

Muang Fai Communities in Northern Thailand: People's Experiences and Wisdom in Irrigation Management

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Since People's or Muang Fai Irrigation Systems have been important to the life of "Muang Fai Communities" in Northern Thailand or Lanna areas for longer than 700 years, water users or farmers should maintain their experiences and wisdom in irrigation system management. At the same time, they should also try to use their potential or expertise to understand problems and then develop and improve their practices to finally achieve the most efficient water management. This will help them to become more efficient in intensively practicing agro-business and using natural resources and the environment wisely throughout the year in order to upgrade their socio-economic status.

Key words: Lanna Thai people, Muang Fai irrigation system, Muang Fai Communities, Muang Fai Agreement, Muang Fai Committees, Huana Muang Fai Characteristics, Water Allocation, Water Fee Collection, Labor Participation

As is well known, Thai people from the past until the present time have lived in the river basins. And agriculture, rice growing or rice monopoly culture particularly, has been their major means of income and provision for a long time. Historical records confirmed that the northern Thai or the "Lanna Thai" people, who also live in the basin areas of many major rivers (ping — wang — yom - nan) originating from the high mountains passing through, have learned and practiced "Muang Fai" irrigation system management for agriculture for longer than 700 years. This is before Phya Mangrai, king of "Lanna Thai" kingdom (B.E. 1262–1317) founded its capital "Chiang Mai" and issued the irrigation law known as "Mangrai Sart" or "Winitchai Mangrai"¹⁾ in the year of B.E. 1839 (A.D.1296). There are also documents of ancient Lanna Thai and other records of Chiang Mai stating that the *muang fai* irrigation had long existed in Lanna Thai kingdom during B.E.1100–1200 (A.D. 557–657) or about 1,348–1,448 years ago (Fig. 1 and Fig. 2).

Water user members of *Muang Fai* system help

each other constructing weirs or diversion dams to block the waterway in the upper part and digging irrigation canal, known among the northerners as "lam -muang" to direct the water to the lower plains. This results in the *muang fai* system community through the formation of an organization of administrators and managers in charge of systematic water usage for cultivation. The *muang fai* or weir system helps ease the administration and develop the agricultural economy. *Muang Fai's* system, then make it's advantageous for the Lanna

¹⁾ 7 versions of the Mangrai Sart law code:

• The 1st version or the oldest version of Mangrai sart, is believed to be the version discovered by Lanna-Siho-Bhikkhu who found it at Wat Saohai, amphoe Saohai, Changwat Saraburi. The language and the characters used belongs to that of the Thai-Yuan inscribed on the palm leaves totaling 48 pages on both sides of each leaf except for the last leaf on which only one side was written.

Prasert Na Nagara: Mangrai Sart: rewritten into the present-time language from Wat Saohai version B.E.2342 (A.D.1799). Printed on the occasion of the Royal Funeral of Luang Hotrakityanupat, B.E.2514 (A.D.1971)



Fig. 1. The Lanna Thai Kingdom.



Fig. 2. Phya Mangrai and Muang Fai Irrigation.

Thai society when compared to hydraulic societies in other regions of the country.

Examples of Sanya Muang Fai During Mangrai Dynasty B.E.1839–2101 (A.D.1296–1558)

*“When a weir is constructed, it is necessary to have law and regulations under which the management will be effective. Because of this reason, Mangrai Sart or Phya Mangrai’s Laws include the regulations on the matter in great details. No matter how good the irrigation is, confusion and dispute can rise if it lacks laws and regulation to control.”*²⁾ Those laws and regulations are now known as “Sanya Muang Fai” or *muang fai* agreement. This agreement has been developed and adjusted to use in the People’s Irrigation System in Lanna areas until now.

“Section 1: There should be alternation of subjects

doing royal services for 10 days, helping the construction of weir and working in the crop fields for another period of 10 days This will be justifiable and go along with old tradition.” and

*“Besides, when a king rules the country, let him arrange for subjects to serve the throne some and to build the cities, weir and work in the fields some. This will bring happiness and prevent starvation.”*³⁾

*“Whoever destroyed the spirit house near the weir offends the spirits and can cause destruction of weir. He has to rebuild the spirit house and offer proper sacrifice, and then he has to repair the weir.”*⁴⁾

“Section 1: When one of the two farmers owning rice plots next to one another refuses to help his neighbor irrigate the water into the rice plots, and instead, he steals the water from his neighbor. In such case if he is killed by a neighbor, it is justified. If the neighbor has not killed him, the neighbor can

• The 2nd version belongs to Mr.Kraisri Nimmanhemindra who copied it from the original of The French Consulate in Chiang Mai named Notton (Camel Notton) in B.E.2482 (A.D.1939) containing more information than the first one.

