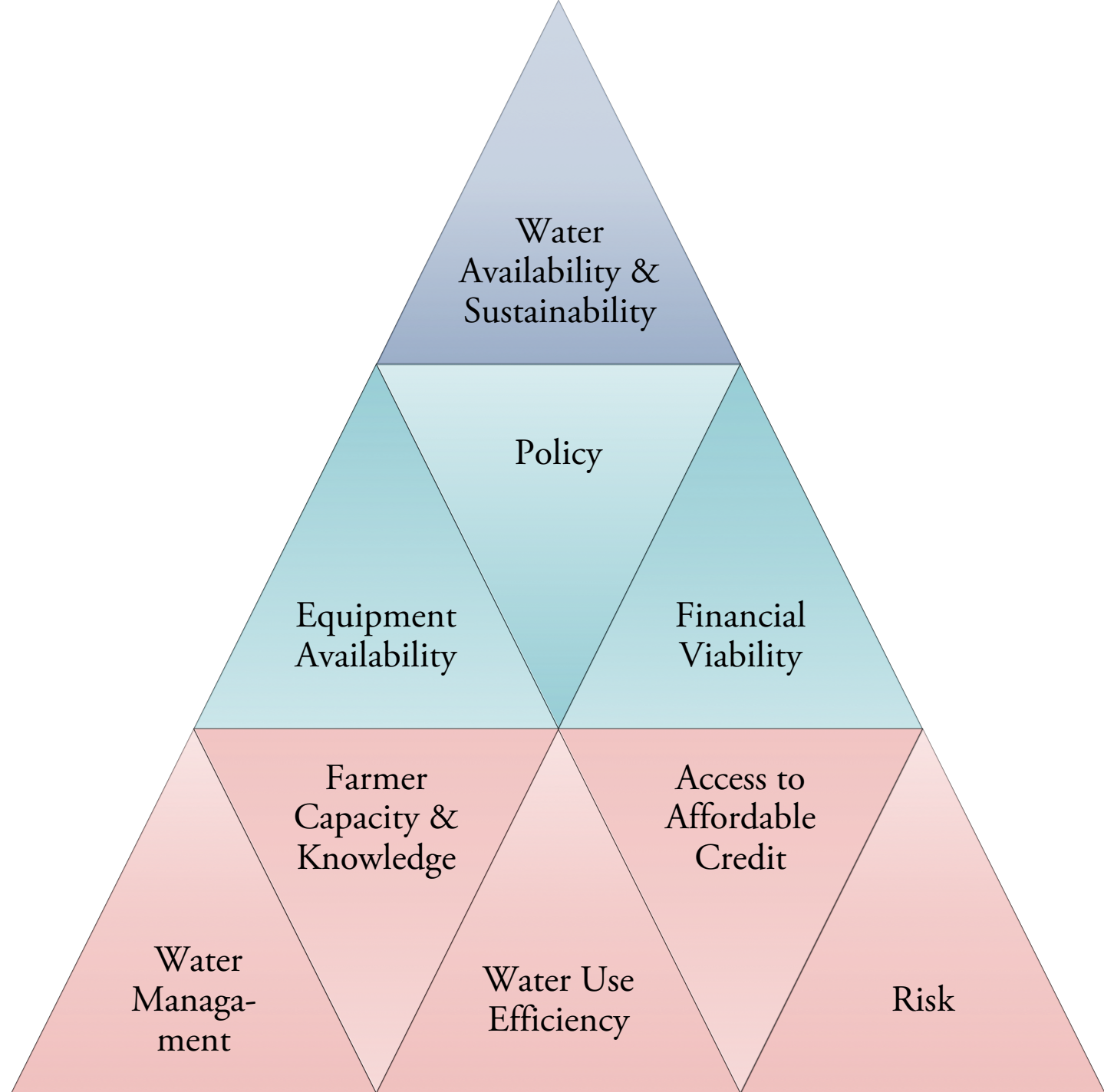


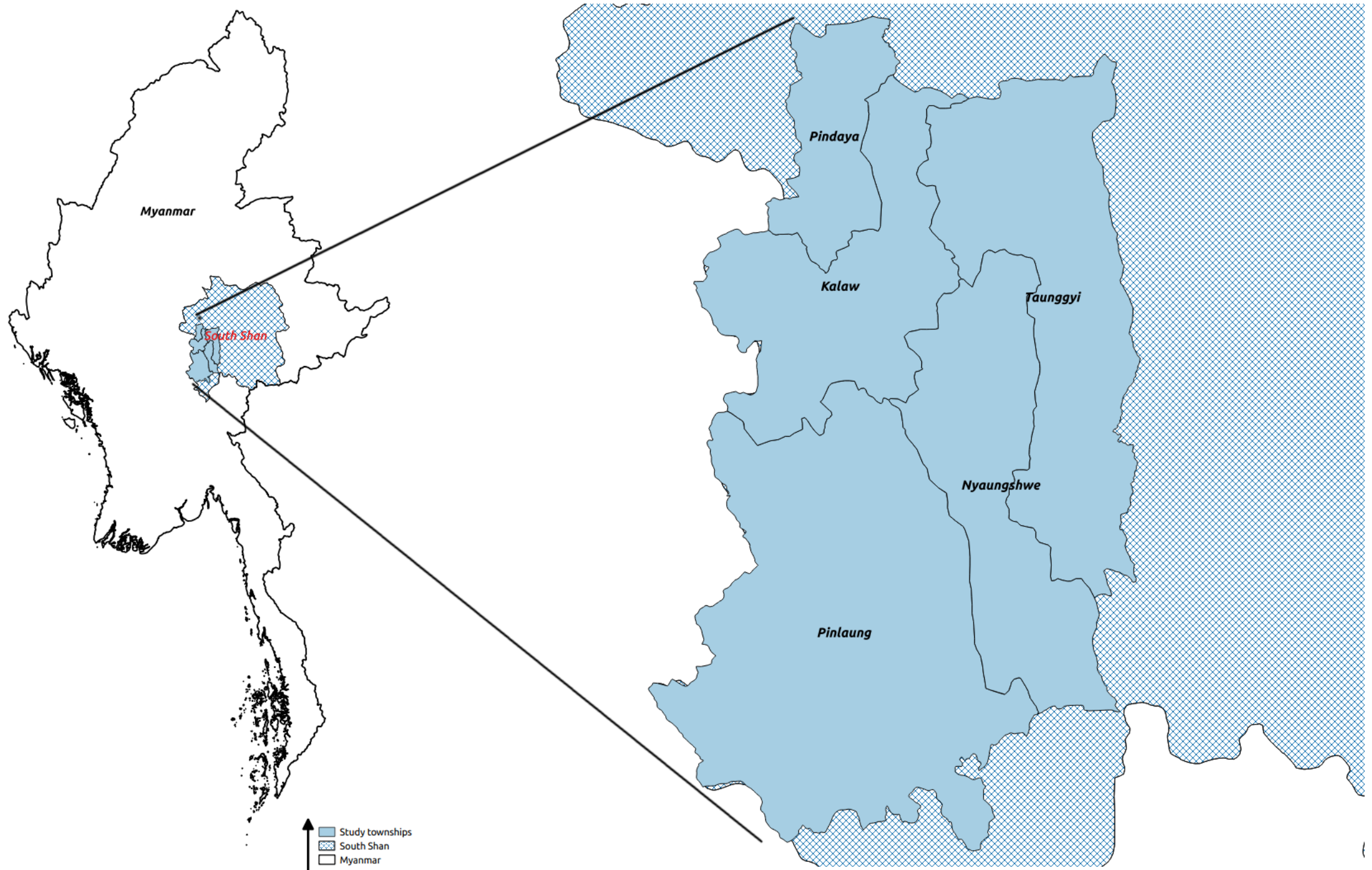
South Shan off-season vegetable farming

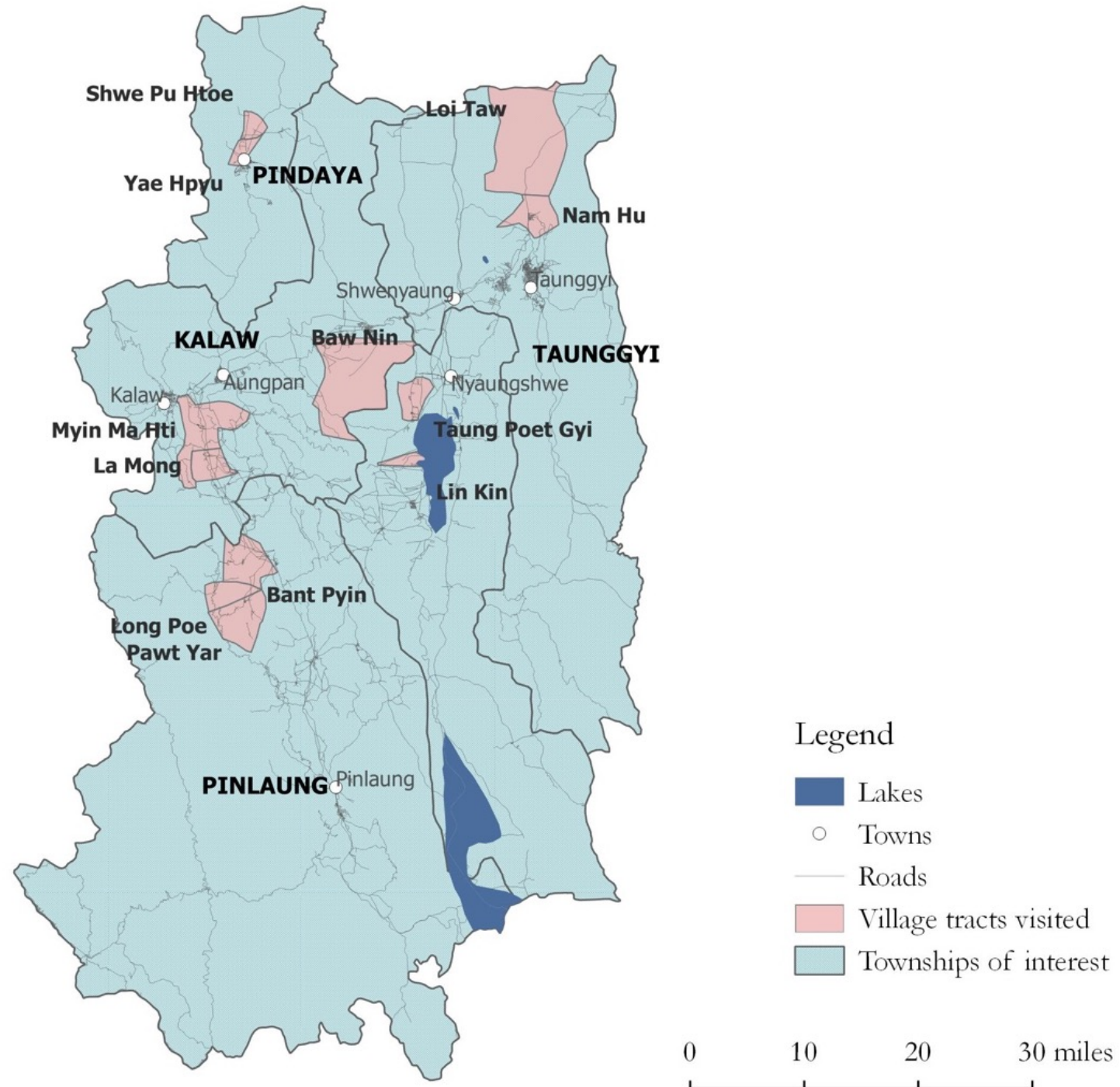
WATER ACCESS ANALYSIS

Christian Snoad, March 2017









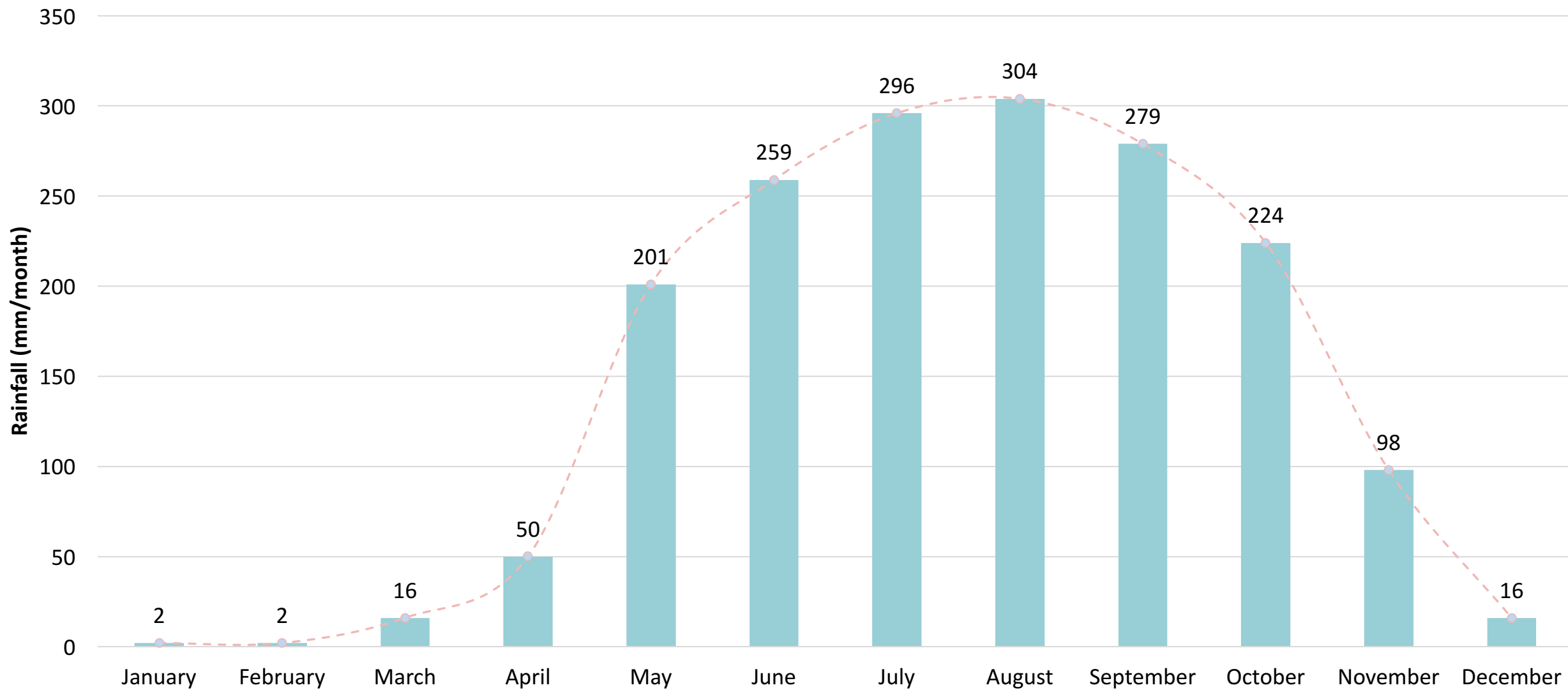




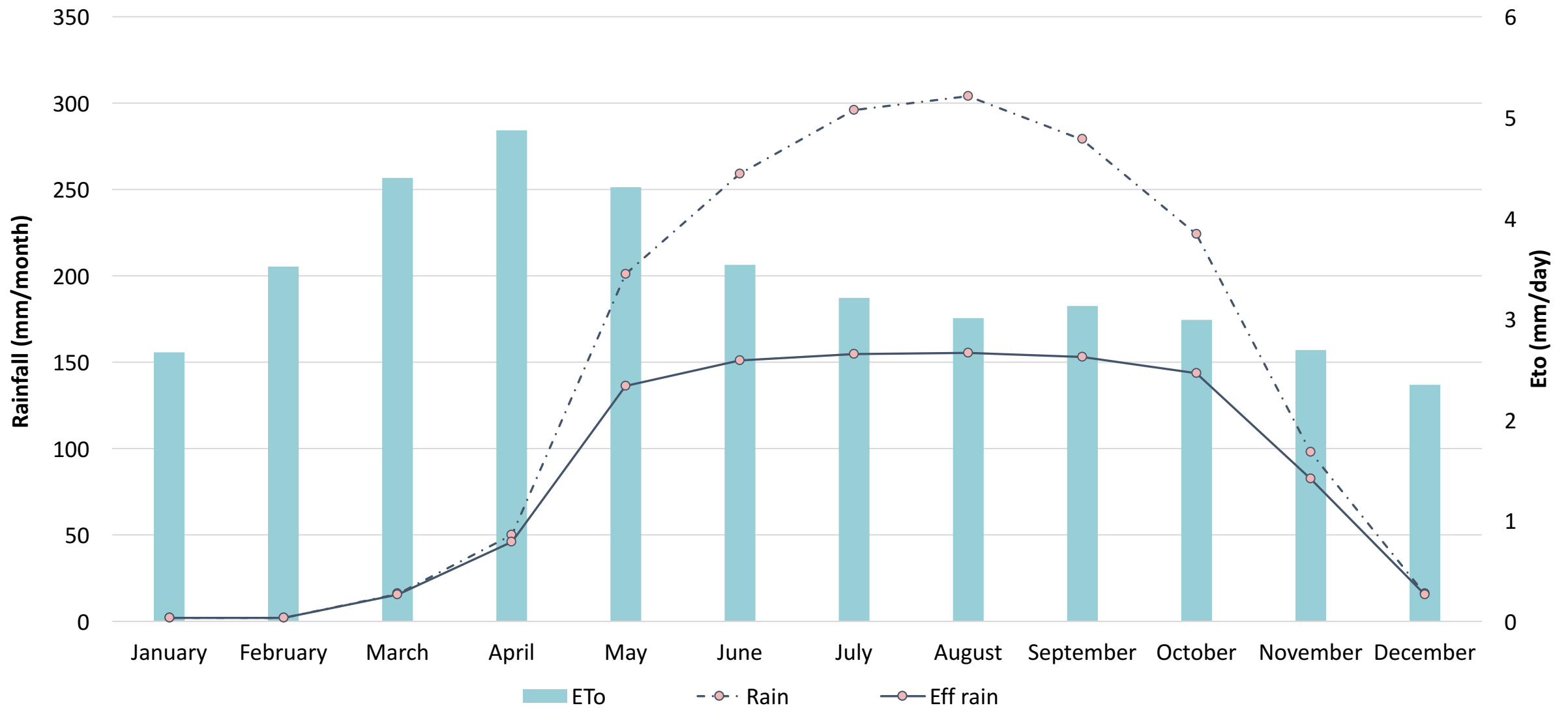
CURRENT SITUATION



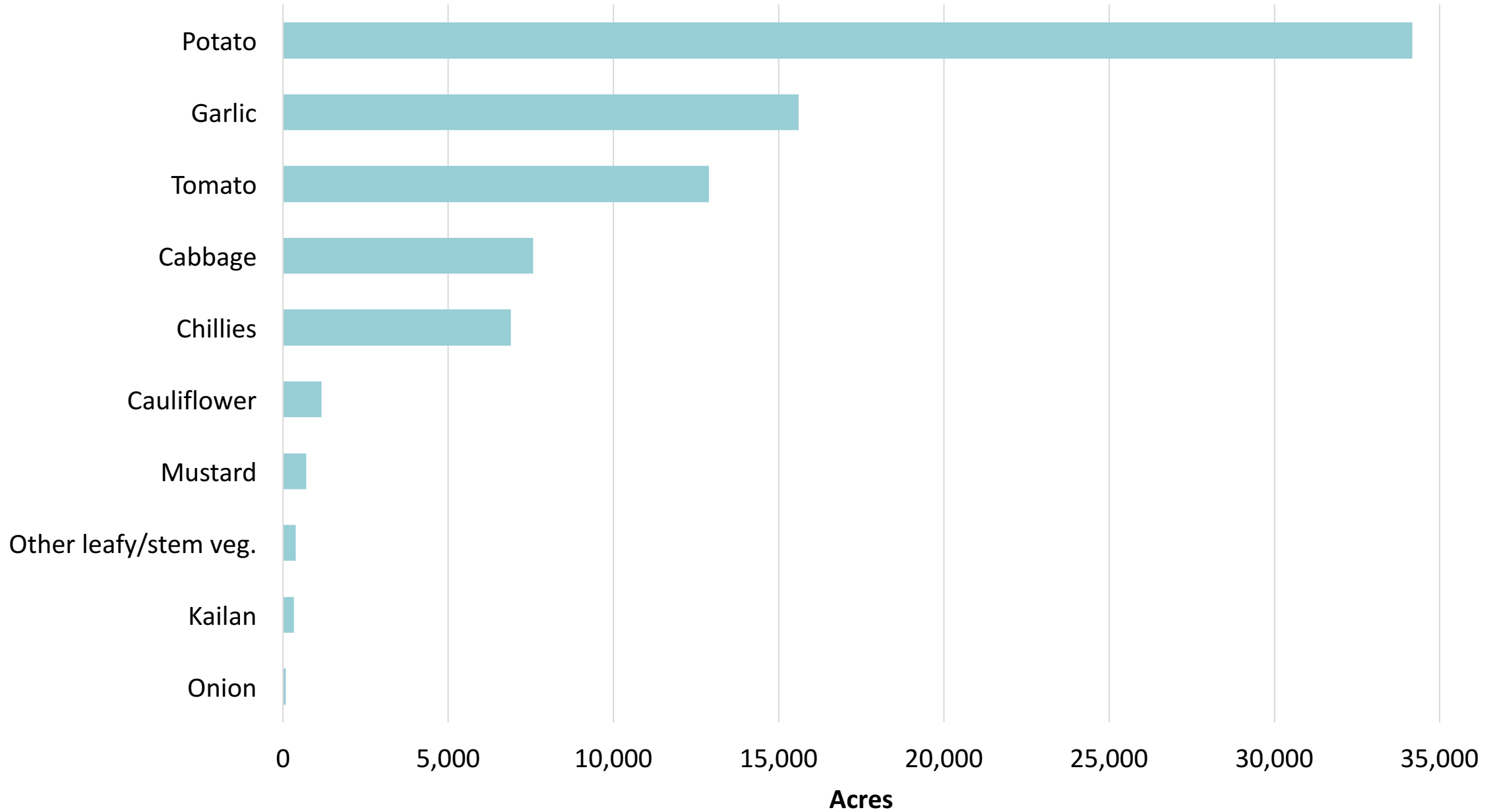
AGRICULTURE



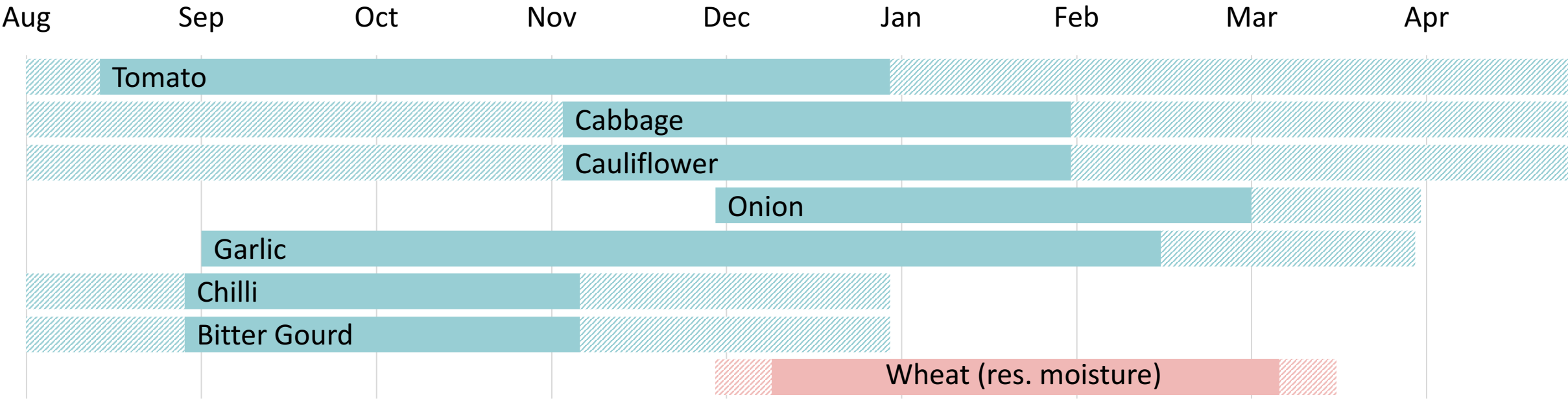
Average rainfall in project area from Taunggyi data station. Source: (FAO CLIMWAT)

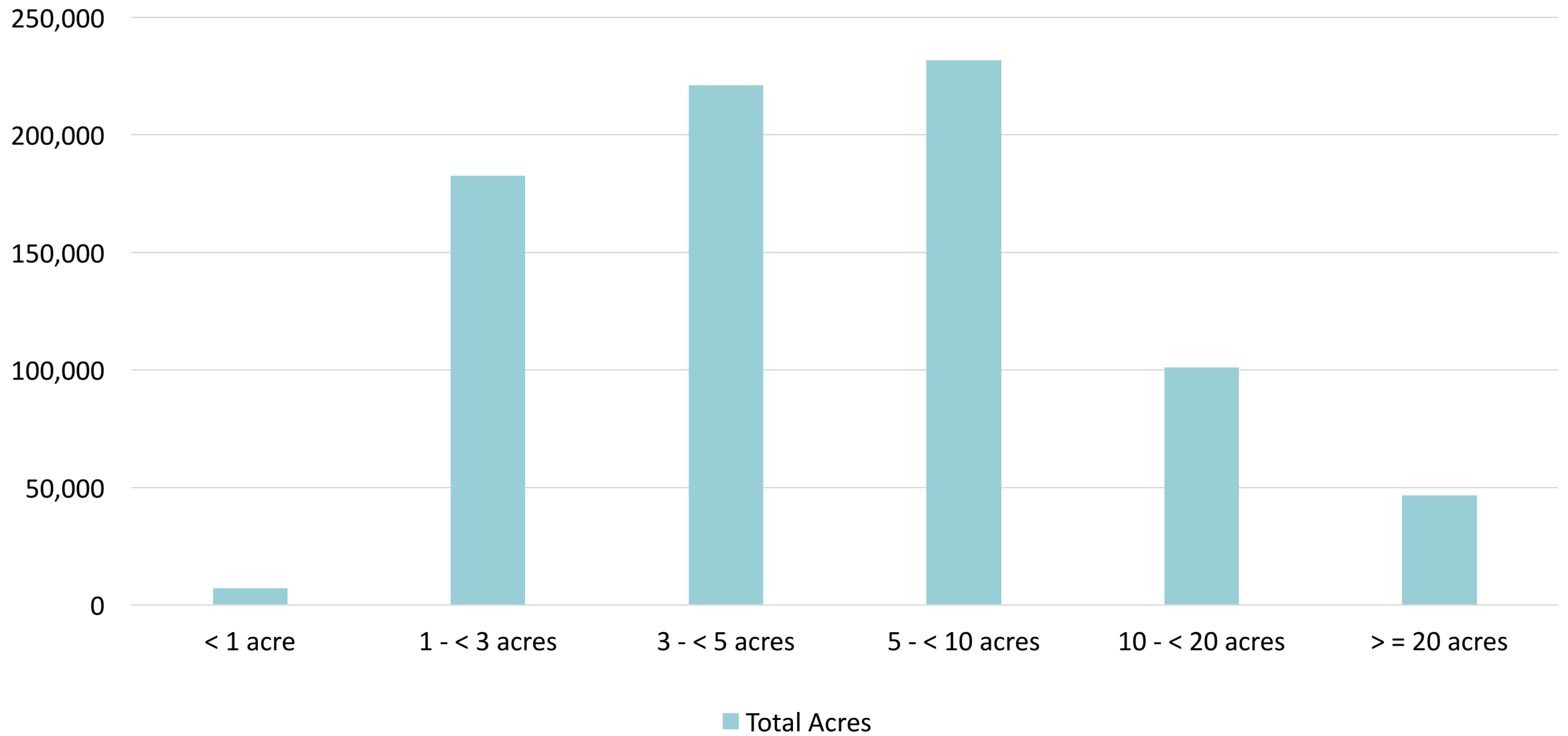


