Alternate Wetting and Drying Irrigation (AWD): a technology for water saving in rice production

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In Asia, about 40% of all fresh water diverted is for rice irrigation

How Much Water do People Use?

	Liters of Water
Daily Drinking Water	2 – 5 Liters of Water
Daily Household Use	20 – 500 Liters of Water
1kg of Rice	3,000 – 5000 Liters of water input to the field

Pressure to produce more food (rice) is getting greater because of ever increasing population

But also:
More people want
- **more industry**
- **more drinking water**
- **more cities**
- **more swimming pools**
- **more….**

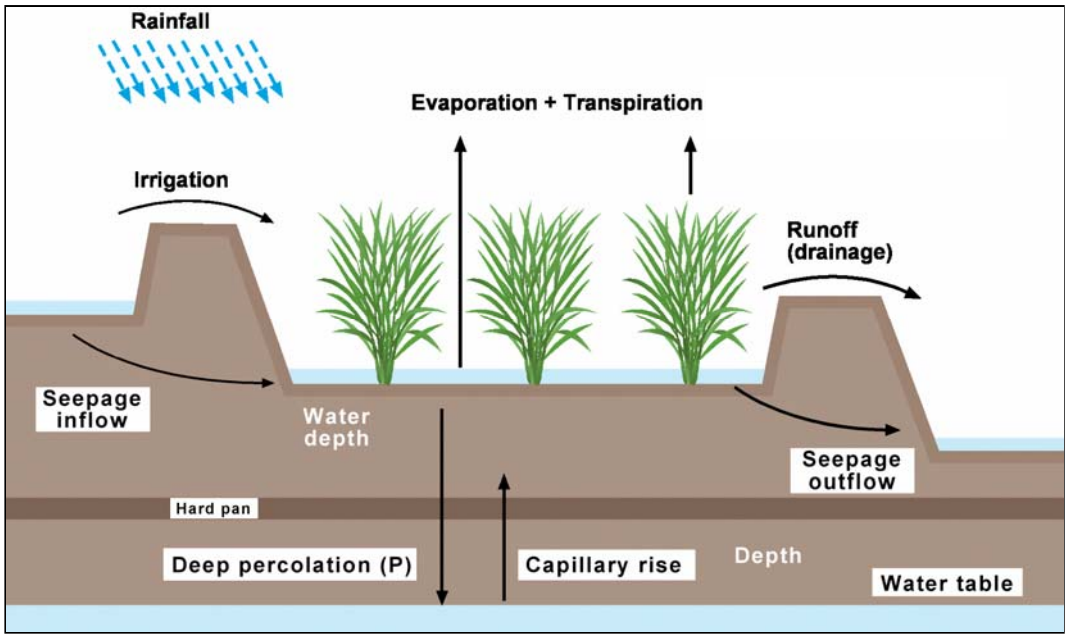
=> Water is getting scarce and expensive

Bangladesh:

- **Irrigation of Boro rice entirely depends on GW and Tubewells**
- **Farmers pay 30% of rice output for irrigation**
- **Gasoline cost >10,000 Tk/ha ➔ foreign currency**

