



Perception Study of the Influence of Trees and Greens in Open Spaces on thermal comfort

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INTRODUCTION

- ❖ Built environment is a part of the physical environment & surroundings encompasses buildings, spaces, constructed elements of the environment created or modified by man.
- ❖ The use of open spaces is influenced by the microclimatic conditions provided, whereas microclimate and thermal perception definitely depend on urban design
- ❖ The outdoor thermal environment is impacted by the built environment, evaporation and evapo-transpiration of plants and shading by trees .
- ❖ This part of the study assesses the perception of staff and students in a Nigerian university on the roles of trees and greens on their environment *while other section (already presented as poster) investigates the influence on microclimatic conditions*

STUDY AREA

- F.U.T, Akure, Nigeria
- Six Faculties
- Established in 1982
- Population size: Approx. 15, 000



Fig 1: Aerial view of the university (extract from Google Earth)

METHODOLOGY

- ❖ **Snow balling technique:** used to select 90 respondents across the University including staff and students.
- ❖ **A well structured interview** schedule was used to collect data from selected respondents.
- ❖ Data obtained from the study were analyzed **using descriptive statistics such as mean (μ) and percentages.**

Field survey

- ❖ Sex
- ❖ Age
- ❖ Academic status
- ❖ Number of open spaces
- ❖ Preferred place for relaxation
- ❖ Perception of the university landscape
- ❖ Seasonality
- ❖ Health impact derived from outdoor spaces

Results and Discussion

Table 1: Socio economic characteristics of respondents

| | | Frequency | Percentage (%) |
|---|---------------|------------------|-----------------------|
| ➤ | Sex | | |
| | Male | 52 | 59.1 |
| | Female | 36 | 40.9 |
| ➤ | Age | | |
| | Below 20 | 2 | 2.3 |
| | 21-30 | 42 | 47.7 |
| | 31-40 | 27 | 30.7 |
| | 41-50 | 16 | 15.4 |
| | 51-60 | 1 | 1.1 |
| ➤ | Status | | |
| | Undergraduate | 15 | 17.0 |
| | Post-graduate | 25 | 28.4 |
| | Non-academics | 16 | 18.2 |
| | Academics | 32 | 36.4 |



