

RAPID ANALYSIS AND SPATIALISATION OF RISK

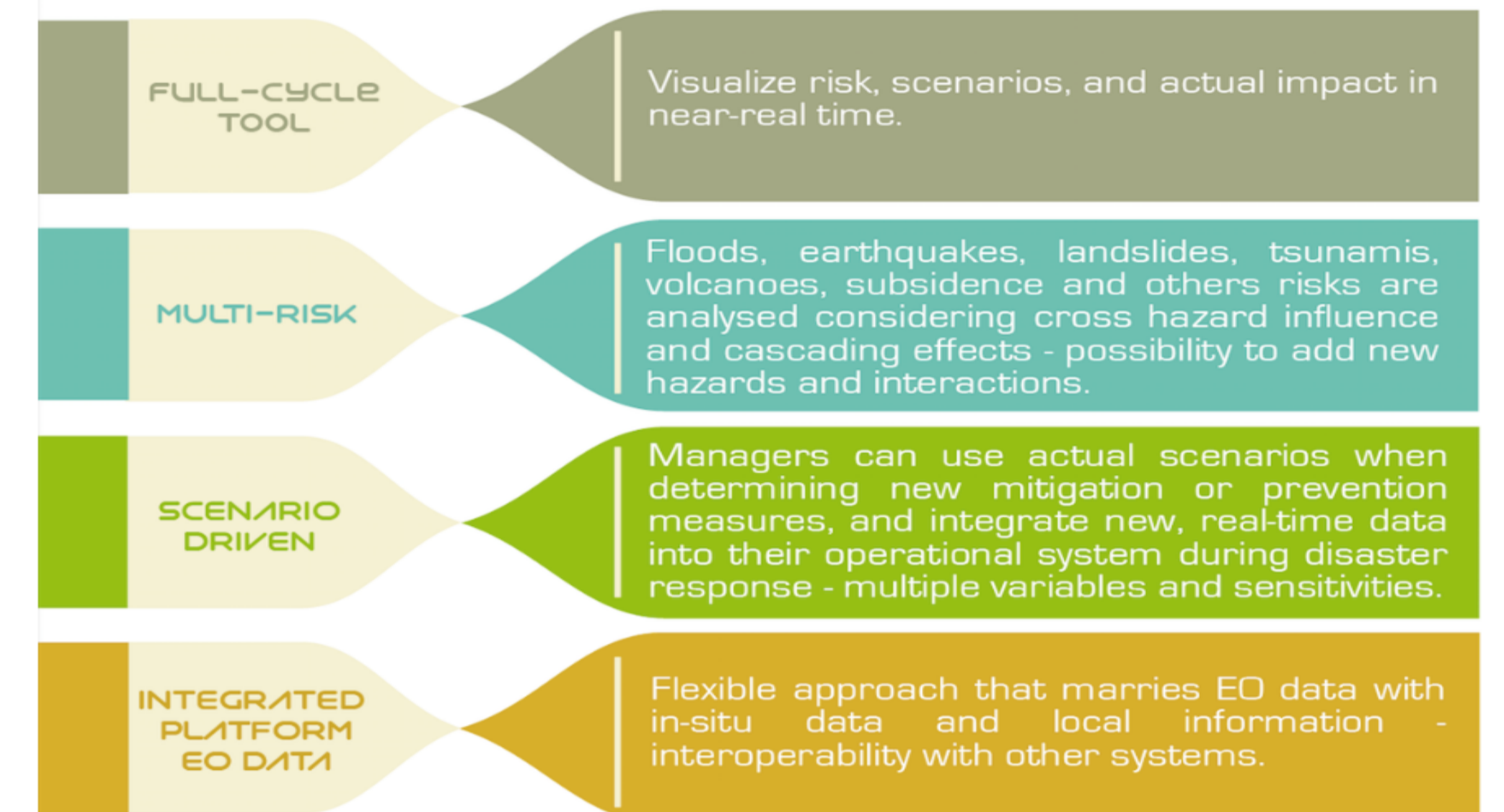
