



UNIVERSITY OF MAURITIUS



EngageSDG

COMMUNITY ENGAGEMENT TO GATHER THERMAL PERCEPTION IN BUILT SPACES AND FOR COMMUNITY EMPOWERMENT TO PROMOTE HEAT HEALTH USING PASSIVE AND NATURE-BASED SOLUTIONS (NBS) MEASURES

University of Mauritius - Pilot Project Reporting

Project Team Members:

Assoc Prof Dr Mahendra Gooroochurn (Project Leader)

Assoc Prof Dayawatee Gobhurdhun (Team Member)

Dr Nicolas Ragodoo (Team Member)

Neha Jugessur (RA)

SDGs Targeted

SDG 3 - Good health and well-being

SDG11 - Sustainable Cities and Communities

SDG13 - Climate Action

1

Pilot Project Justification

- Summer conditions cause poor indoor environmental conditions in Mauritius' concrete buildings, including homes and offices;
- Measurements on prototypes at UoM show temperatures in excess of 40°C, which is well beyond the threshold of human comfort (27°C)
- Heat has been correlated to health complications, increased stress levels and overall counter-productive in working and learning spaces, detrimental to our general welfare;
- The project aims to:
 - (1) Collect thermal perception from communities through an online survey;
 - (2) Co-create low-cost solutions based on passive and bioclimatic design principles and NbS;
 - (3) Run real-world labs to implement and test the solutions through pilots.

2

Project Methodology

- Online survey through a google form to collect thermal perception data across the various strata of the population
- Co-creation workshop to work with communities to train them on passive design and NbS techniques in layman language and apply any local knowledge and materials they may have. They should be able to then propose bespoke solutions for their specific households
- Real-world labs across communities to test and collect quantitative measurements on thermal improvement using temperature sensors
- Collection of thermal perception from the households participating in the pilot tests before and after the intervention

3

Performance Assessment of PAs

- Evaluation of the efficacy of the co-creation workshop through participant feedback before and after the workshop on awareness of key topics discussed;
- Expert evaluation of the bespoke measures proposed by each participant for his/her household;
- Data collection and analysis of temperature measurements to provide improvement metrics on thermal comfort;
- Participant feedback on any improved thermal perception through qualitative evaluation.

4

Expected Outputs and Outcomes

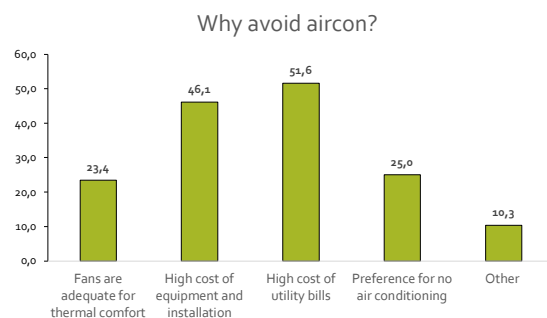
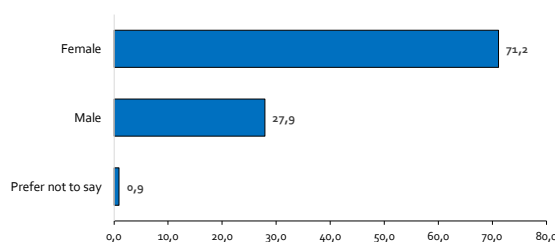
- First scientific data on evaluation of thermal perception of households through qualitative and quantitative data in Mauritius;
- Evaluation of the PAs adopted for feedback on the IPF and for extending the framework to other communities;
- Short-Term: Key findings on negative impacts of heat on human health, productivity and welfare;
- Medium Term: Key results to advise policies for housing in Mauritius, especially social housing projects targeting low income and vulnerable segments of the society;
- Medium Term: Changes in policies on building construction codes and practices in Mauritius to adapt to the effects of climate change from a thermal comfort perspective.

