



5<sup>th</sup> General Meeting  
**Network of Asian River Basin Organizations**  
Chiang Mai, Thailand • 15–18 May 2013

## Groundwater Management for Agriculture

Ministry of Natural Resources and Environment

Department of Groundwater Resources, Thailand

Mongkhon Somwandee

Assistant Director

Bureau of Groundwater Resources

District-7, Thailand



## Water



- Water is a precious commodity.
- For agriculture it is a necessity.
- With an increase of population and industry as well as the changing climate, water is becoming more scarce in some regions of Thailand.





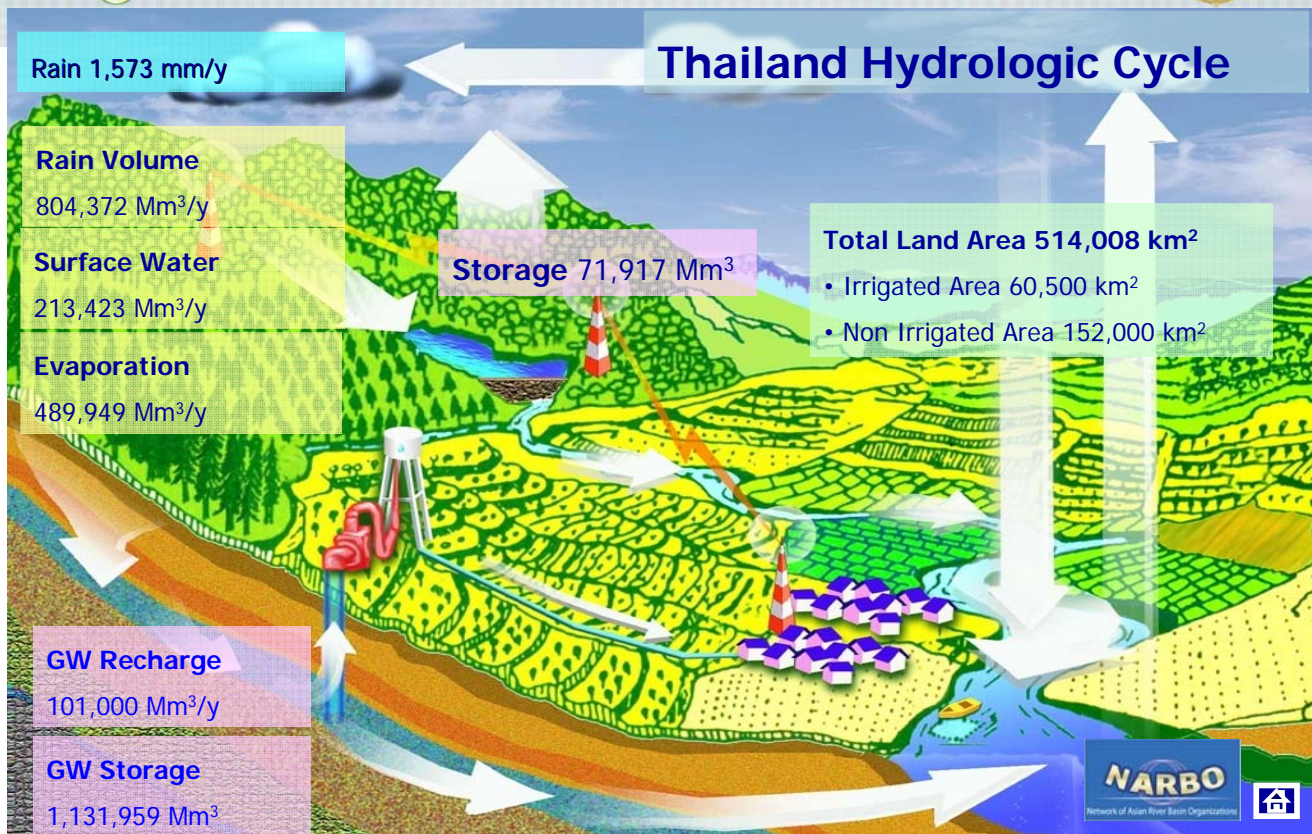
# Water problems

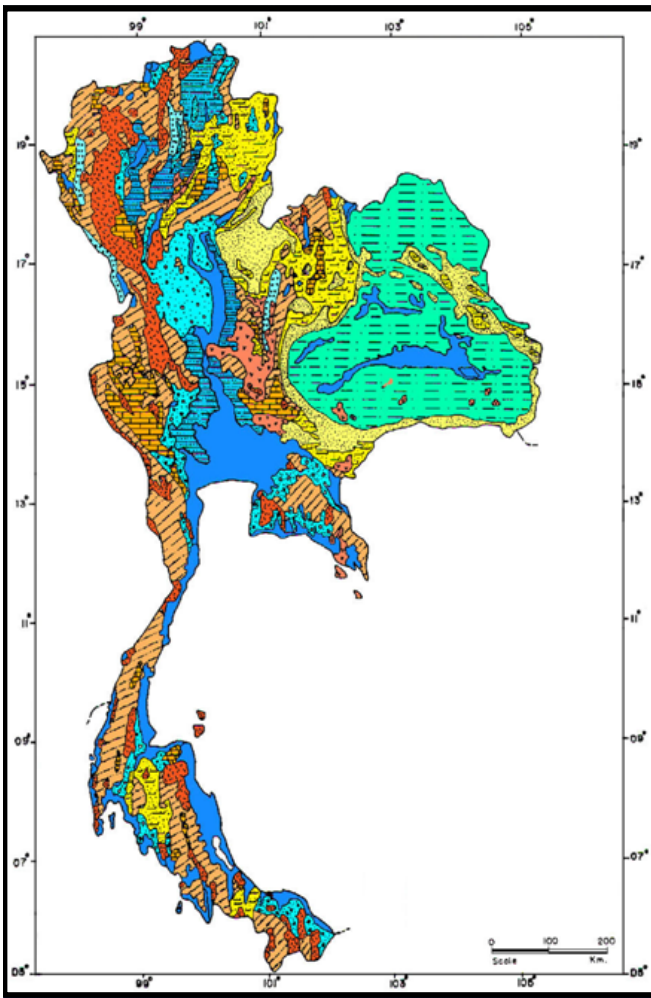


- The Department of Groundwater Resources recognised the importance of underground water resources development for the agricultural industry.
- Research and development were carried out in order to maximise efficiency in periods of droughts and floods.














