

RMCG

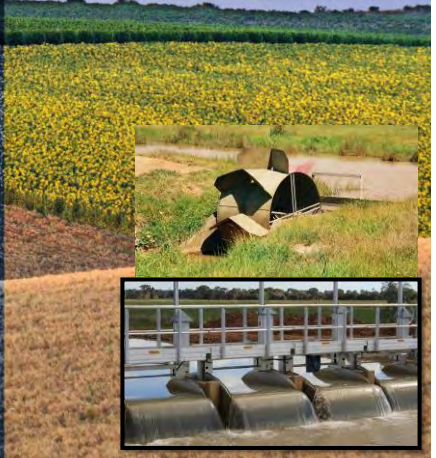


# Modernising a pressurised pipeline *Supply system for high value Agriculture in Asia*

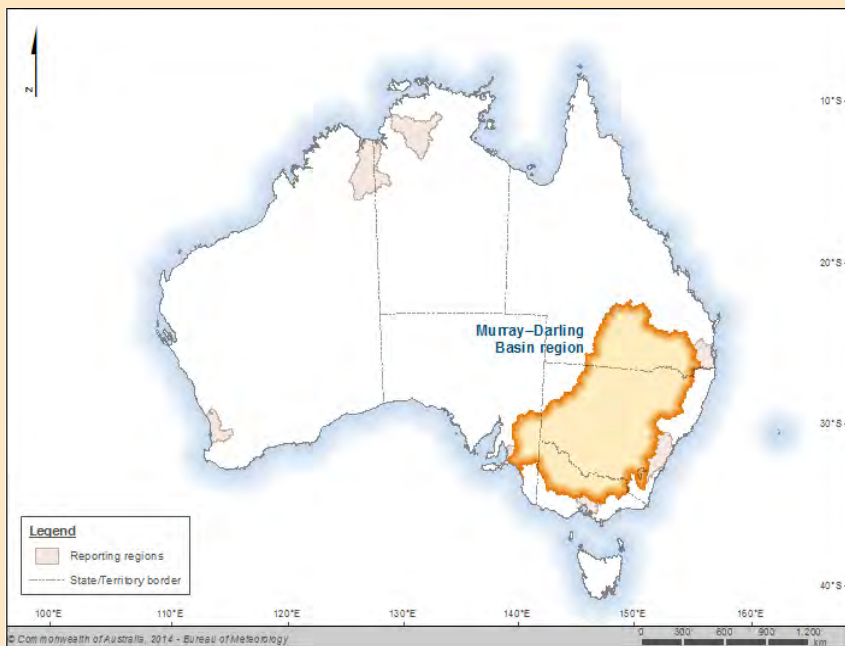
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ICID Adelaide

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## Australia has five general types of irrigation systems

- Northern areas – large on farm storage's with cotton surface irrigated (laser graded)
- Traditional canal – large canal (300,000ha) systems with cotton/rice/dairy pastures surface irrigated (laser graded) – mix of Rubicon control and semi automation
- Pressurised pumped piped supply (500-10,000ha) systems supplying horticulture (grapes – wine/table/dried, fruit trees, almonds, vegetables)
- Direct river diversions by private pumping (100ha – 10,000ha) for mainly almonds/cotton/grapes – use sprinklers/drip
- Groundwater by private pumping (100-500ha) for every type of farm systems

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## Canal versus Pipes Sprinkler/Drip versus Surface

It all depends but there are principles

- **Soils drive crop type** – high value crops require sprinkler/drip – thus need pipe supply
- **Large flows are better in canals/rivers** - <600mm pipes are efficient
- **Topography** – flat areas using surface irrigation (rice/cotton/cereals/maize) use canals – avoid pumping but if steep then use natural head for pipes.
- **Energy/water/food nexus** – weigh up the long term impact of energy use relative to water efficiency and food production

## Water Efficiency Improvement in Drought Affected Provinces (WEIDAP) Project

### Impact

To improve climate resilience, environmental sustainability and agricultural water productivity in drought-affected provinces

