

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

Protocols and preliminary findings from pilot studies in Ghana and India

Giacomo Zanello<sup>1</sup>, C. S. Srinivasan<sup>1</sup>,  
Paul Nkegbe<sup>2</sup>, Radhika Cherukuri<sup>3</sup>

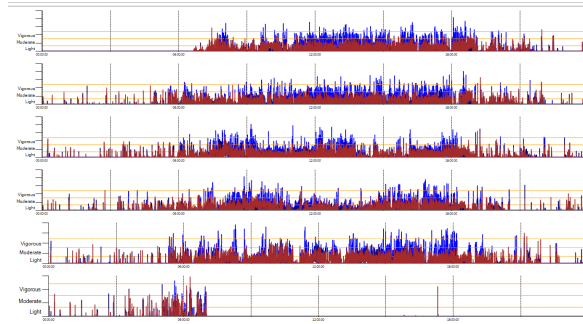
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AHN 2017





**Energy expenditure**

**Food intakes**



**Time-use / activity**



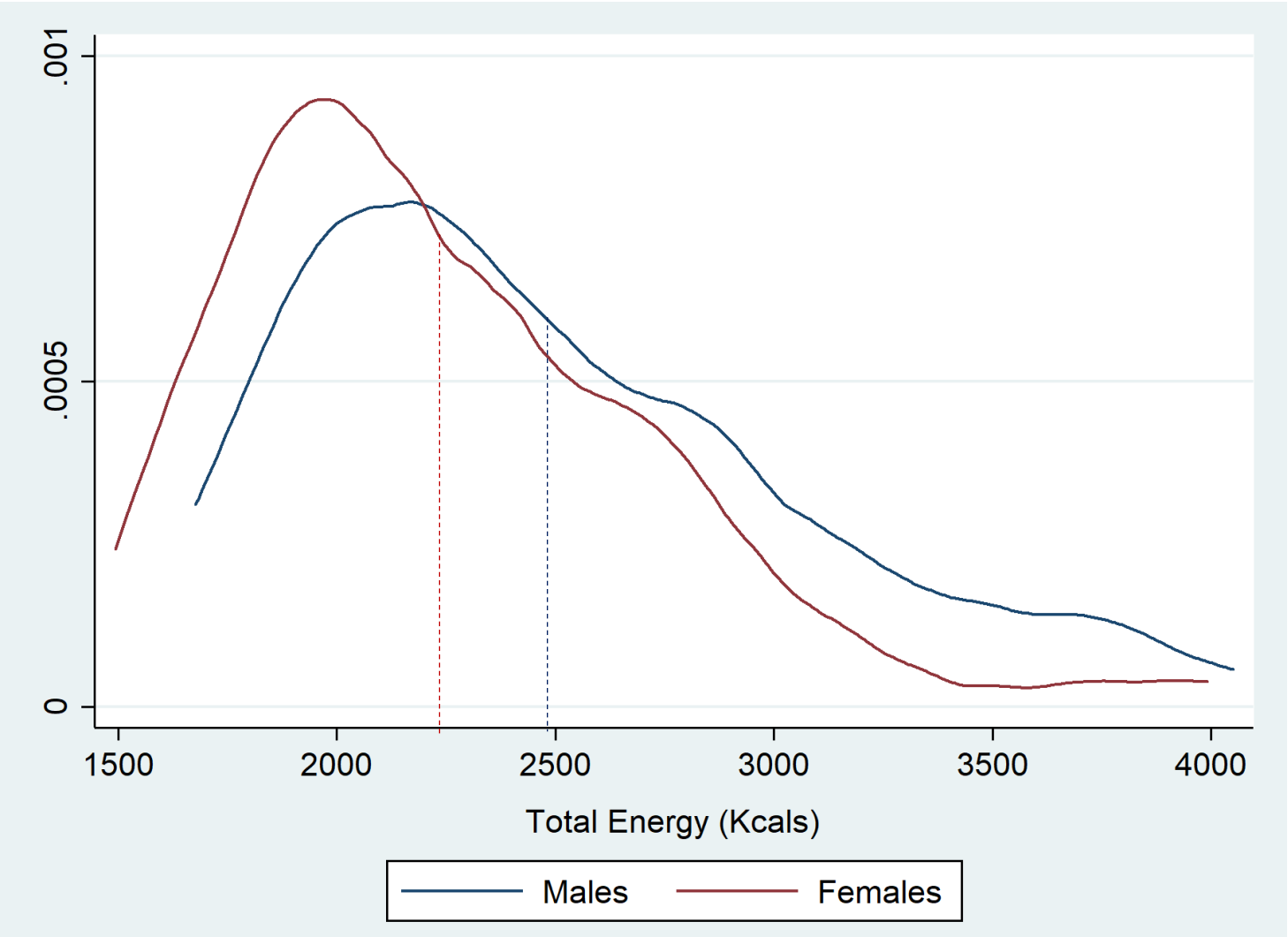
# CONTRIBUTION

- 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**

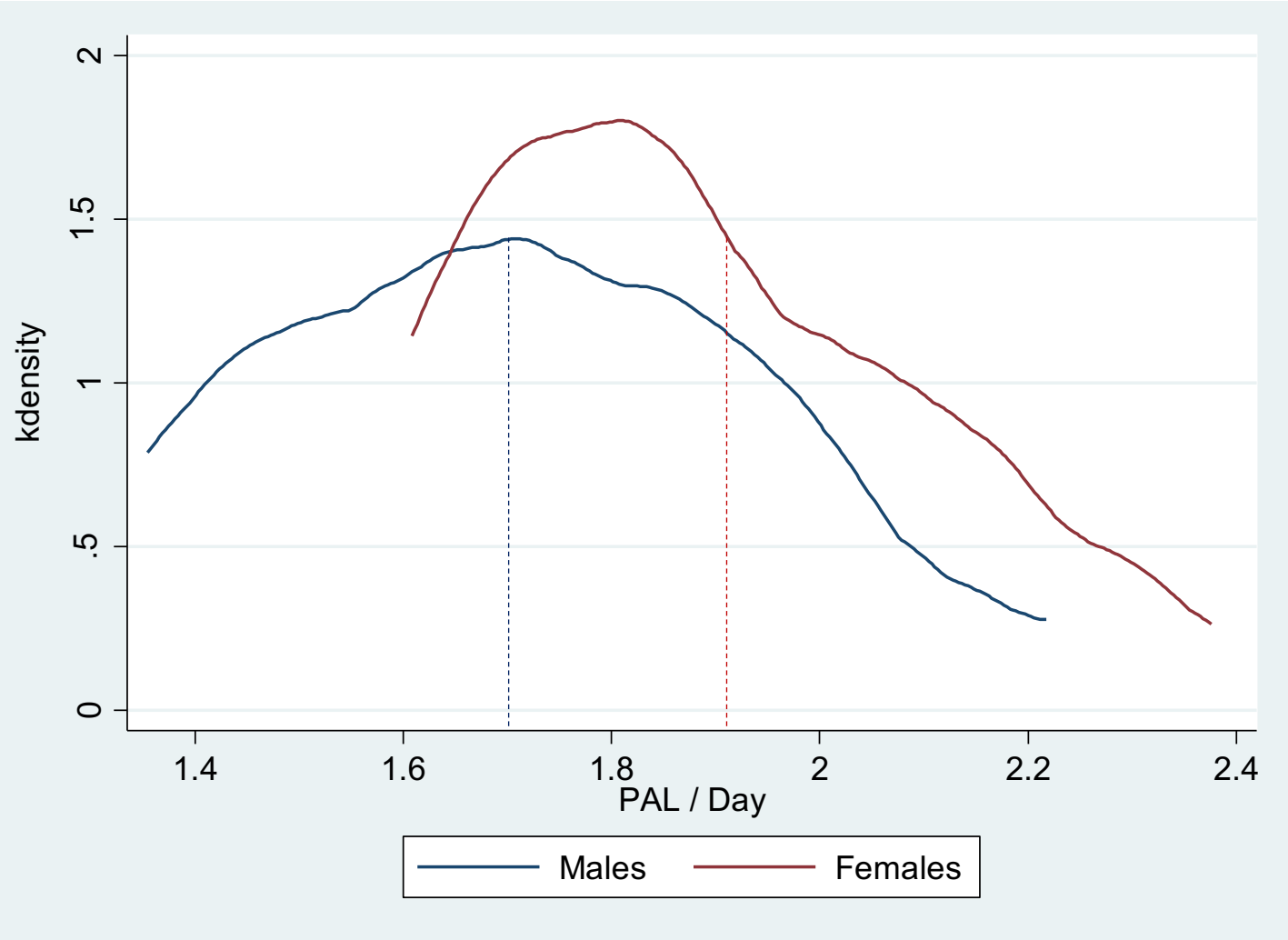
# STUDY DESIGN

- Pilot in Ghana (Upper East Region)
- Pilot in India (Telangana State)
- In each pilot:
  - Total sample of 40 individuals (20 males and 20 females, 20 