Projet InSPred
2014-2016

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Objectives:

- Model maize insect pest distribution and abundance in Kenya through a multidisciplinary approach
- Test hypotheses on drivers, to select models, to establish scenario
- Create permanent collaboration between different discipline within BASC for future projects.

Methodologies:

Data: 350 farms in 6 Kenyan regions.

- Climate CORDEX ARS 50km resolution in Kenya + donwnscaling to 5km using 20 years fine scale meteorological data to be compiled across Kenya
- Land use. Questionnaires on land use, irrigation, insect pest management, agroeconomy and education level
- Insect abundance. 2 year survey. Lepidopteran cereal stemborers, and coleopteran large grain borer.

Strategy for the analysis:

- Model selection at each level based on train/test correlation
- Scenario building based on LVM and LUCC projections

In a second step we will test the feedback of insect pest density on vegetation and land use. To eventually modify the LVM model

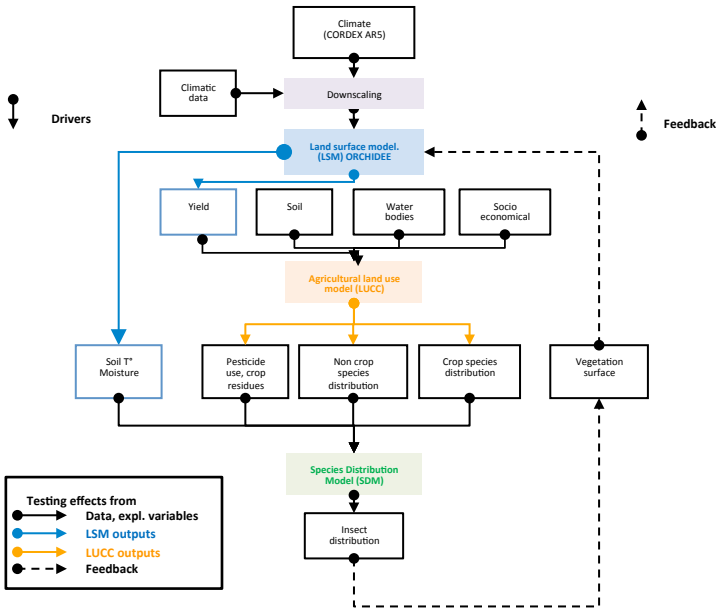

Figure 1 : Model diagram

The model will have three hierarchical modules: (i) a land vegetation model (LVM), (ii) a land use model (LUCC) using LVM outputs and other GIS data as independent variables, (iii) a niche model (SDM) using LUCC and LVM outputs and other GIS data as independent variable

Optional:

a spatial dynamic module for insect will eventually be added using a dispersion model inferred from genetic data to study dynamics of expansion / range restriction during seasonal cycles

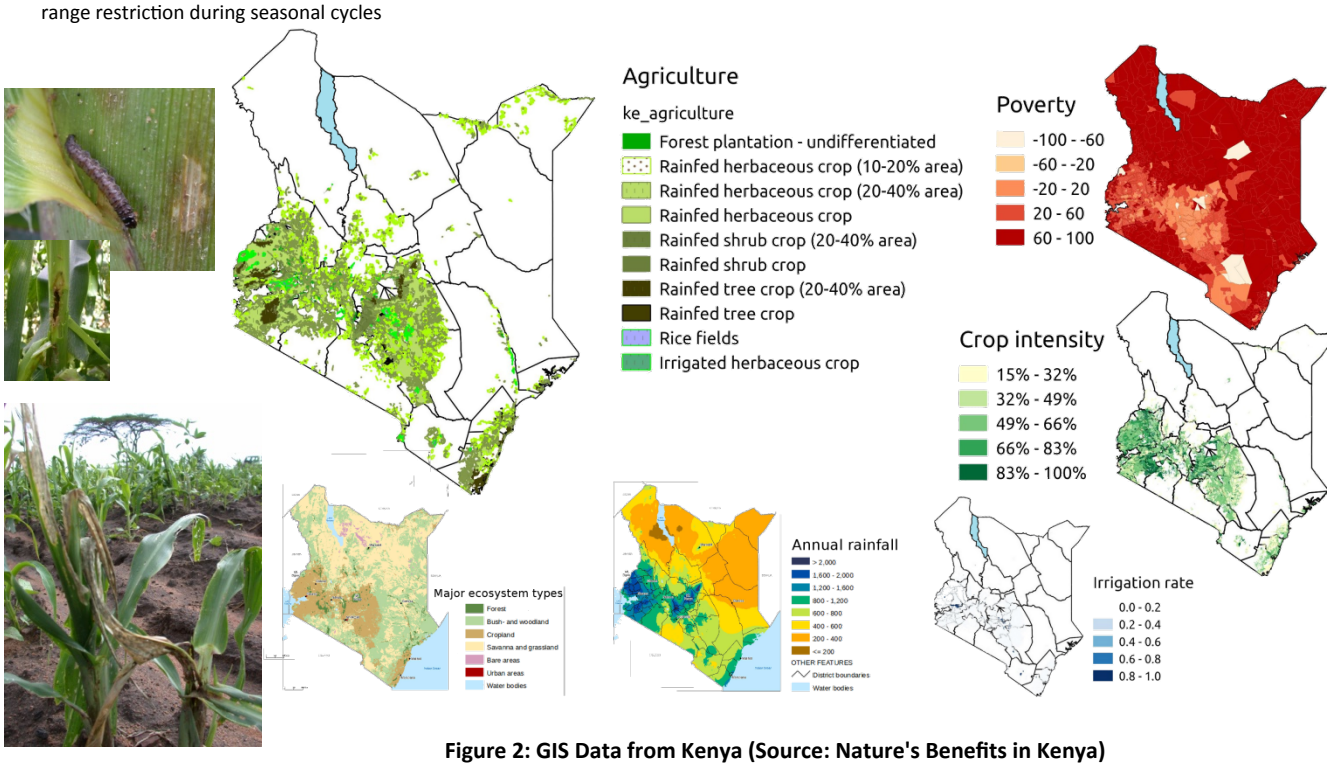

Figure 2: GIS Data from Kenya (Source: Nature's Benefits in Kenya)