

Evan A. Thomas *Editor*

Broken Pumps and Promises

Incentivizing Impact in Environmental
Health

 Springer

Evan A. Thomas
Editor

Broken Pumps and Promises

Incentivizing Impact in Environmental Health

 Springer

Editor

Evan A. Thomas
Department of Mechanical and Materials Engineering
Portland State University
Portland, OR, USA

ISBN 978-3-319-28641-9 ISBN 978-3-319-28643-3 (eBook)
DOI 10.1007/978-3-319-28643-3

Library of Congress Control Number: 2016931273

Springer Cham Heidelberg New York Dordrecht London

© Springer International Publishing Switzerland 2016

Chapter 3 is published with kind permission of © 2016 by International Bank for Reconstruction and Development/The World Bank

This work is subject to copyright. All rights are reserved by the Publisher, whether the whole or part of the material is concerned, specifically the rights of translation, reprinting, reuse of illustrations, recitation, broadcasting, reproduction on microfilms or in any other physical way, and transmission or information storage and retrieval, electronic adaptation, computer software, or by similar or dissimilar methodology now known or hereafter developed.

The use of general descriptive names, registered names, trademarks, service marks, etc. in this publication does not imply, even in the absence of a specific statement, that such names are exempt from the relevant protective laws and regulations and therefore free for general use.

The publisher, the authors and the editors are safe to assume that the advice and information in this book are believed to be true and accurate at the date of publication. Neither the publisher nor the authors or the editors give a warranty, express or implied, with respect to the material contained herein or for any errors or omissions that may have been made.

Printed on acid-free paper

Springer International Publishing AG Switzerland is part of Springer Science+Business Media
(www.springer.com)

Foreword

In 2007, The Rockefeller Foundation convened a group of philanthropists, social impact leaders, and finance professionals at our Bellagio Center overlooking Lake Como to find new solutions on how to mobilize private capital to solve humanity's greatest challenges.

It might seem an odd place, seemingly so far away from the problems of the real world, to discuss such consequential topics. But that's precisely the Center's power: its serene location encourages those attending the conferences within its gates to dream big. And that's exactly what this distinguished group did, coining the term "impact investing" for a field that would help investors invest with the intention of both profit and social and environmental impact.

While the idea of using private capital to help solve humanity's greatest challenges wasn't itself novel, this new approach of double-bottom-line investing would lay the groundwork for new products and processes to channel more money, more effectively, towards these goals. And it comes at a critical time for philanthropy, as global philanthropic funds, even when combined with the development or aid budgets of governments, add up to billions of dollars. Meanwhile, the cost of solving the world's most critical problems runs into the trillions, including an estimated \$2.5 trillion annual funding gap needed to achieve the Sustainable Development Goals (SDGs) in developing countries alone. Private capital is urgently needed in order to fill this gap and address pressing global challenges.

Since that meeting at Bellagio, the field of impact investing has taken root with the help of new infrastructure built with \$40 million funded by The Rockefeller Foundation, including the creation of the Global Impact Investing Network, the rise of B-corporations, and the establishment of the Impact Reporting and Investment Standards and GIIRS analytics, now considered the "gold standard" for measuring a company or fund's social and environmental impact.

But there is still great opportunity for growing and developing the metrics and measurement tools that enable us to evaluate what is working and what is not. For those investors who seek to align payments with performance, innovations in both technologies and organizations will be needed.

At The Rockefeller Foundation, we are working to help support many of these innovations through Zero Gap, an effort dedicated to mobilizing large pools of private capital for social good. To do this, we are identifying the next generation of innovative finance products, partnerships, and processes that have the potential to create outsized impact. Employing a venture philanthropy model, Zero Gap supports early-stage design and leans heavily on collaboration and experimentation with both private and public sector partners. Whether it is pay for performance mechanisms or new institutional investment models, the solutions we are pursuing will all require objective data, feedback loops, and incentives for demonstrating that impact is actually achieved.

In the pages that follow, contributors discuss some of the emergent innovations in measuring the impacts of investment, with a specific look at poverty reduction. Edited by Professor Evan A. Thomas, this collection will be a valuable addition to the discourse on how we can better incentivize and evaluate impact across range of issues.

