Towards Energy Recovery from Waste in Developing Countries: An Analysis of the Prospects and Challenge of Waste Management in Abuja Nigeria

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Introduction

Globally, 2.01 billion tonnes of municipal solid waste (MSW) is generated annually, and this is expected to increase to 3.40 billion tonnes by 2050, with projections showing that most of the increase will be in the Sub-Saharan Africa region. Nigeria like other developing countries in the region is faced with various waste management challenges. Governments are showing interest in Waste-to-Energy technologies, to simultaneously deal with the problems of increasing waste and electricity access. However, the selection and introduction of these technologies require knowledge of waste characteristics, comprehensive legal frameworks, and efficient waste management systems. This research examines the challenges of the Nigerian waste management system from a socio-demographic point of view, with an aim to construct a conceptual waste management framework for the introduction of new technologies

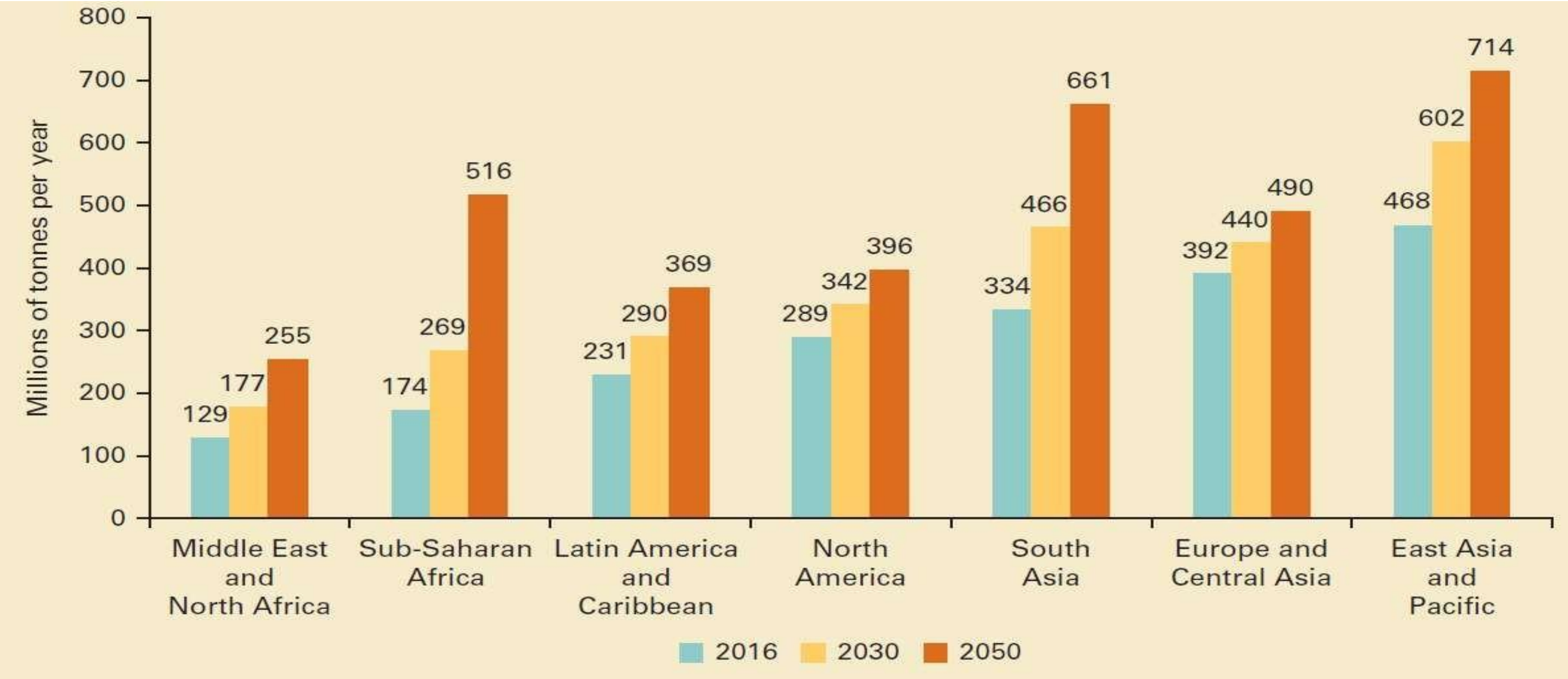


Figure 1: Waste generation projections by region

Objectives

- To evaluate the challenges of the Abuja waste management system and evaluate the effects of different socioeconomic factors
- To characterize the current household waste streams and quantities by carrying out a representative compositional analysis
- To critically assess the level of stakeholder participation in waste management within Abuja city.
- To evaluate current international legislative policies and provisions in waste management that can be adopted to drive waste management iAbuja.
- To evaluate available and near future WtE technologies and assess their application within a Nigerian context

