the Nu River are far less traceable by the public.

Although the EIA for the hydro planning of the middle- and down- stream of the Nu River passed during a review meeting in 2004, neither its final approval nor any change to the original planning had been publicized at the time of writing. Then in September 2007 the NDRC listed the Nu River as one of the priority areas for hydro development by 2020 in its Mid- and Long- Term Development Plan for Renewable Energy. The Maji Project, along with Yabiluo, Liuku and Saige were ALSO listed as key projects in the NEA’s *12<sup>th</sup> Five-year Plan for Hydropower Development* and *12<sup>th</sup> Five-year Plan for Renewable Energy*. On January 1, 2013, the State Council announced the *12<sup>th</sup> Five-year Plan for Energy Development*, calling for an in-depth discussion and orderly launch of the “one reservoir, four cascade stations” proposal that included Maji, Yabiluo, Liuku and Saige. On December 31, 2013, the Yunnan Provincial Government confirmed in the Yunnan’s *12<sup>th</sup> Five-year Plan for Energy Development* the construction of the “one reservoir and four cascade stations.”

According to Article 5 of The Law of the People’s Republic of China on Environmental Impact Assessment (2002), “the State shall encourage relevant units, experts and the public to participate in environmental impact assessments by proper means.” However, participation currently only take place after the project design has been finalized - too late in the process for public participation to have much effect.<sup>6</sup> According to Article 17 of the Interim Procedures for Public Participation in Environmental Impact Assessment, “the construction unit or the EIA agency it commissions shall give serious consideration to public opinion and shall include its feedback on whether public opinion is adopted into the EIA report”. Article 56 of the new environmental law that took effect in 2015 stipulates,

“The developer or its entrusted affiliation which conducts EIA of a construction project shall explain relevant situations to the potentially-affected communities when preparing the environmental impact report, and will solicit public opinions. The department that is responsible for the examination and approval of environmental impact assessment documents for the construction project shall make public the full text of the envi-

5 关于金沙江上游拉哇水电站“三通一平”工程环境影响报告书的批复. [http://www.mep.gov.cn/gkml/hbb/spwj1/201508/t20150806\\_307827.htm](http://www.mep.gov.cn/gkml/hbb/spwj1/201508/t20150806_307827.htm)

6 促进中国绿色发展的媒体与公众参与政策. <http://www.cciced.net/ztbd/yzh/2015yzzh/meetingdoc/201505/P020150515507944014032.pdf>

### Maji hydropower project on the Nu River

Location: mid- and down-stream of the Nu River mainstream, downstream of Libuxia, Maji, Fugong County

Profile:

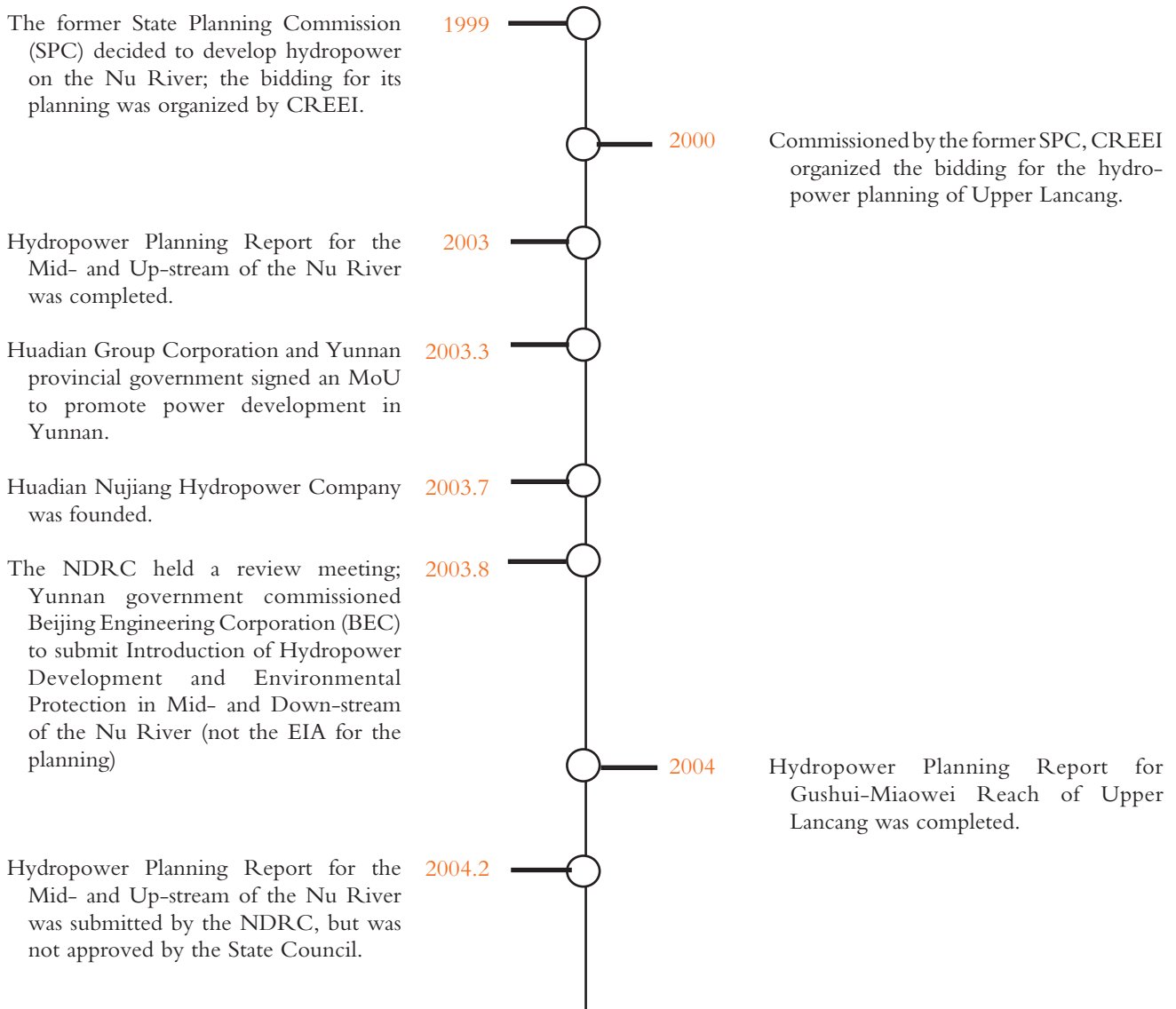
- 3rd dam of the “2 reservoirs, 13 cascade power stations” proposal in the Hydropower Planning Report for the Mid- and Down-stream of the Nu River Mainstream
- Project Area: 106,100 km<sup>2</sup>
- Full Supply Level (FSL): 1,575m; Storage at FSL: 4,707 million m<sup>3</sup>; Live Storage: 3,194 million m<sup>3</sup>; adjustable annually
- Height: 280 m
- Proposed Total Capacity: 4,200MW