Water savings = Cost savings and reducing energy crisis

Field water balance lowland rice



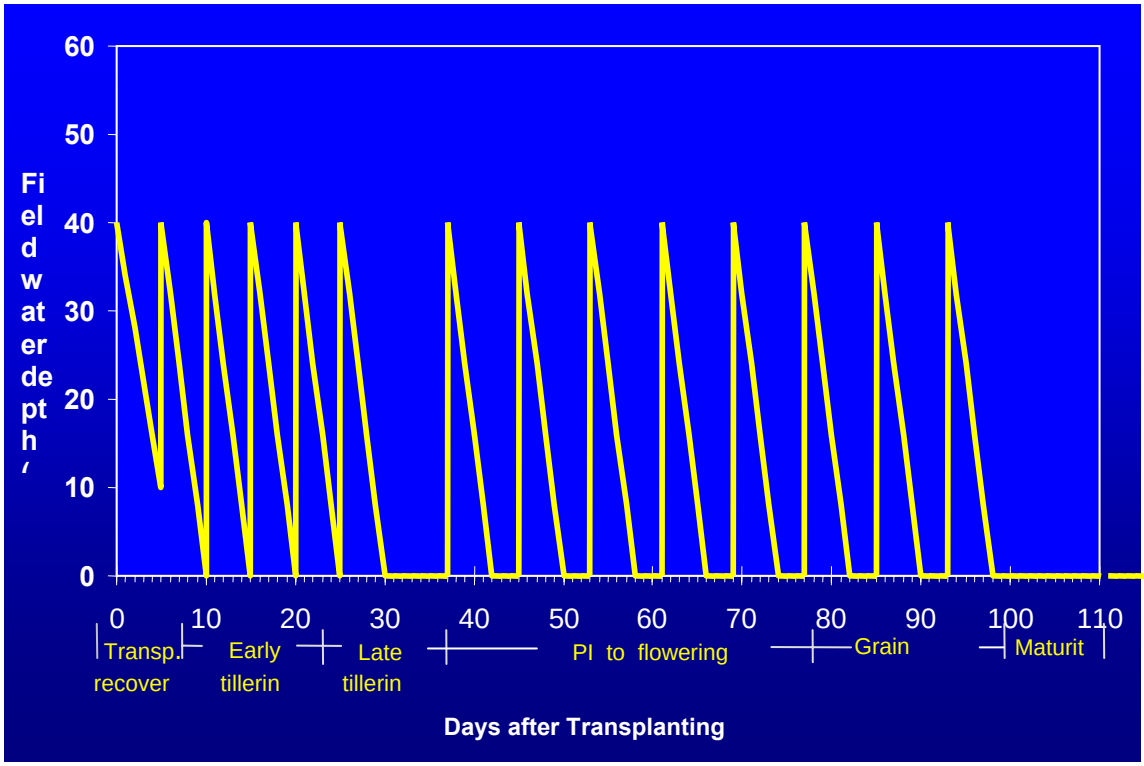
I + R = (E + T) + (S+P) + ΔS

Water requirements in lowland rice

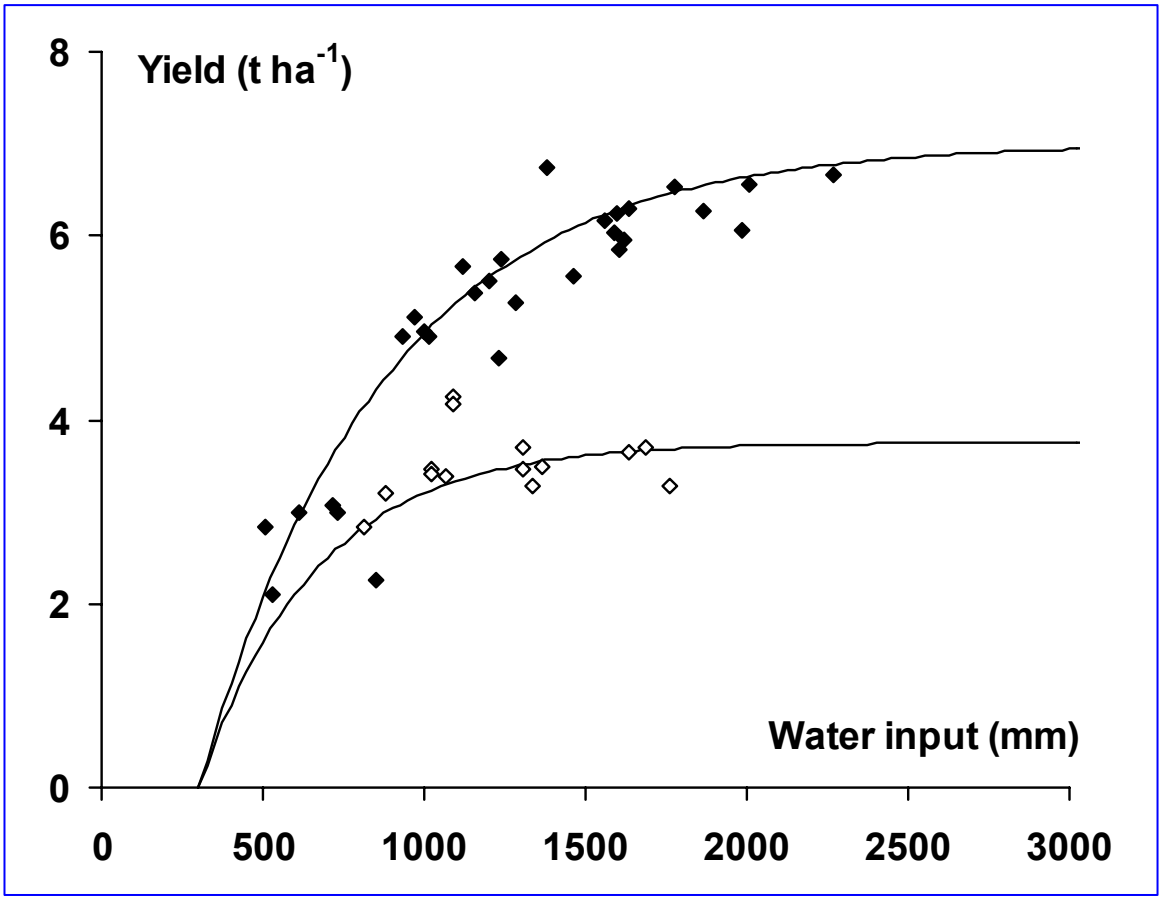
	Daily mm d^{-1}	Season (100 d) mm
Land preparation		175-750
Evapotranspiration		(30% E, 70% T)
- wet season	4-5	400-500
- dry season	6-7	600-700
Seepage & percolation		
- heavy clays	1-5	100-500
- loamy/sandy soils	25-30	2500-3000