5

• Online survey (detailed) – 215 participants

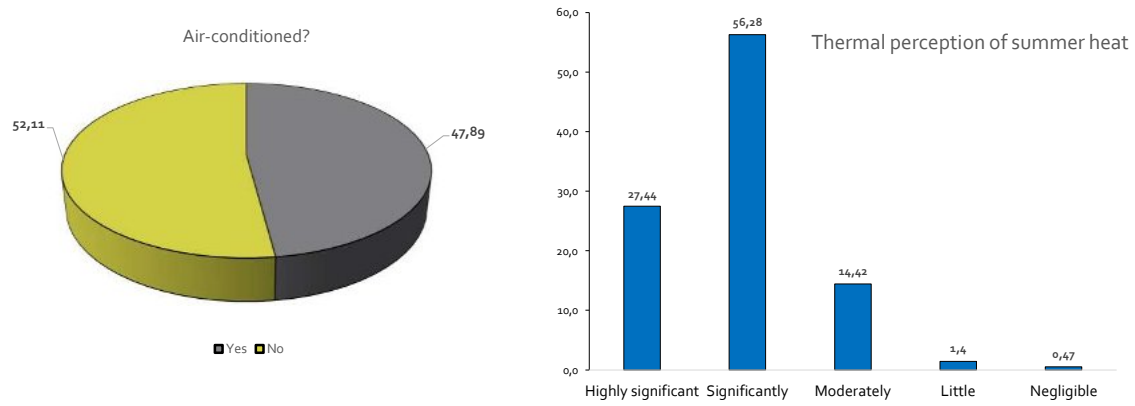
Age Group	Frequency	Percent
18-35	172	80
36-50	32	14.88
51-65	10	4.65
Above 65	1	0.47
Total	215	100

Respondents living in air-conditioned homes commonly reported a noticeable rise in electricity bills during the summer months. In particular, 27% indicated that their bills increased by around two times, while 17.5% reported an increase of more than two times



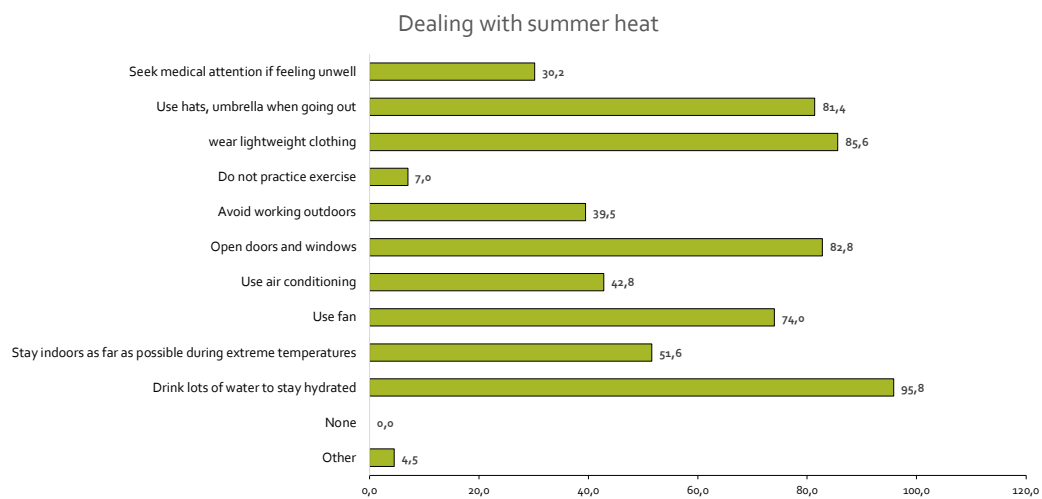
6

• Online survey (detailed) – 215 participants



7

• Online survey (detailed) – 215 participants



8



9

• Awareness workshop ran at La Valette, Bois Marchand and Brisee Verdiere

1. Understanding of Climate Change:

- What is the level of understanding of climate change among residents, including knowledge of its causes and impacts?

2. Perception of Thermal Comfort:

- How do residents feel in their homes during the summer season in terms of comfort and temperature?