### Dahuaqiao hydropower project on the Lancang River

Location: upstream of the Lancang River, upstream of Yingpan, Lanping County

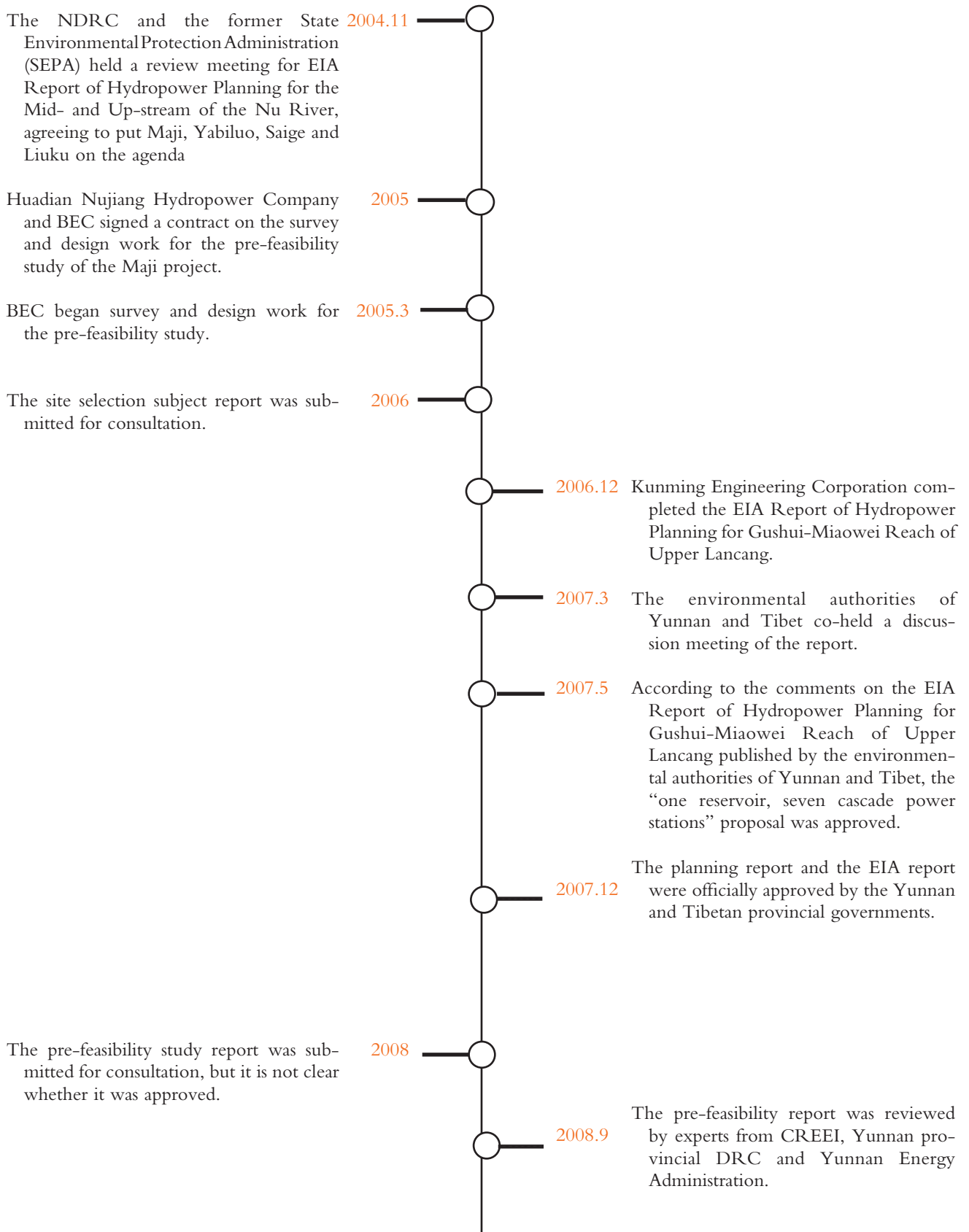
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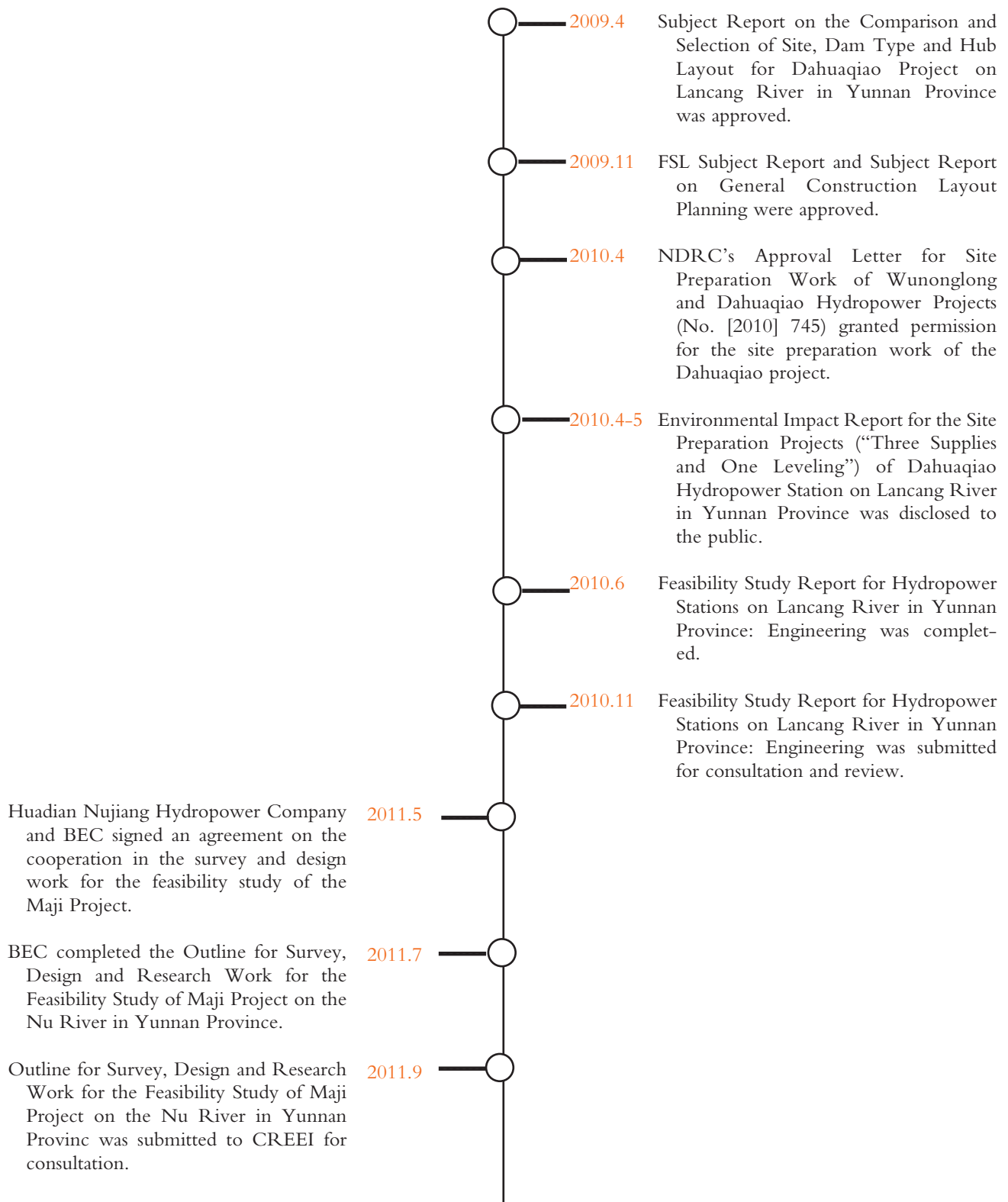
- 6th dam of the 8 cascade power stations planned in the upstream of Lancang River mainstream
- Project Area: 92,600 km<sup>2</sup>
- Average Annual Discharge: 925 m<sup>3</sup>/s
- FSL: 1,477 m; Storage at FSL: 293 million m<sup>3</sup>; Live Storage: 41 million m<sup>3</sup>; adjustable weekly
- Height: 103 m
- Total Capacity: 920MW