households) wearing accelerometry devices for 5 full consecutive days each
  - Total of 200 days and 4,800 hours worth of data
- Initial household questionnaire followed by daily individual questionnaires (male and female) capturing 24h recall of time use and food intakes

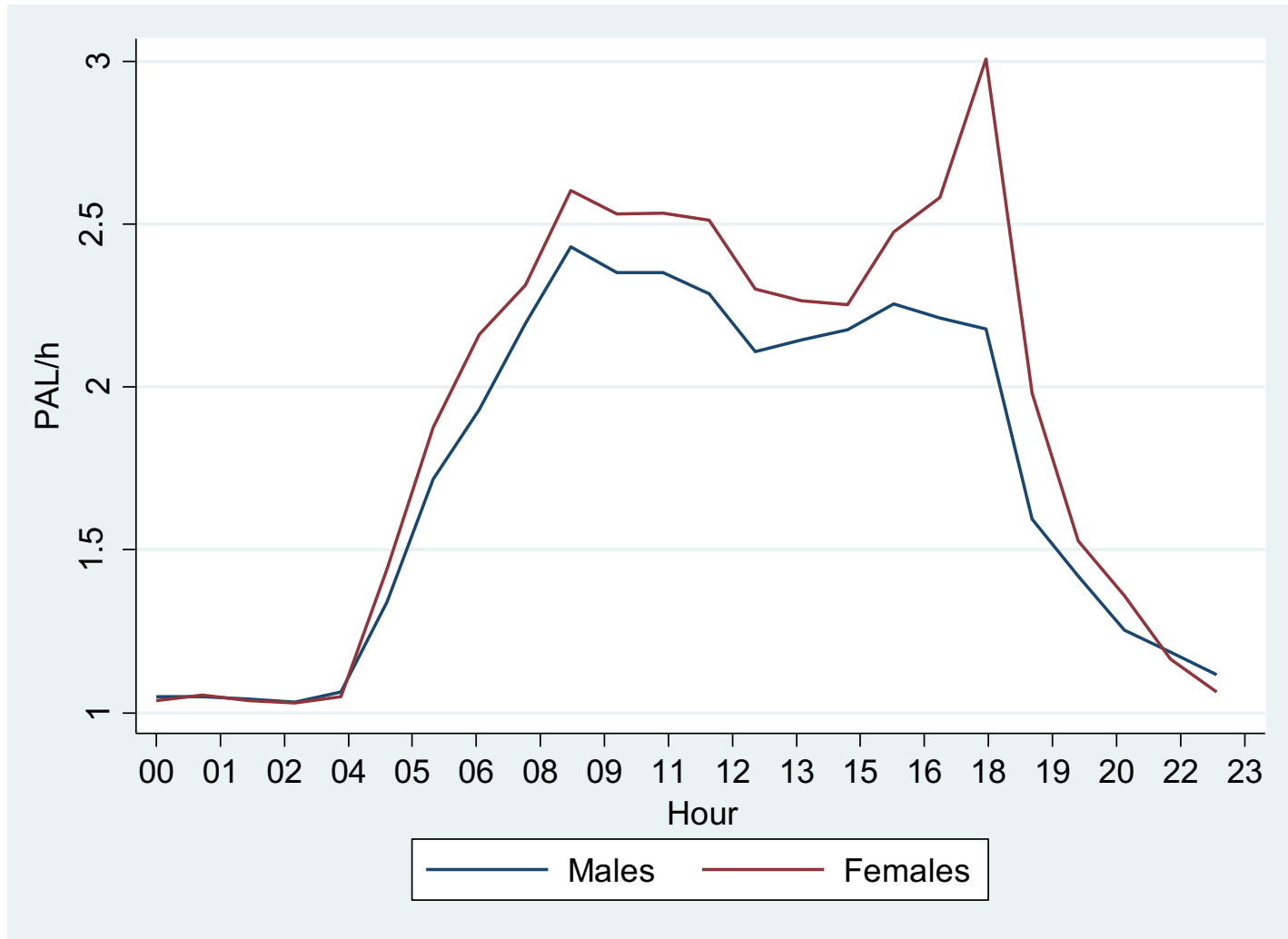
# DISTRIBUTION OF TOTAL ENERGY EXPENDITURE BY GENDER (GHANA)



