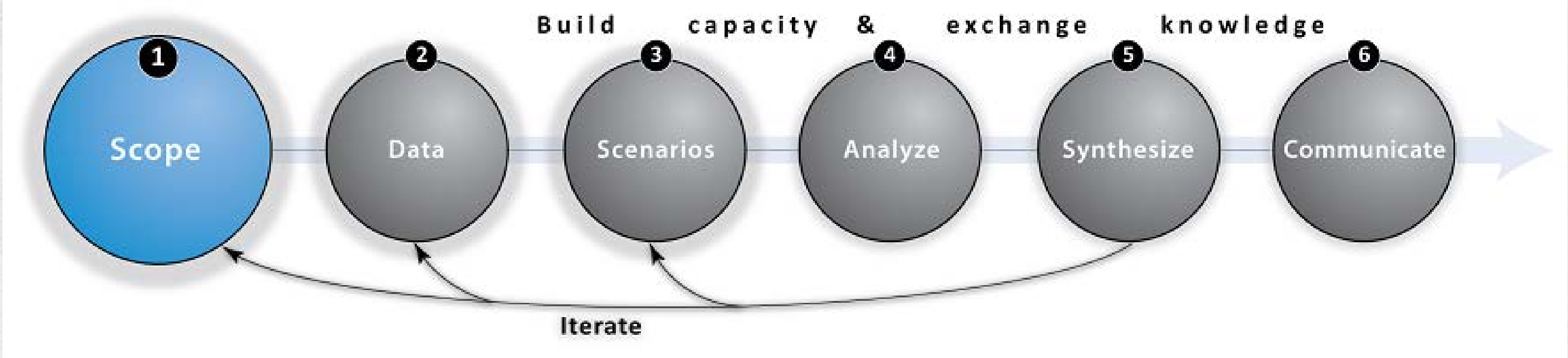
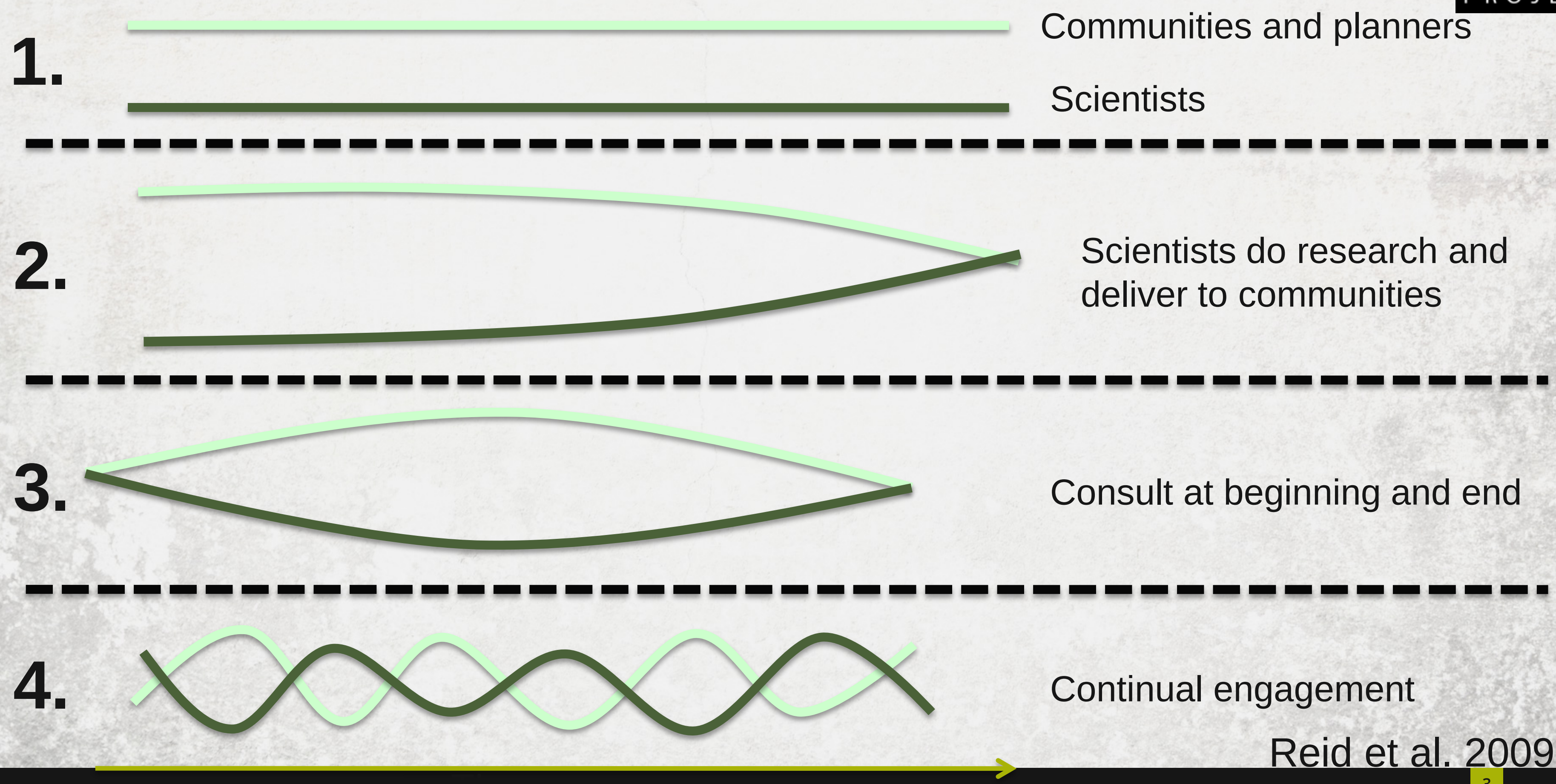
ENGAGING STAKEHOLDERS, COLLECTING AND PREPARING DATA, AND SCENARIOS

