

**Bac Giang Department of Agriculture and Rural Development
Irrigation Management Company of Bac Giang**

REPORT

**WATER RIGHTS AND WATER ALLOCATION IN IRRIGATION SCHEME OF CAU
RIVER – BAC GIANG**

I. GENERAL

The Thac Huong irrigation scheme was planned, investigated and designed by French in the end of 19th century and early 20th . the scheme was constructed in 1922 and put into operation in 1936.

Location of the scheme:

North: adjacent to Yen The District
North West: adjacent to Thai Nguyen province
West: adjacent to Hanoi
South: adjacent to Bac Ninh Province
East: adjacent to Bac Giang City and Yen Dung District (in Bac Giang province).

The scheme is limited by left bank of Cau river and right bank of Thuong river. The total natural area of the scheme is 57.325ha.

Main tasks of the scheme

- Supply water for 28,500ha of cultivation land of 4 districts, namely Phu Binh (Thai Nguyen province), Viet Yen, Tan Yen, Hiep Hoa (Bac Giang), and other uses of domestic supply and economic sectors.
- Navigation: iron ore and timber products are transported from Thai Nguyen to Hai Phong in the channel and rice and salt are conveyed from Hai Phong to Thai Nguyen.

Components of the scheme:

1. Gravity irrigation:

- Thac Huong dam crossing Cau river is 100m long and 6.5 high. This is a concrete dam with a crest level of 21.13m.
- Da Gan weir as a barrier across Trai Cau canal. This weir is 36m long, 6.5m high and made of concrete.

These two dams can discharge of highest flow of 1,595m³/s.

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- 10 intakes in Da Gan weir have dimension of 1.3x2.3 and design discharge through intake is 25m³/s.
- About 52.3km of main canal have bottom width of 10-12m.
- 21.5km of floating canal have bottom width of 4.5-6m.
- 11 secondary canals have total length of 205km
- 652km of tertiary canals
- 1143km on-farm canal

On-canal structures:

- 12 boat lock
- 82 bridges
- 52 spillways
- 299 submerged sluices and siphons
- 60 regulators
- 972 intakes having dimensions of θ 20- θ 80
- Since its first operation, the energy dissipation tank of Thac Huong dam have been seriously eroded for 5 times in 1929, 1943,1948, 1964 and 1973.
- During French war, the sections of this dam were exploded and restored in 1955.
- The last rehabilitation of this dam was in 2000. the work was funded by ADB under ADB2 project. At present , the dam yard is largely damaged.
- Irrigation canals and on-canal structures are seriously degraded: a lot of sedimentations, eroded canal bank. The far reaches of the scheme receive almost no water as dead canals. This is why there is water shortage in the scheme.

2. Pumped irrigation

- Since 1960, due to water shortage, 18 pumping stations have been built along Cau river, Thuong river and Da canal to drain for water logging area and irrigate part of far reaches of the gravity scheme. There area 215 pumps with ranging capacities from 960-2300m³/s. the design capacity of these pumps can irrigate 6744 ha and drain 8610 ha.
- The IMC also manages a reservoir in Yen The district with a storage capacity of 6.4 million m³ which will meet part of irrigation water demand of tan yen district.

II. OPERATION AND MANAGEMENT OF THE SCHEME

1. Water rights

Thac Huong irrigation scheme gets water from 4 sources:

- a. Thac Huong source: this source of water is from upstream of Cau river basin in Thai Nguyen and Bac Kan provinces. As designed by French, the basic flow in dry season

to Thac Huong dam is 12m³/s. so far, this low flow is very small which was down to 4.7m³/s in March 1993.

