

# URBAN TREES & CLIMATE CHANGE

Exploring the possibility of 'a house - a tree strategy':  
evidence from Ghana

CSC Midlands and Oxford Regional Network event:  
Scholars' Presentation Day

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# OUTLINE OF PRESENTATION

- ☐ Background to the study
- ☐ Research questions
- ☐ motivation and policy context
- ☐ Research methodology
- ☐ Preliminary results and findings
- ☐ way forward

# Motivation and policy relevance of RTG

- ❖ Everyone contributes to CC, everyone is vulnerable to CC, everyone has to take climate response actions (Wolf et al., 2009; Dobson, 2003)
- ❖ Civic ecological approach to fostering climate and envtal responsibility
- ❖ A key climate action espoused by SDG 13 and 11 and 3
- ❖ Urban forestry remain unexplored area for “REDD+” prospects for Ghana
- ❖ Contribute directly to achieving a resilient and sustainable cities and towns
- ❖ trees proved so far to be cleanest and greenest climate response action



ENVIRONMENTAL  
PROTECTION  
AGENCY, GHANA



## Promoting urban trees for climate change mitigation and adaptation;

Exploring the possibility of 'a house, a tree strategy' from  
Ashaiman Municipality, Ghana



# RESEARCH QUESTIONS

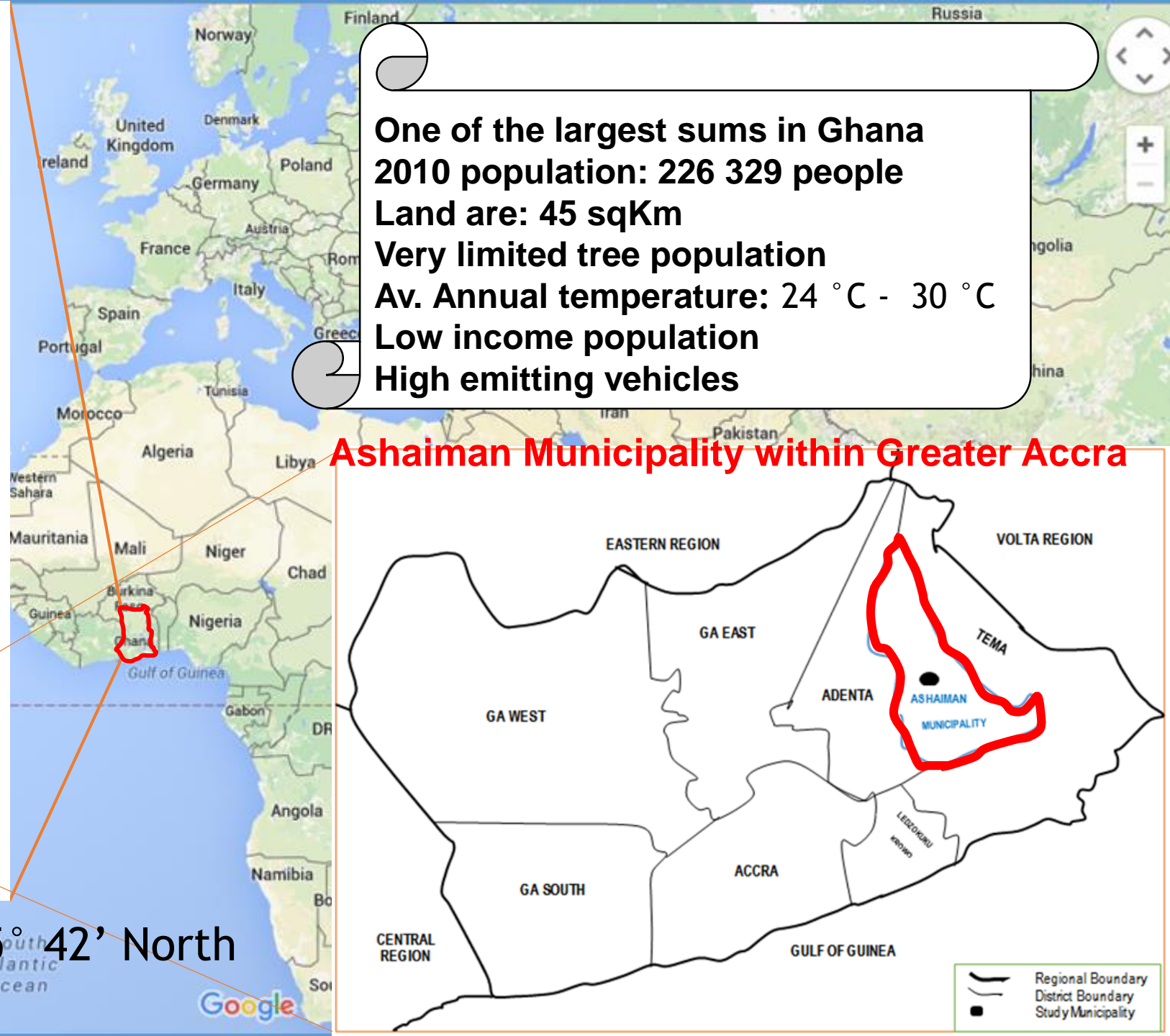
## Broad research question:

Are households likely to undertake Residential Tree growth (RTG) as climate change response?

## Specific guiding questions

- ☐ What are households' perceptions about residential trees?
- ☐ Are households' willing and able to undertake RTG?
- ☐ What factors are likely to affect households' RTG?
- ☐ Are institutions open to support households' RTG?





One of the largest sums in Ghana

2010 population: 226 329 people

Land are: 45 sqKm

Very limited tree population

Av. Annual temperature: 24 °C - 30 °C

Low income population

High emitting vehicles

**Ashaiman Municipality within Greater Accra**

Ashaiman falls within Latitude 5° 42' North  
and Longitude 0° 01' west.



# Satellite imagery highlighting Ashaiman Municipality, 2016







Portion of Ashaiman municipality. picture taken during fieldwork, July 2016



# RESEARCH METHODOLOGY

Research design	Research methods	Sample size/participants	sampling	Method of Analysis
Case study	Literature review, observation	Ashaiman Municipality	Purposive	Content analysis
Cross-sectional	Pilot survey	30 participants, House owners, caretakers, occupants	stratify, Systematic, purposive	Coding. SPSS processing Central tendencies, Correlation, Whitney test ANOVA, Chi-square
	Semi-structured questionnaire Bidding game	126 @ $\alpha = 95\%$ , House owners, caretakers, occupants	stratify, Systematic, purposive	
	Interviews	11, (EPA, FC, Parks and Gardens, Municipal departments, assembly members	Purposive	
	Focus group discussions	2, House owners	Purposive	Transcription, Focus coding, Thematic analysis

## SUMMARY TABLE OF SAMPLE SIZE DETERMINATION

Total Housing Units in Ashaiman Municipality (20608)	Questionnaires administered	Sample size (N) relied on	Response achieved	
			n	%
20007 used	139	126	128	101.59