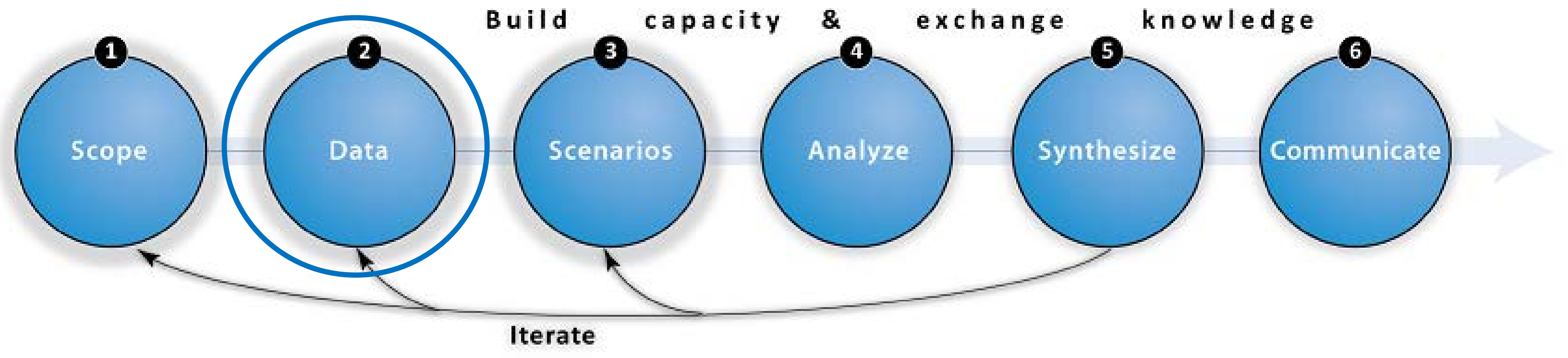

Build capacity & exchange knowledge
1
Scope
2
Data
3
Scenarios
4
Analyze
5
Synthesize
6
Communicate
Iterate