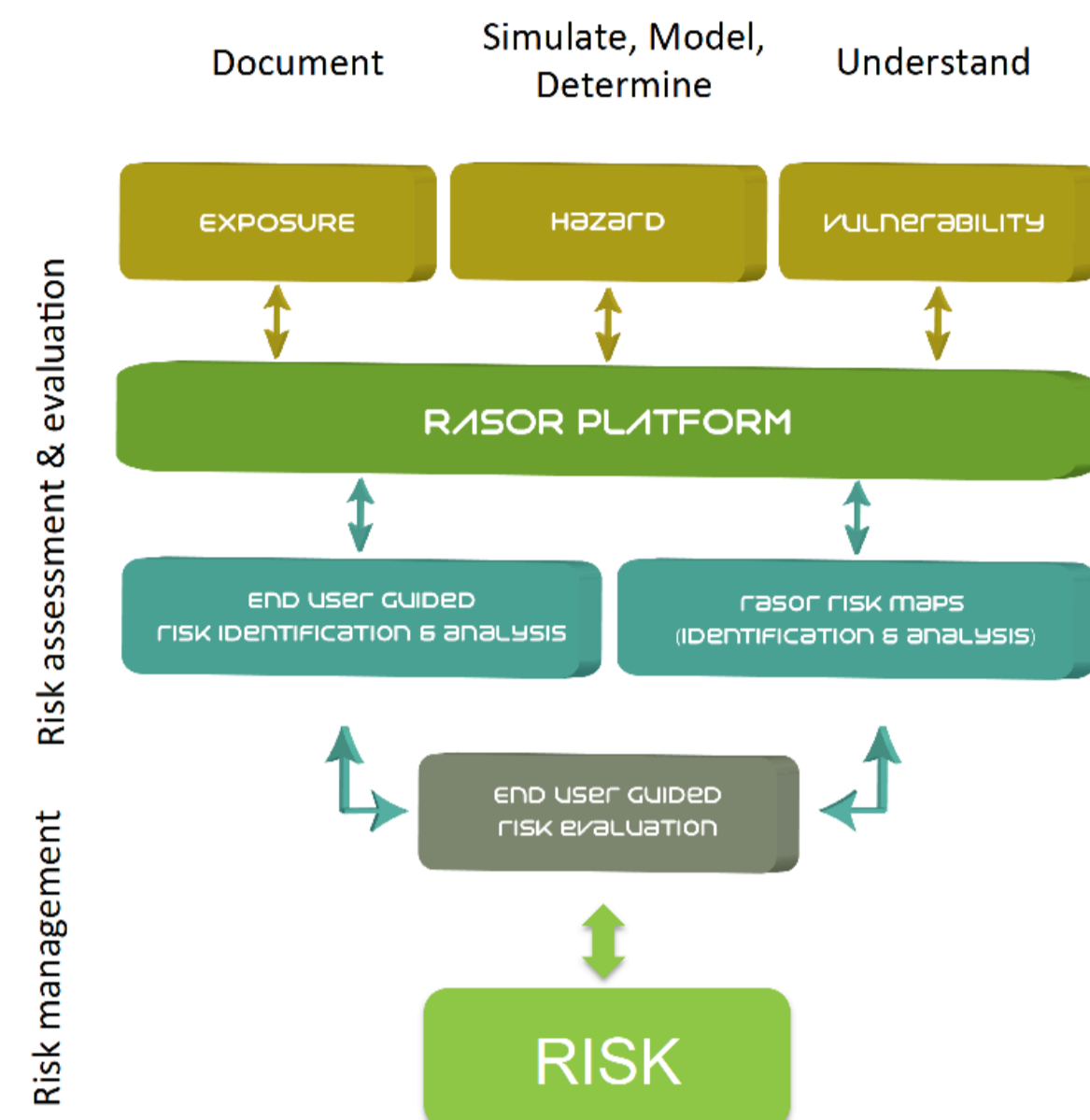
Impact assessment on a global scale with the RASOR platform