APPROVAL PROCESS FOR LARGE HYDROPOWER PROJECTS AND ANALYSIS OF THEIR STAKEHOLDERS  
A CASE STUDY OF THE NU RIVER





**APPROVAL PROCESS FOR LARGE HYDROPOWER PROJECTS AND ANALYSIS OF THEIR STAKEHOLDERS  
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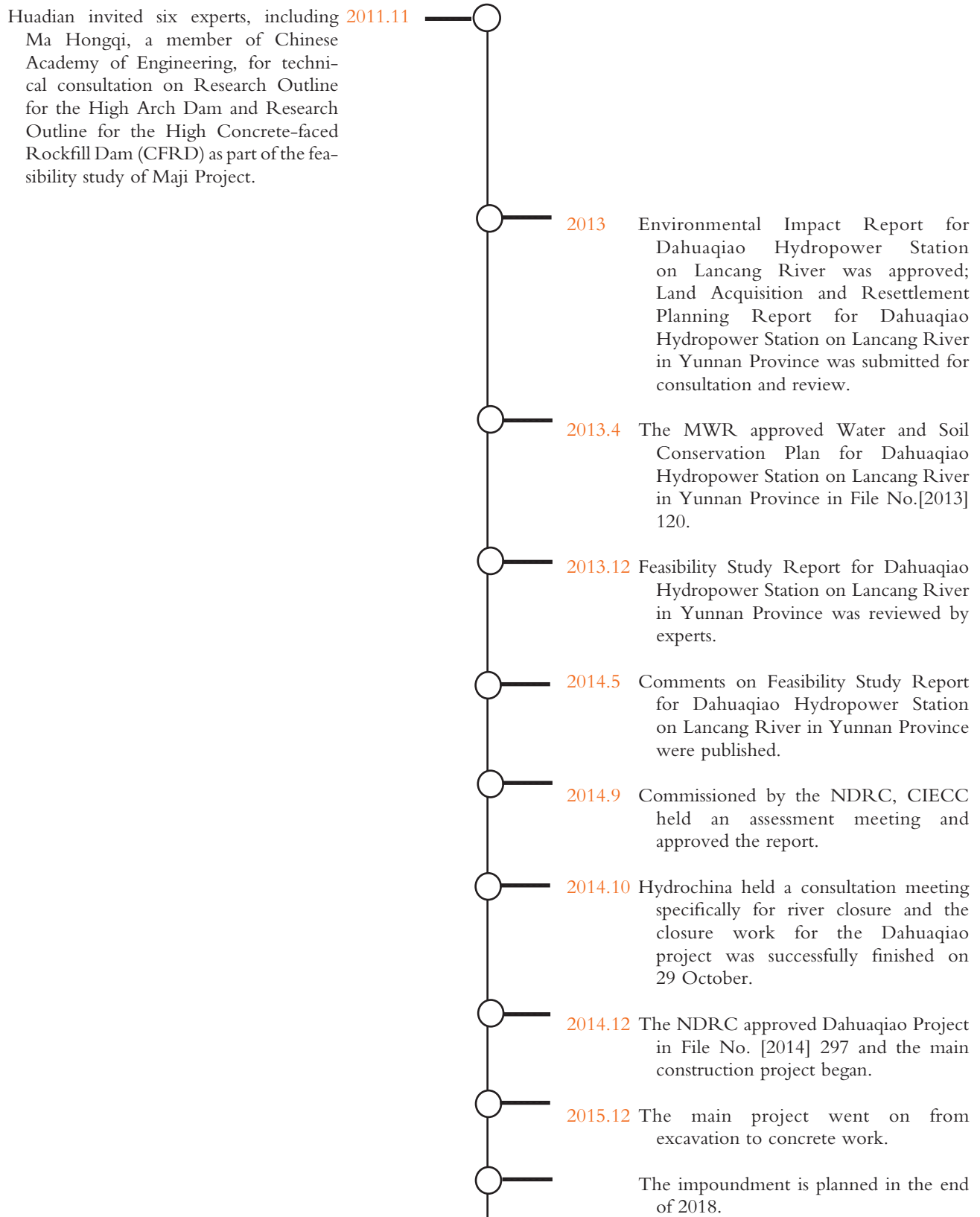


Figure 2. Timeline for Maji Dam on the Nu River and Dahuaqiao Dam on the Lancang River

ronmental impact reports of the construction project upon receipt thereof with exception of commercial secrets and confidential circumstances as specified by the State. In the case that a construction project developer fails to solicit sufficient public comments, the developer will be request by the law to fulfill the task.”

Therefore, the new environmental law attaches more importance to information disclosure and public participation. Hopefully, the EIA process in the future will be more transparent and open to the public.

However, these laws and regulations do not specify the time, methods or the number of people in public participation. As a result, many hydro projects have not satisfactorily implemented these regulations. On April 19, 2010, Huaneng Lancang River Hydropower Co., Ltd. (Hydrolancang) disclosed for the EIA for the Dahuaqiao project for public consultation. The disclosure lasted for only 13 business days from 19 April to 5 May. The two parties to be contacted were Hydrolancang, the hydro developer, and PowerChina's BEC, the research institute commissioned to carry out the EIA. No third-party supervisory body was involved. It was unclear whether the public opinion and suggestions received could be properly addressed and if public participation fulfilled its intended role.

### Lack of ecological assessment in EIAs

EIAs, including the EIA for planning hydro developments and the EIA that is part of the feasibility study, can help avoid and mitigate negative impacts of development projects on the natural environment. Unfortunately, EIAs are not playing a strong role in the protection of China's environment. Instead, they have become “legitimate accomplices” contributing to environmental degradation. The above analysis of the hydro development process shows that site preparation often begins soon after the pre-feasibility study report is approved. Therefore EIAs which are submitted after site preparation work begins do not fulfill their intended purpose.

The Chinese government has realized the tremendous environmental challenges brought about by the rapid economic development and is beginning to prioritize environmental protection. The Environmental Protection Law and the Law on Environmental Impact Assessments are first steps in this direction. In addition, China has gained a better understanding of the need for ecological and environmental protection.

In 1997, the MEP published the HJ19-1997 standard (Technical Guideline for Environmental Impact Assessment: Non-polluting Ecological Impact).<sup>7</sup> This applies to the EIA of construction and regional development projects that make use of ocean resources or developing coastal zones. It also applies to projects in various sectors including water conservation, hydro, mining, agriculture, forestry, animal husbandry, transportation, and tourism. It was replaced in April 2011 by the HJ19-2011 standard (Technical Guideline for Environmental Impact Assessment: Ecological Impact)<sup>8</sup>, which can be used in the assessment of all ecosystems that would be impacted during construction projects. It can also be used as a reference for regional planning EIA.

In the assessment process, laws and regulations focus on pollution, with little attention to ecological or biodiversity protection. Generally, pollution is observable and easy to monitor and assess, while ecological impacts are long-term, difficult to quantify, and could only become visible after decades have passed. China's pursuit of rapid economic development pays insufficient attention to ecological protection.

In 2006, Fauna & Flora International (FFI) evaluated the EIAs submitted at national and provincial levels in terms of biodiversity and ecosystem integrity. The study found that Chinese EIAs did not adequately consider ecological issues, nor did they contain recommendations to mitigate or avoid negative ecological impacts. Chinese EIAs generally apply to construction projects and are thus more concerned about environmental pollution. Few engaged in the assessment possess professional knowledge in ecology.<sup>9</sup> These are key reasons why the progression of ecological impact assessment work has progressed slowly in China.