Average rainfall, effective rainfall and evapotranspiration at Taunggyi data station. Source: (FAO CLIMWAT)

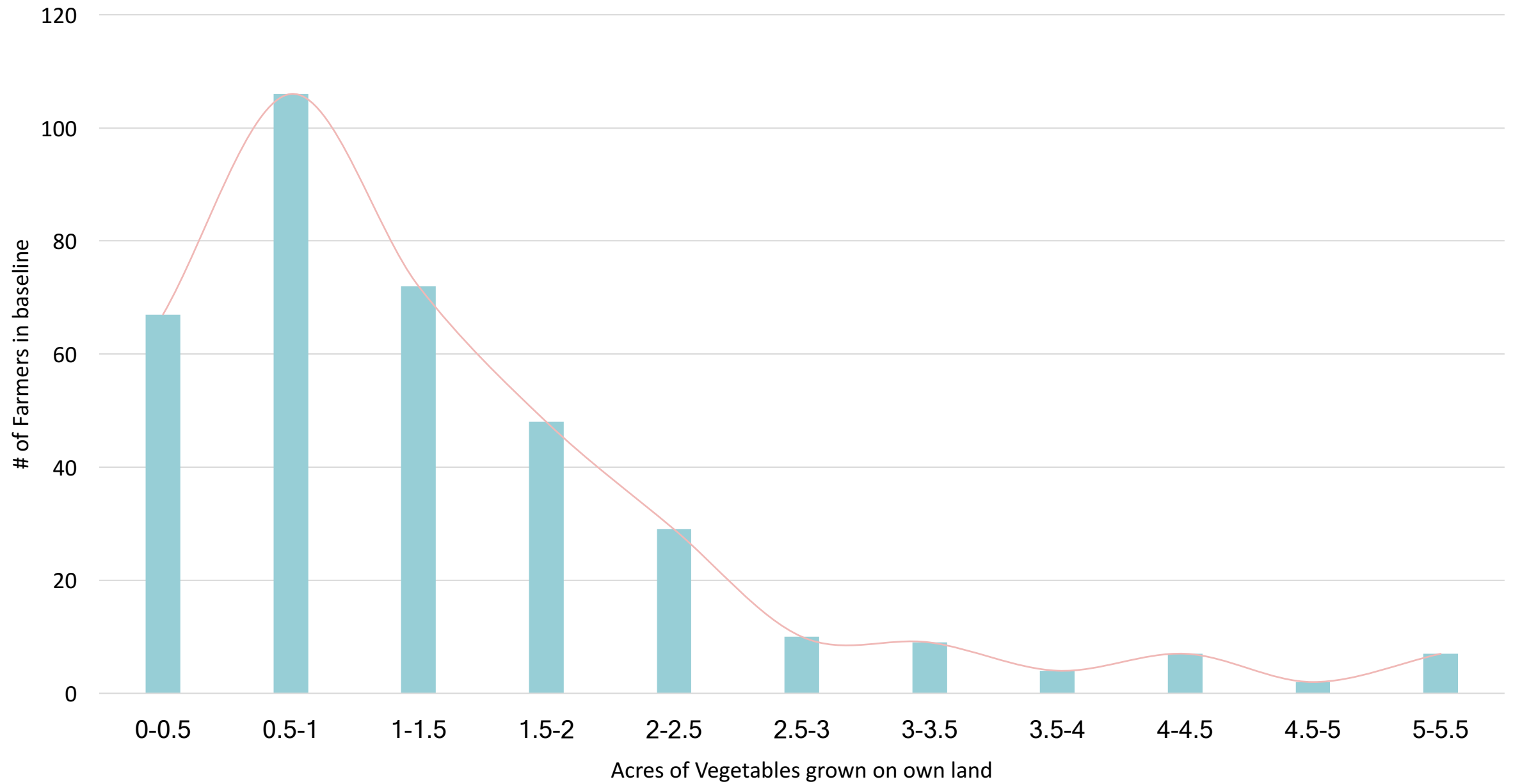


Acres of vegetables grown in Taunggyi District in 2010. Source: (MOAI Agricultural Census, 2013)

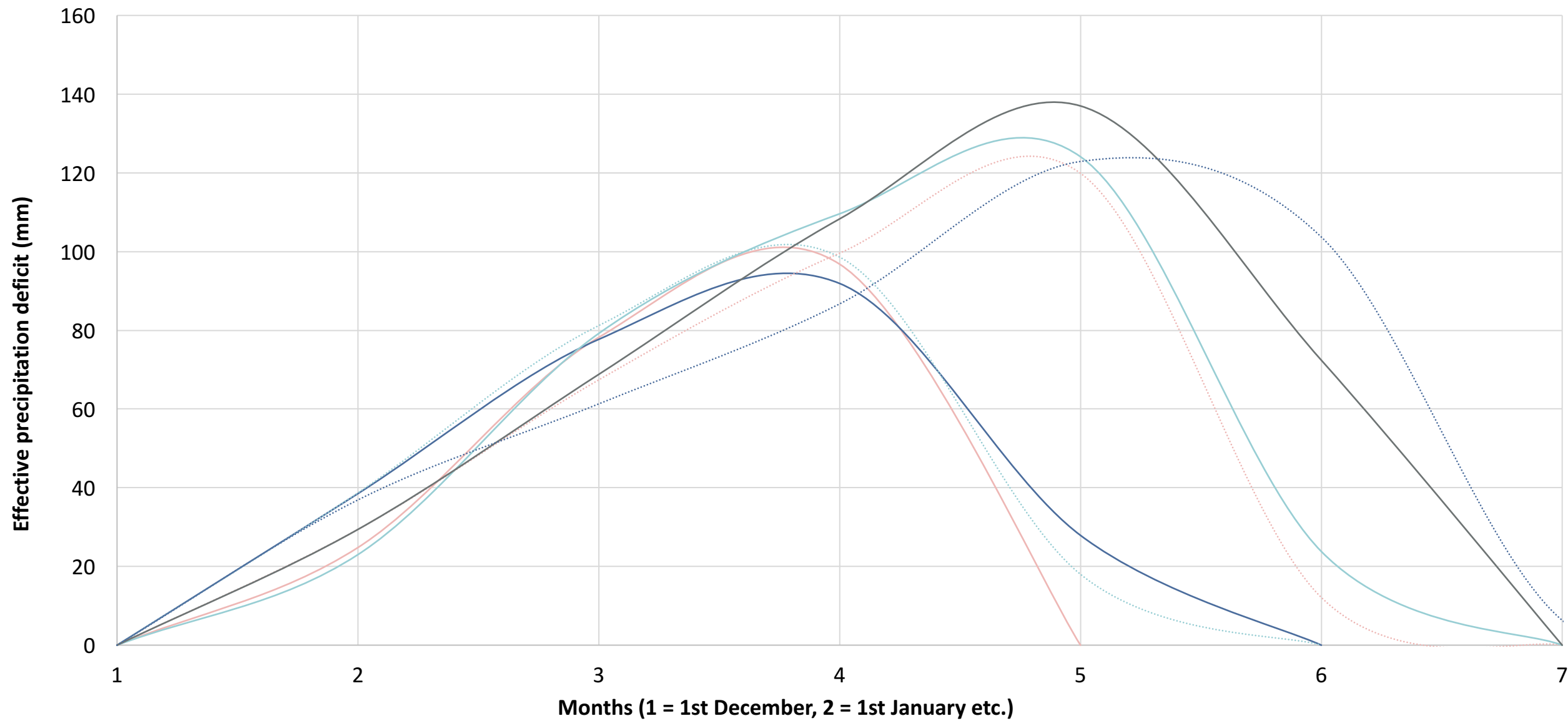




Total area of holdings by size category. Source: (MOAI Agricultural Census, 2013)



Total area of vegetables grown in MVMW area. Source: (MVMW baseline, December 2016)



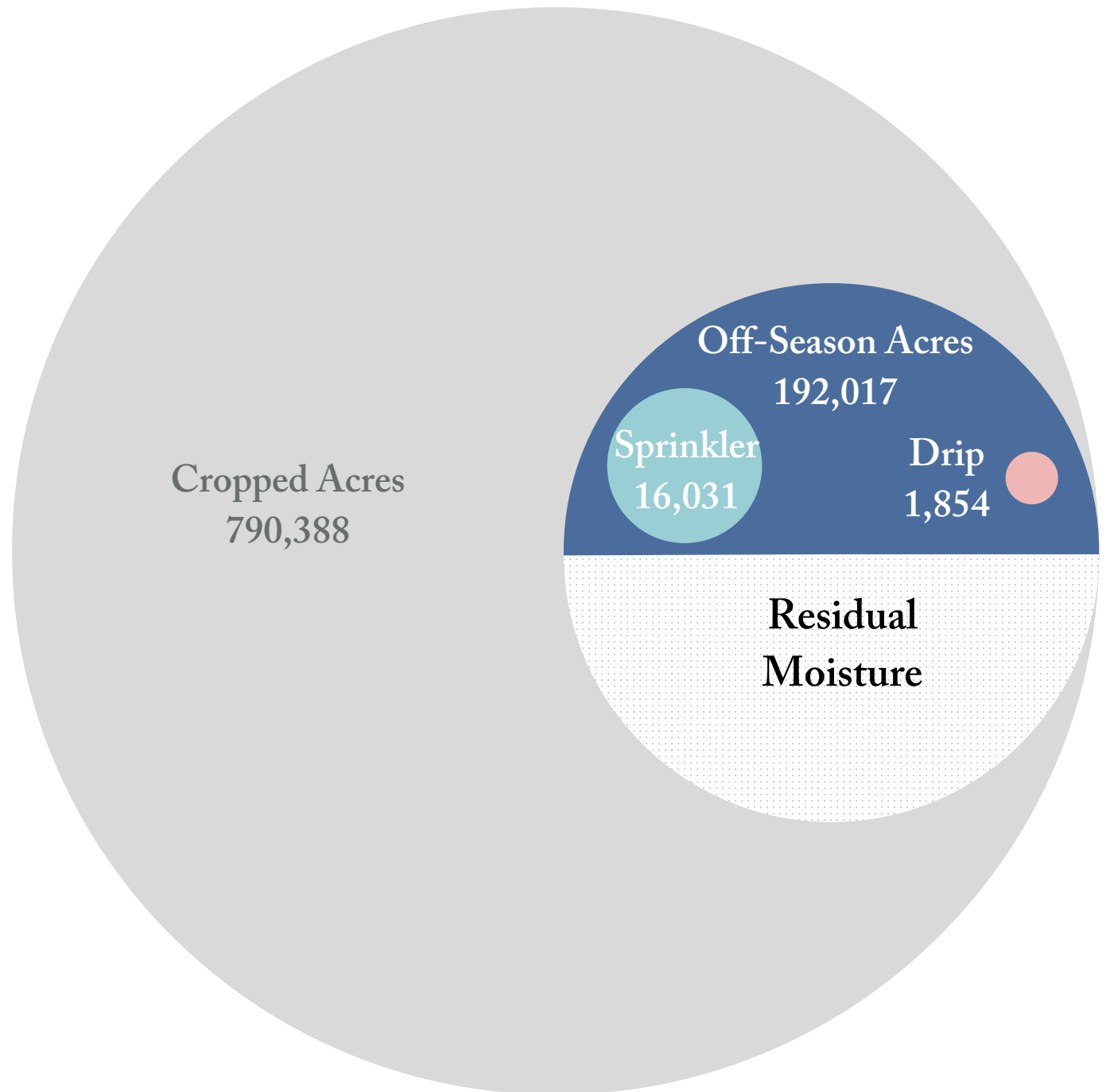
Green Beans Garlic Small Vegetable Sweet Pepper Potato Tomato Cabbage

