School of Agriculture, Policy and Development

University of Reading

USE OF ACCELEROMETER DEVICES TO CAPTURE ENERGY EXPENDITURE IN AGRICULTURAL AND RURAL LIVELIHOODS

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[4] National Institute of Rural Development (NIRD)

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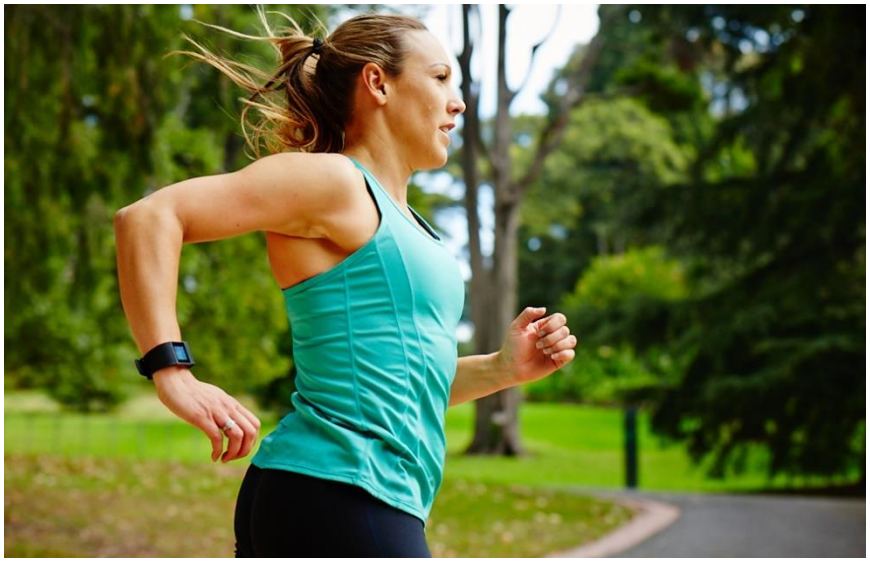


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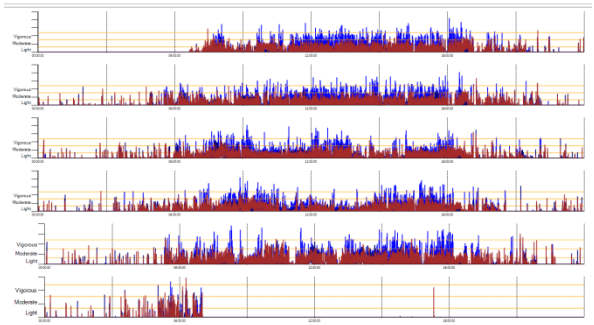


Energy expenditure

Accelerometers

Food intakes

Individual 24 hours recall

Time-use / activity

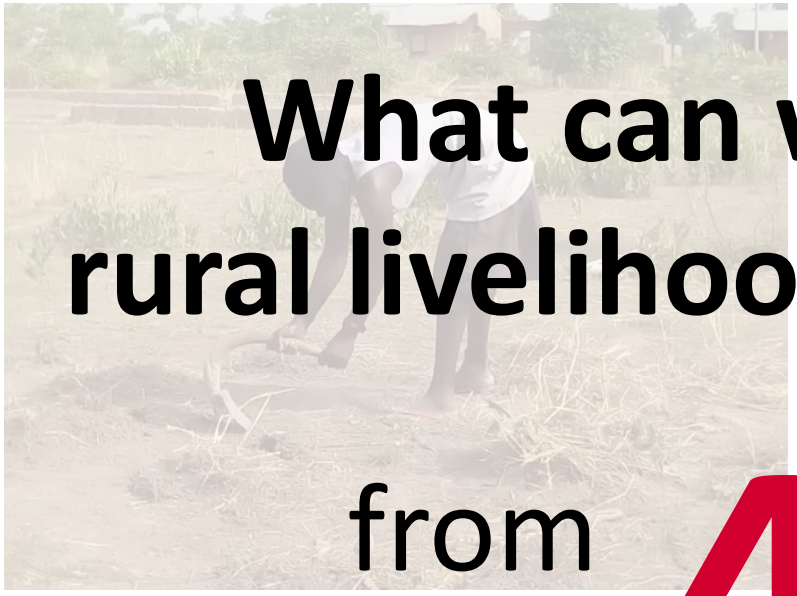
Individual 24 hours recall

CONTRIBUTION

- The methods and approaches developed with this study can be used to facilitate a better understanding of:
  i. The **prevalence, depth and severity of undernutrition** in rural areas in developing countries
  ii. **Energy requirements** for specific livelihood activities
  iii. The **link between agricultural development interventions and nutrition outcomes** for different members of rural households
  iv. The **intra-household, gender differentiated labour allocation, and energy expenditure patterns**
  v. The **effect of health** conditions and illnesses on livelihood activities.