Fig 2: Pictorial view of staffs and students under trees



Fig 3: Pictorial view of students under trees for shade

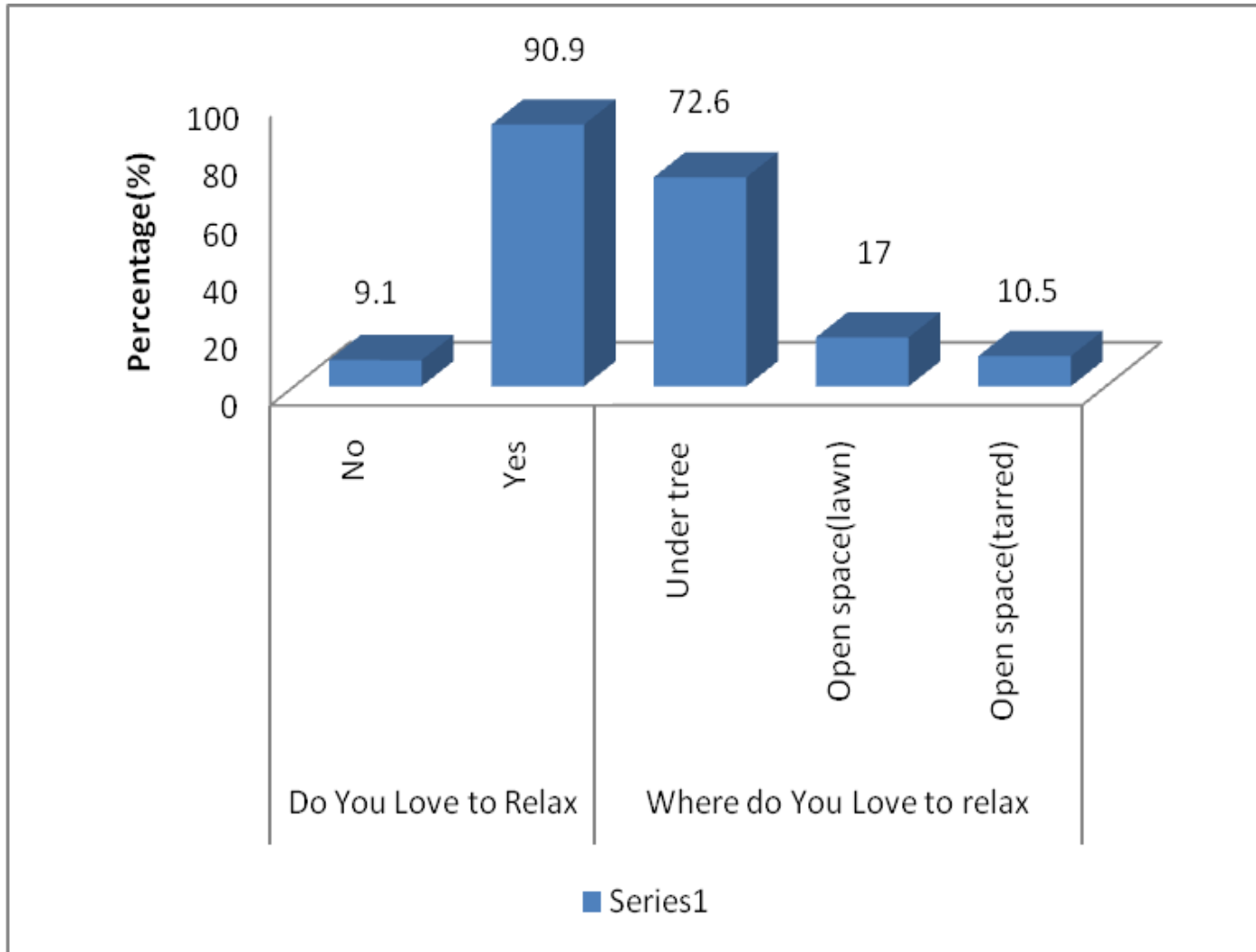


Fig 4: Statistics of respondents preference to relaxation and choicest location

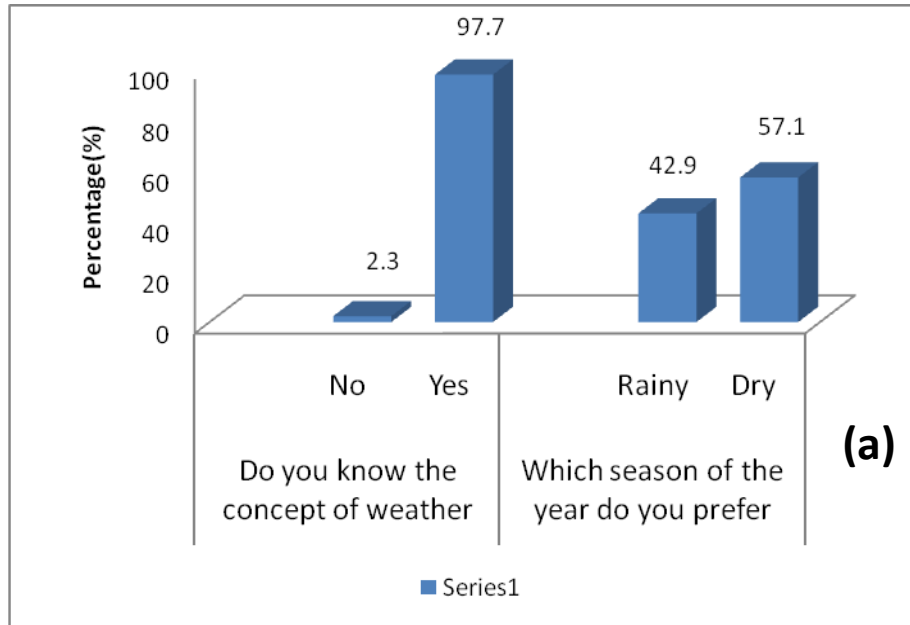


Fig 5. (a): Showing respondents' concept of weather and season of preference.

