



Sustainable Wastewater Management in Developing Countries

New Paradigms and Case Studies from the Field

Carsten Hollænder Laugesen and Ole Fryd with Thammarat Koottatep and Hans Brix



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Table of Contents

Preface			vii	
1	Sustainable Wastewater Management:			
		At a Conserve a	1	
	1.1	At a Crossroad	1 7	
	1.2	The Way Forward	9	
2	Reflections on Sustainable Wastewater Management			
	2.1	Discussing Appropriateness and Sustainability	19	
	2.2	The Eleven Fundamental Issues	20	
3	Elen	ents of Sustainable Wastewater Management	33	
	3.1	Framing Appropriateness and Sustainability	33	
	3.2	The Ten Nods of Appreciation	34	
	3.3	Scale, Systems, and the Six Elements for Appropriateness	39	
	3.4	Element 1: Wastewater Collection Systems	41	
	3.5	Element 2: Wastewater Treatment Systems	45	
	3.6	Element 3: Energy Consumption	58	
	3.7	Element 4: Urban Integration	60	
	3.8	Element 5: Re-Use and Re-Entry of Wastewater	62	
	3.9	Element 6: Organization and Finance	70	
	3.10	Nodding in Perspective: The Width and Depth of		
		Assessing Appropriateness and Sustainability	80	
	3.11	Sense and Simplicity	87	
4	Sustainable Wastewater Management at the Chairman's			
	Hou	se: A Recovery-Based, Closed-Loop Household System	89	
	4.1	The Living Lab of Dr. Ksemsan Suwarnarat	89	
	4.2	Reflections on Appropriateness and Sustainability	92	
	4.3	Smart Technologies at the Chairman's House	96	
5	Constructed-Wetland Wastewater Treatment at Baan			
	Pru'	Teau: A Low-Cost Cluster Community System	100	
	5.1	Supporting a Cluster of Houses	100	
	5.2	Reflections on Appropriateness and Sustainability	104	
	5.3	Smart Technologies at Baan Pru Teau	110	

v

6	Wastewater Management Design at Koh Phi Phi:				
	A R	ecovery-Based, Closed-Loop System	114		
	6.1	The Flower and the Butterfly	114		
	6.2	Reflections on Appropriateness and Sustainability	124		
	6.3	Smart Technologies on Koh Phi Phi	132		
7	Energy-Optimized Wastewater Treatment at Siriraj Hospital:				
	A La	arge-Scale, On-Site Treatment System	152		
	7.1	Year after Year	152		
	7.2	Reflections on Appropriateness and Sustainability	156		
	7.3	Smart Technologies at Siriraj Hospital	159		
8	Constructed Wetland at Patong: A River Treatment System				
	8.1	Doing the Next Best	163		
	8.2	Reflections on Appropriateness and Sustainability	169		
	8.3	Smart Technologies in Patong	173		
9	Pond and Constructed-Wetland Treatment at Sakon Nakhon:				
	A Sı	ıstainable Municipal System	178		
	9.1	Fields of Action	178		
	9.2	Reflections on Appropriateness and Sustainability	185		
	9.3	Smart Technologies at Sakon Nakhon	188		
10	Wastewater Planning in Pathumthani Province: Appropriate				
	Plar	nning of Large-Scale Wastewater Management	194		
	10.1	Thinking Small, Big Scale	194		
	10.2	Reflections on Appropriateness and Sustainability	223		
11	The Way Forward, Mainstreaming, and Other Reflections 228				
	11.1	The Sustainable Ecosystem Approach: Going Mainstream	229		
	11.2	Three Key Interlinked Conclusions Are Mainstreamed	231		
	11.3	Local Context: Going Mainstream	235		
Ref	erend	ces	239		
Index			241		
Abo	About the Authors				

vi

Contents

Preface

When did I realize change was needed within the wastewater management sector in the tropics? Some years ago I worked in Malaysia as an advisor to a state environmental protection department. We wanted to draft a regulation for wastewater treatment and therefore decided to evaluate the status of the existing systems. We found that 91 treatment plants had been constructed in the state. Of these, 89 were either malfunctioning or inactive. Of the two in operation, one was a recently built plant that was expected to fail soon. The other was a municipal pond system that was not operated by anyone but, because wastewater was flowing through it by gravity, it was therefore labeled as being in operation!

