TU Delft

Delft University of Technology

Voices on Sustainable Ports in Africa

Stories from Tema Port, Ghana

Kothuis, Baukje; Slinger, Jill

Publication date
2018

Document Version
Final published version

Citation (APA)
Kothuis, B., & Slinger, J. (Eds.) (2018). *Voices on Sustainable Ports in Africa: Stories from Tema Port, Ghana*. Delft University Publishers.

Important note
To cite this publication, please use the final published version (if applicable).
Please check the document version above.

Copyright
Other than for strictly personal use, it is not permitted to download, forward or distribute the text or part of it, without the consent of the author(s) and/or copyright holder(s), unless the work is under an open content license such as Creative Commons.

Takedown policy
Please contact us and provide details if you believe this document breaches copyrights.
We will remove access to the work immediately and investigate your claim.

This work is downloaded from Delft University of Technology.
For technical reasons the number of authors shown on this cover page is limited to a maximum of 10.

Kothuis, Slinger

VOICES ON SUSTAINABLE PORTS IN AFRICA

STORIES FROM TEMA PORT







VOICES ON SUSTAINABLE PORTS IN AFRICA

STORIES FROM TEMA PORT, GHANA

EDITED BY
Baukje Bee Kothuis
Jill Slinger

VOICES ON SUSTAINABLE PORTS IN AFRICA

STORIES FROM TEMA PORT, GHANA

Baukje Bee Kothuis & Jill Slinger (Eds.)

The Sustainable Ports in Africa program is a collaborative multidisciplinary
NWO Urbanizing Deltas of the World research project

DELFT UNIVERSITY PUBLISHERS 2018



Baukje Bee Kothuis, Jill Slinger

FORTY-SEVEN STORIES IN ONE BOOK

PREFACE

This book is a storybook. Forty-seven stories from people that are in one way or another connected to the port of Tema. Some live right next to it, or work at the port or in the direct environment. Others are involved in businesses or organizations that provide services, goods, knowledge or research for ports and their facilities, economics or development. Some in Ghana, some in the Netherlands.

All are stakeholders, in their own specific way and with their own specific story. These are the people we have drawn into our academic research project 'Design of Sustainable and Integrated Ports within an African Context.'

It all started in the first year when we played a serious game "Sustainable Ports" with a group of port business leaders. Many ideas and incentives arose from this endeavor. The year after, a design workshop was convened and attended by a large group of local and regional stakeholders. Multiple inspiring design options and visions were brought to the table. New connections were established and ideas were shared. And now, this very large group of interviewees helped to make this book possible by telling their stories, allowing us to listen to their voices. These pages intend to connect many stakeholders, hopefully not only on paper but also in real life.

This book
On the next page, the three professors heading that academic research project, will start by explaining the project and its vision and philosophy. The book is then arranged in three sections.

In the first section, the people that live and work in the direct environment of Tema Port tell their stories: about daily life near the port, about their fears and hopes, dreams and expectations for a future connected to the new port development. These interviews provide an intimate glimpse into people's lives and ideas.

The second section focuses on businesses and organizations in Ghana and in The Netherlands. These stakeholders explain how or why they got involved with Tema Port, and share their business and organizational views on the port development. Again their stories are revealing and their ideas can incite us to sustainable action.

The final section is somewhat different. It presents the perspectives of the academics involved in the research project. Researchers from multiple Ghanaian and Dutch universities and from diverse backgrounds form our team. In their interviews they tell us about their specific expertise and how they envision a sustainable port. It is captivating to read what they have learned from this project and the range of people involved.

What's next?
We bring this book back to you, the people that we interviewed in Tema, Accra and The Netherlands. And expect that you will be inspired hearing the stories of other stakeholders. We trust that you will not only read your own words, but also hear the voices of other individuals, communities, organizations and businesses. And we hope you will convey these inspirations and stories to many others in your daily life and working environments.

By telling stories, listening and informing each other of different perspectives and values, people can learn new or unexpected points of view. We hope that this book can be part of that and creates opportunities to rearrange opinions and behaviours and of course inspires the design of sustainable ports within an African context!

Images below: Impression of the stakeholder workshop at the port of Tema in 2017, kindly hosted by Ghana Ports and Harbours Authority. Including participants from Ghanaian and Dutch businesses, national and local governmental organizations, local NGO's, and academics from the University of Ghana, Legon, Delft University of Technology, Wageningen University, Free University Amsterdam, UNESCO-IHE, Deltares and respresentatives of the NABC/GNBCC and the Dutch Embassy in Accra.

Image page 3: Design of the NWO-UDW research project "Integrated and Sustainable Port Development in Ghana within an African Context".









Jill Slinger, Tiedo Vellinga, Kwasi Appeaning Addo

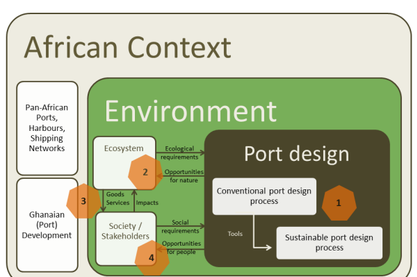
DEVELOPING SUSTAINABLE PORTS IN AFRICA

INTRODUCTION OF THE NWO-UDW RESEARCH PROJECT

Prof. dr. Jill Slinger is the scientific research leader of this project. She is an associated professor at TU Delft and visiting professor at Rhodes University, South Africa.

Prof. (emeritus) dr. Tiedo Vellinga is the Dutch program leader of this project. He is emeritus professor at TU Delft and worked as a director of infrastructure management at the Port of Rotterdam.

Prof. dr. Kwasi Appeaning Addo is the Ghanaian scientifc and program leader of this project. He is associate professor of Marine and Fisheries Sciences, University of Ghana, Legon.



Ports provide an essential link to the world market, enabling countries to trade their goods and strengthen their economies. However, the global and regional benefits of port developments do not always translate into benefits to local stakeholders. There is often a mismatch between the positive global and regional effects of port development and the impacts (dis-benefits) that can be experienced locally. Port development requires a paradigm shift from a conventional economic and engineering oriented approach to a stakeholder-inclusive and environmentally, economically and socially integrated approach to become sustainable.

The research project "Integrated and Sustainable Port Development in Ghana within an African Context" aims to learn how to develop integrated and sustainable African ports that meet economic, social and environmental needs now and in the future. The Port of Tema, which has evolved from a small fishing village to Ghana's leading industrial centre and seaport in the last decades, forms the focal case study of the research.

The research project, funded by the Netherlands Organisation for Scientific Research, is carried out by a consortium comprising the University of Ghana, Delft University of Technology, the VU Amsterdam, Wageningen University, Deltares, UNESCO-IHE-Delft and the Netherlands African Business Council and is supported by NGO's and private sector companies. The project is characterized by:

- An inter-disciplinary approach, combining the engineering, ecological, economic and governance aspects of port development will produce an 'Africa-specific' design-framework and design tools to integrate and optimise the environmental, economic and public benefits of ports.
- A basis in the PIANC and IAPH Sustainable Ports Documents, which provide guidance on the planning, design and operation of sustainable ports;
- An 'action based' research approach and an applied research perspective;
- Demand driven knowledge development, meaning that users are in direct contact with the researchers and provide input in the form of stating their interests
- Ecosystem-based engineering design;
- A focal case study in Ghana and the aim to spread the message to other ports in Africa;
- A bottom-up, stakeholder-inclusive approach that emphasizes cooperation and collaboration between researchers and local stakeholders. Multi-stakeholder workshops and interviews with stakeholders to hear their stories are key aspects.

Specifically, the research is organised into four connected sub-projects, each covering a different aspect of sustainable port development:

1. Integrated engineering design
2. Ecological change and opportunities
3. Ecosystem services
4. Governance

A specific objective of the governance component of the project is to find out what local stakeholders value as a sustainable port. This book is an outcome of this endeavor, seeking to present and share the voices of a range of stakeholders on Tema and its port.



CONTENTS

PREFACE 3 FORTY-SEVEN STORIES IN ONE BOOK
Baukje Bee Kothuis, Jill Slinger

INTRODUCTION 5 DEVELOPING SUSTAINABLE PORTS IN AFRICA
Jill Slinger, Tiedo Vellinga, Kwasi Appeaning Addo

ONE 11 STORIES FROM STAKEHOLDERS IN TEMA AND BEYOND

TEMA FISHING HARBOUR 13 CHANDLING & TRANSPORTATION
Emmanuel Obulu & Derrick Acquah

TEMA FISHING HARBOUR 15 SELLING FISH
Faustina Nomo & Juliet Adam

TEMA FISHING MARKET 17 FISHING BY CANOE
Justice Atla & Peter Mesah

CHURCH VILLAGE 19 COMMUNITY COMMITTEE
Philip Seshie

CHURCH VILLAGE 21 TAXI DRIVER
Edem Agortey

SAKUMONO LAGOON 23 LAGOON CRAB FISHING
Francis Hukporti

SAKUMONO VILLAGE 25 TAKING CARE OF THE COMMUNITY
Nene Mantey, Nene Akpaglik, Moses Teye, John T. Maklalo, Richmond Sogbaton, Doglas A. Sogbaton, John Nyamedji

SAKUMONO VILLAGE 27 SAKUMONO TMA JUNIOR HIGH SCHOOL
John Nyahe

TEMA NEW TOWN 29 OPINION LEADER
Solomon Tetteh

PRAMPRAM 31 FISHING BY CANOE
Jacob Tettey & Nathaniel Agetey Alhao

TEMA CITY 33 RUNNING A HOTEL
Christopher & Monica Afedzi

TEMA CITY 35 *WORKING IN THE PORT: LOGISTICS*
Faustina Afrah Yeboah

TEMA CITY 37 CITY PLANNING
Francisca Okyere & Ali Amadu

TWO 39 STORIES FROM BUSINESSES & ORGANISATIONS IN GHANA AND THE NETHERLANDS

TEMA PORT 41 GHANA PORTS AND HARBOUR AUTHORITY: TEMA PORT
Edward Kofi Osei

TEMA PORT 43 GHANA INSTITUTE OF FREIGHT FORWARDERS
Kwabena Ofosu-Appiah, Joseph Agbaga & Robert Baffo Dapaah

TEMA PORT 44 SHIPPING AGENTS
Bas de Vaal



TEMA PORT 45 GREENWICH MERIDIAN TOWER AND CRUISE TERMINAL
Azonko Simpi
ACCRA 46 THE DEVELOPMENT INSTITUTE
Ken Kinney
ACCRA 48 CONSULTING FOR THE WATER SECTOR
Barnabas Apom
ACCRA 50 CONNECTING BUSINESS IN GHANA AND THE NETHERLANDS
Afke van der Woude
ACCRA 51 EMBASSY OF THE NETHERLANDS
Fred Smiet & Jan Anne van der Veer
NETHERLANDS 53 CONSORTIUM PARTNERS AND ADVISORY BOARD MEMBERS
Boskalis, Daan Rijks | WWF, Daphne Willems | EIA, Rob Verheem | FMO, Anton van Elteren | NABC, Anitra van der Kraan | IHE Delft, Dano Roelvink | Deltares, Martijn de Jong

THREE 55 ACADEMIC PERSPECTIVES FROM GHANA AND THE NETHERLANDS

UNIVERSITY OF GHANA 57 MARINE AND FISHERIES SCIENCES
Kwasi Appeaning Addo
CSIR WATER RESEARCH INST 58 CLIMATE AND HYDROLOGICAL MODELLING
Barnabas Akurigo Amisigo
UNIVERSITY OF GHANA 59 MARINE GEOCHEMISTRY
Edem Mahu
UNIVERSITY OF GHANA 60 COASTAL DYNAMICS
Philip Neri Jayson Quashigah
UNIVERSITY OF GHANA 61 COASTAL ECOSYSTEMS
Emmanuel Kwadzo Brempong
UNIVERSITY OF GHANA 62 SUBSIDENCE REGIMES
Selasi Yao Avornyo
UNIVERSITY OF GHANA 63 WATER QUALITY OF THE SAKUMONO LAGOON
Michael Kwame-Biney
DELFT UNIVERSITY 64 GREEN PORTS
Tiedo Vellinga
DELFT UNIVERSITY 65 INTEGRATED AND SUSTAINABLE COASTAL SYSTEMS MANAGEMENT
Jill Slinger
VU AMSTERDAM 66 ECOSYSTEM SERVICES VALUATION
Liselotte Hagedoorn
WAGENINGEN UR 67 GOVERNANCE
Heleen Vreugdenhil
DELFT UNIVERSITY 68 PORT PLANNING
Poonam Taneja
DELFT UNIVERSITY 69 COASTAL ENGINEERING
Wiebe de Boer
DELFT UNIVERSITY 70 MARINE ECOLOGY
Arno Kangeri
DELFT UNIVERSITY 71 STAKEHOLDER-INCLUSIVE DESIGN
Baukje Bee Kothuis
DELFT UNIVERSITY 72 MSC RESEARCH: HINTERLAND CONNECTIONS, TEMA TOWN SYSTEM DYNAMICS, TWO COASTAL LAGOONS
Koos Toebes, Jorrit van der Houten, Ascha Simons, Chris Wauben, Niels van Leeuwen, Lars Pije
EPILOGUE 75 SPREADING THE MESSAGE
Jill Slinger

ONE | STORIES FROM STAKEHOLDERS IN TEMA AND BEYOND



Emmanuel Obulu & Derrick Acquah

CHANDLING & TRANSPORTATION

TEMA FISHING HARBOUR



Image above:
Mr. Emmanuel Obulu, owner of 'By the grace of God Ltd.'

Image to left:
Tema fishing harbour.

Image to right:
The team of 'By the grace of God Ltd.'
Mr. Derrick Acquah is at left front.

We meet Mr. Obulu in the Tema fishing harbour, in the workshop and storage area of his outboard motors under a plastic canopy. Mr. Derrick Acquah is one of his employees, who helps with translating our questions.

What do you do for a living?
I am a seaman, and owner of a fishing and chandler business called *By the Grace of God Ltd*., We bring supplies to the ships that are anchored in the bay, waiting for entrance in Tema Port. We take the goods out to them and transport their crew members ashore. I have speedboats to do this, canoes with a large outboard motor.

Does the port expansion affect your business?
No, it does not affect my work right now. It is no problem. It will bring more business to me, because I can go with the speedboat to the new and bigger vessels and that will make an even better business flow.

In what way could the expansion of the port be made even better for you?
Well, I would like many more vessels to come, but preferably these should be smaller tankers and fishing ships, because that is better business for me. The very large (container) ships are not good for me, because I cannot get alongside and pick up people or deliver goods. Also the big containerships won't allow us near when they are anchored, and we cannot get to them once there are berthed in the port, because we are not allowed in there by the port authorities.

What do you expect for the situation in the fishing harbour in 20 years time?
I think we need change, in 20 years it will be different with the younger generation. They will have better things, more ships, and the business will grow. The fishing ships that are here now, will still be here, but there will be more tankers and larger trawlers as well. But I am sure the smaller vessels will also still be around.

What do you hope the situation to be in 20 years time?
I hope there will be an improvement in the lifestyle of the people around here. This means better premises, better modes of transport and not living hand to mouth as we are living now. Better working places would mean brick and zinc instead of the wood and canvas we erect our places from today; and more services to us seamen, like water and electricity.



Fish market in Tema fishing harbour.



Faustina Nomo & Juliet Adam

SELLING FISH

TEMA FISH MARKET



Image above:
Mrs Faustina Nomo &
Mrs. Juliet Adam.

We meet Faustina and Juliet at the open-air fish market in the Tema fishing harbour. They sell red snapper from a large unplugged freezer that is filled with ice blocks and shavings, as there is no electricity available. After we've exchanged a few sentences, they call in their *sister* Janet from her stall at the opposite side of the street, to support with English translating.

What is your job?
We are traders. Janet sells tomatoes and we sell fish from the sea, that we buy directly from the fishermen here in the fishing harbour. We buy from different fishermen, whatever they will bring in. Do you want to buy one of my fish? Look, they are big and beautiful.

Will the expansion of the port of Tema, or many big ships coming in, change your situation?
No, I don't think it will. The expansion will not cause any harm to us. About the effects of the big ships you cannot ask us, you will have to ask the big bosses. But the fish depends on the sea, not on big port expansion. The fish will stay here, in the same place, the same situation. No problem. Sometimes you get a lot, sometimes you don't. If more people come to the fishing harbour, we will sell more fish. And the people that buy fish will also buy tomatoes, so we all will sell more.