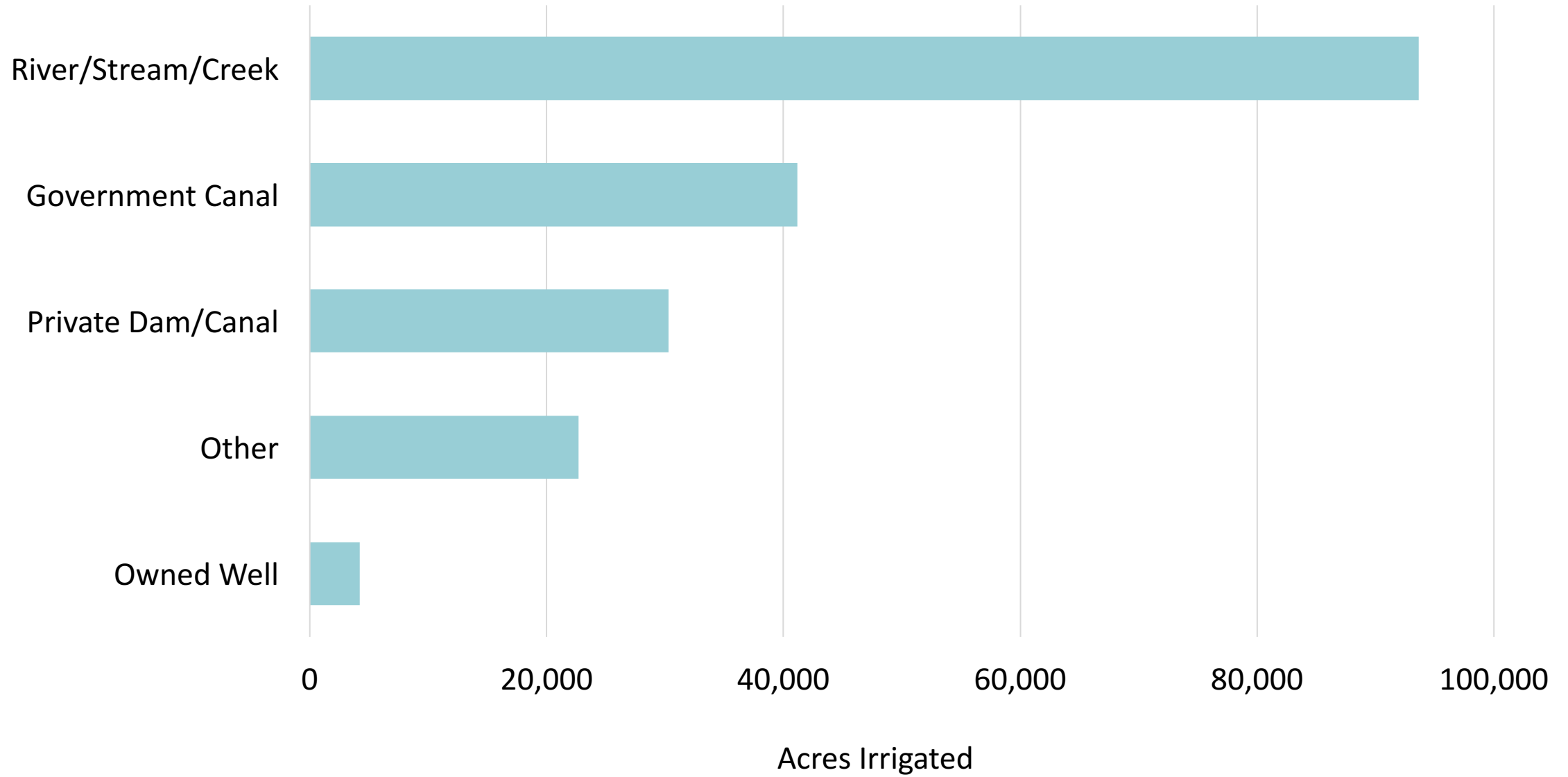


CURRENT UTILIZATION

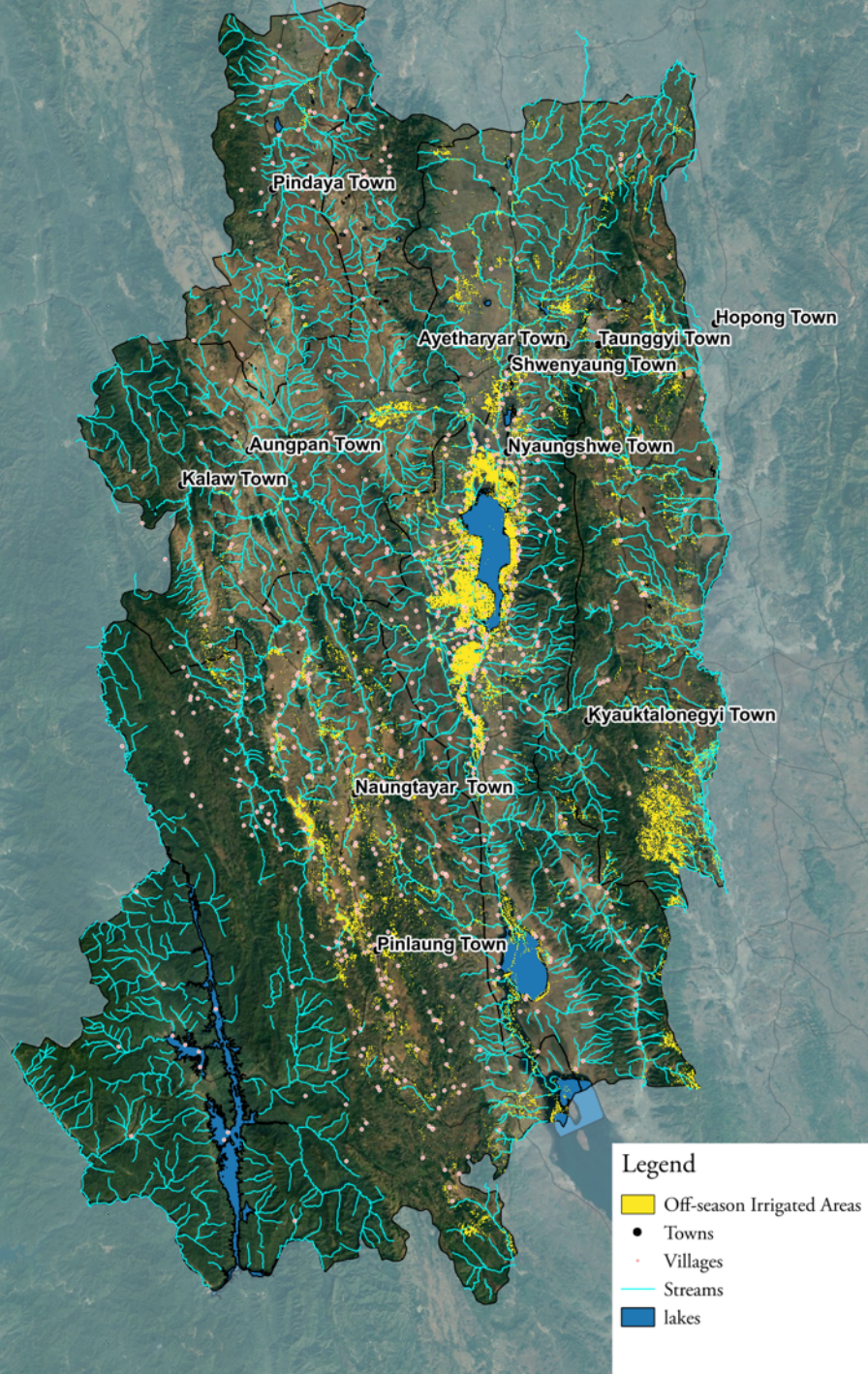
OFF-SEASON IRRIGATION

Taunggyi District





Total acres irrigated by type of water source in Taunggyi District. Source: MOAI Agricultural Census 2010



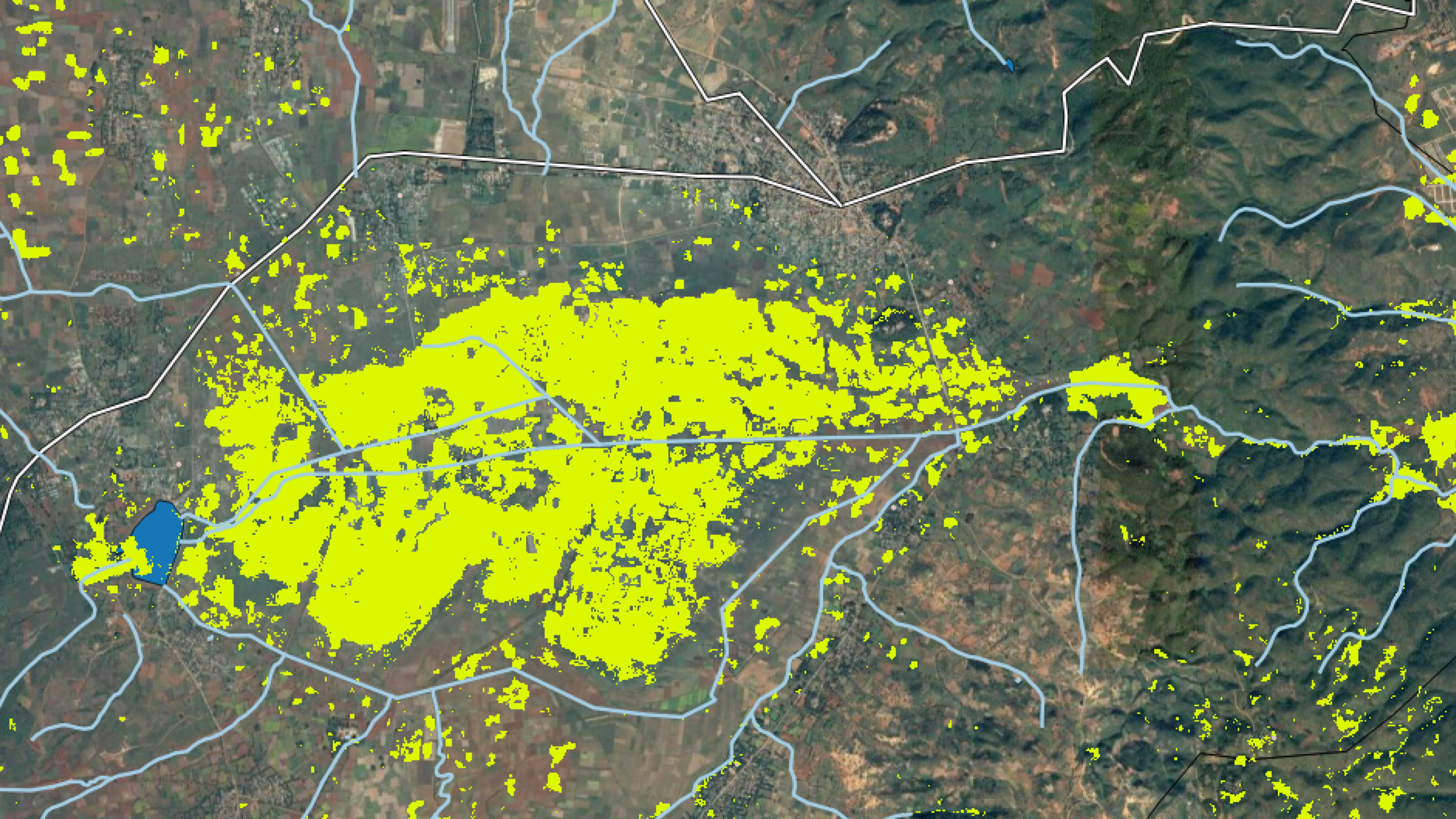
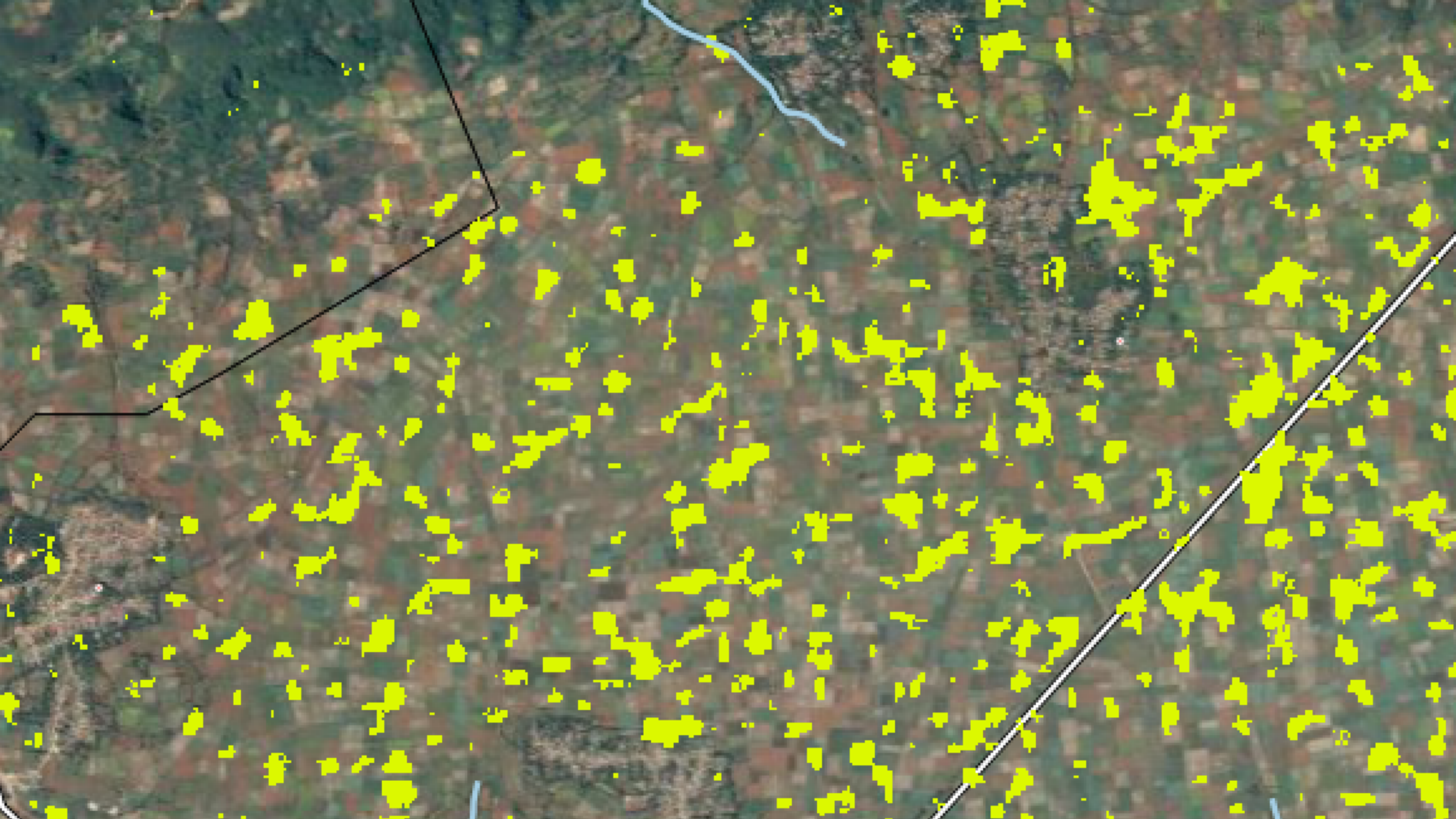
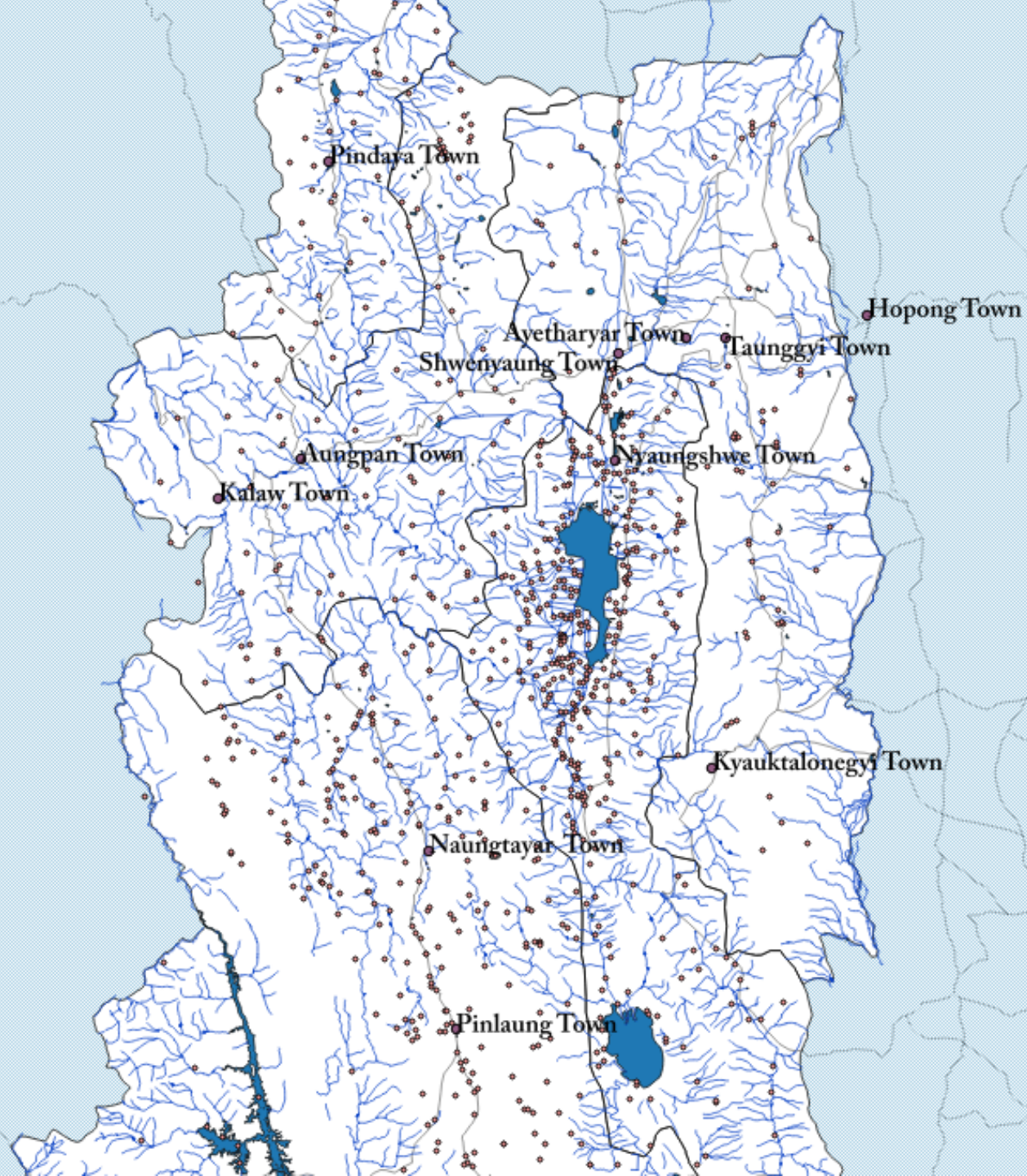