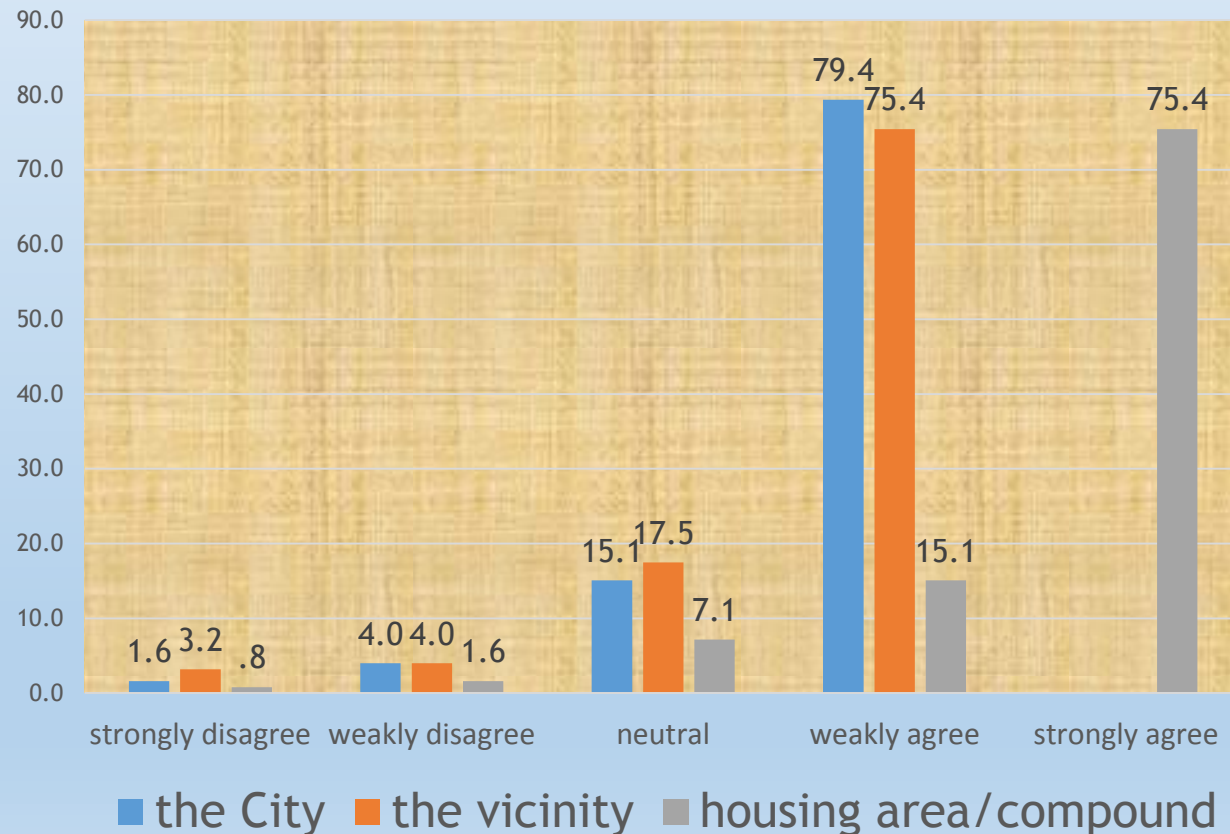
Degree of precision /MRE = 5%	Confidence level 95%	Standard Error SE $= \frac{MRE}{1.96} = 2.55$	Pilot survey: P = 91% agree to RTG	$N = \frac{P(100\%-P)}{(SE)^2} = 126$
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139 questionnaires proportionally distributed over 16 strata (electoral areas)	Sampling interval ranges 129-144
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# PRELIMINARY ANALYSIS AND FINDINGS

% perception about urban trees among  
house owners/occupants



- ❖ Use of a likert type of question to assess perception on three levels
- C = City
- V = Vicinity
- R = Residence (housing area/compound)
- ❖ Majority found urban trees good to have
- ❖ Appears to be a true test of perception - significant majority agree to

