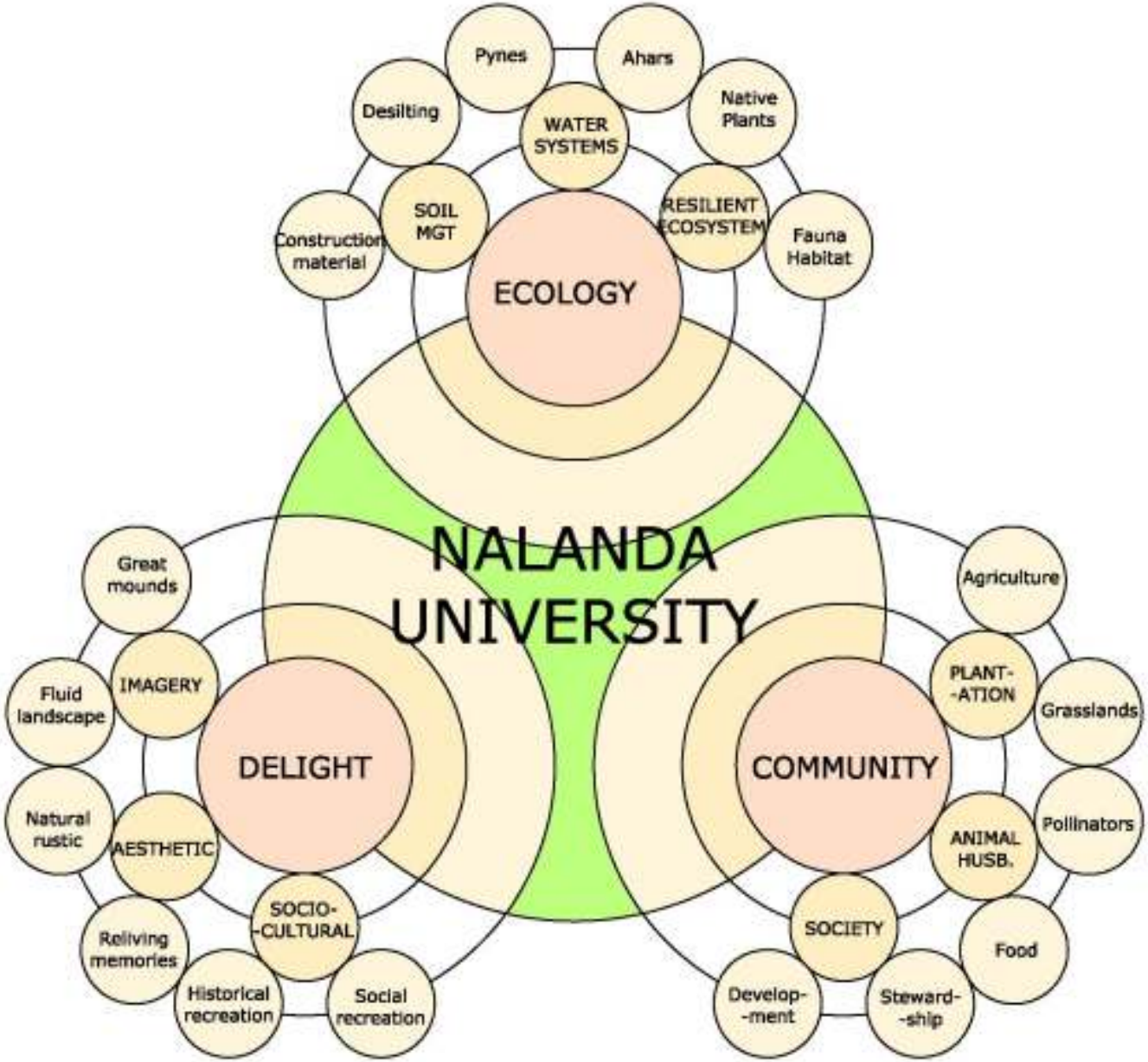
Proposed Landscape Development

for

Nalanda University

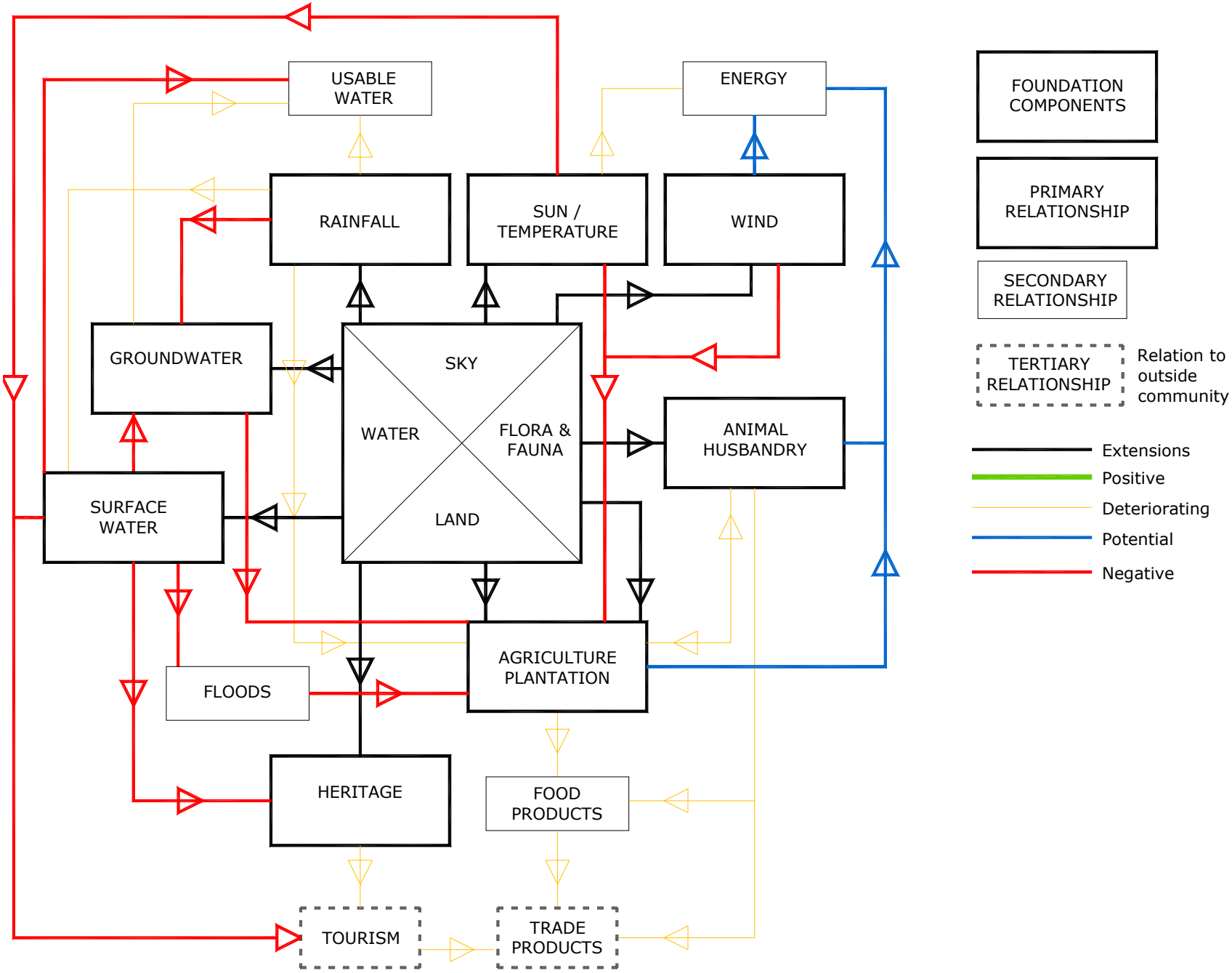
Rajgir, Bihar

Landscape concept – An interlinked process

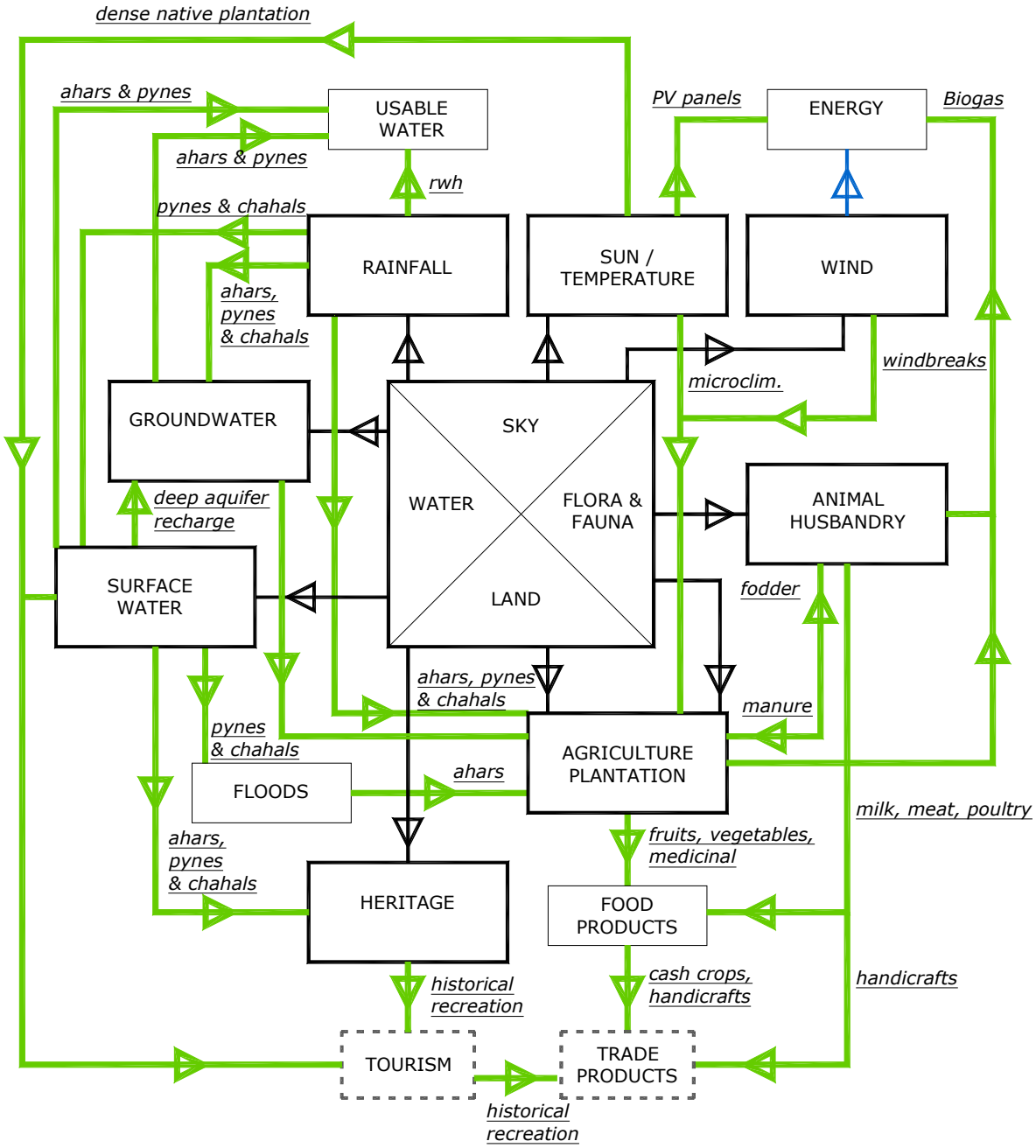


*__Thompson, Ian.__ *Ecology Community and Delight: An Inquiry into Values in Landscape Architecture* . London : Routledge, 1999.