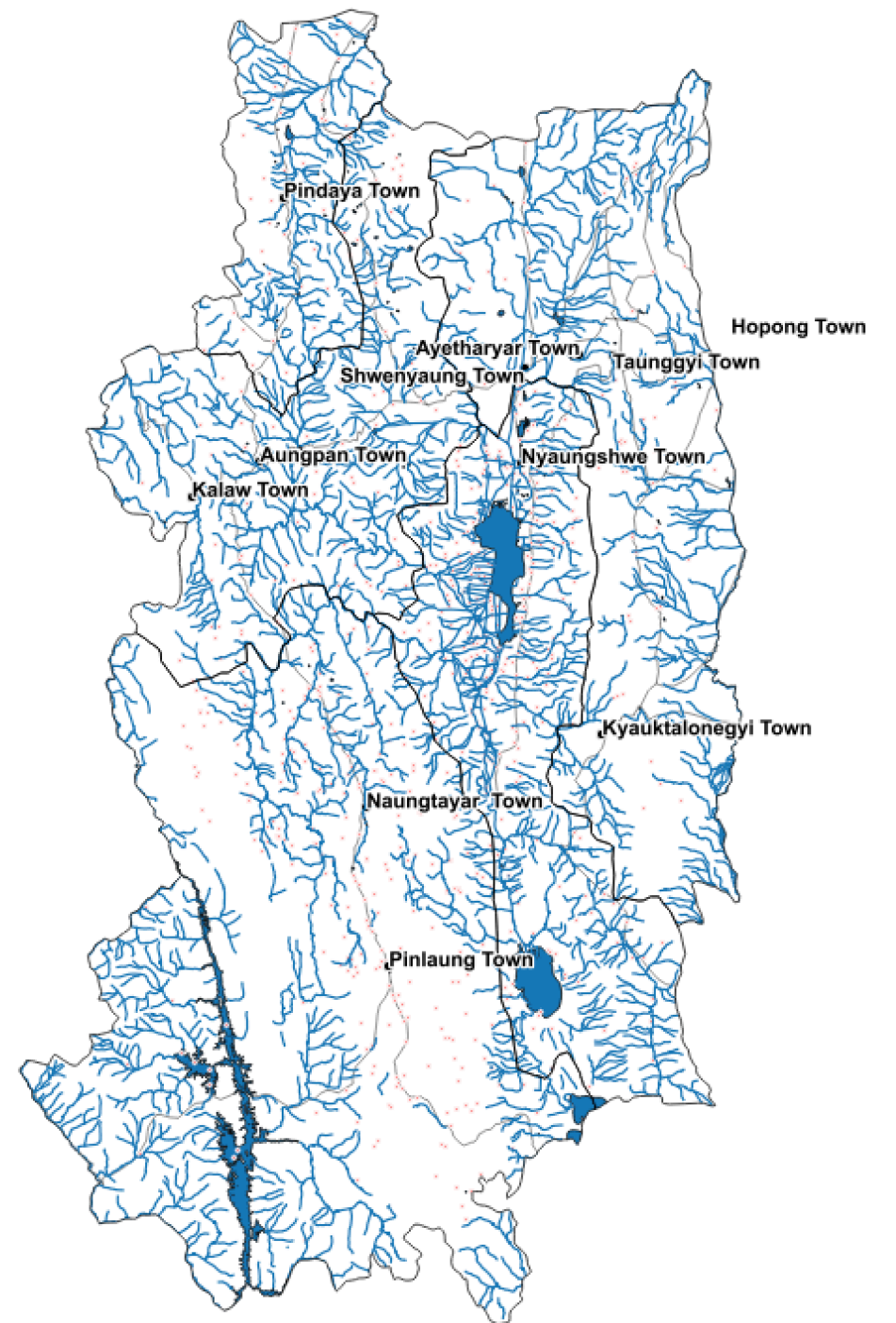
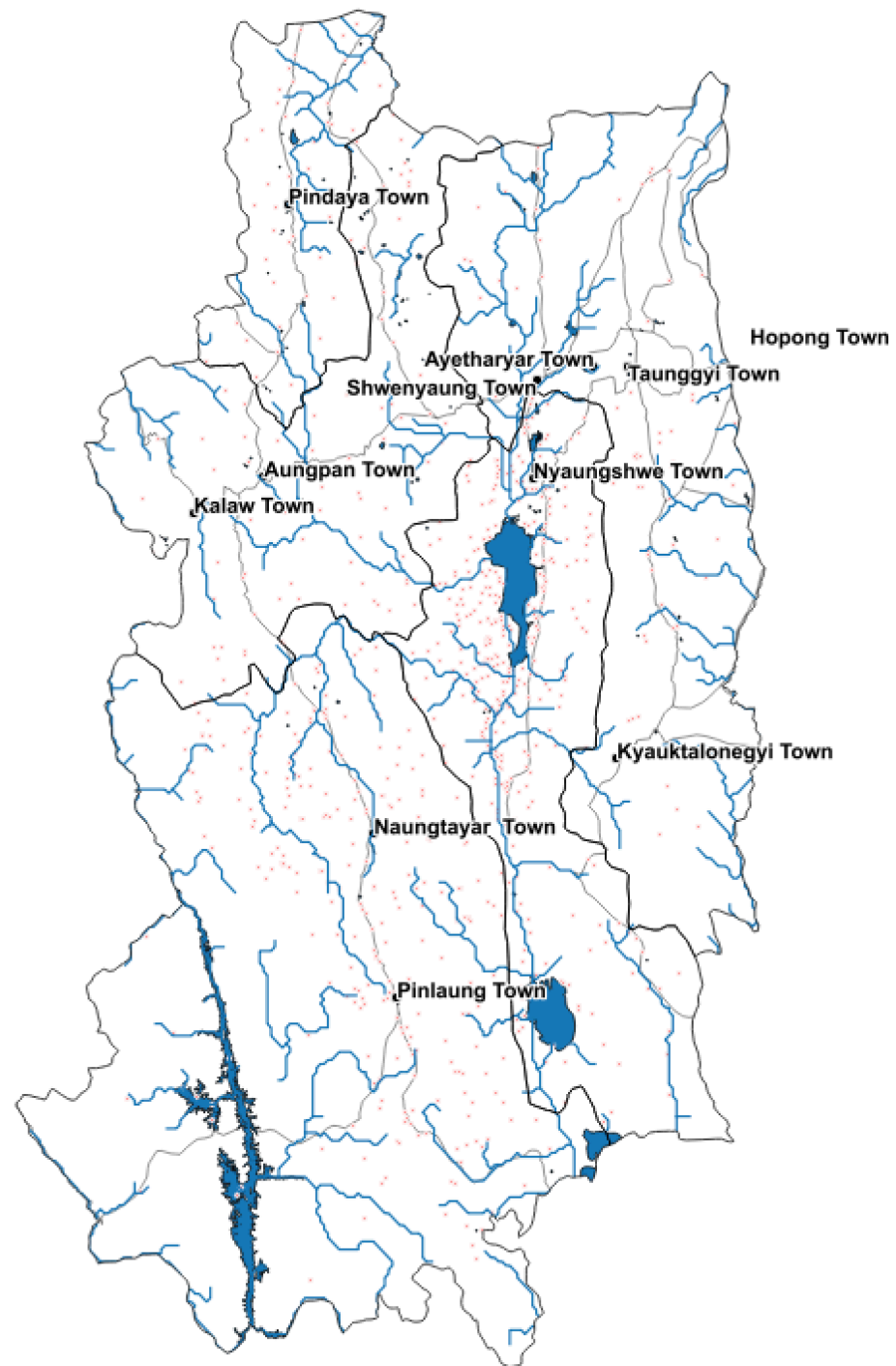