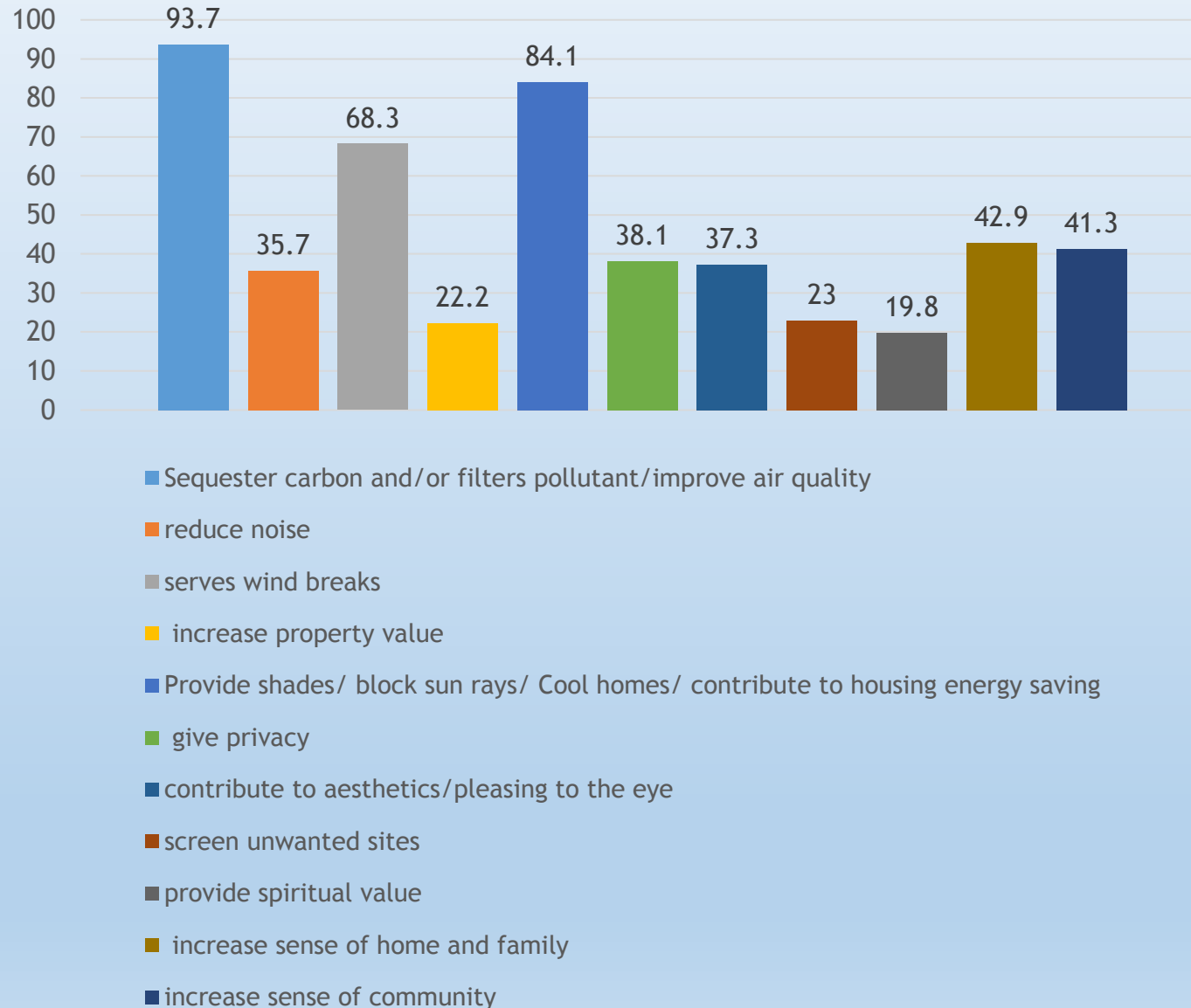
A significant positive correlation is found among house owners/occupants' perception about having trees within the city, vicinity and housing area as good

Variables	Spearman's rho correlation	Is having trees within the city good?	Is having trees within your vicinity good?	Is having trees within the housing area good?
Is having trees within the <b>city</b> good?	Correlation Coefficient	1.000	.813**	.813**
	Sig. (2-tailed)		.000	.000
	N	121	119	115
Is having trees within your <b>vicinity</b> good?	Correlation Coefficient	.813**	1.000	.565**
	Sig. (2-tailed)	.000		.000
	N	119	121	116
Is having trees within the <b>housing area</b> good?	Correlation Coefficient	.813**	.565**	1.000
	Sig. (2-tailed)	.000	.000	
	N	115	116	117

\*\* . Correlation is significant at the 0.01 level (2-tailed).