Current status of Man-nature relationship in site & its region



Strengthening Man-nature relationship in site & its region through integration & connection



FOUNDATION COMPONENTS

PRIMARY RELATIONSHIP

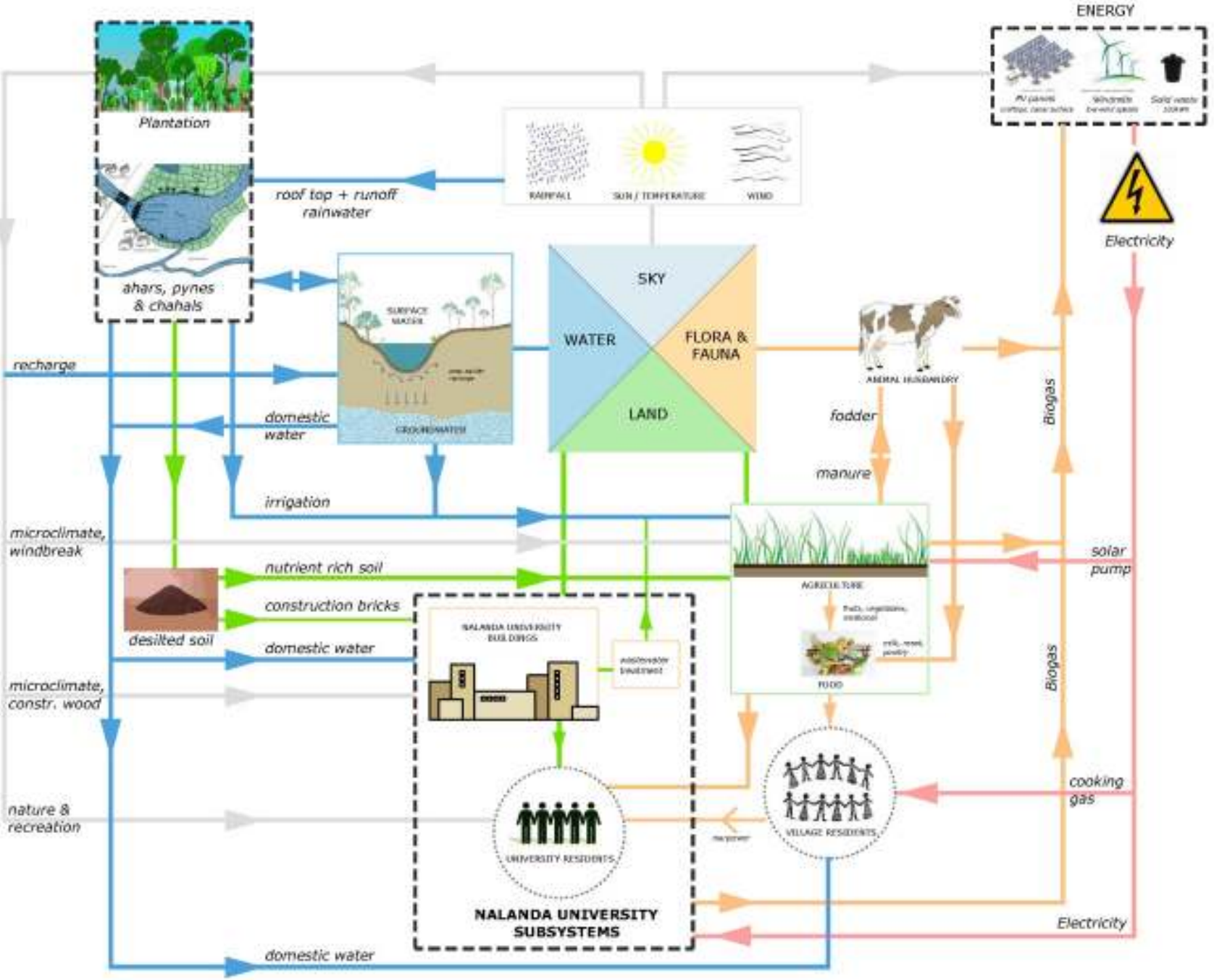
SECONDARY RELATIONSHIP

TERTIARY RELATIONSHIP — Relation to outside community

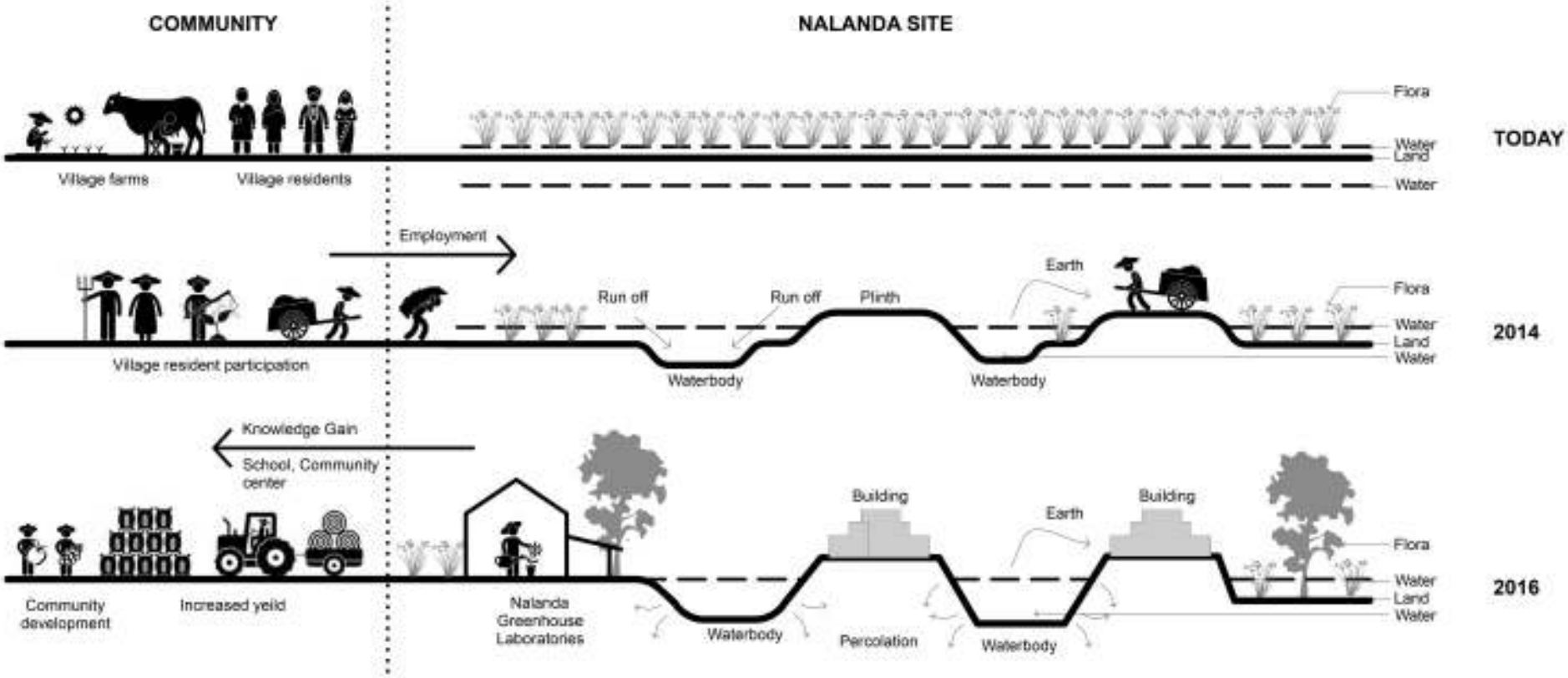
- Extensions
- Positive
- Deteriorating
- Potential
- Negative