What could be done to make selling your fish better?
It would be much better for us if we could have better cooling for our fish; we would like brand new fridges. Now we only use our fridges as cooler-boxes. And we have to buy ice, much ice because it melts very fast. It would be much better if we could have these good (polystyrene) boxes.

What do you think the fishing habour will look like in 20 years time?
I do not know, how can I know this?

How do you hope this market will look like in 20 years time?
I hope this place will be neat, not dirty and dusty. And with clean and level floors, no sand, mud and potholes. And there shall be more roofed market buildings that give us shade, so we can have good business and earn plenty of money.

Fishing canoes in
Tema fishing harbour.



Justice Atla & Peter Mesah

FISHING BY CANOE

TEMA FISHING HARBOUR



Image above:
Mr. Justice Atla &
Mr. Peter Mesah.

We meet Mr. Justice Atla and Mr. Peter Mesah in the Tema fishing harbour on Saturday, when they're just leaving the fishing boat area, to go home after a day's work.

What is your job?
We are fishermen, we fish from the ship called 'Shining Star' from Chemu Beach. We have been fishing here in Tema for the past three years now, but we are only in the port for berthing. When we go fishing, we take the boat to the beach and from there we pull the nets into the sea with our boat and then pull them back to the beach. The fish are then hauled onto the beach.

Will your work change with the expansion of the port?
I don't think the expansion of the port will change much for us. The big ships don't catch the fish we want to catch, because they go much further out to sea than we do. The big tuna-boats also use different hooks, we fish with nets, and we fish with canoes. So when there are more big boats, it will be good for us fishermen, there will be more opportunities for employment. We will have more work.

The containerships sail into the port, but they work with cargo, not with fish, so they do not threaten our jobs. But these ships do make it difficult for the fish. The fish stay very much further down because of the big tankers and container ships, and that makes it more difficult for us to catch them, because we cannot reach that deep with our nets.

Could your work be made better or easier?
It would be great of we could also fish in the port area, because there is much fish there, but we are now not allowed to fish there.

How do you think this place will look in 20 years time?
That is a difficult question to answer. You will have asked the canoe owners. I think it will have changed a lot. There will be different canoe owners and different canoes. Probably also plenty canoes, as there will be big ones, just as well as smaller ones needed.

Mr. Philip Seshie shows the new community toilet block.



Philip Seshie

COMMUNITY COMMITTEE

TEMA CHURCH VILLAGE



Image above: The community committee.

We meet Mr. Philip Seshie at Community 5, Church Village just before his weekly Committee meeting starts. He leads us around the community.

Who are you and what is your connection to the community here?
I am the chairman of the local Community Committee 'Centro Mosque Zongo Association'. We try to coordinate some communal issues for people living in Tema Community 5, Church Village. Our community consists of about 220 structures: churches, some small shops and living quarters. The buildings are mainly made out of wood, and each house can contain man, wife and 2 to 4 children. Some structures have electricity and we have a water tank and tap, where people can get clean drinking water. More than 600 people are living here.

We meet with the full community once every month, to discuss our issues. We want to stay in Tema; but to rent a house here is very expensive. Therefor the Committee works hard to make life for the people better here, to develop the place. So for example, we have gone to all houses for a contribution to build a toilet block. The first 3 toilets are almost completed now. They will be for women only. The men come later, as 3 toilets for over 600 people are not enough. We need more.

How does the new port development affect your community?
I don't think the new port will affect our community; there is quite a distance between here and where it is coming (about two kilometres). The expansion is closer to the mouth of the lagoon, that's not close to us. But the new port will need many new workers, and some of us work there already. Other workers will come in from outside, and they too might want to live in our community because this is cheaper living. But I don't know where they are going to live: the closer you live to the lagoon, the more you get flooded.

How do the floods affect your community?
Well, when the water comes, it is dirty and full of silt because there has never been any dredging here. I know because I was born here, and in all my life, that is over 40 years, I've never seen any dredging of the lagoon. When I was a teenager in the 1980's we would fish and swim in the lagoon. But now that's impossible because of all the silt. And with the flooding all this silt pollutes our community. We then take refuge in the churches. The National Disaster Funds provided mosquito nets and the churches gave mattresses and blankets, so the people have a place to sleep. There are some promises for more help, but we cannot wait for the government. So with the Committee we organize the communal labour, for example to clean up after a flood.

What do you hope this place will look like in 20 year's time?
As a community we very much hope the lagoon will be dredged. It needs dredging; the channel is too small. And there are only three openings, very small ones, so it is difficult for the water to enter the sea. After the bigger floods it takes sometimes two to three weeks for the water to go away. So I hope the lagoon will have dredging to open more channels, and will have more openings to the sea. And I wish for more toilets.

Local shop in Tema Church Village.



Edem Agortey

TAXI DRIVER

TEMA CHURCH VILLAGE



Image above:
Mr. Edem Agortey.

We meet Mr. Edem Agortey at the edge of the Sakumono lagoon, on a Sunday afternoon at the small amenities shop of his wife.

What do you do for a living and where do you live?
I am a taxi owner and drive my own taxi. I live in Tema, next to the Sakumono Lagoon in Community 5, Church Village. I live here now for 6 years with my family, but originally we came from the Volta Delta region. In my taxi, I take customers from around this area, from Tema city and from the port to places around here and in Accra.

How will the new port development affect your work?
I can't tell now. I do not know this while they are still building it. First the port expansion has to be finished and then we can see what happens. But it will be good for my business if more workers in the port will come to this area. It gives me more work from the port, because I also drive customers from Tema port to the airport in Accra.

You live so close to the lagoon, do you use the water of the lagoon for fishing or go there to swim?
No, I do not go to the water, because I can't swim. So I do not like it and it's too dangerous. Also you cannot drink the water of the lagoon, it's very dirty. But yes, you can eat the fish. Only it is not us that fish in the lagoon; that is for the people from the other side, from the Sakumono Village. Every year, around June, the lagoon floods. Sometimes more, sometimes less. In 2015, on June 3rd, the water came very high, while in 2016 and 2017 it also came, but less high.

What impact does the flooding of the lagoon have on your life?
Each year we have to leave our houses during the floods, and live at the higher grounds of the church, or go to the school area. Sometimes for a few days to a week, but in 2015 it was for more than two weeks. We try to take as many things with us as we can. But if the floods come in the night, you don't know and can lose many things, like my wife did from her store. Afterwards we have to clean a lot and for a long time because the water brings lots of dirt and animals. All our houses are covered in mud and dirt from the lagoon. We then do communal labour to clean up the area; this is organized by our local committee.

What do you hope this place will look like in 20 years time?
I hope that after the port is finished, maybe they will look at the way water of the lagoon is blocked from the sea. Because now the water can't flow into the sea, it floods back into the lagoon. The openings are very small and there are only two or three. Maybe they can make them bigger and more openings, so the water can leave the lagoon. I hope that will prevent the floods from the lagoon.



Francis Hukporti

LAGOON CRAB FISHING

SAKUMONO LAGOON



Image above:
Mr. Francis Hukporti.

Image to left:
Mr. Francis Hukporti crab fishing at the lagoon.

We meet Mr. Francis Hukporti in the Sakumono Lagoon, east side. He is checking his crab catching devices.

What is your job and where do you live?
I am Francis Hukporti. I used to live for a long time in Community Two and fish in the lagoon. Then I went inland and became a batik professional. But I often come back here for my craft: crab fishing.

What is the Sakumono Lagoon used for?
Some people come here to worship the gods of the lagoon; they used to come every year around Easter before they started their fishing season. But now I do not see them.

I myself go to the lagoon to fish for crab. I go around looking for the holes. When I find a hole, I'll mark it with a red rubber and set the trap. First you have to open the trap, then put some cassava in and set a small broomstick on it. If the crab enters, it will pull the cassava under the stick. The crab is the trigger, it catches itself! I know how it works; I come here for a long time already, started crab fishing in 1982,

Has the lagoon changed much since that time?
Yes, it has changed very much. Before, there were many, many coconut trees, all lined along the beach. And the fishing boats went fishing from there. Now it is all rocks along the coast. Because the sea is eating the land; the sea is chopping the land, it wants to take the road.

In earlier times, a lot of seawater was coming in and out, but now it is only very little water. There is much pollution coming into the lagoon. It does not damage the crabs but it damages the fishes. That is because of all the grass you see. There used to be a little bit of grassy area: there was a river over here, and a lagoon. But the polluted water that enters the lagoon from the upper side is now making this grass, lots of grass, it has covered almost every place. The water in this part of the lagoon used to be very salty. But now, it is not salty anymore; it's dirty. You cannot drink it: in the old times because of the salt, and now because it is polluted.

What do you hope the lagoon will look like in 20 years time?
I hope that the lagoon will be beautiful. With coconut trees, sand and many, many birds; like there used to be in the earlier days. And that the water of the lagoon will be clean again, so we can fish. Maybe then the tourists can come here as well, they can watch the birds, eat the crabs and buy some batiks!

Images to right:
Crab fishing tool.





Tema Port development near Sakumono Village.



Nene Mantey, Nene Akpaglik, Moses Teye, John Tettehocansey Maklalo, Richmond Sogbaton, Doglas Amatey Sogbaton & John Nyamedji

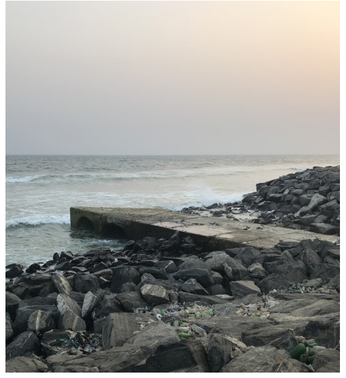
COMMUNITY LEADERS

SAKUMONO VILLAGE



Image above: Community leaders of Sakumono Village.

Image below: Plastic rubbish at the Sakumono lagoon outlet.



We meet the community leaders in the community house in the middle of Sakumono village, close to the lagoon.

Who are you?
We are the community leaders of Sakumono Village: Nene Mantey, Chief of Sakumono; Nene Akpaglik, Chief fisher man; Moses Teye, Chief of the youth; John Tettehocansey Maklalo, in charge of the community; ; Richmond Sogbaton, Assembly man; Doglas Amatey Sogbaton, secretary to the Chief fisherman; and John Nyamedji, Deputy Chief.

How does the new port development affect your community?
Before the port was here, we were catching a lot of fish, but since the development of the port it has become more difficult. Our fish catch has reduced to almost nothing. It is only plastic. Some rubbish is cleaned out, but more than that is put in again every day. Since the expansion of the port it has become very much worse. Because of the new breakwater all the rubbish comes back to our fishing area, and the plastic tears our nets. It is very difficult to make any income. This is very bad, because all livelihood in this community is related to fishing.

Can the port development be made better for your community?
Before, we could also use the lagoon for fishing. But now there is also too much pollution in the lagoon because of rubbish and discharge flowing in when it rains. The water is dirty and the smell is bad, and there is not much water. The lagoon is choked at the exit. Many years ago, there was a lot of water and the sea entered the lagoon, but now the sea cannot come in anymore. Long ago, we used to catch big fish here, fresh water fish. Now there are only very small fish in the lagoon. The lagoon must be dredged and also opened; the sea must come in again.

What do you think the community will look like in 20 years time?
We do not know what is going to happen. You see, 20 years ago there was no grass in the lagoon. The sea was very far away, we had to walk over the sand to get to the water. We think it will be bad. In the past we had three things: family, lagoon and sea. But now, look at our houses, the lagoon is choked, and we do not catch any fish in the sea anymore. The port project does not think about us, we are squeezed in and life is very difficult for us. We used to earn 200 cedis for our fish, but now we make only 2 cedis. Our income is disappearing, so how can we pay school fees for our children?

What do you hope Sakumono village will look like in 20 years time?
All the development profits and work go to other people, not to us, while we have been living in this place for so long. Now the project seems not to concern about the communities, but we hope they will also develop this side of the Tema area. We would like to see employment for our community at the port, unschooled labour for now and later schooled labour for our children. We hope they can build schools and libraries in this community, and toilets. And if the lagoon can be dredged and opened, we dream of fishing there again.

Sakumono TMA
Junior High School.



John Nyahe

SAKUMONO TMA JUNIOR HIGH SCHOOL

SAKUMONO VILLAGE



Image above:
Mr. John Nyahe.

We meet Mr. John Nyahe in his office at Sakumono TMA Junior High School in Sakumono Village. The school houses over 300 students. The school grounds are bordering the edge of the lagoon; just a man-high brick wall is dividing them.

What is your relation to this school and community?
I am John Nyahe, I came here in 2017 to be Principal and Head Master of this school. Before I worked as an officer in the Education Office, coordinating for the whole district. So I know many of the schools here. God has been good to me; I love my work very much.

Does the new port development affect Sakumono village?
Construction has come very close to our community, but it does not affect us directly because the water does not come all the way to this place. The road is still in between. But if the port is bigger, it will bring about more business activity. So who knows? It might benefit us in a way. If our people would have access, that might transform their life style. If it keeps them out, for technical reasons, no one knows, then it is only an inconvenience to them.

The new port is positioned in the major fishing grounds of this community, and fishing and fish processing is our only activity here. So by taking these grounds away, it also takes away the future for our children.

How can the port development make things better for your community?
Honestly, this school is so full of destitute children, of very poor background and a good number of broken homes. We have some charitable organisations that are supporting us; like the church and the assembly, this helps our school. So we can educate them to abstain for immoral behaviour. But only very few can afford to pay fees, so most cannot get further education. And the only business is fishing, so most of them will assist the fishermen or the netters to earn some money for a living.

The only way to change things is to empower them though education. The port could help build that, imagine a government project of a higher school, or even a university in this place. Because in the future, children can only be employable after they have specialised.

How do you think the community will look like in 20 years time?
Well, the lagoon is dry now, but in the rainy season it fills up. It becomes a fishing ground for this community. But if the port project extends to affect the lagoon, then this important source of income would also be affected. If there is no fish, what are they going to do? The only option would be to move. This community consists mainly of two ethnic groups, the Damgbe from the south and the Ewe from the north. Being an Ewe myself, I know that Ewe are settlers, with fishing and farming as main occupation. So if the fishing ends, we are displaced. The only option is to go back north, where the land is impoverished and no longer offers the livelihood people would expect.

What do you hope it will look like in 20 years time?
I think the social aspects of the project must also be added into the plan. Then I hope that there will be different jobs than fishing. For example there could be invested in some big cool stores in this community that would be owned communally with the help of the assembly. Then big fish from the deep sea could be brought in, fish that our fishermen would like to catch, but cannot reach now. The fish from the cool store can be bought by the people here and they can process it. They can smoke it, fry it, and sell it. These are businesses they know already and they can easily adapt. That will give them jobs.

For the school, I think it will become beautiful here. I pray for this every day. I envision a library for our school, because books are most important in education. It should be the priority of our government. Also I see a nice fence around the school grounds, modern canteens, and grassing of the park. It will look so nice, that holidaymakers come over to see our place. And that will give little shops at the street some business as well, so the whole community will benefit.

Tema New Town, coastal area with powerbarge in the background.



Solomon Tetteh

OPINION LEADER

TEMA NEW TOWN



Image above: Mr. Solomon Tetteh.

Image below: motor repair shop in Tema New Town.



We meet Mr. Solomon Tetteh in Tema New Town at a motor repair shop close to the fishing harbour. He completed his education at Tema Tech(nical college) and is now an opinion leader of the community in Tema New Town.

Who are you?
I am Solomon Tetteh and I was born in this community. I used to work as machinist on a tanker and as a fisherman.

Can you introduce your community?
This community consists of the indigenous people of Tema. We had to move when the port was developed between 1958 and 1962, but we are not benefitting from the port. Barely any of us works there. Many of us are fishermen, but it becomes harder to catch fish, we now have to go further away and use four times as much fuel and spend a full night and day at sea to fish.

The port has degraded our community; there is no more sand here. Before, we used to be able to walk to the fishing harbour, but now the beach is gone and there are buildings in between. In the early morning a power barge wakes us up and vibrates through the community. If you lean against the wall of your house, it is moving. The power barge also emits gasses that might be bad for our health.