• The 3rd version was found at Wat Chiangman in Chiang Mai. It was rewritten and contains many parts that were rearranged into different orders from the first one. (Chiang Mai Cultural Center, Chiang Mai Teachers’ College, B.E. 2527 or A.D. 1984)

• The 4th version has not been brought into this writer’s view, but is kept at Chiang Mai University. This version is written with the Lanna Thai characters or the Thai Yuan character.

• The 5th version belongs to Wat Moen Ngern Kong, amphoe Muang, changwat Chiang Mai. It was transcribed and published by the Department of Socio-Anthropology, Faculty of Social Sciences, Chiang Mai University in B.E.2518 (A.D. 1975) and was reprinted the second time by the Social Research Institute, Chiang Mai University in B.E.2525 (A.D.1982).

• The 6th version belongs to Wat Chaisathan, amphoe Saraphi, Chiang Mai and was published by the Chiang Mai Cultural Center, Chiang Mai Teachers’ College, B.E.2527 (A.D.1984).

• The 7th version “Mangrai Sart” Wat Changkham, amphoe Muang, changwat Nan. Transcribed by Aroonrut Wichienkeeo. Printed by Department of Anthropology, Research School of Pacific Studies, The Australian National University, Australia, 1984.

²⁾ Kraisri Nimmanhemindra “Mangrai’s Irrigation Laws”, *Social Sciences Review*, Vol. 3, No.1, June, 1965 p’ 11

³⁾ 5th version: Wat Moen Ngern Kong, p.3

⁴⁾ 1st version: Wat Saohai, p.97; and 2nd version: Notton, p. 47

request a fine of 1,100,000 bia⁵⁾” (Notton, p. 41)⁶⁾, and Wat Chaisathan version, p. 19, recorded 11,000 bia)

“Section 1: If any ruler or anyone, who cultivates rice paddy in rainfed or irrigated field, fails either from lack of experience and insight or from negligence to make use of some lands, but claims that the crops do not give good yield and requests for rental reduction, let him be granted reduction for 3 years. However, if after that period of grace he still claims the same, do not consent, but instead take away from him the right to operate the land.”⁷⁾

“When one liab nam (one weir committee) quarreled with water user who destroyed irrigation canal for stealing water and was killed on his duty, the water user or the killer must be fined 1,000,000 bia. But, if the water stealer was hit and died by liab nam, it was considered no wrong.”⁸⁾

Sanya Mang Fai

Sanya mang fai nowadays are the laws and regulations drafted under consent and agreement of all member of both the irrigation administrators such as *huana muang fai* (*kae fai* or *kae muang*), *rong huana muang fai* (deputy chair, there was one), *phuchuai huana muang fai* (assistant, if there was one) and *lam nam* (water messenger) and the water users. The purpose of this drafting is to control water usage in their irrigation area.

The main contents of *Sanya Muang Fai* found during a period of approximately 50 years has not been much different from that *Abha*⁹⁾ has compiled (Vanpen Surarerks, 1986). The contents are as follows:

- Appointed and named the persons who are *huana muang-fai*, *phuchuai* and *lam nam*.
- Promised to obey the *huana muang-fai* in all matters.