Total season : 675-4450 mm
Typical value : 1500 mm

Reducing outflows: AWD



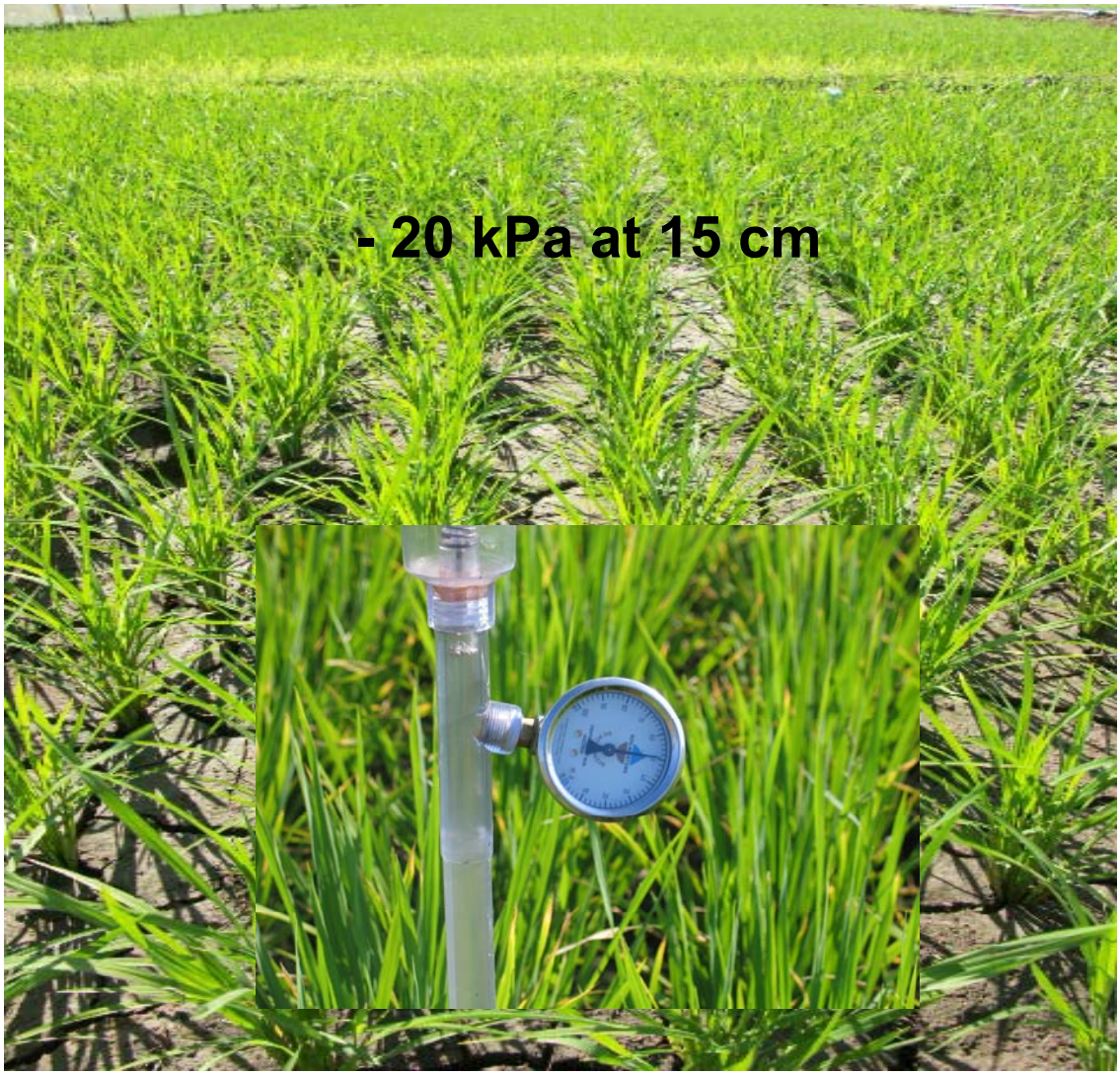
Effect of less water (AWDn)



