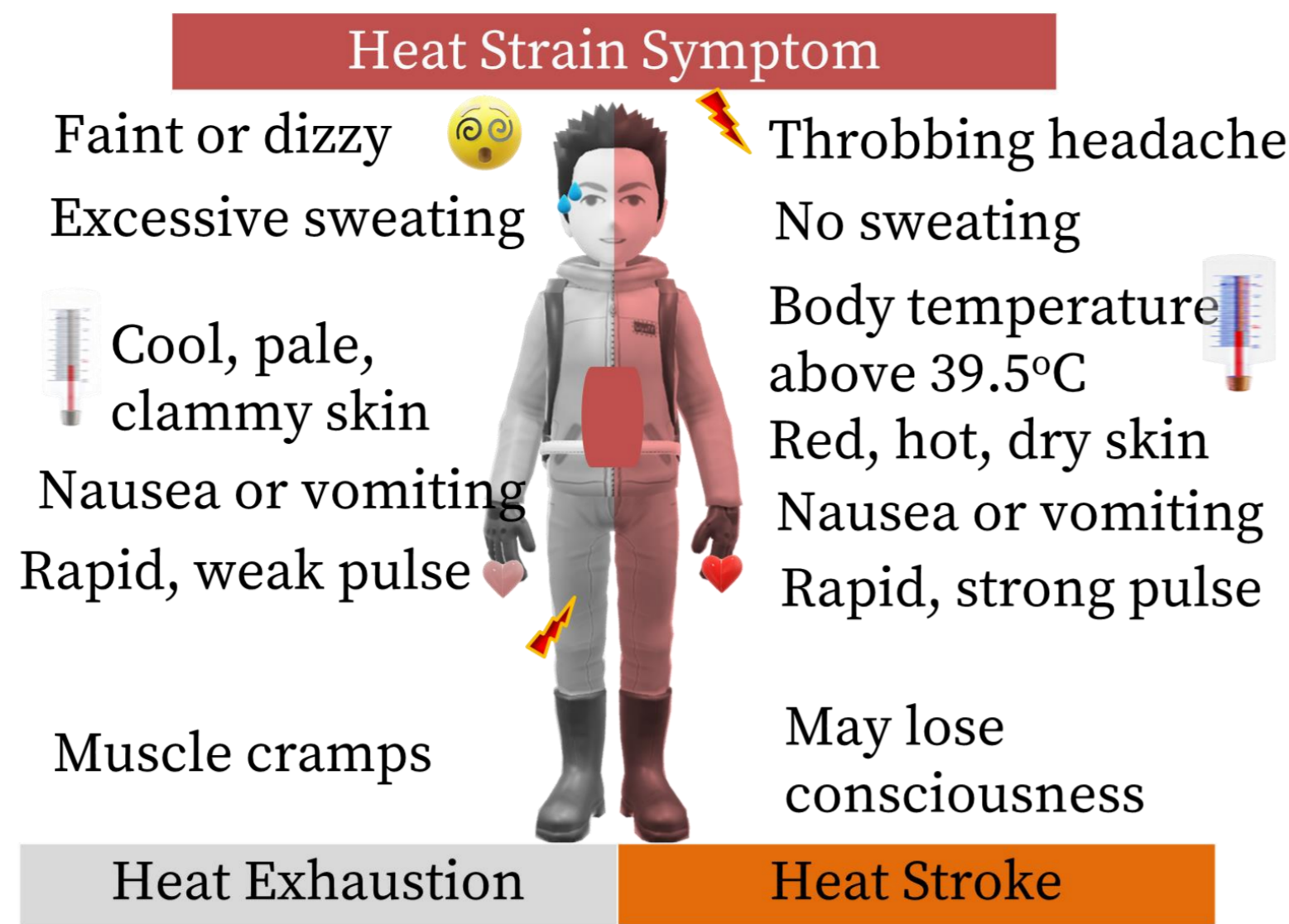
