Assessing Households' Carbon Footprint and Its Determinants in Ibadan Metropolis, Nigeria

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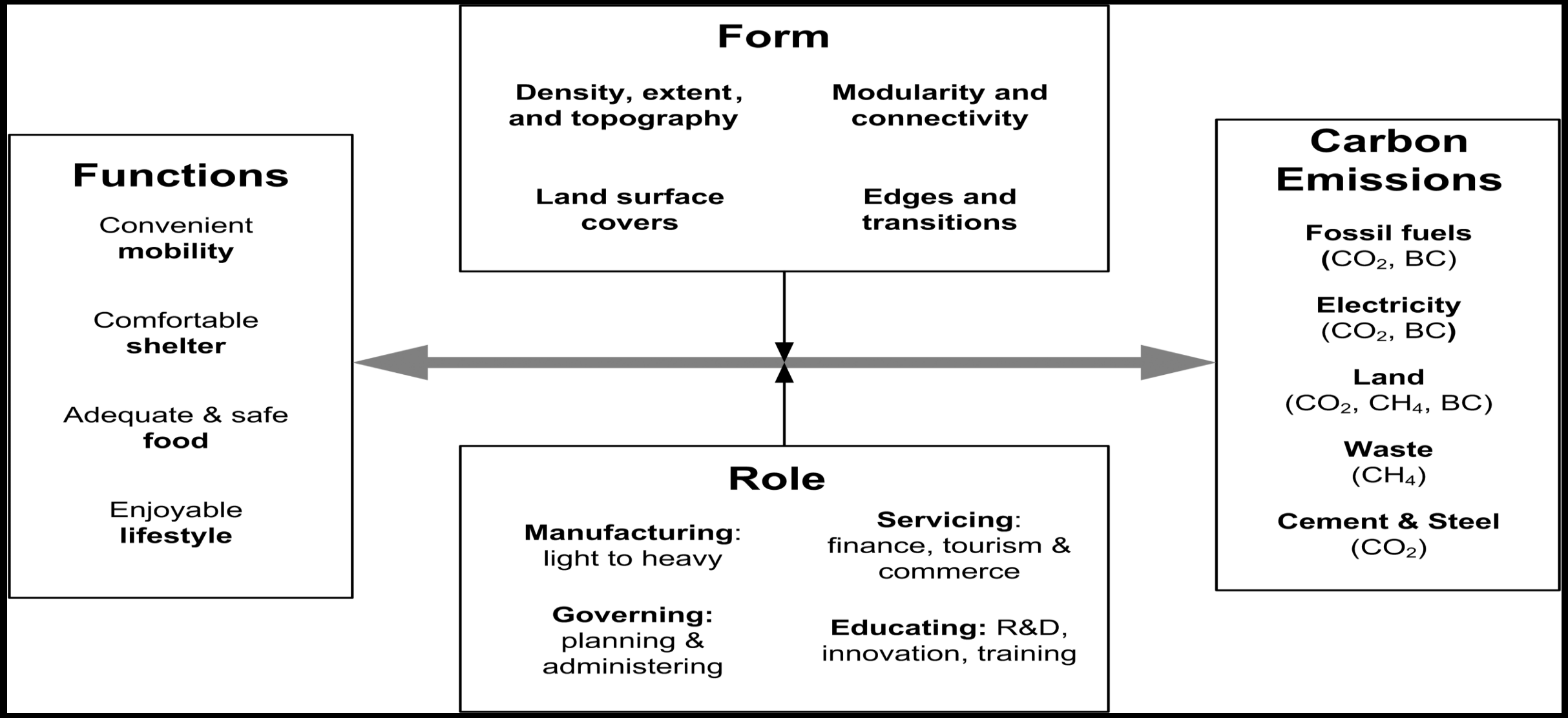
Nigeria's emissions are expected to grow to around 900 million tonnes per year in 2030

NIGERIA'S INTENDED NATIONALLY DETERMINED CONTRIBUTION 2015

Relationship between household functions and Carbon emission



Analytical tool

The greenhouse gas emission model for developing nations proposed by the Energy Research Centre, South Africa was used in this study.

All the unit costs are expressed in Naira (₦)

Analytical tool

I. Emission from electricity consumption (means)

$$GHGem = 12\text{-month} \times \frac{\text{Cost/month} \times \text{Emission factor/tariff}}{\text{Number of household occupancy}} \quad \ldots\ldots 1$$

$$= \frac{12 \times ₦\ \text{/month} \times \text{kWh/}₦ \times \text{ton } CO_{2e}\ \text{/ kWh}}{\text{Number of household occupancy}} \quad \ldots\ldots 2$$

Analytical tool

II. Emission from transportation

For a private car, using average volume of fuel per month.

$$GHGem = \frac{12\text{-month} \times \text{Litre} / \text{month} \times \text{Emission factor}}{\text{Average occupancy of vehicle}}$$

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$$= \frac{12\text{- month} \times \text{Nl/month} \times \text{L} / \text{Nl} \times \text{ton } CO_{2e} / \text{L}}{\text{Average occupancy of vehicle}}$$

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Analytical tool

sion from transportation

For public transportation

$$GHGem = \frac{12\text{-month x distance / month x Emission factor/distance}}{\text{Average occupancy}} \quad \ldots\ldots\ldots 5$$

$$GHGem = \frac{12\text{-month x km /month x ton CO2e / km}}{\text{Average occupancy}} \quad \ldots\ldots\ldots 6$$

* Petrol emission factor = 0.43963132Kg CO_{2e} /Kwh

Result and Discussion

Source of lighting	Categories	Frequency (%)
Electricity	Yes	292 (91.5)
	No	27 (8.5)
Generator	Yes	78 (24.5)
	No	241(75.5)
Inverter/Solar	Yes	5 (1.5)
	No	314 (98.5)

