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

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

**Government Staff**

- **SEDAHAN AGUNG** (Regency tax collector)
- **SEDAHAN YEH** (River tax collector)
- **PEKASEH** (Head of Subak)
  - **PENYARIKAN** (Secretary)
  - **JURU RAKSA** (Treasury)
  - **JURU ARAH** (Messager)
  - **KELIAN TEMPEK/BANJAR/MUNDUK** (head of sub group)
  - **KESINOMAN/JURU ARAH/SAYA**
- **KERAMA SUBAK** (members)

- **KELIAN TEMPEK/BANJAR/MUNDUK** (head of sub group)
- **KESINOMAN/JURU ARAH/SAYA**
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 itself. 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.
As a member 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 started to prepare a WATER RESOURCES MASTER PLAN with the cooperation of 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)