# DISTRIBUTION OF PHYSICAL ACTIVITY LEVEL (PAL) BY GENDER (GHANA)

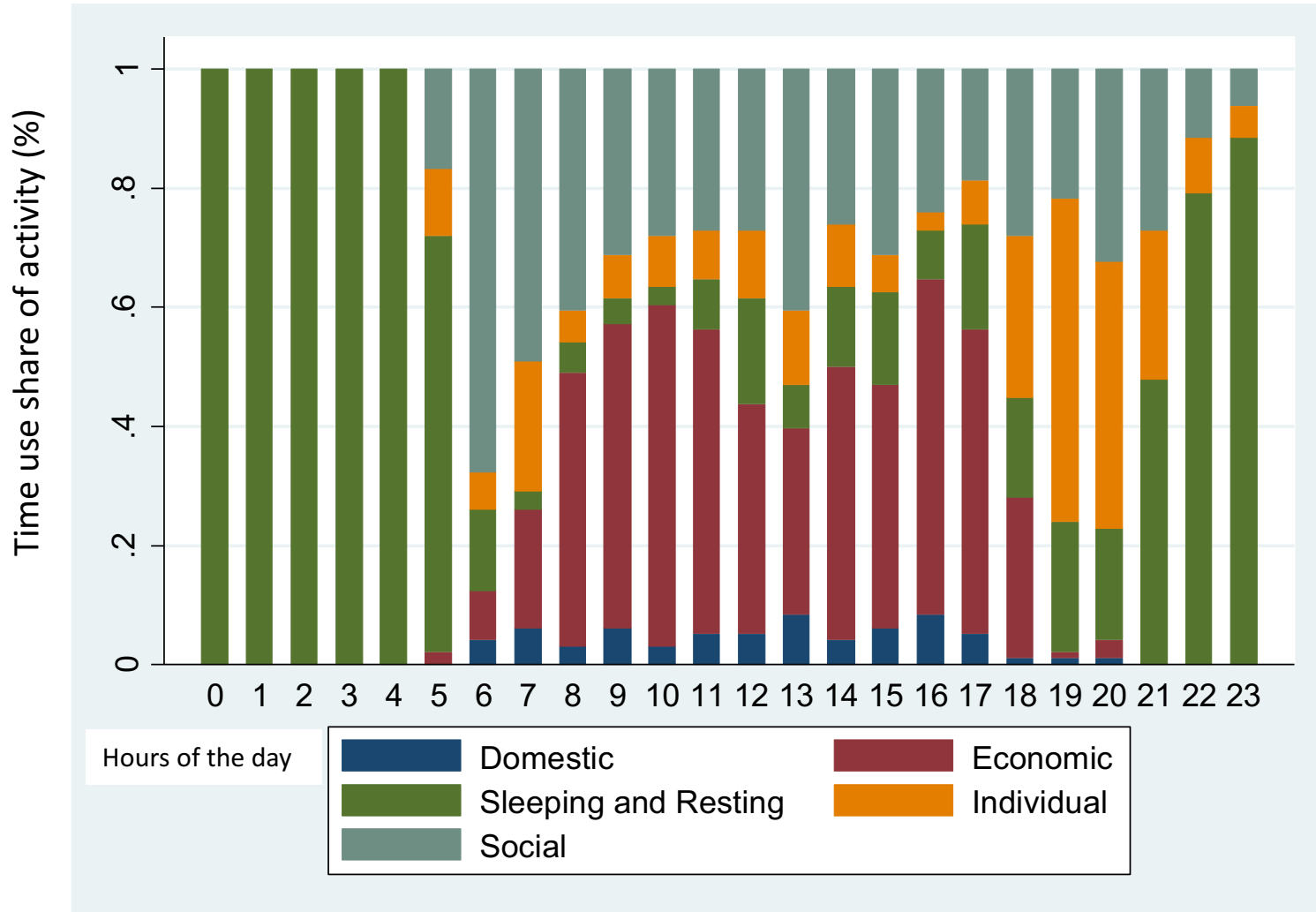


# MEAN PAL FOR MEN AND WOMEN THROUGH THE DAY (GHANA)

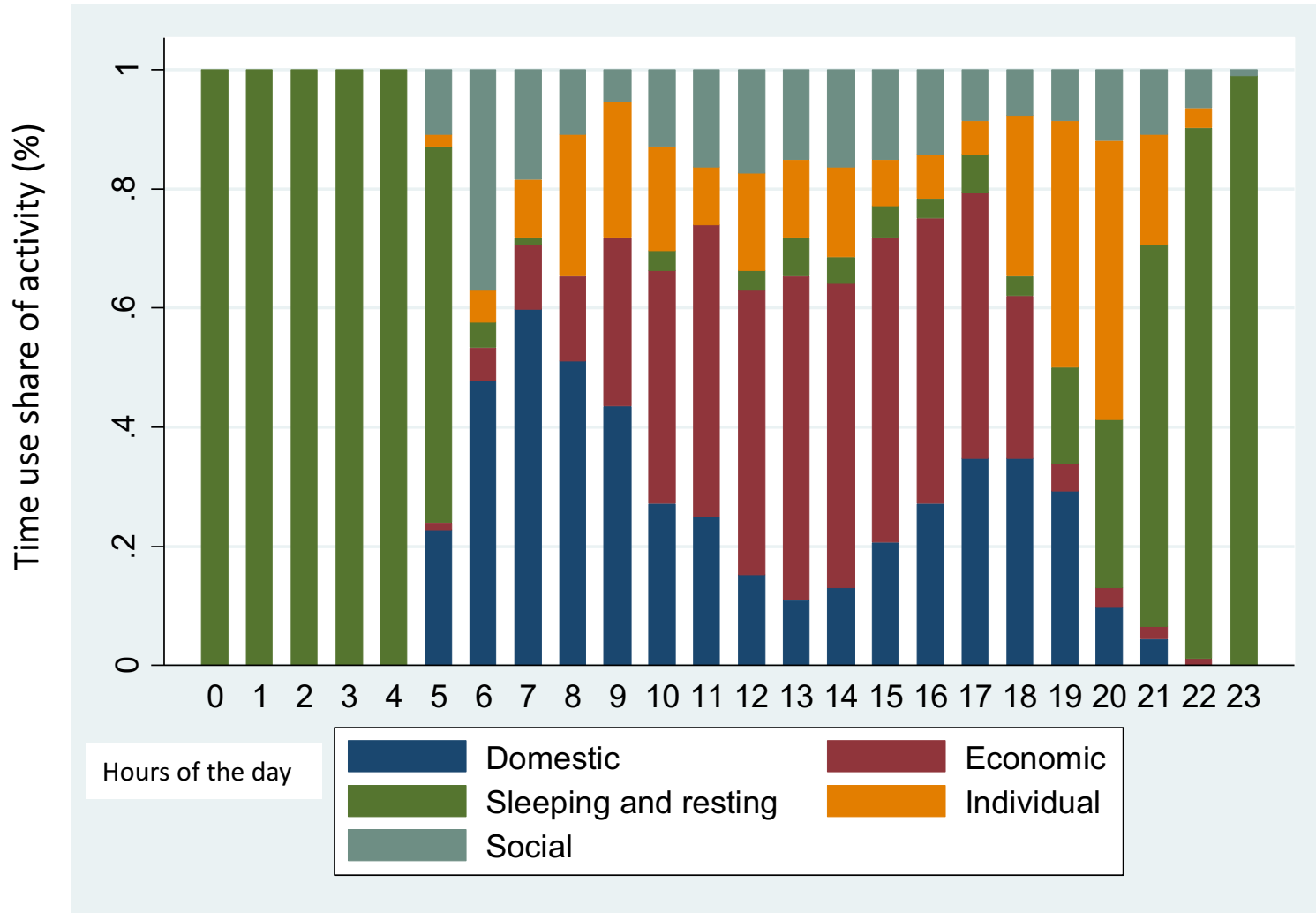




# TIME USE PATTERN THROUGH THE DAY – MEN (GHANA)



# TIME USE PATTERN THROUGH THE DAY – WOMEN (GHANA)



# ENERGY EXPENDITURE AND TIME USE FOR ACTIVITIES (GHANA)

	Males		Females	
	AEE	Time	AEE	Time
<b>Domestic activities</b>	4%	3%	30%	21%
<b>Economic activities</b>	51%	22%	38%	20%
<b>Sleeping and resting</b>	9%	40%	7%	37%
<b>Social activities</b>	23%	24%	10%	10%