Sources of lightening of the Respondents

Source: Author's Computation from the Field Survey (2018)

Results and Discussion

Category (number of car)	Frequency (%)
0	142 (44.5)
1	121 (38.0)
2	53 (16.6)
3	2 (0.6)
4	1 (0.3)

Car ownership of Respondents

Source: Author's Computation from the Field Survey (2018)

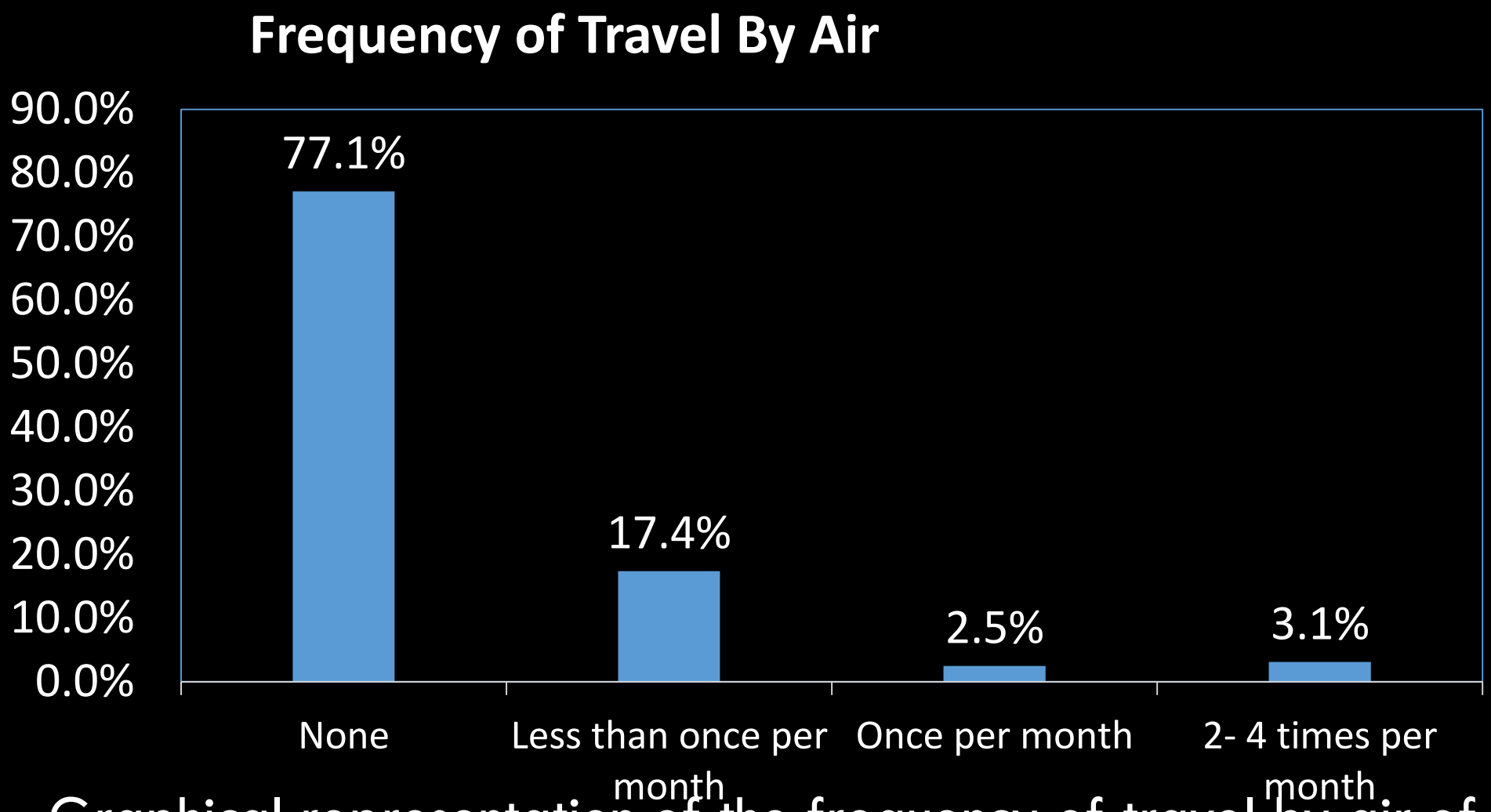
Results and Discussion

Item	None	Work mainly at home	On foot /bicycle	Motorcycle	Public transport	Car personal	Car pool
Respondent	0.0 (0.0)	43 (13.5)	9 (2.8)	3(0.9)	162(50.8)	64 (20.1)	38 (11.9)
Partner	0.0 (0.0)	11 (3.4)	20 (6.3)	13 (4.1)	174 (54.5)	92 (28.8)	9 (2.8)
Child(ren)	53 (16.7)	3.0(0.9)	38 (11.9)	1.0 (0.3)	150 (47.0)	0.0 (0.0)	74 (23.2)

Mode of commuting by households

Source: Author's Computation from the Field Survey (2018)

Result and Discussion



Graphical representation of the frequency of travel by air of respondents.

Source: Author's Computation from the Field Survey (2018)

Results and Discussion

- The profile of household shows a match with households' consumption of electricity and use of transportation

- The estimation of carbon emission reveals that households mean emission in Ibadan, Nigeria was 250.97 $kgCO_{2e}$/person/annum.

Summary and Conclusion

- The carbon footprint of Ibadan was estimated to be minimal compared with some other metropolitan centres around the globe

Thank You

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