### Outcome

Climate resilient and modernized irrigation systems providing flexible and affordable services to beneficiary farmers in the five participating provinces

### Outputs

1. Climate resilient irrigation management services adopted
2. Flexible and modernized irrigation systems developed
3. Efficient on-farm water management practices adopted







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## Current Irrigation Practices



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WEIDAP



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# Modernizing Irrigation Systems in Drought Affected Provinces of Viet Nam

Water Efficiency Improvement in Drought Affected Provinces Project (WEIDAP)

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## Australian Riverland / Sunraysia study tour



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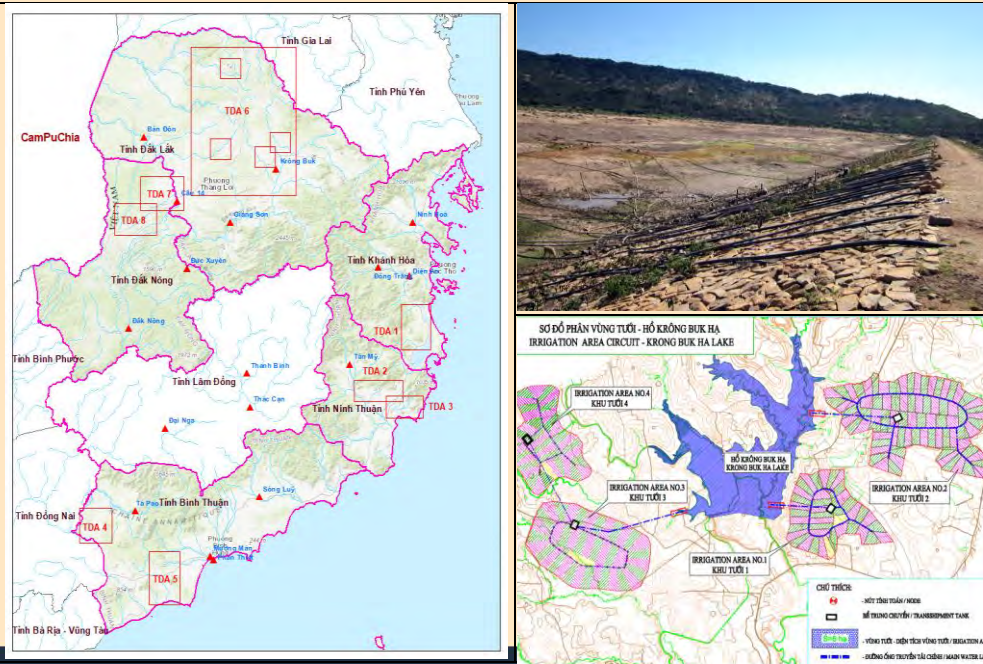
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## Use of a pressurised pumped piped supply system - Requires a Paradigm shift

- Focus on Level of Service – LoS
  - Water on demand – almost
  - Pressure
  - Direct connection
  - Don't filter
- Pipe is a network – canal is a tree – canal engineers don't understand this
- Variable speed pumps and SCADA not Header tanks
- Capacity is driven by
  - Crop/demand – average peak month (we spend too much time on accuracy)
  - Hrs/day – daytime or nighttime - 24 hours cause use cheap automation on farm
  - Minimum Flow rate – around 5l/sec for up to 5 ha regardless of area cause 50mm systems on farm are efficient cost
  - LoS – almost water on demand – flexibility factor or extra capacity – natural queuing happens – not a lot to make a difference!
- Operators need to take their hands off the system – give up control
- Water Users Group – needed for most canal systems to manage water in tertiary systems – there is no tertiary pipes in a network!!
- "Epanet" design – free computer program – two extremes – no flow and full flow