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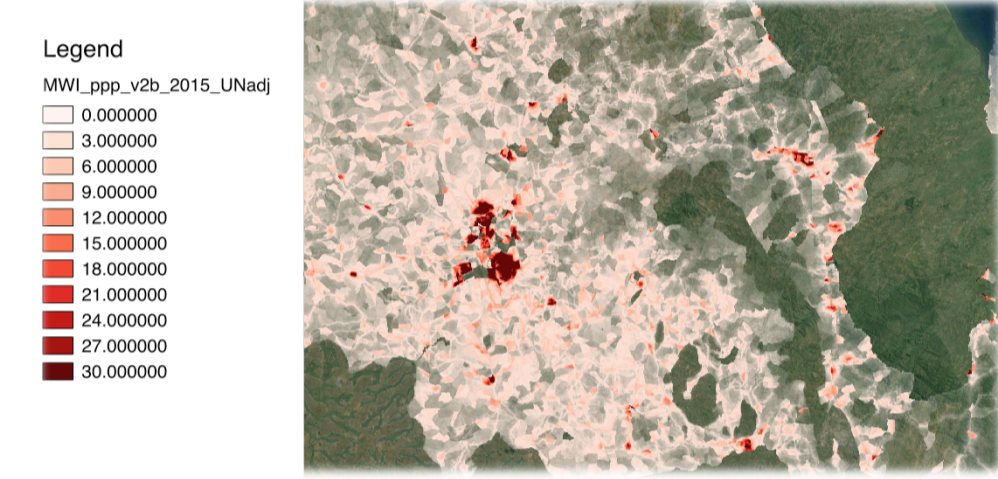
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RASOR (Rapid Analysis and Spatialization Of Risk) platform performs multi-hazard risk analysis for the full cycle of disaster management. A scenario-driven query system simulates future scenarios based on existing or assumed conditions and compares them with historical scenarios. RASOR integrates diverse data and products across hazards, update exposure data quickly and make scenario-based predictions to support both short and long-term risk-related decisions. Global applicability of such system is subjected to data availability at relative high resolution. The RASOR has access to high resolution datasets at global scale (such as 12m resolution tanDEM-X by DLR), that allow a fairly detailed implementation of hazard models embedded into the platform, aimed to predict the effects of earthquakes, tsunamis, floods, landslides, subsidence, etc.). However, global datasets on exposure contain information only at national/provincial scale and cannot be directly used on damage computation. To sort out this inconsistency, RASOR incorporates downscaling methodologies for exposure data to be consistent to high-resolution hazard layers. Considering buildings, lumped census data or EO-based imageries provide information on different construction parameters aggregated on large areas. Through those parameters it is possible to define typical building classes and relate them to a vulnerability model. Data on those classes need to be disaggregated using high resolution EO-based built-up mask layers (e.g. Global Human Settlement Layer by Joint Research Center) to obtain a spatial distribution at a reasonable fine resolution. Mapping schemes techniques may also be used to spatially distribute disaggregated data to increase results accuracy. The same downscaling procedure can be applied to other assets such as population, crops, GDP. Global population data can be further disaggregated at settlement resolution (30m), taking into account country-based societal habits (working hours, etc.). Coarse resolution data on agricultural sites and crop production may be disaggregated cross-comparing with finer EO-based land cover layers. This methodology has been successfully implemented in data poor context, such as Malawi, allowing for a complete flood risk assessment. Exposure and flood hazard layers at a relative high resolution form the basis for a risk assessment that produces figures aimed to increase scientific-supported awareness of risk at the national level and sub-country level. This can help to protect people and properties of Malawi against future floods.