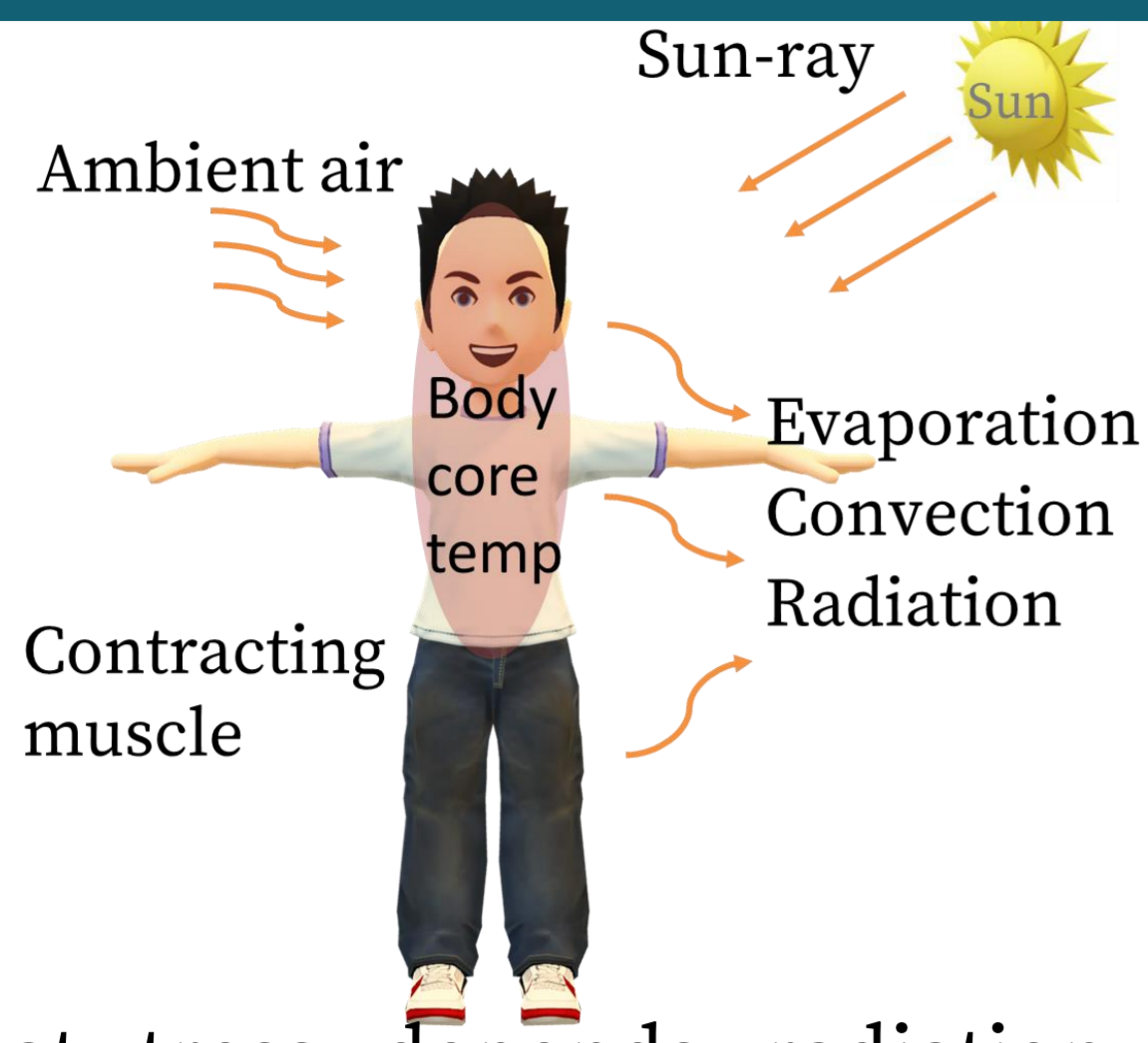