Intervention	Action taken or infrastructure created
(Issue)	Issue unsolved
rwh	Rain water harvesting
microclim.	microclimate improvement through plantation
ahar	earthern embankment reservoir
pyne	canal for rainwater diversion & direction
chahal	swale for rainwater direction + groundwater percolation

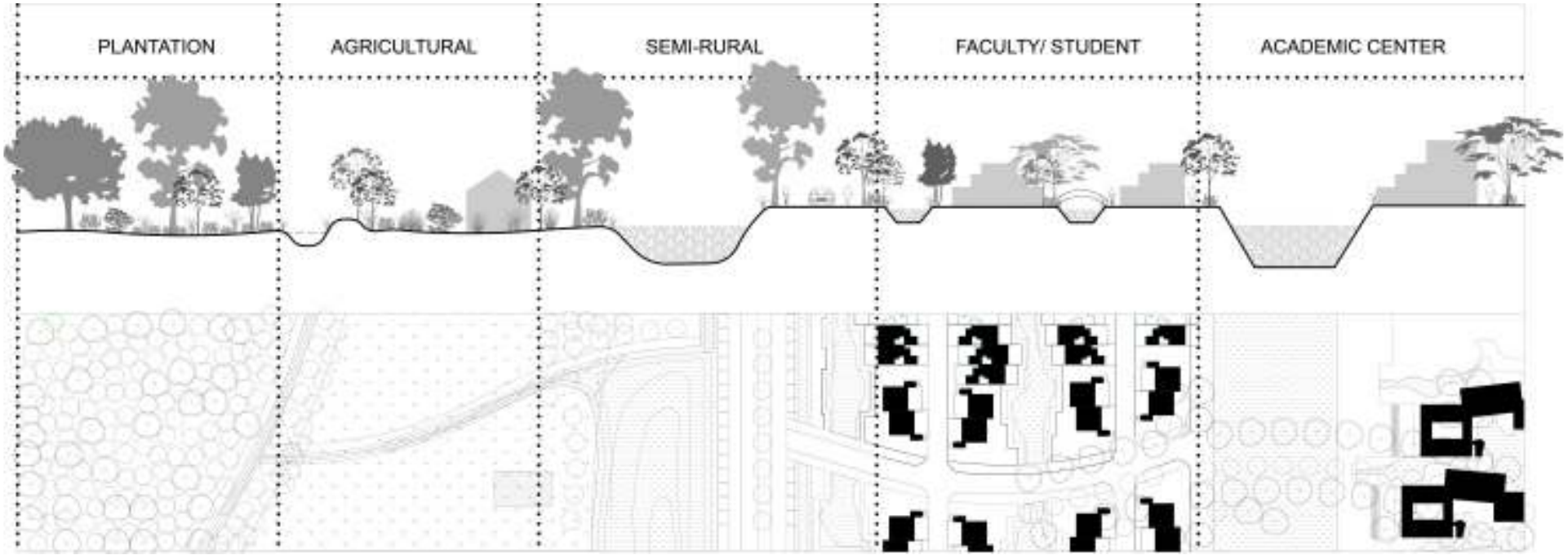
ECOLOGY **Proposed Man-nature resource cycle on site**