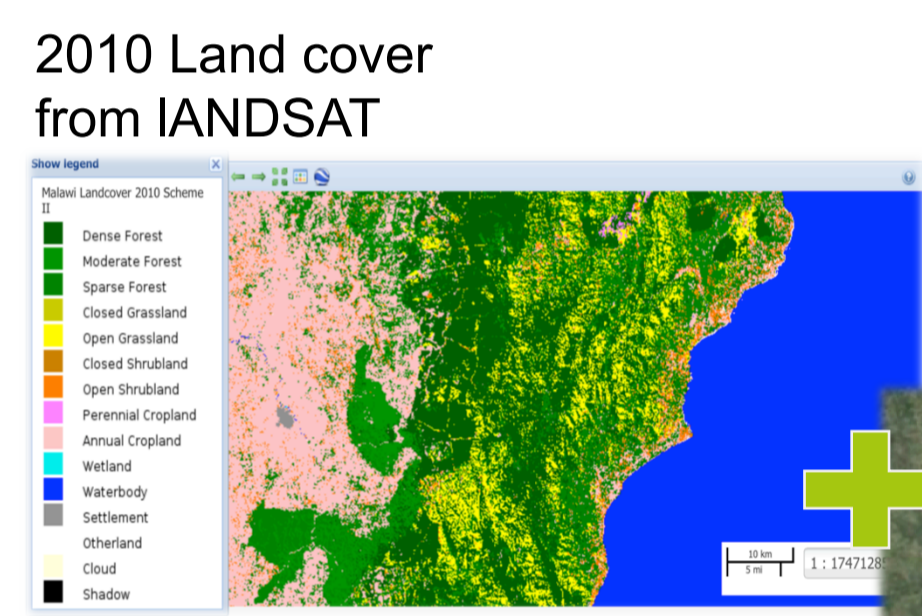
THE Rasor platform



1. POPULATION FROM WORLDPOP



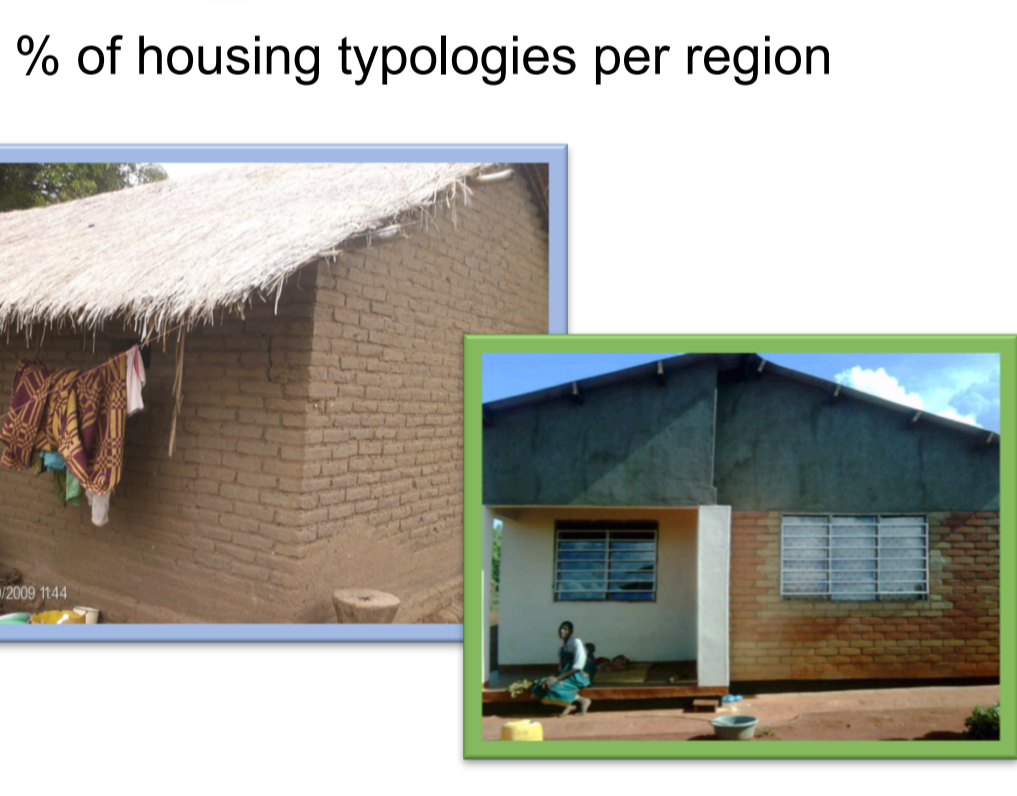
Exposure layers



2. Built-up area

POPULATION MASKS:
-pixels with more than 3 people
-pixels with more than 5 people

