



Figure: Main entities of the LUCAS-GEMMES model

Table: Agent actions in land-use adaptation

Action	Input	Output	Function
Agro-ecology zone (AEZ)			
Set AEZ to provinces		list of AEZ that province is located	Each AEZ asks the provinces that intersect with the AEZ to set the list of AEZ
Province			
choose adaptation strategy	<ul style="list-style-type: none"> - salinity level - subsidence cumulative threshold to react - AEZ strategies - macro variables: interest rate, 	<ul style="list-style-type: none"> - Provincial adaptation profiles 	Each province can have many adaptation profiles. Selected profiles based on the AEZ and threshold of land subsidence
Get subsidence	<ul style="list-style-type: none"> - AEZ zone - List of subsidence 	<ul style="list-style-type: none"> - subsidence regions 	Updating the list of

Farming unit (F.U)			
choose land-use	<ul style="list-style-type: none"> - constraint: provincial adaptation profile - macroeconomic cut-off, F.U budget - land suitability - weather (temperature, precipitation) 	Land-use type for cell	<p>F.U looking for the adaptive LUT for land suitability,</p> <p>Check if weather impacting LUT</p> <p>Check provincial adaptation profile of province</p>
compute_incom	profit of LUTs, Land suitability of land-use	updating budget of F.U	Updating budget of F.U based on benefit of LUT depend on land suitability level and groundwater control of the province (strategy of province)
Apply adaptation strategy			
Land unit			
World - global entity			
Providing climate data	- climate dataset	<ul style="list-style-type: none"> - subsidence regions - list of climate in the province – assigned to district level 	Updating the list of
Providing salinity	- list of salinity maps	Salinity per 5 years	
Providing macro economic	Macro economic dataset from GEMMES model		
Exposure analysis	List of farming unit cells Yearly temperature	risk-exposed for rice and shrimp	Calculate risk-exposed area.

	and precipitation		
Vulnerability analysis	List of farming unit cells in risk. List of adapted	vulnerable area	