COMMUNITY **Integrating society as generator and conservator of the campus**

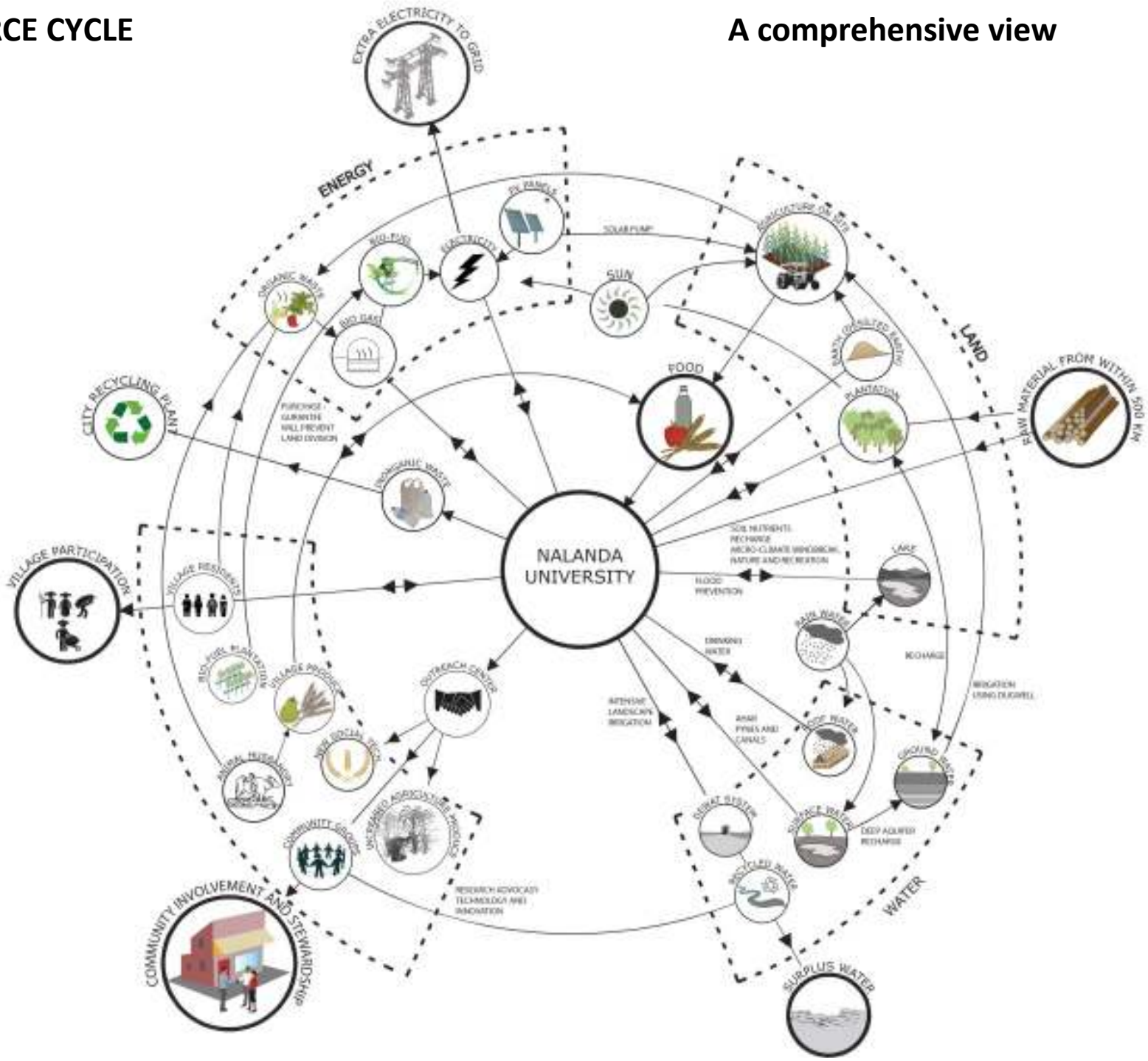


DELIGHT **Landscape imagery that conserves native landscape vignettes**

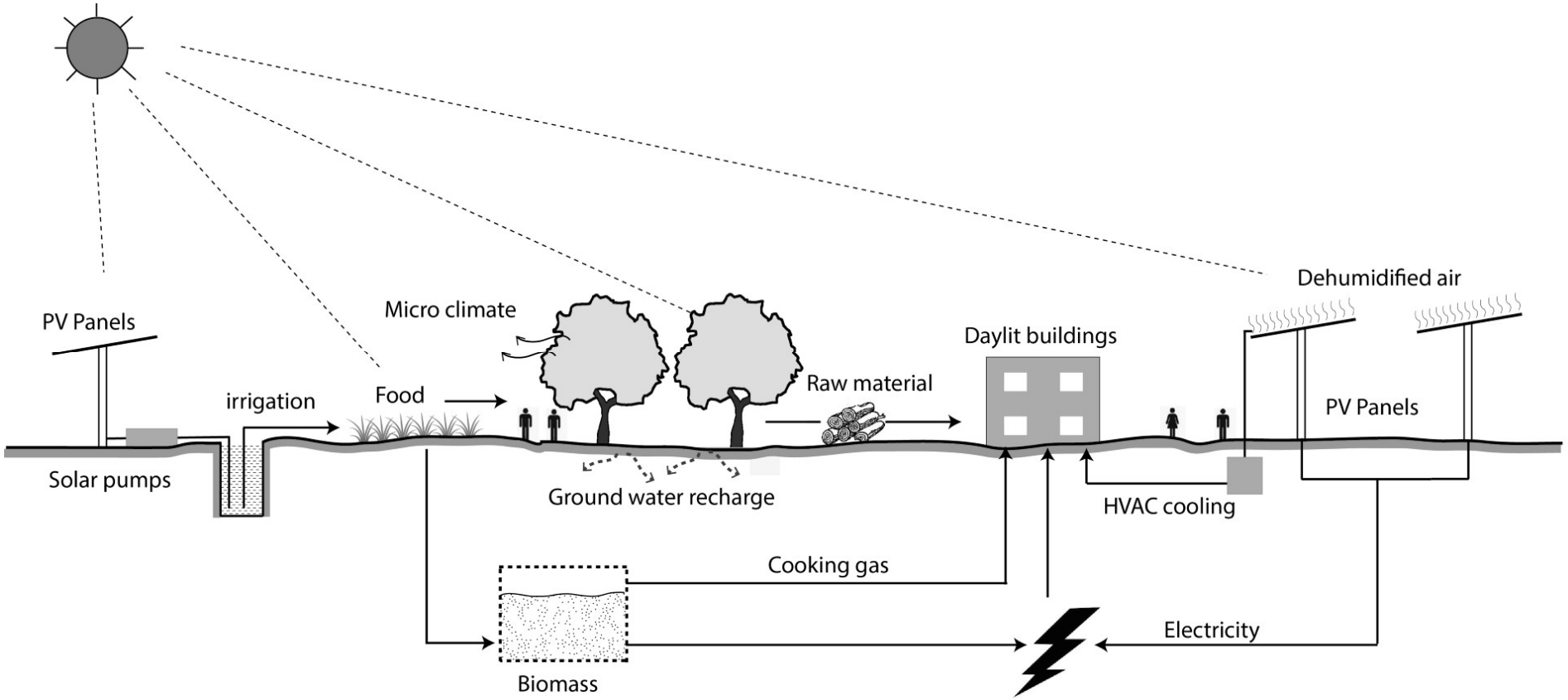


RESOURCE CYCLE

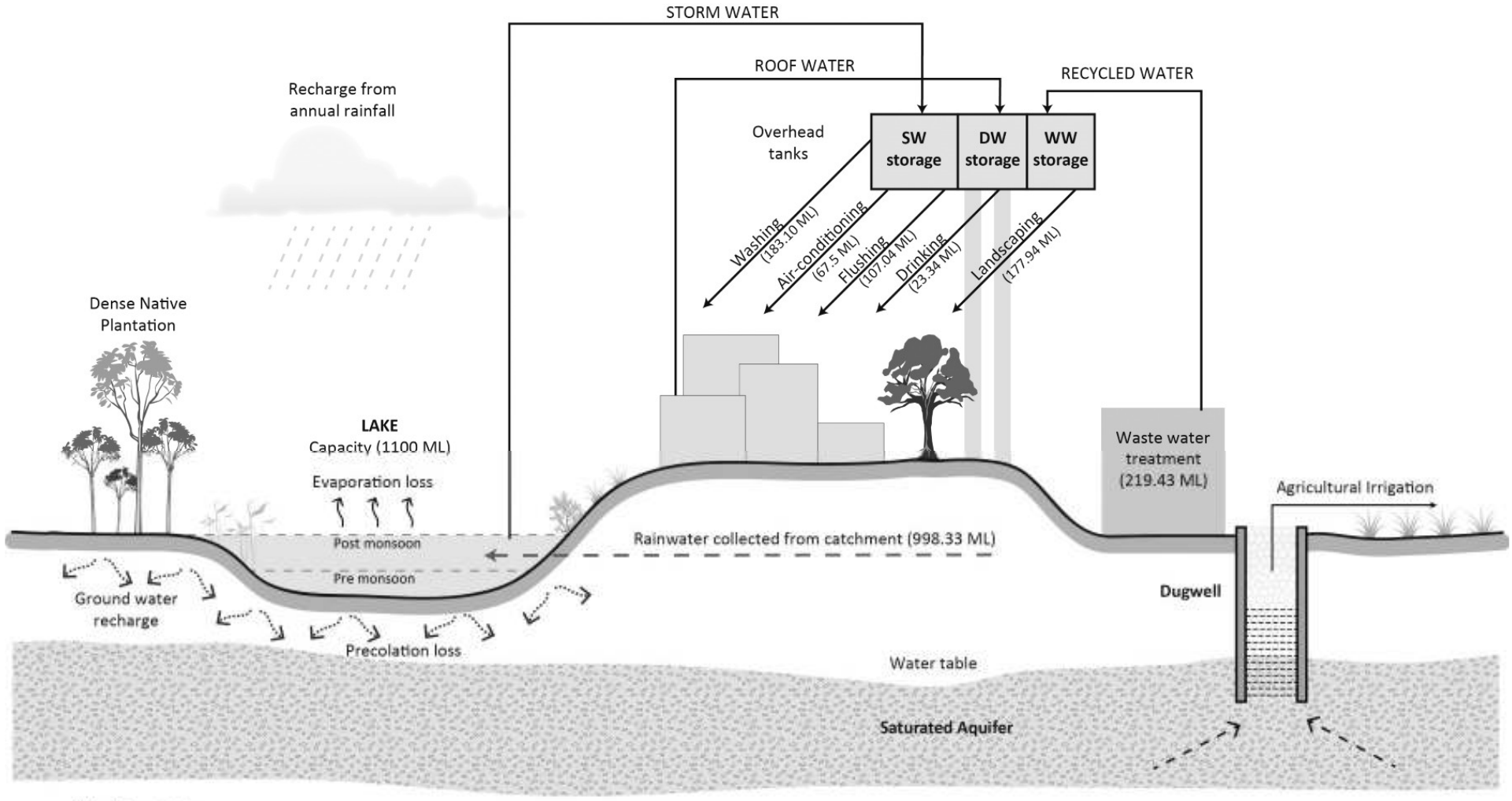
A comprehensive view



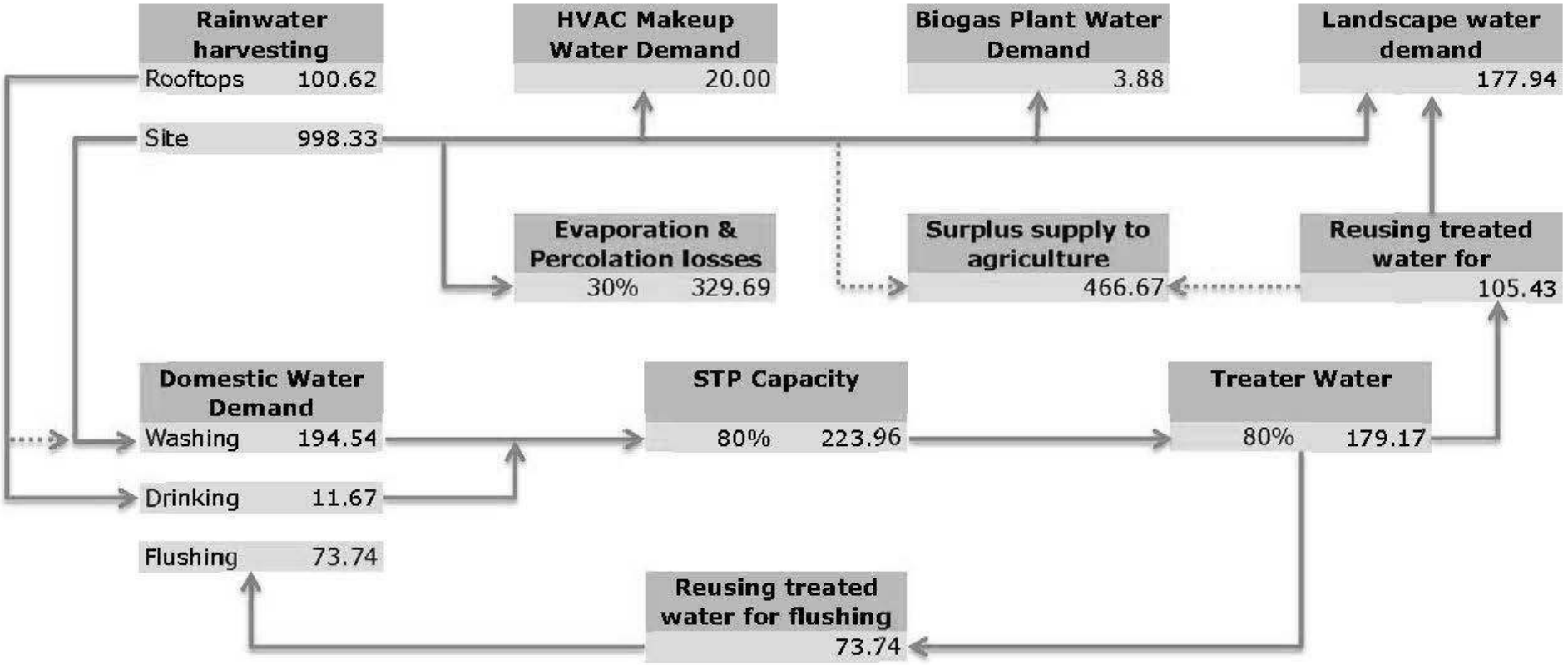
Harnessing solary energy – direct and indirect uses