Safe AWD concept and implementation

- Multi-location field exps (Phil., India, China)
- On-farm, multi-stakeholder pilot sites
- Socio-economic evaluation at pilot sites

Safe AWD => reduced water input 15-30% without yield loss

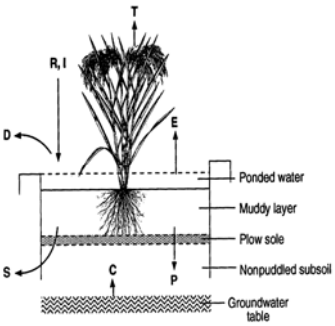


Safe AWD concept and implementation

- Simple key messages for farmers
- Simple tool for farmers

A practical indicator to irrigate

- 20 kPa at 15 cm ~ water depth 15 cm



Safe AWD = Irrigate when water depth ~ 15 cm

Field water tube - installation

Push tube by hand vertically

Drive cylinder using mallet

Check clearance from soil surface

Appearance of installed PW tube

Remove soil inside the tube

Check and level the Top of the tube

“Safe AWD practice”

- Start AWD 10 DAT
  Or 20 DAS

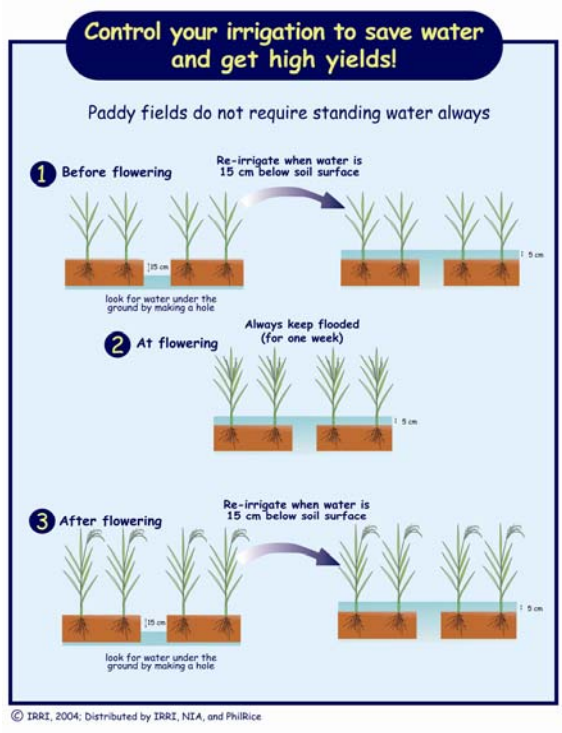
2. Irrigate when water is 15-20 cm deep (simple tool !!)