7 环保部HJ19-1997号行业标准《环境影响评价技术导则 非污染生态影响》<http://www.zjepb.gov.cn/UPLOAD/EPStandard/Hj019.pdf>

8 环保部HJ19-2011号行业标准《环境影响评价技术导则 生态影响》<http://img.zhuzhou.gov.cn/1hbj/201310/201310230900047.pdf>

9 野生动植物保护国际中国项目办公室. 中国环境影响评价中增加对生态和生物多样性考虑时所需要的能力建设: 生态影响评价培训需求评估报告. 2006. [meetingdoc/201505/P020150515507944014032.pdf](http://meetingdoc/201505/P020150515507944014032.pdf)

## 2. Stakeholder analysis for large hydropower development projects on the Nu River

Large hydro projects on the Nu River involve many stakeholders (see Table 1). CHEN Shuisheng, uses hydro developments on the Nu River, to analyze changes in China's public policy-making model. He divided the stakeholders of hydro development on the Nu River into three categories: policy beneficiaries (the pro-dam group), policy victims (the anti-dam group) and the neutral group. CHEN concludes that social groups and organizations are increasingly concerned about public policies and are therefore becoming important participants in their development.<sup>10</sup>

### Functional government departments

Governments at all levels, from Yunnan Province to Nu Prefecture and smaller counties, are driven by economic benefits and regard hydro development on the Nu River as a strategic move for local development. They all actively seek cooperation with Huadian Group Corporation. They represent important members of the pro-dam group who believe that hydro development on the Nu River will bring considerable tax increases, boost local economy, and help fulfill political goals. ZHAO Zhenzhong, an ex-official from the Nu Prefectural Office Planning Commission, said in an interview that once the cascade power stations on the Nu River are completed, they will contribute 2.7 billion yuan annually to local fiscal revenues and that Nu Prefecture alone would have a one-billion yuan increase in fiscal revenues every year.<sup>11</sup>

Planning by other departments from the Nu Prefecture also demonstrate the importance attached to hydro development on the Nu River. For example, in the *11<sup>th</sup> Five-year Plan* and *Mid- and Long-Term Plans for Forestry Development in Nu Prefecture*, the prefectural government proposed “prohibition on the peak, resettlement on the hillside and afforestation in the river valley” along with zoning by ecological function and altitude control for hydro development. For peak areas with an altitude of more than 2,500 m – especially the “Three Parallel Rivers of Yunnan Protected Areas”, the Gaoligong Mountain National Nature Reserve and other provincial protected areas – farming, hunting, logging or animal husbandry is strictly forbidden to maintain the natural

and ecological integrity of the landscape. For ecologically vulnerable areas between 2,000 m and 2,500 m and ecologically deteriorated areas lower than 2,000 m, resettlement and reforestation (including afforestation, ecological forest and economic forest plantation) measures should be taken to restore the ecosystem. In these areas, water and soil issues such as sedimentation, debris flow and landslide need to be properly treated. In the river valley area below 1,570 m, hydro development should be prioritized and all parties are to foster hydro as a pillar industry. Through an ecological protection fund and the policy of “energy instead of relief, power instead of firewood,” the protection cost issues and the conflict between development and conservation can be solved, thus achieving a development-protection balance and a doubly beneficial situation with both economic and ecological gains.

When it comes to environmentally sensitive areas, what role can government departments play? In the Simplified EIA Report for Maodinghe II Hydropower Plant in Deqin, Yunnan<sup>12</sup>, a response letter by the Yunnan Provincial Office for the World Heritage Committee to the Maodinghe project explained that the project site is not located in the “Three Parallel Rivers of Yunnan Protected Areas.” The inclusion of this letter in the EIA indicates that hydro projects must first obtain approval from this provincial committee.

The agricultural authorities in charge of the National Aquatic Germplasm Resources Conservation Area for Endemic Fish in the upstream of the Nu River should have played an important part in the process for EIAs of construction projects. However, agriculture authorities in the Nu Prefecture passed the Subject Report on the Impact of Hydropower Planning on the National Aquatic Germplasm Resources Conservation Area for Endemic Fish on the Nu River submitted by Huadian Nujiang Hydropower Company in October 2013.<sup>13</sup> Although the review found that the cascade of power stations on the Nu River would fundamentally alter the environmental features of the protected river, the report was approved on the condition that an allocated river reach be set aside to fulfill its function. The challenges and decisions regarding these development projects leads one to question the influence and effectiveness of agriculture authorities on hydro development.

10 陈水生. 2015. 从怒江水电站开发看中国公共政策模式变化. 东方早报. 上海经济评论.

11 怒江建水坝 专家齐反对. 2013. 新京报. <http://www.china.com.cn/chinese/2003/Nov/448837.htm>

12 《云南省德钦县茂顶河二级水电站环境影响报告书简本》.2013

13 州农业局组织召开水电开发对怒江中上游特有鱼类国家级水产种质资源保护区影响专题论证报告初审会. <http://www.ynzxc.gov.cn/S1/S1506/C622/DV/20131021/4384320.shtml>