⁵⁾ 1 ngoen = 1,000 bia. The rate derives from “Samuttarat” (folk laws) transcribed by Aroonrut Wichienkeo, Chiang Mai Teachers’ College, 1981. (From the statement at that time 10 ngoen equaled 10,000 bia) p. 14

⁶⁾ 1st version: Wat Saohai, p. 83

⁷⁾ 1st version: Wat Saohai, p. 107

⁸⁾ Mangrai Sart A-wahan 25, Wat Nantharam, p. 12

⁹⁾ Abha Sirivong Na Ayuthaya, 1979. *A Comparative Study of Traditional Irrigation Systems in Two Communities of Northern Thailand*, Chulalongkorn University Social Research Institute

- Set the annual work calendar, June to mid-November (only in the rainy season).
- Set to work on dredging and repairing the system.
- Set the exemptions for those who are ill and unable to work.
- Set the rate of fines for those who did not work as scheduled and for *huana* and *lam nam* who did not carry out their duties.
- Set the rate of fines for those who steal water or cause damage to the weir.
- Set the rate of fines for each piece of equipment that water users fail to bring to maintain system such as for dredging canals.
- Set the rate of fines for being absent from meetings.
- Established the method for dredging the canal from the upper weir to the lower weirs.
- Some systems set fines for those who did not bring food on workdays.

The Weir Maintenance

The fixed time for weir repairing is around June which is the time after the peasants have finished dredging all the canal systems (*main canal and lateral canals or ditches*). (Fig. 3, Fig. 4 and Fig. 5)

The period for weir repairing ranges from 1 to 10 days. The year in which the weir has suffered major damages, there may be many sessions of weir repairing or there may be one session 15 days or longer.

The dredging session may be only once a year



Fig. 3. Fai Mae Chaem with Old and New Spirit House.

(March or June) or twice a year in some systems (the first session will be in June and the second one in December).

The Example of Fai Mae Sao

The equipment required for weir repairing (wood) is determined by the area of 1 rai (0.16 ha).

1. Three sizes of lak fai Hardwood
 - 2 sok (1 m) amount 20 sticks
 - 1.5 sok (0.75 m) amount 20 sticks
 - 1 sok (0.5 m) amount 20 sticks



Fig. 4. Weir Maintenance.

2. Mai Khoa
 - 3 wa (6 m) amount 1 stick
3. Ta-Khe or Charakhe
 - amount 2 bundles

Fai Mae Sao at the time before it was included in the National Irrigation System, was a small irrigation project covering only 1,484 rai and it had ample water supply so there was no need to use the dividing devices of tang and pan khiang* as in other systems. The weir was also in good condition so there was no need to require lak fai contribution some years. The rules concerning the requirement of equipment for maintenance were stated in general as can be seen above. Weir repairing was scheduled for once a year in June and it took only one day to do the work.

* "thang" or tang was a passage way for water to enter the fields from a dividing structure called "khiang" or "tae" which was located at the mouth of some laterals or sublaterals. This also refers to the apportioning of labor for dredging the canals.

"thang" or "taang" termed by the National Irrigation System "thang rabai nam khao plaeng na" or "farm turn-out"

"khiang" means water dividing structure in the People's Irrigation System.

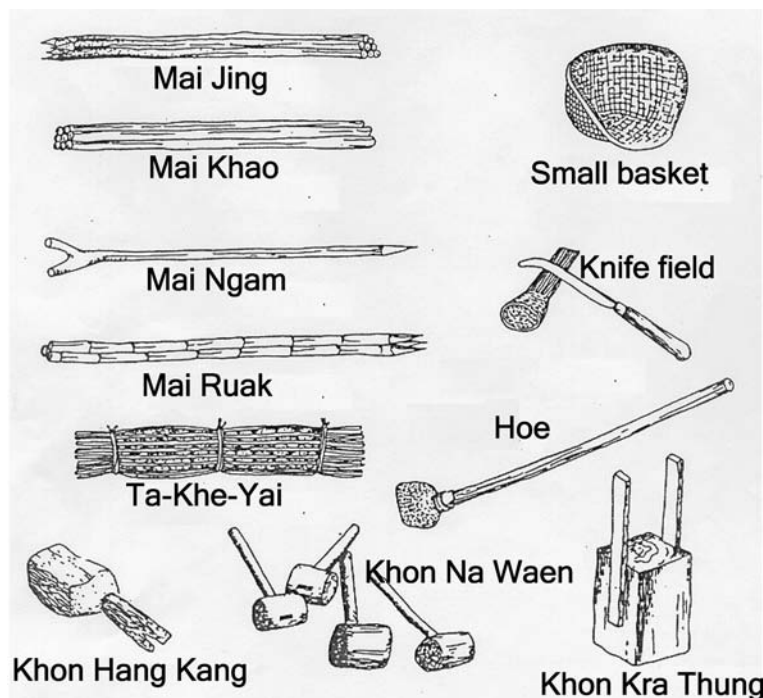


Fig. 5. Equipment for Maintenance of the Weir and Canal-Long Muang Ti Fai.