Challenges

Open dumping

Low collection rates

Drivers and Prospects

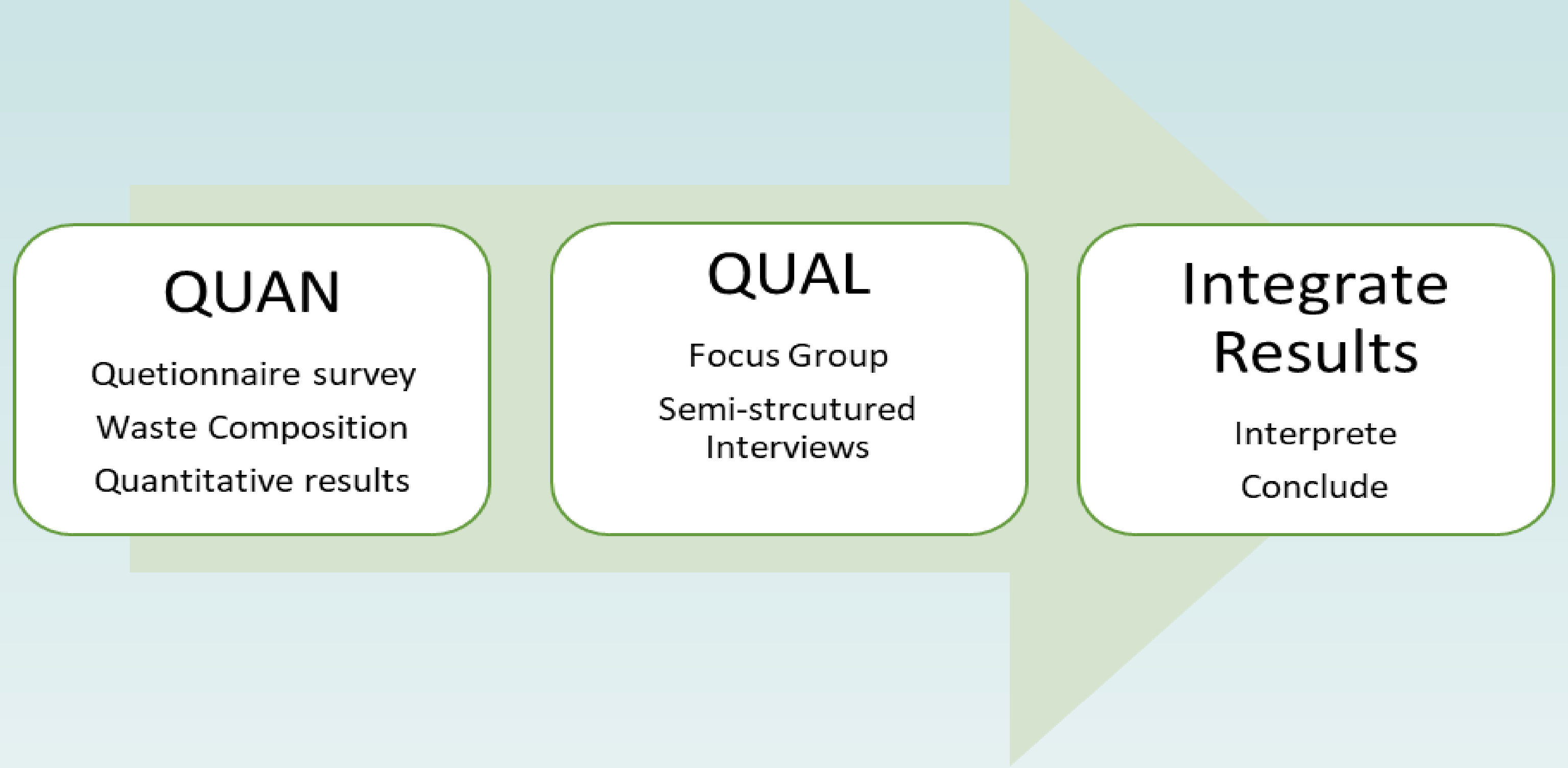
Energy security

Environmental awareness

Figure 2: Waste-to-Energy

Methodology

- Sequential Explanatory
- Following the waste trail from generation to final disposal