Does the new port development affect your community?
In a way it is good, bigger vessels will come with major commodities. But we will lose fishing grounds, which will negatively impact our catch, maybe by 10 to 15%. But this is not the biggest problem; we will lose more land in our community as the sea takes it away. People will have to relocate. Pollution will also become worse, and it is already very bad.

How can the port development become better for your community?
It would be better if most of the workers for the new port could be taken from our community, so that the benefits also come here. Many of us cannot afford to go to school or stay in school. Maybe the port can also support us with education and provide health facilities.

What do you think the community will look like in 20 years time?
It will be bad. Look at the shore, the erosion and the rubbish. Every morning they come to collect the rubbish, but it is not enough. There is always more coming than they take away. This will keep affecting our health and we now only have a small health clinic for so many people. The roads are now very bad, full of potholes; I don't think this will change for the better.

What do you hope this place will look like in 20 years time?
I hope it will be better, that the port takes care of the whole community; it should not be a problem to help this small community. I hope for social interventions and improvements in our health care facilities. We also need a sea defence to prevent erosion of the coast. Not just rocks, the waves will get to it, but a large sand area to keep the waves far away.

Canoes on the beach and fishing at sea at Prampram Lower Town.



Jacob Tettey & Nathaniel Agetey Alhao

FISHING BY CANOE

PRAMPRAM



Images above: Mr. Nathaniel Agetey Alhao (left) and Mr. Jacob Tettey (right).

Image below right: Prampram Lower Town fishermen's meeting place.

We meet Mr. Jacob Tettey and Mr. Nathaniel Agetey Alhao at the Chief fishermen's meeting place in Prampram Lower Town, near the beach. The meeting place is used for community gatherings, and as we conduct the interview, several men are consulted while playing draughts.

What is your job and how long have you lived here?
We are fishermen, and have lived all our life here. We are all born and bred here. Fishing is the most important source of income in our community. We do not only catch fish with our canoes, but we also have woodcutters, who build the canoes, and of course netters.

How does the port development affect your community?
One of the main changes in the past years is that there are bigger storms, the storm (surge) rises because of the port. The waves hit the beach hard and take the sand away. You can see it, because before the beach stretched as far as where the waves now break. This has changed and now the erosion comes really close to where we live. It is a steep slope to the water and a very small beach, which makes it difficult to store our canoes safely. The water comes up high, up to the beach berm. We are safe up here in the building, but the sea comes closer and closer.

Is your fishing still the same as it used to be?
In the past 16 years there is a lot of illegal 'light fishing' that affects our livelihood. These vessels carry light bulbs and generators on board and at night they attract the fish with this light in the water. Many fish will come, also the very, very small ones. And they catch them all, while the small ones need to spawn, so we can still have fish later. But these fishing boats from Ada and Tema take everything. It is not allowed, and we try to stop them, but this leads us into fights. The government has authority to stop them but they don't. Now we often have nothing in our nets when we go out at dawn to catch fish. Empty nets. No fish means no work in our community. That is the main problem here.

What do you think this place will look like in 20 years time?
If they do not do anything to fix things, the erosion will destroy this area. The high water level with high waves will take it all.

What do you hope this place will look like in 20 years time?
We hope the government will build a wharf here, with an area for selling and buying the fish. We need it for loading our canoes and land them to unload the fish. They said before they would do this, but they never came. I hope this will be a nice place, where fathers can enjoy it like their forefathers did. And not suffer like we do now. We are all fisherman here, and with all these changes, what do we do, what can our wives and kids do, for work?



Image top:
The Crismon Hotel in Tema, Ghana.

Image below:
Dusty roads are a nuisance for tourist business.





Christopher & Monica Afedzi

RUNNING A HOTEL

TEMA CITY





Images above:
Mr. and Mrs. Afedzi.

We meet Mr. Christopher Afedzi and Mrs. Monica Afedzi of the Crismon Hotel at the director's office. Their hotel won the Tourism Award of Ghana in 2016.

What is your business and how long have you lived here?
We are the owners and managing directors of the Crismon hotel in Tema Community 5. We started this business in 1998. First we had only two rooms, but we have consistently reinvested the profits. We built it up to the current luxurious hotel with a pool, lounge and dining area, and party and conference rooms.

Does the new port development affect your business?
Well, it will a little for sure, as we are here in Tema and close to the port. Some contractors from the new port development come here, which creates extra business for us. We are currently expanding our hotel, which we would have done anyway, also without the new port; but of course we hope this port will help the business to grow. The port can create an inflow of people. But if we want to keep them in Tema, this city needs to be attractive.

Could the port expansion help to make Tema more attractive?
As we said, Tema needs to adjust. Look outside! We still have a dirt road in front of our hotel. We keep everything clean, but guests are surprised when they first see it, they do not expect this for such a good hotel. With the port expansion, first of all the infrastructure needs to be upgraded to good standards. They have started with some roads now, and this is really the number one challenge and necessity. To manage entrance to the new port and prevent traffic building up, we need network planning for traffic flow. That and better quality roads will ensure a faster flow and everything will look nicer.

Another way to make Tema more attractive is development of tourist attractions. That would be fantastic. At this time, people don't have any reason to stay in Tema; they all go to Accra. We have the Greenwich Meridian that could be exploited for example; and look at the Sakumono lagoon. When we started the hotel here, we could walk from the entrance to the green shores of the lagoon and enjoy views of nature. Now there are many illegally built houses in between and the lagoon itself is dirty and not accessible. But it was named a protected RAMSAR site, because some birds come every year, and it could be made into a national asset. If it would be dredged and opened up, all the way from the Green Mountains at Ashana to the sea, it would attract tourists. There could be little boats on it. And maybe a bridge crossing, which would ease the traffic even more.

What do you think this place will look like in 20 years time?
I think the lagoon will not be there any more; it will be choked. And the new port will attract more workers, and the illegal housing will spread further. So Tema needs to be well planned and some policies have to be implemented; for infrastructure upgrades first and other issues as well. But we are positive; we think the good roads will come.

What do you hope this place will look like in 20 years time?
We hope cruise ships will arrive in the new port. When the minister came to visit the new port of Tema, we've heard on tv that this is possible. The dredging is so deep that these big ships can land here. To make these tourists stay in Tema, we need the tourist attractions. And I hope we will have good roads, tarred roads. That's my first priority. That everything will not be so dirty and we won't need to clean the dust from our hotel every day.

Cargo trucks near Tema Port.



Faustina Afrah Yeboah

WORKING IN THE PORT: LOGISTICS

TEMA CITY

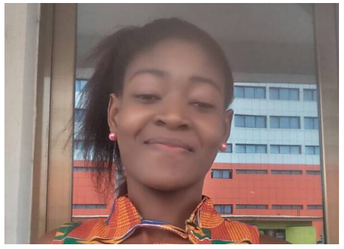


Image above: Ms. Faustina Afrah Yeboah.

We meet Ms. Faustina Afrah Yeboah in the city centre of Tema, asking her for directions to a restaurant for lunch. She happens to be an employee of one of the businesses serving Tema Port, and explains to us what the expansion of the port means for her work and life.

Who are you and how is your work connected to the port?
My name is Faustina Afrah Yeboah. I live in Tema and for three years now I've worked at the Cargo Center Ghana Ltd, a company that works on clearing cargo and the logistics linked to this. We have an office just outside the port premises, and in our company about 27 people are employed. I'm a data-entry officer, I enter information into the system for goods going in and out of the port.

How does the new port development affect your work?
The new port development is very good, because it cuts delays and therefor minimizes workers stress. As the port expands, the trucks will have more physical space to turn and move around. This will reduce much of the congestion within the port itself. Currently, when there's a lot of on and off loading, the trucks often get blocked and have difficulty getting in and out of the port.

Furthermore, the new development is aimed at a paperless system. This makes my work easier; I can enter information quicker, and get my data in the shortest time possible. We then work with barcodes that are scanned, instead of people having to walk from place to place to get the information and then bring it to us, as we do now. The automated system will make everything faster.

What do you think the port will look in 20 years time?
I think the port will also become a tourist attraction, both for local and international visitors. Lots of people are interested to see what is going on here, because it is a special place. It is very big and tourists like to get informed about the new port and how it works in the new way. Maybe there might be even a tourist office in the port, when the port management sees the need for this.

I don't think there will be any other real effects on the town of Tema and Community 5 where I live. The new port expansion will create more employment though, and both people living in Tema as well as people from outside will take up those jobs.

What do you hope for Tema in 20 years time?
For Tema, I hope that the congestion on the roads outside the port will be reduced, that things become more efficient, just as they are becoming more efficient within the port with this new development.

Also I hope that the new port will help to increase the export of Ghanaian products and that revenues will also increase. The port expansion can be a boost for the income of our country.

Francisca Okyere & Ali Amadu

CITY PLANNING - TEMA METROPOLITAN ASSEMBLY

TEMA CITY



Image above:
Mr. Ali Amadu and Mrs. Francisca Okyere.

We meet Mrs. Francisca Okyere, Spatial Planning Officer and Mr. Ali Amadu, Development Planning Officer, at the offices of the Tema Metropolitan Assembly.

What is your task?
The Assembly, under the Local Governance Act, 2016 ACT 936, is the highest political, planning and administrative Authority in its area of jurisdiction. Thus, the Assembly is responsible for the overall planning, development and management of all development activities within its area of jurisdiction.

The exclusive development and management functions of the Assembly as mentioned above have been further set out in the Land Use and Spatial Planning Act, 2016 (Act 925). The Act further emphasizes, in Section 34 of Act 925, the purposes of establishment of a District Planning Authority, that:

> *A District Assembly or a spatial planning authority is for the purpose of this Act the spatial, human settlement and planning authority for its area of authority.*

This mandate, in practice, includes development and building permitting, which is a requirement for all physical developments undertaken within the Metropolis.

Relative to the Tema Port the Assembly's development management authority covers all ancillary activities within the Port area; that means those activities which are not core port infrastructure.

How do your responsibilities relate to national level planning?
Ghana's decentralisation process is designed to ensure that policies and programmes at the National level informs planning, decision making and implementation at the local Assembly level to facilitate the achievement of overall national goals. Meanwhile, the planning and policy formution at the National level, which translates into projects that are eventually executed at the Assembly, is informed by comments, proposals and feedback gathered from consultative and participatory processes and structures at the local Assembly level. There is a foward and backward linkage in the national and local level planning.

In regard to spatial planning, there is also the adoption of the three-tier planning system, which requires the preparation of a National Spatial Development Framework (upper tier/National level) , that translates into the preparation of a Structure Plan (middle tier/Sub-national or Regional level), which finally informs the preparation of Local Plans (lower tier/Local level) at the Assembly. By implication, whatever spatial plan is prepared at the Assembly to facilitate the discharge of its responsibilities must have emanated from a higher level plan, to ensure better coordination, harmonisation and or integration of plans and projects.

What does the port expansion mean to you and your oganization?
The Tema Port expansion obviously comes with some positive and negative effects. Currently, a new well equipped hospital has been built by the Port Authority, which will provide improved access to healthcare for the community. In addition, road improvements are being done to some major road corridors in the Metropolis; a proposed construction of a new container and track parking terminal, which we envisage will help decongest the existing situation in and outside the port area, amonsgs others. All of these support the Assembly's development agenda.

However, there is also the attendant negative effects that we envisage to come with the port expansion including, a greater incidence of floating population which come in and out to do business with the port and its related activities; increased waste generation and management challenges; increased damage to the city's inner road corridors by heavy duty trucks which often divert onto these roads to avoid traffic on the main roads, and also park indiscriminately along the shoulders of the roads and cause damage to the drains; invasion of open spaces and slum developments by additional squatter population which are likely to migrate into the city to seek job opportunities, etcetera.

The inner city of Tema, for instance, was built to complement the port activities, then. Presently, the city on all fronts has grown beyond what it was planned for. One of the very affected sectors of the inner city is the housing situation - requiring critical interventions like redevelopments and making a conscious effort to provide for the urban poor; given that the expansion will most likely drive more activities and attract even more people to the city.

All these will call for well coordinated, integrated, intersectoral and participatory approaches to managing or resolving the emerging issues; which means it can not be done by the Assembly alone.

How do you include stakeholders in your planning for Tema?
Nowadays, we use more consultative and participatory methods in our planning and decision making processes. In planning for what programmes and projects to be done in a given period the Assembly consults with focused groups including representatives of Civil Society and Community Based Organisations, NGOs, Residents Associations, relevant public and private institutions, etcetera, to solicit for their comments and proposals, to inform the plan.

The Assembly engages these groups - either separately or together at public hearings or town hall meetings as may be necessary- for the identification of proplems or issues confronting the city, proposal of relevant strategies, and prioritization of interventions and actions to resolve the issues, amongst others.

What do you think Tema would look like in 20 years?
Tema, as it is now, is virtually fully built. A significant proportion of the developments, especially as can be seen in the inner city and its surrounding residential enclaves, are low rise buildings. As a result, there is a lot of pressure on the limited land space for increased housing and other socio-economic amenities to support the city's growth.

In order for the city to remain relevant, in 20 years time, it would more likely experience renewal; like increased densities - with high rise developments of some strategic parts of the city, especially in and around the core business district (CBD). For example, the Tema Development Company Limited (TDC) has even started developing high rise residential apartments of 8 storeys in some selected old areas of the town.

Besides, most of the residential areas beyond the CBD would most likely transit into mixed used zones. It is worthy of note that, given the trend in our development setting, these changes would most likely be individual private sector led, which often pay little attention to the necessary improvements in the supporting infrastructure like roads, utilities etcetera, because of the high costs involved. Thus, is it important that a conscious effort is made to provide the necessary supporting infrastructure to complement the growth that the city is looking forward to attract, or else it would have a negative effect on the expected growth.

Image below:
Tema Metropolitan Assembley Shield.



TWO | STORIES FROM BUSINESSES AND ORGANISATIONS IN GHANA AND THE NETHERLANDS

Image below:
Tema port.

Image to right:
Ghana Ports and-Harbour Authority (GHPA) shield.





Edward Kofi Osei

GHANA PORTS & HARBOUR AUTHORITY: TEMA PORT

TEMA PORT



Who are you and what is your professional background?
I am Edward Kofi Osei, a man of diverse background with a diverse education ranging from business to law, and international relations. I have six degrees and have lived in Ghana and abroad, spending most of my working life in the United States.

How are you involved with Tema Port / this project?
In March 2017, I was appointed Director of Tema Port by the President (Nana Akufo Addo). I was asked to come back to Ghana for this position. It has been quite an adjustment.

What do you think of Sustainable Ports?
It is a very interesting concept in the sense of how do you define sustainability. Is sustainability dealing with the main functions of a port or does it refer to both the main functions of a port and its impact on its immediate environment? I think of the examples of like the Port of Camden (in the United States), which is a 'shithole' dump, but the port exists and functions even though the neighbourhood around it is 'dead'. In contrast there is New York Port, which has vibrant city life around it and port functions.

So, is sustainability ensuring that the port continues to function or considering the immediate environment? For me it means that sustainability is both continuing port functions and taking the impact on the immediate environment into account, because in the long run for a port to attract cargo and workers it has to exert an impact on its environment.

Take congestion, for example. If a port is a first class port, but the road networks are congested the importers and exporters will refuse to use the port. The port itself suffers. A sustainable port means that the port impacts its immediate environment, but that the linkages between the port and the economies around it need to be sustained.

How does the Sustainable Ports project differ from a more traditional view?
I'm excited about the project. We can take this thinking and make it part of long term strategic planning. In strategy meetings, instead of talking about building another berth, we can also think about road networks, housing for workers and others, and education, so that it is attractive to the workforce. We can bring this to bear in planning any port.

What is your particular learning?
Awareness – I have gained awareness of these issues that one naturally doesn't think about when planning a port – dealing with environmental impact issues.

What are the next steps?
The next step is not to make this another classroom exercise, but to actually engage the port community, the stakeholders whose functions impact the ports functions and vice versa. Also, to engage policy makers from municipal level to the president, because some policies (port developments) are driven at the national level.

What does this mean for the coast of Ghana, and Africa?
The project, if explored/expanded and policymakers are made aware, will shape the debate and influence the construction of new ports in Ghana and West Africa, because a lot of port expansions are anticipated along the West African coast.