3. Impact on Health:

- To what extent does overheating in homes during summer affect residents' health? (Respondents were also required to list any specific health issue that they had).

4. Impact on Overall Wellbeing:

- To what extent does overheating in homes during summer affect residents' general wellbeing?



10

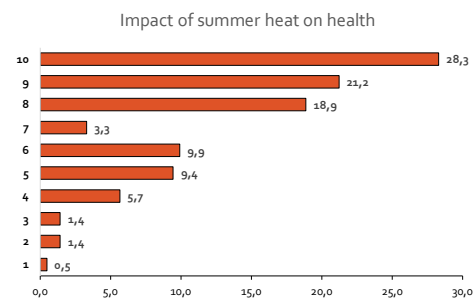
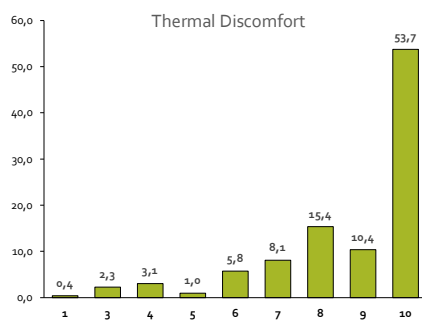
- Awareness workshop ran at La Valette, Bois Marchand and Brisee Verdiere



11

- Awareness workshop ran at La Valette, Bois Marchand and Brisee Verdiere

Location	Count	%
Bois Marchand	29	43.9
La Valette, Bambous	12	18.2
Brisee Verdiere	25	37.9
Grand total	66	100



12

- Composite Heat Impact Index (CHII) based on scores for thermal discomfort, health and well-being for three locations.
- Mean scores were calculated for each location as follows as a means to validate the brief survey results across three communities.
- La Valette – Mean CHII of 8.09
- Bois Marchand – Mean CHII of 7.96
- Brisee Verdiere – Mean CHII of 6.53
- Results show similarity of impact on climate-induced heat health. Further statistical analysis can be used to provide more detailed distribution of results across the three communities (triangulation).

13

- Co-creation workshop ran at La Valette



14

Real-World Lab at La Valette



15

Real-World Lab at La Valette



Prior research work shows over 65% of heat is transmitted through the flat roof in the Mauritian context.

M. Gooroochurn, J. Y. Coret, N. Brown, S. Venkannah and A. Wright, "Assessing the efficacy of passive measures for the tropical context of Mauritius through parametric simulations and in-situ measurement", CIBSE 2021 Technical Symposium, UK 13-14 July 2021.



16

Real-World Lab at La Valette



Prior research work shows over 65% of heat is transmitted through the flat roof in the Mauritian context.

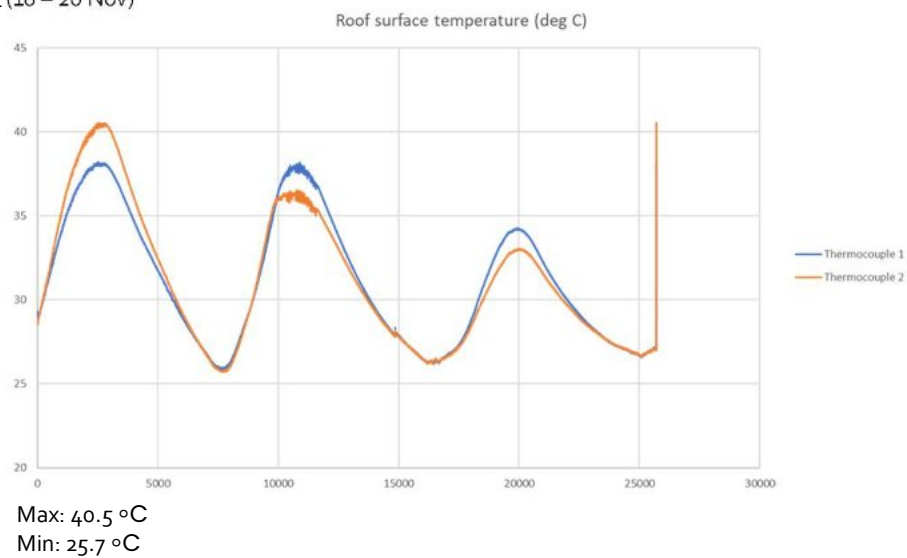
M. Gooroochurn, J. Y. Coret, N. Brown, S. Venkannah and A. Wright, "Assessing the efficacy of passive measures for the tropical context of Mauritius through parametric simulations and in-situ measurement", CIBSE 2021 Technical Symposium, UK 13-14 July 2021.