As an engineer and an entrepreneur working in global health, Professor Thomas has assembled compelling examples of technology, finance, and feedback that offer intriguing opportunities to close the gap between intent and impact. For example, the high adoption of mobile phones can help to accelerate the time it takes to make data actionable, while closing gaps in distance and subjectivity. Meanwhile, crediting systems, such as energy metering or carbon finance credits, can help align payments flowing from communities, donors, and investors with performance measures.

The development of such systems will be critical to supporting shared goals of mobilizing larger amounts of private capital to have more measurable and meaningful impact. Professor Thomas has edited much of this book while overlooking the same grounds as the pioneers of impact investing suggests that the Bellagio Center has once again inspired dreams that will transform lives around the world.

Judith Rodin, Ph.D.
The Rockefeller Foundation
New York, NY, USA

Acknowledgments

This volume is a collaboration between all of the chapter co-authors as well as the numerous collaborators, funders and partners involved in the efforts presented. Particular thanks to Springer Editor Sherestha Saini and Portland State graduate student Emily Bedell. The Editor, Evan A. Thomas, dedicates this book to his wife, Lauren Alstot, and his mother, Anne Beirne.

Contents

1 Introduction	1
Evan A. Thomas	
2 Performance Over Promises	5
Kristi Yuthas and Evan A. Thomas	
3 Trade-Offs and Risks in Results-Based Approaches	19
Claire Chase and Aidan Coville	
4 How Feedback Loops Can Improve Aid and Governance	31
Dennis B. Whittle	
5 Intent to Impact – Diluted Safe Water Monitoring	47
Thomas F. Clasen	
6 Mobilizing Payments for Water Service Sustainability	57
Johanna Koehler, Patrick Thomson, and Robert Hope	
7 Enabling Ecological Restoration Through Quantification	77
Alex H. Johnson and Joe S. Whitworth	
8 Incentivizing Impact – Privately Financed Public Health in Rwanda	99
Evan A. Thomas, Christina Barstow, and Thomas Clasen	
9 A Critical Review of Carbon Credits for Household Water Treatment	135
James M. Hodge and Thomas F. Clasen	
10 HAPIT, the Household Air Pollution Intervention Tool, to Evaluate the Health Benefits and Cost-Effectiveness of Clean Cooking Interventions	147
Ajay Pillarisetti, Sumi Mehta, and Kirk R. Smith	

11 Innovations in Payments for Health Benefits of Improved Cookstoves	171
Ken Newcombe, Tara Ramanathan, Nithya Ramanathan, and Erin Ross	
12 The Role of Mobile in Delivering Sanitation Services	179
Michael Ronan Nique and Helene Smertnik	
13 Combining Sensors and Ethnography to Evaluate Latrine Use in India	195
Kathleen O'Reilly, Elizabeth Louis, Evan A. Thomas, and Antara Sinha	
14 Sustainable Sanitation Provision in Urban Slums – The Sanergy Case Study	211
David Auerbach	
15 Pay for Performance Energy Access Markets	217
Dexter Gauntlett, Michael Ronan Nique, and Helene Smertnik	
16 Mobilizing Commercial Investment for Social Good: The Social Success Note	231
Lorenzo Bernasconi Kohn and Saskia Bruysten	
Index	239

Editor Biography



Evan A. Thomas, Ph.D., PE, MPH is an Assistant Professor and Director of the Sweet (Sustainable Water, Energy and Environmental Technologies) Laboratory, and a Faculty Fellow in the Institute for Sustainable Solutions at Portland State University. He works at the interface of engineering, environmental health, and social business, with professional experience working in government, industry, non-profits, and academia. He holds a Ph.D. in Aerospace Engineering Sciences from the University of Colorado at Boulder, is a registered Professional Engineer (P.E.) in Environmental Engineering in the State of Texas and holds a Masters in Public Health from the Oregon Health and Science University.

He is also a social business entrepreneur engaged in global health programs. Evan was a founding volunteer with Engineers Without Borders–USA in 2002, which led to co-founding Manna Energy Limited in 2007. In 2012, he co-founded SWEETSense Inc., an Oregon technology company. He also served as the Chief Operating Officer of DelAgua Health, a social enterprise partnered with the Government of Rwanda.

Prior to joining PSU, Evan worked as a civil servant at the NASA-Johnson Space Center in Houston, Texas. At NASA, he was a principal investigator and project manager in the Life Support and Habitability Systems Branch working on concepts and flight hardware for sustainable Moon and Mars spacecraft.