<b>Personal activities</b>	14%	12%	15%	12%

# MAIN FINDINGS: GHANA VS INDIA

- Individuals in India tend to have **lower PAL** and energy expenditure than Ghanaian participants
- In India, women **do not seem to trade off social activities with domestic activities**
- Indian women tend to be **less mobile and perform less intense activities** compare to Ghanaian ones
- **Different household's characteristics** (size, land ownership, etc.) **and activity patterns**, and **better infrastructure** may be part of the differences in physical activities of farmers in India and Ghana

# NEXT STEPS

- Include consumption data in the analysis and model the relationship of energy expenditure, time use, and food intakes across households
- Scale up the pilots (IMMANA Grant 2.03):
  - 480 respondents in India, Nepal and Ghana across the whole agricultural season and different production systems (rainfed vs. irrigated)

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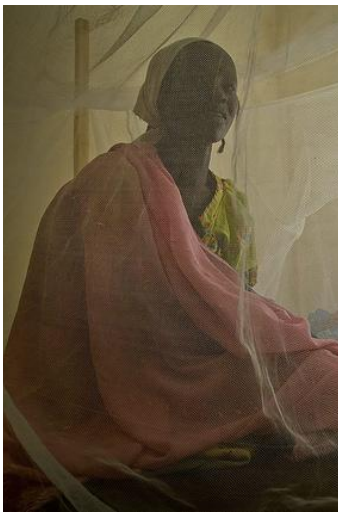
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# POTENTIAL APPLICATIONS



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