Nam Yok - Water Exemption as Remuneration for Administrators

Remuneration for administrators is called *nam yok* by the northerners. It means *nam tang* or exempted. As discussed earlier in order to qualify for 1 *tang*, a member has to supply 1 laborer for each 5 or 10 *rai*. So *nam yok* refers to the water (*nam*) for which an exemption (*yok wen*) is granted. There is no need to supply labor, equipment or even make financial contributions.

The Example of *Fai Mae Chaem**

Administrators	Nam yok (rai)		3rd rate 1988- present
	1st rate Before 1978	2nd rate 1978-1987	
Committee Members	60	15	72
1 huana muang fai	35	6	48
2 rong huana	20	20	48
3 phuchuai in village level or kae muang each	20	20	Each of 7 committees 36
4 phuchuai kae muang and lam nam each	60	20	72
Administrators and other positions	20	10	24
5 kamnan	20	10	Each of 11 watchmen at farm turn-out 16
6 phuyai ban			
7 Other positions to be considered			

**Fai Mae Chaem* still has 2 more cases for water exemption at present, which are as follows: 1. Monasteries' farmlands or cultivated areas, 2. Schools farmlands or cultivated areas

Water Fee Collection

"*kha nam*" or water fee or irrigation fee is a kind of compensation the administrators collect from the water users on different occasions and in various ways according to the agreement made between the administrators and the water user members. Generally the set rate for "*kha nam*" is determined by the amount of cultivated land owned by the farmers, who use the water, the same way as for "*nam yok*" affair. The rate is always calculated by

the *muang fai* agreement based on 1 *rai*. The differences lie in the frequency of collection, which range from 1 *rai* per one growing season (around half a year) to 1 *rai* per year.

From previous studies one may describe the water fee collection in the People's Irrigation System as follows:

- Compensation for Weir Administrator
- Fee for Irrigation Maintenance
- Compensation for persons who look after the weir, and head regulator, or for "nai truat nam" or "liap nam"
- Fee for Rain Praying Ceremonies or for Offering to the Spirit of the Weir

The Example of *Fai Phya Kham*

In the first 15-20 years when *Phya Kham* was the *huana muang fai* there was no water fee collection. The members would give whatever amount they felt directly to *Phya Kham* in the form of unhusked rice.

But later, around 70 to 75 years ago, they began to collect the fee to give as compensation to the administrators.

"For each one hom or 3 *rai* of cultivated land, one had to give 1 *taang* of unhusked rice or 1.5 *thang* or 15 kilograms per year."

The fee was divided among the administrators namely *huana muang fai* and *phu chuai*. Such practice, however were cancelled along with the cancellation of *nam yok* when *Fai Phya Kham* was constructed into semi-permanent of *hin thing* (stone filled or loose stone weir) type weirs in 1971.

The collection of water fees is still in practice at present in the *Phya Kham* system. The rates vary in different *luk fai* (checks or sub-weirs). In *tambon Yang Noeng* areas of *luk fai Mae Fa Pha*, the water users had to pay compensation to each one of cultivated land at the following rate:

1982-83 • In the rainy season or the main crop growing season 1 *thang* (10 kg) of unhusked rice/rai

• In the dry season or the upland (or field) crop growing season 10 baht cash/rai

• Besides, they also had to pay 25 *stang* per one *rai* (some gave 50 *stang* for the weir and head regulator each year.

1997-present • In the rainy season or the main crop growing season 1 *thang* (10 kg) of unhusked rice/rai

- *In the dry season or the annual crop growing season 100 baht cash/rai*
- *In the irrigated area of Lamyai (longan) garden, the gardeners had to pay either 60 baht/year or 10 baht/tree/year (about 20 trees/rai)*

Labor Participation in the Repairing of the Weir and Clearing and Dredging of the Canals

Labor contribution for repairing the weir and clearing and dredging canals was considered fair and reasonable for all members because it was determined by the amount of water allocation based on the amount of land owned by each member. This is based on the simple logic that those who have a smaller amount of land use less water so they should supply less labor and those who have more land use more water so they should provide more labor on and so forth as indicated in section 16 of the People's Irrigation Act of 1939.

