

Agricultural intensification and deforestation in Cameroon: the REDD-Camer Model

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Why a model?

- Impacts of agricultural intensification on reductions in deforestation in the REDD context
- Effects of trust in local authorities on the feasibility, cost and effectiveness of REDD mechanisms in the Cameroonian context

Why an agent-based model?

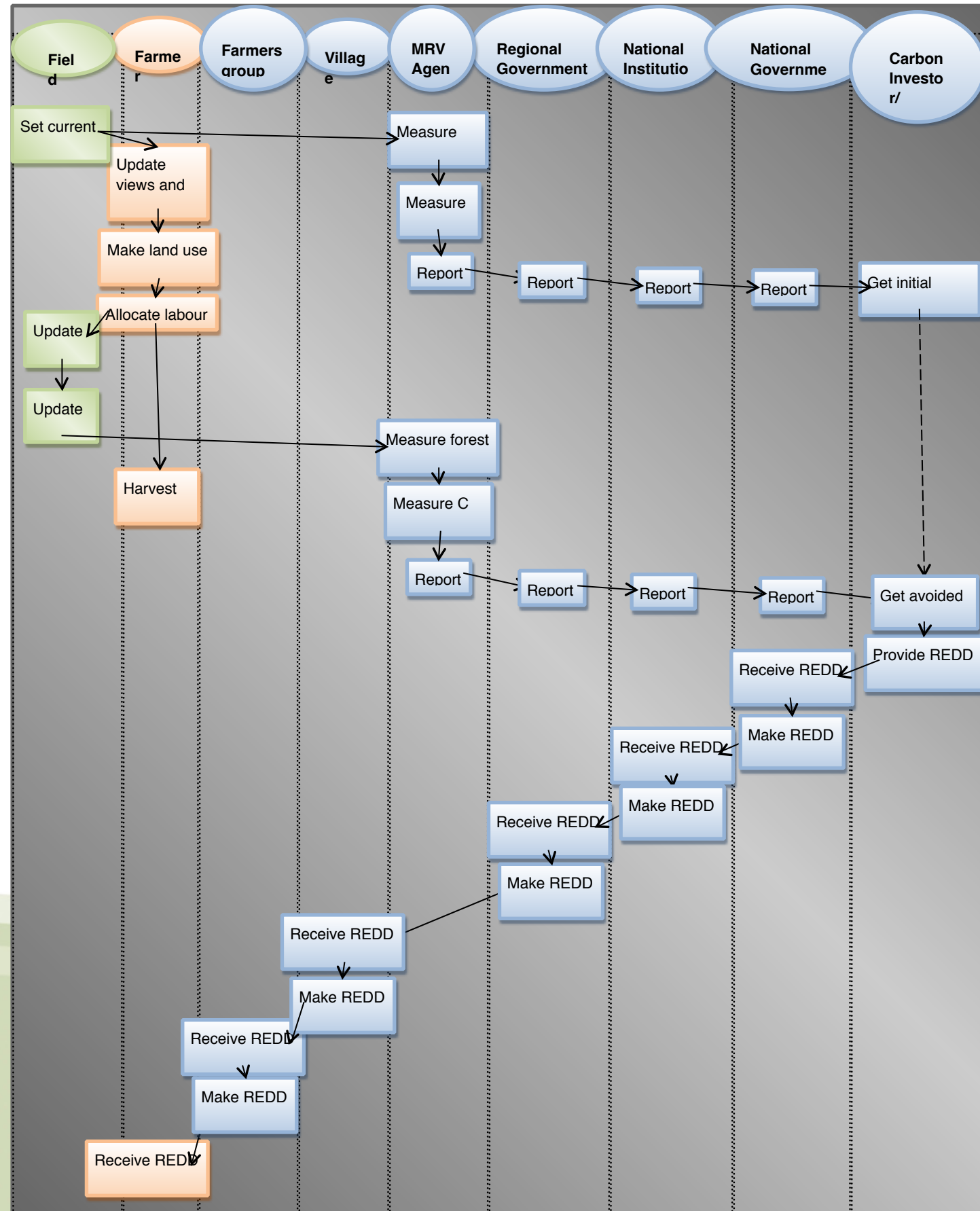
- To take into account non economic factors such as:
 - Trust in the authorities (village leader, government agency, NGO) in charge of setting of the scheme and delivering the benefits of REDD
 - Cooperation among farmers to achieve a desirable avoided deforestation level
 - Peer-pressure and reluctance to change