Reasons for this reduced flow:

- Exhausted watershed
 - Since 1960 up to now, a lot of small reservoirs have been constructed and prevent water from flowing downstream.
 - Thai Nguyen industrial zone consumes a large part of this discharge.
- b. Water from Cau and Thuong rivers and pumped return flows from local canal
- c. Water from Da Ong reservoir in Yen The district
- d. Water supplied from Coc reservoir annually in dry season

2. Water allocation

- In dry season, there is water shortage in the scheme, so the water allocation to 28.500ha and domestic supply for more than 800.000 people are a very difficult task.
 - In winter-spring crop, there are there polders to be irrigated by the scheme, depending on elevation.:
- + Polder I: upstream of Lu Yen revetment will irrigate a cultivation area of 100ha in Phu Binh district.
- + Polder II: downstream of Lu Yen revetment up to Ben Thon (along main canal) will irrigate a cultivation area of 14,000ha in Phu Binh, tan yen districts and 3 communes of Viet Yen district.
- + Polder III: flow in Troi canal to irrigate a cultivation area of 14,400ha in Hiep Hoa and Viet Yen districts.
- Once the basic flow to Thac Huong dam is more than 10m³/s, entire scheme will be irrigated at the same time; and less than 10m³/s will be supplied to different polders in rotation way. The irrigation schedule is: one Day for polder I, and 6 Days for each of polder II and III.
 - A basic flow of 6m³/s will be added to water source from Coc reservoir. Da Ong reservoir will be opened to supply part of water in pumping stations along Cau and Thuong rivers and Da Mai canal to irrigate far reaches of the scheme.

3. Outcomes

Although there is a water shortage in Thac Huong irrigation scheme and structures are deteriorated, thanks to different supplemental sources of water, all the cultivation areas in the scheme are fully irrigated. However, the productivity of about 8000ha of late crops in the far reaches of the scheme is not high.

4. IMC organization

Since its formation, the company has had different names, say, Cau Irrigation Management board, then Cau River Irrigation Company and Irrigation Management Enterprise. Since 1998 up to now, according to Circular No.06 of Ministry of Agriculture

and Rural Development, the existing name is Cau River Irrigation Management Company (Cau IMC).

The company is organized as an inter-district company.

Personnel

Total Personnel: 323 people (251 male and 72 female)

Director board: 3 people (1 director and 2 deputy directors)

- + Administrative and personnel department
- + Water resources and structures management department
- + Accounting department
- + Planning and technical department
- + Irrigation enterprise of Phu Binh district
- + Irrigation enterprise of Tan Yen district
- + Irrigation enterprise of Hiep Hoa district
- + Irrigation enterprise of Viet Yen district

Under these enterprises are irrigation groups and pumping station groups.

Business enterprise is specialized in investigation and design of hydraulic structures, roads and civil works in group C and outside Bac Giang province.

Education:

Water resources engineer:	33
Economist:	5
Water resources technicians:	19
Accountants:	18
Pump operators:	125
Irrigation workers:	92
Other workers:	31

5. Difficulties and challenges

- There is water shortage in the scheme from January to May annually
- The scheme has been seriously degraded and no fund for rehabilitation is available
- There is imbalance in financial operation. The annual revenue can not cover electricity fee, water fee (buy water from Coc reservoir) and maintenance cost.
- Farmers only sign contracts for part of their cultivation land (not all) which are irrigated and drained by the scheme. Especially, during winter crop, about 17,500 ha are actually irrigated but only 3,500ha are contracted to the company.
- Violations to canal system, especially the protection corridor of drainage and irrigation canals.

III. RECOMMENDATIONS

- Many issued policies for the company have not been fulfilled. E.g. para 1- art 7 in Decree 56 put “if revenue of the company can not cover legal expenses, the government will subsidize the deficits to ensure satisfactory benefits of government officials and labors”. And “the company will be subsidized by the government to repair damaged structures or to compensate for the natural disaster etc...” as in art 11 and 13 in Decree on exploitation and protection of irrigation works.
- The water fee for the irrigated winter rice area of Phu Binh district in Thai Nguyen province can not be collected for the province has subsidized. This deficit should be compensated to the company.
- For water users, there should be sanctions imposed on water user households who do not contract for the area to be irrigated, or for smaller area or fail to pay in due time and with due amount.
- There is a shortage of 30 million m³ of water during winter-spring crop. However, only 15-20 million m³ of water are bought from Thai Nguyen IMC. This is because the water fee collected can not cover the payment. It is recommended that the government will subsidize this cost.