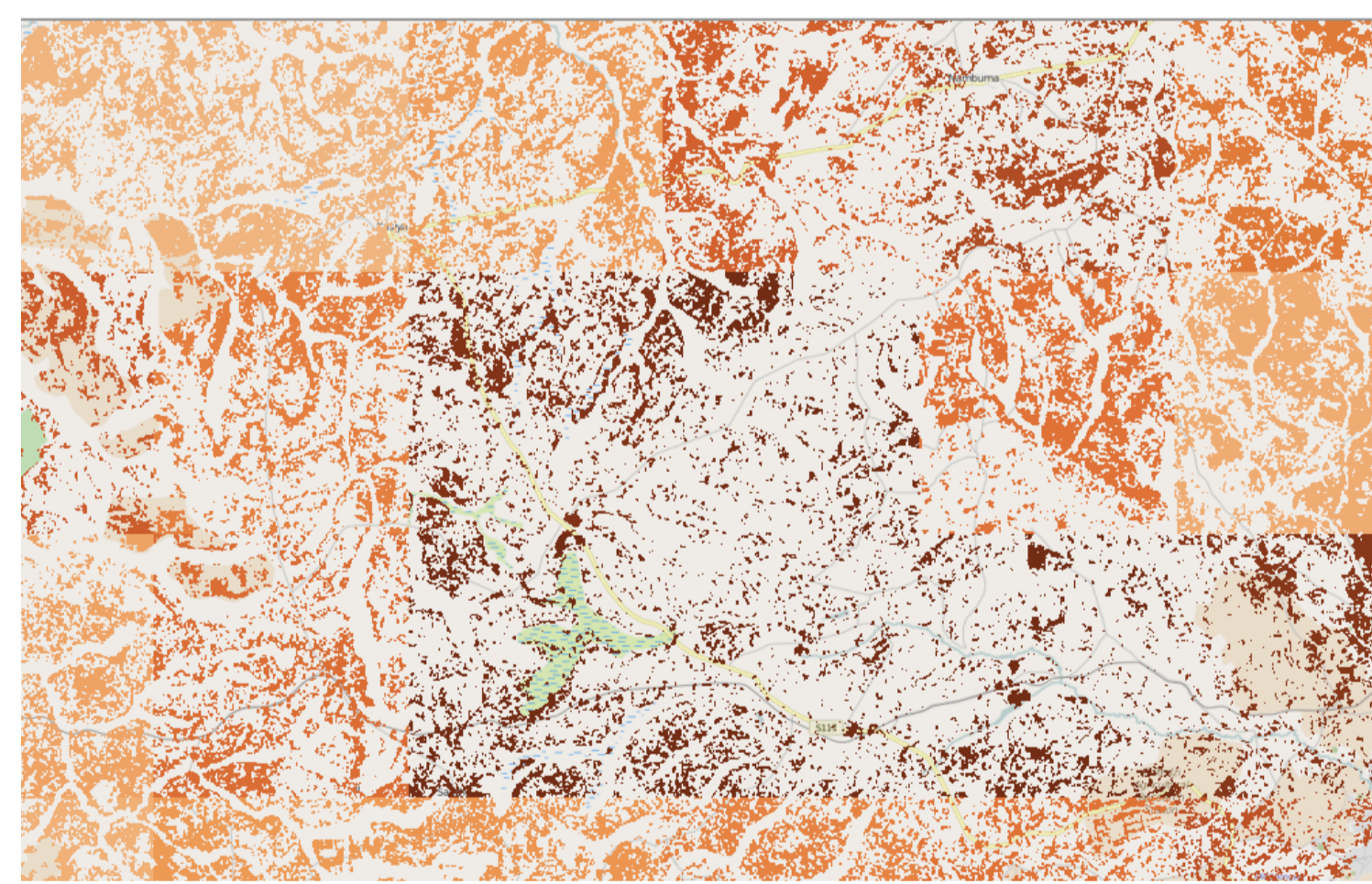
CRITERIA to identify built-up area extension