Examples of Labor Participation - *Kan Song Raeng*

1. *Fai Luang Mae Sao*

General Rules: Obligation to supply labor in repairing weir and clearing canals was determined by the area of land owned:

1.1. *Land area:*

0.1-10	rai	contribute	1	laborer
10.01-20	rai	contribute	2	laborers
20.01-30	rai	contribute	3	laborers

1.2. *Land rented from different owners: must be considered separately;*

e.g. 3 separate plots of rented land

1st plots	5	rai	contribute	1	laborer
2nd plots	5	rai	contribute	1	laborer
3rd plots	5	rai	contribute	1	laborer

2. *Fai Ton Kaeo*

Till	Irrigated	contribute	1	laborer*
1983	area 15 rai			
	Irrigated	contribute	2	laborers*
	area 15 rai			
Since	Irrigated	contribute	1	laborer*
1984	area < 10 rai			
	> 10 rai	contribute	2	laborers*

Since 1999 Cancellation of labor (water users) contribution for repairing the weir, it was instead supported by the Mae Rim municipality's budget and labors.

**The laborers must be 17 years or older. Any laborer younger than 17 years will be sent back and the absence of worker is worth a 50 baht fine per day.*

In General, there occurred many changes in the traditional irrigation systems. After the weir of *Fai Mae Chaem* was changed from the former bamboo to be a reinforced concrete since 1988, the labor contribution for repairing the weir was cancelled. Only the labor contribution to clearing and dredging canals was left

Subjects of Punishment and the Rate of Fines in Sanya Muang Fai

Causes of Problems • *Water stealing*

- *Being absent from scheduled work and duties for repairing the weir, and clearing and dredging the canals*

- *Forgetting or failing to bring maintenance equipment of the weir and canal*

- *Other cases mentioned in Sanya Muang Fai*

Fines

1. Case of water stealing

1st time • Persons involved or violators are warned from *huana munag fai* (water headman or head of the People's Irrigation System), *phuyai ban* (head of the village) or *kamnan* (head of the *tambon* or sub-district).

- *huana muang fai* judges the disputes that arise between water users members by warning the two parties

2nd time • Violators pay the fine based on the rate set by the Muang Fai Committee of each system (the rate of fines are usually 50-500 baht per infraction or higher).

3rd time • Violators are judged by the local government officials at the amphoe level. Due to the People's Irrigation Law of B.E. 1939, they may be fined up to but not more than 50 baht per time or be jailed for no more than 10 days per infraction or both (be fined and be jailed) In some irrigation systems only the first two levels or two types of punishment mentioned above are practiced.

2. Absent from the work of dredging and repairing the system

- *Water users who are absent from the work mentioned will be fined due to the agreement of each*