Kwabena Ofosu-Appiah, Joseph Agbaga & Robert Baffo Dapaah

GHANA INSTITUTE OF FREIGHT FORWARDERS

TEMA PORT



Who are you and what is your background?
In the middle in the picture is Mr. Kwabena Ofosu-Appiah, current president of Ghana Institute of Freight Forwarders (GIFF) in Tema; to his left is Mr. Joseph Agbaga, immediate past president of the GIFF, and to his right is Mr. Robert Baffo Dapaah, forwarding practioner and former Head of Education and Training at GIFF, in their offices in Tema.

What is your task?
The Ghana Institute of Freight Forwarders is an umbrella body, an association of about 300 commercial entities engaged in freight forwarding, customs brokerage and transport and allied services.

One of the key corporate objectives is capacity building for both existing and prospective members of our association. The GIFF Academy offers FIATA validated diploma in international freight forwarding and higher diploma in supply chain management.

What does the port expansion mean for your association?
There are many landlocked countries to the north of Ghana. The port expansion is needed to serve these countries, and for Ghana itself. As you know, we struck oil about 10 years ago. To export this resource we need improvement in infrastructure and other resources to receive bigger vessels such as tankers and Panamax vessels. We expect the turn-around time to be swift and expect a high through-put of cargo.

Containerization and freight concepts such as intermodal and multimodal transport have changed the way cargoes are sent across the world. The advent of door-to-door services, technological advancement have resulted in unfair and inequitable shares in supply chain services that inure to the benefit of multi-national and big companies. This has resulted in lack of jobs and contracts to small firms like many of our corporate members. In spite of their competency in the industry backed by hands-on-experience by members and their staff, the local small companies no longer have leverage.

These are real issues confronting our association and its members.

How could the work of your association be made better or easier?
The freight forwarding and customs brokerage industry is under-resourced. Unlike our colleagues abroad, and except for a few corporate members, most of the small and medium-sized freight forwarders are unable to access financing from banks in our countries.

We also need to provide hands-on industry experience, so that people can acquire competence. Some of the companies in our association consist of talented people that have trained themselves on the job. But, the Ghanaian people who have knowledge, the human capacity, are often picked by the bigger companies. It is difficult for the smaller companies to find and keep employing such people. Also, the bigger companies have expensive machinery and equipment whereas the companies in our association might not have this and yet need to compete with them. So, they don't get the job.

We need the rail link to connect with the interior and the landlocked countries. If Ghana does not have the money to put the railway in, then the conglomerates will join forces to do this, as in Cote D'Ivoire. Then they have the captive market for themselves and we are excluded.

Perhaps the local content laws may have to be re-visited to provide more clarity and openness to scrutiny in order for its implementation to achieve the reasons they were enacted. For example, in Philippines trade on the seas is considered international but from the ports every activity in the supply chain services becomes national. A similar law would help our industry.

What do you think of a sustainable port?
You know, people in Africa are very fertile and the population in Africa is growing. For a sustainable future, we need to consciously make the attempt that people get a share in the benefits from development, like the port expansion. This may not look very responsible or make financial sense now, but it does if you project it into the future. Security guarantees a long-term future, but today's situation cannot guarantee a stable future. Africa is tired of only hope. It is now the third generation who is hoping, and they are less patient. Everybody knows on paper what has to be done, but who does the work? You know that he who pays the piper calls the tune. But, people need to be able to have a share in the supply chain.

What do you think Tema and its port will look like in 20 years time?
There will be a drift of people to the port because they think there are easy jobs. But, living in the area of a port is the most expensive in the country. The business model must take into account the needs of the people. Look at their lifestyle, how they are living, what entertainment or activities they do. If more people come to Tema, where will they go? Where will they live, and where will they do their activities? You could incorporate Meridian Rock into the port. You could have tours. Why not? Perhaps, there is a lack of vision. And, Sakumono Village – what will happen to them? The port is now located where they fish.

Around the RAMSAR site – the Sakumono Lagoon – one recommendation is to get the place dredged, get the silt out and enlarge the opening. You could then use this place for aquaculture, or have boats on it for recreational use, with restaurants around the shores. This would generate income and business for the local and indigenous people. This dredging needs to be done, so that people see it and believe it. Not only saying it, but doing it!

What do you hope?
We hope for a developing country – that people in this area have a job in our industry, linked to the port. But if the large companies take over this won't happen. We are sincerely concerned about this.

The Deputy Minister of Transport presented the report of the MDP group on the port expansion. The port functions as the reception area, but after that the freight has to go out. It is a new approach to think about how a port can benefit the community, thinking about how knowledge can be shared along the line. We want to train students to have broader visions of what they could be doing. We have here the very message to give them the understanding beyond what they see, to think about the future. When all of us have this understanding we can go beyond transporting the goods.

The knowledge base needs to be transformed. We would like to train groups and equip them with knowledge that they could then use themselves, for example facilitation skills like in the stakeholder workshop. Apart from such communication skills development, we want to equip our course participants with practical knowledge, so that they will have a future in freight forwarding and beyond.



Bas de Vaal

SHIPPING AGENTS

TEMA PORT



Who are you and what is your background?
I am Bas de Vaal, managing director of Ports Marine and MTG. We are a shipping agents and logistic company delivering ship agency and freight forwarding services for importing and exporting in Africa. We are located right outside the port at the fishing harbour gate.

We operate liner services and chartered vessels, which call Tema port with project and any other types of cargos. And we operate a container depot, where we store containers for various companies. On our premises we also have a warehouse, used to store tuna cans for a tuna-canning factory; these are sent to the Netherlands.

How are you and your company involved with the expansion of Tema port?
I am personally not involved in the expansion itself, the project is fully done by the MPS group. But I am very interested in it because it will bring a lot of changes. All container traffic will go to the new port and that might have impact on our depot. I'm sure the expansion will also affect my business.

What is a Sustainable Port to you?
For me it means that a port is fair. It's a place for fair employment. A safe place to discharge and load cargos. Sustainability means that an eye is kept on the environment, even in the difficult West African conditions. These are very different from the Dutch conditions and conduct, but for a sustainable port we must try to keep certain standards.

When I speak of difficult conditions, I mean issues like the heat, the dust, the age of the port, and the kind of products that are being discharged; for example cement clinker that is very dusty. And also the pollution by the trucks, this is incomparable to the new trucks we have in Holland. For sustainability, we have to try to slowly raise the standards and improve the conditions in the port, within the means we have here in Ghana.

What do you think the Tema port will look like in 20 years time?
I think it will still be congested, even with the new port coming. So they already have to think about the next step. Ghana is growing very quickly. For a start, the infrastructure leading towards and out of the port is still lacking. There is no water, no rail, just roads. If Tema Port wants to compete with the ports of Lomé and Abidjan, and wants to serve Burkina Faso and all the hinterland countries, it has to grow even bigger because these economies are growing as quickly as the Ghanaian. So, twenty years from now, I hope there are new plans to expand the port even more.

What do you hope Tema port looks like in 20 years from now?
I hope the roads will be improved, and that there will be a place where trucks can park before reaching Tema roundabout. This would be perfect to limit traffic inside and in the immediate surroundings of the port, and to stop trucks from parking randomly alongside the roads. In twenty years, the organization of incoming and outgoing trucks will be more efficient, so they don't have to wait so long around the port.

Such efficiency can be created for example by developing better access roads and by clearing cargo more quickly. That means improving the customs system, like with the step that is being taken now by the vice-president: a paperless system. But this is only the first step. In the future I hope a fully paperless process will clear goods in a few hours.

Azonko Simpi

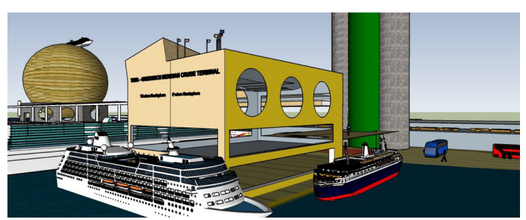
GREENWICH MERIDIAN TOWER AND CRUISE TERMINAL

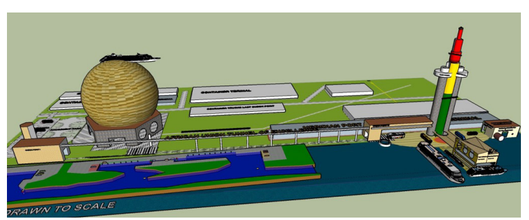
TEMA PORT



Image above:
Mr. Azonko Simpi.

Images below:
Renderings of envisioned Greenwich Meridian Tower and Cruise Terminal.





Who are you and what is your background?
I am Azonko Simpi. I am a musician by my degree, a sound engineer and acoustician, inventor, and the CEO of World Time Limited.

How did you become involved with Tema Port?
We want to get world time from a passive state to an active state by connecting the time clock to music. To give authenticity to the world time clock, we realized we had to go to the Greenwich Meridian, and in Ghana this is of course in Tema. But when I came to Tema, I realized it was not fully clear where the meridian is. So we developed a landmark that would signify the location of the Greenwich Meridian at the last point on land towards the Equator and the South Pole. We have called this point Terra Nihil Locus Mundiale (Land Zero Global Position). It is located at Latitude 5.37N, Longitude 0 and is right at Tema Port.

What the landmark about?
We envision the landmark as a tower combined with a cruise terminal. Part of that landmark is a pillar right on the Greenwich Meridian. It is to be located in the so-called Tema Time Park, where we will connect the time culture to the music culture with the Classic Africa Sync Clock that we invented. The landmark will be the Center of the World, incorporating an educational center where the port can present itself and scientists can connect to the public. It's a wonderful location for concerts for Classical African Music, and of course for all kinds of innovative experiments with time, music and the sea.

What do you hope Tema port looks like in 20 years from now?
We hope the Greenwich Meridian Tower and Cruise Terminal will be built as part of the new port development. We have already made some potential designs that were shown in the stakeholder workshop of your project we participated in. In my opinion, such a tower and terminal have the potential to attract many tourists from Ghana and far beyond. It would have facilities to host both local and international conferences, as organizers will very much like to have their functions at the Center of the World. And I think it will also attract cruise ships from all over the world. Tourists enjoy to learn and experience at this iconic landmark: taking their pictures on the meridian, listen to African music, and look at port activities.

Ken Kinney

THE DEVELOPMENT INSTITUTE

ACCRA



Who are you and what is your background?
My name is Ken Kinney, I am Executive Director for The Development Institute and Coordinator for the Delta Alliance Ghana Wing. I've been working in the Volta delta for six years now, and my real passion is about sustainable management, which involves conservation, livelihoods and economic development. One of things I am advocating for is complete land use. This means all the available lands should be put to the use they are suitable for, and then there should be spatial planning. That can be the beginning of sustainable management of all the resources.

How is the Development Institute involved with the Tema port project?
We became involved trough the Delft University of Technology, our role in the project is to facilitate local contacts and arrange logistics; and I also support Dutch students who come to Ghana. The work of The Development Institute is not directly connected to the port expansion.

What is a Sustainable Port to you?
A sustainable port should involve places that are conserved. It should involve livelihoods for the communities that are around the port. And it should really, really bring about economic development. So in the absence of all these three components, even with the hard component of a port expansion in place, I would say it is not sustainable.

As Tema port stands now, it wouldn't be called a sustainable port. A lot of the development is just done with the technical issues in mind: How do we ensure we have space for ships to dock, have a place to keep our containers, and that the government derives maximum revenue. But there seems no thinking about issues concerning: How do we create areas for conservation? How do we connect the port to people's livelihoods?

How could sustainability in the Tema port area be enhanced?
Firstly, Chemu Lagoon and Sakumono Lagoon are both wetlands - the latter is even protected: it is a RAMSAR site. It is supposed to be a place for resupplying water and for migratory birds. And a place where communities should be able do some level of fishing and recreation. But we see a lot of pollutants and encroachment, and the places have no regulation and management. Basically, the lagoon is being filled for housing. For Chemu lagoon there is not even a vent to enter the sea, so there is no recharge from the sea. That makes it a closed system, which is not the best. It is choked, it needs to be dredged; this will increase fish life in the sea and the lagoon. We are looking into this with The Development Institute. Improvement is strongly needed for the people of Tema New Town. When they were relocated in the sixties, they used to have the Sakumono lagoon as a resource, and then shifted to the Chemu lagoon. Now, there are no resources left at all. We have found out that it is possible to do sanitation of the lagoon; but an adaptation fund still has to come through.

Secondly, it is very important to re-demarcate the boundaries of the lagoons. Make sure that regulations are strengthened, as there should be no more encroachment in these areas. If we need to use pillars and barbed wire totally around it to achieve this, government is to investment in that. There should to be a couple of entrances for people to enter, but they cannot start building in the area. We need strong measures to prevent that and the fencing would regulate entrance. Tema municipality then could even collect fees, which can be used to develop or manage the lagoon. There can be recreational activities: fishing, relaxing and enjoying the nature. For that you need facilities, which the municipality should invest in; and there could also be some revenue out of that.

Finally, the Tema planning department should consider the Building-with-Nature concept. Now most of the houses are already virtually halfway in the lagoon, and not well built nor built with the right materials. People fill up the lagoons with sand, which is not sustainable because of the salt content. The salt easily overpowers and degrades all the cement. I think there is a system to ensure they could build specific kinds of houses that can co-exist with the entire ecosystem and not harm the lagoon.

What do you think the Tema port area will look like in 20 years?
Tema is expanding and if it does not start some conservation activities in its surroundings, but also in the city itself, air pollution will increase, pollution of water bodies will also increase, and eventually you will see that the city will collapse. That would also be very bad for the port. Human life and nature, there is a very interesting relationship. If there is no nature, people have no place to rest, no place to relax, and so the cycle of tiredness, disease and stress will eventually not help to make the city very productive. If nothing is done, the two lagoons will be dead in twenty years. There will be no animal life, it will be highly polluted, and serve as a source of epidemics, an inoculum for diseases.

What do you hope Tema port will look like in 20 years?
In twenty years, I envision a sustainable port and a city with the two wetlands restored and functioning properly full of life, plants, fish, with migrating birds coming in and out. I envision a well planned and restored city of Tema, with a lot of green areas. I envision people around the wetlands, relaxing and enjoying nature. I envision no poverty, because there is a complete development of livelihoods for the poor. I see economic development for the entire city of Tema, including the port and fishing harbour. Finally, I see Tema port connected extensively to the eastern part of Ghana, linked with rail, water and sea transport, well connected all the way to the Volta delta.

Images to right: Mr. Ken Kinney with The Development Institute organizing various high-level stakeholder meetings and consultations.





Barnabas Apom

CONSULTING FOR THE WATER SECTOR

ACCRA



Who are you and what is your background?
I am Barnabas Apom, consultant for the water sector at GNBCC, the Ghana Netherlands Business and Culture Council, and CEO of RESEARCHLIME Ltd, Survey data collectors.

I have been involved as a focal person in a lot of stakeholder involvement for projects in the port and the water sector. For GNBCC I also work with a lot of water organisations in Ghana, like Unicef and WaterAid. I have a broad overview of the water sector: the rural stakeholders, the districts, the businesses, the rural communities and district assemblies, mostly bottom-up.

How is GNBCC involved with the Tema port?
GNBCC is a membership organization and we work to resolve our member's challenges. Quite a lot of them are involved in export, logistics, and taking care of container shipments, for instance. Often they are stationed in the port or in the so-called free zones around the port. A free zone is an area that the government has established for Foreign Organizations to operate as if they are operating in international environment. GNBCC helps our members to engage with stakeholders that are involved in the port sector, which is a major sector in Ghana. We use our network - for example the Dutch Embassy, the companies, the district assemblies and the government - to bring the interests of the stakeholders to the forefront of decision makers at a national level. GNBCC links the businesses and find the challenges that they are facing; and then tries to bring the stakeholders and the decision makers together to address these challenges.

How is the work of GNBCC related to the port expansion?
The expansion of the port will open up all kinds of business. There will be a lot more involvement of our membership companies in the port interactions. It might also attract more companies from The Netherlands to work in Ghana. GNBCC is basically facilitating business between the Netherlands and Ghana. Once the new port opens and business is started, we will have a lot more events. So it will definitely affect GNBCC's work.

What is a Sustainable Port to you?
I think for a port to be sustainable, there are two main points. Firstly, it has to take into account the needs of all the stakeholders involved. Their consent, and their grievances. If the port is benefitting, and the majority of the people like communities and smaller companies are not involved in any way, it will lead to violence and destruction later on. Even the fishes in the port should be considered, because they are also going to be affected.