ENERGY EXPENDITURE IN LMICs

- Traditionally energy expenditure has been capture with factorial method or Doubly-Labelled-Water (DLW) method.
- Several studies from ‘60s and ‘70s involving small samples of rural households.
- Only few studies in low-income countries have attempted to relate activities with energy expenditures, and none linking to time-use.
- Using tri-axial accelerometer sensors to capture movements (direction and intensity), recent devices provide measurement of variables which was previously not feasible at scale. They do not record effort.




What can we learn about rural livelihoods and agriculture

from tracking **40** **Ghanaian farmers**


for a total of **26,880** hrs?

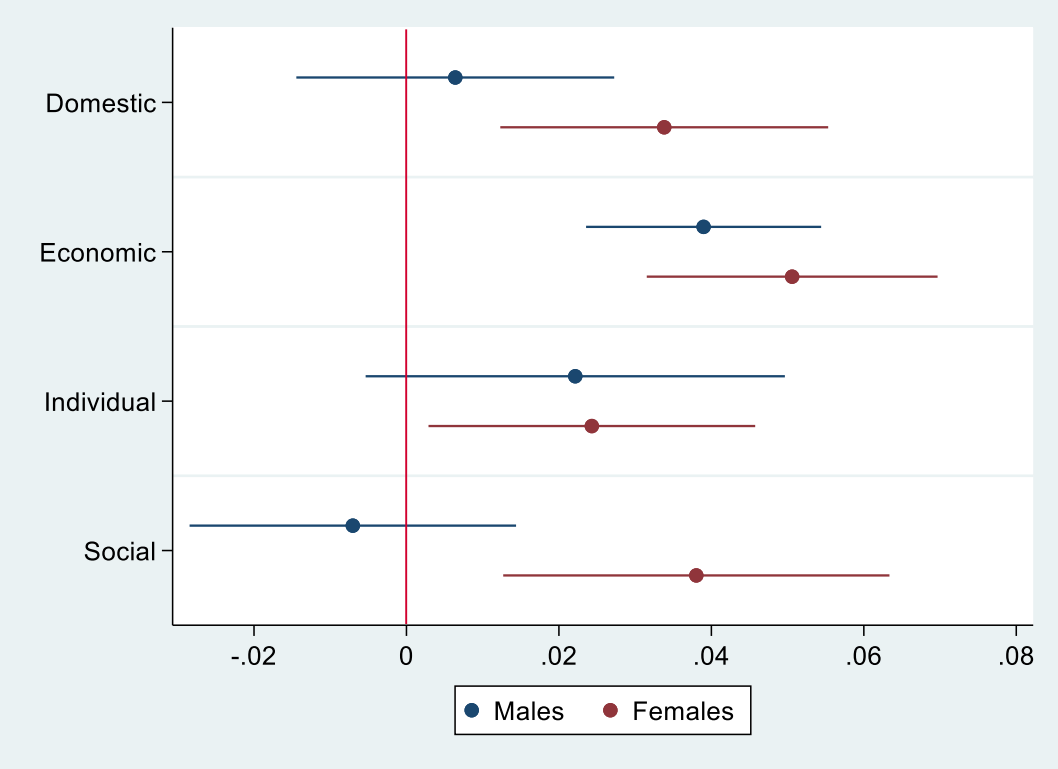
PHOTOS FROM THE FIELD

PHOTOS FROM THE FIELD

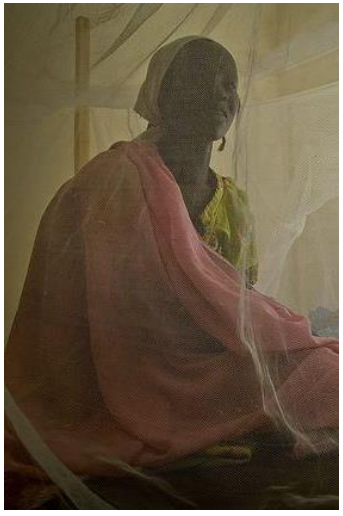
PHOTOS FROM THE FIELD

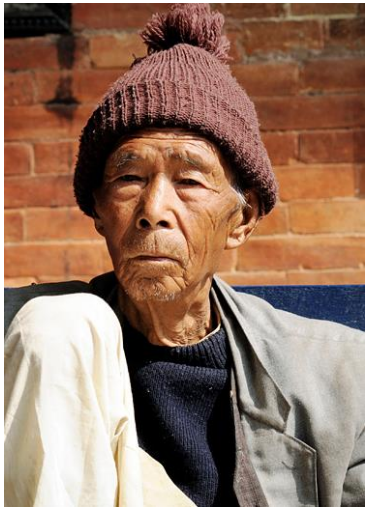
SNAPSHOTS OF INSIGHTS…

- **Physical activity levels** of women is greater than men across agricultural seasons.
- The greater proportion of **time** and **energy** that women spend on domestic activities appears to involve a trade-off against opportunities for economic activities and social interactions.
- Fixed Effect model: all activities significantly affect women's PAL. Men's PAL significantly affected only by economic activities.



…AND POTENTIAL APPLICATIONS OF THE METHODOLOGY





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