Chapter 1: Introduction

Over two billion people today have inadequate sanitation. Dozens of groups world-wide are attempting to bring new science and new, low-cost technologies together to create inexpensive, locally-produced devices to build a new system of distributed waste treatment accessible to all.

To change water and waste-water systems from today's model of large, piped, centrally-processed systems to a new distributed system
requires four mutually supportive components:

- a clear understanding of the science and engineering of water and waste
- a design and implementation
  plan based on specific characteristics of each site
- an economic and business
  plan capable of sustainable, profitable operation
- a management and political environment
  dedicated to the highest standards of quality and community responsiveness.

Many initiatives today address the lack of sanitation in India, in China, and in urban slums world-wide. These new systems should find application in every home, at every level of economic wealth.

The RedHorse Constructors initiative to build a compact, energy-efficient home treatment system draws on lessons from operating the Kibera Town Centrein Nairobi, Kenya, for almost ten years.

This sequence of chapters seeks to:

- introduce the parameters of the global problem,
- present the array of solutions presented as of July, 2019
- present the technical underpinnings of new tools in data science to allow analysis and design
- present tools for global exchange of operational and cost data, to allow open sharing of best practices