Weather

Yes = 97.7%

No = 2.3%

Season

Rainy = 42.9%

Dry = 57.1%

Fig5. (b): Effect of different weather variables on respondents

| Weather Variables | Yes | No |
|-------------------|-----|-----|
| Relative Humidity | 80% | 20% |
| Sun | 75% | 25% |
| Rain | 70% | 30% |

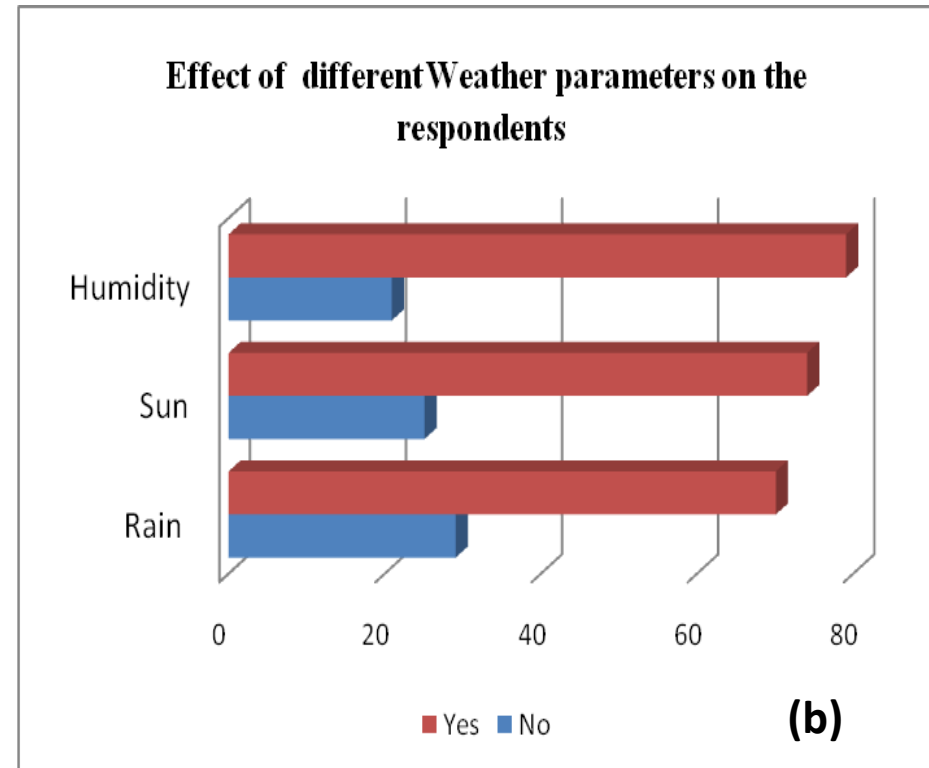


Fig 5: Influence of weather on respondent

| Statement | Not at all (%) | Moderately(%) | Highly(%) |
|---|-----------------------|----------------------|------------------|
| Green space offer same comfort as normal spaces | 19(20.9) | 46(52.3) | 23(26.7) |
| Effective force of tree as a place of comfort | 21(24.4) | 31(34.9) | 35(40.7) |
| Green space contributes to good health | 20(23.3) | 25(27.9) | 43(48.8) |

Table 2: Respondents' perception about green spaces

- ❖ 23% -relieved of headache
- ❖ 20%- relieved of fatigue
- ❖ 12%- relieved of depression
- ❖ 11%- Mood change
- ❖ 11%- Increase emotional balance
- ❖ 7%- increase cognitive ability
- ❖ 9%- increase cognitive ability