Secondly, sustainability is about ownership. The local people have to feel that they are all part of this expansion of the port. The indigenous should feel that it belongs to them; that is necessary for the sustainability of any project. I have a lot of examples of water points and water stations that are abandoned because the local people don't feel that it belongs to them. That is why ownership is very important for sustainability.

What do you think the Tema port looks like in 20 years?
Apart from the site physically increasing, it will bring a lot of activities and interaction in the port. Organizations coming in for example from Burkina Faso and Benin are not able to reach the port, because we do not have the facilities, like parking areas for the trucks. In the next 20 to 30 years the port is going to open up not only for Ghana but also the whole of West Africa, because is it an easy entry to this part of the continent.

The port will bring in a lot of new and modern activities. The vice president is aiming to make everything paperless and automated at the port. While this is good it also has consequences. Many local people living around the port are manual workers. So we have to bring alternative livelihood activities, think about how we can create other jobs for them.

What do you hope Tema port looks like in 20 years?
I hope the politicians will have the political will to construct new and safe infrastructure to connect the West African countries, like train lines, roads, parking lots etcetera. Otherwise, with a lot of cars and cargo on the roads, it will cause many accidents. I hope the expansion will bring more prosperity to the country.

Another thing that I wish quite much is that most of the things involved in the production and operation of the new port will be established within our country. Now, most organizations bring goods and materials in from outside, but that is not a sustainable way to do things. It should come from our own country, so jobs can be created for our people. The new port will need many new containers, why don't we create a container factory in Ghana?

For me this links back to the inclusiveness of the port, we should get local people involved and create jobs for them. People from the villages whose fishes are no more out there, because of pollution or otherwise. Our country has jumped through development, and many have no capacity in or access to new technologies. We just put them loose. So we have to do things that keeps everyone busy and makes them feel they are part of it. Imagine that the people of Sakumono lagoon, Tema New Town and Prampram could work in factories connected to port development. Get the port linked to their existence, their life. That is the very key to sustainability.

Image right top: Mr. Apom with his team in the field.

Image right bottom: Mr. Apom inspecting an innovative water treatment system developed in Ghana.





Afke van der Woude

CONNECTING BUSINESS IN GHANA AND THE NETHERLANDS

ACCRA



Who are you and what is your profession?
I am Afke van der Woude, since two years I am working in Accra at the GNBCC, the Ghana Netherlands Business and Culture Council, as a project manager. Together with the Dutch Embassy and other Dutch organisations, we do a lot of projects to broadly promote business between Ghana and the Netherlands.

How is GNBCC involved with the Tema port?
GNBCC is involved in the port through several projects, organizing activities for our partners that have an interest in the port and the port expansion. I first got to know about it because of the Sustainable Ports project we do together with the consortium that Delft University of Technology is also part of. For this project we facilitated several things, such as workshops in the port, which also enabled us to meet a lot of stakeholders.

And on the other hand GNBCC also knows about current developments and expansion of the port through our members. There's a lot of trade between Rotterdam and Tema, so many of our members, either Ghanaian or Dutch, are active in the port and in the free zone around the port.

How is the work of GNBCC related to the port expansion?
In 2015 GNBCC was involved in a tender towards the port expansion, we acted as a facilitator for the Dutch partners that submitted a proposal for this tender. That is how we work, we usually don't initiate, but facilitate. In the practical sense of organizing things for members, but also with relations and connections.

What is a Sustainable Port to you?
A sustainable port would be a port that is eco-friendly, inclusive towards the people living in and around the area, and economically sustainable. With that I mean that the companies and people working there can sustain a profit, can benefit. Furthermore a sustainable port means that it is well connected to other areas and actors around the port. Not only the port in itself should be sustainable, but also the connections to the hinterland.

What do you think the Tema port looks like in 20 years?
I fear from what I see going on now that it will be completely constructed covered in concrete, very congested, and very polluted. Tema is growing fast, but not in a very green or eco-friendly way. Yes, within the port there are good developments; it's quite clean and well-organized. But surrounding the port there is still a lot of development needed for it to function well. Congestion and pollution will not change for the better if the current trends continue.

What do you hope Tema port looks like in 20 years?
I hope of course that it will look much nicer then what I just described. I do see some developments going on - in terms of infrastructure and connectivity - that will improve the area. And that people are aware that some form of city planning is needed to deal with all these flows of goods, people, cars, trucks and other traffic around the port. So I think that there will be some movement in that direction. But in an ideal world, it would not only be targeted at infrastructure connectivity, but also green areas, proper housing, and cleaning up the area to make it a more inclusive and sustainable city. That would be nice, to use the economic development to develop also other aspects of Tema.

From the GNBCC perspective, I also hope it will be a very well functioning and profitable port, that attracts a lot of Dutch companies. Tema Port is functioning quite well already, as we know from our members. So, if the port becomes even more efficient and professional, I think we will have a very nice partner for Dutch companies to use as an entry point to West Africa. To do their trade and hopefully establish themselves in Ghana.

Fred Smiet & Jan Anne van der Veer

EMBASSY OF THE NETHERLANDS IN GHANA

ACCRA



Who are you and what is your profession?
I am Fred Smiet, First Secretary, Water & Climate affairs (left on the picture). My work deals with development cooperation in the water and sanitation sector, and trade promotion issues. Currently, we also started focusing on integrated water management and coastal zone issues in Ghana.

And I am Jan Anne van der Veer, Second Secretary of the Dutch Embassy in Ghana, Trade & Private Sector Development (right on the picture). I work for Dutch companies that want to do business in Ghana and with young Ghanaian entrepreneurs that want to set up their business here in Ghana.

How is the Dutch Embassy in Ghana involved with the Tema Port expansion?
We used to have a ports development program, and currently maintain contact with companies that are involved with the port. The port expansion touches on the work of a lot of companies that either are Dutch, or have strong ties with the Netherlands. In fact, many shipping lines and shipping agencies have their European head quarters in Rotterdam. So for the Dutch embassy there is definitely a strong link between the port of Tema and Dutch companies, as the port development affects their work and business.

What is for you a sustainable port?
In my perception this is a facility that does not impact negatively on its environment, being the social and ecological surroundings. In that sense you can call it a green, or eco-friendly port. Apart from that, it should also be commercially sustainable, so that companies working in this port are able to make a profit and to keep developing.

What do you think the Tema Port area will look like in 20 years time?
The area is developing very fast. In the past year, several small developments have already started, especially concerning the roads connecting to the port. From the plans I've seen so far, the port will look very different: larger scale, more automated. So the port business will grow, not only because of the growth of the Ghanaian economy, but also because of the growth of ECOWAS and the countries that depend on Tema port: like Burkina Faso, Mali, Niger. The ECOWAS will provide easier trade across the borders and that will tremendously help the expansion of Tema port. And for the area around the port: if the encroaching is not stopped there, the lagoons might be completely filled and fully settled in a few years from now.

What do you hope the Tema Port area will look like in 20 years time?
I hope that the feeder roads and other systems that lead to the port will be improved. Hopefully there will also be room for other developments like the ones we see in the Rotterdam port: room for recreation and for nature. The ideal port would be a green port that has minimal negative impacts. And I hope that the lagoon will be saved. I regularly go bird watching in the lagoon for example; it has great value. Also, it seems to be an important religious and cultural spot. As this is of great importance to the Ghanaians, I hope this might help to save the the lagoon area.



VOICES FROM CONSORTIUM PARTNERS AND ADVISORY BOARD MEMBERS OF THE ACADEMIC RESEARCH PROJECT

THE NETHERLANDS

Boskalis
Daan Rijks, Senior Engineer

Why is an integrated and sustainable ports perspective important?
"Integration and sustainability are the license to operate nowadays. In my opinion, ports can only be future-proof when they have these aspects on their agenda. And accepting this point of view, one has to figure out what it exactly means. That's why research is needed: on design of integrated and sustainable frameworks and creating awareness. And, last but not least, on a collaborative approach: these practices can never succeed single-handedly."

Why are you and your organization connected to the project?
"We think sustainability and integral design are important issues because we see it increasingly occurring in many different projects and places. Thus we should get the best and most updated knowledge. What is the most effective and inclusive approach, how to organize these projects? This academic research program provides a good example. And of course Bokalis values to be part of the network that is created within and around this research program."

World Wide Fund for Nature, the Netherlands
Daphne Willems, International Fresh Water Expert

Why is an integrated and sustainable ports perspective important?
"Because that is the only way forward if we want to keep a livable earth on the long term. When this kind of large-scale developments like container ports are not based on integrated, inclusive and sustainable design principles, we will wreck the wide environment in a whizz."

Why are you and your organization connected to the project?
"The World Wide Fund for Nature, The Netherlands is connected to the Sustainable Ports project because we believe it is possible to find a balance between ecology and economy. However, to achieve this, we need more knowledge. And that kind of knowledge is developed in this project."

Netherlands Commission for Environmental Assessment (EIA)
Rob Verheem, Director International

Why is an integrated and sustainable ports perspective important?
"In 2016 we carried out a study for the Dutch Ministry of Foreign Affairs to identify possible measures for enhancing the quality of environmental and social impact assessments for port development in emerging and developing countries. What we found, somewhat to our surprise, was that in many of the 11 assessments we looked at essential information was lacking. Think of sediment dynamics, climate change or land rights. But also the economic justification for the development and impacts on workers. Taking a sustainability perspective therefore would seem to be important, as these issues apparently are not taken aboard automatically."

Why are you and your organization connected to the project?
"This topic is very relevant for the Netherlands Commission for Environmental Assessment as we advise government on environmental and social impact assessment of their port developments."

Dutch Development Bank (FMO)
Anton van Elteren, Senior Environmental & Social Officer

Why is an integrated and sustainable ports perspective important?
"Most important is to take into account a wide range of options to make infrastructure future proof, especially with a large infrastructure project like a container port. But as long as there is lack of knowledge about more sustainable alternatives, it can be difficult to convey this to the engineers and others who are designing that port."

Why are you and your organization connected to the project?
"First of all from a personal interest, because I am a biologist by origin, with geology as a secondary major. Furthermore, as an environmental specialist of FMO I always deal with water and infrastructure projects. In addition, from the approach of FMO's new 'NL Business' department - which finances private companies and projects in developing countries - we also want to play a role in financing such projects that have Dutch input. So, it is good to have knowledge of the new insights in the field of sustainable building. Additionally, in the past we have financed ports that were developed in the traditional way and can therefore pass on the lessons learned in these cases. Finally, sustainability and integrated design are aspects that we hope to bring in from our role as a financier."

Netherlands African Business Council (NABC)
Anitra van der Kraan, Program Officer

Why is an integrated and sustainable ports perspective important?
"Because an integral and sustainable perspective reinforces the chain or sector approach. In this way you stimulate various parties that belong to it really work together in the different phases and parts of port development. Not only in a vertical, but also in a horizontal integration: this helps saving costs, increases efficiency and develops a more sustainable project."

Why are you and your organization connected to the project?
"The NABC is a network organization, of which start-up SMEs and larger companies are members, and many of these companies are in the water sector and port development, such as engineering firms and construction and transport companies. It is important for us to be able to serve these members over the long term. By connecting to a long-term program like this research project and the knowledge that is developed, we can help Dutch companies to gain access to this market and help them to combine forces and knowledge and save costs. The Sustainable Ports project is also important to us because it provides insight into what optimal conditions are to prepare a port for sustainable development. Dutch companies value this: entering into long-term business relationships by supplying high quality goods and services, but also by collaborating and improving the entire (port) sector. Often they also offer high quality and innovative products that are sustainable. So a blueprint for integrated and sustainable port development can support their product or business case."

Deltares
Martijn de Jong, Coordinator of Program Waterborne Transport

Why is an integrated and sustainable ports perspective important?
"I think it fits in this time: you can't do it any other way, the old way of designing ports does not fit in today's society. This kind of developments and interventions in a coastal area have such major consequences that society requires integrated and inclusive design. Sustainability has fortunately become an integral part of most of these projects."

Why are you and your organization connected to the project?
"Deltares has a broad group of experts who have expertise in many of the areas involved in future port design, including technical and ecology topics. And one of the challenges in this project is exactly that broad scope. We can therefore contribute ideas, advise, and also increase our knowledge base in a research project such as this."

IHE Delft Institute for Water Education
Dano Roelvink, Professor of Coastal Engineering and Port Development

Why is an integrated and sustainable ports perspective important?
"To develop ports for a sustainable future, we need a more integrated and inclusive design because these ports not only serve a great economic purpose, but they also have major impact on their surroundings."

Why are you and your organization connected to the project?
"For my own coastal engineering and port development group, we are interested in port development and in trying to minimize the coastal erosion that they often cause. And for IHE Delft in general, there are many other interesting focus areas related to port development like coastal wetlands, water and sanitation, aquatic ecosystems, hinterland connections, etcetera. These are all linked to more sustainable management of the environment of such large infrastructure developments."

THREE | ACADEMIC PERSPECTIVES FROM GHANA AND THE NETHERLANDS

University of Ghana,
Legon, main campus.



Kwasi Appeaning Addo

MARINE AND FISHERIES SCIENCES

UNIVERSITY OF GHANA, LEGON



Who are you?
My name is Kwasi Appeaning Addo, professor of Marine and Fisheries Sciences, University of Ghana. In the Sustainable Ports in Africa project, I am co-ordinating research activities, administration and science in Ghana, and connecting the project to people within Ghana.

How did you come to be involved with Tema Port and this project?
The Netherlands African Business Council called me about potentially collaborating in an interesting project that involved marine science. I started talking with other interested Ghanaian and Dutch parties and contributed to the research proposal. Finally we won the project, so here we are now.

What do you like about the project? Why are you interested in participating?
I like the collaboration. Although shipping and ports are not my direct area of expertise, I see it as an opportunity to learn about this aspect within the coastal system, to grow my understanding and participate in discussions. I like the openness, the collaboration, the discussions, and I like the methodology that we apply, involving stakeholders from the beginning and people buying into the project. So this will go a long way to helping me in future projects and activities.

What do you think of Sustainable Ports? How have you changed your idea about a Sustainable Port?
My ideas have changed a lot. Previously I thought a port was all about engineering - the design of engineering structures - and trade. This project has taught me that a port goes beyond this. A sustainable port involves the environment, ecology and people in a cohesive and interactive way. This is not something that I was used to. Through this project, I have seen how these systems interact, and sustain economic and operational functions within a port setting.

What is your particular learning?
I have learned about all the systems that operate within a port to enable it to function and to become sustainable. Also, as a scientist I have learned how to develop stakeholder meetings. I think the approach that is used in this project, this way of doing it, involving people in thinking about their futures, is a unique method. I am a natural scientist by training and have never been a moderator of these kinds of processes before. But, moving forward, I realise that the approach in engaging stakeholders is something that I have really learned, and it is becoming more and more part of me. Going around and gathering the information, the right type of information from stakeholders is the right way for me.

What are the next steps?
This knowledge, this information should not remain on the shelf as often happens. We should move it to the next stage where we engage further with the people who are involved in port activities. So that they really understand what it means to have a sustainable port.

Then the developing ports in West Africa and Africa in general will incorporate these ideas into the initial design and into their implementation process, the operation of these ports. But, as a researcher I think it also important to disseminate the new knowledge into academia, into the public domain of science. We need to develop very good papers, publish in journals with wide readership so that worldwide people can begin to think about sustainable ports and how developing countries can implement the idea of sustainable ports into their development agendas.

Barnabas Akurigo Amisigo

CLIMATE AND HYDROLOGICAL MODELLING

CSIR WATER RESEARCH INSTITUTE



Who are you?
My name is Barnabas Akurigo Amisigo and I am a hydrologist with a government agency, the CSIR Water Research Institute. CSIR stands for the Council for Scientific and Industrial Research.

How did you come to be involved with Tema Port and this project?
I am involved in climate modelling, hydrological modelling, and work with Professor Appeaning Addo on coastal modelling through the DECCMA project. Through him I heard about the SMART ports project, the Sustainable Ports.

This was a little new to me, as I am not used to ports. It is an interesting new development, involving systems thinking and modelling; not just looking at what they do in the port itself, but also linking to the upstream aspects both biophysically and socially.