Study on the Impact of Heat Stress on Human Productivity and Economy in Cambodia

Institute of Technology of Cambodia, National University of Singapore, The Hong Kong Polytechnic University, Ministry of Education

Contact: Project Investigator, Kinnaleth Vongchanh (Ph.D.), kinnalethv@yahoo.co.uk, (+855)99 351 199
Thermal Lab., Institute of Technology of Cambodia.

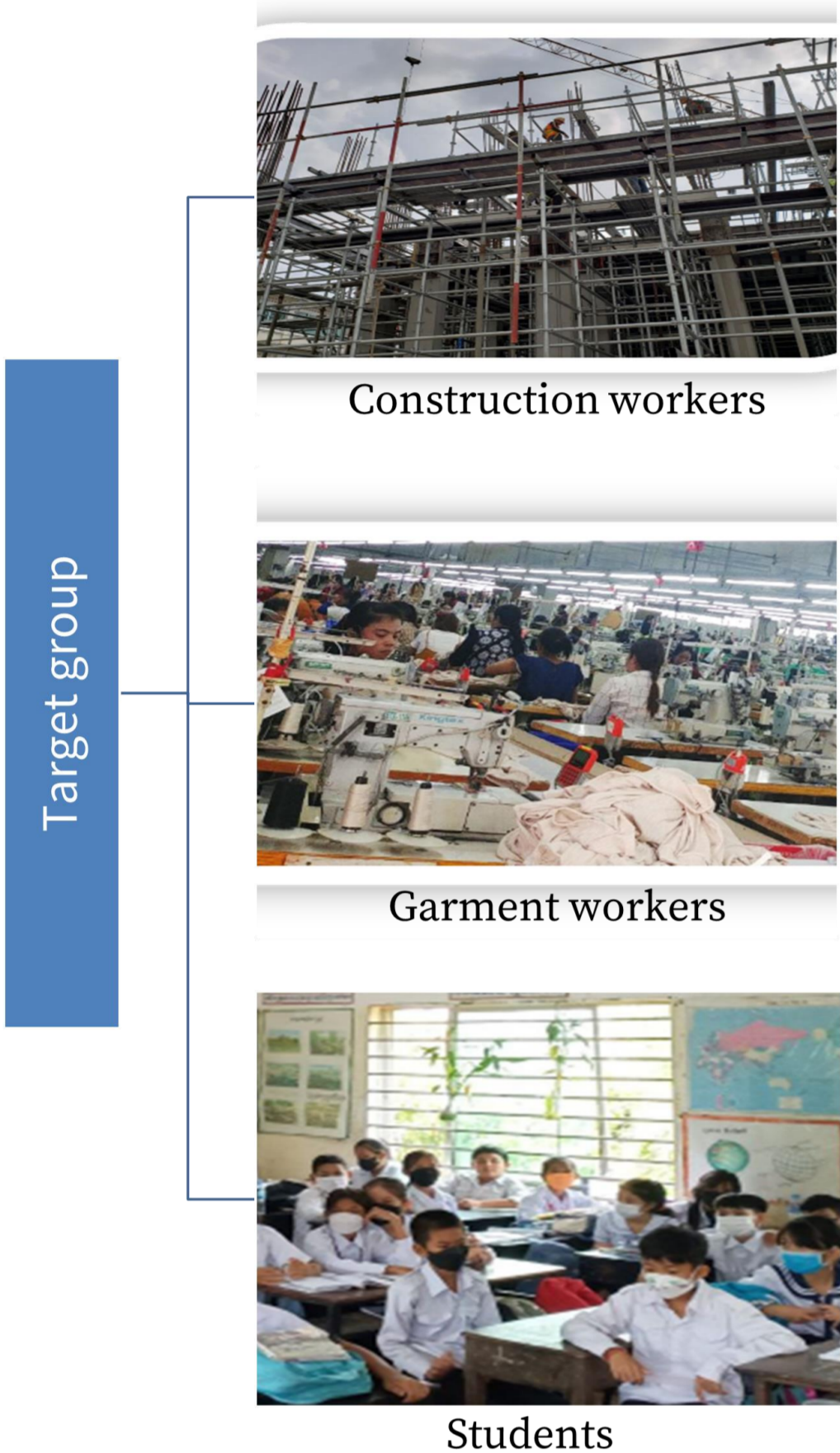
Background



Heat stress depends radiation, air velocity, ambient temperature, relative humidity, clothing, body core temperature, human's activities.

Heat stress causes heat strain including heat exhaustion or heat stroke.

Global temperature rise due to climate change might make the phenomenon of "heat stress" causing in the loss of the total number of working hours.



When workers work under the heat stress condition, they could:

- slow down the work
- take more or longer break time
- limit the number of worker hours
- which all could contribute to the loss of productivity

To improve productivity and prevent productivity losses in three sectors including construction, garment, and education sectors, expected results from this research will be presented to the ministries for policy planning, and proposed solution to make the surrounding environment cooler.

Objectives

Overall goal of the study is prevent economic loss for policy planning and increase human resources in this research field in Cambodia.

- 1 • Build human resources in the heat stress field
- 2 • Investigate the impacts of heat stress on productivity
- 3 Develop economic model on impact of heat stress
- 4 • Identify the work rest schedule for construction worker
- 5 • Build evidence on the impacts of heat stress on productivity

