GFG, Migration and the Environment: Modelling FNNR Interactions: What we are learning and gaps to address

Richard E. Bilsborrow, Professor
Department of Biostatistics and Geography (Adjunct)
Carolina Population Center, University of North Carolina
richard_bilsborrow@unc.edu

Hypothesized impacts of GfG payment

- 1. Reduces cropland area, small payment/income, seedlings to start trees growing

- 2. Could lead to various livelihood responses that do not release labor or lead to out-migration:

- a) increased labor applied to remaining crop areas, called agricultural intensification

- b) increased off-farm work

- c) expansion of business or new business

- d) increased leisure

- 3. Or it releases labor for out-migration, depending on hh size and composition, individual attributes, community attributes, etc., which may affect migration

Topics to discuss

- What have we learned up to now from designing and conducting the household and community survey?

- From analyses so far?

- 1. PES effects on out-migration

- 2. PES effects on livelihoods

- 3. migration effects on livelihoods

- Reciprocal effects, and CHANS modeling of people and environment linkages

Survey Data Collection and lessons learned

- In 2014 the main survey was implemented covering 605 hhs in FNNR

- We learned that usable data on hhs and maps were available to select a representative sample with oversampling

- Following a week of training, inexperienced students from Tongren Univ were taken to FNNR to carry out first official interviews in presence of each other and supervisors.

- Interviewers needed more time and possibly training to become good, but it happened, completing 605 hhs

- Questionnaires worked well after some experience, and produced much generally reliable data

- Difficult topics included incomes, whether acceptance of GfG was really voluntary or not, etc.

Special aspects of questionnaires

- Questions on GfG and NFCP seemed to work well

- Some questions on size of land and land use preGfG, at time of accepting, and time of survey; cp with migration

- Many variables only obtained at time of survey, esp. details; can be compared between GfG & non-GfG and between migration and non-mig hhs

- Sections 7-8 provide event history data on

First, what is "migration" and why might it be a key factor to study?

- Is one of the three demographic variables (with fertility and mortality) that determines the size, composition and geographic distribution of population.

- Is the variable that c*hanges most rapidly*, in response to economic change, natural disasters, policy changes, etc.

- Is *defined as* a move to change the place of usual residence which involves crossing an administrative border (a county or province in both China and the United States).

- Distinguish local vs. non-local (within county vs. not), but in our FNNR study, consider whether is within FNNR or not?

- Most is not local, and to urban destinations, viz. rural-urban

- This eases pressures on land/environment/forests in general, and is also explicit aim of GfG and NFCP

Determinants of migration

- Available variables include those at individual, household, and community;

- Individual include age, sex, education, marital status, prior agri and non-agri work, prior residence outside county, giving birth, having relatives living outside county

- Household include hh size, composition by age, gender; size of landholdings, main crop, whether had business, debt, big economic change, received big gifts

- Community level include age, no. hhs in community, presence of or time to nearest primary/secondary school, agri market, healfth center, all weather road, etc.; % hhs in GfG, daily agri. Wage, main economic activities

Impacts of out-migration

- On environment: Changes in land cover (LC) including reforestation due to GfG replacement of agricultural land by forest.

- On agricultural intensification: changes in land use (LU), such as changing crops, using more labor to weed more, or applying more fertilizer to increase crop output.

- On contributing to the changes in livelihoods mentioned above. But how to disentangle the initial changes resulting from the small payment and policy acceptance, from effects resulting from the out-migration possibly stimulated by the GfG in the first place?

- Which came first, and induced the other?

Feedback effects of out-migration

- Effects potentially greater than those of the initial effects of GfG on labor out-migration

- Primarily result from the income effects due to whether and how much remittances are sent back to the origin hh, and for how many years after departure

- So there is a need to study this, including who remits—by age, sex, education, etc.

- And what are the income effects of remittances on origin hhs, as %hh income, use of remittances, whether this leads to a decline in work effort (the original induced effects), etc.

Livelihood impacts on hhs of GfG

- Could lead to various responses that do *not* involve releasing labor for or lead to out-migration:
- a) increased labor applied to remaining crop areas, or agricultural intensification
- b) increased off-farm work
- c) expansion of business or creation of a new business
- d) no labor response at all, just increased leisure
- However, the trivial size of GfG payments (2%) compared to hh income from other sources, and the fact that hhs are already involved in diverse livelihoods and out-migration makes it very difficult to detect and measure differences in changes over time in GfG hhs than in non-GfG hhs

Another challenge

Separating out impacts of GfG and out-migration on hhs in the short run, and then in the intermediate run, after various years of possible changes occur (or not!), and after the impacts of remittances reverberate through recipient hhs over time up to the time of the survey

Agent-based models for FNNR

- Developing ABMs to model the multiple but small changes due to migration and livelihood strategies of hhs is one challenge in terms of model construction and content

- Challenge of detecting series of small differences in GfG and non-GfG households and hence overall impacts of GfG

- Finally, how much real integration is possible of the demographic-socio-economic behavior and human-nature linkages?

Xié, xie!
Many thanks.