SCOPING

Models of collaboration



Reid et al. 2009



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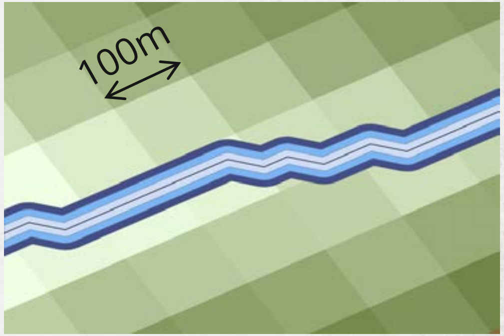
DATA

SPATIAL INPUT BASICS

- Have all data in the same projected coordinate system
- Check the units
- Use an appropriate resolution for your goals
  - Overall detail needed
  - Interaction between layers
  - Speed/memory

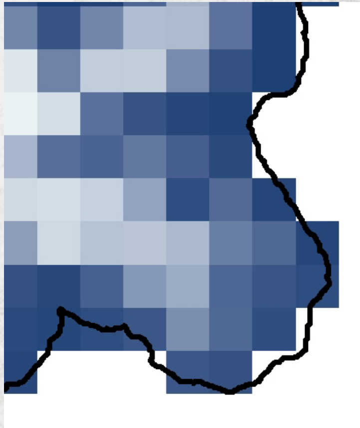


Riparian buffers

Resampling the DEM from 30m to 90m

Watershed	Resolution	Sediment Retention	Sediment Export
Guabas	90m	1,268,257	97,685
	30m	1,081,782	86,769
Fraile	90m	2,208,148	87,933
	30m	1,746,993	69,087

Resampling coarse layers



DATA SOURCES

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The best data is as local as you can get, as detailed as you need

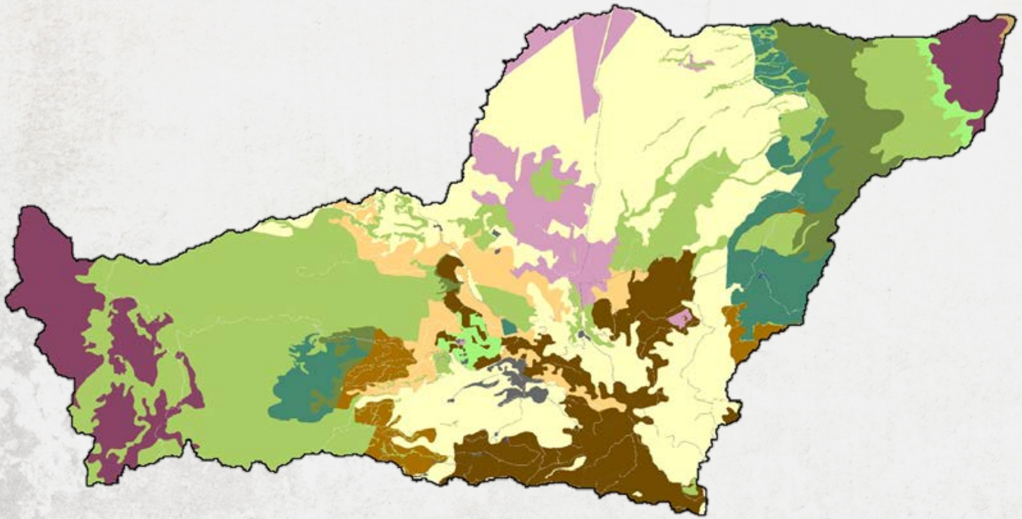
- National, local governments and agencies, NGOs
- Literature search

Global sources

- Land cover: MODIS, GlobCover, GLC-2000, Univ. of Maryland
- DEM: NASA, WWF HydroSheds
- Soils: FAO Harmonized World Soil Database, SOTER