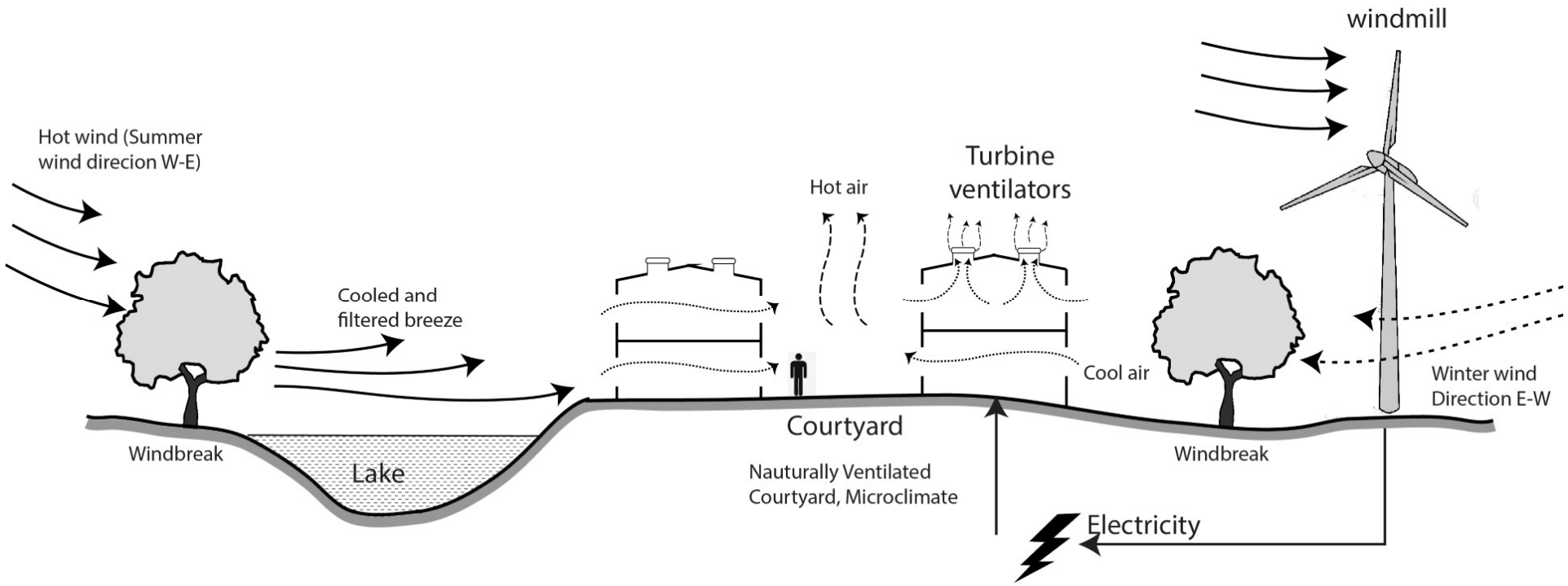
Developing a campus water cycle



Creating an annual water balance



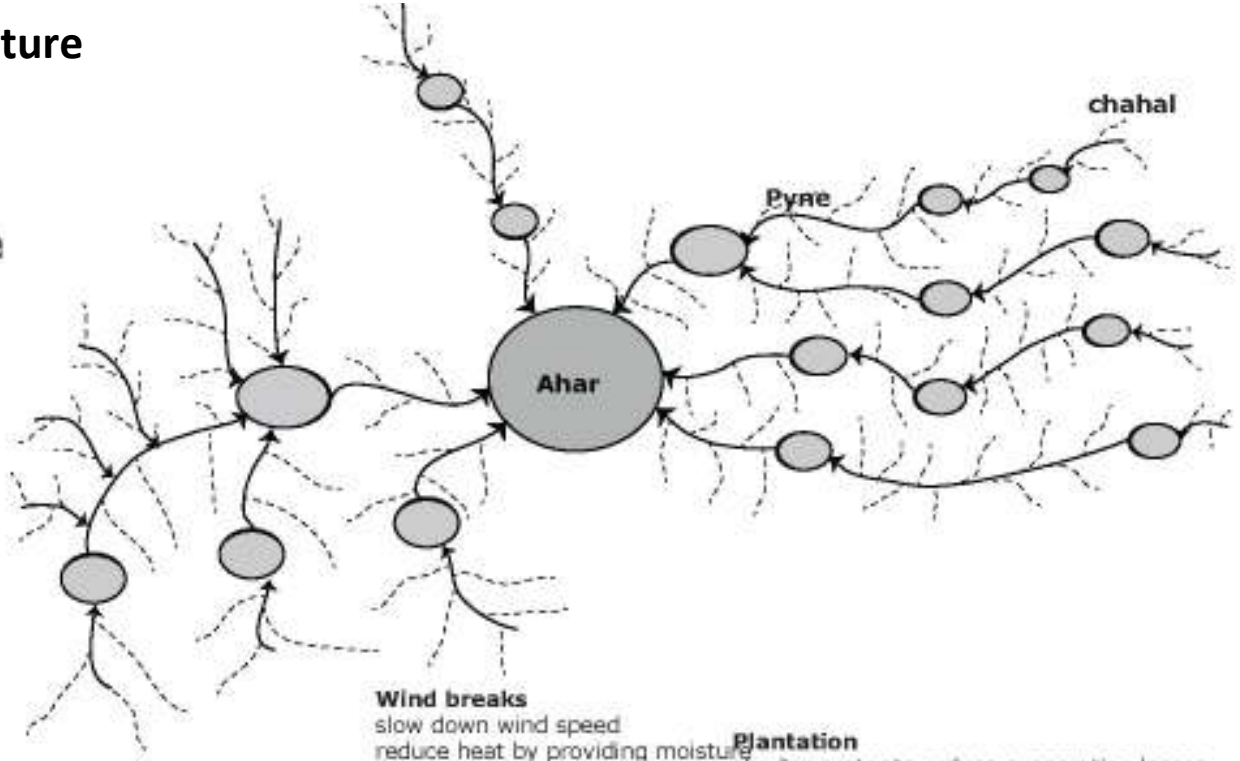
Harnessing wind energy – direct and indirect uses