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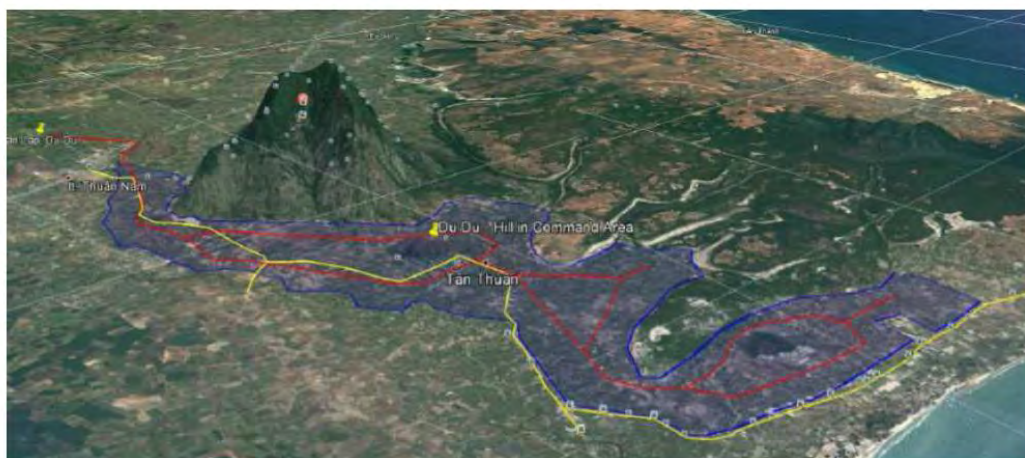


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Figure 10: Layout of gravity piped system and command area for Du Du Tan Thanh (Source: PRIMEX, 2017)



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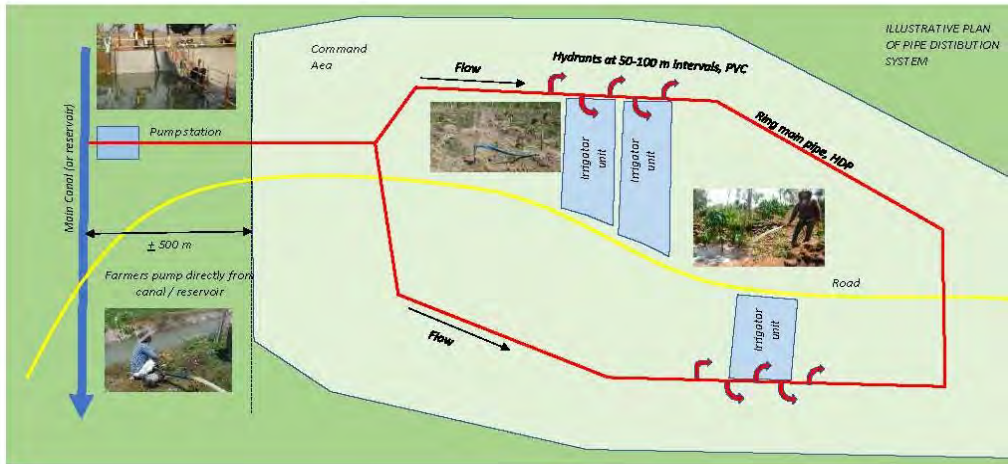
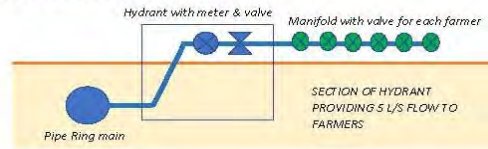
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# DIAGRAMMATIC ILLUSTRATION OF SUBPROJECT MODERNISATION AND LEVEL OF SERVICE CONCEPT

Management Tiers:

- i. Reservoir and/ or main canal
- ii. Pipe system supply to hydrants
  - a. 5 l/s hydrants with manifolds (farmers want 2-3 l/s flow typically)
  - b. Number of hydrants is supply flow divided by 5 l/s
  - c. 500 m maximum distance from plot
  - d. Indicative spacing 50-100 m along pipelines
  - e. Residual heads (1 m – 10 m minimum)
- iii. Farmer hydrant to plot pipe and on-farm irrigation equipment



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## Thank you – questions?

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