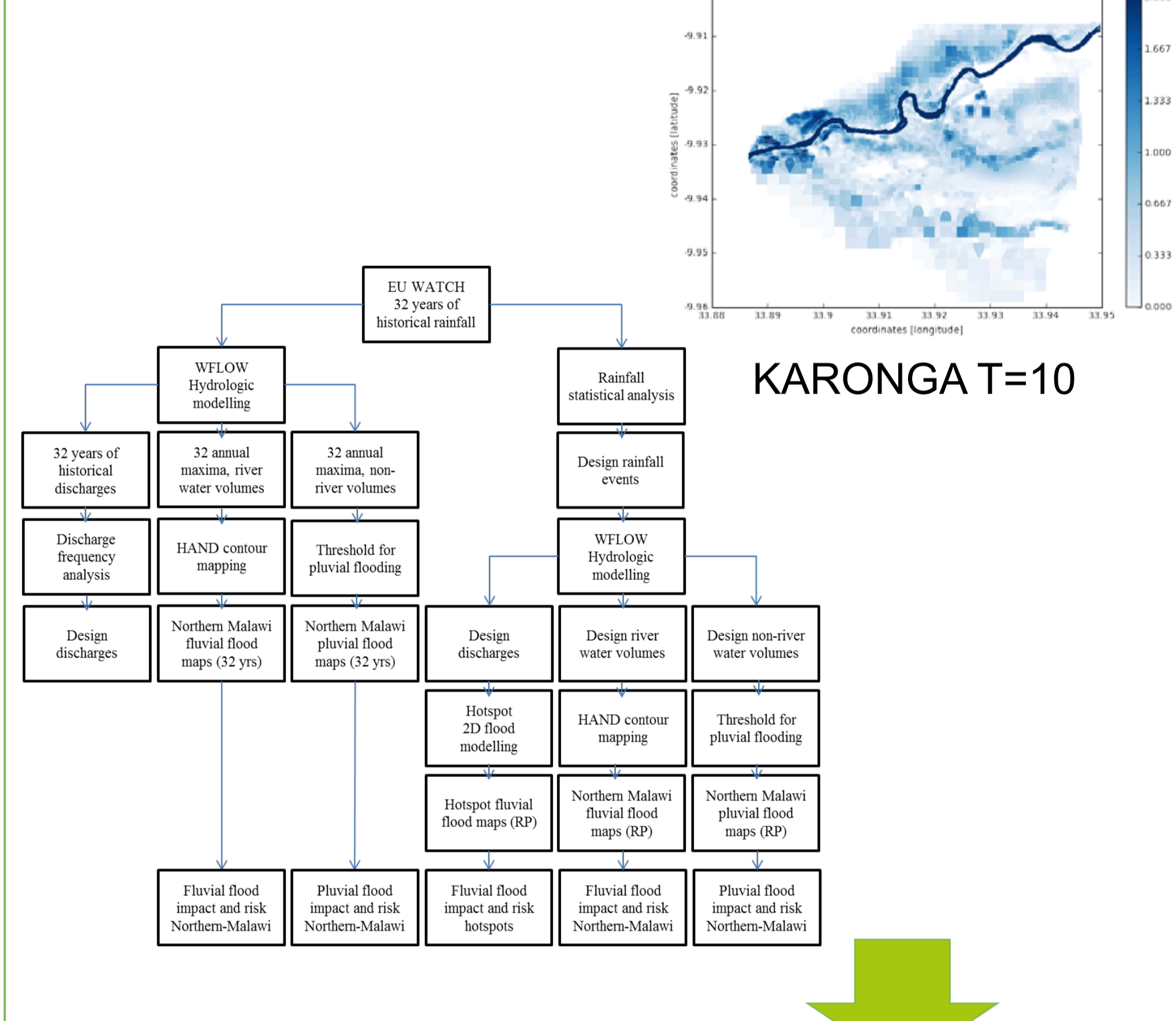
% of traditional, semipermanent, permanent housing per each pixel of Built-up area