What do you think of the idea of Sustainable Ports?
The concept of sustainable ports means not treating the port as an isolated entity, but taking the concerns and dreams of various stakeholders into account. So, people who are not normally associated with ports, can help to support the port to grow. I think it is a very good idea. In fact it brings to mind my hydrological modelling where I take not only the physical processes and environment into account, but also the livelihoods and concerns of people living in the catchment. The systems approach of the sustainable ports projects resonates very well with me.

How does the Sustainable Ports project differ from a more traditional view?
This Sustainable Ports approach brings into play a number of components: the ecosystem, economics and cultural issues. It links people that are located away from the port itself. This is quite new for me. I am used to just thinking of the catchment. It is an integrated way of looking at various interests and identifying them up-front – not when the port construction is finished and problems come. From the outset, you are looking at compatible and non-compatible interests and trying to marry them.

What is your particular learning?
My learning point is how this port is going to link up with upstream issues. So, connecting the issues of the lagoons in the area with their catchments. Are we just going to tick a box – as in: we have a lagoon here that will be impacted by the port, and an eye must be kept on it. Or are we really going to look at the catchment, and also how the lagoon affects the port and the port the lagoon?

What are the next steps?
It's important to link up with people in this project: the port developers and the scientists with similar concerns to mine, both Dutch and Ghanaian. We need to follow this into the future, monitoring the impacts of the port on the ecosystems and the ecosystems on the port. We need to measure the dynamic interactions over time, expressing our expectations and comparing them with the data from monitoring.



Edem Mahu

MARINE GEOCHEMISTRY

UNIVERSITY OF GHANA, LEGON



Who are you?
My name is Edem Mahu. I am a lecturer in the Department of Marine and Fisheries Sciences at the University of Ghana. My research focuses on sediment dynamics, pollution in marine systems and the cycling of metals and nutrients in the coastal marine environment.

How did you come to be involved with Tema Port and this project?
Professor Appeaning Addo, contacted me to ask if I was interested in a potential position in a project on Sustainable Ports in Africa. I was very interested and my name was included in the proposal. My focus lies on the sediment dynamics of the Ghana coast, especially the project area of Tema. I collaborate in the geochemical aspects of the project such as the water quality of the Sakumono Lagoon, trying to understand the biophysical functioning of the system.

What do you think of Sustainable Ports?
I think a sustainable port is a port whose design has taken multiple aspects into consideration, such as social aspects, economics, the environment in addition to engineering aspects. These aspects interact, and a port cannot be considered in isolation. As such, a sustainable port doesn't only focus on money, but considers the environment and the livelihoods of the people that the port interacts with or affects. Such a port looks into the future, while considering the short-term benefits, so that both present and future generations can all enjoy the economic, ecological, social and cultural benefits that come with this.

How does this differ from present practice?
The Sustainable Ports concept is different from how things are done in Ghana. It strives to involve stakeholders from scratch. It is the other way here and in most of Africa. Typically, engineering infrastructures and buildings are completed without any input from key stakeholders. When the very people who are supposed to benefit start receiving negative impacts due to system failure, then we start thinking of what actions to take. Our planners do not anticipate how many people a port development will attract, for example. Maybe these people cannot be accommodated by the environmental system. It could collapse. This is not just true for ports, it is even happening with other major projects in the country. Key questions to ask include whether or not possible environmental consequences of such projects have been duly considered. We need to conduct good environmental impact assessments, particularly with state-owned projects. The private sector is mostly obliged to comply with environmental protocols. A colleague at the Environmental Protection Agency confirmed that most state-owned projects are rolled out without duly assessing environmental impacts. So, the project is initiated, the problems start and then we start trying to find solutions. We need to change the way we do things.

What is your particular learning?
I've learned that every development requires a systems approach. I applaud this project, because it began by talking to stakeholders. In the past we would have ignored stakeholders, even though we know that problems can arise by ignoring them. In this project, we talked to them from the beginning, exploring ways in which the port development might benefit them, trying to design a green port for what they need.

What are the next steps?
In moving forward, I see the big problem as finding ways of collaborating between academia, industry and communities. We need to come together to solve problems. As a scientist you can't do it alone. We need to involve stakeholders so that we all can benefit from research and our environment now and in the future. Right now, each sector is doing their own thing and we only realise later that it could have been done differently, in collaboration. It is not helpful to continue along this line. We need to learn to work together in Ghana.

Philip-Neri Jayson-Quashigah

COASTAL DYNAMICS

UNIVERSITY OF GHANA, LEGON



Who are you?
My name is Philip-Neri Jayson-Quashigah. I am doing a PhD in marine science, on the coastal dynamics, shoreline erosion and sediment of the Volta Delta. I am monitoring the coast using a drone and doing simulation modelling using Delft3D. I started my studies with a Bachelors' degree in Geography and then a Masters' degree in Environmental Science. For my PhD, Professor Appeanning Addo is my main supervisor, and we have contacts in Bremen University.

How did you come to be involved with Tema Port and this project?
I work directly with Professor Appeanning Addo collating information, writing up findings and co-authoring a review paper on the delta. I will be contributing to our papers within this project.

What do you think of Sustainable Ports?
Along the coast of West Africa, ports have been built and there is increased erosion on the downdrift side. That is where I see the problem for sustainability. A sustainable port means that you try to design something without downdrift impact. You try to gain from the port at the site, versus reducing impacts on the downdrift side. You are also not destroying the ecological environment. I think it is the way to go for me!

How does the Sustainable Ports project differ from a more traditional view?
We are learning the new way to develop ports – so, preventing shoreline change and downdrift impacts.

What is your particular learning?
Prior to the project, the first time I had heard about sustainable ports was from a friend who just started his PhD in Germany. Then this project Sustainable Ports in Africa started, giving me more ideas about sustainable ports – how we can really make our ports better. Now when I meet my friend, I am able to really discuss with him. I have told him about this project on Sustainable Ports looking specifically at Tema, Ghana, at the impacts and the ecosystems around it. He is doing something similar, comparing Tema, Togo and a port in Germany.

What are the next steps?
These ideas are new for the ports people. We need to follow up with the people, communicating and feeding back on what we have learned and the future ideas. This is important; otherwise it is just left there. I mean the stakeholders in the port, at the workshop in February 2017, but also with the government. Maybe we can put a photograph of the stakeholders at the workshop in this book and send it to them.

Emmanuel Kwadzo Brempong

COASTAL ECOSYSTEMS

UNIVERSITY OF GHANA, LEGON



Who are you?
I am a young man who completed his BSc in 2017. My name is Emmanuel Kwadzo Brempong and I come from the Volta region of Ghana. I am the oldest of three children and my interest is the coastal ecosystem - how to manage the balance between human and natural interests. I am looking for a future in academia. I want to go more towards research, to do something different than my predecessors have done.

How did you come to be involved with Tema Port and this project?
I completed my bachelor thesis under Professor Appeanning Addo on coastal erosion in the Volta Estuary. Professor Appeanning Addo recruited me to start my further education for a Masters of Science. I came on board with this project Sustainable Ports in Africa.

What do you think of Sustainable Ports?
The Sustainable Ports concept is very, very important in the lives of individuals who use water bodies as their source of income. There is no doubt about it, if you want a water body to continue producing and providing income, it has to be managed well both for the nation and the communities involved. It is essential for both sustaining production and the natural resources, so that we can benefit from the ports for a longer period of time.

How does the Sustainable Ports project differ from a more traditional view?
Usually, I would look at a port and not really think or mind about it. I know they are doing their business. I would not really think about the funding and financiers or that if it doesn't continue to produce income, what I would lose as an individual. But, now I realise that a port has an effect on my life. I am no longer indifferent, no longer just thinking every country has ports to make the country look good.
What is your particular learning?
Growing up, I didn't particularly value the environment. This project gives me an idea about how important the coastal environment is. I have learned to appreciate how important nature and natural resources are to us as individuals. Besides that, I am learning how to work in a research team and learning a little bit about the Dutch culture.

What are the next steps?
Personally, my next step is further education. For the project, we need to seek funding to work together further and to spread the message about sustainable ports - that you need to involve local people and government ministries. Next steps towards sustainability will also involve a modern way of doing things, making things easier by data management methods and using computational models for example.

Selasi Yao Avornyo

SUBSIDENCE REGIMES

UNIVERSITY OF GHANA, LEGON



Who are you?
My name is Selasi Yao Avornyo. Initially I was studying for a Masters' degree in marine science, but this has now been upgraded to a doctoral study. I am a student researcher on the Sustainable Ports in Africa project.

How did you come to be involved with Tema Port and this project?
I look at the subsidence regime within the Volta Delta. I am investigating where and at what rate subsidence is occurring, and its bearing on recent flooding and coastal erosion in the region. I identify the drivers of subsidence and the human influences on subsidence. These include the damming of the Volta River and the associated sediment starvation of the delta. And also the extraction of groundwater for irrigation, particularly near the town of Angloga where they have a lot of wells.

What do you think of Sustainable Ports?
A sustainable port involves managing the operation of a port system where everything is in place. But, you want to look at all the other factors. You want to include stakeholders, and every other activity that is going on in the port. You put adaptive mechanisms in place to ensure that all these sectors or aspects of a port agree with each other. Also, running one aspect of a port should not negatively impact another.

How does the Sustainable Ports project differ from a more traditional view?
Here in Ghana, the little that I have seen with my limited experience, is that some sectors suffer at the expense of other sectors. When you go into the port you realise this, particularly during the construction. The ecology suffers the most. In port development, they look at the engineering, the construction aspects, and ignore the ecology. Also not all social lives are considered by the ports. The people living in the environs of the port do not benefit much from the activities in a port. It is only a few high-ups that benefit from the engineering, building construction and new facilities, but the social and ecological aspects suffer.

What is your particular learning?
This project is the future. I was not much concerned about the ecological aspects of port development. But, with this project, I realised there is more to a port than the construction and management aspects. You have to consider so many other things and include the engineering, ecological, social and economic aspects.

All these things must be in play. All stakeholders, I learned, must also be involved. I realised with the workshop that it is an all-inclusive approach, each and every person there matters. Even the port development managers were involved to seek ideas and the exchange of opinions about how things could be improved and made more sustainable. I believe that with such measures in place and with the different aspects looked at both independently and together, our ports can be managed properly so that other sectors also benefit.

What are the next steps?
Looking at Africa, most of the ports are being run without some of the knowledge necessary for a sustainable port. Once this project establishes a baseline, and brings to the foreground the most important aspects that need to be looked at, the sustainable port approach can be replicated for existing ports and for new ports. Then we would have an efficient and improved port system, managed for people and considering the environment. The impacts of ports on the environment would not be entirely negative, as we often have now!

Michael Kwame-Biney

WATER QUALITY OF THE SAKUMONO LAGOON

UNIVERSITY OF GHANA, LEGON



Who are you?
I am Michael Kwame-Biney, working with Professor Appeaning Addo on research on Sustainable Ports in Africa. How we can advise the ports for sustainability.

I am studying the problems of the Sakumono Lagoon. The people fish in the lagoon and some use it for drinking water, especially the children, or wash in it. Normally, I go and speak with the people to ask what they need and how they go about their daily activity. I speak to people directly about the lagoon, because those living close to the lagoon know interesting facts that we don't know.

They have cultural beliefs associated with the lagoon. They can tell about how their friends pollute the lagoon, in different ways. Sometimes, they even suggest how we can help them best to stop this pollution. They do not say that they themselves pollute, it is always their friends or neighbours, but they are all part of it.

How did you come to be involved with Tema port and this project?
I am involved with the Sakumono Lagoon and the Sustainable Ports in Africa research program for one year now. I go there about twice a month, and it will be more often now because my first year of Masters classes is finished.

What do you think of Sustainable Ports?
I think Sustainable Ports are very important, because first it is about how you can develop a port, how you can use it and how it can be available for future generations. So, a port can be a very good thing. The only problem is how to integrate other stakeholders into it and how it can work for all our benefit. We need to talk to the people involved. To stakeholders such as the community, the businessmen, the project managers and the government, so that we can link their needs. It is important for all of us that this happens.

We are not trained in this (stakeholder-inclusive) way of working. I was lucky enough to be assigned to complete an internship of three months at Marine Operations in Takoradi Port. There I saw that there are big men making decisions for people. People in the community are employed, but instead of listening to get advice from that community, managers tend to do their own thing. Employees do not really get any benefit, except for their daily money. These port managers are usually not from the community, but from elsewhere. They are employed as managers because of their academic background. It is still like this now, it is no different.

How does the Sustainable Ports project connect to your study?
Actually, it is linked to my whole study. As part of my study, I look at the effects of climate change, the sediment budget, marine pollution – all these things happen in ports. They are all linked. In the ports there are a lot of companies. You get CO2 release, erosion of sediment, dumping of harmful substances in port waters. In my course, you are encouraged to integrate, to think about linkages.

What is your particular learning?
I learned more about the sediment budget. From Google Images, seeing how a port can trap sediment on the upstream side and deprive the downdrift side of sediment, causing erosion along the coast.

What are the next steps?
The goal – if the investor is not restricted in making decisions – is for a 'whole' port. We have a lot of information that the engineers alone don't have. A 'whole' port uses information wider than engineering and finances in its design.

Tiedo Vellinga

GREEN PORTS

DELFT UNIVERSITY OF TECHNOLOGY



Who are you?
My name is Tiedo Vellinga, emeritus professor of Ports and Waterways at the Delft University of Technology. In December last year, I retired from the Port of Rotterdam after 38 years in infrastructure management. But I will continue the supervision ongoing research projects, amongst which this Sustainable Ports project.

How did you come to be involved with Tema Port and this project?
I was approached by the Netherlands African Business Council (NABC) – a group of Dutch companies active in Africa and linked to the Urbanising Deltas of the World research initiative of the Netherlands Organisation for Scientific Research (NWO). I was asked to join hands with them and Deltares in applying for research funding on African ports. I immediately sought partnerships with the University of Ghana via the NABC, with other universities in the Netherlands, and within TU Delft. Wageningen Marine Research, the Free University of Amsterdam and UNESCO-IHE became involved.

What do you think of Sustainable Ports?
That's a great subject! The concept can really inspire people. In the past, ports were designed mono-functionally for the economy, ignoring their physical and social environments. Believing that a port is necessary for economic growth, and for jobs and employment, they were planned into their environments and only then were the impacts looked at. That ports can also create other values was neglected. These values are not realized if you don't do port development well from the outset.

There are lessons from the past. In fact, the Maasvlakte 2 - the newest expansion to the Port of Rotterdam - represents a drastic change in thinking. The same is happening in Tema. Usually, a port is developed and gradually everything settles down. Then the negative aspects become dominant – traffic congestion, air pollution – and people do not want business to go on as usual. In case of the Maasvlakte 2, the port was allowed to expand, but simultaneously and with the same priority level, it had to improve the liveability. There was a striking similarity with the second stakeholder workshop in Ghana in February 2017 when the port-related stakeholders indicated that they were fed up with business as usual, and that things have to change. I think there has been a disconnect between growth and the environment. We need Green Growth, that is economic growth that leads to a better environment. And Green Growth as an economic driver is an inspiring lead for thinking about sustainable ports

What is your particular learning?
In this research project I have learned that you need to be very cautious about drawing early conclusions. You need to listen to local people and put a lot of effort into understanding the system. It is difficult accomplishing this from a distance. The biggest leaps in knowledge came from interacting with local people, seeing the system itself, hearing people's needs and their considerations and deliberations. I learned that the African context is much more important than I thought at the outset.

What are the next steps?
The next steps involve our theory of change. We need to move from outputs to outcomes and impacts. This means facilitating the transfer of knowledge. We need to make sure that through this project Ghanaian researchers can be the ones presenting our joint material to decision makers in Ghana. The knowledge needs to be embedded in their education programmes and their strategic decision making. From this success in Tema and our partnership with the University of Ghana, we need to scale up within the African Green Ports Network that we develop to other ports and other countries.

Jill Slinger

INTEGRATED AND SUSTAINABLE COASTAL SYSTEMS MANAGEMENT

DELFT UNIVERSITY OF TECHNOLOGY



Who are you and how did you come to be involved in this project?
I'm Jill Slinger, the scientific research leader of this project. I'm an associate professor at Delft University of Technology and visiting professor at Rhodes University, South Africa. I work in integrated water and coastal management all over the world, and specifically around the South African and Dutch coast. I became involved in this project because a port forms an integral component of a coast.