LAND USE

Choose an appropriate number/types of land cover classes

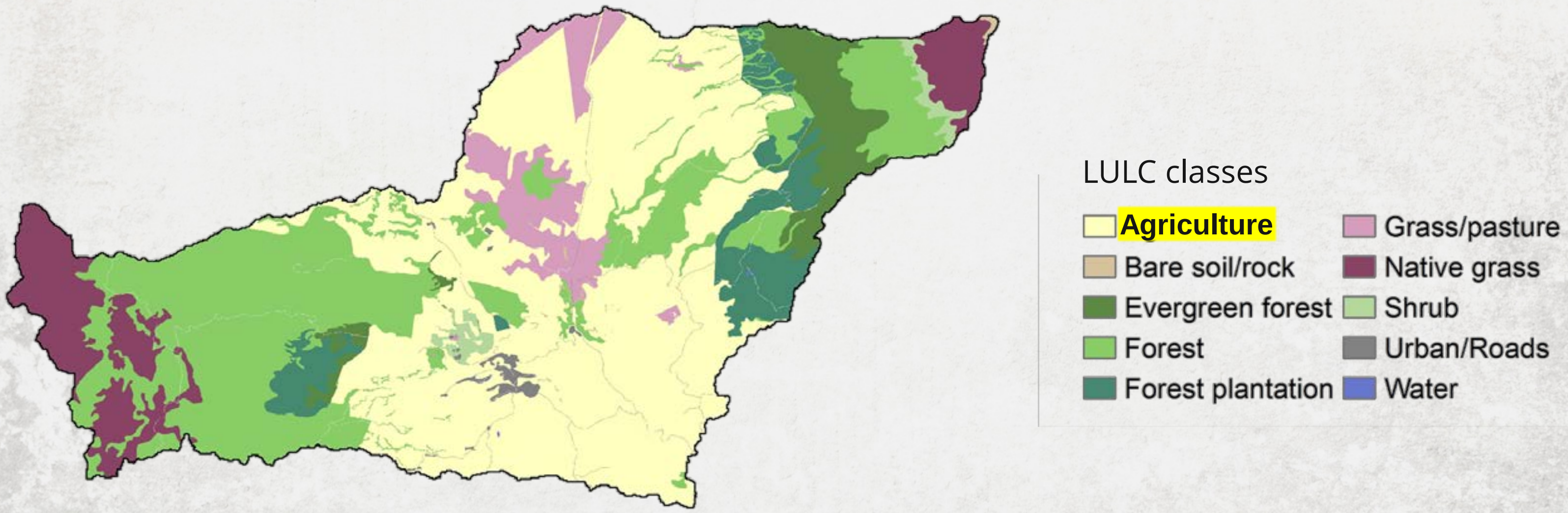


LULC classes

- Bare rock
- Bare soil
- **Coffee**
- **Corn**
- Evergreen forest
- Forest
- Forest plantation
- **General agriculture**
- Grass
- Native montane bunchgrass
- Shrub
- **Tea**
- Unpaved road
- Urban
- Water