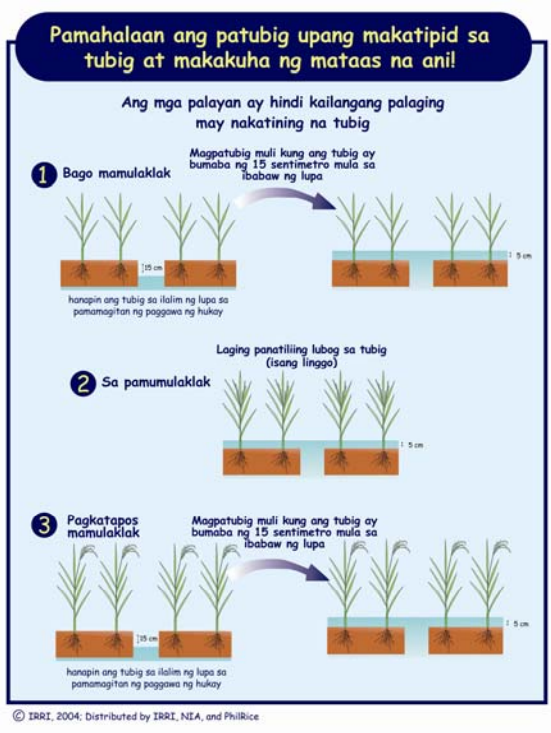
3. Keep 5-cm flooded at flowering

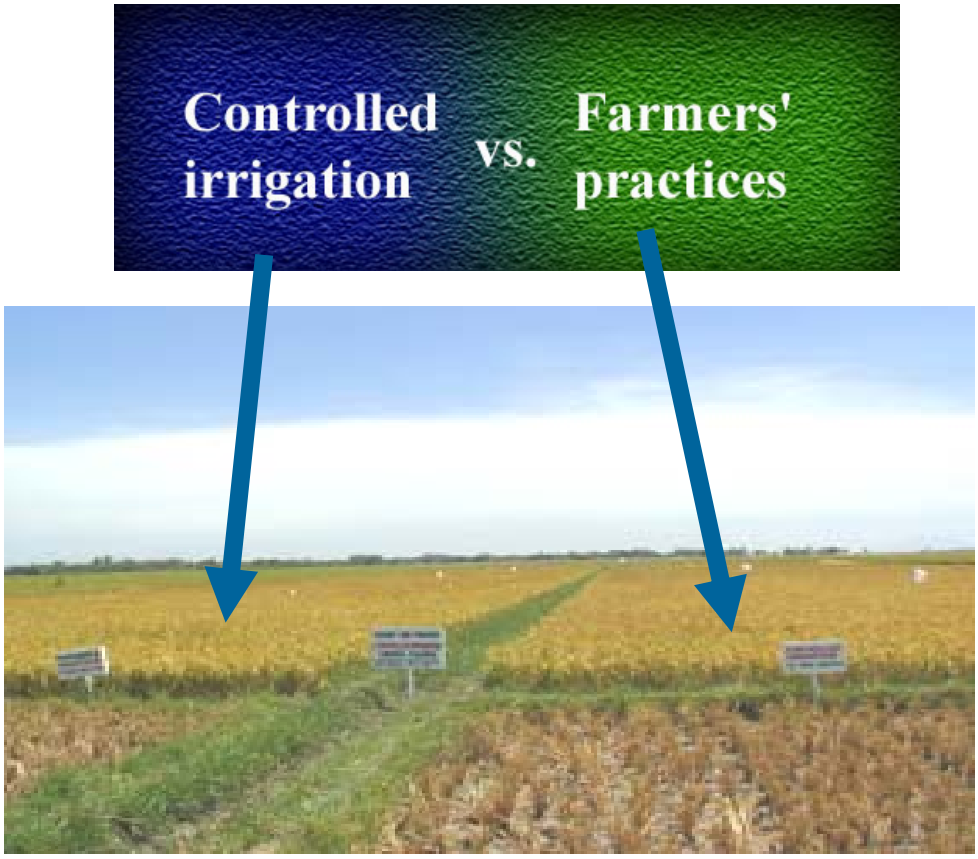
Main idea to convey:

- Water is there even when you can’t see it
- Create confidence by farmers
- Farmers then to experiment with threshold value
- No recipe for soil type, hydrology**,** variety, ..