Data have been collected

- 12 focus group questionnaires
- 286 household questionnaires in 11 villages
- 409 questions per household
- Household data
 - General description: age, sex, marital status, children, religion, main activity
 - Goods: TV, bikes, bicycles, animals
 - House: electricity, water, building material, use of fuelwood
 - Farms: number of fallow fields, mixed crops, cocoa, coffee, plantain, ownership, indication of relative sizes
 - Data on land use decision rules, prices, expenses, land use rights, deforestation drivers
- Data currently being analysed

Preliminary observations

- In most cases, no permission is required to use land belonging to the larger family
- Only one household reported having title on their land
- 190 out of 286 households (66%) declared that their first reason of deforesting is fertility (actually 87% of those who answered the question)
- Other reasons include marking land ownership or creating a new plantation in anticipation to a special event



Model design

- Agents
 - Households
 - Villages
 - MRV agent
 - Fund provider
- Land patches

Model design

- In the **BAU scenario**, each household decides to put an old fallow or a forest patch into cultivation:
 - when production from current cultivated patches fall below the required subsistence needs
 - as an anticipation of a special event (randomly generated)
- As response to the **REDD scheme** (intensification), households decide whether or not to participate to the scheme
- Each household that decides to participate to the scheme will avoid converting forest into cultivated patch. Options considered for the decision include:
 - rationale behaviour (comparing current vs. expected income)
 - level of trust in the authority managing the scheme
 - peer-pressure (participates when most acquaintances are participating)
 - random

Model design

- The MRV agent measures output at the village level, and decides that the village has successfully participated if avoided deforestation above a set level
- Benefits of successful participation of the village could be:
 - equally shared among households regardless of their individual participation,
 - or targeted at the participating households

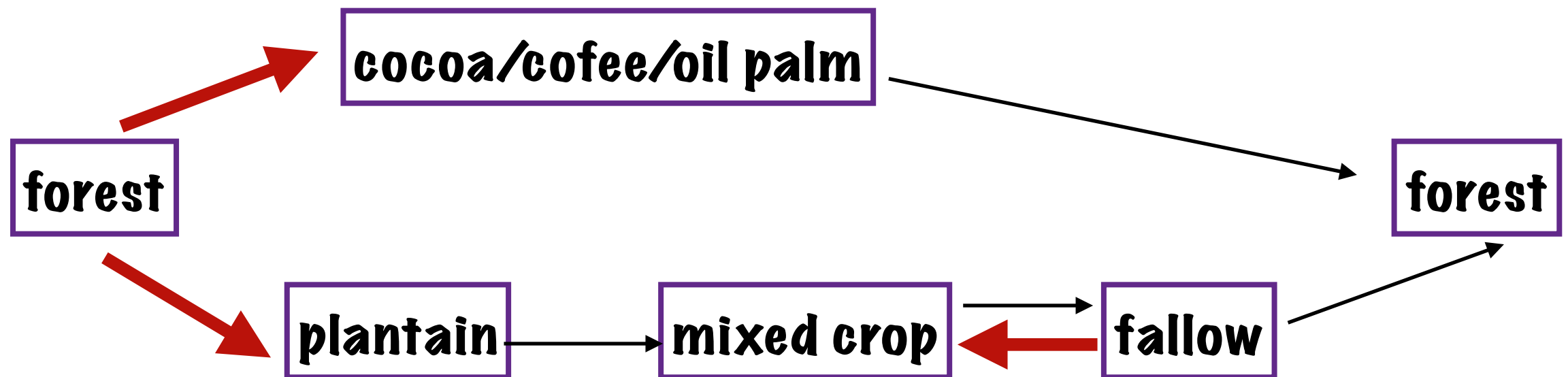
Model design

- A scenario is defined by
 - the household decision making option
 - the benefits sharing option
- Other model assumptions
 - Availability of REDD funds
 - Household needs: function of family members + (random) anticipated event