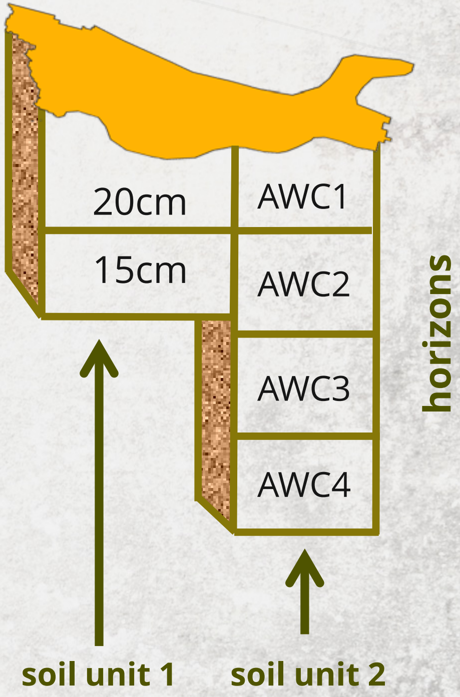
LAND USE

Choose an appropriate number/types of land cover classes



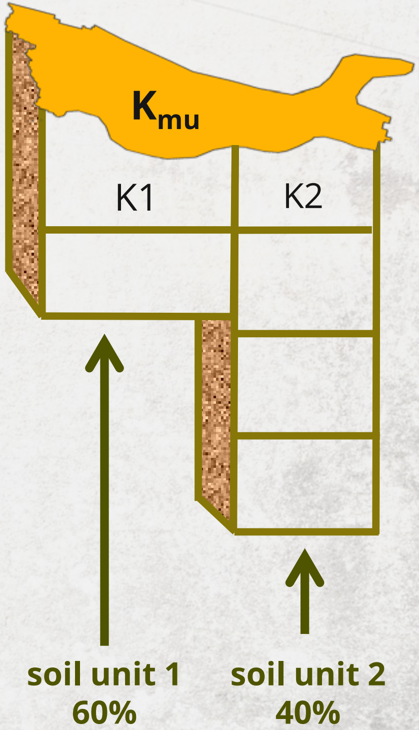
SOILS

- If working with soil databases…
  - Soil depth: add up horizons or find max depth field
  - AWC: Sum of provided AWC values across horizons



SOILS

- If working with soil databases…
  - Soil depth: add up horizons or find max depth field
  - AWC: Sum of provided AWC values across horizons
  - Erodibility: %sand/silt/clay/carbon in top horizon; use table to convert to K values
  - Mapping unit value = weighted average across soil units
- *More info in the doc: HWSD_HOWTO*



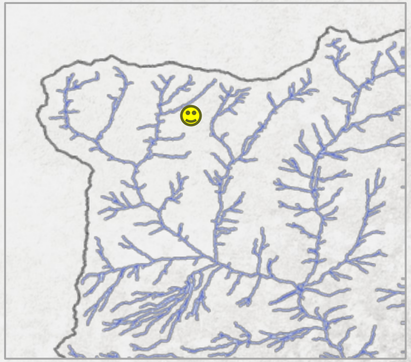
$$K_{mu} = (K1*.6) + (K2*.4)$$

TOPOGRAPHY/HYDROLOGY

- Preparing the DEM: Mosaic, fill holes, fill sinks, burn streams
- Verify watersheds and/or create with ArcHydro/ArcSWAT/AGWA/BASINS/DELINEATEIT…
- Determine threshold flow accumulation – RouteDEM or manual GIS

Threshold = 10,000

Threshold = 100



CLIMATE

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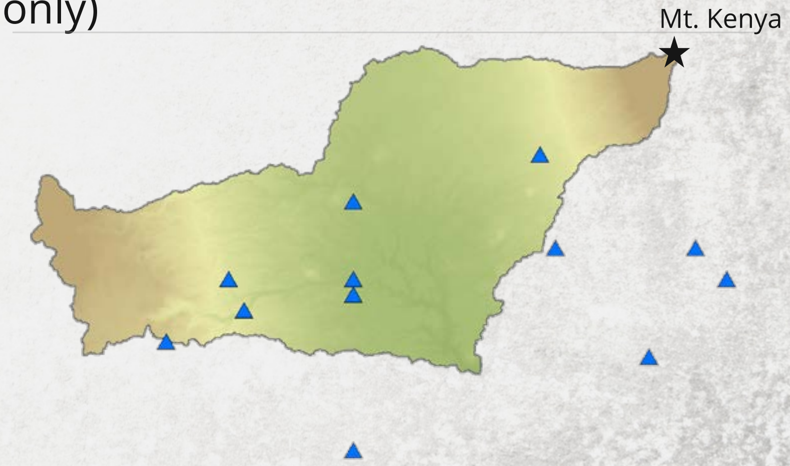
- Precipitation from weather stations, gridded local or global data, climate change scenarios
  - **WorldClim**: Monthly precipitation, min/max temperature
  - **CGIAR**: Monthly precipitation, min/max temperature, potential and actual evapotranspiration
  - **NCAR**: Climate change scenarios (precip only)
- Average over 10+ years
- If weather stations:
  - Best to have full coverage
  - Test out interpolation methods
  - Adjust for elevation?