3. CROPS

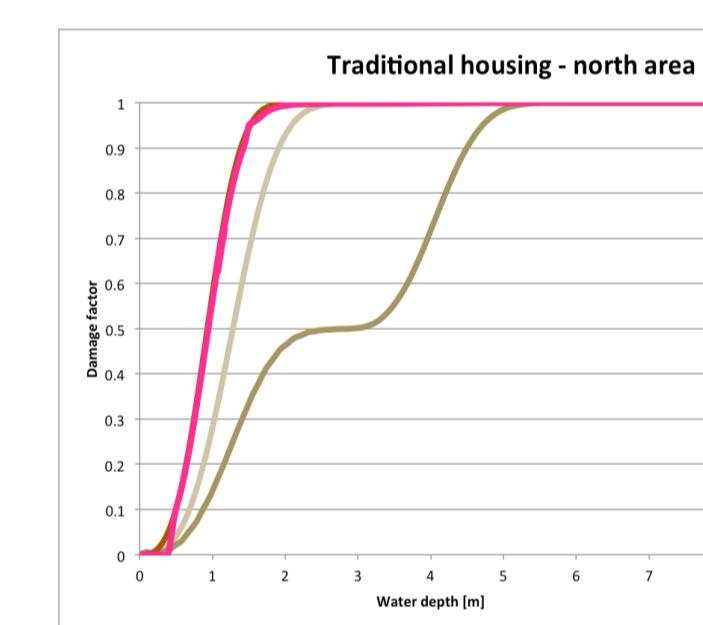
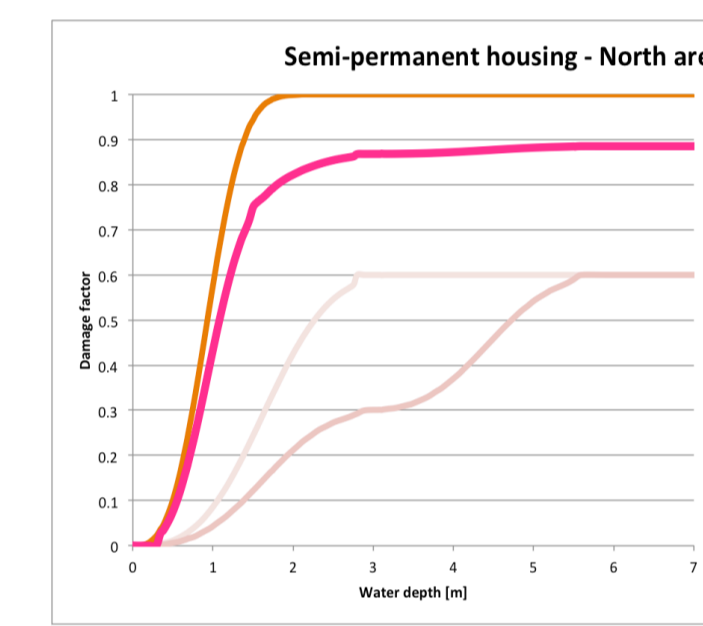
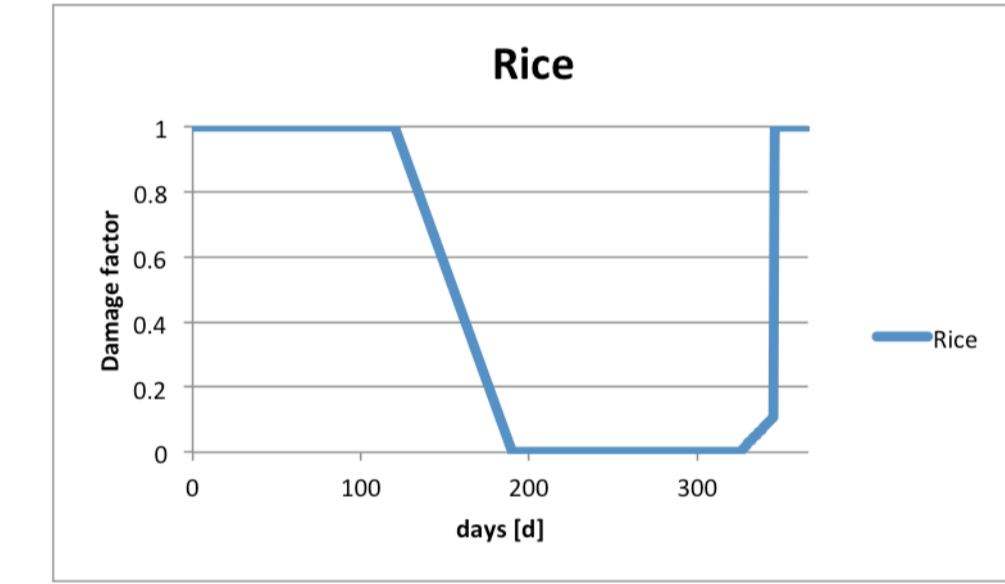
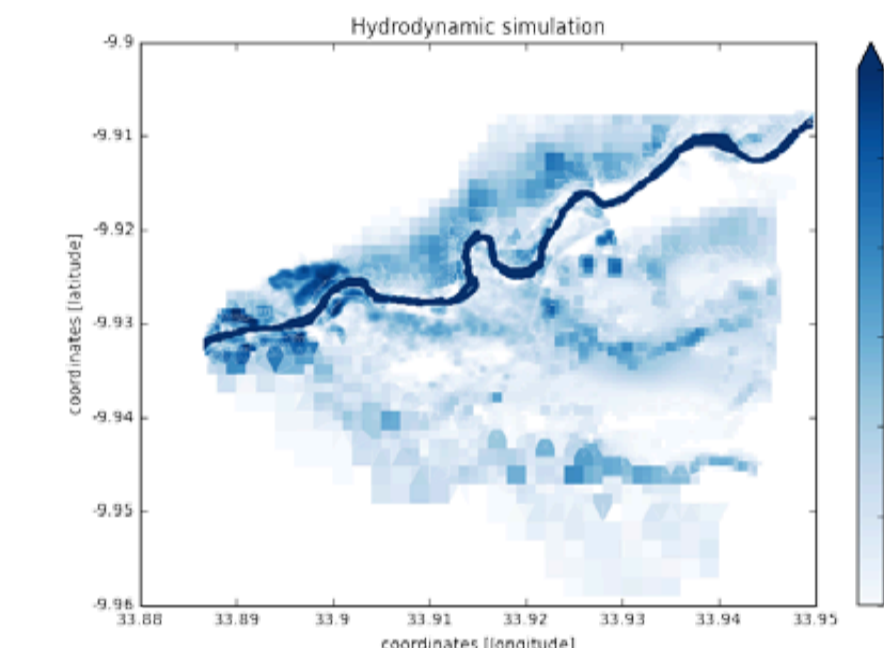
- geolocalization (at 30m by 30m resolution)
- annual production (tons)
- production price (USD/tons)
 - cassava
 - cotton
 - groundnuts
 - maize
 - pigeon peas
 - potatoes
 - rice
 - sorghum
 - tobacco