Table 1. Stakeholders involved in hydropower development on the Nu River

Category	Name of Unit	Role
Government	the State Council	Determines the approval of river hydropower planning
	the NDRC	Launches hydropower development plans, approves documents of site preparation projects and the main projects
	the MEP	Approves the EIA reports
	the MWR	Approves the water and soil conservation reports
	the MLR, the Ministry of Transport, the Ministry of Forestry, etc.	Participate in planning and consultation; approve subject reports
	the Ministry of Agriculture	Approve subject reports for the National Aquatic Germplasm Resources Conservation Area for Endemic Fish in the upstream of the Nu River
	Yunnan provincial government	Approves hydropower planning reports and promotes hydropower development
	Yunnan DRC, Yunnan Energy Administration	Organize review meetings for subject reports
	Yunnan Environmental Protection Department	Supports hydropower development on the Nu River
	the Tibetan government	Approves hydropower development in the middle- and up-stream of the Nu River
Local Government	Yunnan Resettlement Bureau	Reviews resettlement reports
	Niujiang prefectural government and its departments	Actively promotes hydropower development on the Nu River
	county-level governments	Cooperate on hydropower development
		Organizes the planning and bidding for river hydropower development
	Beijing Engineering Corporation Limited	Surveys and compiles pre-feasibility study and feasibility study reports, including subject reports needed for feasibility study
	Huadong Engineering Corporation Limited	Compiles technical reports
	Huadian Niujiang Hydropower Company	Organizes technical consultation during feasibility study
	Huadian Group Corporation	holds 51% of the share
	Yunnan Provincial Energy Investment Group Co., Ltd., China Resources Power Holdings Co., Ltd., Yunnan Power Investment Co., Ltd., China Southern Power Grid	hold 10-20% of the share
	China Southern Power Grid	Participate in the consultation; Build high-volt transmission lines
Supporters	hydropower development and design experts	Research hydro's role in mitigating climate change and promoting economic development; emphasize safety of hydro technologies
	ecologists, geologists, etc.	Ecologists point out negative impacts of hydro development on ecosystems; Geologists emphasize the inappropriateness of hydro development due to the geological features of the Nu River area
	the Beijing News, Beijing Youth Daily, CBNweekly, The Paper	Report on the hydro projects; draw social attention
Media	Domestic Media	Reports on and hydro projects; draws social attention
	International Media	Organize community surveys, conduct publicity work and raise public awareness
Environmental NGOs	Green Earth Volunteers, Green Watershed, Institute of Public & Environmental Affairs (IPE), Friends of Nature (FoN), etc.	No viable channel to voice their opinions and demands
Local Communities	communities in Niujiang Prefecture (the uninformed people and the opponents)	
Downstream Countries	Burma, Thailand	Governments are not involved; local civil society is opposed to hydropower projects

### Developers

Huadian Nujiang Hydropower Company's decision to dam the Nu River is due to economic considerations, and is the result of all hydro and water resources companies vying for development projects on the rivers of Southwest China. Nowadays, due to an oversupply of electricity that cannot yet be exported, Huadian has shown a declining interest in hydro development on the Nu River.

### Hydropower design institutes

As the project designer, Beijing Engineering Corporation (BEC) compiles all relevant technical files. BEC also assists in getting approval for the project. As a professional hydro plant designer, BEC is usually an active supporter of hydro projects on the Nu River

At the national level, CREEI also plays a crucial role in the planning of river hydro development. If the overall planning could take a more holistic approach and assess the ecological, social and cultural impacts on a wider scope, projects that might cause ecological damage or economic loss could be avoided from the very beginning.

### Media, civil society and environmental experts

It is worth noting that media, environmental NGOs, ecologists and other stakeholders played an important part in the decision-making process of hydro development on the Nu River. When the planning of hydro development on the Nu River came out in 2003, it soon received widespread public attention. Dr. HE Daming from Yunnan University raised six questions that formed the theoretical basis for opposition from the MEP and other experts. The dissenting opinions from ecologists and geologists were highly valued by the government. In addition, participation from many environmental NGOs amplified the anti-dam voices. There was strong support on a number of occasions including the 2<sup>nd</sup> Member Assembly of China Environmental and Cultural Promotion Association, and CECPA. Various media outlets (China Youth Daily, CBN) were opposed to hydro projects and their reporting on the whole story of hydro development on the Nu River exerted tremendous pressure on the government.

### Local communities

Local communities in the Nu Prefecture are the most relevant stakeholders affected by hydro development,

yet they are also the most neglected. The government believes that hydro development will boost the local economy and therefore benefit local people. However, the opinions of the local people are seldom valued. Minority groups account for 92% of the local population (more than 50% are Lisu minority people) and most of them are poorly educated with insufficient Mandarin language skills to voice their demands, which undermines their influence in the decision-making process of hydro development. These communities are victims of hydro development who suffer from loss of cultural and natural resources that development incurs.

### Downstream countries

Other important stakeholders in hydro development on the Nu River are the downstream countries of Burma and Thailand. The Nu River is a trans-boundary river and the downstream countries are concerned about the impact of the cascade power stations on fisheries and flooding. The trans-boundary environmental impact was not assessed in the planning of hydro development on the Nu River. This lack of consideration is a destabilizing factor in China's relations with its neighboring countries.

Figure 3 shows the stakeholders' degree of support and influence for hydro development on the Nu River.

The pro-dam group, including the NDRC, hydro companies, the MWR, the Yunnan Provincial Government and the Nu Prefectural Government, are much more influential than the anti-dam group, which includes the MEP, environmental NGOs, and media.

The government's functional departments at both national and local levels take a neutral or even supportive stance, even if they are supposed to play a supervisory role in the environmental issues of hydro projects.

Ten years ago, environmental NGOs, media and anti-dam experts were successful in stalling the Nu River's hydro development. They caught the attention of the country's top decision-makers. As a result, the State Council sent important instructions to postpone projects on the Nu River, warning that "hydro development on the Nu River should be treated with prudence and caution." After a decade of calmness, the Nu River issue has lost some of its public attention. The positive influence and active role of celebrities, experts and scholars, media, and social organizations are inestimable and should be further enhanced.