## Groundwater Resources Situation of Thailand

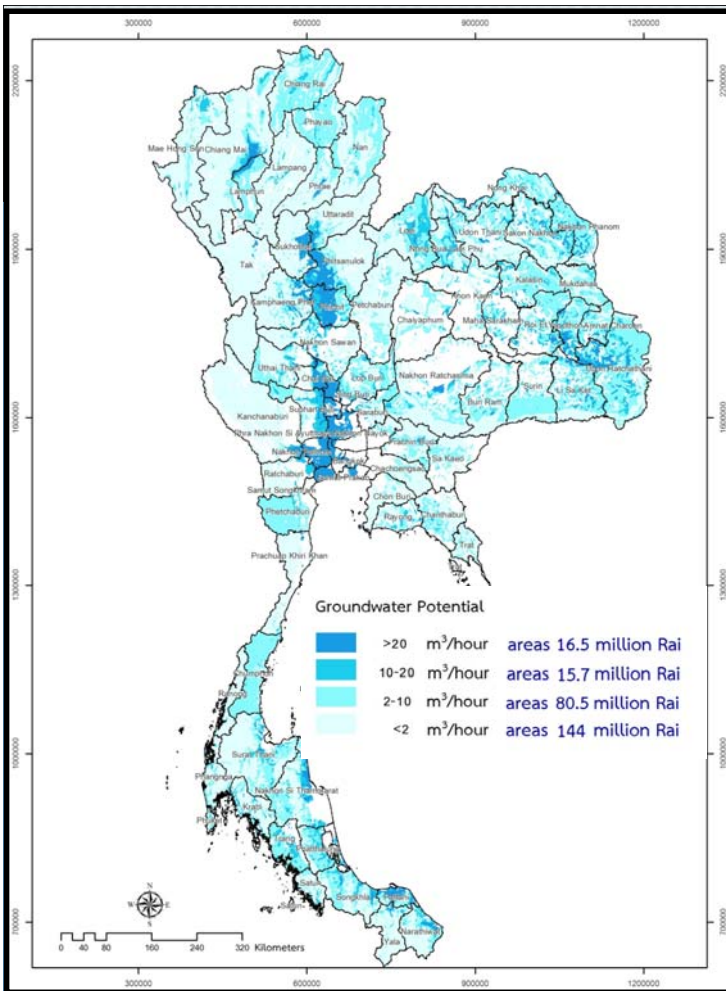




# Hydrogeologic Unit of Thailand



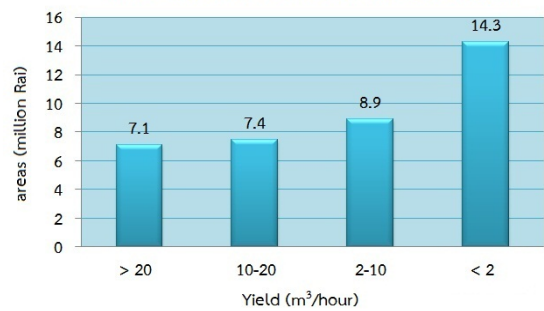
-  Alluvial Aquifer
-  Low Terrace Aquifer
-  High Terrace Aquifer
-  Colluvial Aquifers
-  Upper Khorat Aquifers
-  Middle Khorat Aquifers
-  Lower Khorat Aquifers
-  Carbonate Aquifers
-  Metasediment Aquifers
-  Volcanic Rock Aquifers
-  Igneous Rock Aquifers



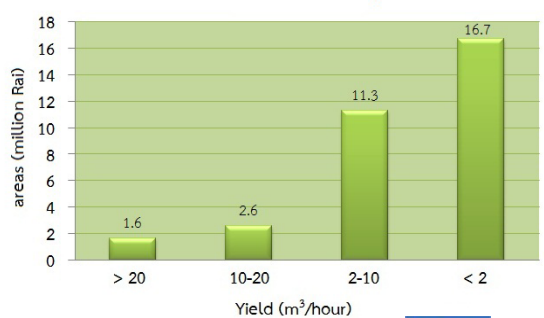
# Groundwater Potential of Thailand



The Central, Eastern and Western Region



The Southern Region





## Conjunctive Use of Groundwater and Surface Water Management for Agriculture in Thailand



Master plan for IWRM / provinces / pilot areas



project formulation



Project implementation Process



Information system for management of groundwater and surface water

Civil participation/ stakeholders



## groundwater for agriculture project



### Why needed ?

- Drought problems occur in all regions of Thailand
- Due to population growth, social and economic expansion, change in land use, and deforestation, the demand for water is escalating rapidly
- Climate change phenomenon has affected Thailand, resulting in droughts and shortages of water for cultivation

Department of Groundwater Resources (DGR) began the development of groundwater for agriculture project in order to study and establish provision of groundwater.

In addition, it has outlined a proper development for each area to maximize the efficiency of groundwater during periods of drought. The aim is to ensure profitability. Local governmental agencies and agriculturist groups are encouraged to partake in the management.