Some years later I moved on to work in Thailand in the newly established national wastewater management authority. One of the first things I did was to visit most of the 76 municipal treatment plants in the country, and it quickly became apparent that the situation in Thailand was similar to that in Malaysia. All these expensive engineered treatment systems, and almost all of them malfunctioning! It really puzzled me. As a public sector specialist I had never seen anything like this before—a sector where, apparently, the same mistakes were repeated over and over again. How could a sector and its planners, engineers, and economists accept, or at least not constantly challenge, such a degree of failure? How could they continue to propose, design, and finance similar systems and technologies that already had been proven not to work? Despite how amazing this looked, I came to realize it was nevertheless a fact. I consulted other colleagues within the sector who had worked outside the luxurious conditions of Western countries, and they all had the same stories and experiences-in Asia, Africa, and South America, in fact, in all tropical countries. Because I have now worked for more than 10 years in developing countries, mainly in Asia and South Africa, I, too, have come to know all the complex and interlinked political, economic, cultural, and institutional reasons why wastewater management in developing countries lacks the ability to change direction and approaches.

-Carsten H. Laugesen

This book presents reflections on and actual stories about appropriate and sustainable wastewater management systems in the tropics. General reflections are followed by case stories and the implications and applications that can be drawn from these stories from the field. This book is intended to inspire rather than prescribe and dictate; to support thoughtful innovations rather than replication of dogmas.

Our aim is to reflect on, discuss, and provide examples (and thereby hopefully inspire) a broader use of robust, reliable, cost-effective, and efficient wastewater management systems that work in practice. "Sense and Simplicity" is the principle we have chosen to guide theory and practice.

This book has been written by a multidisciplinary team of people who would like to support better wastewater management planning and implementation in the future. This team has experienced, especially in developing countries, numerous failures of traditional planning, design, and implementation of wastewater management systems, and would like to contribute to reducing such failures in the future. We are not locked into a single approach (e.g., "small is beautiful," "pro-low-tech," or "anti-centralization"). We believe in localized best solutions—a "fit the local context" approach to assessing what is best. Success is only achieved when something works in real life—not in theory or not what might be possible if this or that were in place. Success is what proves to work, year after year, and thus has an actual positive impact on public health and the environment.

The main authors are Carsten H. Laugesen and Ole Fryd, with Thammarat Koottatep and Hans Brix providing invaluable inputs, comments, and corrections. The following have also provided valuable contributions and comments to this book and the experiences it is based upon: Ksemsan Suwarnarat, Sarawut Srisakuna, Suchai Janepojanat, Chatdanai Jiradecha, Niras Limprayoonyong, Pisit Srivilairit, Henrik Lynghus, Jacob Hamburger Hansen, Ejlif Mikkelsen, Kenneth Wright, Mikkel Rye Christensen, Bablu Virinder Singh, Tony Greer, Waraporn Kanchanapiboon, Thasanee Dejpraikhala, and Kitti Uyakul. We are deeply grateful to the Danish International Development Agency (DANIDA), especially Kit Clausen and Marinette Forbes Ricarde, and to Tracy Hart from the World Bank, for their valuable support.

> —Carsten H. Laugesen, Ole Fryd, Thammarat Koottatep, and Hans Brix

1

Sustainable Wastewater Management: An Introductory Overview

>>> 1.1 At a Crossroad

Wastewater management in developing countries is at a crossroad, and it is generally agreed there is an urgent need for a shift in the approach to wastewater management and planning in developing countries. Needs are growing, resources are scarce, previous management systems have failed, and traditional techniques and solutions are not rapid, efficient, or cost-effective enough to solve the wastewater management problems developing countries are facing.

At a time when traditional paradigms have proven insufficient and new ones have yet to fully take form, many new emerging views, opinions, and competing systems and technologies are seeing the light of day. Some of these are more appropriate and sustainable than others. This is an excellent time for rethinking, experimenting, and seeking new paths.

1.1.1 It Is Difficult to Change Direction

Despite the past failure of most centralized systems, it is likely that most new wastewater management systems in developing countries will continue to be advanced, centralized, and with a continued high probability for failure. The reasons for this are many and interlinked.

The first and probably most important reason is the political preference for large, one-off investments. Other significant reasons include inertia; the wish to compare favorably with developed countries; the education and expertise of local wastewater engineers; and whether international water and wastewater consortia are providing funding and consultancy.

The complexity of wastewater planning often supports the choice of advanced, centralized wastewater management systems. When planning large-