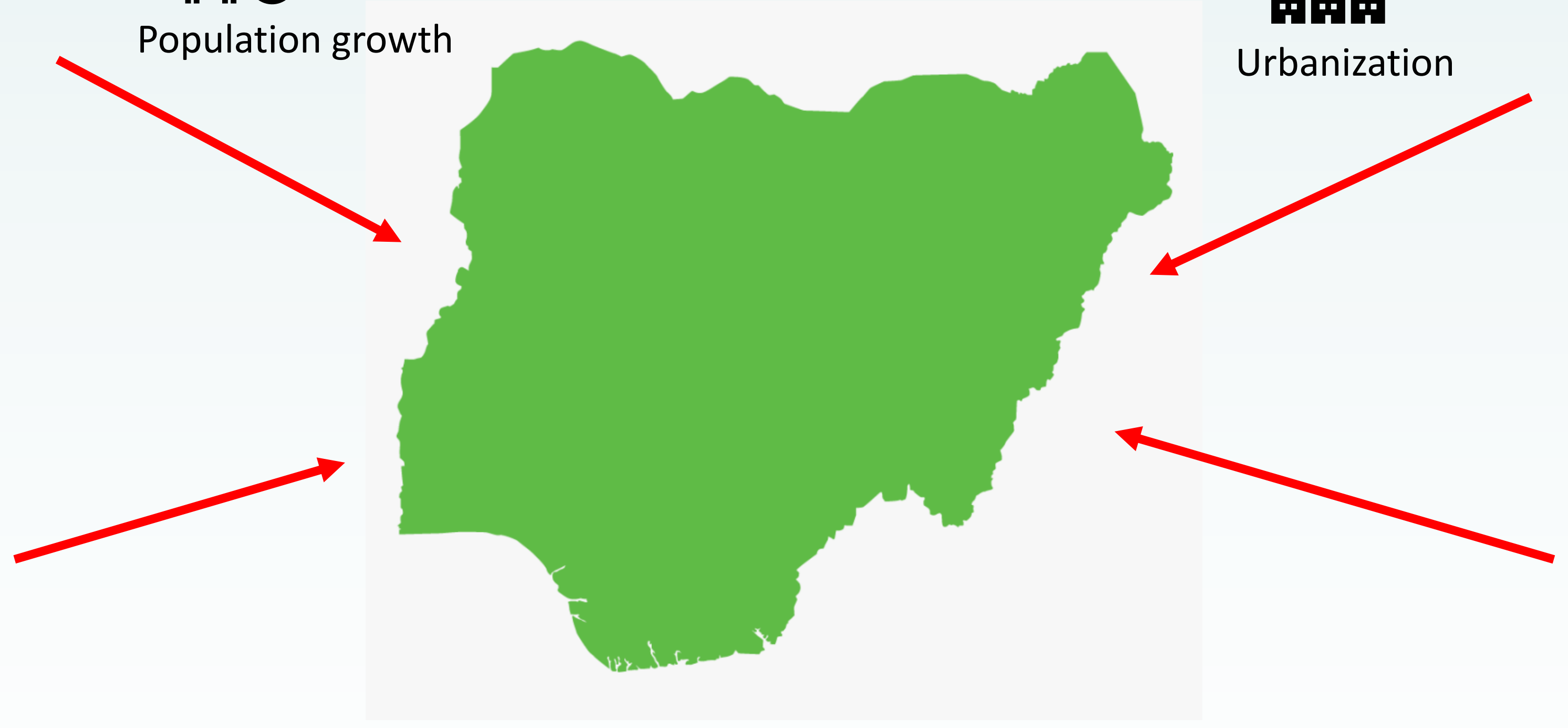


QUAN
Quetionnaire survey
Waste Composition
Quantitative results

QUAL
Focus Group
Semi-strcutured Interviews

Integrate Results
Interprete
Conclude

Focus on Nigeria

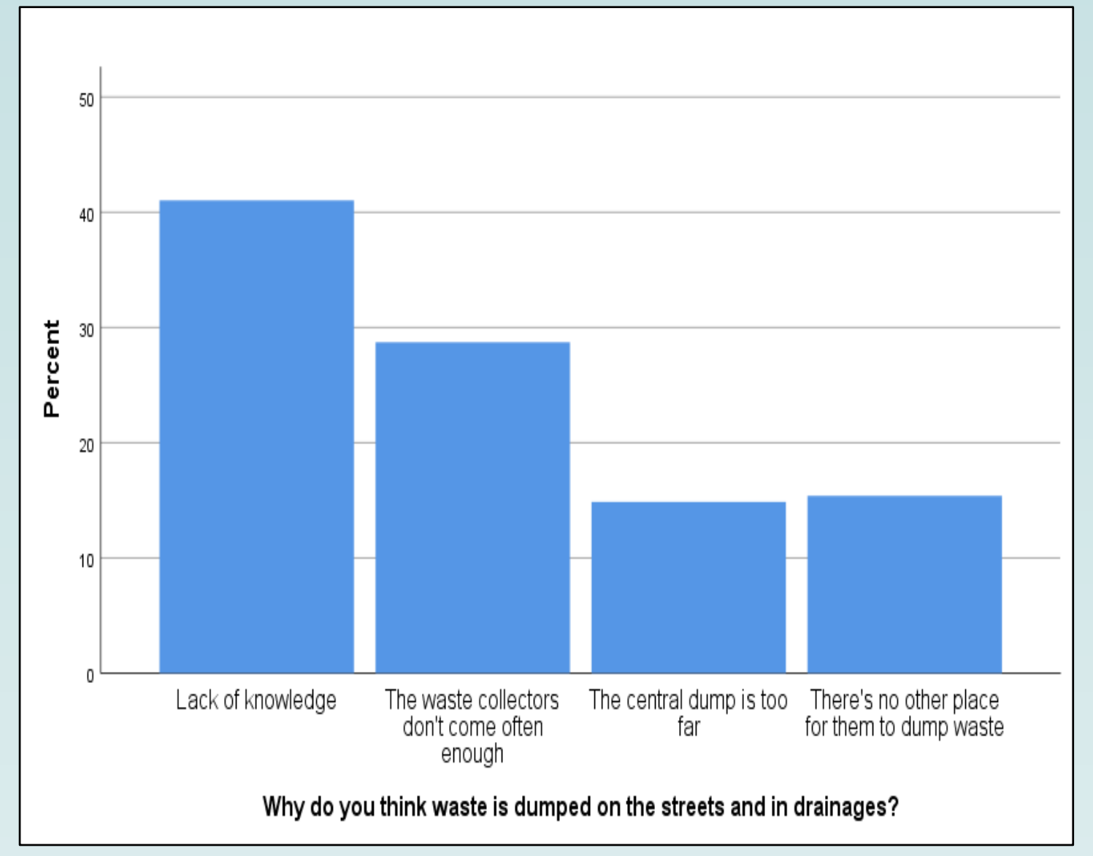


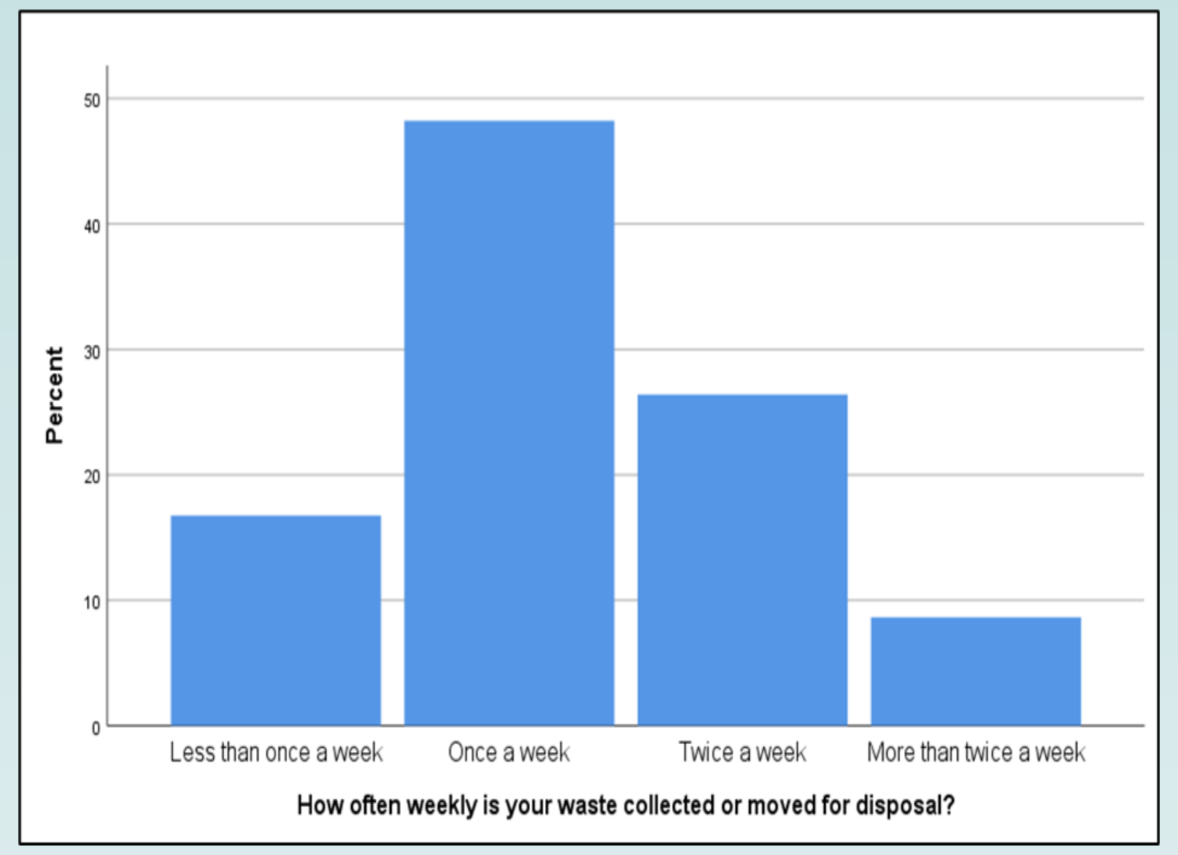
Population growth

Urbanization

- Population set to increase from 200million to <400 million by 2050
- Among top 10 sea-polluting countries

Preliminary Results





- Open dumping is practiced across the various districts/income levels
- The perception of respondents is that lack of knowledge is the main reason for open dumping
- Waste collection is mostly done once a week across the various districts/income levels
- There is a strong statistical relationship between districts/income levels and the willingness to pay for waste services
- There is a relationship between employment status and participation in the environmental sanitation exercise
- Poor public awareness due to lack of information and communication

Future Work

- Waste composition study
- Focus group and Interview sessions