CLIMATE

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PET (Potential Evaportanspiration)

- Modified Hargreaves: Monthly: precip, min/max temperature, radiation
- Hamon: Monthly: Hours of daylight, mean temperature

AET (Actual Evapotranspiration)

- InVEST Water Yield model
- Other relatively simple methods involving ETk and PET

Rainfall Erosivity (R)

- Optimally, find published values or have rainfall energy/intensity data
- Might be equations for calculating R from annual precip for your area
- Simple method from Roose for West Africa

MISCELLANY

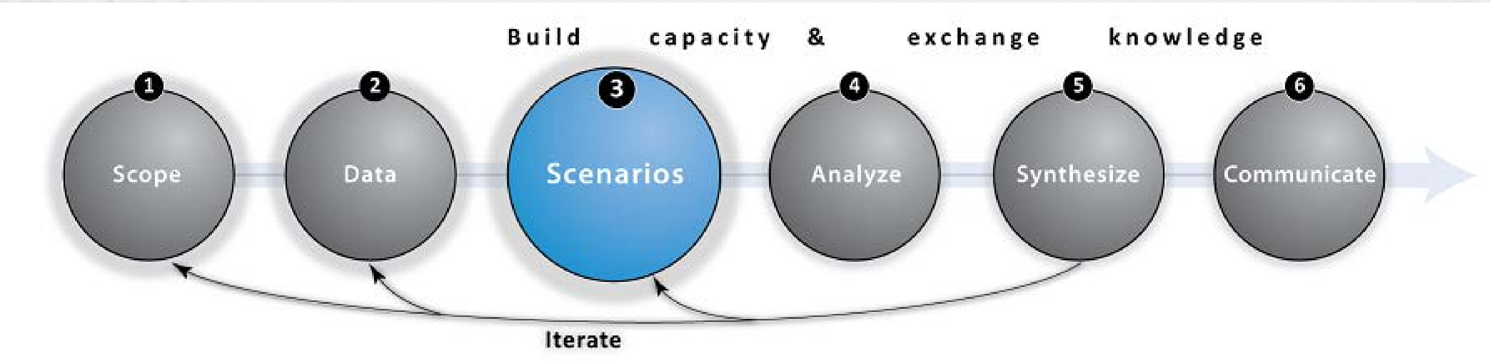
Beneficiaries:

- Straight population density maps (e.g. census)
- Use FlowLength to find # of people downslope

LULC Coefficients:

- Literature search; FAO; USDA
- Roughness: Manning's n for overland flow
- RIOS cover_rank from Leaf Area Index
- NatCap parameter value database (naturalcapitalproject.org)