Key technologies and approaches introduced

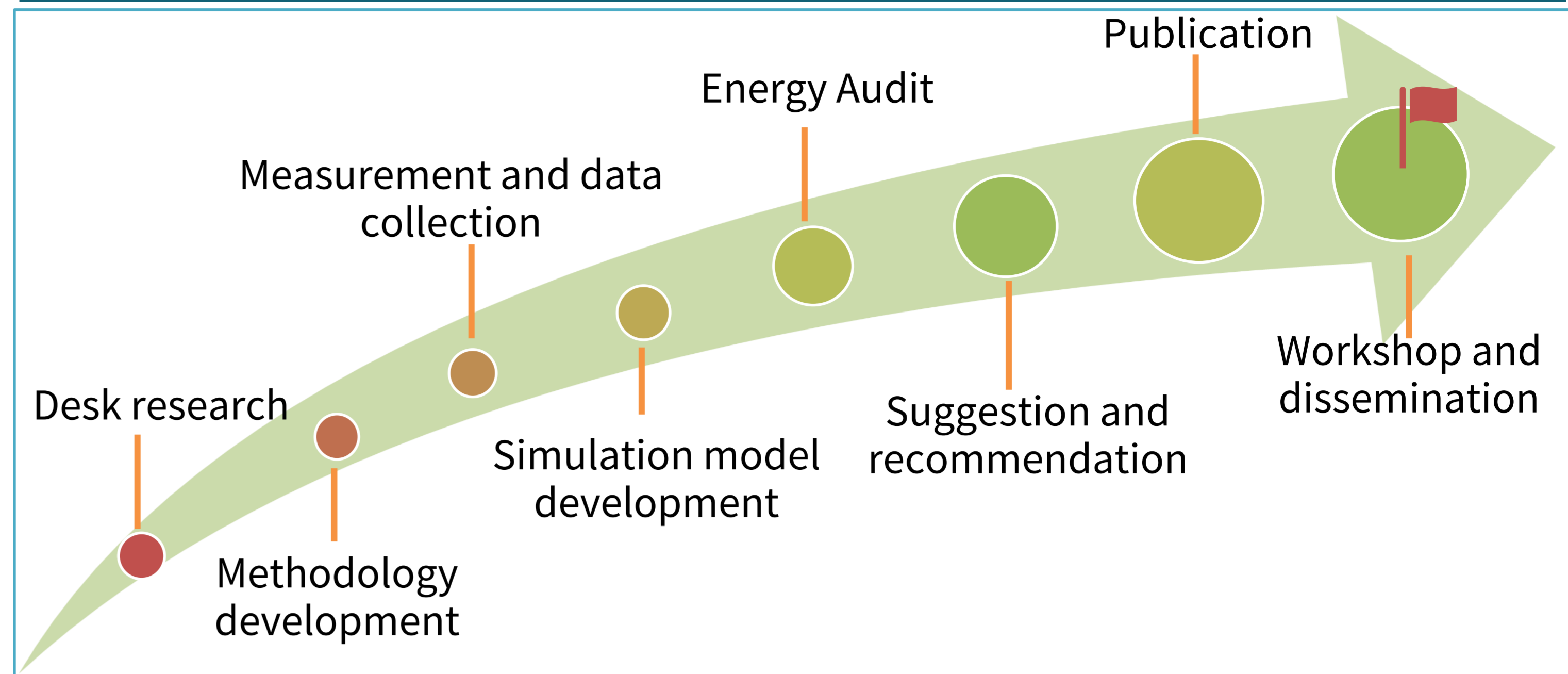
Physiological Parameters

Questionnaire and measurement survey



| | Garment sector | Construction sector | Education sector |
|-----------------|--|--|-----------------------------|
| Sampling number | 2 factories 250 participants | 2 sites 36 participants 2 times per year | 2 schools Boys and girls |
| Criteria | Sewing dept. | Rebar worker | No air conditioner |
| Duration | weather condition record | | |
| | 1 year | 2 weeks | 2 weeks |
| | Production volume Defected project Absent number | 8 hrs per day 1 day per 1 participant | |
| | April- May, and Nov-Dec | | April- May |

Outputs and key activities



Achievement Aug 2020-June 2022

01 Human resources

Increasing human resources in this research field.

02 Collaboration

Strengthening research and academic activities for long-term partnerships collaboration

03 Heat Stress base

Heat stress measurement tools/devices in Cambodia and Measurement methodology, data input platform

04 Cooler workplace

Solution to make surrounding area cooler. Energy efficiency adaptation.

Ph.D. candidate

Master

Measuring devices

Energy Audit

Measurement

Handbook of Heat Stress Measurement

QN & input platform

The 1st Heat Stress Cambodia workshop

QN survey

Approved

Key challenges and lessons learnt

Challenges

- Research is not exactly the same as the original plan
- Modification of workplan is required for more accurate results
- The enrolment of sites is very difficult
- Due to the climate change and lack of data stations to predict the weather condition, it causes difficulty in planning the right day for measurement
- The estimated budget was limited.

Lesson learnt

- Positive (cost and time saving) for hosting virtual event/meeting
- Prioritize the accurate results instead of sticking with original plan
- The importance to understand and support each other between grantor and grantee team
- Contribution and collaboration between the research partners