Key message on posters and brochures



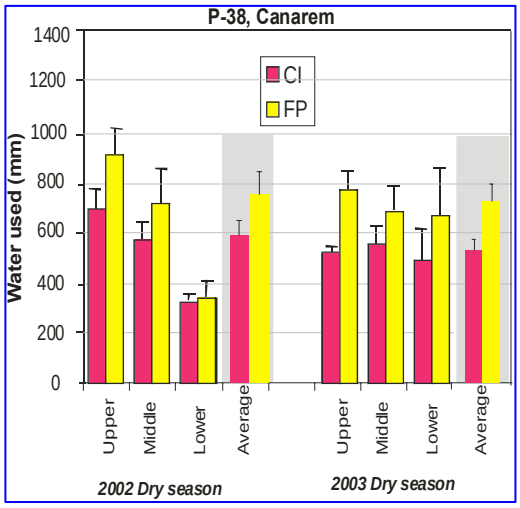


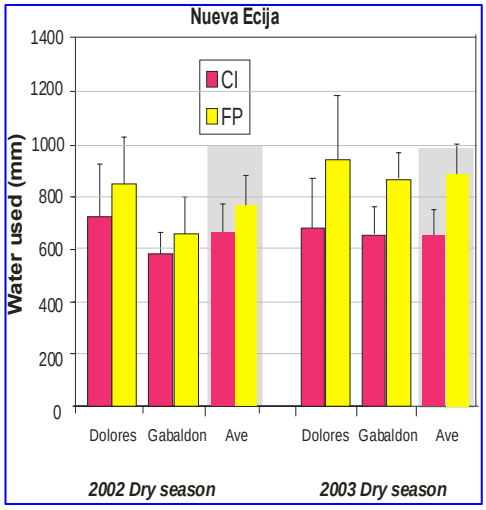


Use of same posters in Mekong delta, Vietnam (2006)

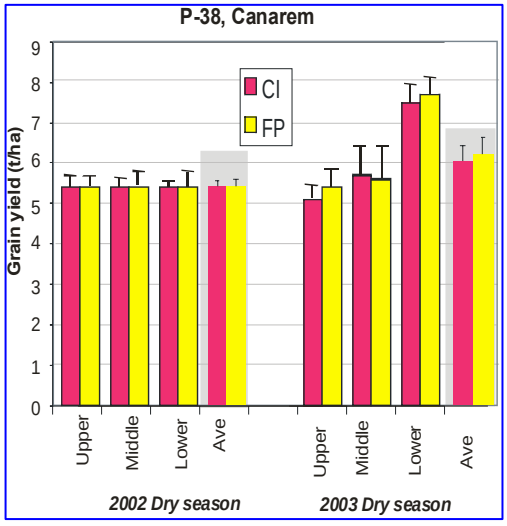
Use of extension leaflets in Mekong delta, Vietnam (2006)

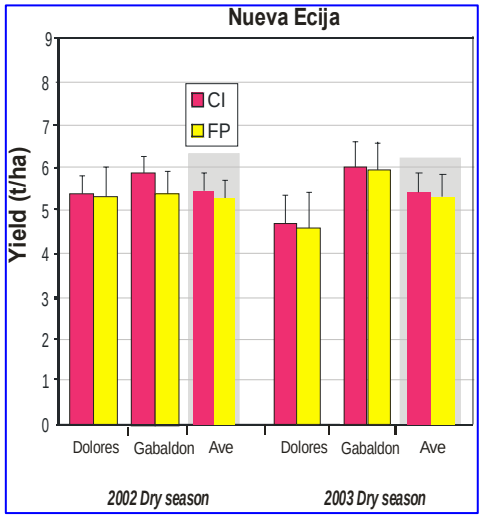
Irrigation water used (mm)





Grain yield (t/ha)





FINAL REMARKS (1)

- AWD already existed for long time
- The water tube: pivotal role in dissemination
- In BD: 10% reduction in water means reducing 40 L of gasoline/ha. If only half of boro rice area apply AWD, we can save 80 ML of gasoline
- AWD also reduces Arsenic in the soil and plant

FINAL REMARKS (2): constraints

- How to make AWD benefit farmers?
- Weeds: important to keep flooded 2 wks after transplanting
- Vote of THANKS