NatCap User forum: *http://forums.naturalcapitalproject.org/*



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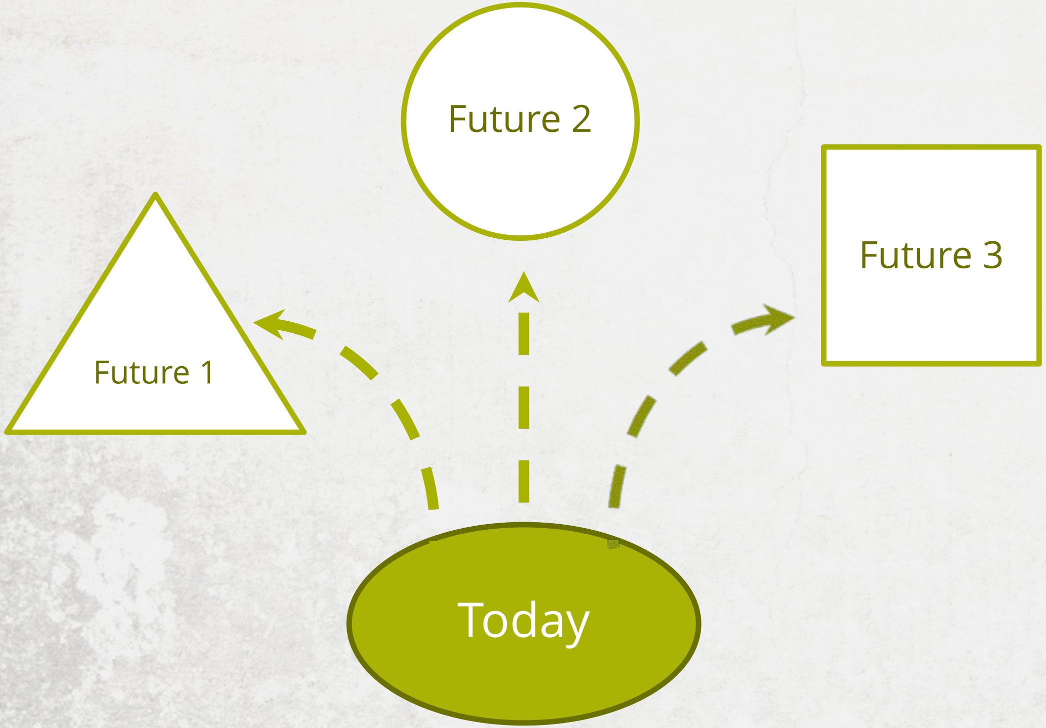
SCENARIOS

SCENARIOS
TELL A STORY ABOUT THE FUTURE



- Simplified & plausible
- Explore future choices, uncertainties
- Spatially explicit (for ecosystem services)

SCENARIOS
KEY ASPECTS

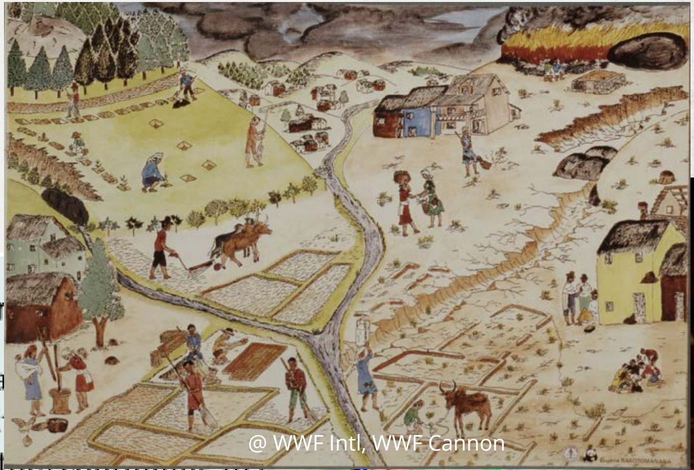
- Scenarios can take many forms
  - Narratives
  - Numbers
  - Drawings
  - Maps

Narrative scenarios: Matazar

Annual GDP growth in Tanzania
is now over USD 1500 (PPP), wi
and the tourism and mining sect
growth has slowed to 2 percent per year due to chil
fertility rates. The population in 2025 will be about
occurs mainly in regional and coastal cities due to r

TABLE 12 Matrix of probabilities of land-cover transitions

	Forest	Grassland	Agriculture	Shrubs	Woodland	Urban	% change
Forest	0	6	4	2	1	1	-30
Grassland	0	0	1	0	0	2	-10
Agriculture	0	0	0	0	0	0	20
Shrubs	0	0	5	0	0	1	-20
Woodland	0	0	6	1	0	1	-10
Urban	0	0	0	0	0	0	5


