

TRADITIONAL WATER MANAGEMENT IN BALI (SUBAK)

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PUBLIC WORK SERVICES
PROVINCIAL GOVERNMENT OF BALI

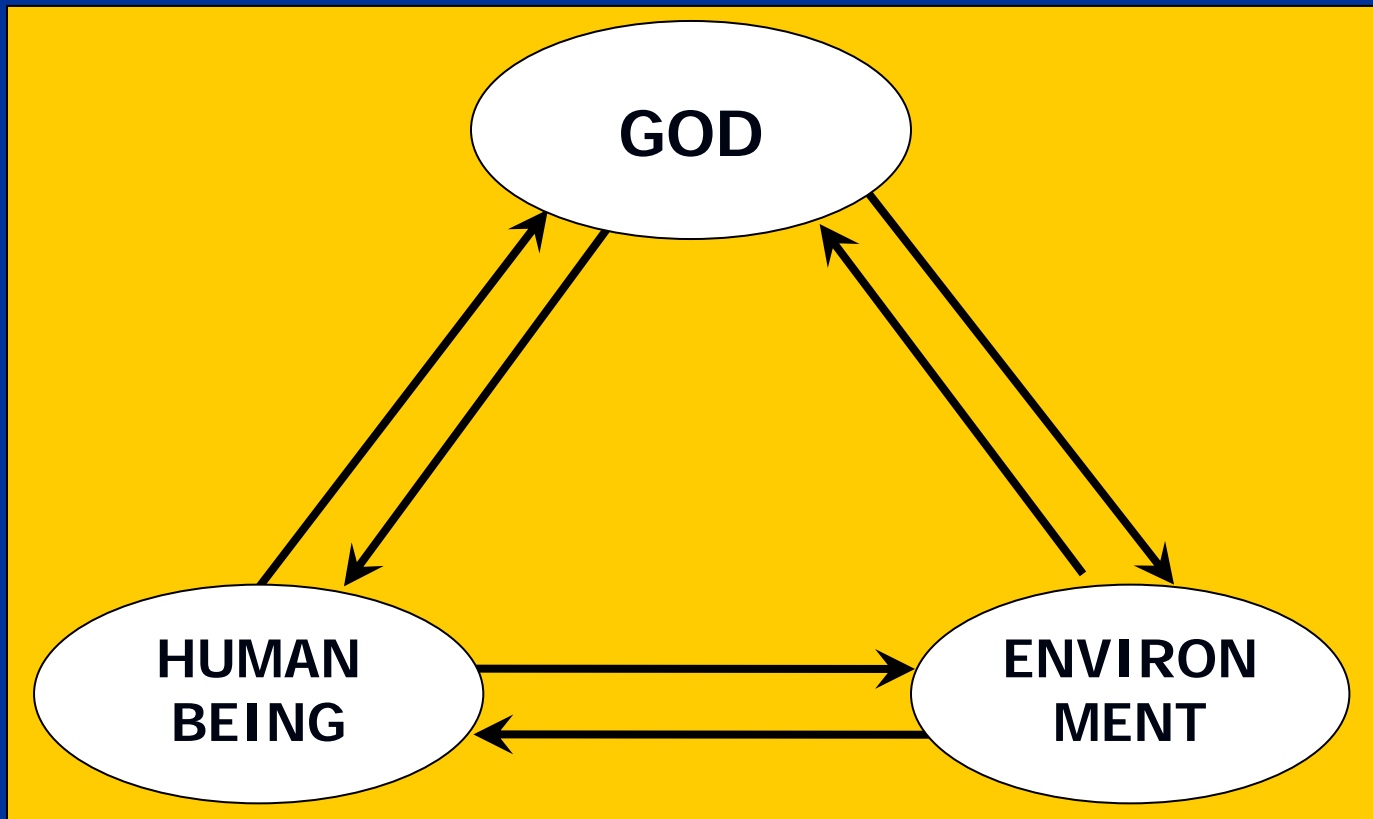
INTRODUCING

Subak is an ancient irrigated-agricultural practice in Bali.

Numbers of *Subak* and Rice Field Area in Bali

Regency/ Kota	Numbers of <i>Subak</i>	Width of Area (Ha) *	Percentage of Width
Jembrana	77	6,733	8.23
Tabanan	220	22,873	27.95
Badung	95	10,334	12.63
Denpasar	41	2,856	3.49
Gianyar	128	14,937	18.26
Bangli	51	2,648	3.24
Klungkung	37	3,932	4.81
Karangasem	221	6,844	8.36
Buleleng	273	10,666	13.04
Total	1,143	81,823	100.00

Subak always maintain an harmonious relationship with the three element : the God, their community, and to the Mother Earth, based on “*Tri Hita Karana*” philosophy which mean “*achieving the happiness, with those three harmonious relationships*”:



Actualization of those expression are in the form of **"Parhyangan"** (pura or religious structure), **"Pawongan"** (organization and its members) and **"Palemahan"** (rice field area), that all regarded as the causes for achieving the happiness :



HISTORY OF SUBAK

There is no certain years stated the *Subak* founding. But some inscription namely **Prasasti Trunyan** (881 M), **Prasasti Sukawana** (882 M), **Prasasti Bebetin** (896 M), **Prasasti Pandak Badung** (1071 M), and **Prasasti Raja Anak Wungsu** (1072 M) stated some terminology on agriculture activities that related to existence of the method of fulfilling water demand for cultivated area.