What do you think of Sustainable Ports?
I think sustainable ports are a necessary perspective to adopt and especially now, as we face the challenges of this century. If you do not think of changing ports into sustainable entities within the coast, you will not meet the development goals of the future, and will disappoint thousands and thousands of people. Ports are central places where trade comes together, where ecosystems exist, where local people are employed, so they are the nodes at which we need to introduce adaptive management towards sustainability.

What about your involvement with Ghana?
Some of the aspects of the Ghanaian situation are very familiar to me from my South African background. For instance, that there is a dual governance system in Ghana, with the traditional authority working parallel to the rules and regulations of governments. And how to deal with that: by involving local people and traditional leadership, as well as authorities to work towards new developments in Ghana and towards a sustainable port.

How does the Sustainable Ports project align with your other activities and what did you learn from it?
In all my research projects, I work with stakeholders. I help people to get involved in planning in their local environment, but I have not previously made such connections with ports. So I had to come to understand more about how a port functions and what a port can do for its local community. And for me that represents not only a wonderful learning opportunity, but also an excellent manner in which I can give back some of my broader knowledge on coastal management into the more specific area of port development.

I am committed to making a substantial contribution here, and this book is a part of that contribution. It is about local peoples' voices being heard by port managers and other authorities, and vice versa; that people understand how managers and authorities are thinking when they manage and care about the various aspects of a port, for instance trade routes, logistics, planning, customs. These are not always directly related to the job opportunities that people see or the impacts they feel. Exchanging these voices is one of the challenges I see, and one of the most important aspects of sustainable ports.

What are the next steps?
The next steps are to spread the message that each port can move towards sustainability, no matter where they are now. And to spread that message in Africa via stories. Africa is the continent that is facing the most port development in the coming years. More than 150 ports and ports expansions are planned! It is also a continent with a burgeoning population, and fast growing trade. Instead of first making the mistakes that have been made in other ports of the world, and developing without thinking about the local people and environment, I'd like Africa to take this leap into the future through truly integrated development. How port developments are financed also has to change to support this. Conditions need to be included such as integrated involvement of local stakeholders in port development plans, and that these plans should entail a process towards sustainability.

Liselotte Hagedoorn

ECOSYSTEM SERVICES VALUATION

VU AMSTERDAM



Who are you? And how did you become involved in the project?
I am Liselotte Hagedoorn, I am a PhD student at the Institute for Environmental Studies at the Vrije Universiteit in Amsterdam. My supervisor for my PhD, dr. Mark Koetse - who was alread involved in the Sustainable Ports in Africa project - asked me if I would be interested in taking my research expertise and fieldwork experience in Vietnam and Micronesia to Ghana.

My role in the project is to look into the benefits that we as humans receive from the ecosystems that we depend on. To be more precise: my research focusses on economic valuation of nature based solutions in developing countries using the results of discrete choice experiments and household surveys. Overall, I have been working on this topic for over two years now.

Why are you interested in participating in the project?
I think it is very interesting to look at this port because it is a big development project, and something that is taking place in coastal areas all over the world. These developments have huge effects on their surroundings. The effects are of course apparent in the direct environment of Tema port, but impacts also reach very far inland, or further down along the coastline, with all the trade, transport and physical processes.

And I find it very interesting that in our project we see the port as a part of a larger system. I am convinced that this is essential for the overall framework for designing sustainable ports that we are developing as a team; this holistic way of thinking is imperative to make it a more inclusive approach.

What do you think of Sustainable Ports? And what is your particular learning?
First of all I looked at a sustainable port from my own perspective, so as a port that takes into account the ecosystems surrounding it and the people that depend on them. I looked at how the ecosystems that would be affected by the port could be sustained; or how the development could be made more inclusive by restoration of other ecosystems. What I have learnt through the project is that enhancing sustainability not only happens in the environmental surroundings of the port, but can also be also achieved with a different take on traffic, housing, social structures and so on. Port sustainability actually applies to broad range of topics.

What are your next steps?
My next steps are that I will be conducting surveys in Tema City. We will interview the people that are most closely related to the ecosystems in and around the city, to investigate the values local people attach to these ecosystems. What changes for them because of the port development that is currently taking place and that will take place in future? And how can these communities be included in the port development, when its larger environment and the local ecosystem values are taken into account?

To develop and conduct the surveys for this project, I am working together with a quite large team consisting of many local people and some people from The Netherlands: we collaborate with the University of Ghana Legon, with The Development Institute, with a local survey company, and with Dutch parties like IUCN-NL and BothENDS

Heleen Vreugdenhil

GOVERNANCE

DELFT UNIVERSITY OF TECHNOLOGY



Who are you?
I am Heleen Vreugdenhil. I work at Delft University of Technology on Sustainable Ports in Africa and I'm part of the research team working on the port of Tema. I am the team member with a governance expertise background.

How did you come to be involved with Tema Port and this project?
After completing a PhD at Delft University of Technology some time ago, I looked for opportunities to further develop concepts on sustainability and governance. There were opportunities in port development, so I helped to write a proposal on Sustainable Ports in Africa for submission to the Netherlands Organisation for Scientific Research (NWO). When the proposal was granted, I was appointed as part-time post-doctoral researcher on the project. This complements my other work as researcher in water and coastal governance at Deltares.

What do you like about the project? Why are you interested in participating?
I like to work on sustainable development. In ports, in particular, there are large opportunities to become more sustainable. I enjoy participating in this project, because it is truly a collaboration of people with different scientific backgrounds. In most research projects you do have people from different scientific fields, but they each work on their own sub-projects. In this project, we integrate the sub-projects and cooperate actively in the overall project. So, we learn a lot, and take steps towards more sustainable port designs. I find this inspiring!

The project team is really nice, so that helps. Also, working in Ghana is inspiring. It gives energy and there are more opportunities to make a difference and bring about change than in a similar study in the Netherlands.

What do you think of Sustainable Ports and how have you changed your idea about a Sustainable Port?
There is a great deal to win regarding sustainability in ports. I learned that it is very difficult to compare different ports, regarding their sustainability. There are very different views on sustainability, but we do have a good understanding of what we don't want. One of the key aspects of our project is to broaden the scope at which you work. A port is not just a single entity, but is an element in a broader landscape. A port is part of the coastal system. When you are designing a port, you need to view it is this way and not just as an isolated entity.

What is your particular learning?
I have learned a great deal about ports and what you can achieve regarding sustainability, but it is the community of port specialists that I find most intriguing. As a community we can still learn a great deal about sustainable development - not just the scientists, but also the practitioners. Port development is not as far as other fields in regard to sustainable development. So, we can make a significant contribution.

What are the next steps?
Africa is on the rise, and many ports will be built or expanded, so it is even more important to contribute to the development of African economies and societies through sustainable ports.

So, the next steps are to roll out our sustainable ports concept - the integrated thinking and the broad scope. These are the key elements. It would really be an achievement to roll this out to other ports and put it into practice in the design of a particular port.

Poonam Taneja

PORT PLANNING

DELFT UNIVERSITY OF TECHNOLOGY



Who are you?
I am Poonam Taneja, enjoying being a researcher at Delft University of Technology and interacting with students, keeping me young. I work in the section Ports and Waterways of the Department of Hydraulic Engineering. My area of research is Port Masterplanning and design of port infrastructures in various countries

How did you come to be involved with Tema Port and this project?
I was involved during the research proposal phase. So after the proposal was accepted, it was logical that I stayed involved. I like the project and the people, so I can't help lending a hand wherever I can. The project is a great source of learning. As civil engineers, we tend to focus on engineering. We generally don't include stakeholders, do participatory processes or consider ecosystem services.

But port development is so much more than civil engineering. The world is different now. The social and environmental aspects are almost more relevant than the engineering aspects. So, for my own learning, and that of my students, I have made sure to attend the research integration meetings (RIM's) for the project held in at (bi-) monthly intervals in Delft. I have learnt new ideas, words and concepts and have taken on tasks from the project simply to stay involved, it feels good to be part of this multidisciplinary team.

What do you think of Sustainable Ports and has your thinking changed?
I now know that Sustainable Ports are more than engineering. Two years ago, I was very sceptical. I thought about the functionality of a port. Now I think that the technical problems can always be solved. We have very smart engineers. It is the social environmental problems that need to be scrutinized well to understand the mechanisms behind them, using theoretical concepts to understand. Only then can these things be tackled properly. It sounds easy to consult or engage with stakeholders, to do this or do that, but the science behind setting up these processes requires knowledge of people and theories. Disciplines like anthropology come into it.

So, I think I have changed. Sometimes I hear port people talking now and recognise that they are saying the things I was saying two years ago. Then I wrote things into the research proposal that I understood intellectually, but I didn't feel in my heart. Now I feel them!

What do you like about the project?
I like that we are making a difference. To be part of a big change in port development that is really essential.

What is your particular learning?
My PhD research investigated flexibility and adaptability aspects in ports. Through this project I learned that sustainable port and and port development is not only about cranes, logistics, transport modalities and containers, but also about people benefitting and prospering from the port. I am a hard-core technical person, so this change in me is truly astounding!

What are the next steps?
I am involved in student research project on ports in Guatemala, Myanmar, Port of Rotterdam and even in Piraeus in Greece. For me, the next steps are to steer these projects in the right direction, to think more broadly. I want to deepen my knowledge of the broader research field, so that I can coach my students better. I find it so interesting that I am devoting my free time to this.

Wiebe de Boer

COASTAL ENGINEERING

DELFT UNIVERSITY OF TECHNOLOGY



Who are you?
My name is Wiebe de Boer. I studied Water Engineering and Management at the University of Twente and now have two jobs. At Deltares I am employed at the Harbour Coastal and Offshore Engineering Department and at Delft University of Technology I work on the Sustainable Ports in Africa research project.

How did you come to be involved with this project?
I find it interesting and challenging to work at the interface between disciplines. In this project there is the environment, governance and stakeholders, economics and engineering. Bridges need to be built, especially conceptual bridges, and I like to contribute to this. There are also interfaces between the developed and the developing world, and between science and practice, and this interests me.

What about your involvement with Tema and Ghana?
I really liked the week-long visit to Tema and Ghana, especially on the perspectives of the Ghanaians on port development, on nature and sustainability. You can't read this in a book, you have to be there. I also learnt about meaningful stakeholder engagement, instead of just ticking a box. I was initially sceptical about what would be possible regarding sustainable port development. But, by actually digging into the information, we discovered that different port development alternatives were investigated beforehand. This shows that more may have been possible than I initially thought in terms of sustainability.

What do you think of Sustainable Ports?
I think sustainability is the future and we should start working on it from today onwards. It is absolutely required to ensure liveability of our planet and opportunities for future generations, not only in ports, but in general. The term sustainability is sometimes too broad for people to grasp the meaning precisely. It's a philosophy that's important to enable the future.

What do you like about the project and why do you participate?
I believe in sustainability and want to contribute by making it practically achievable – not only empty words. We need to translate our learning into practical guidelines, methods and tools so that people can base their actions on our learning in this project. I also like to work on interfaces and get a grip on misunderstandings or misinterpretations so that they can be prevented or resolved. Finally there is a personal challenge for me. Through this project, I can develop my scientific skills and broaden my horizon further.

What is your particular learning?
Something that I had realized, but now really understand is that understanding different perspectives requires time and effort from both sides. If this effort isn't invested then it doesn't work out. Also, that if you dig hard enough there are more different design alternatives than you may originally have thought. It is easy to go for the defaults, but with time and effort more is possible.

What are the next steps?
Within the project, the next steps are to develop the concepts practically so that we provide guidance for use in new projects. Incorporate our lessons in the framework for Sustainable Port Development and in the methods and tools compendium. Otherwise, the lessons will not be picked up by others.

Beyond the project, the next steps include advocating the lessons we have learned to the wider research community and practitioners, and educating them. This requires intensive communication and cooperation between the disciplines relevant for sustainable port development.

Arno Kangeri

MARINE ECOLOGY

WAGENINGEN UNIVERSITY & RESEARCH



How did you come to be involved in Tema port and this project?
My supervising professor for my PhD asked me if I would be interested in working in a project in Ghana on port sustainability for African Ports. And although I had never worked on ports before, this was a natural choice, because not only do I have a Kenyan heritage, but many of my friends live and work in various parts of the continent, I therefore have a great interest in Africa and its challenges.

Why are you interested in participating in the project?
Ports tend to be large impact structures and systems, and the term 'sustainable ports' thus seems a bit of a conundrum in essence when looked at from the perspective of impact on their environment. Therefore, I find it very challenging to participate in finding a minimal impact way of constructing them, and even ways to make the impact beneficial for the wider ecological and social environment of the port. Working to map stakeholder interests, research insight and local expertise is in my view the way to achieve sustainable development. In essence, the integration of ecosystem function into land-use planning, urban development and industrial innovation to achieve greater functionality while reducing environmental impact.

What do you think of Sustainable Ports?
My idea about a sustainable port has changed quite a bit since I started on this project. I have gone from thinking about just nature inclusive design, to broader multifunctional solutions in which many elements of the port have multiple uses and can accommodate multiple fields of interest.

One of the most encouraging things that I encountered while in Ghana doing research for the Sustainable Ports project, is that amongst the users and most of the grassroots stakeholders we spoke to, there is a very good understanding of what sustainability is and why it is important. I think this makes it easier to collaborate towards a more sustainable future. The most limiting factor seems to be the political and economic will.

What in particular did you learn?
I learned a lot of things. I learned for example that I really like to work in a multidisciplinary team. I find it much more interesting and stimulating to discuss problems with people from different backgrounds, rather than with people with the same perspective. And I learned that sustainability is not just about environment and nature, it is also about people and their support for innovations and innovative thinking.

What are the next steps?
A completely new sustainable design is not possible in the current phase of port development, but I think the next steps for the port in Tema would be working towards additive sustainable elements. Trying to find those elements in the design that improve the functioning of the port and at the same time care for environmental consequences, for ecology as well as for people. Furthermore, a large role that Tema port could play in the ports community in West Africa is to push for the kind of thinking that a sustainable port requires.

Baukje Bee Kothuis

STAKEHOLDER-INCLUSIVE DESIGN

DELFT UNIVERSITY OF TECHNOLOGY



Who are you? How did you become involved in this project?
I am Baukje (Bee) Kothuis, I'm a design anthropologist and work partly at Delft University of Technology and partly as an independent consultant. I became involved in this project through Dr. Jill Slinger, who asked if I would support the academic knowledge integration and stakeholder-inclusive design aspects for this project.

Why are you interested in participating in the project?
I was very interested because it is a multidisciplinary and stakeholder-inclusive project. We look from so many different perspectives at potential for sustainable design and future development of sustainable ports in Africa. I'm interested too in design projects where due credit is given to local expertise, not only to academic or formal expert knowledge. It is an art to do this in a way that these groups stimulate rather than hinder each other and ultimately lead to 'wholesome' integrated and sustainable solutions.

As an academic team we developed a great working procedure to learn to understand each other's disciplines, including bi-monthly Research Integration Meetings, mini-lecturing each other on specific expertise and looking into each other's methods. I was very impressed with my Dutch and Ghanaian colleagues collaborating with me in social science workshop practices and loved that they introduced me to their methods. We have co-organized the workshop conducted in February 2017 with a large group of Tema Port stakeholders, ranging from businesses, NGO's, governmental organisations from national to district level. They were consulted on their values, wishes, dreams and nightmares for Tema port development. As academics, we learned a lot from these local experts, and they were also very interested in our disciplinary presentations.

What do you think of Sustainable Ports?
Sustainable ports in my opinion are ports that include in their design the human, economic, political, geophysical, historical, and natural environment. Talking about the African context, I think it is impossible to one-on-one impose solutions that are designed for Asian, American or European countries on Tema or any other African port. Often designers are aware of this for geophysical, but not so much for social contexts. In Ghana for example, and in many other African countries, a very different institutional system exists, where the formal and traditional are intertwined in an intricate way. Locally, people know well how to work with this and handle it. However, when a foreign system is copied to such a specific societal context, in the end there are losers in all respects, which can be people, economy, and ecology.

What is your particular learning?
I learned a lot from doing the interviews for this book. People working and living in and near Tema Port are truly concerned and willing to think along for a better collective future. I liked very much that we could also consult people who are usually not asked for their values and the impact on their livelihood by the port development. And that the sustainable ports design framework is trying to take these insights into account. I'm quite sure that in the end, these efforts will mean a win-win situation for both the port and its environment.