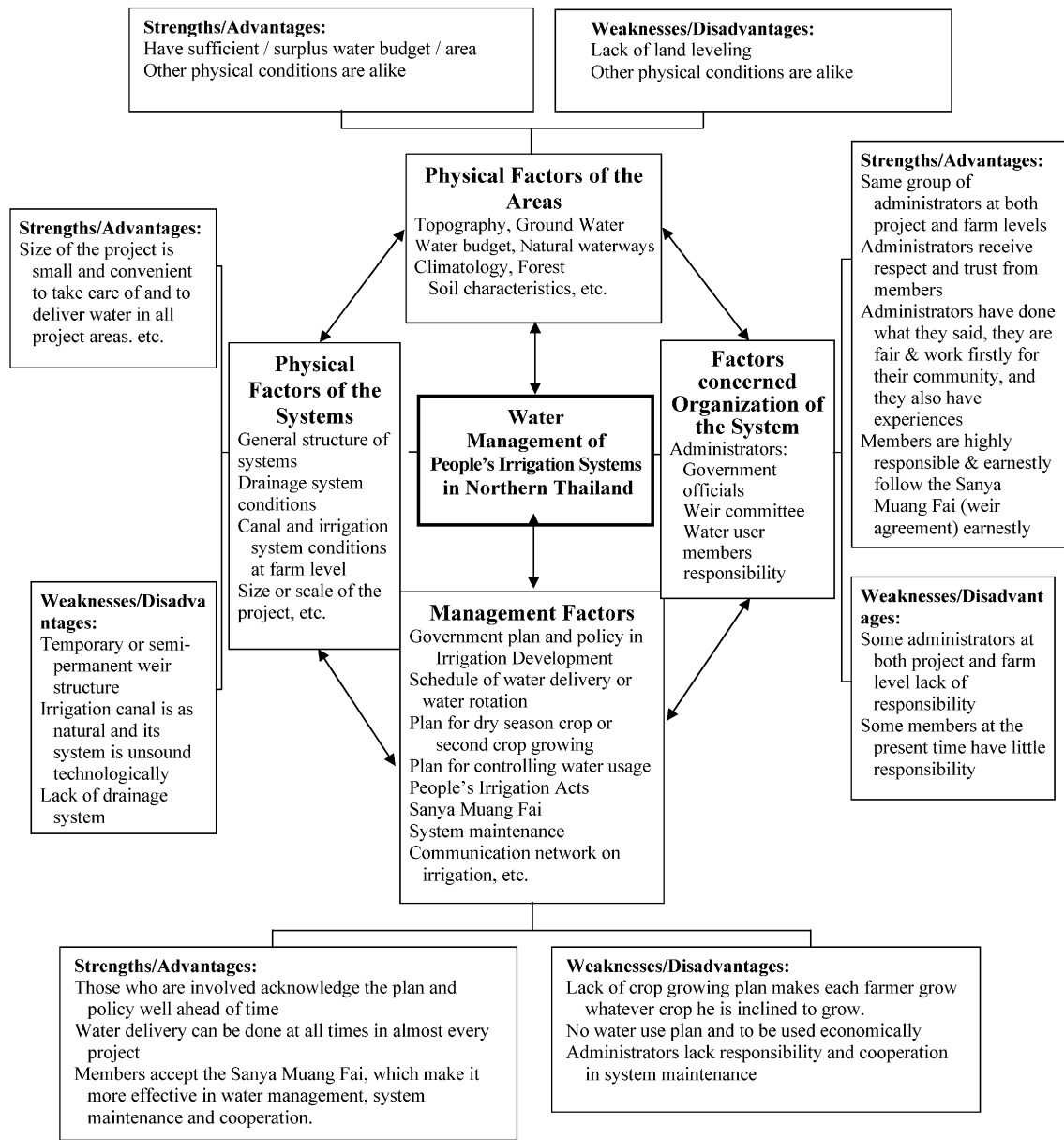


Fig. 6. Strengths and Weaknesses for Water Management of People's Irrigation Systems in Muang Fai Communities, Northern Thailand.

system at different rates (pers./time or pers./day).
 For examples: 10 baht, 15 baht, 50 baht, 150 baht,
 200 baht and 500 baht

Remark: The rate of fines mentioned above can be used in the different cases as follows:

- Start to work very late at 09:00 a.m–10:00 a.m. will be considered the same as being absent from the work

- Depart before huana muang fai or other weir committee inspect their work, or leave the work

earlier than usual time without permission

- Not working as ordered by huana muang fai and trying to escape from one's responsibility on system maintenance

Rules of Punishment and the Rate of Fines

Case of forgetting to bring equipment for maintenance of the weir and canal

- The rate of fines for each piece of equipment that water users fail to bring to maintain the system