When Majapahit Kingdom occupy Bali, The King to charge an ***Asedahan*** for coordinating some *Subak* and collecting agricultural tax (***upeti*** or ***tigasana***). The terminology of the *asedahan* is still adopted until now in the name of ***Pasedahan***.



ORGANIZATION

Subak is led by a chairman called ***Kelian Subak*** or ***Pekaseh***. Terminology of the chairman is a little different between one to another regencies. Some times ***Kelian Subak*** mean as chairman of the ***Tempek*** (sub-*Subak*), and some times ***Pekaseh*** is mean as a group of farmer who collecting water from any sources for their planting.

Previously, highest coordinating authority in the *Subak* organization is called ***Sedahan Agung***. He is a government officer.



Extended Subak Structure



MEMBERSHIP

Basically, the *Subak* membership is categorized into :

1. The members who are directly involved in irrigation activities is called ***Sekeha Yeh*** (water user association), also referred to as the *krama pekaseh*.
2. The members who are not directly involved but oblige to pay is called ***Pengampel***
3. The *Subak* members who are not required to work directly and not oblige to pay is called ***Leluputan***. Usually they are religious priests.



PRESENT OPERATION AND MAINTENANCE

A *Subak* irrigation system consist of four major components :

- a. the main structure**
- b. the main canal**
- c. the distribution canals**
- d. the drainage facilities**

Before the construction of weir by government of Indonesia, all the operation and maintenance activities are conducted by the group it self. When the weir being permanent, half of this responsibility take over by government staff. But in a certain conditions, farmers participation through collective working (*gotong-royong*). They share material and money.

WATER RIGHT AND FINANCE SUPPORTING

The division structures are practically broad crests with a width proportional to the number of *Subak* members, or to the related water portions for the irrigation of the rice fields located downstream of the structure.



In case that available water is not sufficient for irrigating the whole area of the *Subak* (i.e. during the dry season), two alternatives could be implemented:

- a. Each Subak member receives an amount of irrigation water proportionally reduced with respect to the reduced available water.
- b. The area to be irrigated is established on the base of annual agreement and crop rotations.
- c. The farmers, who are receiving the water firstly are called “*Ngulu*” ; secondly “*Mawongin*” and finally, “*Ngasep*”

SPIRITUAL PART

As Hindus people and implementing the “*Tri hita karana*” philosophy, *Subak* have spent their spiritual life to impressing the hope and thanks to The Good. The impressions are in form of collective ceremonies as follows: *Mendak Toya* ceremony, *Nangkluk Merana*, *Ngusaba*, and individual ceremony for the beginning of land preparation or *ngendagin*, *mabiukukung*, etc. *Subak* members who are belonged to other religions such as, Moslem, Christian etc.



WOMEN PARTICIPATORY

As a members of farmers family, women participatory are not only found on ritual activity, but also on maintaining facilities and harvesting the yield. In both activity stated above, women participatory seem no significant difference. In certain *Subak*, it is found that one or two of the *krama subak* who directly in charge for all *Subak* activities are women.



ROLE AND THREATEN IN THE MODERN AREA

External Threaten

Externally, *Subak* extremely stress by following matters :

1. Land for agriculture function is now decrease because of acquisition by non-agriculture purpose. At the end of 1993 that achieve 88,551 Ha but the remain in 2003 is 81,823 Ha.
2. Water demand for non-agriculture sectors are increased.
3. Trade-off between wet land agriculture yields to manufacturing products is getting lower.



Internal Threaten

Internally, there are several weakness of *Subak*, are :

1. The land managed by farmers as *Subak* members are limited between 0.24 to 0.40 Ha.
2. Education level and individual financial capacity on operating their farm business are low scale.
3. Limited skill owned by *Subak* members on implementing agriculture technology and water management are particularly limited on previous pattern accepted from their ancient.
4. Farmers motivation to keep standing wet-land agriculture activities are decreased especially in young generation.
5. Low educated for generally farmer limited the adoption of new technology or innovation.