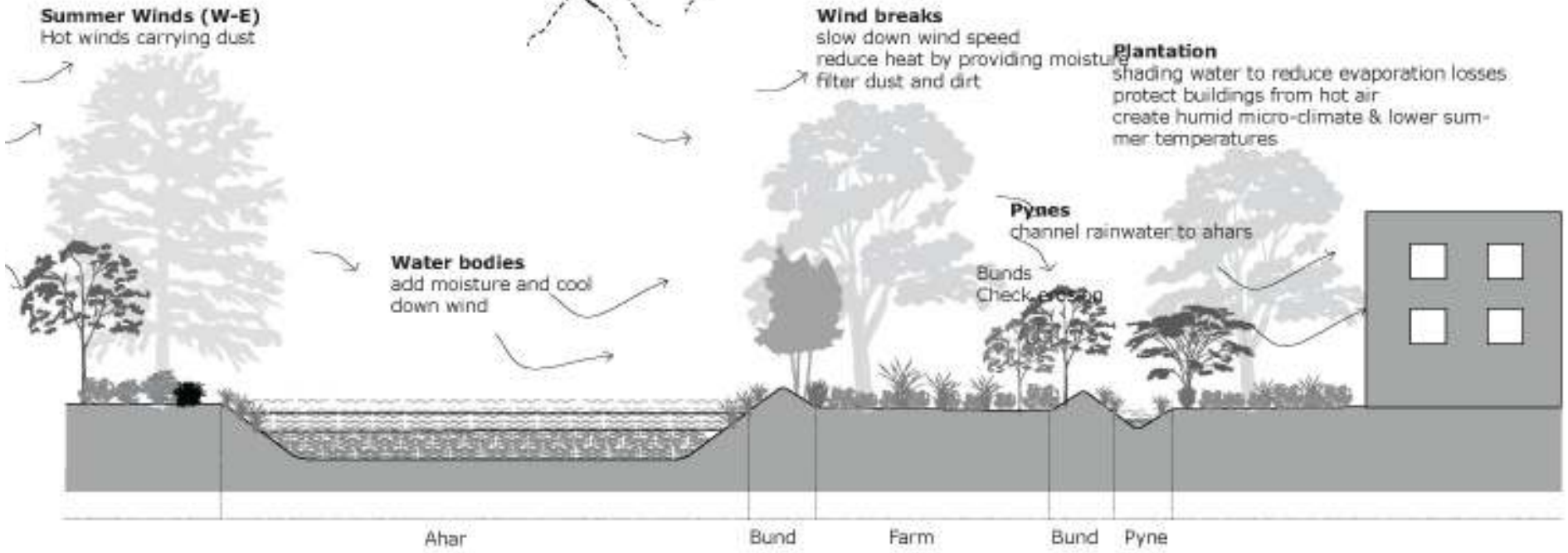


Creating Landscape infrastructure

Landscape Infrastructure

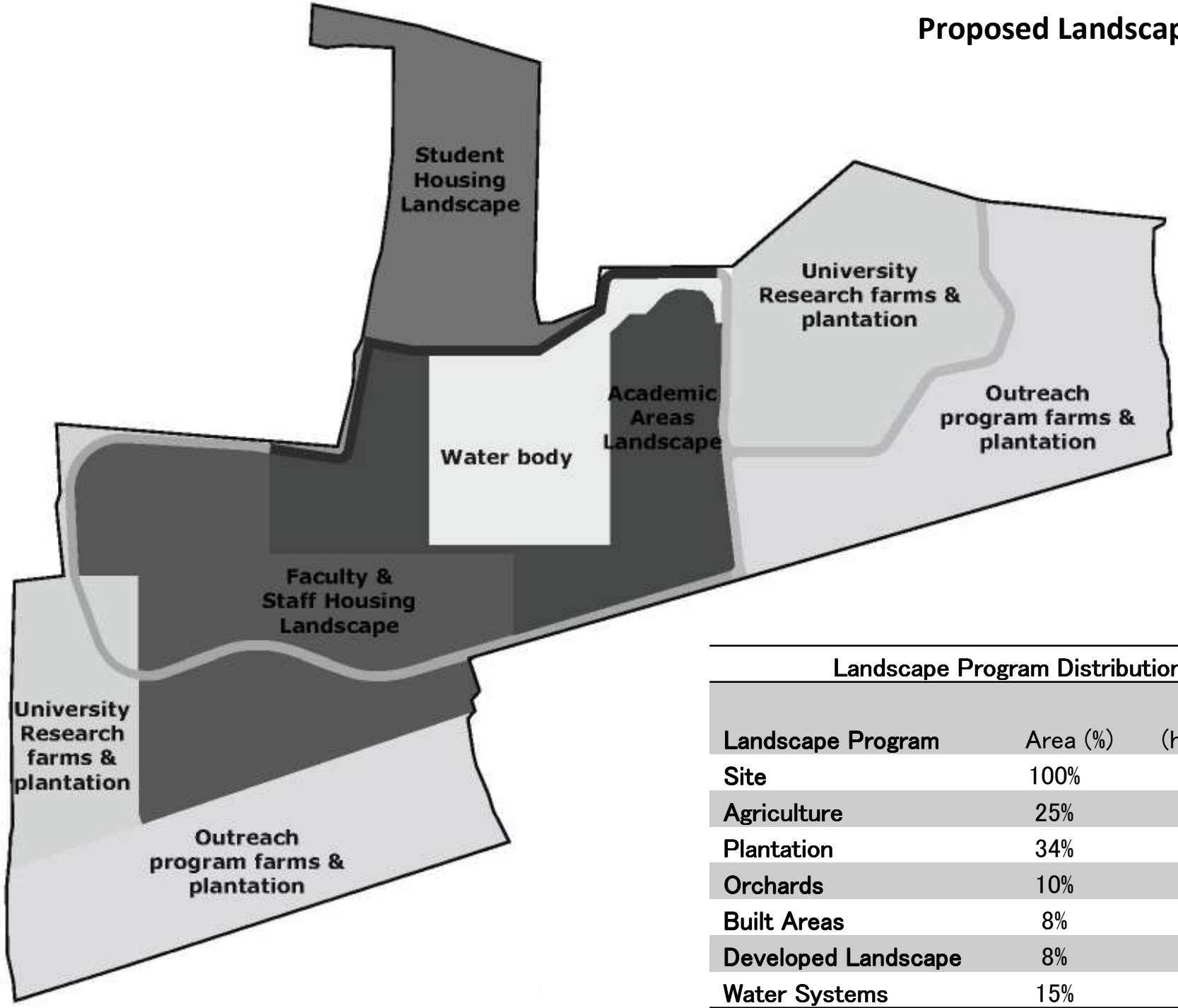
Reviving traditional Ahar-Pyne-Chahal system for water-security leading to productive natural and agrarian ecosystem





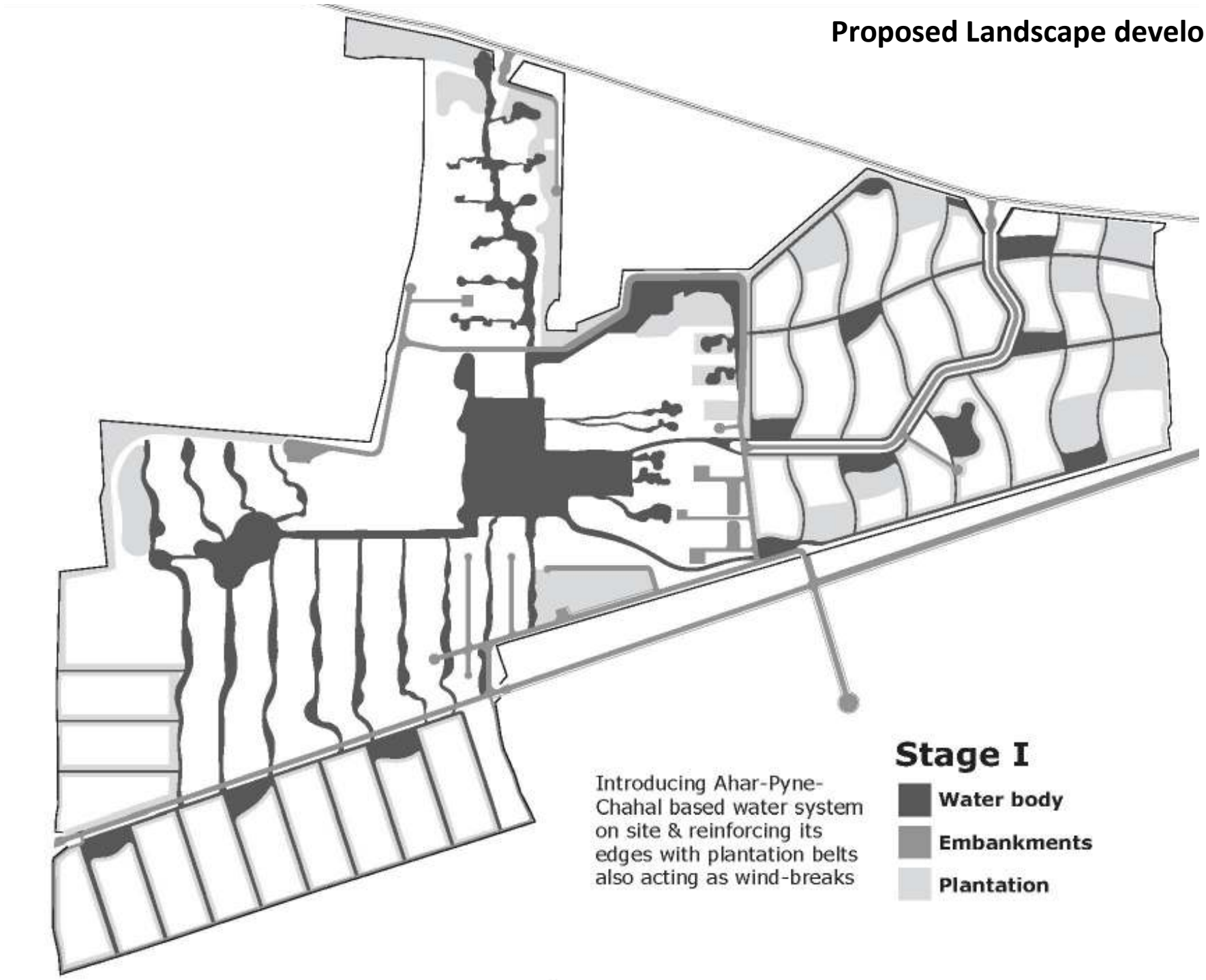
Typical ahar-pyne section with seasonal water level variation

Proposed Landscape zoning



Landscape Program Distribution		
Landscape Program	Area (%)	Area (hectares)
Site	100%	182
Agriculture	25%	45.5
Plantation	34%	61.88
Orchards	10%	18.2
Built Areas	8%	14.56
Developed Landscape	8%	14.56
Water Systems	15%	27.3