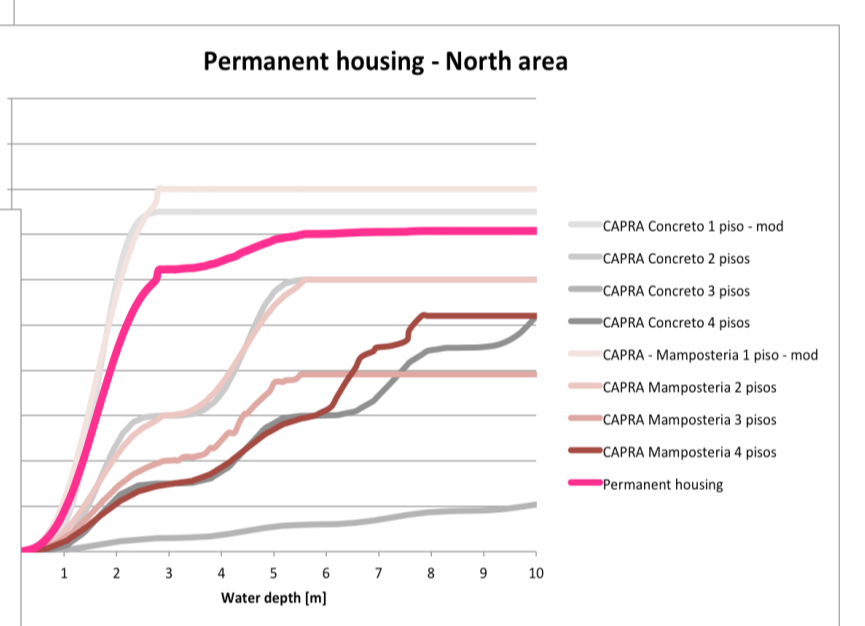
-NORTHERN MALAWI + 3 HOTSPOTS -TANDEM-X 12 METERS AVAILABLE AT GLOBAL SCALE



flood modelling



CAPRA - material		Building stock material		Housing typologies	
Material	Category	Traditional	Semipermanent	Permanent	Other
Concrete	X			X	
Brick	X		X		
Wood	X				X
Straw	X	X			
Plastic	X				X
Other	X				X



RP	LOSS BUILDINGS [\$]		
	North	Centre	North+Centre
5	652711	1617599	2214697
10	961295	2173863	2959383
20	1274944	3083964	4048491
50	2107389	4825616	5959148
100	39097456	7304852	7770157
200	4781983	8516812	8948293
500	5420592	9207136	9544642
1000	5626240	9373584	9918664

RP	LOSS CROPS [\$]		
	North	Centre	North+Centre
5	15919563	10075443	24769311
10	17489688	10984943	26844738
20	19067667	11784448	28860604
50	21049695	14488235	31996125
100	22871420	20154469	34918914
200	24103987	23684983	37054963
500	25341195	25856876	39253481
1000	26803032	26160571	40951076

RP	AFFECTED POPULATION		
	North	Centre	North+Centre
5	30157	64764	89344
10	34813	73209	98203
20	35656	80811	106488
50	38454	94459	117372
100	43414	109924	131451
200	45531	119409	141890
500	46759	124359	151335
1000	47283	125590	155563

IMPACT ASSESSMENT

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AGDAM Agricultural Flood Damage Analysis - User's Manual, US Army Corps of Engineers, Hydrologic Engineering Centre, 1985.

HEC-FIA Flood Impact Analysis - User's Manual, US Army Corps of Engineers, Hydrologic Engineering Centre, 2012.

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PARTNERS