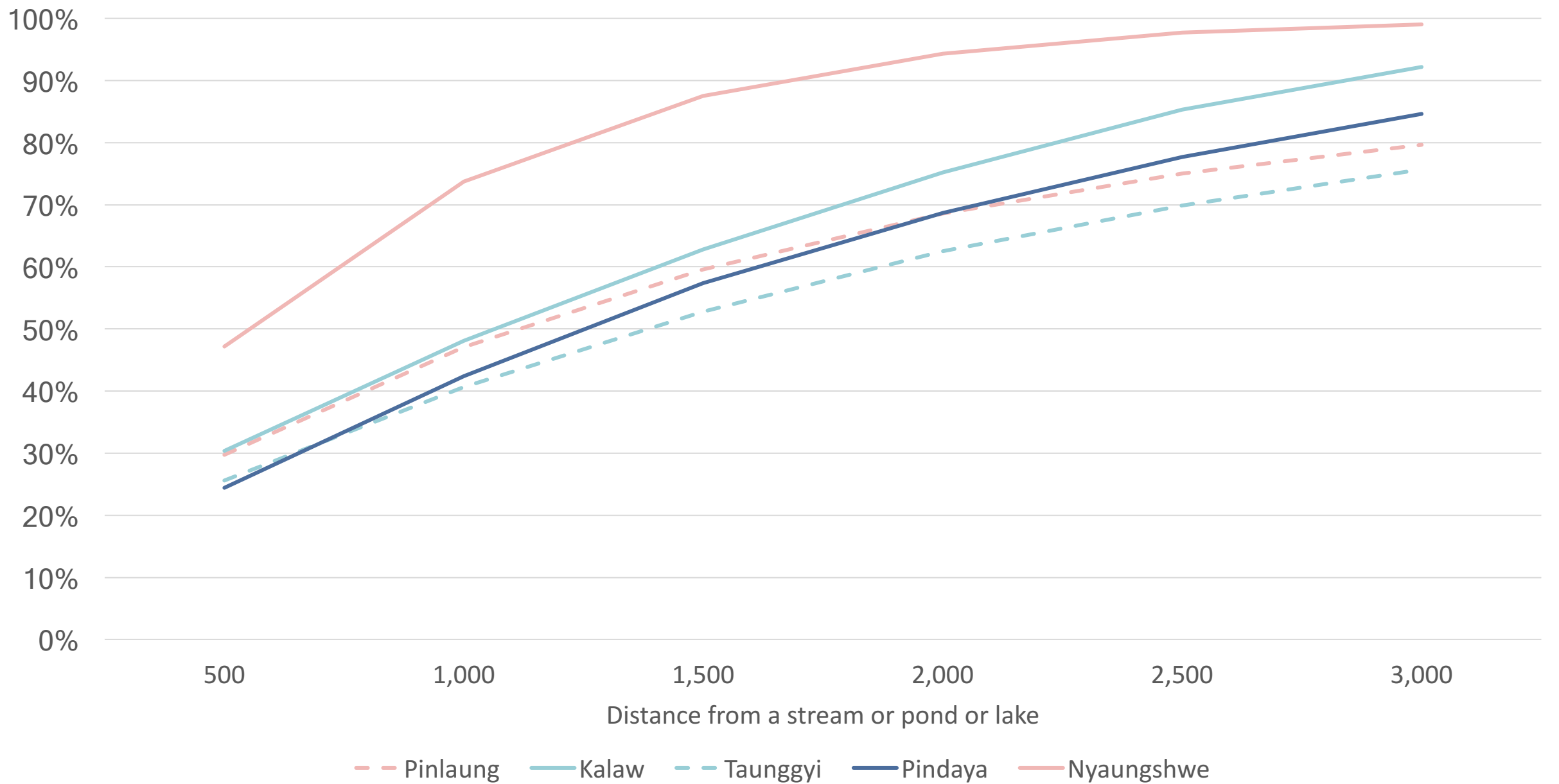
Image © 2016 DigitalGlobe

Google Earth



















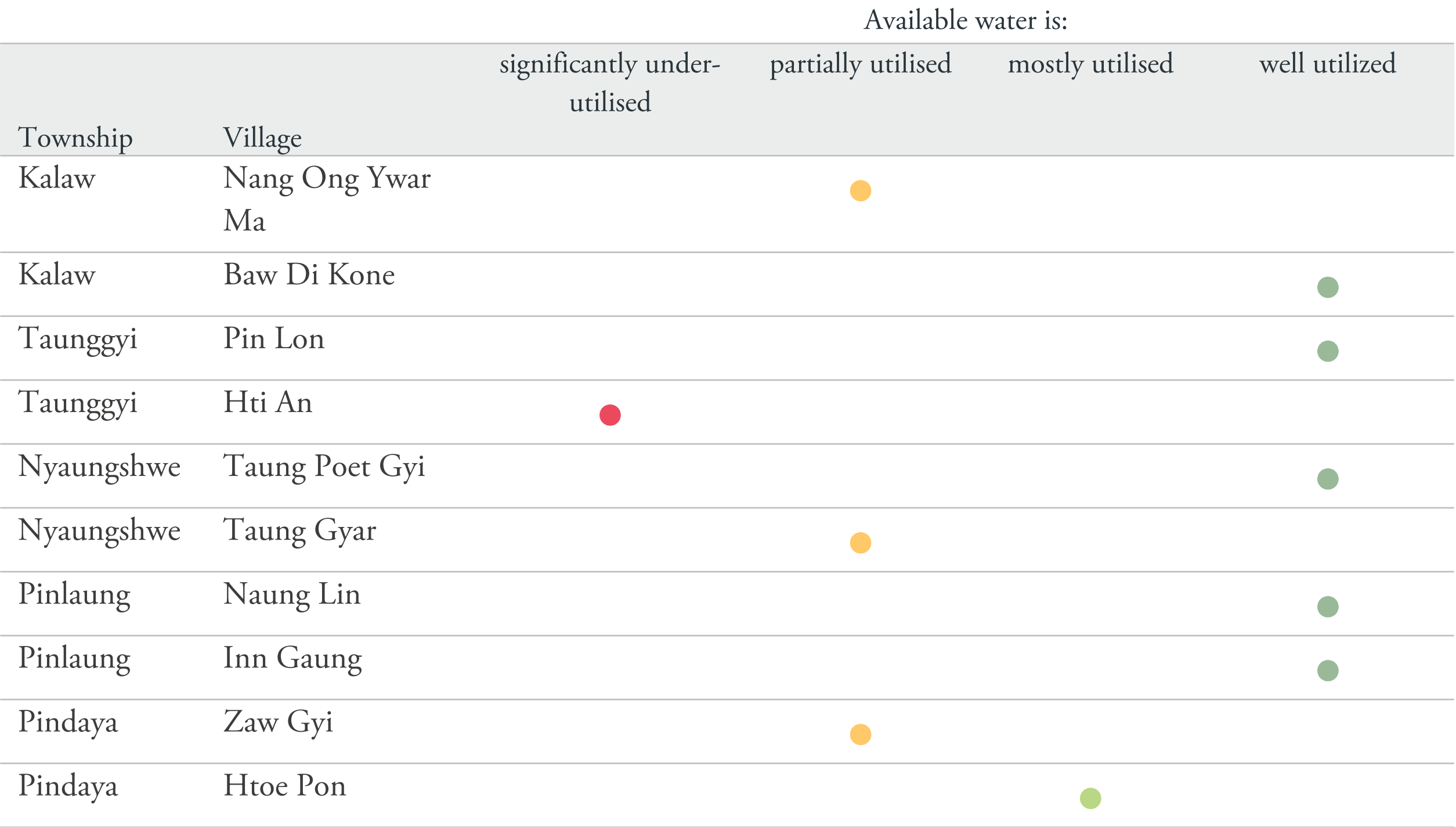










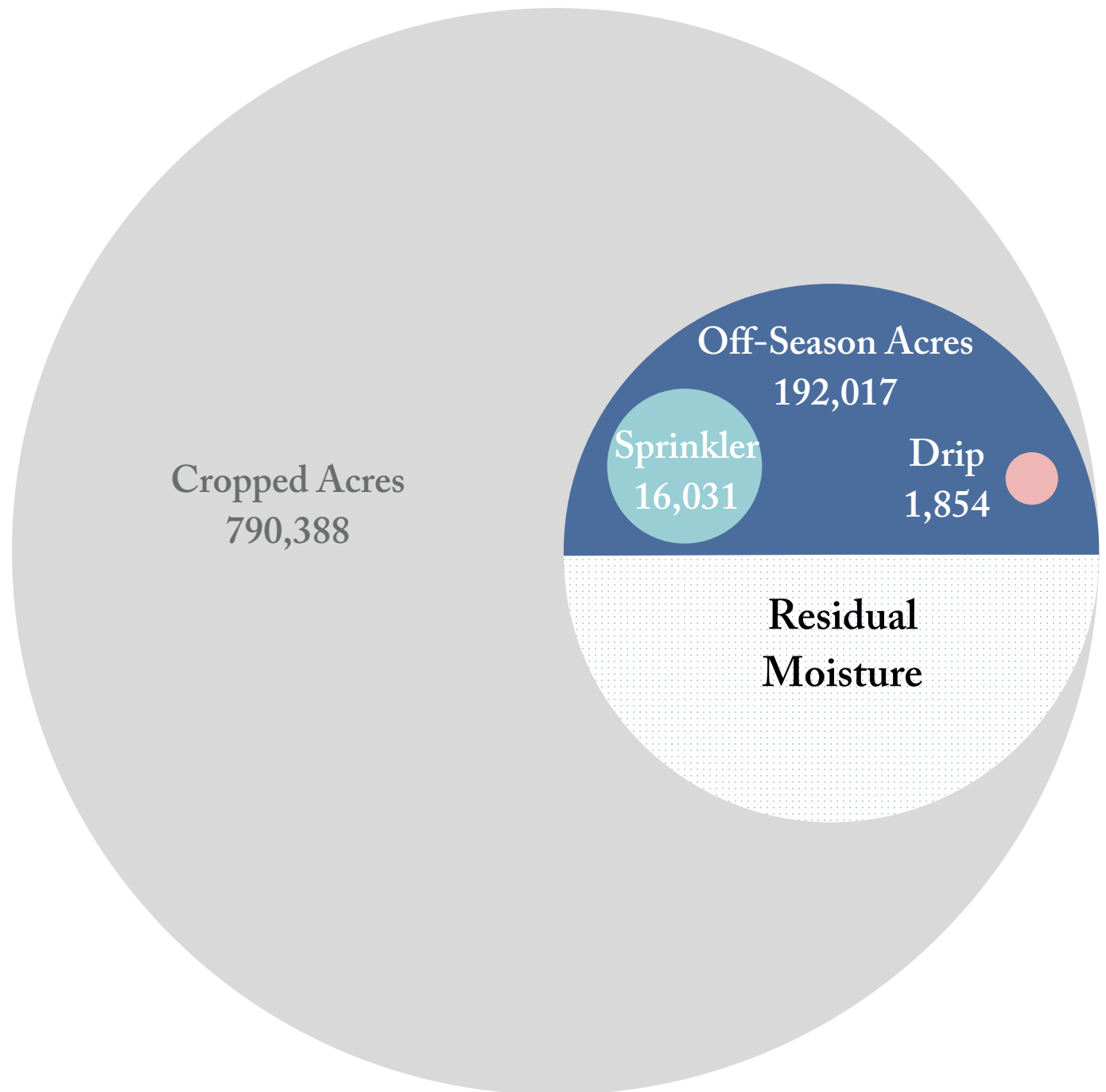




IRRIGATION PRACTICES

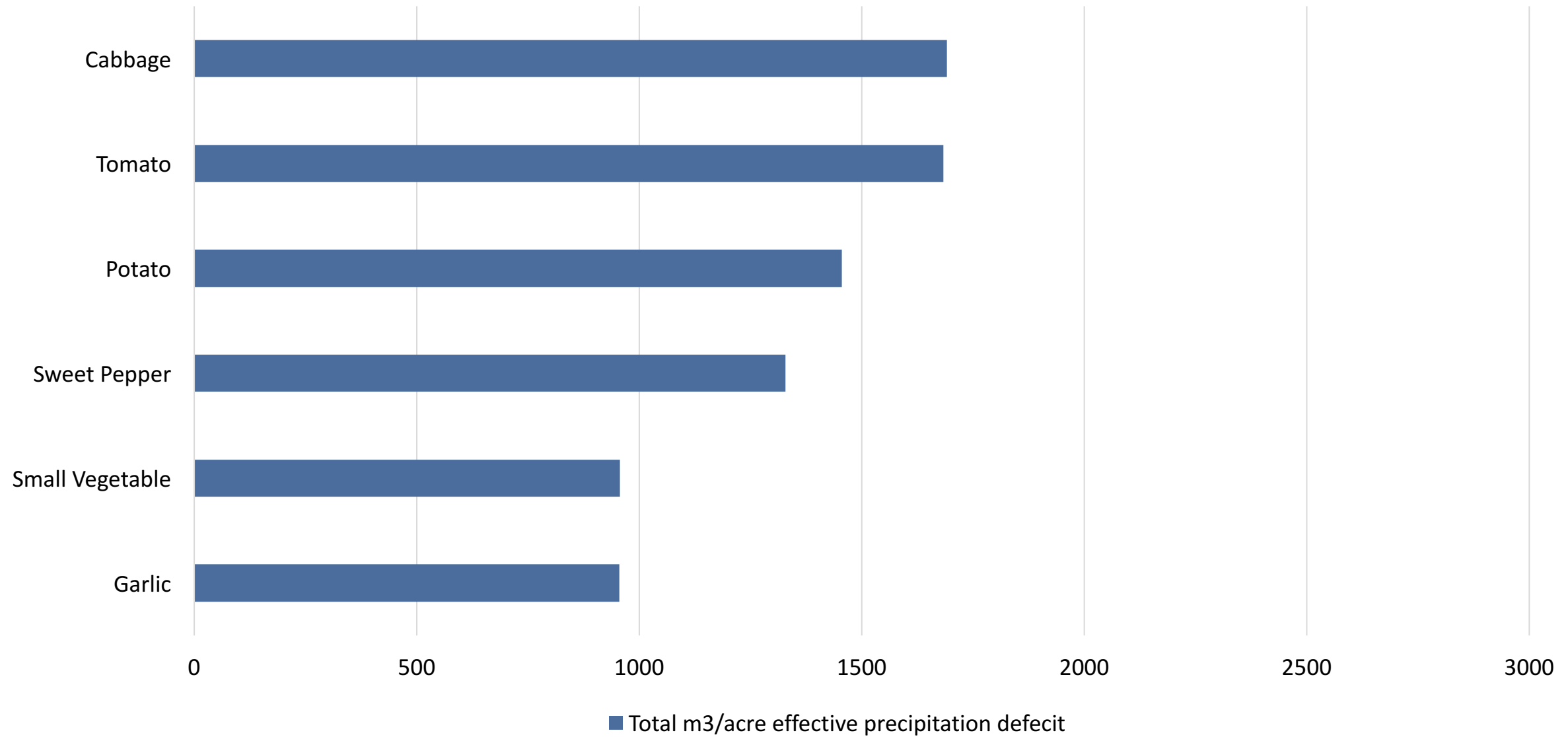
OFF-SEASON IRRIGATION

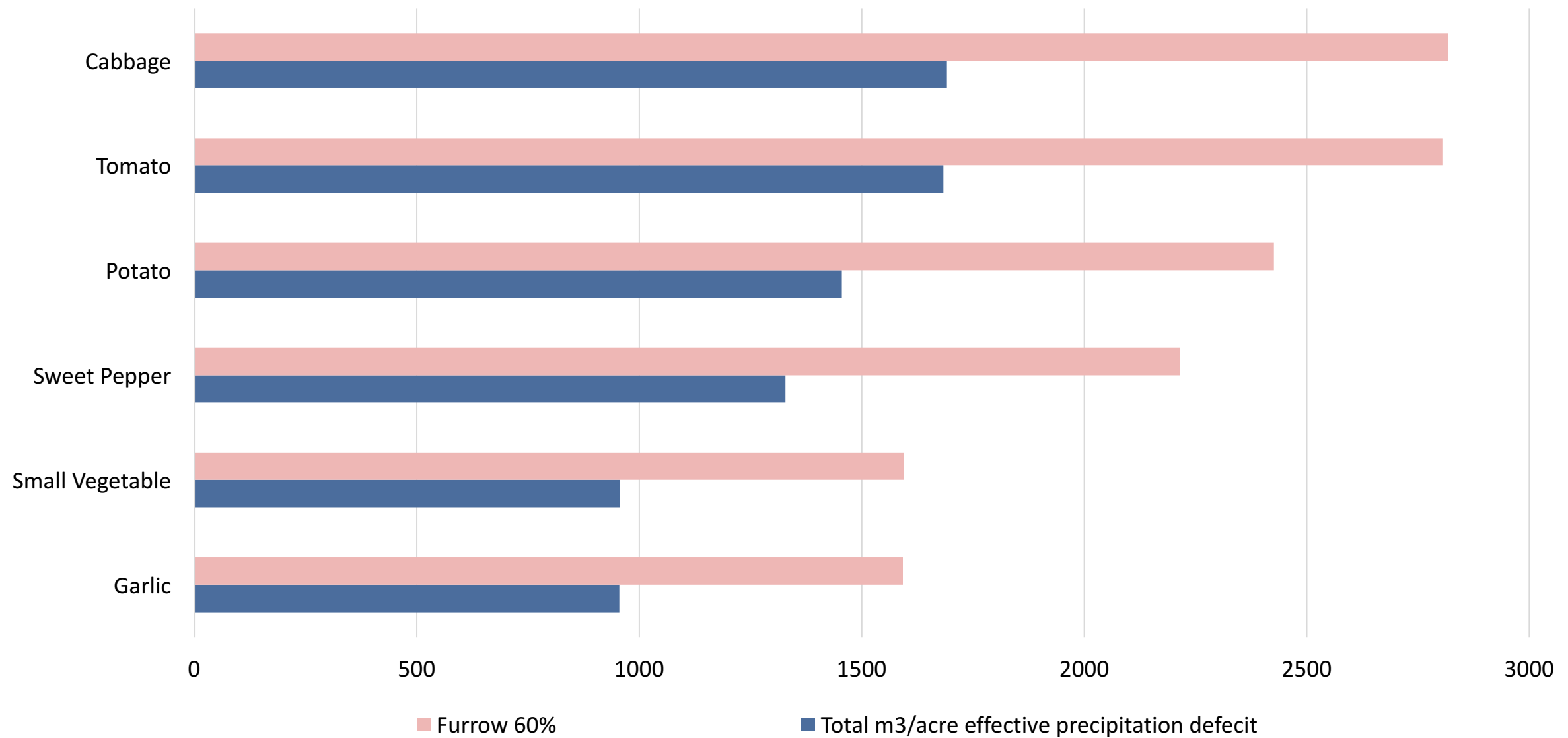
Taunggyi District

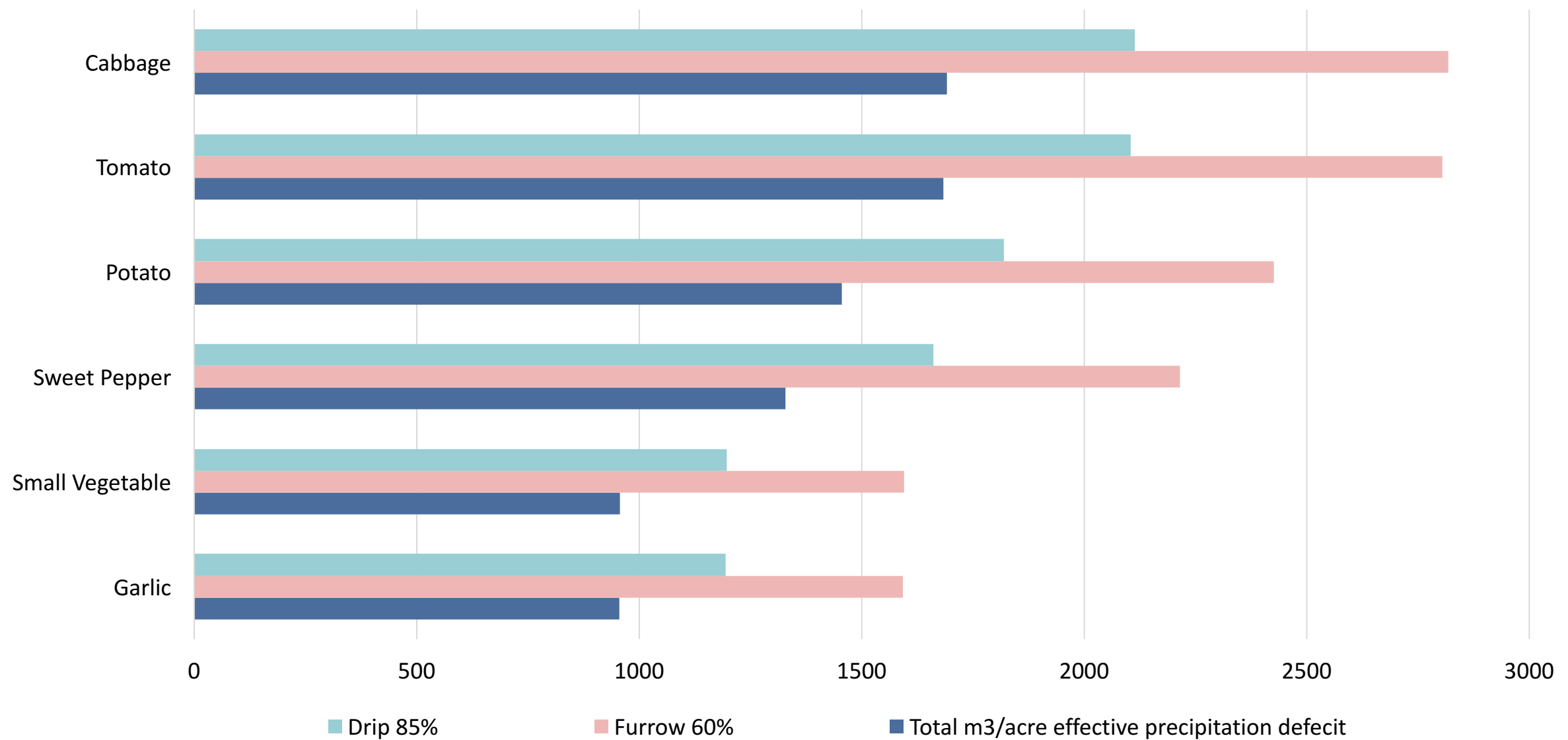


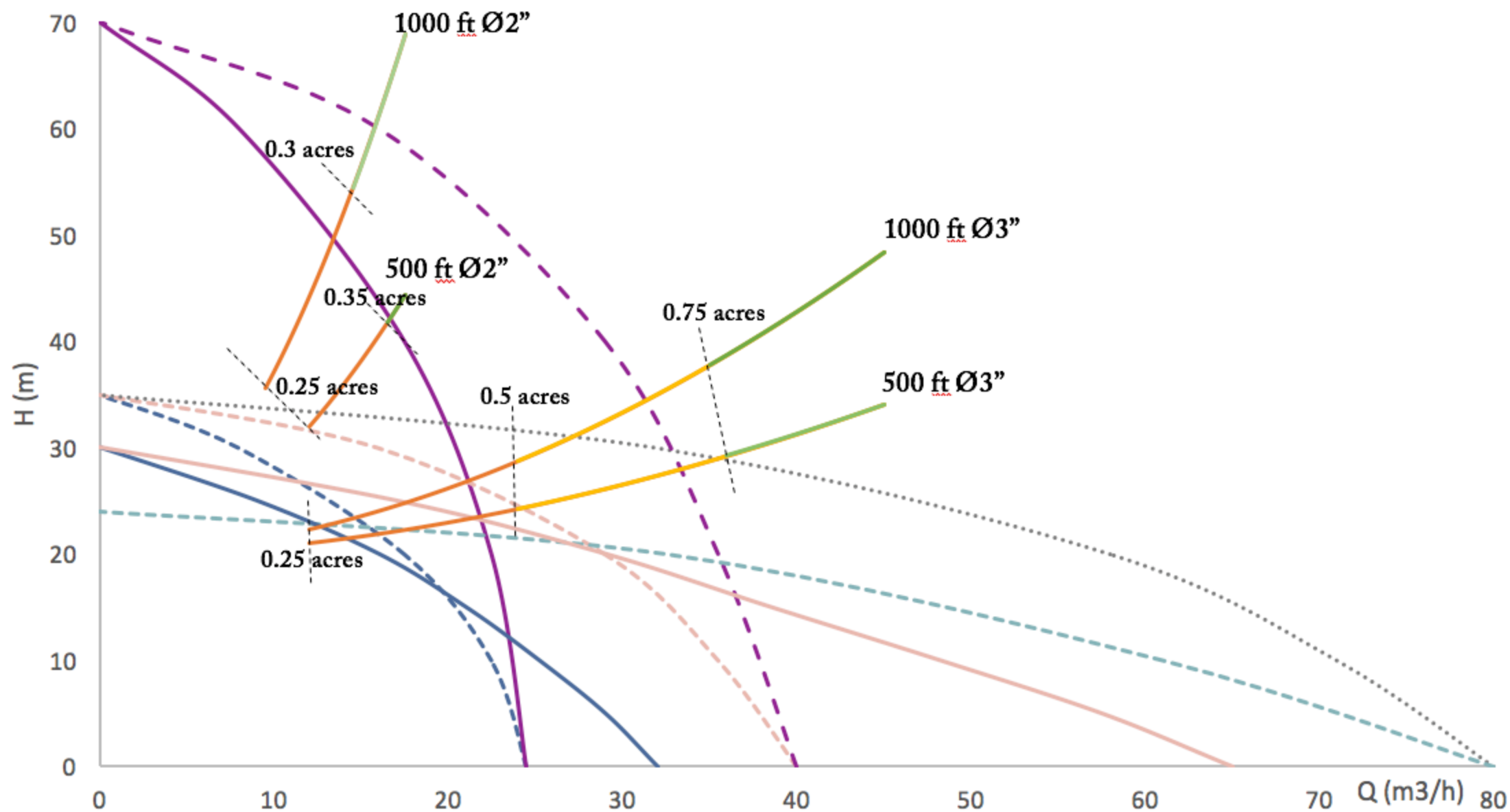












Cost estimates

Sprinkler

- 900,000 – 1,100,000 MMK/acre

Drip Systems

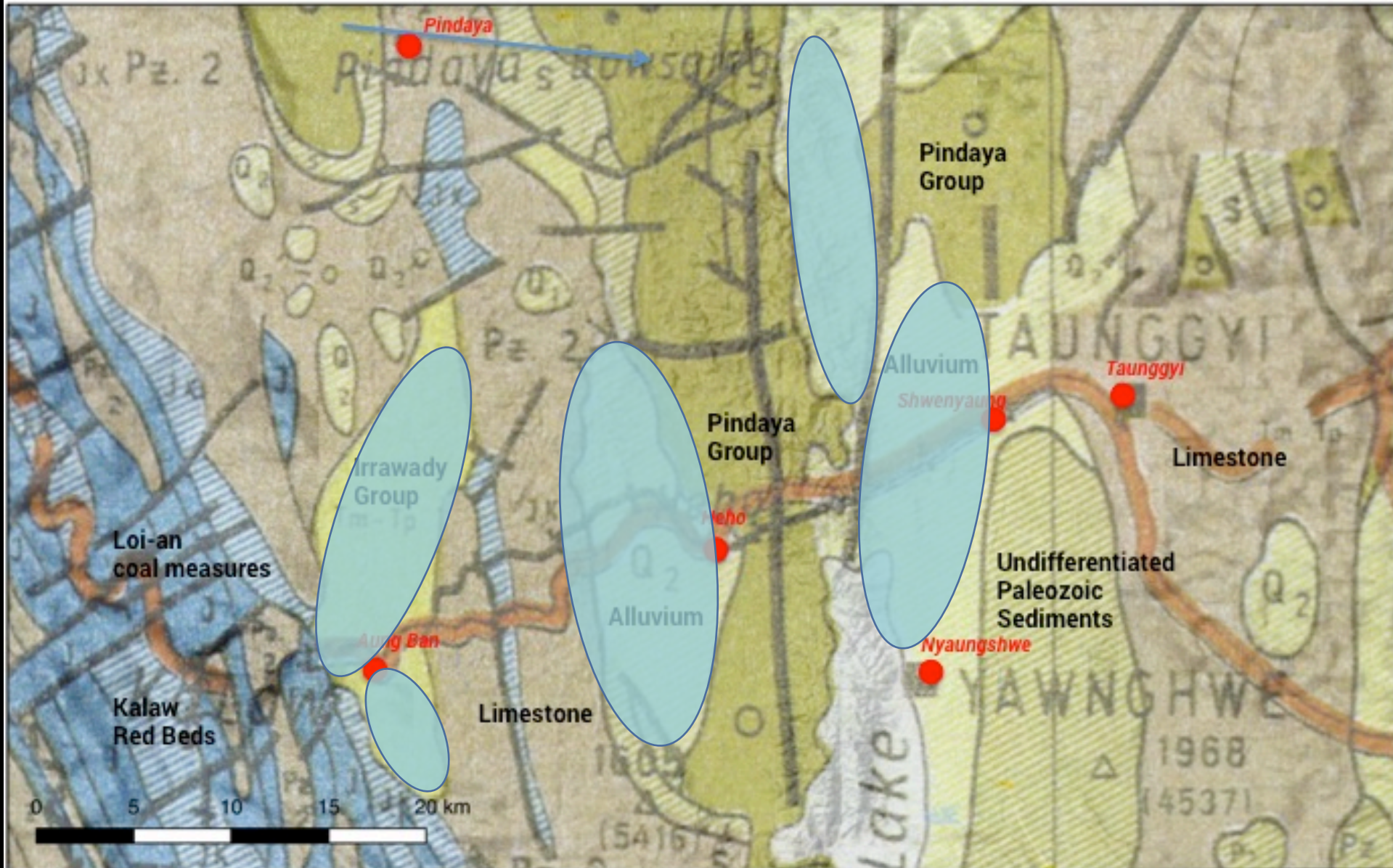
- 1,500,000 MMK / acre
- 900,000 MMK / acre
- 600,000 MMK / acre



NEW WATER

New Water Sources

- Springs
- Rainwater harvesting
- Dams
- Groundwater

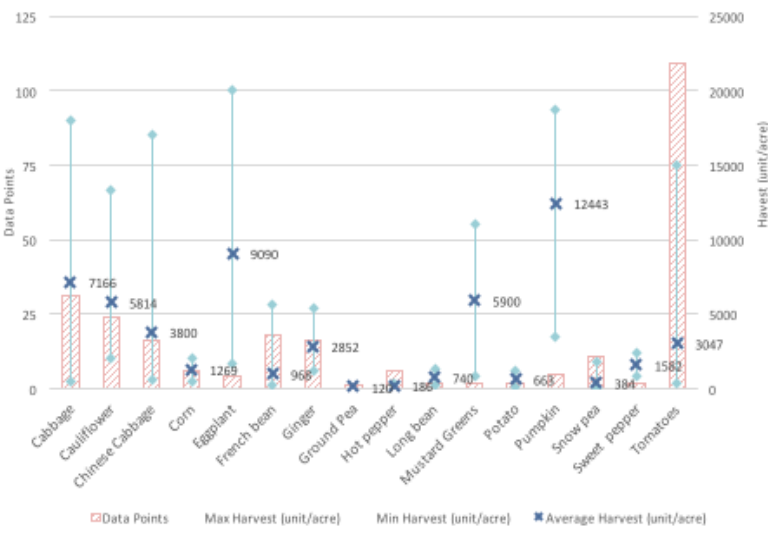


GROUND WATER RELIEF	Figure 1:		Geology and drilling report locations	
	Project:			
	Date:	21/02/17	Author:	GB