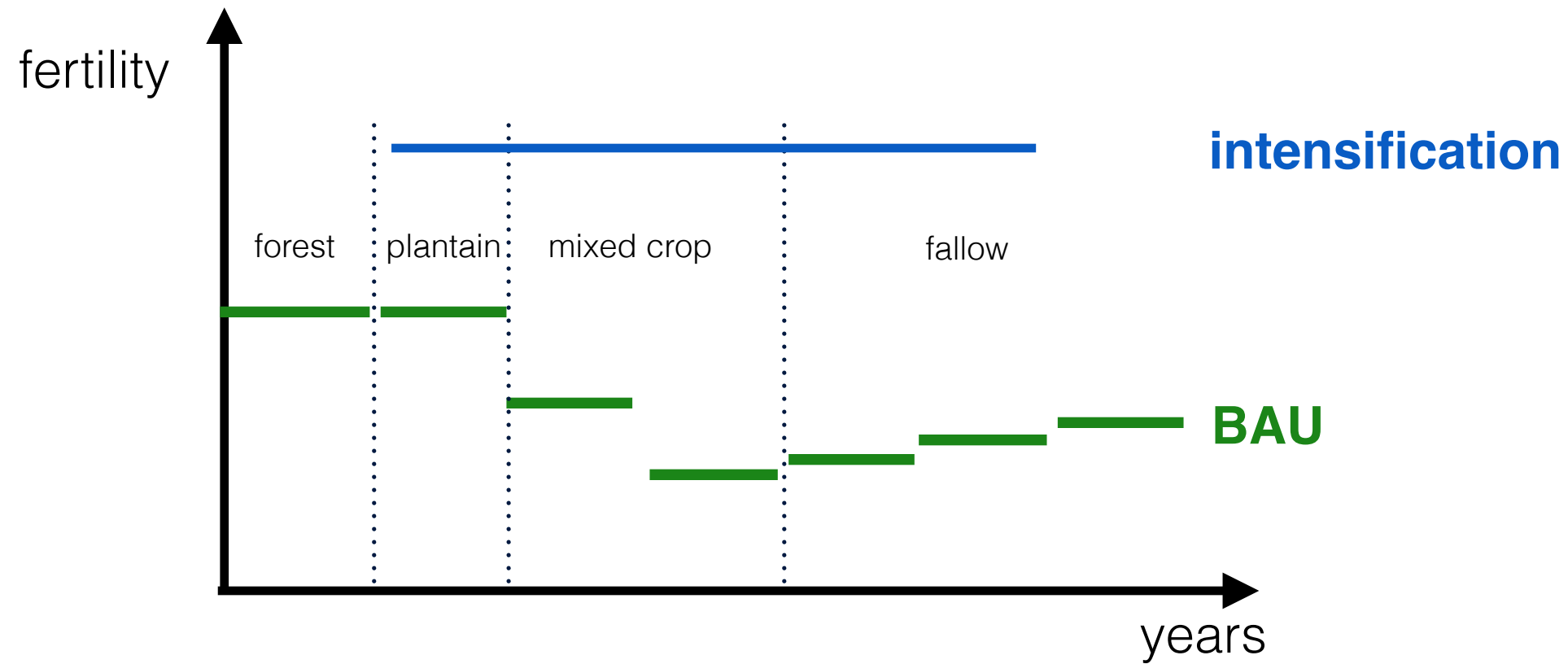
Model design

- Land use transitions
 - Production of mixed crop patches decreases with time
 - Minimum years into fallow before returning to cultivation
 - Fallow aging until becoming forest or converted back to cultivation
 - Ownership of old fallows and forest patches return to the village
- **Model calibration requires full analysis of survey data**
- **Model development will link decision with the spatial analysis of probability of deforestation (Laura/Alessandro)**

Land use transitions



Agricultural intensification



Model outputs

- Effectiveness
 - How much avoided deforestation can be achieved?
- Efficiency
 - At what cost?
- Equity
 - Who pays/benefits for/from REDD?



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THANK YOU