Proposed Landscape development



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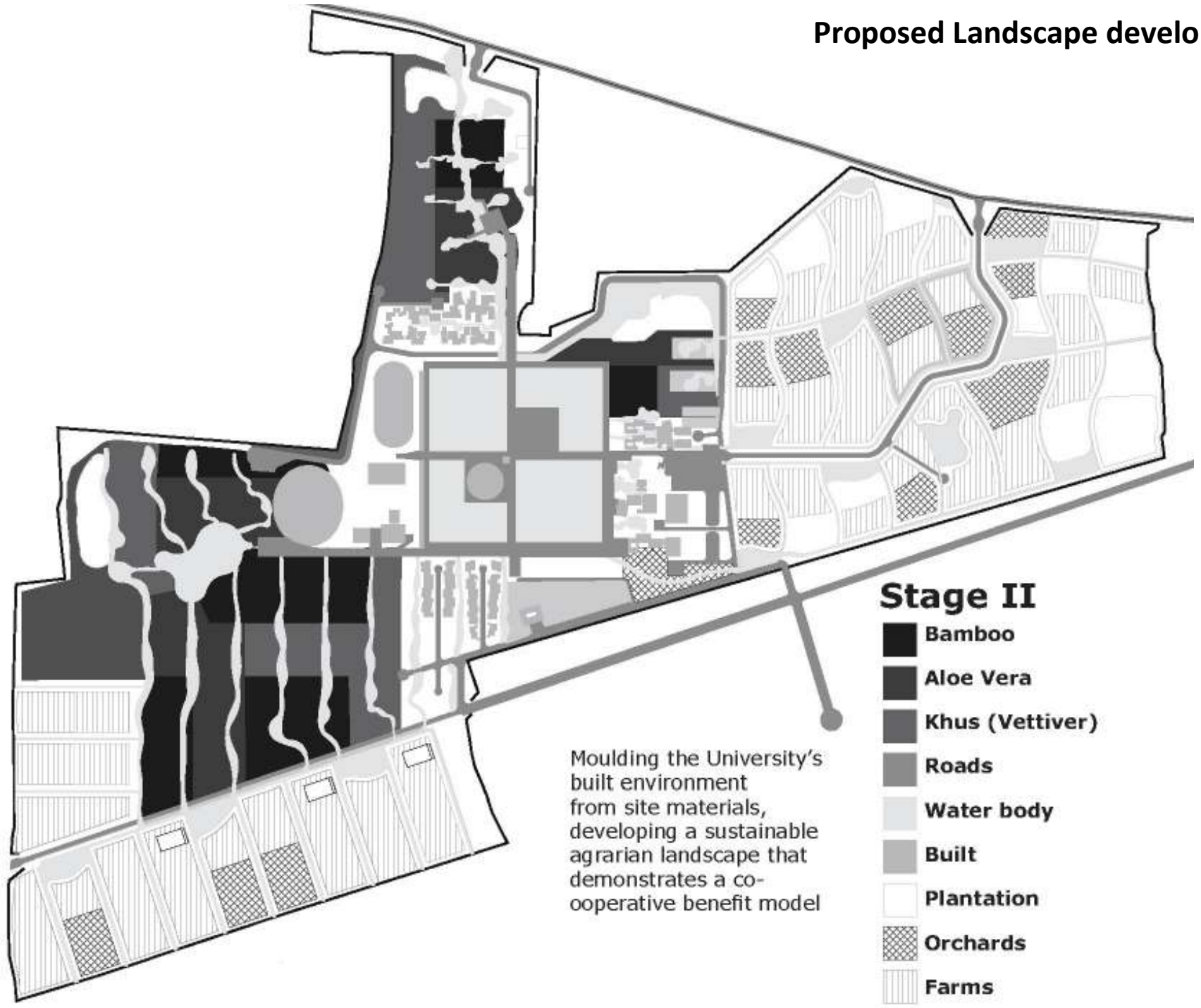

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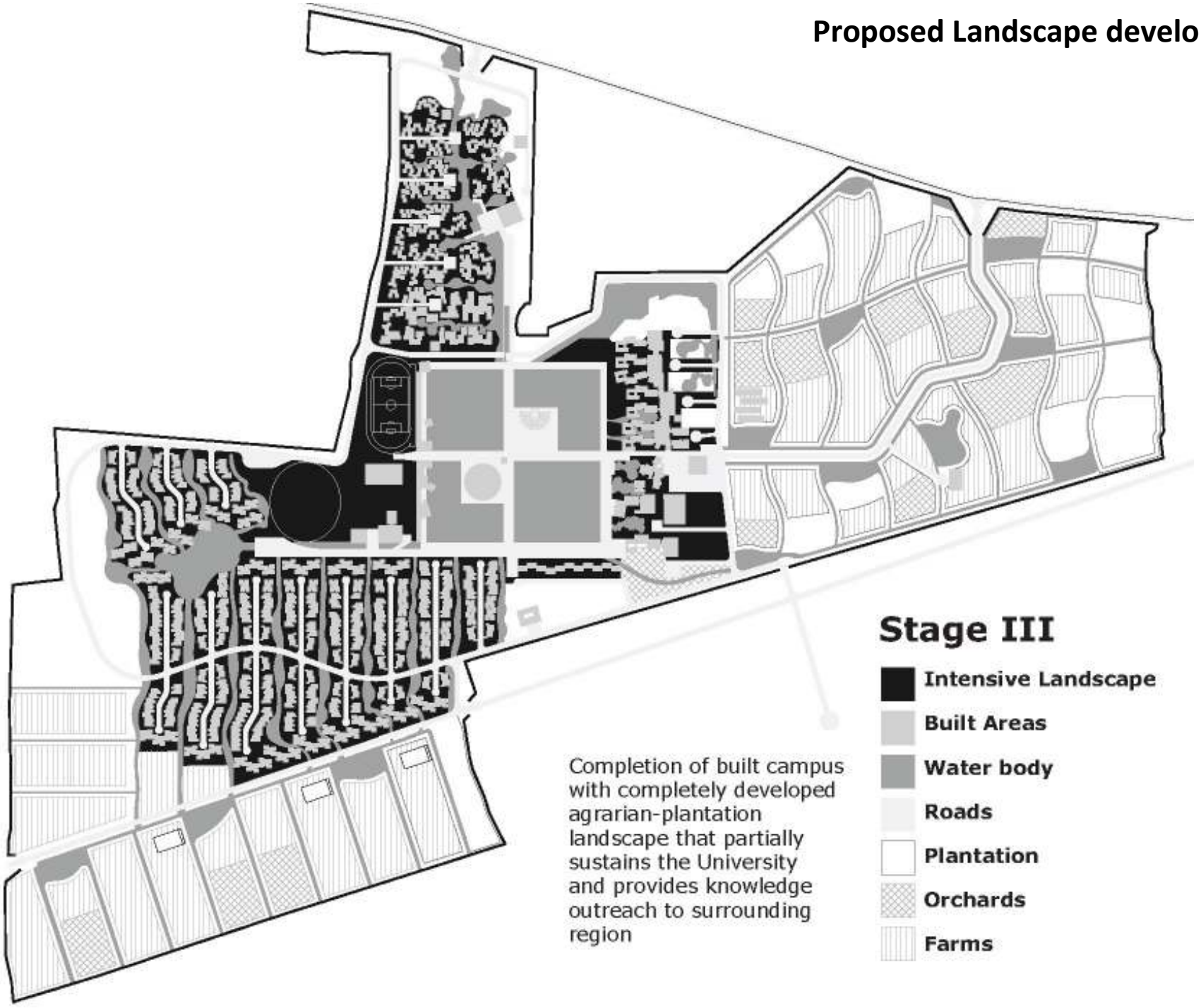
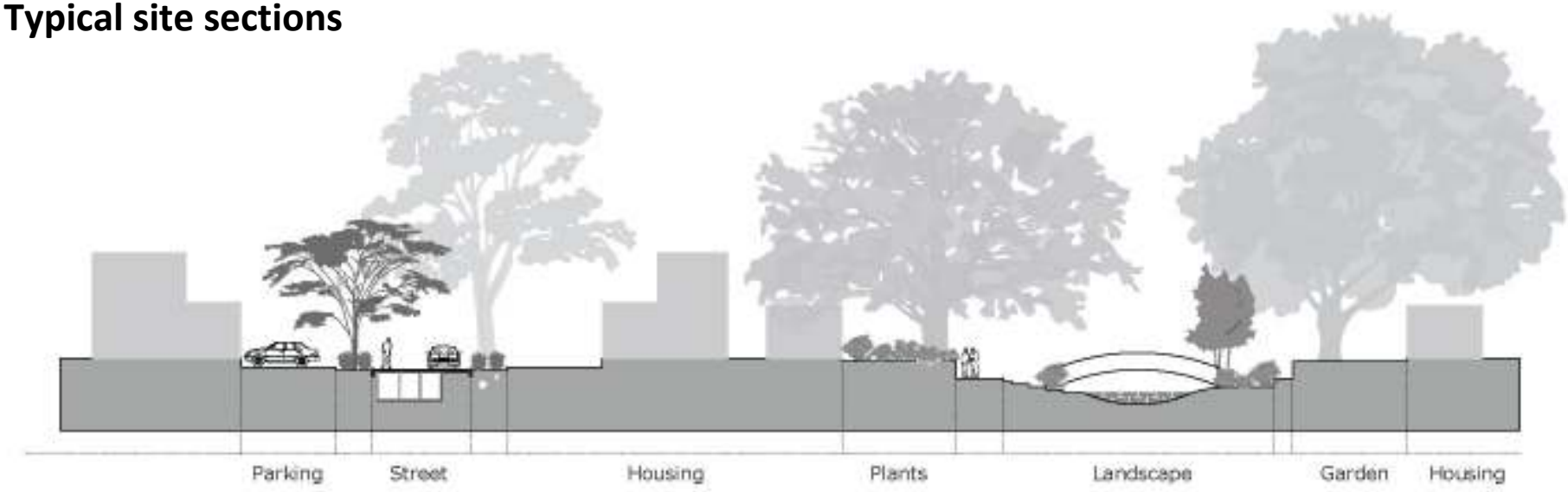
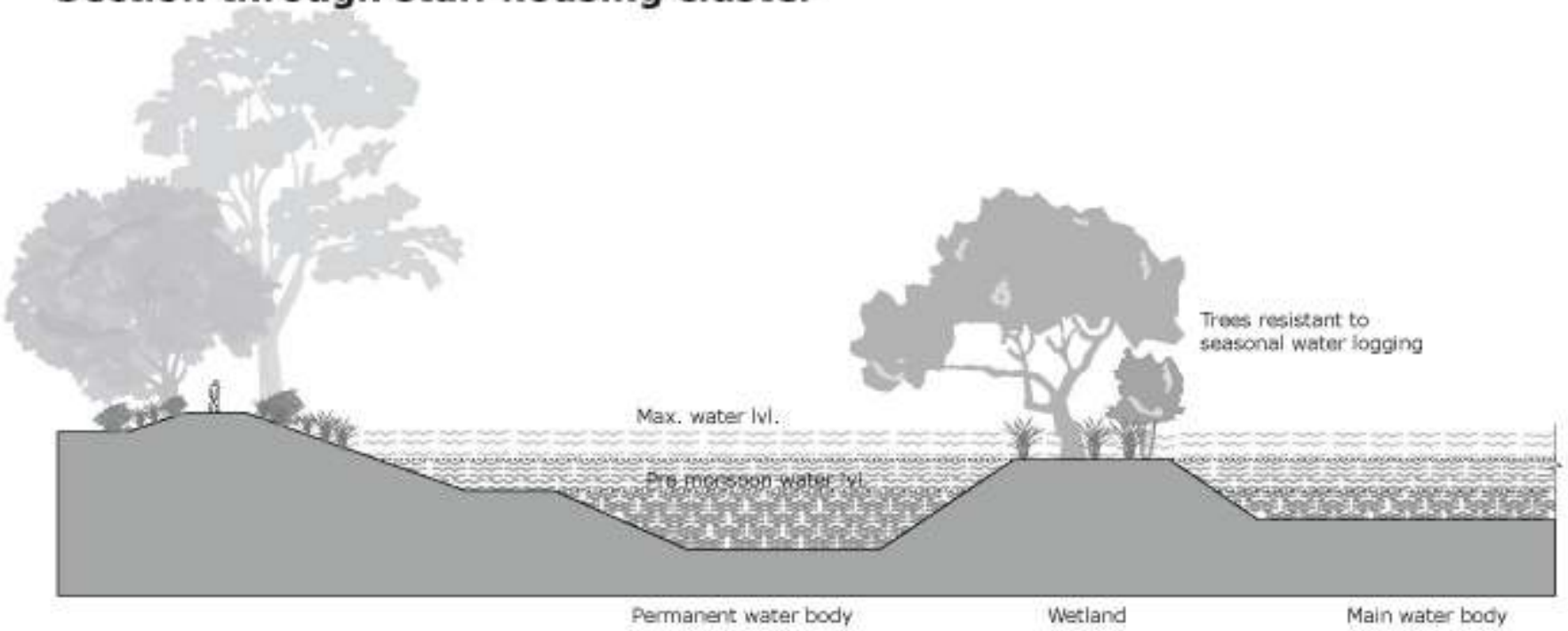