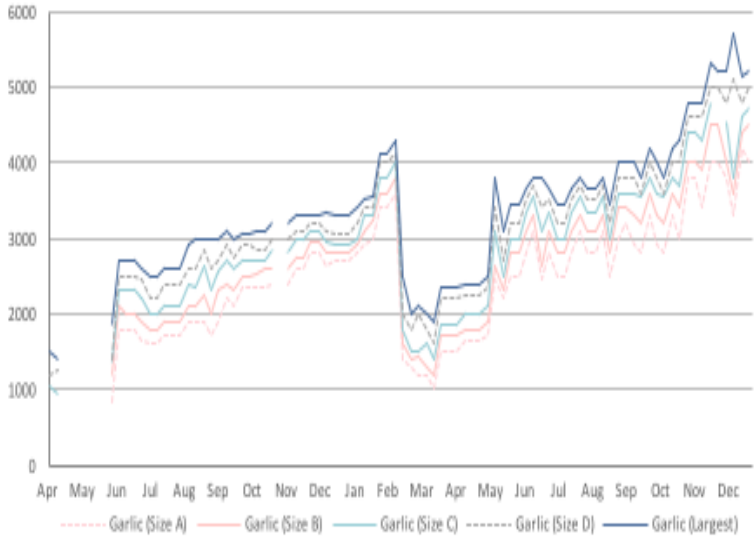


FINANCIAL ANALYSIS

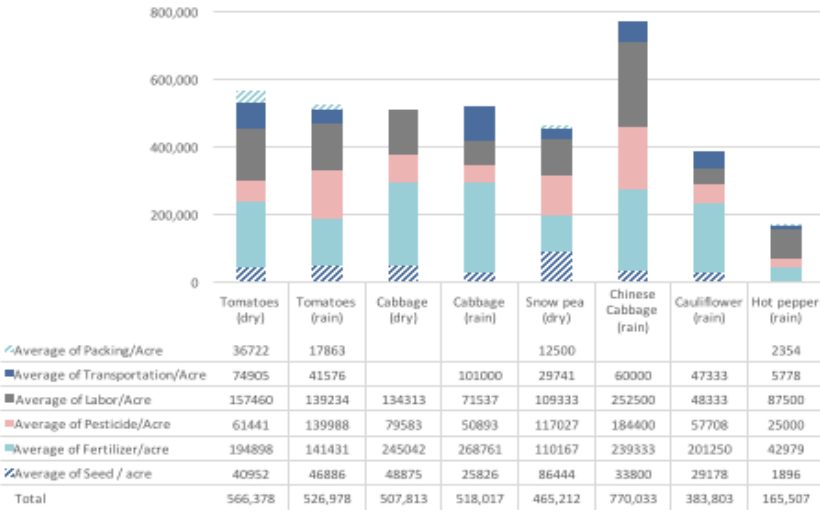
Yields



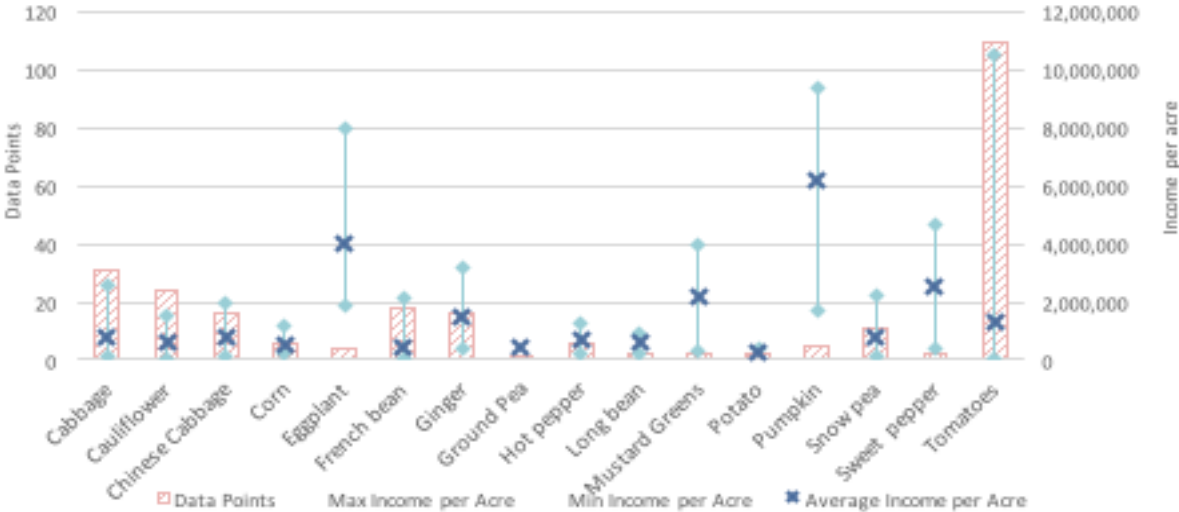
Selling Price



Input Costs



Net Margin per Acre



Net Margin per Acre

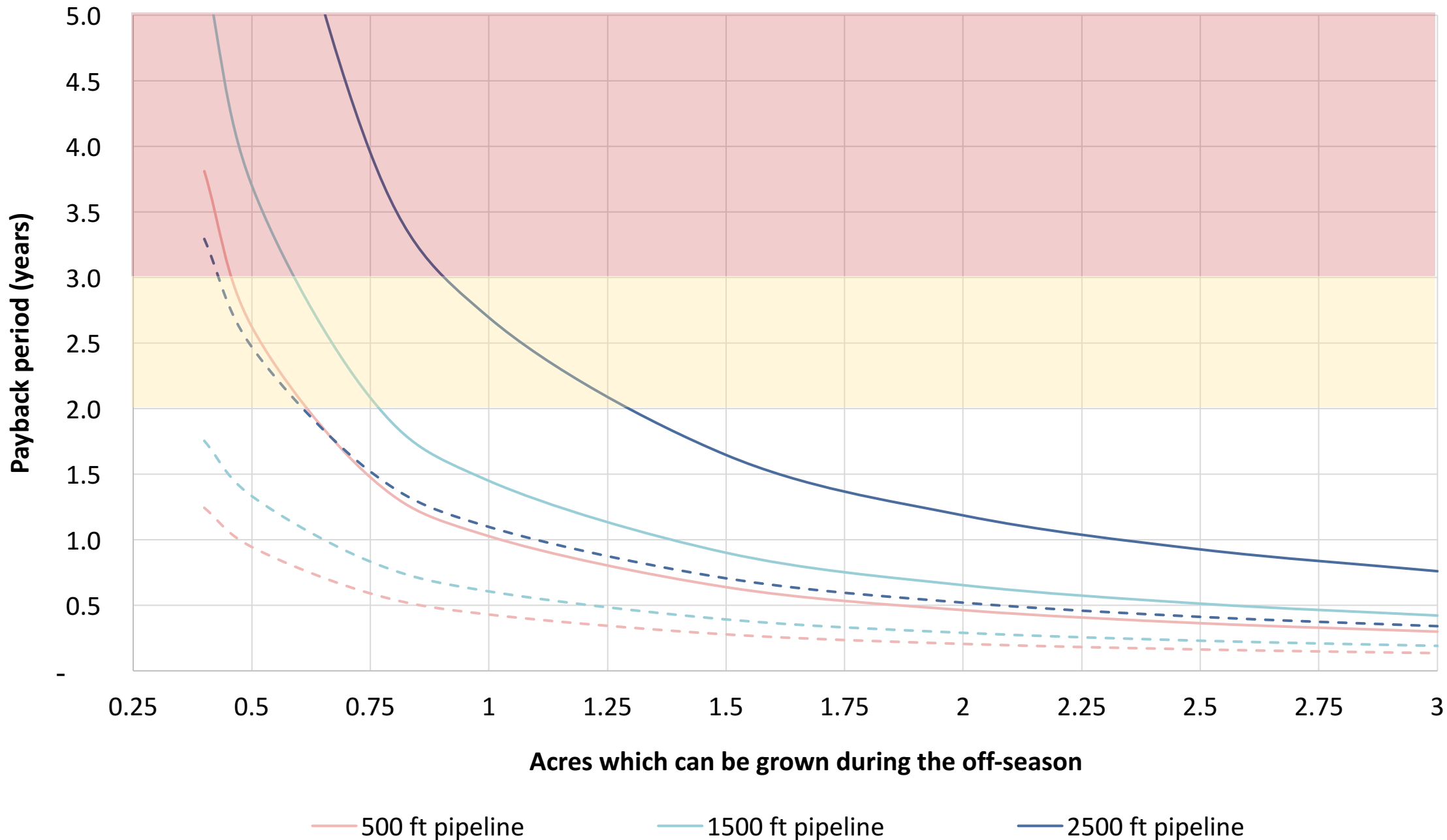
Net margin figures for cost modelling

- | | |
|--|-----------------|
| 1: Current 'unimproved' practises, average net margin per acre | = 800,000 MMK |
| 2: 'Improved' practises (without drip irrigation), average net margin per acre | = 1,600,000 MMK |

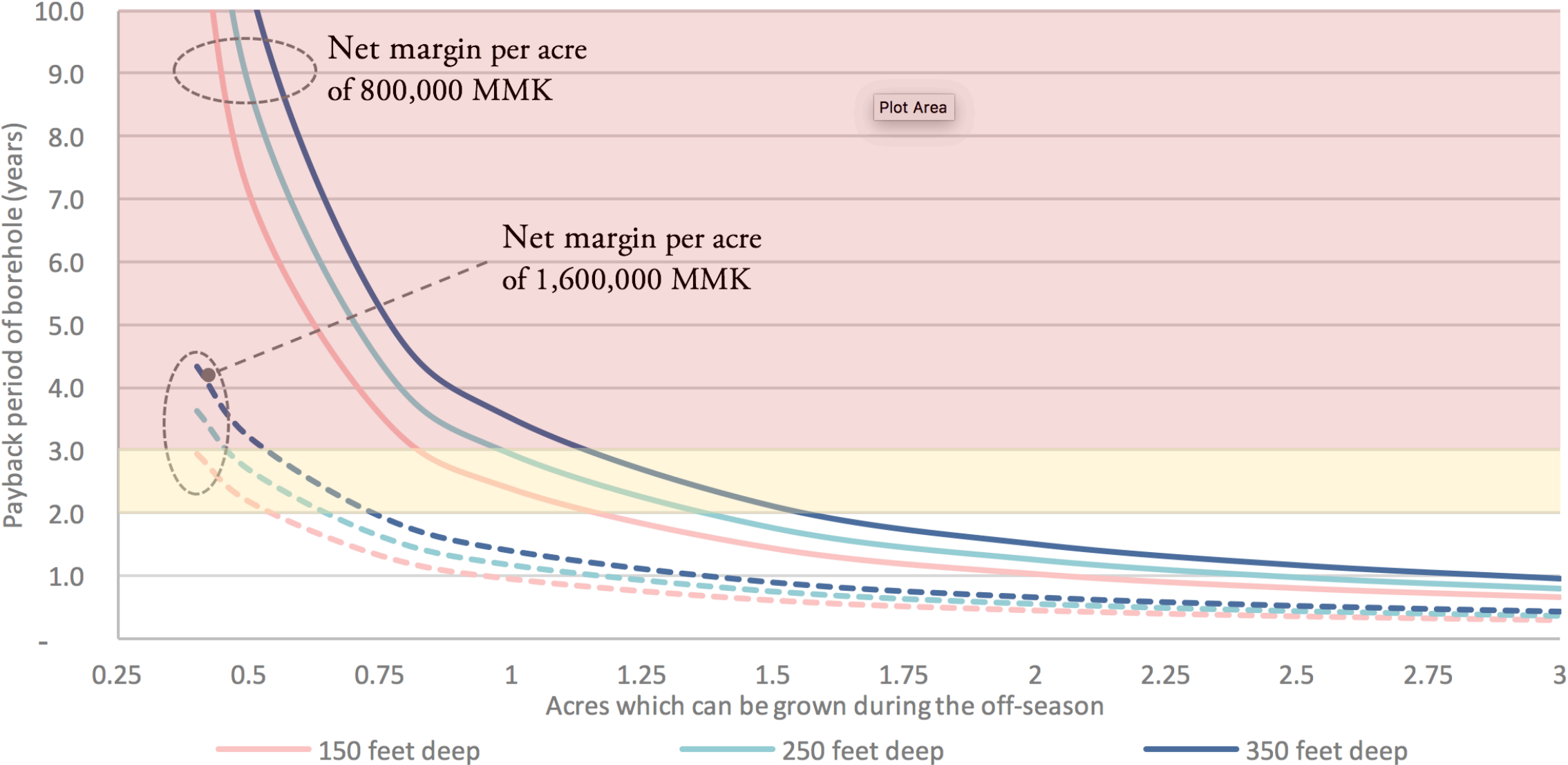
Cost Benefit Analysis

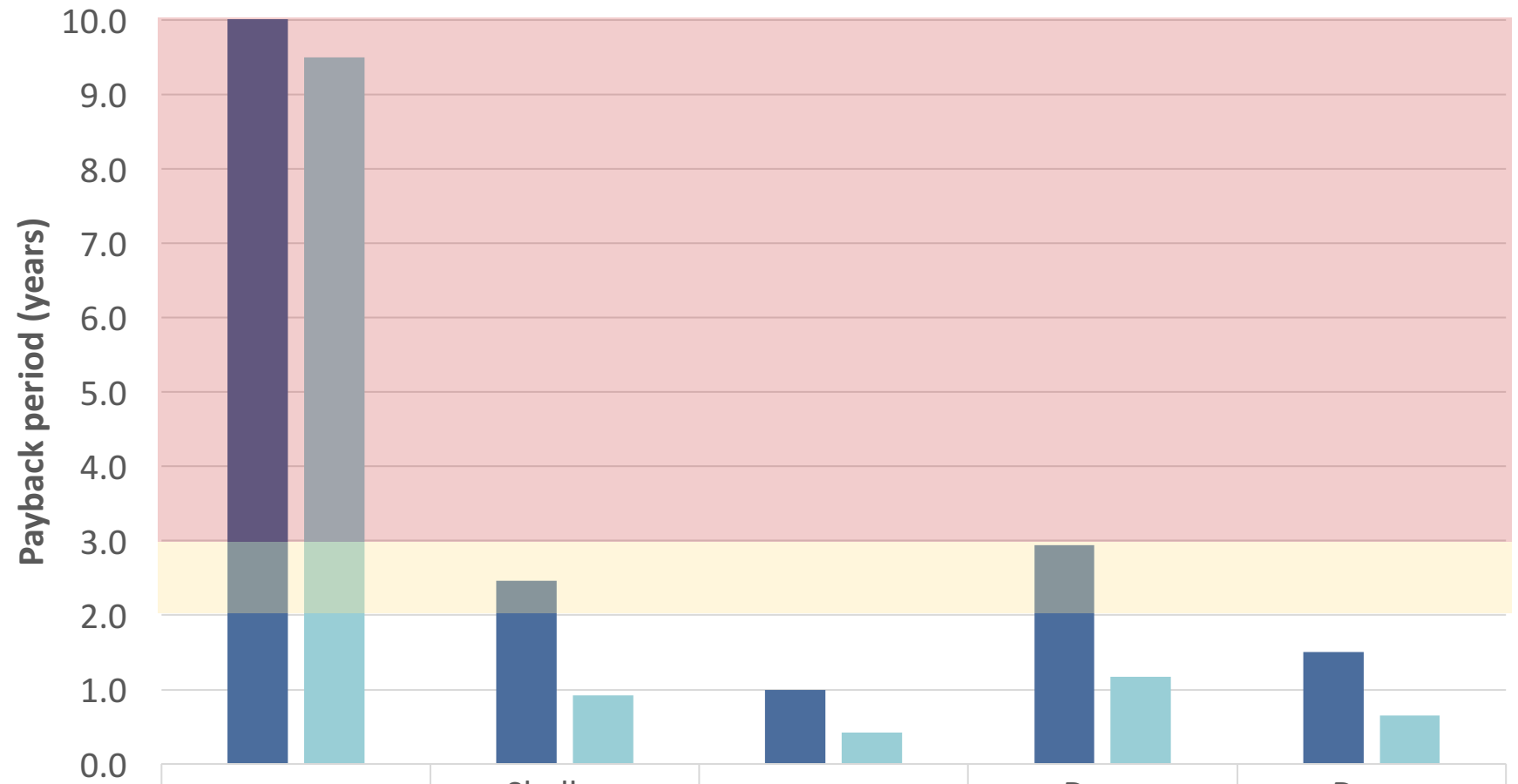
- Pumping from existing streams
 - Rainwater harvesting
 - Shallow groundwater
 - Deep groundwater
-
- Dams