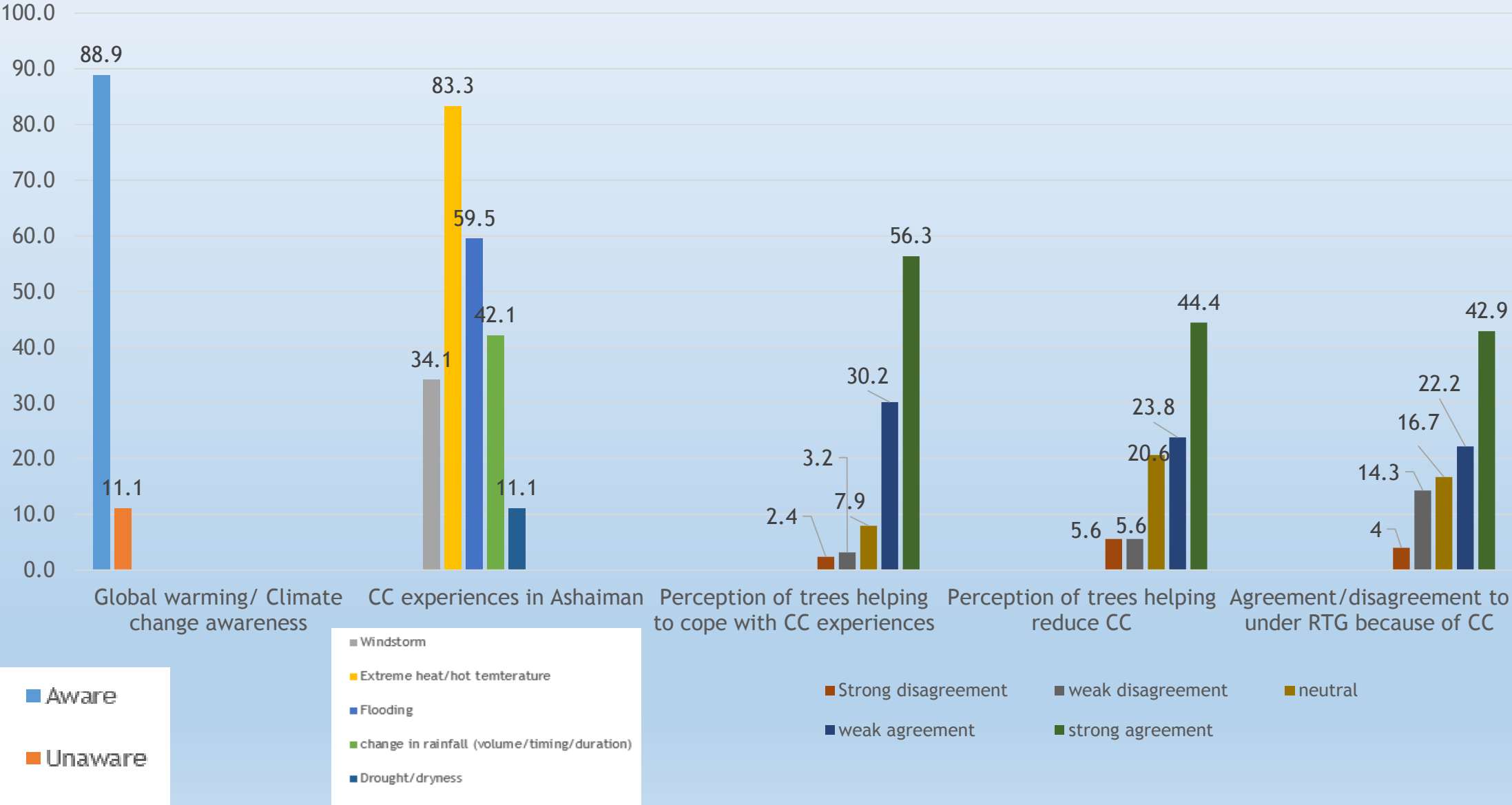
## Reasons to have trees within housing area/compound (%)