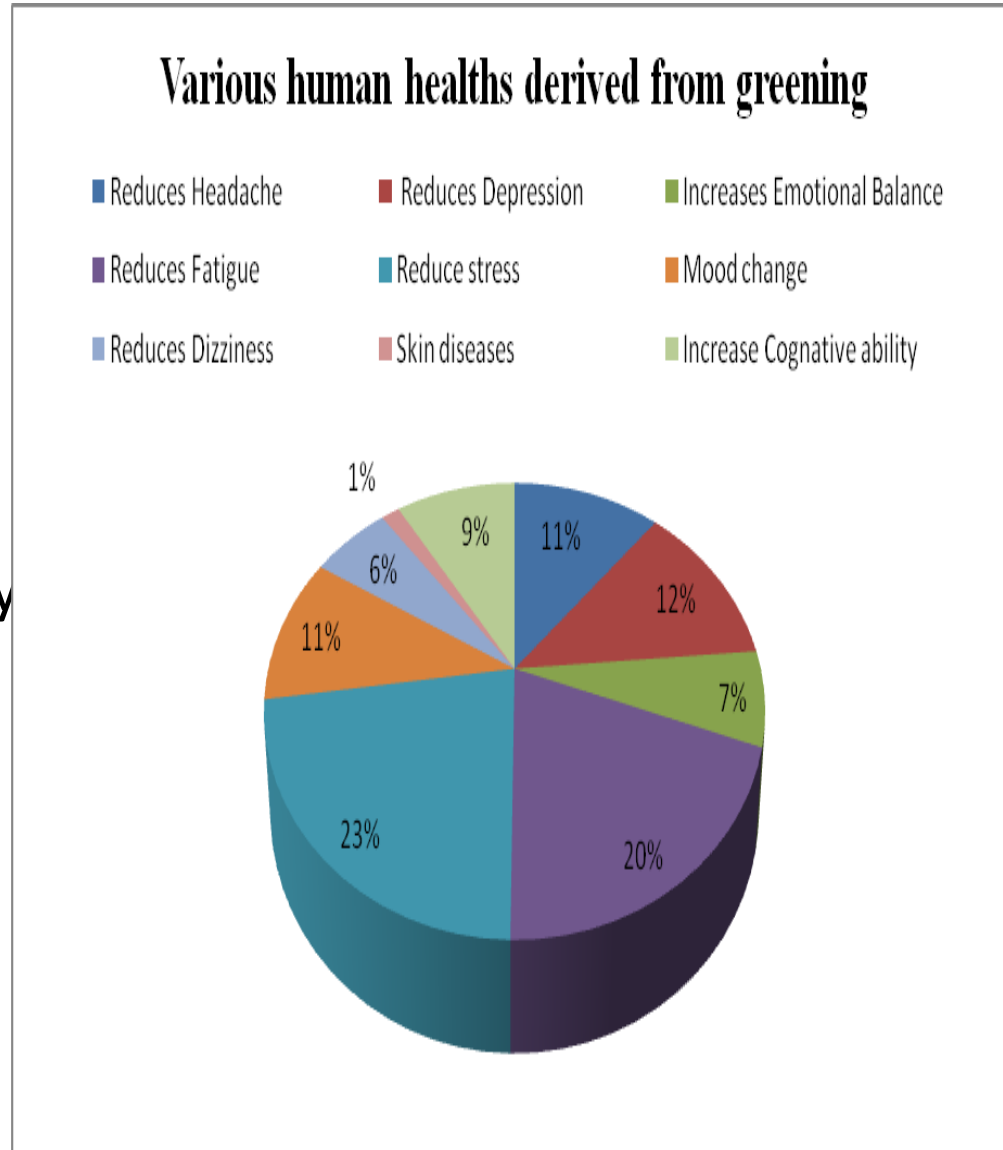


Fig 6: Response on health benefits derived from greening

Conclusion

Trees and greens(lawns) can be very effective;

- Evaporative cooling and evapotranspiration
- Reflectance
- Shading

Trees and green(lawns) reduces solar radiation and lower air temperature due to shading and evapotranspiration. Lower air temperatures are essential to improve thermal comfort conditions

FUTURE PLANS

- Classification of various trees types based on foliage densities, LAI etc
- Assessment of the thermal comforts using various micro-climate models

THANK YOU FOR LISTENING