Pumping from Existing Streams

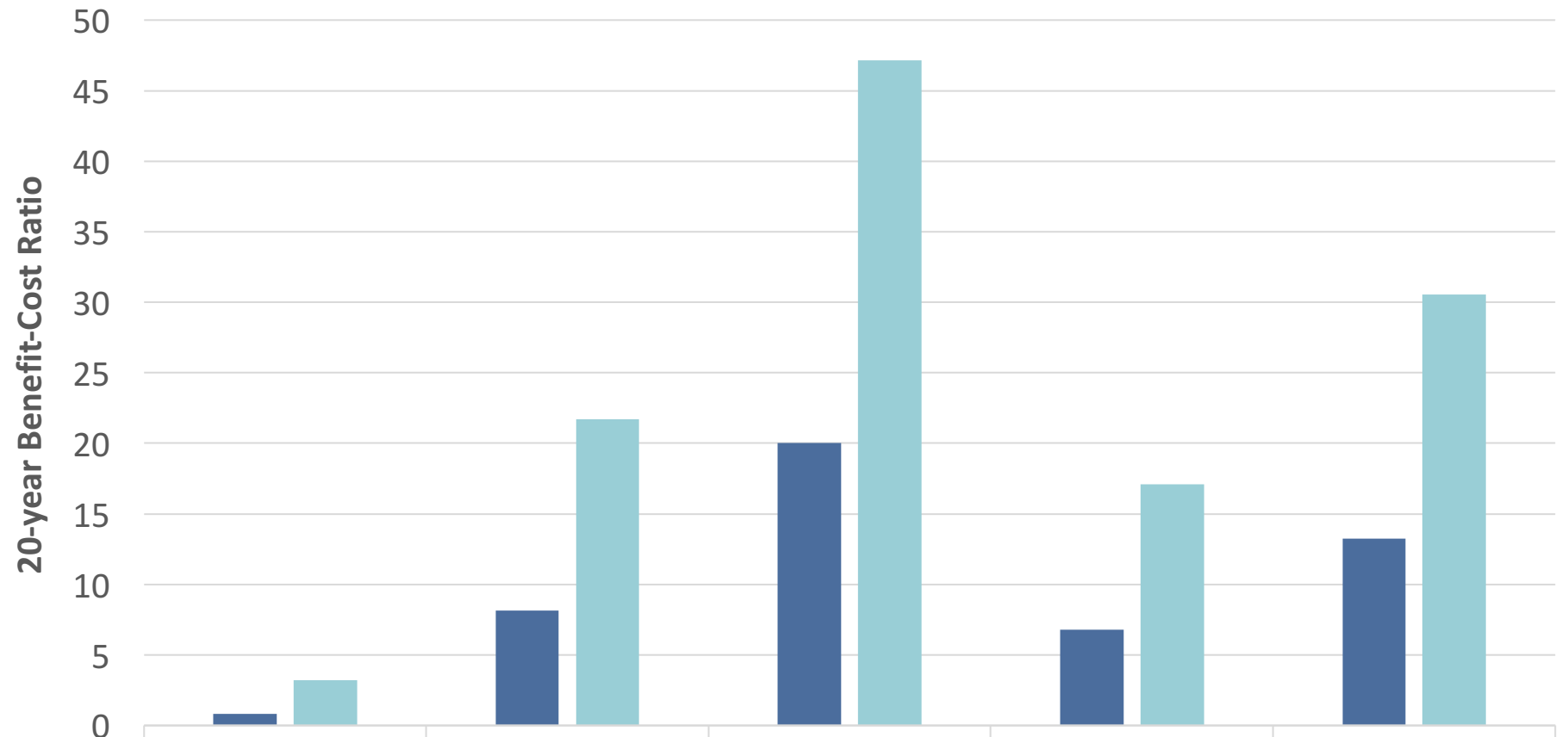


New Deep Tube Wells

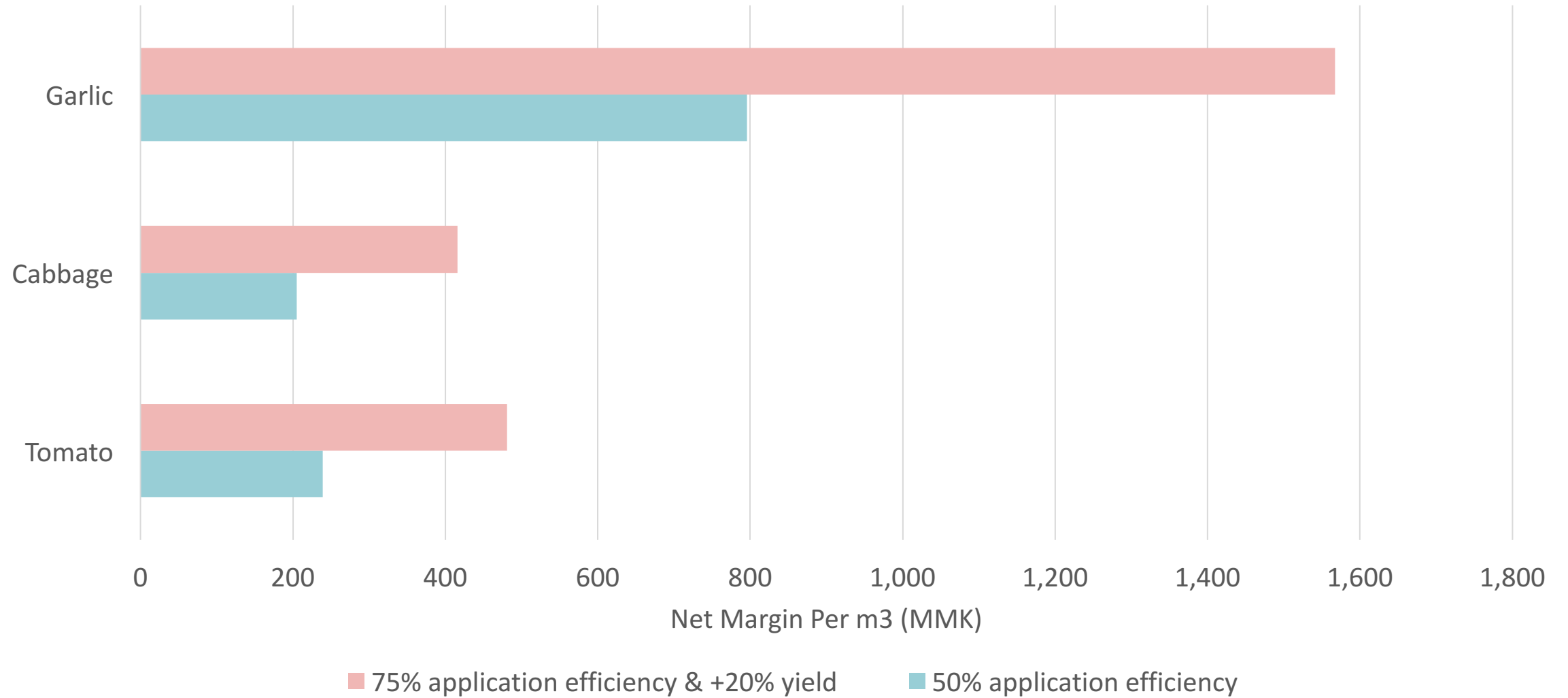




■ 800,000 MMK per acre net margin	23.8	2.5	1.0	2.9	1.5
■ 1,600,000 MMK per acre net margin	9.5	0.9	0.4	1.2	0.7

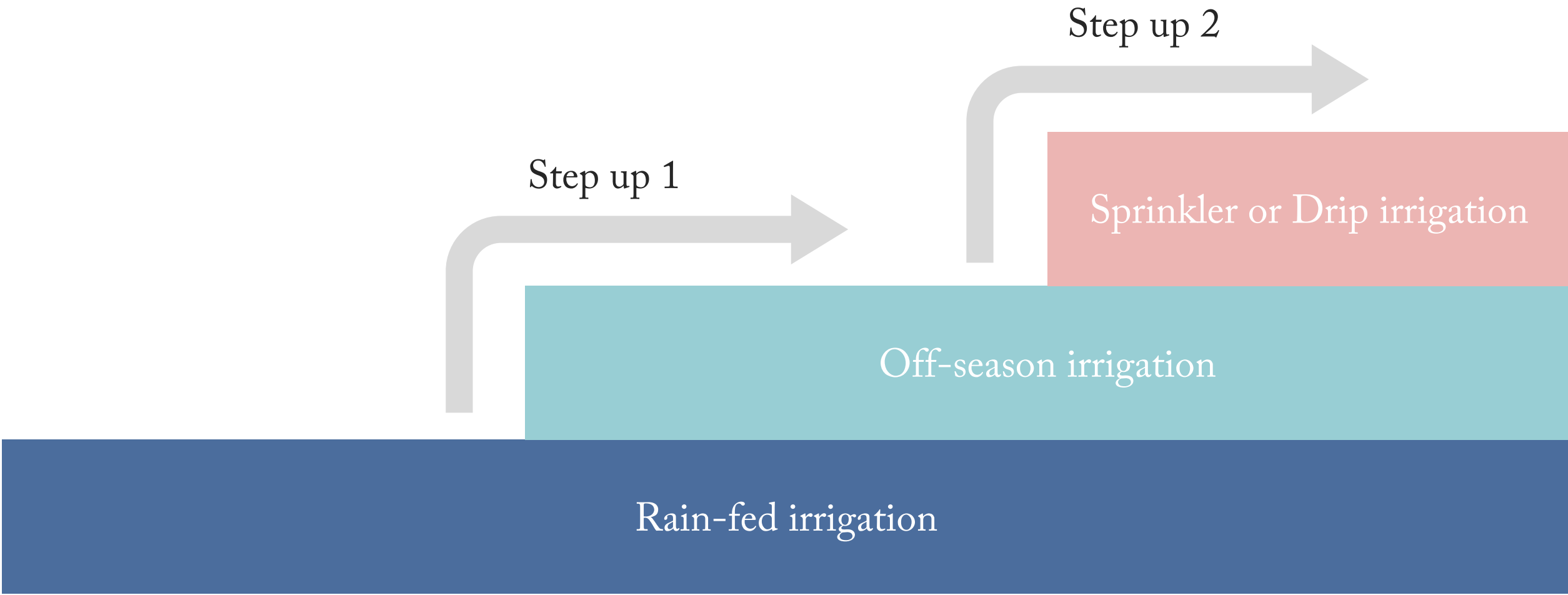


■ 800,000 MMK per acre net margin	0.84	8.1	20.0	6.8	13.3
■ 1,600,000 MMK per acre net margin	3.23	21.7	47.1	17.1	30.6





BARRIERS



Barriers: Increasing water usage











Township	Village	Risk of low selling price or unviable crop	Access to funds or affordable credit	Waiting for proof of cost benefit	No knowledge of the solution
Kalaw	Nang Ong Ywar Ma				
Taunggyi	Hti An				
Nyaungshwe	Taung Gyar				
Pindaya	Zaw Gyi				
Pindaya	Htoe Pon				





Image © 2016 DigitalGlobe

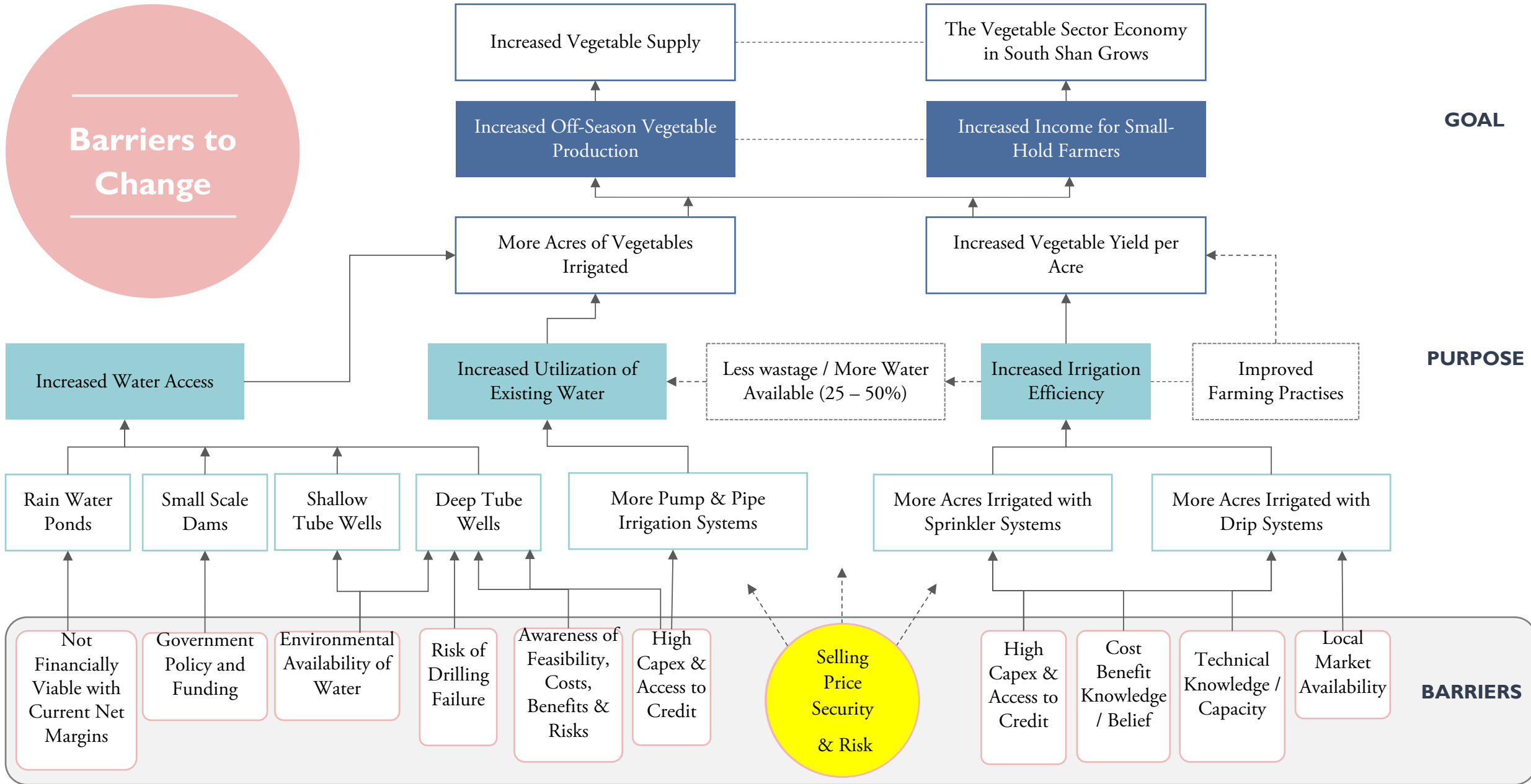


Image © 2016 CNES / Astrium

Imagery Date: 11/25/2016 20°

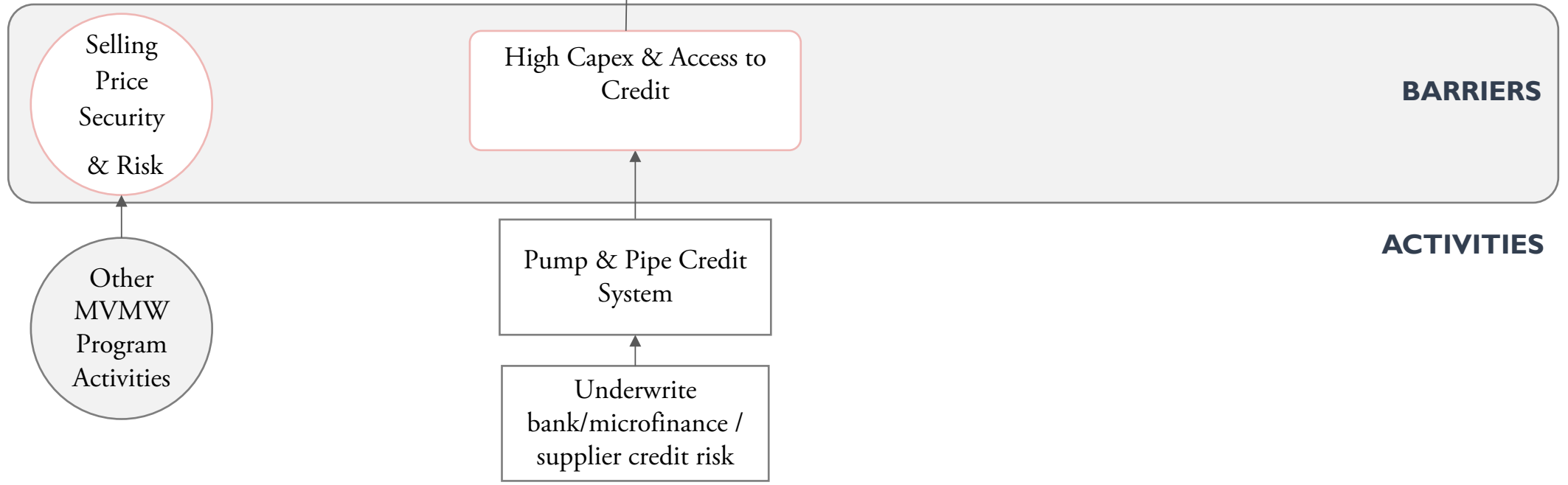
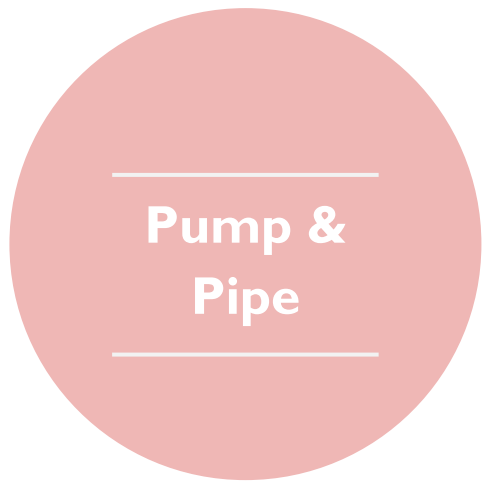
Barriers: Sprinkler & drip utilization

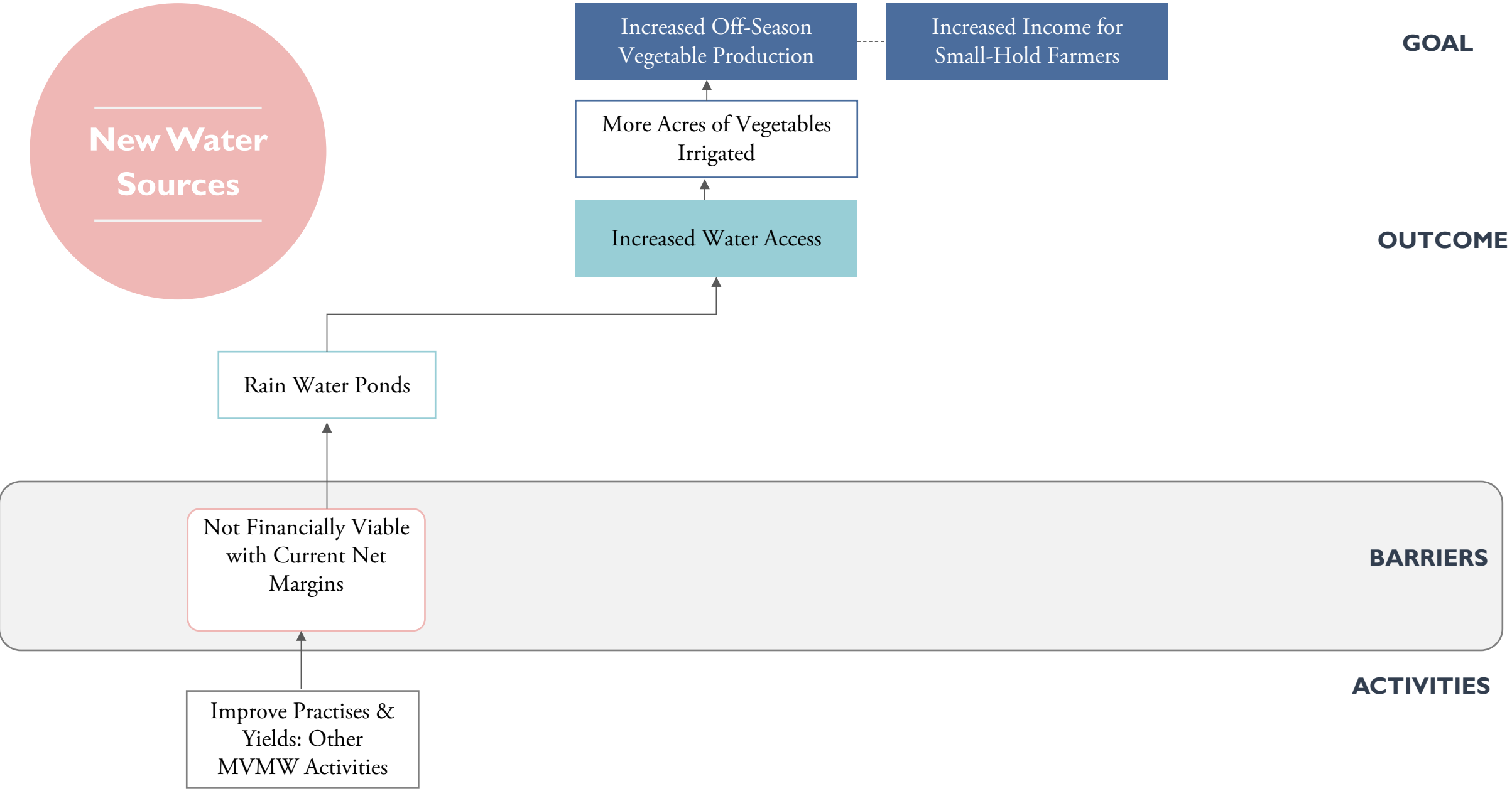
		Risk of low selling price or unviable crop	Access to funds or affordable credit	Uncertainty of the return on investment	Not convinced drip will work
Kalaw	Nang Ong Ywar Ma	●	●	●	
Taunggyi	Pin Lon	●		●	
Taunggyi	Hti An	●	●	●	
Nyaungshwe	Taung Poet Gyi			●	
Pinlaung	Naung Lin		●		
Pinlaung	Inn Gaung			●	●
Pindaya	Zaw Gyi	●	●	●	
Pindaya	Htoe Pon		●		