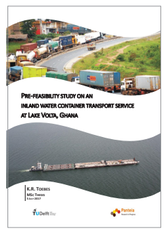
What are the next steps?
The next step is that we bring this book back to the people that we interviewed in Accra, Tema and The Netherlands. And I trust that people will read not only their own pages, but also hear the voices of other stakeholders. By telling stories, listening and informing each other on different perspective and values, people can learn new or unexpected points of view. I hope this book can be part of that and creates opportunities to rearrange opinions and conduct and of course for design of sustainable ports within an African context!

Koos Toebes

HINTERLAND CONNECTIONS

MSc thesis research

DELFT UNIVERSITY OF TECHNOLOGY



Full Title:
'Pre-feasibility study on an inland water container transport service at Lake Volta, Ghana.'

Available from repository.tudelft.nl 'Education' section.

The inland waters of Ghana have a considerable potential for the operation of inland water transport (IWT) services. These services could be part of a multimodal transport corridor, to connect the northern regions and the northern landlocked countries with the industrial southern part of the country, which also includes the port of Tema, one of the gateways of the landlocked countries. However, these waters are currently barely used for freight transportation.

The absence of a high quality IWT service is mainly unfortunate, as Ghana suffers from the consequences of the unilateral road transport market: the many trucks leads to congestions, traffic hazards and long (and unreliable) transport times. Besides this, the freight transportation by road is rather expensive.

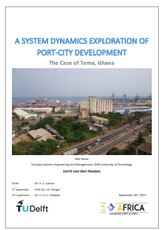
The feasibility of three different IWT services is investigated: roll-on/roll-off of truck/trailer combinations or roll trailers on the one hand, and lift-on/lift-off of containers on the other hand. All the alternatives are based on the concept of barges being pushed by push tugs, as this is the most promising concept from a financial point of view.It can be concluded that the potential transit container market of 8,000 TEU/year, for which the IWT service has to compete for, is too small to result in a profitable service. However, when relocating the transit traffic (clearance) procedures from Tema Port to Buipe Port, the yearly container throughput via Lake Volta will be much higher, making an IWT service viable and profitable. Besides, this relocation will result in extra space in the port of Tema, and can result in more efficient clearance procedures, thereby decreasing the total door-to-door time of transit traffic.

Jorrit van den Houten

SYSTEM DYNAMICS TEMA

MSc thesis research

DELFT UNIVERSITY OF TECHNOLOGY



Full Title:
'A System Dynamics Exploration of Port-City Development: The Case of Tema, Ghana.'

Available from repository.tudelft.nl 'Education' section.

Large-scale infrastructure projects such as ports can have a significant impact on the development of nearby cities. While economic benefits of the port spill over to other regions, often internationally operating firms, port-cities experience negative externalities like environmental and land use issues and traffic congestion. Traditional port impact studies are expensive, and offer a static picture that doesn't take into account the complex adaptive nature of the port-city system.

There is a need for a comprehensive dynamic model of port-city development, incorporating beneficial and negative externalities of port infrastructure development on the city and peri-urban green space. A system dynamics modelling study is performed using the case study of Tema and its port on the Gulf of Guinea in Ghana, to evaluate interventions for sustainable port-city development in an African context. A model is conceptualized and specified, based on Forrester's Urban Dynamics model, fit to cope with relative scarcity of available data. It incorporates and explicitly models road transport congestion, informal settlement and green space encroachment, as well as port infrastructure.

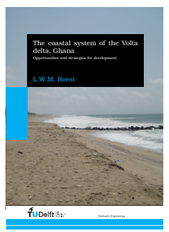
Model testing and use show that the model is fit for the purpose of exploring the long term impacts of port infrastructure investments on the port-city system. Interventions aiming at sustainable development are simulated and evaluated for their performance. Recommendations regarding interventions and the potential future use of the model with stakeholders are made.

Bart Roest

GHANA COASTAL SYSTEM

Commissioned MSc research report

DELFT UNIVERSITY OF TECHNOLOGY



Full Title:
'The coastal system of the Volta delta, Ghana: Opportunities and strategies for development.'

Available from repository.tudelft.nl 'Research' section.

The Volta delta is a very dynamic environment, forming the interface between the Volta river and the Atlantic ocean. The delta is a home for many communities, settled both at the shorelines and more inland. Furthermore the delta provides great natural values and a habitat for many species.

The coastline of the Volta delta suffers from erosion, threatening these communities and natural habitats. Furthermore the delta largely consists of low-lying lands which are prone to flooding. The large scale geology and morphology of the delta are explored and the natural forcing of the coastal system is determined in terms of waves, currents and human impact.

Lastly flood protection and mitigation strategies are explored for the area. It must be noted that in ultimo hard protection measures will not provide a definitive solution. Maintenance is key in any kind of coastal protection strategy. Hard structures are very costly to construct and maintain, although nourishments may not be suitable in every location. More dynamic solutions and retreating from the most hazardous locations would be a better and more sustainable way forward.

This report was commissioned by the Delft Deltas Infrastructure and Mobility Initiative (DIMI) for the Volta Delta special case, a collaboration with the NWO-UDW program 'Sustainable Ports in Africa'. In extension of the workshop in the Volta delta, early October 2017, a literature review is produced to bundle the existing knowledge of the coastal system of the Volta delta and to process this knowledge in practically for design purposes.

Ascha Simons, Chris Wauben, Niels v Leeuwen, Lars Pije

TWO COASTAL LAGOONS

MSc Multidisciplinary Project

DELFT UNIVERSITY OF TECHNOLOGY



Full Title:
'Analysis of two coastal lagoons in Ghana. An investigation of boundary conditions for the redisgn of two lagoons along the Ghanaian coast.'

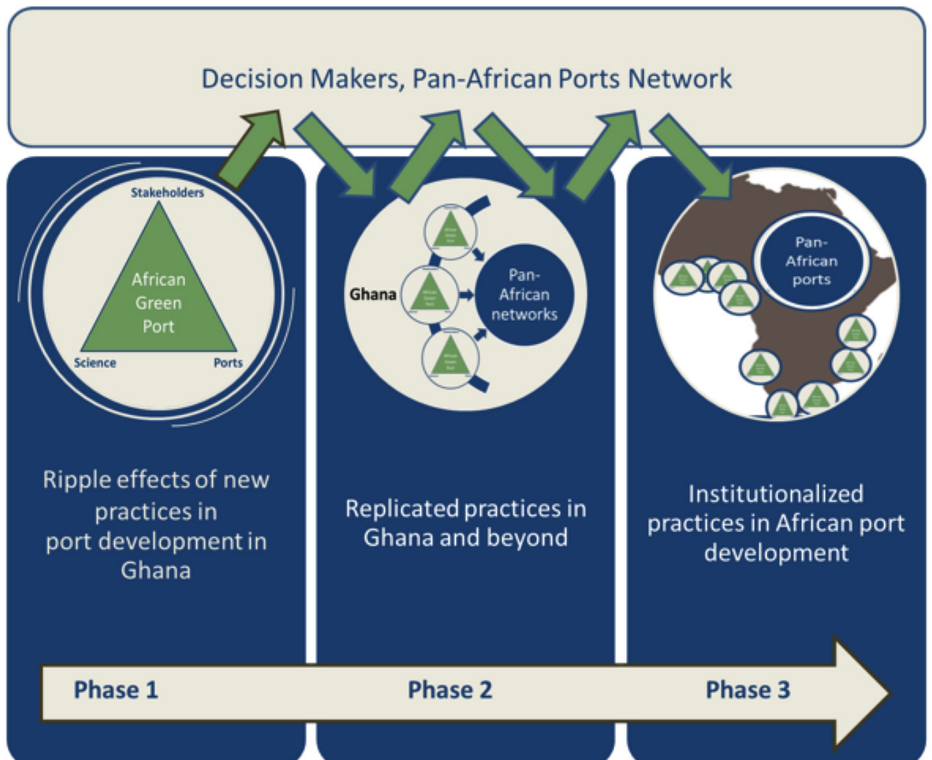
Available from repository.tudelft.nl 'Education' section.

Two polluted Ghanaian lagoons are investigated and possible engineering solutions are suggested and researched.

The first lagoon is the Sakumo lagoon, located between Accra and Tema. This lagoon is connected to the sea through a small culvert, which enables a limited amount of water exchange. Since a few years, fishermen have been unable to catch fish in this lagoon, because invasive plants prevent them from entering the basin. The siltation rate is high due to increasing friction because of these plants and limited sediment outflow through the small culvert. Furthermore, the water quality in the lagoon is poor. An overland flow model and a mixing model are used to evaluate the effects of a change in layout of the lagoon mouth. From this, it follows that a larger connection to the sea is beneficial to the water quality while still maintaining flood safety. However, decisions on the redesign of this lagoon mouth should be made with close regard to stakeholder interests.

The second lagoon is the Klottey lagoon, located in the city centre of Accra. The surroundings of this lagoon are planned to become an area of tourism. Near the lagoon, a new fishing harbour is planned. The water quality in this lagoon is poor and its water flows along the shoreline of Accra. The water quality in and near the lagoon is investigated with the development plans of the area in mind. Furthermore, the shoreline response as a result of these interventions is assessed.

Image below: New stakeholder-inclusive, ecosystem-based port development practices developed and applied inTema, Ghana (Phase 1). Subsequently, the replication of these practices in Ghana and beyond is envisaged, followed by their institutionalization through bottom-up adoption and Pan-African networks. Spreading the message by communicating the stories of stakeholders is critical to the success of Phases 2 and 3.



Jill Slinger, Baukje Bee Kothuis

SPREADING THE MESSAGE

EPILOGUE

The main aim of our Sustainable Ports in Africa project is to develop knowledge for integrated and sustainable ports in Africa. We have drawn on perspectives from 1) engineering, 2) ecology, 3) ecosystem services, and 4) governance to develop an integrated process for port design. Our generic framework and tools for the planning and the design of sustainable ports within the African context are based on a stakeholder-inclusive approach applied in the city of Tema and its port. This approach implies consulting and listening to the voices of stakeholders, as presented in this book.

We are grateful to all of the people who have shared their stories in this book. We consider that the stories of stakeholders about Tema and its port hold a significance beyond their locality. They are evidence of a bottom-up approach to port development in which the multiple perspectives of diverse stakeholders reveal the many facets of a port's impact on a city and her people. As such, they are representative of many ports in Africa where port authorities, planners, educators, scientists, fishermen, freight forwarders, terminal operators, hotel owners, and the urban poor struggle to understand and adjust to the changes associated with port development. By sharing their learning, hopes and concerns, they help to spread the message that port development needs to consider economic, social and environmental needs to be sustainable.

This book is designed to share their call for a move towards balanced and sustainable development and to communicate that researchers are producing a framework and tools for the design of sustainable ports. Most importantly, the broad, integrative, stakeholder-inclusive, ecosystem-based design approach of the Sustainable Ports in Africa project can help in moving an existing port along the path to sustainability.

After reading the book, you can help to spread the message that sustainable ports become possible when a broad, integrative and ecosystem-based design approach is adopted that starts by taking stakeholders into account. When the liveability of the local environment is considered important, a port can grow, can deliver global and regional benefits, and can deliver less local impacts.

For this message to be effective, it needs to spread from port to port, but also needs to be adopted by pan-African port and shipping networks and financiers. If this approach can be spread and translated into developmental outcomes, it will have a far-reaching impact influencing practice and policy along the African coast.

COLOPHON

VOICES ON SUSTAINABLE PORTS IN AFRICA
STORIES FROM TEMA PORT, GHANA

Editors Baukje Kothuis, Jill Slinger
Publisher Delft University Publishers, Delft University Library

Credits for photo's & images:
All photo's courtesy of Baukje Kothuis, except for
page 32: courtesy of Crismon Hotel, Tema;
page 45: courtesy of Azonki Simpi;
pages 48, 50, 65-70: courtesy of interviewees;
page 49: courtesy of Barnabas Apom;
page 57, 59-63 courtesy of Ascha Simons;
image page 74: courtesy of Jill Slinger.

First edition, September 2018
ISBN 978-94-6186-945-6
NUR 950

The production of this book was supported by the Netherlands Organisation for Scientific Research under grant number W07.69.206; Delft Infrastructures and Mobility Initiative (DIMI), and the Multi-Actor Systems Research Program of the faculty of Technology, Policy and Management at TU Delft. Research for the Sustainable Ports in Africa project is carried out by a consortium comprising researchers and staff from the University of Ghana, Delft University of Technology, the VU Amsterdam, Wageningen University, Deltares, IHE-Delft and the Netherlands African Business Council. The project is supported by NGO's and private sector companies in Ghana and The Netherlands.

Copyright © 2018 by the editors and authors, unless otherwise stated. All rights reserved. No part of this publication may be reproduced or stored by any electronic or mechanical means (including copying, photocopying, recording, data storage, and retrieval) or in any other form or language without written permission of the editors.

The sources used preparing this book have been identified to the best of our ability and permission has been granted to use the materials. If a source has been incorrectly identified or appears without the appropriate permission, please contact the publisher and/or editors.



TU Delft

NWO

TU Delft | Deltas, Infrastructures & Mobility Initiative

The voices	Page
Afke van der Woude	50
Ali Amadu	36
Anitra van der Kraan	53
Anton van Elteren	52
Arno Kangeri	70
Ascha Simons	73
Azonko Simpi	45
Barnabas Apom	48
Barnabas Akurigo Amisigo	58
Bart Roest	73
Bas de Vaal	44
Baukje Bee Kothuis	3, 5, 71
Chris Wauben	73
Christopher Afedzi	33
Daan Rijks	52
Dano Roelvink	53
Daphne Willems	52
Derrick Acquah	13
Doglas Amatey Sogbaton	25
Edem Agortey	21
Edem Mahu	59
Edward Kofi Osei	41
Emmanuel Kwadzo Brempong	61
Emmanuel Obulu	13
Faustina Afrah Yeboah	35
Faustina Nomo	15
Francisca Okyere	36
Francis Hukporti	23
Fred Smiet	51
Heleen Vreugdenhil	67
Jacob Tettey	31
Jan Anne van der Veer	51
Jill Slinger	3, 5, 65, 75
John Nyahe	27
John Nyamedji	25
John Tettehocansey Maklalo	25
Jorrit van den Houten	72

	Page
Joseph Agbaga	42
Juliet Adam	15
Justice Atla	17
Ken Kinney	46
Koos Toebes	72
Kwabena Ofosu-Appiah	42
Kwasi Appeaning Addo	5, 57
Lars Pije	73
Liselotte Hagedoorn	66
Martijn de Jong	53
Michael Kwame-Biney	63
Monica Afedzi	33
Moses Teye	25
Nathaniel Agetey Alhao	31
Nene Mantey	25
Nene Akpaglik	25
Niels van Leeuwen	73
Peter Mesah	17
Philip-Neri Jayson-Quashigah	60
Philip Seshie	19
Poonam Taneja	68
Richmond Sogbaton	25
Rob Verheem	52
Robert Baffo Dapaah	42
Selasi Yao Avornyo	62
Solomon Tetteh	29
Tiedo Vellinga	5, 64
Wiebe de Boer	69

Ports provide an essential link to the world market, enabling countries to trade their goods and strengthen their economies. However, the global and regional benefits of port developments do not always translate into benefits to local stakeholders. There is often a mismatch between the positive global and regional effects of port development and the impacts that can be experienced locally. Port development requires a paradigm shift from a conventional economic and engineering oriented approach to a stakeholder-inclusive and environmentally, economically and socially integrated approach to become sustainable.

The research project 'Integrated and Sustainable Port Development in Ghana within an African Context' aims to learn how to develop integrated and sustainable African ports that meet economic, social and environmental needs now and in the future. The Port of Tema, which has evolved from a small fishing village to Ghana's leading industrial centre and seaport in the last decades, forms the focal case study of the research.

A specific objective of the governance component of the project is to find out what local stakeholders value as a sustainable port. This book is an outcome of this endeavor, seeking to present and share the voices of a range of stakeholders on Tema and its port.



ISBN 978-94-6186-945-6

Kothuis, Slinger **VOICES ON SUSTAINABLE PORTS IN AFRICA** STORIES FROM TEMA PORT