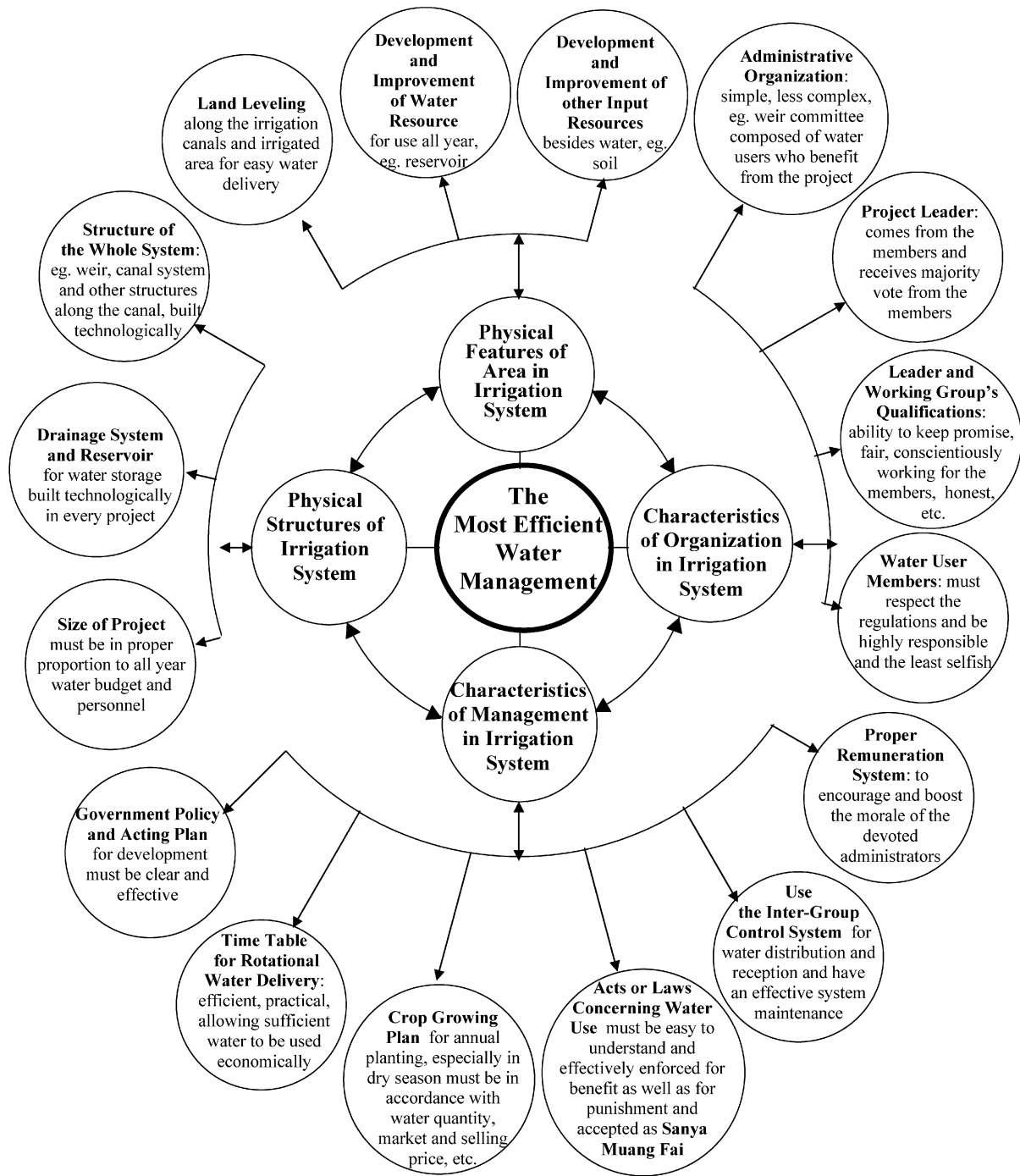


Fig. 7. Model of the Most Efficient Water Management for Agriculture in Muang Fai Communities, Northern Thailand.

is generally 5 bahts

- The rate of fines for forgetting to bring all or some of “lak fai” (weir pillars) as required by huana muangfai is approximately 1–5 baht each
- The rate of fines for forgetting to bring “sa poh”

(a small woven bamboo basket which is used to carry dirt) is approximately 2–10 baht each

Conclusion

The People's Irrigation System through “Sanya

Muang Fai” in which the water users or farmers cooperate to build devices to irrigate their farmlands in river basins of *Lanna* areas known as “*Muang Fai System*,” has been practiced since A.D. 557–657. This *sanya muang fai* has been referred in both People’s Irrigation Act of 1939 and the National or State Acts of 1942 and its amendments in 1980, 1983 etc.

Since Peoples’s Irrigation System is important to the life of “*Muang Fai Communities*” in northern Thailand or *Lanna* areas, water users or farmers should not only maintain their experiences and wisdom in irrigation system management. At the same time, they should also try to make the best use of their potential or expertise, understand problems (Fig. 6), and then develop and improve their practice to, finally, achieve “*the most efficient water*

management” (Fig. 7). This will make them more efficient in doing agri-business intensively throughout the year and upgrading their socio-economic status as well.

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