@ WWF Intl, WWF Cannon


@ WWF Canon, Simon Rawles

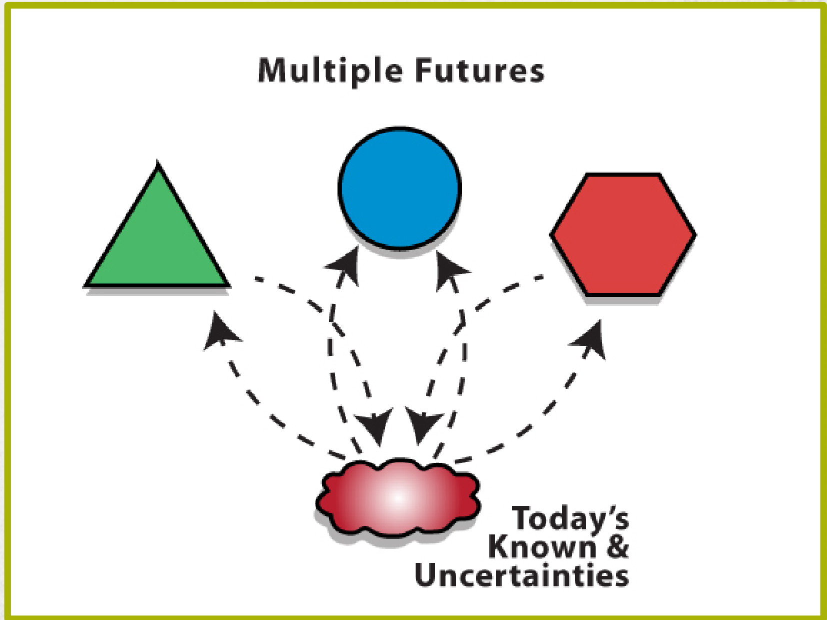
WHAT MAKES A USEFUL SCENARIO?

KEY CHARACTERISTICS

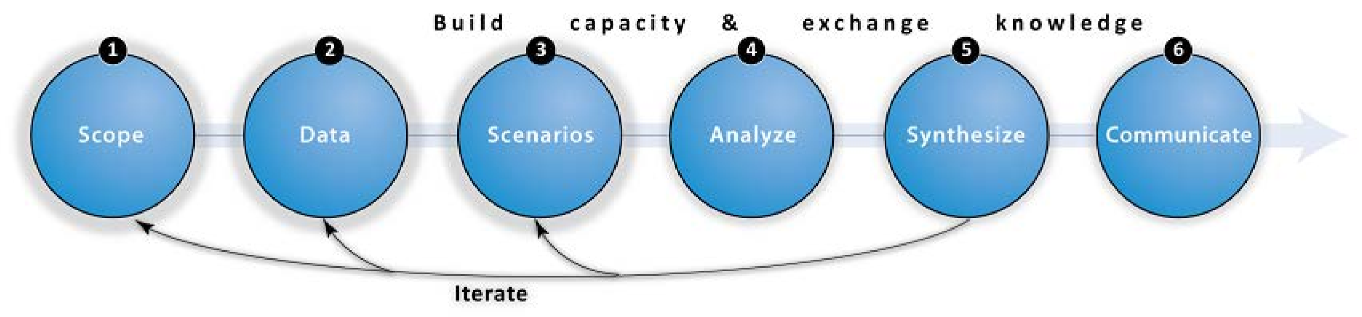
- Relevant
- Participatory
- Legitimate
- Plausible
- Understandable
- Distinct
- Scientifically credible
- Comprehensive
- Iterative
- Surprising, challenging assumptions

SCENARIOS

- Storylines that describe possible futures
  - Not predictions
  - Spatially-explicit scenarios are an important input to InVEST



Q&A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