STRENGTHENING AND EMPOWERING FOR FUTURE EXISTENCE

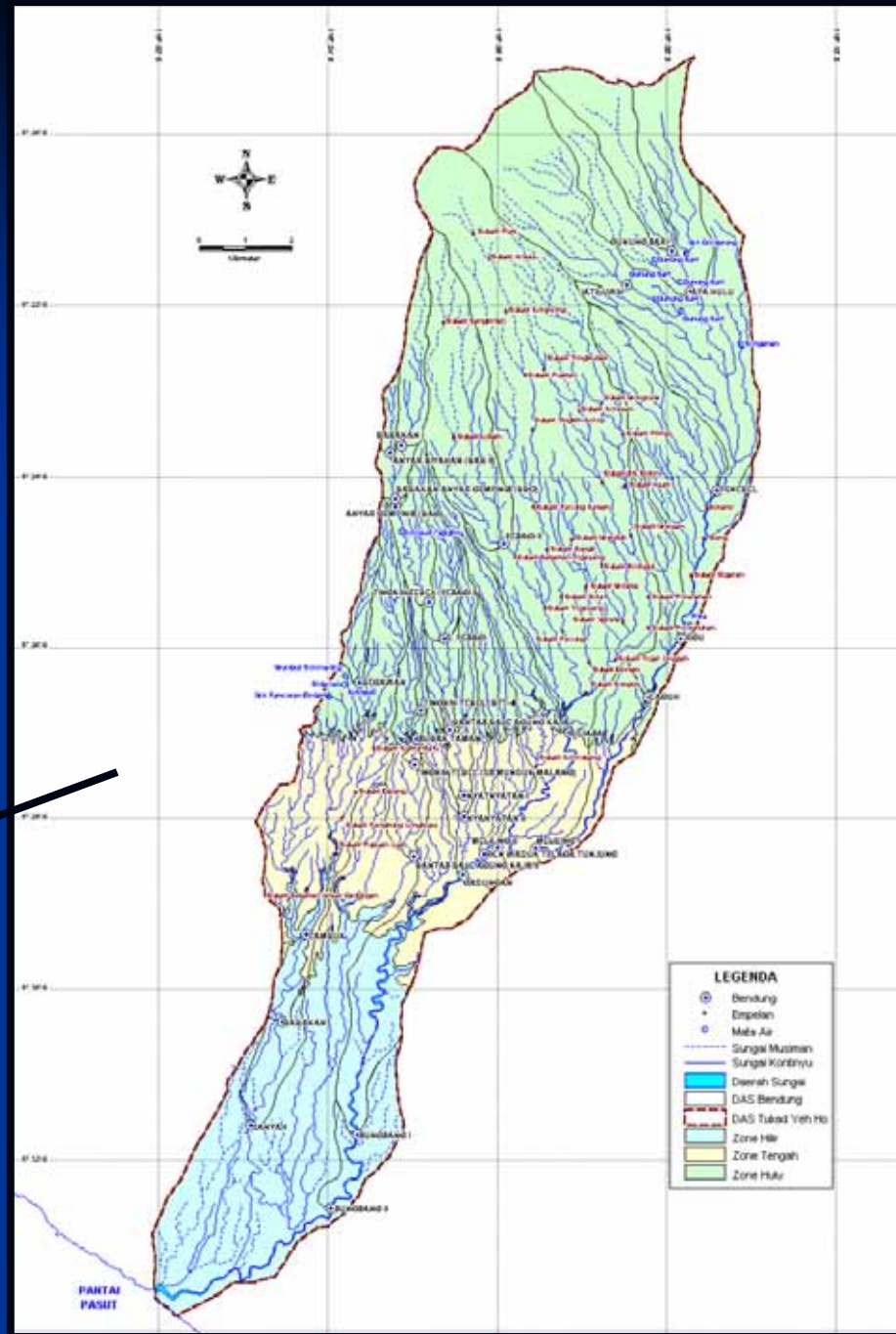
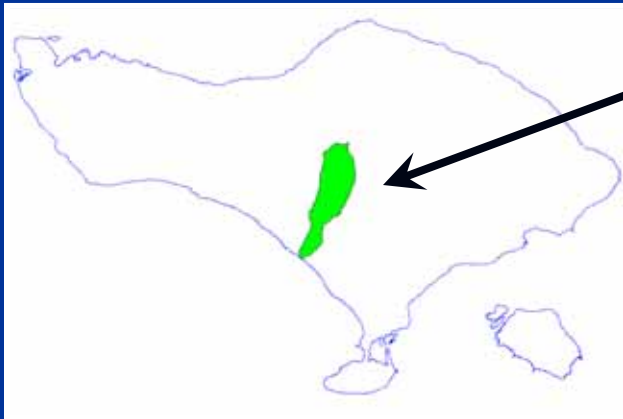
Agriculture is still hoped to run and exist for its several strategic role. For the purpose, several strategic action are proposed :

1. Reinforcement of *subak* bargaining to prevent land resource and access to water resource through “**Subak-subak Gede** (Subak Union) and or **Subak Agung** (Subak Federation) establishment in a whole river basin”.
2. Priority should be put on existing irrigation area to use available water resource as they used firstly. *Subak* as one of Balinese local genus is already recognized by The World, for which The Law no. 7 / 2004 put first priority in equal position with water for drinking on water consumption.
3. Attach *Subak* or farmers delegation on water resource management in river basin level.
4. Allowing **Subak Agung** or **Subak Gede** to manage their own river area which its structure or water uses dominated by agriculture purpose.
5. To set protection toward all agriculture function and irrigation scheme services area through strategic policy on a spatial planning.
6. Guidance and training.

Recently, Government of Bali has start to preparing **WATER RESOURCES MASTER PLAN** with the cooperation with JICA Study Team. The product was hoped to involve the conditions to strengthening and empowering *Subak* position on water management for their own sustainability and overall development



Irrigation System in River Basin in Bali (Tukad Yeh Ho)





THANK YOU