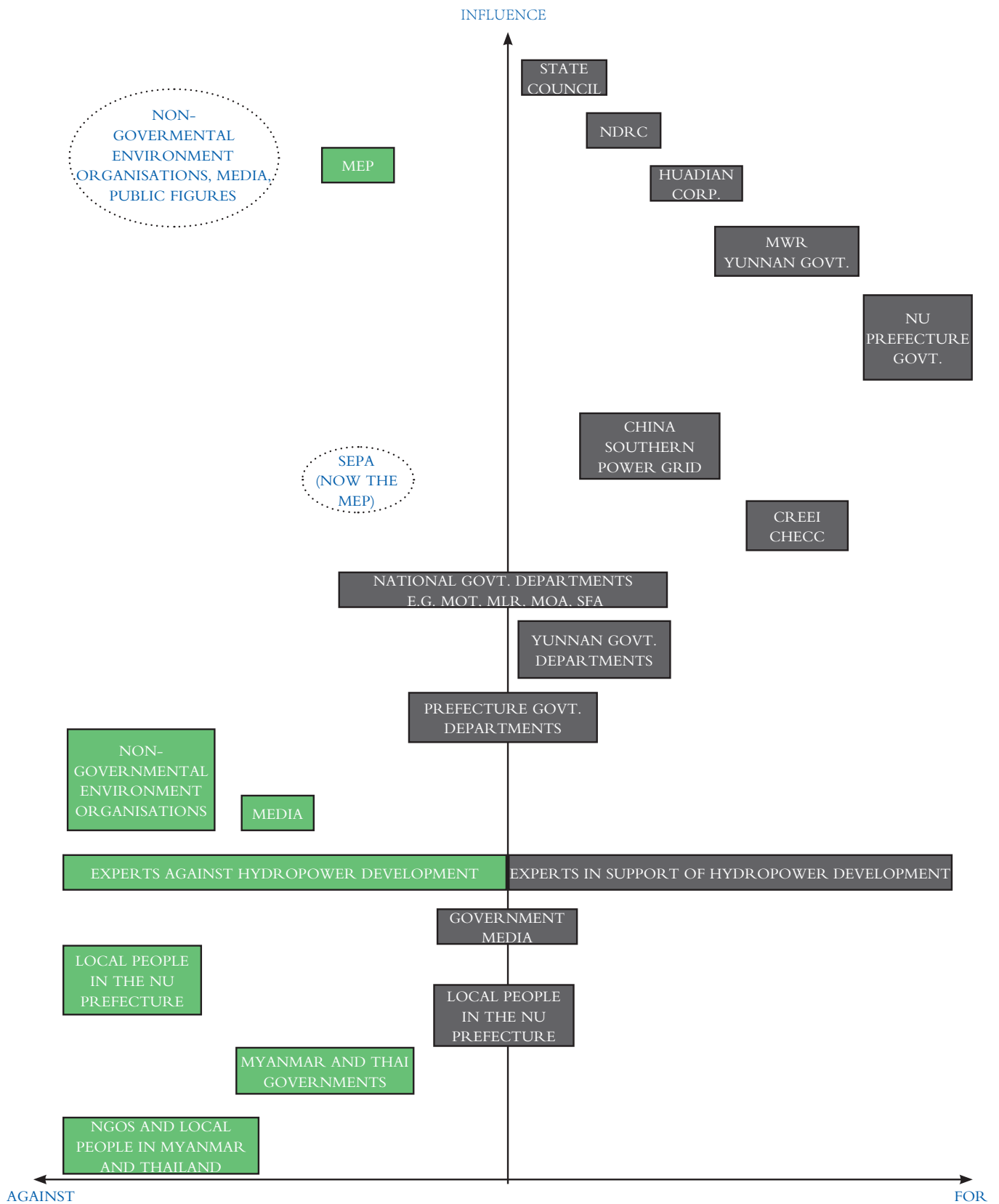


Figure 3. Stakeholder analysis for hydropower development on the Nu River



The Chinese government is increasingly aware of the importance of environmental protection. The MEP was promoted from the State Environmental Protection Administration, and is now more powerful and can play a critical role in supervising, approving or disapproving hydro projects on the Nu River.

It is also necessary to amplify the voices of local people. Although many people living along the Nu River are opposed to the projects, their voices are seldom heard or valued by the top decision-makers.

There is no inter-state agreement on hydro development on the Nu River between China and Thailand or Burma. Regardless, NGOs and people in downstream countries have the right to know about how upstream hydro developments might impact them. Their voices can then be heard and addressed by their own governments.

Apart from the above stakeholders, hydro development on the Nu River is also subject to supervision by international treaties, because the Nu River is the core of the “Three Parallel Rivers of Yunnan Protected Areas”, World Heritage Site. In the same year that the “Three Parallel Rivers” was listed as a World Heritage Site, the Yunnan provincial government published its hydro development plan for 13 cascade power stations on the Nu River. The World Heritage Committee (WHC) was very concerned and identified the “Three Parallel Rivers” as a key monitoring and protection project. The WHC sent an expert team to evaluate the impact of hydro plants on the Nu River and concluded that hydro development is one of the main threats for the “Three Parallel Rivers.” For many years since, the WHC has been observing the region. In 2015, the WHC’s state of conservation report<sup>14</sup> indicated that while there is no indication that dams or reservoirs are, or will be, located within the protected area, there continue to be concerns about the construction of several dams which started prior to the completion of the EIA, and the impacts of dams on scenic landscape values and on landscape connectivity. The WHC urged the Chinese government to submit a Strategic Environmental Assessment (SEA) report as soon as possible. The WHC will play a significant role in the long term monitoring and protecting the Nu River.

