Using Basin Rights Approach to Calculate Laos' Water Rights relevant to Dam Building

Beng Hydropower is currently undergoing a consultation process among the four MRC member countries. Now, it is opened for all interested stakeholders to engage in the consultation process. I am happy to have this opportunity to submit my idea about the dam building in mainstream Mekong within Laos's boundary.

MRC has initiate 3 consultations process due to Lao's hydropower station plan on Mekong. It is foreseeable that MRC would call other several dam building project consultation process because of Lao's mainstream hydropower station plan and operation. Since other three notified countries do not have the right to veto or oppose the project and it give no mandatory for the Member Countries to reach a conclusion on the prior consultation for a proposed project, the process would hardly give any substantial influence to the infrastructure in Mekong River. This proposal aims to provide some brief idea about whether Lao has right to use the water and what is the amount of that quota. It would give some basic conscious about country water rights in Mekong.

This concept of water rights under basin rights consideration prioritizes the ecological water requirement of a river; the water requirement for drinking, sanitation, and food production of basin populations. if the total runoff of the river cannot provide the nature rights and human rights, then the state's rights should be zero. And if this is the case, perhaps countries should consider retooling massive infrastructure on the river, or in some cases, abandoning it altogether. After subtracting this river and human rights water quotas, the remaining water quota allows for the state's development, such as massive water transfer projects, industrial utilization, and/or hydropower.

Model

The model has three parts: nature rights for the river's ecosystem; human rights for the basin population, and water rights for each basin country. That is the basic platform for facilitating different stakeholders. Therefore, we use this formula:

B=N+H+W; where
B= Basin rights;
N=Nature rights of river;
H=Human rights of individual water needs;
W=Water rights for basin states.

Then, in order to calculate N, H and W, we assume that:

D=Whole discharge of the basin;
Δx = Country x's contribution rate;
P=the amount of the basin population; then:
N=D∗10% (arid basin);
Or, N=D*20% (semi-arid basin);
Or, N=d*30(humid basin)

Accordingly, human rights to water can be calculated by the following formula:

H=P∗1000 m^3/cap/yr (arid basin);
Or, H=P*1300 m^3/cap/yr (semi-arid basin);
Or, H=P*1700 m^3/cap/yr (humid basin);

The whole basin rights can be seen as the discharge of all of the basin water, so the whole water rights for all the basin states can be calculated as:

W=B-L-H

And each country's water rights should be W∗Δx.

Mekong River

The Mekong River Basin is one of the world's largest river systems. But the water resources utilization rate within individual countries varies dramatically from the highest (Thailand; 32.1%) to lowest

(Cambodia; 0.1%). This rate reflects the huge differential among the Mekong countries in terms of development.

Now we use Basin Rights approach to calculate the water rights of each basin country. Because the Mekong River Basin is located in a humid area, 30% of the total annual discharge is reserved for nature rights, equivalent to 145.2 km^3. This quota should be reserved in advance. According to each country's population, we entrust each country's human rights to water respectively. The sum is 140.9 km^3. Then the water rights for all six basin countries to negotiate over is 191.71 km^3. Using this number, we can calculate each basin state's water rights respectively by multiplying 191.71 with their contribution rate.

The above table lists the basin rights of the entire Mekong Basin as yearly discharge (km^3). The water quota for each basin country means each country has the rights to use the water amount in each year for its people and should not be prevented by other basin states.

Table 5 Basin rights calculation and water quota in Mekong River Basin

Country	Area (km²)	Discharge (km³/yr))	Population	HR= Pop*1700 m³/yr	NR=Water Ecological Requirements	WR=Water Rights (km³)	WQ (WHR+WR)
China	171,363	90(18.60%)	8,810,800	14.98	484*30%	35.66	50.64
Myanmar	27,581	10(2.07%)	1,000,050	1.70		3.36	5.06
Laos, People's Democratic Republic of	197,254	176(36.36%)	8,639,810	14.69		71.89	
Thailand	193,457	78(16.12%)	35,711,700	60.71		30.90	91.61
Cambodia	157,831	97(20.04%)	16,793,300	28.55		38.42	66.97
Vietnam	37,986	33(6.82%)	15,564,900	26.46		13.07	39.53
SUM	785,471	484	86,520,560	147.09	145.2	191.71	

We can use this approach to assess whether Lao has use the water beyond its water rights. And deduce that if her still has the rights to build infrastructure in the future without infringe other countries' water rights.

Since the data are improving and updating from time to time and not officially recognized by basin states, all the results calculated here are rough .For population and and climate type, we use TFDD spatial database 2016; for basin and country discharge, we use TFDD 2009.

- See more at: http://capacity4dev.ec.europa.eu/hhlawaid/minisite/brir-basin-rights-international-rivers-global-276#sthash.byISrndx.dpuf