17

Analysis of indoor conditions without any passive measure

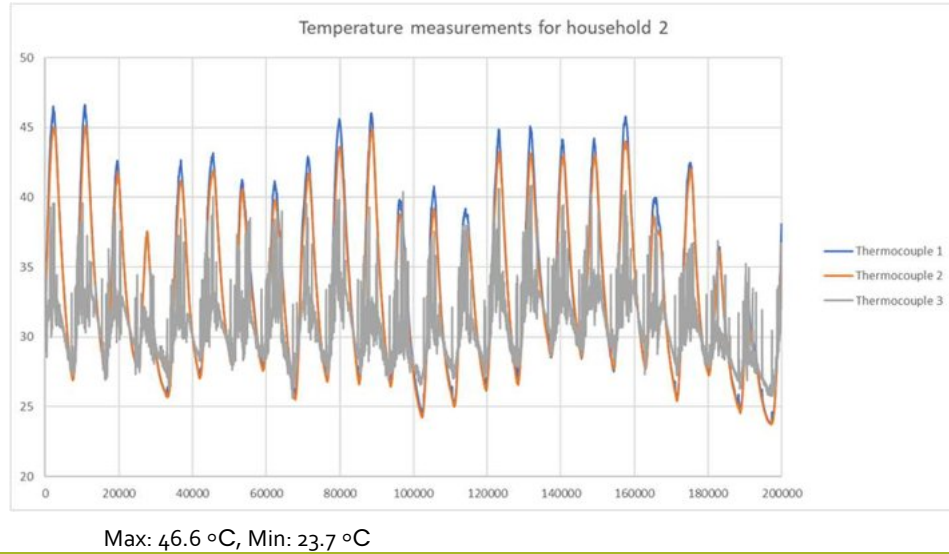
Household 1 (18 – 20 Nov)



18

Analysis of indoor conditions without any passive measure

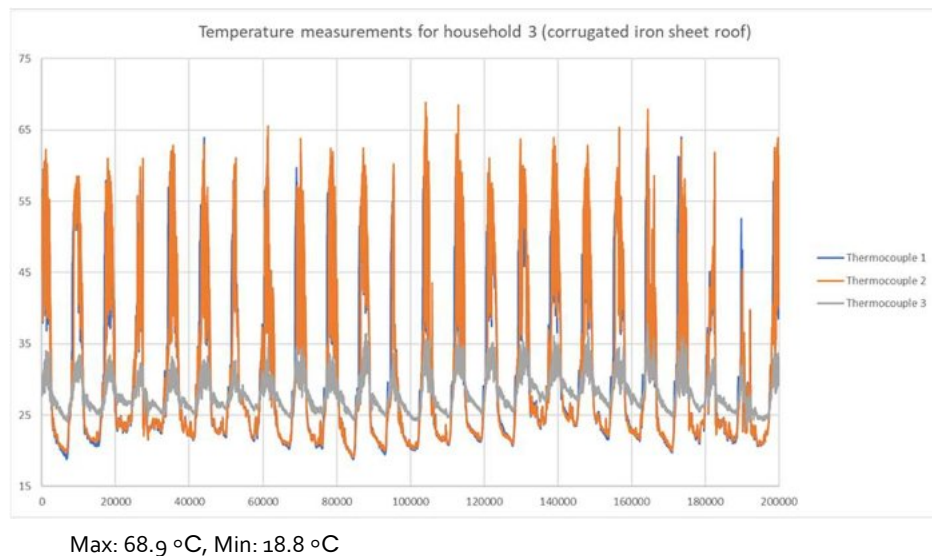
Household 2 (18 Nov – 11 Dec 2025)