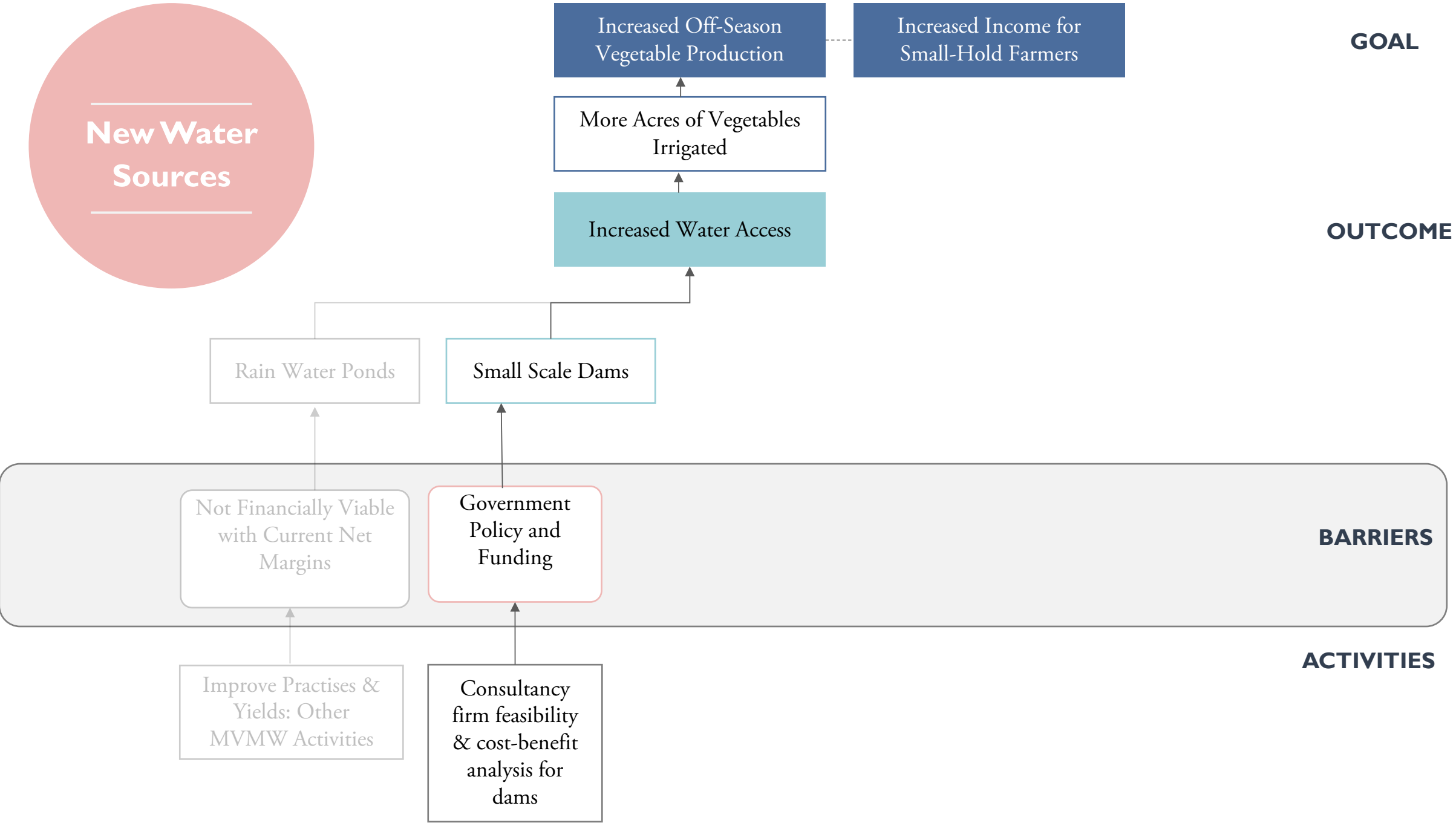


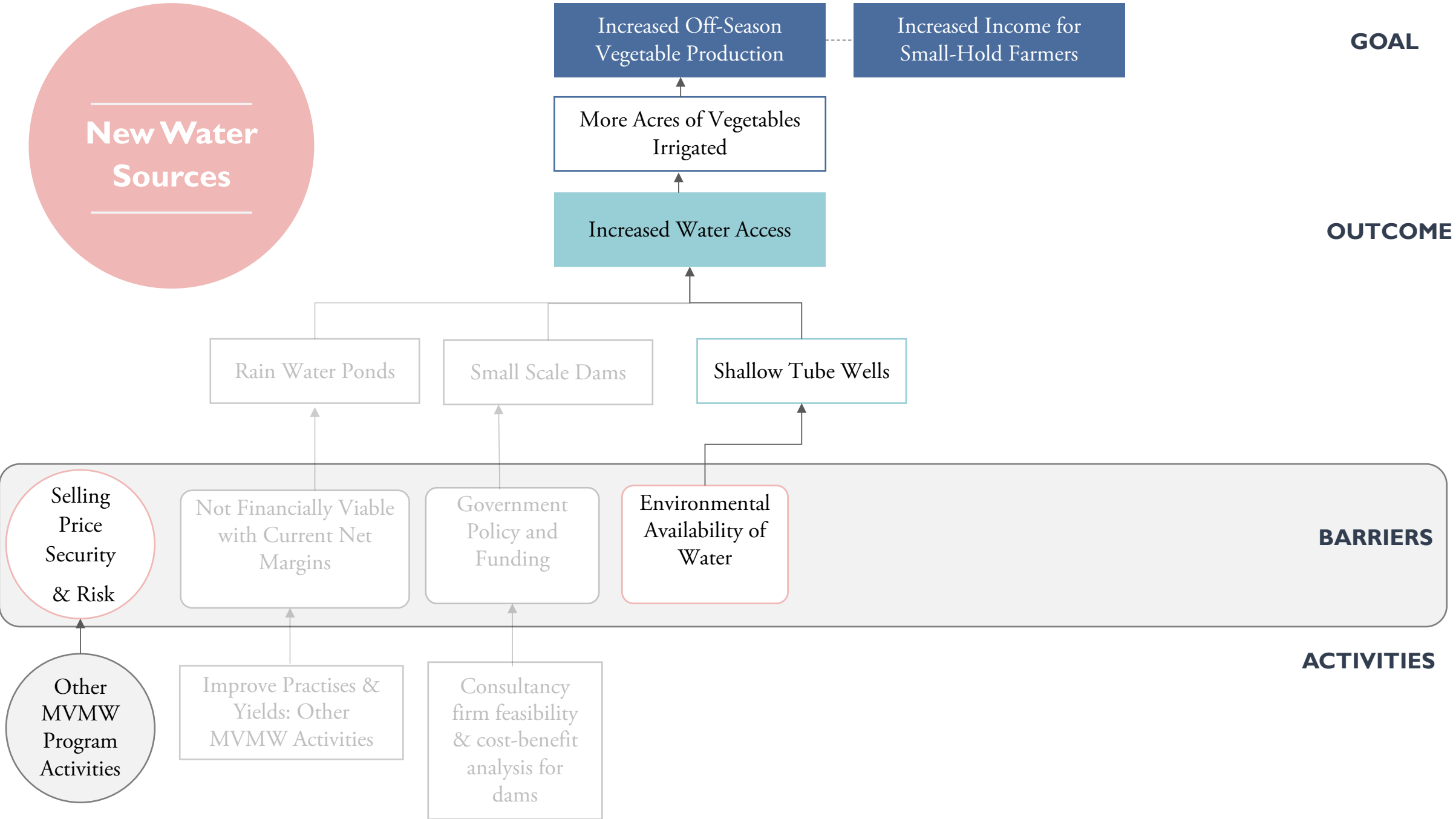
INTERVENTIONS

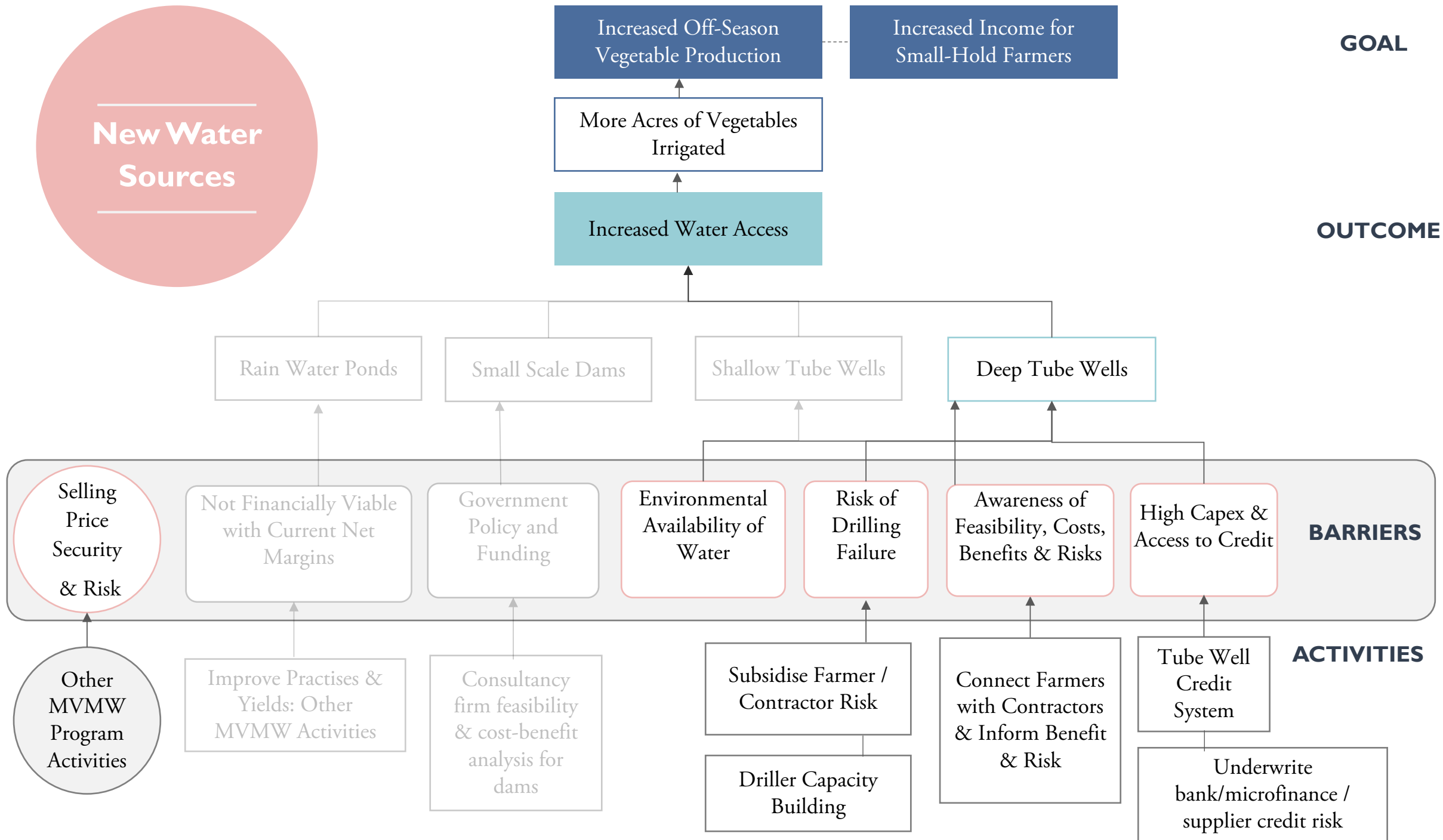
Overcoming the barriers

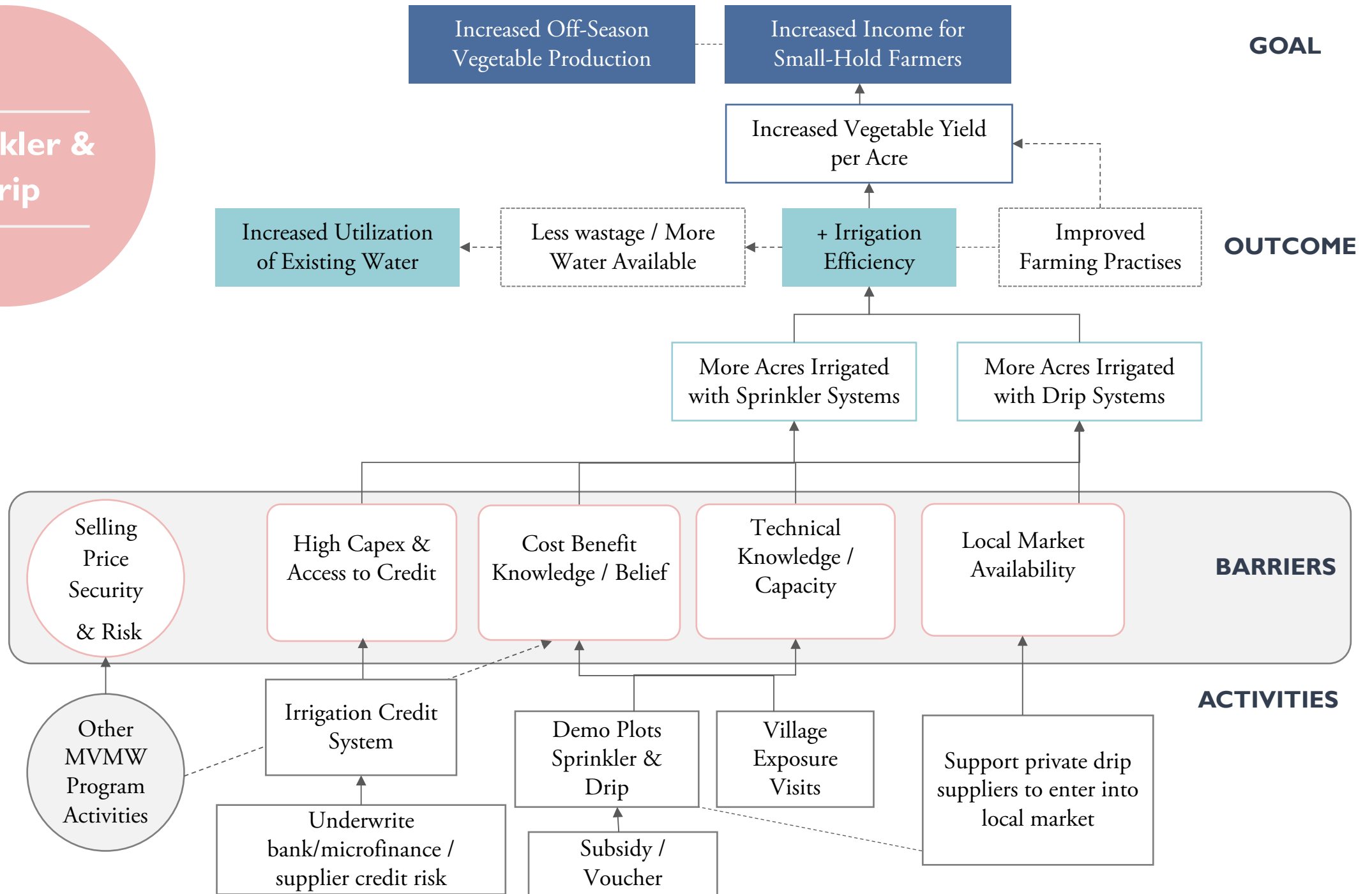


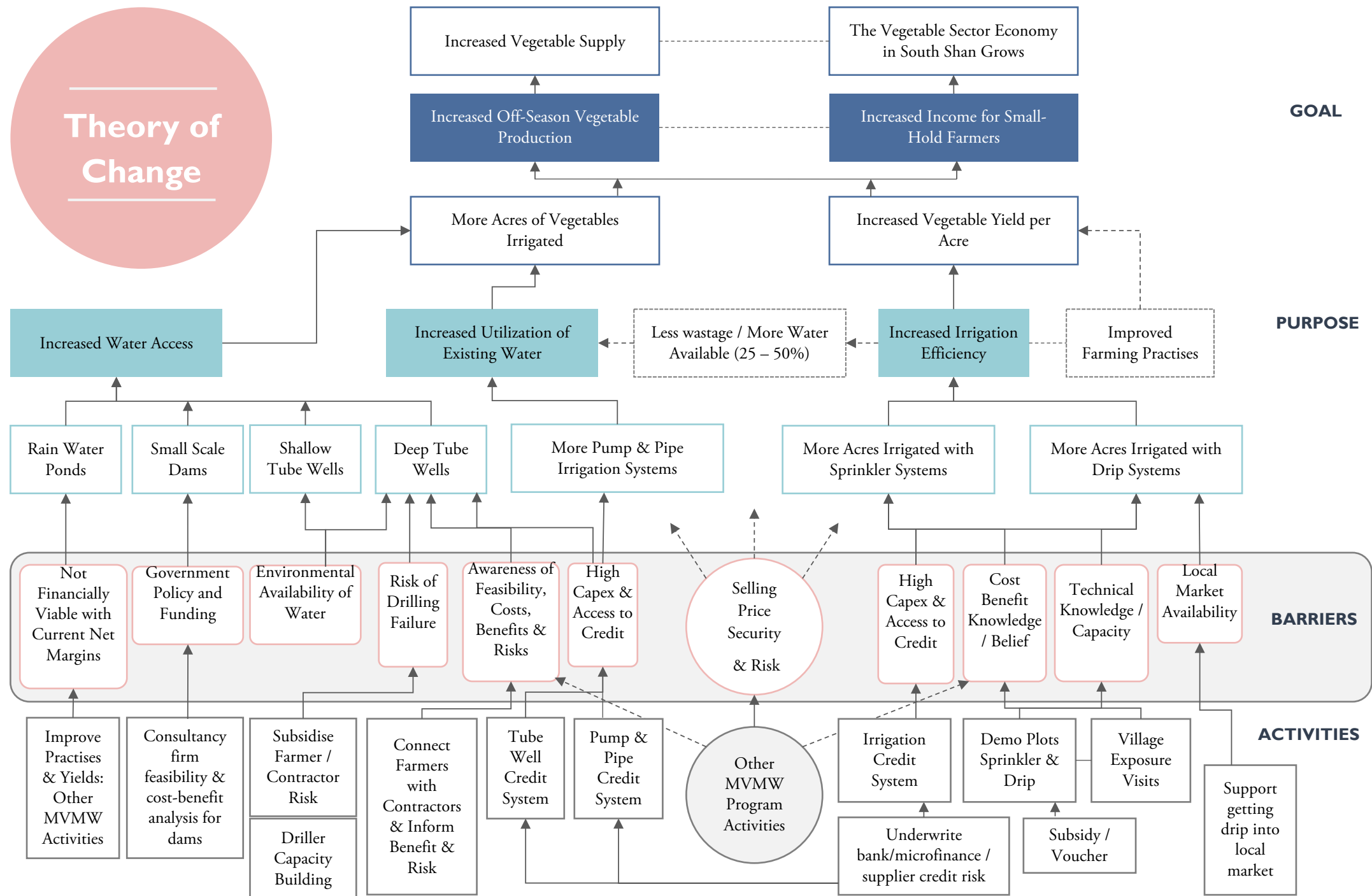














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THANK YOU

Questions