❖ More respondents give reasons related to GW/CC

❖ However, other reasons could serve as incentive to RTG

# Perception and willingness to undertake RTG because of GW/CC





Reported experiences of Climate Change/Global Warming in Ashaiman by age

Age	change in rainfall (volume/timing/duration)			Extreme heat/hot weather			windstorm			Flooding			Drought		
	Yes	No	Total	Yes	No	Total	Yes	No	Total	Yes	No	Total	Yes	No	Total
20-24	3	7	10	9	1	10	3	7	10	3	7	10	2	8	10
25-29	5	7	12	9	3	12	5	7	12	7	5	12	0	12	12
30-34	5	13	18	13	5	18	5	13	18	11	7	18	3	15	18
35-39	4	10	14	12	2	14	5	9	14	7	7	14	0	14	14
40-44	6	10	16	15	1	16	4	12	16	9	7	16	1	15	16
45-49	5	4	9	7	2	9	3	6	9	6	3	9	1	8	9
50-54	7	8	15	13	2	15	8	7	15	10	5	15	2	13	15
55-59	6	3	9	7	2	9	2	7	9	7	2	9	3	6	9
60-64	9	9	18	15	3	18	7	11	18	12	6	18	0	18	18
65+	3	2	5	5	0	5	1	4	5	3	2	5	2	3	5
Total	53	73	126	105	21	126	43	83	126	75	51	126	14	112	126

Educational attainment appears to have influenced influence perception of trees helping to reduce/prevent the cause of Global Warming/Climate Change

Educational Attainment	Perception of Trees helping to reduce/prevent the cause of Global Warming/Climate Change					Total
	Strong disagreement	weak disagreement	neutral	weak agreement	strong agreement	
No formal/Have not had the opportunity	4	3	6	5	3	21
Primary Level	0	1	3	1	6	11
Middle/JSS/JHS	1	2	10	12	20	45
Secondary/SSS/SHS	0	0	2	8	10	20
Commercial/technical/vocational	2	1	4	4	4	15
Tertiary	0	0	1	0	13	14
Total	7	7	26	30	56	126

# Willingness and ability to undertake RTG

## Maximum average WTS on RTG

	Maximum WTS on RTP		WTS on tree maintenance (monthly)		WTS on RTG up to month 1	
	GHC	£	GHC	£	GHC	£
N	126		126			
Mean	36.19	6.96	24.33	4.68	60.52	11.64
Median	30.00	5.77	20.00	3.85	50.00	9.62
Mode	0.00	0.00	0.00	0.00	0.00	0.00
Range	100.00	19.23	100.00	19.23	200.00	38.46
Minimum	0.00	0.00	0.00	0.00	0.00	0.00
Maximum	100.00	19.23	100.00	19.23	200.00	38.46
Sum	4560.00	876.92	3066.00	589.62	7626.00	1466.54
Percentiles	25	0.00	0.00	0.00	10.00	1.92
	50	30.00	20.00	3.85	50.00	9.62
	75	60.00	40.00	7.69	100.00	19.23

Impression was created that planting trees should NOT come with any cost

*“Oh!, as for tree planting, I just have to go to the bush/farm, cut some tree or even ask a brother for seedling, dig hole and plant [and quizzed] will that cost me anything?” - a respondent’s reaction to WTS on RTG*

# Emerging factors likely to affect RTG

## Respondents' anticipated challenges to RTG Impede RTG

- ❖ limited space/improper settlement layout
- ❖ Cost of planting/maintenance
- ❖ damage from activities of children/others who care less about trees
- ❖ stray animals
- ❖ Effects of weather; drought, heat, windy, etc

## Factors identified to promoting RTG

- ❖ Encouragement from leaders
- ❖ Tree benefits
- ❖ Support from children, relatives, friends and clubs
- ❖ space is available
- ❖ Landlord endorsed it



# What can be said so far

- ❖ There has been a favourable perception towards residential trees and as a climate change response
- ❖ Further assessment in this study needs to be carried out on WTS and ATS on RTG

# Way forward

- ❖ Undertake Ability to Spend (ATS) on RTG
- ❖ Undertake a more detail analysis of influential variables; age, income, education etc.
- ❖ Undertake a detail analysis of climatic trends and (where possible) urban tree loss contribution to that
- ❖ Likely urban tree contribution to climate change response
- ❖ analysis of data on research question 4
- ❖ etc

**THANK YOU**