Typical site sections

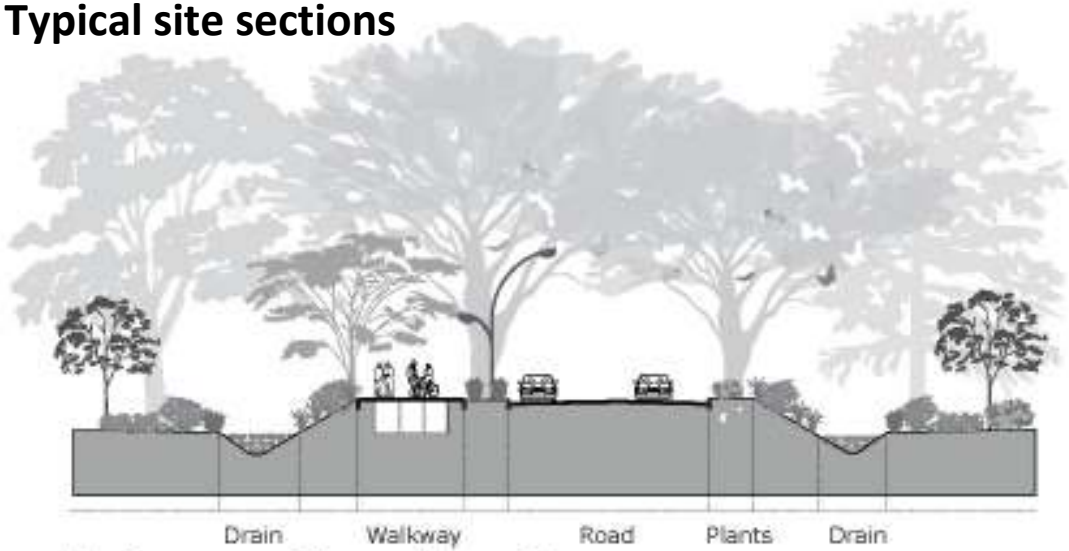


Section through staff housing cluster

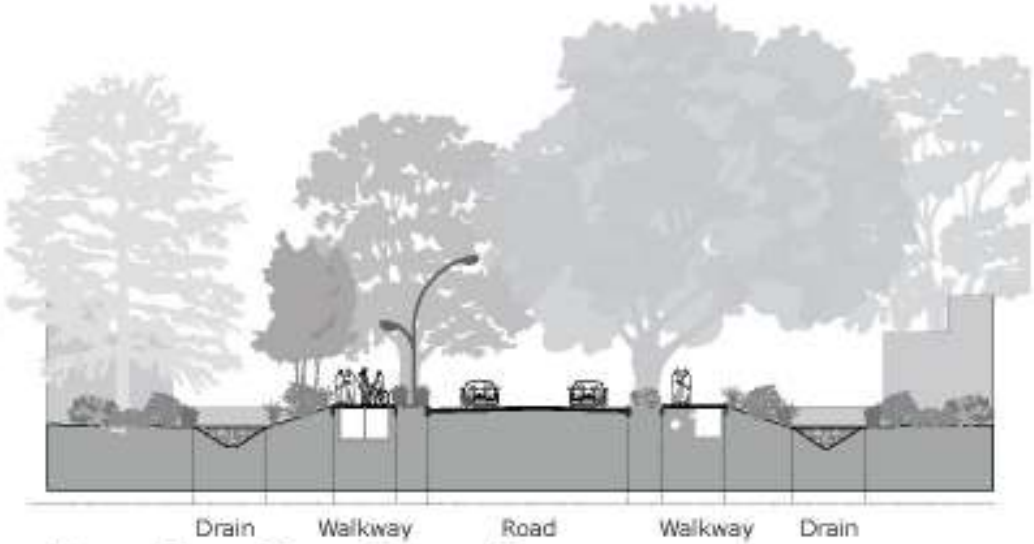


Section through Central Water body

Typical site sections



Entrance Street section



Housing Street section

Self sustenance in Food resources

Crop	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec
Paddy												
Wheat												
Maize												
Mustard												
Sugarcane												
Potato												
Onion												
Lentil												
Long Gourd												
Sponge Gourd												
Bitter Gourd												

Crop Combinations	% of total Area under Agriculture
Paddy +Wheat + Cover Crop	25%
Maize +Onion + Cover Crop	10%
Gourd +Lentil	10%
Gourd +Potato +Cover Crop	15%
Maize +Lentil	35%
Sugarcane + Cover Crop	5%

Self sustenance in Food resources

Yields	*tonnes*	Avg Daily	People served annually
Cereals	191.10	0.3	1,745
Pulses	31.85	0.1	872
Vegetables	400.63	0.2	5,488
Sugarcane	204.75	0.1	5,609
Mustard	8.19	0.1	224
Fruits	354.90	0.2	4,861
Meat (fish)	273.00	0.2	3,739

Agriculture	Area 1	Area 2
	ha	ha
Paddy+Wheat	56	61
Maize+Onion	5	5
Gourd+Mustard+Gourd	3	142
Gourd+Potato+Gourd	3	76
Maize+Lentil	38	128
Sugarcane	3	
Mango	10	
Guava	18	
Fish (ahar / paddy)	51	
Surrounding Area (ha)		494
Surr Area (acres)		1,221

Self sustenance in Energy Resources

Biogas	Quantity	Units
Daily persons food	4	ppl / m3
Waste -Dung / m3	17	kg / m3
Water	17	lt / m3
Area (1000 m3)	0.81	hectares
Cost	15,000	Rs / m3
Cattle Dung Cost	300	Rs / tonne
Biomanure produced	20%	of input
Power required	1	kWh / m3
Manpower	100	Rs / day-m3
Payback period	5 to 8	years
Nalanda University		
Students	2500	daily
Biogas plant capacity	625	m3
Biogas plant area	0.51	hectares
Waste required	10,625	kg / day
Water required	10,625	litres / day
Cost	0.94	Rs. (crores)
Power	625	kWh / day
Manpower	62,500	Rs / day
Biomanure	2,125	kg / day