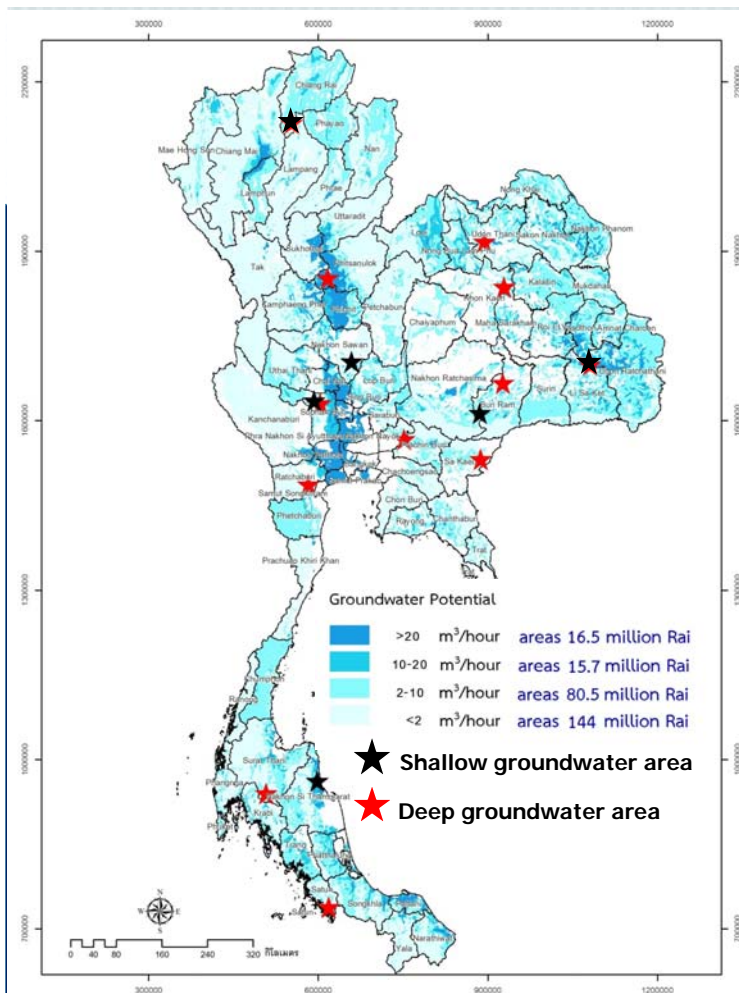
## Objectives of the project

To study and conduct research on suitable provision of groundwater sources for agriculture

To study the usage of groundwater in agriculture in terms of profitability

To study the way in which groundwater is utilized in each place to best suit the type of cultivated crops, ensuring the best yields possible

To create a model that encourages communal participation in the management of groundwater resources



## The project areas

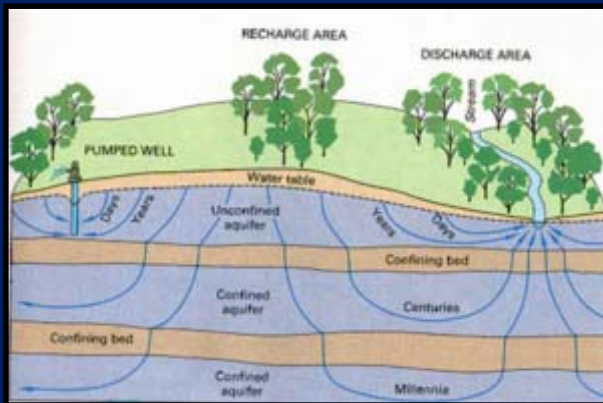




# Project Implementation Process



- Estimate the potential of groundwater



# Project Implementation Process



- Locate drilling position for the well





# Project Implementation Process



Drilling and Well Completion  
(Casing and Slotted placement)



Well Development



Completed well  
(waiting for well construction)