19

Analysis of indoor conditions without any passive measure

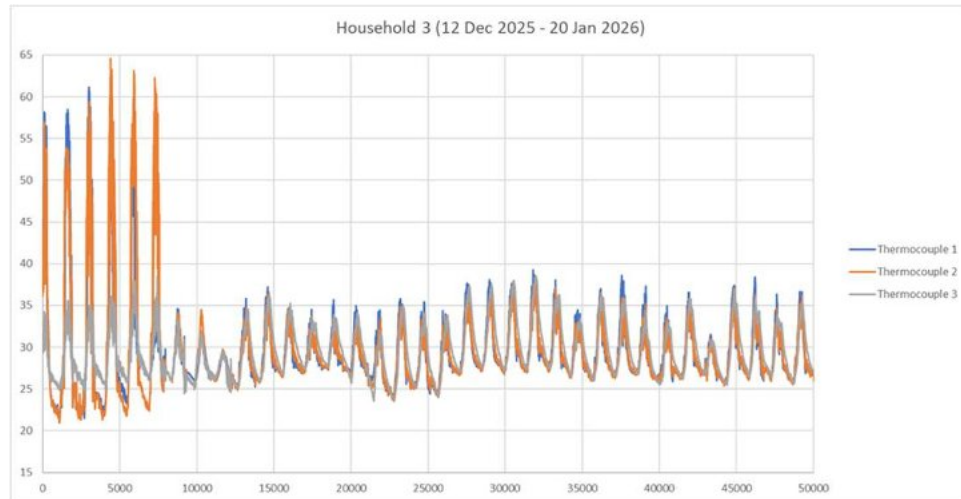
Household 3 (18 Nov – 11 Dec 2025)



20

Analysis of indoor conditions with passive measure

Household 3 (Full profile from 12 Dec 2025 to 20 Jan 2026)



21

Learnings from pilot project and IPF

- IPF was designed to support context-sensitive decision making regarding participatory approaches in the pursuit of the SDGs
- Three participatory components considered:
 1. Survey (online)
 2. Co-creation sessions in terms of community outreach, combined with a structured questionnaire
 3. Real-world lab (living lab)
- Each component of the pilot project addressed a different stage of the participatory approach.

22

Learnings from pilot project and IPF

- **IPF recommendations**
- Surveys are listed among the common methods across participatory approaches and are particularly suitable for knowledge gathering and needs assessment purposes.
- The use of the questionnaire during the outreach program ensured a higher response rate compared to the online approach. This significantly reduced the level of misinterpretation and improved the reliability of the data.
- Co-creation activities with community members ensure solutions meet user needs, increase stakeholder engagement, improve problem understanding, facilitate effective implementation, build trust, and allow for adaptable development
- Real-world labs allowed to collect quantitative measurements to provide objective, scientific data that can be correlated to the community perceptions. Real-world labs also meet the need for demonstration and tangible realization of SDG solutions.

23

Learnings from pilot project and IPF

- **These real-life experiences offer rich empirical evidence for improving the IPF. They indicate that the value of the IPF does not lie in its prescription of a set of research tools, but in its promotion of thoughtful sequencing and adaptation.**
- **We observed that what worked best was not a particular method but the way in which the methods complemented each other.**
- **IPF is a valuable tool and resource to design community outreach programmes to get a preliminary list of suitable PA approaches based on the nature and objectives of the project.**

24



UNIVERSITY OF MAURITIUS

Community engagement to gather thermal perception in built spaces and for community empowerment to promote heat health using passive and Nature-based solutions (NbS) measures

Thank You



EngageSDG