### 3. Discussion and recommendations

For geographical and historical reasons, the Nu River

region lagged in economic development and has low standards of living. Eager to develop the economy, the local government prioritized hydro development on the Nu River. This poses great challenges to the conservation of natural resources on the Nu River. Our analysis has found many problems in the approval process of large hydro projects and the different roles of various stakeholders in shaping the Nu River’s future. Based on these findings, we propose several recommendations with the hope of generating more public discussion about the ecological protection and sustainable development of the Nu River region.

#### Recommendation 1: Strengthen basic scientific research on the Nu River

The “Scientific Outlook on Development” emphasized in the Communist Party’s 18<sup>th</sup> National Congress shows that scientific research is the very basis for social development. Although several protected or conservation areas have been established in the Nu River region and multiple research projects have been conducted, the findings are inadequate to fully reveal the biodiversity values in the Nu River region. The Nu River Snub-Nosed Monkey, the world’s fifth discovered species of snub-nosed monkey was not discovered until 2010. It is highly likely that there are still undiscovered plants and animals that inhabit the Nu River region. Additionally, a project EIA that is not grounded in sufficient research is not scientific nor persuasive.

There is room to improve the EIAs for development projects in ecologically sensitive areas, especially to quantify the long-term scientific assessments of ecological impact. Hydro projects need long-term monitoring because impacts may only be observed over long periods of time. Past experiences have proved that EIAs for many projects were not comprehensive and that ecological impacts were not noticed until decades after projects were completed.

The capacity of and demand for hydro in Southwestern China should be carefully evaluated to determine the need for hydro development on the Nu River. For example, are the hydro projects on the Lancang and the Jinsha Rivers fully utilized? Do they already produce enough to meet China’s hydro demand? A professor from the Department of Hydraulic Engineering at Tsinghua University stated that the Nu River is not yet fully understood and the Nu River region does not have a shortage of electricity. Many hydro stations have already been planned in southwestern China and could be used more efficiently. The Chinese

14 <http://whc.unesco.org/document/135083>

government should spend some more time researching and discussing hydro development on the Nu River and should develop hydro projects only when the need is fully evident.

The biological, cultural and geological diversity of the Nu River are irreplaceable. A better understanding of the demands and roles of various stakeholders in the ecological protection of the Nu River, along with an objective and scientific analysis of planned development, will help local governments create more sustainable development plans. Policy-makers should conduct a more systematic stakeholder analysis.

#### Recommendation 2: Improve the decision-making process

The environmental impact of hydro development on entire river basins is often neglected in the hydro planning phase, causing failures to prepare countermeasures in advance. Decision-makers in China should conduct EIAs for the planning of all hydro developments to eliminate destructive projects.

The separate approvals for site preparation and for the main projects of hydro development have long been criticized by environmentalists. The government should abolish site preparation project approval and deny any construction until the entire feasibility study has been completed. This will not only contribute to a more comprehensive assessment of the environmental and social impacts, but will also avoid economic loss caused by project delays or cancellation. For instance, Liuku Hydropower Station was the earliest hydro project built on the mainstream of the Nu River. Its site preparation work began in 2006, and several subject reports were approved soon after. However, the project was halted in 2011, leaving the connection roads from Liuku to Bingzhongluo unfinished. The site preparation projects began without approval and this unreasonable process, causing an economic loss.

#### Recommendation 3: Enhance information disclosure and public participation

There is not enough information disclosure in the current hydro development process, and the public is not actively participating in development projects that affect them. The law on EIA and the new environmental law both emphasize the importance of information disclosure and public participation. The government should disclose necessary information to encourage more public participation by local people

in the decision-making process. In addition, capacity-building for poorly-educated populations in remote areas should be enhanced so that minority groups in the Nu River region can also participate.

#### Recommendation 4: Explore a localized development mode

Almost all the tributaries of the Nu River have been developed by small hydro, causing the closure or diversion of those tributaries, the alteration of the natural river habitat, and negative effects on the local ecological environment. Moreover, the overdevelopment of small hydro, the oversupply of electricity, and the incompleteness of the power grid have forced the local government to seek other outlets for surplus of electricity, such as development of high energy-consuming factories. Fugong County has finished building a 15,000-ton potassium perchlorate project and another 60,000-ton project is being planned in Gongshan County. According to environmentalists, these chemical projects are the results of disorderly hydro development in Southwestern China. Many of the owners or managers of these projects are also shareholders in the hydro stations. Those investors have overdeveloped the Nu River but are still making environmentally disastrous mistakes by introducing high-energy consuming and polluting mining projects. The need for a large dam on the Nu River must be scientifically evaluated on the basis of nation-wide demand.

The agricultural economy in the Nu River region has also greatly damaged the local environment. Large-scale cash crop plantations, such as tobacco and tropical fruits, occupy the river valley south of Liuku, and have ruined native habitats. The tsao-ko fruit grown in Gongshan are also beginning to damage undergrowth vegetation. Large-scale cash crops are ecologically and environmentally destructive.

In recent years, eco-tourism has been introduced to the Nu River region. Tourism infrastructure including hotels, restaurants, guest houses and shops, is rapidly emerging. 2<sup>nd</sup> Red Bull International Kayak competition was held in the Grand Nu River Valley in March 2015. The Nu River was chosen for its strong torrents. Torrents are precious Nu River resources and are worthy of our protection. The government should actively explore an economic development model that is suitable for the Nu River region. We believe that a sustainable approach to development based on the unique natural and cultural resources of the Nu River is possible.





COMPLIMENTARY