Building groundwater well



Water pump and  
valve system



Groundwater flow out  
from water supply



Water pressure  
measuring device



# Project Implementation Process

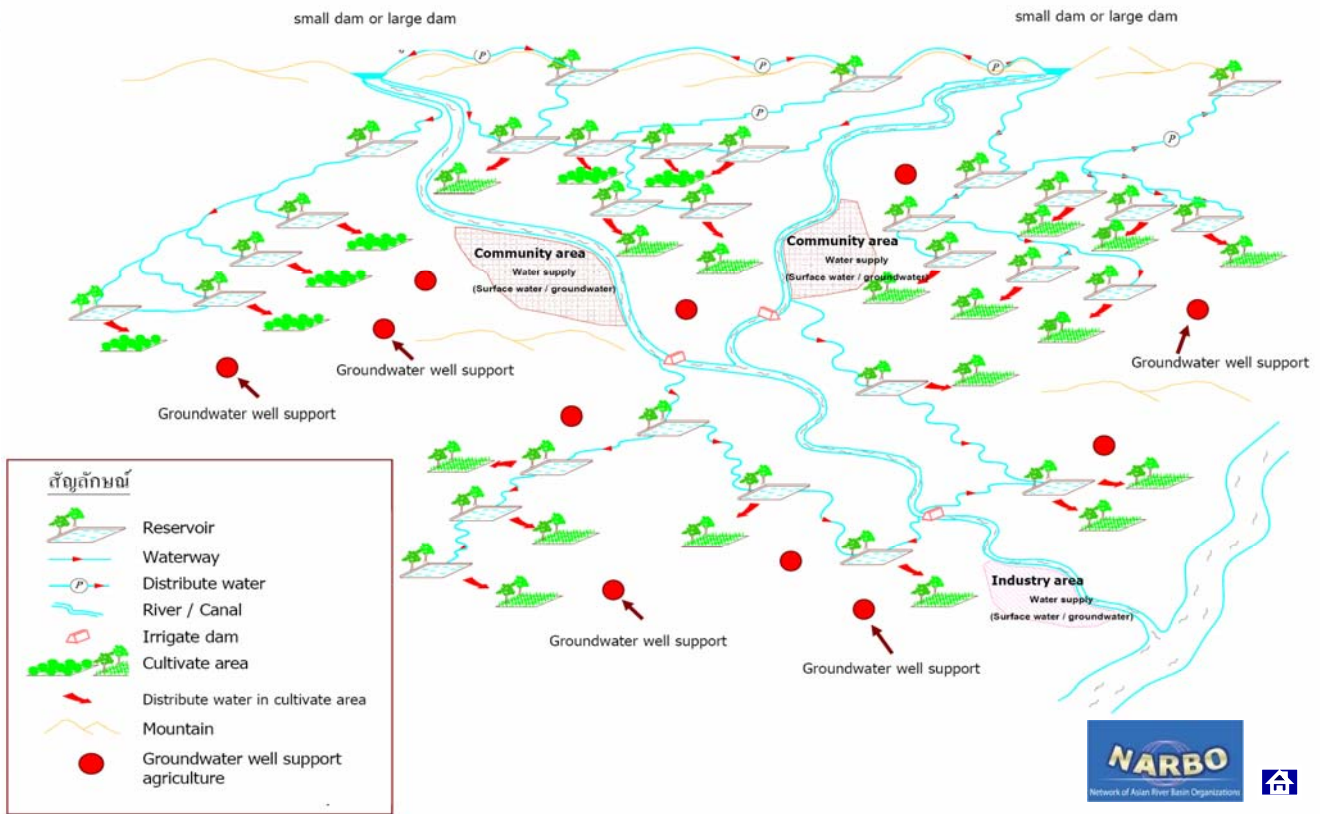


- Water taken from the groundwater and used in agriculture is frequently checked and analysed.





# Conceptual model of integrated conjunctive use of groundwater and surface water in irrigable area



# Information system for management of groundwater and surface water



<http://conjgis.dgr.go.th/dgrconjmis/Default.aspx>

The screenshot shows the web-based GIS interface. The header includes the title 'ระบบสารสนเทศการจัดการน้ำบาดาลร่วมกับน้ำผิวดิน' (Groundwater and Surface Water Management Information System) and 'พื้นที่ภาคตะวันออกเฉียงเหนือ' (Northeastern Region). It features a navigation menu on the left with categories like 'ปริมาณน้ำฝนเฉลี่ย' (Average Rainfall), 'พื้นที่ชลประทาน' (Irrigation Area), and 'ปริมาณน้ำท่า' (Water Yield). The main area displays a map of Thailand with a highlighted region in the northeast. A legend on the right lists various data layers such as 'ขอบเขตจังหวัด อำเภอ ศ.' (Province/County Boundary), 'พื้นที่ชลประทาน' (Irrigation Area), and 'ปริมาณและคุณภาพน้ำบาดาล' (Groundwater Quantity and Quality), with color-coded boxes for different yield and quality ranges. The footer contains contact information for the National Water Research Institute and the NARBO logo.





## Lessons learned from the project



- Stakeholders participation
- For the project to succeed it must have unity between all parties.
  - 1) Government officer
  - 2) Local administration
  - 3) Farmers



## Key for Success



Mutual co-operation and coordination  
between all stakeholders





Ministry of Natural Resources and Environment  
Department of Groundwater Resources  
Thailand



**Thank you  
for  
your attention**

